

VENDOR MECHANICAL CATALOGUE

FOR

9TH OLEFIN COMPLEX
ETHANE CRACKING PLANT



PARS PETROCHEMICAL COMPANY

VENDOR NAME: DRESSER MASONEILAN

ADDRESS: 3, rue saint Pierre
14110 CONDE SUR NOIREAU

VENDOR REFERENCE: 02.4648/ 02.4909 to 4915

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6465C 30 1541 01 1 CHR 10007	6465C 030 MR 1541 01	CONTROL VALVES
Purchase order n°	Requisition n°	EQUIPMENT / DESCRIPTION

TECHNIP




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VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1. REVISE AND RESUBMIT
<input type="checkbox"/> 2. TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3. NO COMMENT - FINAL ISSUE

THIERRY GRANDRY | TECHNIP
2003.04.08 15:55:07 +01'00'
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STATUS CERTIFIED "FINAL"
ISSUED BY : S. LEGE
DATE : 07/04/03

1	07/04/03	SECOND ISSUE
0	03/09/02	FIRST ISSUE
REV	DATE	DESCRIPTION
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY 	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007 EQUIPMENT NAME: <p style="text-align: center; margin-top: 10px;">Control valves</p>
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	
DRESSER Flow Control	DOCUMENT TITLE :	DOCUMENT CODE :
	VENDOR MECHANICAL CATALOGUE INDEX PURCHASE ORDER : 02-4648 02-4909 to 02-4915	A 0401 A Sheet 01 of 02 Rev. 1

9th OLEFIN COMPLEX

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Customer's Order Number CD 6465 C 30 1541 01 01007

MASONEILAN Serial Number : 02.4648 / 02.4909 to 02.4915

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- Air & Power consumptions
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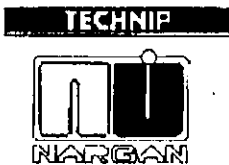
PART 3 ERECTION, OPERATING and MAINTENANCE **MANUALS**

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PART 1

1.1 MATERIAL REQUISITION



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EQUIPMENT / BULK MATERIAL : **Contr. valves & self press. actg. valves**

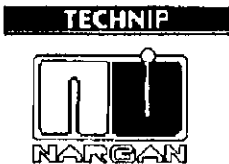
SCOPE OF SUPPLY

The supply is composed of two parts :

Part I : Equipment / Bulk Material Supply

Part II : Documents and Drawings Supply

REV.	DATE (DD/MM/YYYY)	STATUS	WRITTEN BY (name & vice)	CHECKED BY (name & vice)	APPROVED BY (name & vice)
02	17/10/2002	Issue for purchase	T. GRANDRY	F. REGARD	P.E CROUZIER
01	16/07/2002	Issue for purchase	T. GRANDRY	F. REGARD	P.E CROUZIER
00	18/03/2002	Issue for Purchase	T. GRANDRY	F. REGARD	P.E CROUZIER
A	23/08/2001	Issue For Inquiry	JC CHARRE	F. REGARD	P.E CROUZIER
DOCUMENT REVISIONS					



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EQUIPMENT / BULK MATERIAL : **Contr. valves & self press. actg. valves**

PART I : EQUIPMENT / BULK MATERIAL SUPPLY

POSITION	ITEM/TAG	QUANTITY	DESCRIPTION
11011	30-FV-10101	1	CONTROL VALVE
11012	30-FV-10201	1	CONTROL VALVE
11013	30-FV-10301	1	CONTROL VALVE
11014	30-FV-10401	1	CONTROL VALVE
11015	30-FV-10501	1	CONTROL VALVE
11016	30-FV-10601	1	CONTROL VALVE
11017	30-FV-10701	1	CONTROL VALVE
11018	30-FV-10801	1	CONTROL VALVE
11019	30-FV-10901	1	CONTROL VALVE
11021	30-FV-10102	1	CONTROL VALVE
11022	30-FV-10202	1	CONTROL VALVE
11023	30-FV-10302	1	CONTROL VALVE
11024	30-FV-10402	1	CONTROL VALVE
11025	30-FV-10502	1	CONTROL VALVE
11026	30-FV-10602	1	CONTROL VALVE
11027	30-FV-10702	1	CONTROL VALVE
11028	30-FV-10802	1	CONTROL VALVE
11029	30-FV-10902	1	CONTROL VALVE
11031	30-FV-10104	1	CONTROL VALVE
11032	30-FV-10204	1	CONTROL VALVE
11033	30-FV-10304	1	CONTROL VALVE
11034	30-FV-10404	1	CONTROL VALVE
11035	30-FV-10504	1	CONTROL VALVE
11036	30-FV-10604	1	CONTROL VALVE
11037	30-FV-10704	1	CONTROL VALVE
11038	30-FV-10804	1	CONTROL VALVE
11039	30-FV-10904	1	CONTROL VALVE
11041	30-FV-10106	1	CONTROL VALVE
11042	30-FV-10206	1	CONTROL VALVE
11043	30-FV-10306	1	CONTROL VALVE



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EQUIPMENT / BULK MATERIAL : Contr. valves & self press. actg. valves

PART I : EQUIPMENT / BULK MATERIAL SUPPLY

POSITION	ITEM/TAG	QUANTITY	DESCRIPTION
11044	30-FV-10408	1	CONTROL VALVE
11045	30-FV-10508	1	CONTROL VALVE
11046	30-FV-10608	1	CONTROL VALVE
11047	30-FV-10708	1	CONTROL VALVE
11048	30-FV-10808	1	CONTROL VALVE
11049	30-FV-10908	1	CONTROL VALVE
11051	30-FV-10108	1	CONTROL VALVE
11052	30-FV-10208	1	CONTROL VALVE
11053	30-FV-10308	1	CONTROL VALVE
11054	30-FV-10408	1	CONTROL VALVE
11055	30-FV-10508	1	CONTROL VALVE
11056	30-FV-10608	1	CONTROL VALVE
11057	30-FV-10708	1	CONTROL VALVE
11058	30-FV-10808	1	CONTROL VALVE
11059	30-FV-10908	1	CONTROL VALVE
11061	30-FV-10112	1	CONTROL VALVE
11062	30-FV-10212	1	CONTROL VALVE
11063	30-FV-10312	1	CONTROL VALVE
11064	30-FV-10412	1	CONTROL VALVE
11065	30-FV-10512	1	CONTROL VALVE
11066	30-FV-10612	1	CONTROL VALVE
11067	30-FV-10712	1	CONTROL VALVE
11068	30-FV-10812	1	CONTROL VALVE
11069	30-FV-10912	1	CONTROL VALVE
11071	30-FV-10119A	1	CONTROL VALVE
11072	30-FV-10219A	1	CONTROL VALVE
11073	30-FV-10319A	1	CONTROL VALVE
11074	30-FV-10419A	1	CONTROL VALVE
11075	30-FV-10519A	1	CONTROL VALVE
11076	30-FV-10619A	1	CONTROL VALVE



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PART I : EQUIPMENT / BULK MATERIAL SUPPLY

POSITION	ITEM/TAG	QUANTITY	DESCRIPTION
11077	30-FV-10719A	1	CONTROL VALVE
11078	30-FV-10819A	1	CONTROL VALVE
11079	30-FV-10919A	1	CONTROL VALVE
11081	30-FV-10119B	1	CONTROL VALVE
11082	30-FV-10219B	1	CONTROL VALVE
11083	30-FV-10319B	1	CONTROL VALVE
11084	30-FV-10419B	1	CONTROL VALVE
11085	30-FV-10519B	1	CONTROL VALVE
11086	30-FV-10619B	1	CONTROL VALVE
11087	30-FV-10719B	1	CONTROL VALVE
11088	30-FV-10819B	1	CONTROL VALVE
11089	30-FV-10919B	1	CONTROL VALVE
11091	30-FV-10122	1	CONTROL VALVE
11092	30-FV-10222	1	CONTROL VALVE
11093	30-FV-10322	1	CONTROL VALVE
11094	30-FV-10422	1	CONTROL VALVE
11095	30-FV-10522	1	CONTROL VALVE
11096	30-FV-10622	1	CONTROL VALVE
11097	30-FV-10722	1	CONTROL VALVE
11098	30-FV-10822	1	CONTROL VALVE
11099	30-FV-10922	1	CONTROL VALVE
11101	30-FV-10123	1	CONTROL VALVE
11102	30-FV-10223	1	CONTROL VALVE
11103	30-FV-10323	1	CONTROL VALVE
11104	30-FV-10423	1	CONTROL VALVE
11105	30-FV-10523	1	CONTROL VALVE
11106	30-FV-10623	1	CONTROL VALVE
11107	30-FV-10723	1	CONTROL VALVE
11108	30-FV-10823	1	CONTROL VALVE
11109	30-FV-10923	1	CONTROL VALVE



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Contr. valves & self press. actg. valves

PART I : EQUIPMENT / BULK MATERIAL SUPPLY

POSITION	ITEM/TAG	QUANTITY	DESCRIPTION
11111	30-HV-10125	1	CONTROL VALVE
11112	30-HV-10225	1	CONTROL VALVE
11113	30-HV-10325	1	CONTROL VALVE
11114	30-HV-10425	1	CONTROL VALVE
11116	30-HV-10525	1	CONTROL VALVE
11116	30-HV-10625	1	CONTROL VALVE
11117	30-HV-10725	1	CONTROL VALVE
11118	30-HV-10825	1	CONTROL VALVE
11119	30-HV-10925	1	CONTROL VALVE
11121	30-HV-10126	1	CONTROL VALVE
11122	30-HV-10226	1	CONTROL VALVE
11123	30-HV-10326	1	CONTROL VALVE
11124	30-HV-10426	1	CONTROL VALVE
11125	30-HV-10526	1	CONTROL VALVE
11126	30-HV-10626	1	CONTROL VALVE
11127	30-HV-10726	1	CONTROL VALVE
11128	30-HV-10826	1	CONTROL VALVE
11129	30-HV-10926	1	CONTROL VALVE
11131	30-TV-10117	1	CONTROL VALVE
11132	30-TV-10217	1	CONTROL VALVE
11133	30-TV-10317	1	CONTROL VALVE
11134	30-TV-10417	1	CONTROL VALVE
11136	30-TV-10517	1	CONTROL VALVE
11136	30-TV-10617	1	CONTROL VALVE
11137	30-TV-10717	1	CONTROL VALVE
11138	30-TV-10817	1	CONTROL VALVE
11139	30-TV-10917	1	CONTROL VALVE
11141	30-TV-10122	1	CONTROL VALVE
11142	30-TV-10222	1	CONTROL VALVE
11143	30-TV-10322	1	CONTROL VALVE



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PART I : EQUIPMENT / BULK MATERIAL SUPPLY

POSITION	ITEM/TAG	QUANTITY	DESCRIPTION
11144	30-TV-10422	1	CONTROL VALVE
11145	30-TV-10522	1	CONTROL VALVE
11146	30-TV-10622	1	CONTROL VALVE
11147	30-TV-10722	1	CONTROL VALVE
11148	30-TV-10822	1	CONTROL VALVE
11149	30-TV-10922	1	CONTROL VALVE
11151	30-TV-10127	1	CONTROL VALVE
11152	30-TV-10227	1	CONTROL VALVE
11153	30-TV-10327	1	CONTROL VALVE
11154	30-TV-10427	1	CONTROL VALVE
11155	30-TV-10527	1	CONTROL VALVE
11156	30-TV-10627	1	CONTROL VALVE
11157	30-TV-10727	1	CONTROL VALVE
11158	30-TV-10827	1	CONTROL VALVE
11159	30-TV-10927	1	CONTROL VALVE
11161	30-TV-10132	1	CONTROL VALVE
11162	30-TV-10232	1	CONTROL VALVE
11163	30-TV-10332	1	CONTROL VALVE
11164	30-TV-10432	1	CONTROL VALVE
11165	30-TV-10532	1	CONTROL VALVE
11168	30-TV-10632	1	CONTROL VALVE
11167	30-TV-10732	1	CONTROL VALVE
11168	30-TV-10832	1	CONTROL VALVE
11169	30-TV-10932	1	CONTROL VALVE
11171	30-TV-10137	1	CONTROL VALVE
11172	30-TV-10237	1	CONTROL VALVE
11173	30-TV-10337	1	CONTROL VALVE
11174	30-TV-10437	1	CONTROL VALVE
11175	30-TV-10537	1	CONTROL VALVE
11176	30-TV-10637	1	CONTROL VALVE



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POSITION	ITEM/TAG	QUANTITY	DESCRIPTION
11177	30-TV-10737	1	CONTROL VALVE
11178	30-TV-10837	1	CONTROL VALVE
11179	30-TV-10937	1	CONTROL VALVE
11181	30-TV-10142	1	CONTROL VALVE
11182	30-TV-10242	1	CONTROL VALVE
11183	30-TV-10342	1	CONTROL VALVE
11184	30-TV-10442	1	CONTROL VALVE
11185	30-TV-10542	1	CONTROL VALVE
11186	30-TV-10642	1	CONTROL VALVE
11187	30-TV-10742	1	CONTROL VALVE
11188	30-TV-10842	1	CONTROL VALVE
11189	30-TV-10942	1	CONTROL VALVE
11190	30-UV-10127	1	CONTROL VALVE
11191	30-UV-10227	1	CONTROL VALVE
11192	30-UV-10327	1	CONTROL VALVE
11193	30-UV-10427	1	CONTROL VALVE
11194	30-UV-10527	1	CONTROL VALVE
11195	30-UV-10627	1	CONTROL VALVE
11196	30-UV-10727	1	CONTROL VALVE
11197	30-UV-10827	1	CONTROL VALVE
11198	30-UV-10927	1	CONTROL VALVE
12001	30 FV 20001	1	CONTROL VALVE BUTTERFLY FLANGELESS
12002	30-LV-20001	1	CONTROL VALVE CAMFLEX FLANGELESS
12003	30 PV 20001	1	CONTROL VALVE CAMFLEX
12004	30 PV 20022A	1	CONTROL VALVE 41000
12005	30 PV 20022B	1	CONTROL VALVE CAMFLEX
12006	30 PV 20024	1	CONTROL VALVE 41000
12007	30 TV 20024	1	CONTROL VALVE CAMFLEX FLANGELESS
12008	30 PDV 20031	1	CONTROL VALVE VARIMAX
12009	30 LV 20051	1	CONTROL VALVE 21000



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PART I : EQUIPMENT / BULK MATERIAL SUPPLY

POSITION	ITEM/TAG	QUANTITY	DESCRIPTION
12010	30 FV 20061	1	CONTROL VALVE CAMFLEX FLANGELESS
12011	30 LV 20071	1	CONTROL VALVE CAMFLEX FLANGELESS
12012	30 FV 20071	1	CONTROL VALVE 41000
12013	30 LV 20081	1	CONTROL VALVE 21000
12014	30 FV 20081	1	CONTROL VALVE 21000
12015	30 PV 20083A	1	CONTROL VALVE BUTTERFLY FLANGELESS
12016	30 PV 20083B	1	CONTROL VALVE 41000
12017	30 LV 20091	1	CONTROL VALVE CAMFLEX
X 12018	30-UV-20001	1	CONTROL VALVE (HOLD)
X 12019	30-UV-20011	1	CONTROL VALVE (HOLD)
13001	30 PV 30002	1	CONTROL VALVE BUTTERFLY FLANGELESS
13002	30 LV30004	1	CONTROL VALVE 21000
13003	30 LV 30022	1	CONTROL VALVE 21000
13004	30 LV 30024	1	CONTROL VALVE CAMFLEX FLANGELESS
13005	30 LV 30032	1	CONTROL VALVE CAMFLEX FLANGELESS
13006	30 LV 30042	1	CONTROL VALVE CAMFLEX FLANGELESS
13007	30 UV 30051	1	CONTROL VALVE CAMFLEX
13008	30LV 30052	1	CONTROL VALVE CAMFLEX
13009	30 FV30071	1	CONTROL VALVE 21000
13010	30 LV 30071	1	CONTROL VALVE CAMFLEX FLANGELESS
13011	30 TV 30071	1	CONTROL VALVE CAMFLEX
13012	30 LV 30073	1	CONTROL VALVE CAMFLEX
13013	30 LV 30075	1	CONTROL VALVE 21000
13014	30 LV 30093	1	CONTROL VALVE 21000
13015	30 UV 30101	1	CONTROL VALVE 21000
13016	30 LV 30102	1	CONTROL VALVE CAMFLEX
13017	30 LV 30103	1	CONTROL VALVE 21000
13018	30 TV 30104	1	CONTROL VALVE BUTTERFLY FLANGELESS
13019	30 TV 30107	1	CONTROL VALVE 21000
13020	30 KV 30141	1	CONTROL VALVE 41000



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POSITION	ITEM/TAG	QUANTITY	DESCRIPTION
13021	30 KV 30142	1	CONTROL VALVE CAMFLEX
13022	30 KV 30143	1	CONTROL VALVE 41000
13023	30 KV 30144	1	CONTROL VALVE CAMFLEX
13024	30 FV 30151	1	CONTROL VALVE 41000
13025	30 LV 30151	1	CONTROL VALVE 21000
13026	30 FV 30152	1	CONTROL VALVE 21000
13027	30 LV 30153	1	CONTROL VALVE 21000
13028	30 PV 30153	1	CONTROL VALVE 41000
13029	30 TV 30154	1	CONTROL VALVE 21000
13030	30 TV 30155	1	CONTROL VALVE 41000
13031	30 FV 30181	1	CONTROL VALVE CAMFLEX
13032	30 LV 30181	1	CONTROL VALVE CAMFLEX
13033	30 PV 30162	1	CONTROL VALVE CAMFLEX FLANGELESS
13034	30 LV 30164	1	CONTROL VALVE CAMFLEX FLANGELESS
13035	30 FV 30171	1	CONTROL VALVE CAMFLEX
M 13036	30 LV 30701A	1	CONTROL VALVE CAMFLEX FLANGELESS
13037	30 LV 30701B	1	CONTROL VALVE CAMFLEX FLANGELESS
14001	30 HV 40033	1	CONTROL VALVE 41000
14002	30 LV 40051	1	CONTROL VALVE 41000
14003	30 TV 40053	1	CONTROL VALVE VARIMAX
14004	30 LV 40053	1	CONTROL VALVE 41000
14005	30 LV 40081	1	CONTROL VALVE 21000
14006	30 PV 40081C	1	CONTROL VALVE 41000
14007	30 LV 40083	1	CONTROL VALVE 21000
14008	30 LV 40065	1	CONTROL VALVE 21000
14009	30 PV 40071	1	CONTROL VALVE VARIMAX
14010	30 FV 40071A	1	CONTROL VALVE VARIMAX
14011	30 FV 40071B	1	CONTROL VALVE 41000
14012	30 PV 40073	1	CONTROL VALVE 21000
14013	30 TV 40075A	1	CONTROL VALVE BUTTERFLY FLANGELESS



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POSITION	ITEM/TAG	QUANTITY	DESCRIPTION
14014	30 TV 40075B	1	CONTROL VALVE VARIMAX
14015	30 FV 40093	1	CONTROL VALVE CAMFLEX
14016	30 PV 40102	1	CONTROL VALVE BUTTERFLY FLANGELESS
14017	30 LV 40103	1	CONTROL VALVE CAMFLEX
14018	30 TV 40104	1	CONTROL VALVE VARIMAX
14019	30 FV 40108	1	CONTROL VALVE 21000
14020	30 PV 40121	1	CONTROL VALVE 41000
14021	30 LV 40121	1	CONTROL VALVE CAMFLEX
14022	30 FV 40121	1	CONTROL VALVE CAMFLEX
14023	30 FV 40132	1	CONTROL VALVE 21000
14024	30 FV 40135	1	CONTROL VALVE 41000
14025	30 UV 40138	1	CONTROL VALVE 21000
14026	30 PV 40138	1	CONTROL VALVE CAMFLEX
14027	30 FV 40137	1	CONTROL VALVE 41000
14028	30 TV 40137	1	CONTROL VALVE CAMFLEX
14029	30 FV 40138	1	CONTROL VALVE 21000
14030	30 FV 40139	1	CONTROL VALVE VARIMAX FLANGELESS
14031	30 TV 40139	1	CONTROL VALVE 21000
14032	30 FV 40151	1	CONTROL VALVE 41000
14033	30 TV 40158	1	CONTROL VALVE 41000
14034	30 LV 40171	1	CONTROL VALVE CAMFLEX
14035	30 FV 40181	1	CONTROL VALVE VARIMAX
14036	30 LV 40181	1	CONTROL VALVE CAMFLEX
14037	30 FV 40182A	1	CONTROL VALVE 41000
14038	30 FV 40182B	1	CONTROL VALVE CAMFLEX
14039	30 PV 40184	1	CONTROL VALVE 41000
14040	30 PV 40201	1	CONTROL VALVE VARIMAX
14041	30 LV 40207	1	CONTROL VALVE CAMFLEX
14042	30 FV 40211A	1	CONTROL VALVE VARIMAX
14043	30 FV 40211B	1	CONTROL VALVE VARIMAX



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PART I : EQUIPMENT / BULK MATERIAL SUPPLY

POSITION	ITEM/TAG	QUANTITY	DESCRIPTION
14044	30 FV 40212	1	CONTROL VALVE 21000
14045	30 LV 40222	1	CONTROL VALVE 21000
14046	30 LV 40224	1	CONTROL VALVE CAMFLEX
14047	30 LV 40226	1	CONTROL VALVE CAMFLEX
15001	30 UV 50002	1	CONTROL VALVE 21000
15002	30 LV 50021	1	CONTROL VALVE CAMFLEX
15003	30 FV 50021	1	CONTROL VALVE 41000
15004	30 PV 50022A	1	CONTROL VALVE VARIMAX
15005	30 PV 50022B	1	CONTROL VALVE 21000
15006	30 PV 50023A	1	CONTROL VALVE CAMFLEX
15007	30 PV 50023B	1	CONTROL VALVE CAMFLEX
15008	30 PV 50031	1	CONTROL VALVE 41000
15009	30 LV 50031	1	CONTROL VALVE 21000
15010	30 LV 50033	1	CONTROL VALVE CAMFLEX
15011	30 LV 50041	1	CONTROL VALVE CAMFLEX
15012	30 LV 50043	1	CONTROL VALVE CAMFLEX
15013	30 LV 50045	1	CONTROL VALVE CAMFLEX
15014	30 LV 50051	1	CONTROL VALVE 21000
15015	30 LV 50061	1	CONTROL VALVE CAMFLEX
M 15016	30 TV 50062	1	CONTROL VALVE 21000
M 15017	30 PV 50071	1	CONTROL VALVE 21000
M 15018	30 TV 50072	1	CONTROL VALVE 21000
15019	30 UV 50102	1	CONTROL VALVE CAMFLEX
15020	30 PV 50105	1	CONTROL VALVE CAMFLEX
15021	30 PV 50121	1	CONTROL VALVE 41000
15022	30 LV 50122	1	CONTROL VALVE 41000
15023	30 PV 50132A	1	CONTROL VALVE BUTTERFLY FLANGELESS
15024	30 PV 50132B	1	CONTROL VALVE BUTTERFLY FLANGELESS
15025	30 TV 50141	1	CONTROL VALVE 21000
15026	30 LV 50143	1	CONTROL VALVE VARIMAX



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PART I : EQUIPMENT / BULK MATERIAL SUPPLY

M
M

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POSITION	ITEM/TAG	QUANTITY	DESCRIPTION
15027	30 TV 50152	1	CONTROL VALVE 41000
15028	30 LV 50701A	1	CONTROL VALVE CAMFLEX FLANGELESS
15029	30 LV 50701B	1	CONTROL VALVE CAMFLEX FLANGELESS
16001	30 LV 60001A	1	CONTROL VALVE 21000
16002	30 LV 60001B	1	CONTROL VALVE 21000
16003	30 PV 60007	1	CONTROL VALVE CAMFLEX FLANGELESS
16004	30 PV 60008A	1	CONTROL VALVE 21000
16005	30 PV 60008B	1	CONTROL VALVE 21000
16006	30 FV 60011	1	CONTROL VALVE 21000
16007	30 LV 60021	1	CONTROL VALVE 21000
16008	30 LV 60023	1	CONTROL VALVE CAMFLEX
16009	30 LV 60031	1	CONTROL VALVE BUTTERFLY FLANGELESS
16010	30 PV 60032	1	CONTROL VALVE VARIMAX
16011	30 LV 60034A	1	CONTROL VALVE CAMFLEX
16012	30 LV 60034B	1	CONTROL VALVE CAMFLEX
16013	30 PV 60061	1	CONTROL VALVE HOLD
16014	30 PV 60102A	1	CONTROL VALVE 41000
16015	30 PV 60102B	1	CONTROL VALVE 41000
16016	30 LV 60121	1	CONTROL VALVE CAMFLEX FLANGELESS
16017	30 PV 60122A	1	CONTROL VALVE 41000
16018	30 PV 60122B	1	CONTROL VALVE VARIMAX
16019	30LV 60211	1	CONTROL VALVE CAMFLEX FLANGELESS
16020	30 PV 60211A	1	CONTROL VALVE 21000
16021	30 PV 60211B	1	CONTROL VALVE 21000
16022	30 PV 60401	1	CONTROL VALVE 41000
16023	30 TV 60402	1	CONTROL VALVE 78100
16024	30 TV 60406A	1	CONTROL VALVE 78100
16025	30 TV 60406B	1	CONTROL VALVE 21000
16026	30 PV 60411	1	CONTROL VALVE 78100
16027	30 TV 60416	1	CONTROL VALVE 21000



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9 TH OLEFIN COMPLEX

ETHANE CRACKING PLANT

EQUIPMENT / BULK MATERIAL :

Contr. valves & self press. actg. valves

PART I : EQUIPMENT / BULK MATERIAL SUPPLY

POSITION	ITEM/TAG	QUANTITY	DESCRIPTION	
	16028	30 TV 80428	1	CONTROL VALVE 21000
	16029	30 PV 80427	1	CONTROL VALVE 41000
M	16030	30-LV-60001	1	CONTROL VALVE 41000
X	16031	30-LV-80221	1	CONTROL VALVE (HOLD)
X	16032	30-LV-60222	1	CONTROL VALVE (HOLD)
	16033	30-PCV-60063	1	CONTROL VALVE 28000+PRESSURE CONTROLLER 2707
	17001	30 PV 70002	1	CONTROL VALVE 41000
	17002	30 FV 70021	1	CONTROL VALVE 21000
M	17003	30 PV 70023A	1	CONTROL VALVE 41000
	17004	30 PV 70023B	1	CONTROL VALVE 21000
	17005	30 PV 70023C	1	CONTROL VALVE CAMFLEX
	17006	30 FV 70024	1	CONTROL VALVE 21000
	17007	30 LV 70041	1	CONTROL VALVE 41000
	17008	30 PV 70042	1	CONTROL VALVE CAMFLEX
	17009	30 TV 70048	1	CONTROL VALVE CAMFLEX
	17010	30 FV 70081	1	CONTROL VALVE 21000
	17011	30 PV 70063A	1	CONTROL VALVE 21000
	17012	30 PV 70083B	1	CONTROL VALVE 21000
	17013	30 PV 70083C	1	CONTROL VALVE CAMFLEX
	17014	30 FV 70064	1	CONTROL VALVE 21000
	17015	30 FV 70065	1	CONTROL VALVE 21000
	17016	30 PV 70081A	1	CONTROL VALVE 21000
	17017	30 PV 70081B	1	CONTROL VALVE CAMFLEX FLANGELESS
	17018	30 FV 70082	1	CONTROL VALVE 21000
	17019	30 FV 70091	1	CONTROL VALVE CAMFLEX
	17020	30 PV 70091	1	CONTROL VALVE 21000
	17021	30 PV 70094A	1	CONTROL VALVE 21000
	17022	30 PV 70094B	1	CONTROL VALVE CAMFLEX
	18001	30 PCV 80043	1	SELF PRESSURE ACTG VALVE 535V
	18002	30 PCV 80045	1	SELF PRESSURE ACTG VALVE 535V



PAR6 PETROCHEMICAL COMPANY

9 TH OLEFIN COMPLEX

ETHANE CRACKING PLANT

EQUIPMENT / BULK MATERIAL :

Contr. valves & self press. actg. valves

PART I : EQUIPMENT / BULK MATERIAL SUPPLY

POSITION	ITEM/TAG	QUANTITY	DESCRIPTION
18003	30-PCV-80029	1	CONTROL VALVE 21000+PRESSURE CONTROLLER 2707
18004	30-PCV-80049	1	CONTROL VALVE 21000+PRESSURE CONTROLLER 2707
20002	030-1541-01/020002	1	SET OF COMMISSIONING AND START UP SPARE PARTS



9 TH OLEFIN COMPLEX

ETHANE CRACKING PLANT

EQUIPMENT / BULK MATERIAL :

Contr. valves & self press. actg. valves

PART II : DOCUMENTS AND DRAWINGS SUPPLY

DOC CODE (1)	DESCRIPTION	FIRST ISSUE			FINAL ISSUE (5)
		ISSUE DATE (2)	PURPOSE (3)	QUANTITY TYPE (4)	QUANTITY TYPE (4)
A0001	List of Vendor's documents and drawings	+4W	IFR	3C+E	15C+E
A0106	Painting specification	+5W	IFR	3C+E	15C+E
A0401	Vendor Data Book (VDB)	0D before delivery	IFR		14C+4CD
A0401A	Mechanical catalogue index	4M before delivery	IFR	3C	
A3101	Instrument data sheets	+6W	IFR	3C+E	15C+E
A3102	Calculation sheets (valves, actuators, safety devices, flow measuring devices)	+6W	IFR	3C+E	15C+E
A3106	Calibration/setting data sheets, calibration curves, calibration procedure <i>Included in A3101/B1103</i>	2M before delivery	IFR	3C+E	15C+E
A3107	Instrument documentation	2M before delivery	Info	3C+E	15C+E
* A3201	Outline dimensional drawings (with weight indication)	+6W	IFR	3C+E	16C+E
A3301	Electrical power consumption, instrument air consumption, heat dissipation data sheets <i>To be incorporated in A3101</i>	+10W	IFR	3C+E	15C+E
* A3303	Electrical, pneumatic, hydraulic connection block diagrams <i>Included in A3201</i>	+10W	IFR	3C+E	15C+E
A5001	Special precautions for handling prior erection	2M before delivery	IFR	3C+E	15C+E
A5002	Recommendations for storage prior and during erection	2M before delivery	IFR	3C+E	15C+E
A5015	Installation, start-up and commissioning manuals	1M before delivery	IFR	3C+E	15C+E
A5016	Operation and maintenance manuals <i>Included in A5015</i>	1M before delivery	IFR	3C+E	15C+E
B1002	Fabrication and quality control plan	+12W	IFR	3C+E	15C+E
B1003	Inspection release note	1W before delivery	Info	3C	13C



9 TH OLEFIN COMPLEX

ETHANE CRACKING PLANT

EQUIPMENT / BULK MATERIAL : **Contr. valves & self press. actg. valves**

PART II : DOCUMENTS AND DRAWINGS SUPPLY

X

DOC CODE (1)	DESCRIPTION	FIRST ISSUE			FINAL ISSUE
		ISSUE DATE (2)	PURPOSE (3)	QUANTITY TYPE (4)	QUANTITY TYPE (5)
B1004	Inspection book	1W before delivery	IFR		13C
B1004A	Inspection book index	1W before delivery	IFR	3C	
B1103	Test procedures	2M before delivery	IFR	3C+E	15C+E
B1201	PWHT Procedure	+5M	IFR	3C+E	15C+E
B1203	Welder qualification certificates	+5M	Info	3C	13C
B1205	Weld radiographs, dye penetration test reports	1W before delivery	Info	3C	13C
B1209	Hydraulic and other shop test reports	1W before delivery	Info	3C	13C
B1210	Material certificates	1W before delivery	Info	3C	13C
B1214	Certificates for use of electrical apparatus in hazardous area	1W before delivery	Info	3C	13C
B1215	Calibration reports	1W before delivery	Info	3C	13C
C1001	Engineering, procurement, manufacturing and test schedule	+6W	IFR	3C+E	-
* C1002	Physical progress report (monthly)	+6W	IFR	3C+E	-
C1003	Sub-Vendor's and main Suppliers' list	+6W	Info	3C+E	-
C1005	Unpriced copy of main sub-orders	+6W	Info	3C+E	-
C1006	List of spare parts for (tbd) years operation <i>tbd = 2 as per SPIR Form</i>	+16W	IFR	3C+E	15C+E
C1008	Recommendations for protection during transportation	4M before delivery	Info	3C+E	-
C1011	Packing list	2W before delivery	Info	3C+E	-
C1012	Shipping documents, Transport authorization	2W before delivery	Info	3C+E	15C+E
C1013	Origine Certificates of Equipments	+5M	IFR	3C	3C

TECHNIP



PARS PETROCHEMICAL COMPANY

Project N° - Unit

Material Code

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Rev.

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9 TH OLEFIN COMPLEX

ETHANE CRACKING PLANT

EQUIPMENT / BULK MATERIAL :

Contr. valves & self press. actg. valves

NOTES :

- (1) * Priority document subject to penalization or term of payment
- (2) ISSUE DATE : number of D = Days / W = Weeks / M = Months after purchase order effective date (unless otherwise specified)
- (3) PURPOSE : IFR = Issue for review and comments / INFO = Issue for information
- (4) QUANTITY : per type / TYPE : C = Copy, T = Transparency, P = Polyester, M = Microfilm, E = Electronic file, CD = CDROM
- (5) FINAL ISSUE : Document without comments (with document status = 3)

1.2 LIST OF EQUIPMENT

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
		Qté =	358					
02-04648-01		30FV 10101 to 30FV 10901	9	10	1	Varipak	1"	300#-RF
02-04648-02		30FV 10102 to 30FV 10902	9	10	3	Paramax	6"	300#-RF
02-04648-03		30FV 10104 to 30FV 10904	9	10	3	Paramax	6"	300#-RF
02-04648-04		30FV 10106 to 30FV 10906	9	10	2	41000	6"	300#-RF
02-04648-05		30FV 10108 to 30FV 10908	9	10	2	41000	6"	300#-RF
02-04648-06		30FV 10112 to 30FV 10912	9	10	3	41000	4" x 2"	1500"-RTJ
02-04648-07		30FV 10119A to 30FV 10919	9	10	2	41000	8"	300#-RF
02-04648-08		30FV 10119B to 30FV 10919	9	10	2	21000	3"	300#-RF
02-04648-09		30FV 10122 to 30FV 10922	9	10	1	Camflex	4"	300#-RF
02-04648-10		30FV 10123 to 30FV 10923	9	10	1	Camflex	4"	300#-RF
02-04648-11		30HV 10125 to 30HV 10925	9	10	3	41000	6" x 2"	2500#-RTJ
02-04648-12		30HV 10126 to 30HV 10926	9	10	3	78100	2"	1500#-RTJ
02-04648-13		30TV 10117 to 30TV 10917	9	10	1	Camflex	4"	300#-RF
02-04648-14		30TV 10122 to 30TV 10922	9	10	1	Camflex	4"	300#-RF
02-04648-15		30TV 10127 to 30TV 10927	9	10	1	Camflex	4"	300#-RF
02-04648-16		30TV 10132 to 30TV 10932	9	10	1	Camflex	4"	300#-RF
02-04648-17		30TV 10137 to 30TV 10937	9	10	1	Camflex	4"	300#-RF
02-04648-18		30TV 10142 to 30TV 10942	9	10	1	Camflex	4"	300#-RF
02-04648-19		30TV 10127 to 30TV 10927	9	10	3	41000	4"	1500#RTJ
02-04909-01	12001	30FV 20001	1	20	3	Butterfly flangeless	14"	150#-RF
02-04909-02	12002	30LV 20001	1	20	1	Camflex flangeless	4"	300#-RF
02-04909-03	12003	30PV 20001	1	20	1	Camflex	3"	300#-RF
02-04909-04	12004	30PV 20022A	1	20	3	41000	12"	300#-RF
02-04909-05	12005	30PV 20022B	1	20	3	Camflex	6"	300#-RF
02-04909-06	12006	30PV 20024	1	20	2	41000	8"	300#-RF
02-04909-07	12007	30TV 20024	1	20	1	Camflex flangeless	6"	300#-RF
02-04909-08	12008	30PDV 20031	1	20	3	Varimax	16"	300#-RF

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
02-04909-09	12009	30LV 20051	1	20	2	21000	1"	300#-RF
02-04909-10	12010	30FV 20061	1	20	1	Camflex flangeless	4"	300#-RF
02-04909-11	12011	30LV 20071	1	20	1	Camflex flangeless	6"	300#-RF
02-04909-12	12012	30FV 20071	1	20	2	41000	6"	300#-RF
02-04909-13	12013	30LV 20081	1	20	2	21000	1"	600#RF
02-04909-14	12014	30FV 20081	1	20	2	21000	4"	300#-RF
02-04909-15	12015	30PV 20083A	1	20	3	Butterfly Flangeless	16"	300#-RF
02-04909-16	12016	30PV 20083B	1	20	3	41000	16"	300#-RF
02-04909-17	12017	30LV 20091	1	20	1	Camflex	6"	300#-RF
02-04910-01	13001	30PV 30002	1	30	3	Butterfly Flangeless	24"	150#-RF
02-04910-02	13002	30LV 30004	1	30	1	21000	1"	300#-RF
02-04910-03	13003	30LV 30022	1	30	1	21000	1"	300#-RF
02-04910-04	13004	30LV 30024	1	30	1	Camflex flangeless	2"	300#-RF
02-04910-05	13005	30LV 30032	1	30	1	Camflex flangeless	1 1/2"	300#-RF
02-04910-06	13006	30LV 30042	1	30	1	Camflex flangeless	1"	300#-RF
02-04910-07	13007	30UV 30051	1	30	1	Camflex	6"	300#-RF
02-04910-08	13008	30LV 30052	1	30	1	Camflex flangeless	1"	300#-RF
02-04910-09	13009	30FV 30071	1	30	1	21000	1"	300#-RF
02-04910-10	13010	30LV 30071	1	30	1	Camflex flangeless	1"	300#-RF
02-04910-11	13011	30TV 30071	1	30	1	Camflex	3"	300#-RF
02-04910-12	13012	30LV 30073	1	30	1	Camflex	1"	300#-RF
02-04910-13	13013	30LV 30075	1	30	1	21000	1"	300#-RF
02-04910-14	13014	30LV 30093	1	30	1	21000	1"	300#-RF
02-04910-15	13015	30UV 30101	1	30	1	21000	3"	300#-RF
02-04910-16	13016	30LV 30102	1	30	1	Camflex	4"	300#-RF
02-04910-17	13017	30LV 30103	1	30	1	21000	1"	300#-RF
02-04910-18	13018	30TV 30104	1	30	3	Butterfly Flangeless	12"	150#-RF
02-04910-19	13019	30TV 30107	1	30	1	21000	1"	300#-RF
02-04910-20	13020	30KV 30141	1	30	2	41000	4"x2"x4"	300#-RF

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
02-04910-21	13021	30KV 30142	1	30	1	Camflex	4"	300#-RF
02-04910-22	13022	30KV 30143	1	30	2	41000	4"x2"x4"	300#-RF
02-04910-23	13023	30KV 30144	1	30	1	Camflex	4"	300#-RF
02-04910-24	13024	30FV 30151	1	30	2	41000	6"x4"x6"	300#-RF
02-04910-25	13025	30LV 30151	1	30	1	21000	1"	300#-RF
02-04910-26	13026	30FV 30152	1	30	1	21000	3"	300#-RF
02-04910-27	13027	30LV 30153	1	30	1	21000	2"	600#-RF
02-04910-28	13028	30PDV 30153	1	30	2	41000	12"	300#-RF
02-04910-29	13029	30TV 30154	1	30	1	21000	3"	300#-RF
02-04910-30	13030	30TV 30155	1	30	2	41000	6"	300#-RF
02-04910-31	13031	30FV 30161	1	30	1	Camflex	1 1/2"	300#-RF
02-04910-32	13032	30LV 30161	1	30	1	Camflex	1"	300#-RF
02-04910-33	13033	30PV 30162	1	30	1	Camflex flangeless	2"	300#-RF
02-04910-34	13034	30LV 30164	1	30	1	Camflex flangeless	1"	300#-RF
02-04910-35	13035	30FV 30171	1	30	1	Camflex	1 1/2"	300#-RF
	13036	30LV 30701A CANCELLED		30		Camflex flangeless	4"	300#-RF
02-04910-37	13037	30LV 30701B	1	30	1	Camflex flangeless	3"	300#-RF
02-04910-38	13036	30 LV 30701A	1		3	Camflex	6"	
02-04911-01	14001	30HV 40033	1	40	2	41000	8"	300#-RF
02-04911-02	14002	30LV 40051	1	40	3	41000	4"x2"x4"	300#-RF
02-04911-03	14003	30TV 40053	1	40	2	Varimax	6"	300#-RF
02-04911-04	14004	30LV 40053	1	40	3	41000	6"x3"x6"	300#-RF
02-04911-05	14005	30LV 40061	1	40	3	21000	3"	300#-RF
02-04911-06	14006	30PV 40061C	1	40	3	41000	6"x3"x6"	300#-RF
02-04911-07	14007	30LV 40063	1	40	3	21000	2"	300#-RF
02-04911-08	14008	30LV 40065	1	40	3	21000	2"	300#-RF
02-04911-09	14009	30PV 40071	1	40	3	Varimax	8"	300#-RF
02-04911-10	14010	30FV 40071A	1	40	2	Varimax	8"	300#-RF
02-04911-11	14011	30FV 40071B	1	40	3	41000	4"x2"x4"	300#-RF
02-04911-12	14012	30PV 40073	1	40	3	21000	2"	300#-RF

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
02-04911-13	14013	30TV 40075A	1	40	3	Butterfly Flangeless	12"	300#-RF
02-04911-14	14014	30TV 40075B	1	40	2	Varimax	6"	300#-RF
02-04911-15	14015	30FV 40093	1	40	1	Camflex	3"	300#-RF
02-04911-16	14016	30PV 40102	1	40	3	Butterfly Flangeless	14"	300#-RF
02-04911-17	14017	30LV 40103	1	40	1	Camflex	4"	300#-RF
02-04911-18	14018	30TV 40104	1	40	2	Varimax	10"	300#-RF
02-04911-19	14019	30FV 40108	1	40	1	21000	1 1/2"	300#-RF
02-04911-20	14020	30PV 40121	1	40	3	41000	2"x8"x12	300#-RF
02-04911-21	14021	30LV 40121	1	40	1	Camflex	6"	300#-RF
02-04911-22	14022	30FV 40121	1	40	3	Camflex	3"	300#-RF
02-04911-23	14023	30FV 40132	1	40	1	21000	1"	300#-RF
02-04911-24	14024	30FV 40135	1	40	2	41000	6"	300#-RF
02-04911-25	14025	30UV 40136	1	40	1	21000	4"	300#-RF
02-04911-26	14026	30PV 40136	1	40	1	Camflex	1"	300#-RF
02-04911-27	14027	30FV 40137	1	40	2	41000	10"	300#-RF
02-04911-28	14028	30TV 40137	1	40	1	Camflex	2"	300#-RF
02-04911-29	14029	30FV 40138	1	40	1	21000	1"	300#-RF
02-04911-30	14030	30FV 40139	1	40	2	Varimax flangeless	8"	300#-RF
02-04911-31	14031	30TV 40139	1	40	1	21000	1"	300#-RF
02-04911-32	14032	30FV 40151	1	40	2	41000	4"	300#-RF
02-04911-33	14033	30TV 40158	1	40	3	41000	4"	2500#-RTJ
02-04911-34	14034	30LV 40171	1	40	3	Camflex	3"	300#-RF
02-04911-35	14035	30FV 40181	1	40	2	Varimax	12"	300#-RF
02-04911-36	14036	30LV 40181	1	40	1	Camflex	6"	300#-RF
02-04911-37	14037	30FV 40182A	1	40	3	41000	6"x4"x6"	300#-RF
02-04911-38	14038	30FV 40182B	1	40	1	Camflex	6"	300#-RF
02-04911-39	14039	30PV 40184	1	40	3	41000	8"	300#-RF
02-04911-40	14040	30PV 40201	1	40	2	Varimax	12"	300#-RF
02-04911-41	14041	30LV 40207	1	40	2	Camflex	10"	300#-RF
02-04911-42	14042	30FV 40211A	1	40	2	Varimax	12"	300#-RF

VENDOR NAME : DRESSER MASONELAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
02-04911-43	14043	30FV 40211B	1	40	2	Camflex	8"	300#-RF
02-04911-44	14044	30FV 40212	1	40	3	21000	1"	300#-RF
02-04911-45	14045	30LV 40222	1	40	3	21000	3"	300#-RF
02-04911-46	14046	30LV 40224	1	40	3	Camflex	8"	300#-RF
02-04911-47	14047	30LV 40226	1	40	3	Camflex	4"	300#-RF
02-04912-01	15001	30UV 50002	1	50	2	21000	3"	300#-RF
02-04912-02	15002	30LV 50021	1	50	2	Camflex	4"	300#-RF
02-04912-03	15003	30FV 50021	1	50	2	41000	6"	300#-RF
02-04912-04	15004	30PV 50022A	1	50	2	Varimax	10"	300#-RF
02-04912-05	15005	30PV 50022B	1	50	3	21000	6"	300#-RF
02-04912-06	15006	30PV 50023A	1	50	2	Camflex	6"	300#-RF
02-04912-07	15007	30PV 50023B	1	50	2	Camflex	6"	300#-RF
02-04912-08	15008	30PV 50031	1	50	3	41000	4"x2"x4"	300#-RF
02-04912-09	15009	30LV 50031	1	50	3	21000	4"	300#-RF
02-04912-10	15010	30LV 50033	1	50	2	Camflex	4"	300#-RF
02-04912-11	15011	30LV 50041	1	50	3	Camflex	3"	300#-RF
02-04912-12	15012	30LV 50043	1	50	3	Camflex	3"	300#-RF
02-04912-13	15013	30LV 50045	1	50	3	Camflex	2"	300#-RF
02-04912-14	15014	30LV 50051	1	50	3	21000	6"	300#-RF
02-04912-15	15015	30LV 50061	1	50	3	Camflex	4"	300#-RF
02-04912-16	15016	30TV 50062	1	50	3	21000	3"	300#-RF
02-04912-17	15017	30PV 50071	1	50	3	21000	4"	300#-RF
02-04912-18	15018	30TV 50072	1	50	3	21000	2"	300#-RF
02-04912-19	15019	30UV 50102	1	50	2	Camflex	3"	300#-RF
02-04912-20	15020	30PV 50105	1	50	2	Camflex	10"	300#-RF
02-04912-21	15021	30PV 50121	1	50	2	41000	8"	300#-RF
02-04912-22	15022	30LV 50122	1	50	2	41000	10"	300#-RF
02-04912-23	15023	30PV 50132A	1	50	3	Butterfly Flangeless	24"	150#-RF
02-04912-24	15024	30PV 50132B	1	50	3	Butterfly Flangeless	16"	150#-RF

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
02-04912-25	15025	30TV 50141	1	50	2	21000	4"	300#-RF
02-04912-26	15026	30LV 50143	1	50	2	Varimax	8"	300#-RF
02-04912-27	15027	30TV 50152	1	50	2	41000	8"	300#-RF
02-04912-28	15028	30LV 50701A	1	50	2	Camflex flangeless	6"	300#-RF
02-04912-29	15029	30LV 50701B	1	50	2	Camflex flangeless	4"	300#-RF
02-04913-01	16001	30LV 60001A	1	60	2	21000	6"	300#-RF
02-04913-02	16002	30LV 60001B	1	60	2	21000	4"	300#-RF
02-04913-03	16003	30PV 60007	1	60	2	Camflex flangeless	6"	300#-RF
02-04913-04	16004	30PV 60008A	1	60	2	21000	1"	300#-RF
02-04913-05	16005	30PV 60008B	1	60	2	21000	6"	300#-RF
02-04913-06	16006	30FV 60011	1	60	2	41000	3" x 2"	300#-RF
02-04913-07	16007	30LV 60021	1	60	2	21000	4"	300#-RF
02-04913-08	16008	30LV 60023	1	60	2	Camflex	6"	300#-RF
02-04913-09	16009	30LV 60031	1	60	3	Butterfly Flangeless	6"	150#-RF
02-04913-10	16010	30PV 60032	1	60	2	Varimax	12"	300#-RF
02-04913-11	16011	30LV 60034A	1	60	2	Camflex	2"	300#-RF
02-04913-12	16012	30LV 60034B	1	60	2	21000	1 1/2"	300#-RF
02-04913-13	16013	30PV 60061	1	60	3	New Valve		300#-RF
02-04913-14	16014	30PV 60102A	1	60	3	41000	8"x6"x8"	300#-RF
02-04913-15	16015	30PV 60102B	1	60	3	Camflex flangeless	2"	300#-RF
02-04913-16	16016	30LV 60121	1	60	2	41000	6"	300#-RF
02-04913-17	16017	30PV 60122A	1	60	3	Varimax	12"	300#-RF
02-04913-18	16018	30PV 60122B	1	60	2	Camflex flangeless	1 1/2"	300#-RF
02-04913-19	16019	30LV 60211	1	60	2	21000	1"	300#-RF
02-04913-20	16020	30PV 60211A	1	60	2	21000	1"	300#-RF
02-04913-21	16021	30PV 60211B	1	60	2	41000	12"	600#-RF
02-04913-22	16022	30PV 60401	1	60	3	78100	2"	1500#-RTJ
02-04913-23	16023	30TV 60402	1	60	3	78100	2"	1500#-RTJ
02-04913-24	16024	30TV 60406A	1	60	3	78100	2"	1500#-RTJ
02-04913-25	16025	30TV 60406B	1	60	3	78100	2"	1500#-RTJ

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
02-04913-26	16026	30PV 60411	1	60	3	21000	1"	600#-RF
02-04913-27	16027	30TV 60416	1	60	2	21000	1"	600#-RF
02-04913-28	16028	30TV 60426	1	60	2	41000	10"	300#-RF
02-04913-29	16029	30PV 60427	1	60	3	41000	8"x6"x8"	300#-RF
02-04913-31		30UV 60001	1	60	3	41000	10"	600#-RF
02-04913-33		30PCV 60063	1	60	3	28000	1/2"	300#-RF
02-04914-01	17001	30PV 70002	1	70	2	41000	4"x2"x4"	300#-RF
02-04914-02	17002	30FV 70021	1	70	3	21000	3"	300#-RF
02-04914-03	17003	30PV 70023A	1	70	3	41000	3"x 2"x3"	300#-RF
02-04914-04	17004	30PV 70023B	1	70	3	21014-2S	1"	300#-RF
02-04914-05	17005	30PV 70023C	1	70	3	Camflex	12"	300#-RF
02-04914-06	17006	30FV 70024	1	70	3	21000	3"	300#-RF
02-04914-07	17007	30LV 70041	1	70	3	41000	6"	300#-RF
02-04914-08	17008	30PV 70042	1	70	2	Camflex	4"	300#-RF
02-04914-09	17009	30TV 70048	1	70	2	Camflex	3"	300#-RF
02-04914-10	17010	30FV 70061	1	70	3	21000	3"	300#-RF
02-04914-11	17011	30PV 70063A	1	70	3	21000	1"	300#-RF
02-04914-12	17012	30PV 70063B	1	70	3	21000	1.5"	300#-RF
02-04914-13	17013	30PV 70063C	1	70	3	Camflex	12"	300#-RF
02-04914-14	17014	30FV 70064	1	70	3	21000	3"	300#-RF
02-04914-15	17015	30FV 70065	1	70	3	21000	3"	300#-RF
02-04914-16	17016	30PV 70081A	1	70	2	21000	1"	300#-RF
02-04914-17	17017	30PV 70081B	1	70	2	Camflex flangeless	1"	300#-RF
02-04914-18	17018	30FV 70082	1	70	2	21000	2"	300#-RF
02-04914-19	17019	30FV 70091	1	70	2	Camflex	2"	300#-RF
02-04914-20	17020	30PV 70091	1	70	3	21014-2S	1"	300#-RF
02-04914-21	17021	30PV 70094A	1	70	2	21000	1"	300#-RF

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
02-04914-22	17022	30PV 70094B	1	70	2	Camflex	1 1/2"	300#-RF
02-04915-01	18001	30PCV 80043	1	80	1	535V	1"	300#-RF
02-04915-02	18002	30PCV 80045	1	80	1	535V	1"	300#-RF
02-04915-03		30PCV 80029	1	80	2	21000-2S	1"	300#-RF
02-04915-04		30PCV 80049	1	80	2	21000-2S	1"	300#-RF

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PART 2

2.1 LIST OF DOCUMENTS

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
		Qté =	358					
02-04648-01		30FV 10101 to 30FV 10901	9	10	1	Varipak	1"	300#-RF
02-04648-02		30FV 10102 to 30FV 10902	9	10	3	Paramax	6"	300#-RF
02-04648-03		30FV 10104 to 30FV 10904	9	10	3	Paramax	6"	300#-RF
02-04648-04		30FV 10106 to 30FV 10906	9	10	2	41000	6"	300#-RF
02-04648-05		30FV 10108 to 30FV 10908	9	10	2	41000	6"	300#-RF
02-04648-06		30FV 10112 to 30FV 10912	9	10	3	41000	4" x 2"	1500"-RTJ
02-04648-07		30FV 10119A to 30FV 10919	9	10	2	41000	8"	300#-RF
02-04648-08		30FV 10119B to 30FV 10919	9	10	2	21000	3"	300#-RF
02-04648-09		30FV 10122 to 30FV 10922	9	10	1	Camflex	4"	300#-RF
02-04648-10		30FV 10123 to 30FV 10923	9	10	1	Camflex	4"	300#-RF
02-04648-11		30HV 10125 to 30HV 10925	9	10	3	41000	6" x 2"	2500#-RTJ
02-04648-12		30HV 10126 to 30HV 10926	9	10	3	78100	2"	1500#-RTJ
02-04648-13		30TV 10117 to 30TV 10917	9	10	1	Camflex	4"	300#-RF
02-04648-14		30TV 10122 to 30TV 10922	9	10	1	Camflex	4"	300#-RF
02-04648-15		30TV 10127 to 30TV 10927	9	10	1	Camflex	4"	300#-RF
02-04648-16		30TV 10132 to 30TV 10932	9	10	1	Camflex	4"	300#-RF
02-04648-17		30TV 10137 to 30TV 10937	9	10	1	Camflex	4"	300#-RF
02-04648-18		30TV 10142 to 30TV 10942	9	10	1	Camflex	4"	300#-RF
02-04648-19		30TV 10127 to 30TV 10927	9	10	3	41000	4"	1500#RTJ
02-04909-01	12001	30FV 20001	1	20	3	Butterfly flangeless	14"	150#-RF
02-04909-02	12002	30LV 20001	1	20	1	Camflex flangeless	4"	300#-RF
02-04909-03	12003	30PV 20001	1	20	1	Camflex	3"	300#-RF
02-04909-04	12004	30PV 20022A	1	20	3	41000	12"	300#-RF
02-04909-05	12005	30PV 20022B	1	20	3	Camflex	6"	300#-RF
02-04909-06	12006	30PV 20024	1	20	2	41000	8"	300#-RF
02-04909-07	12007	30TV 20024	1	20	1	Camflex flangeless	6"	300#-RF
02-04909-08	12008	30PDV 20031	1	20	3	Varimax	16"	300#-RF

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
02-04909-09	12009	30LV 20051	1	20	2	21000	1"	300#-RF
02-04909-10	12010	30FV 20061	1	20	1	Camflex flangeless	4"	300#-RF
02-04909-11	12011	30LV 20071	1	20	1	Camflex flangeless	6"	300#-RF
02-04909-12	12012	30FV 20071	1	20	2	41000	6"	300#-RF
02-04909-13	12013	30LV 20081	1	20	2	21000	1"	600#RF
02-04909-14	12014	30FV 20081	1	20	2	21000	4"	300#-RF
02-04909-15	12015	30PV 20083A	1	20	3	Butterfly Flangeless	16"	300#-RF
02-04909-16	12016	30PV 20083B	1	20	3	41000	16"	300#-RF
02-04909-17	12017	30LV 20091	1	20	1	Camflex	6"	300#-RF
02-04910-01	13001	30PV 30002	1	30	3	Butterfly Flangeless	24"	150#-RF
02-04910-02	13002	30LV 30004	1	30	1	21000	1"	300#-RF
02-04910-03	13003	30LV 30022	1	30	1	21000	1"	300#-RF
02-04910-04	13004	30LV 30024	1	30	1	Camflex flangeless	2"	300#-RF
02-04910-05	13005	30LV 30032	1	30	1	Camflex flangeless	1 1/2"	300#-RF
02-04910-06	13006	30LV 30042	1	30	1	Camflex flangeless	1"	300#-RF
02-04910-07	13007	30UV 30051	1	30	1	Camflex	6"	300#-RF
02-04910-08	13008	30LV 30052	1	30	1	Camflex flangeless	1"	300#-RF
02-04910-09	13009	30FV 30071	1	30	1	21000	1"	300#-RF
02-04910-10	13010	30LV 30071	1	30	1	Camflex flangeless	1"	300#-RF
02-04910-11	13011	30TV 30071	1	30	1	Camflex	3"	300#-RF
02-04910-12	13012	30LV 30073	1	30	1	Camflex	1"	300#-RF
02-04910-13	13013	30LV 30075	1	30	1	21000	1"	300#-RF
02-04910-14	13014	30LV 30093	1	30	1	21000	1"	300#-RF
02-04910-15	13015	30UV 30101	1	30	1	21000	3"	300#-RF
02-04910-16	13016	30LV 30102	1	30	1	Camflex	4"	300#-RF
02-04910-17	13017	30LV 30103	1	30	1	21000	1"	300#-RF
02-04910-18	13018	30TV 30104	1	30	3	Butterfly Flangeless	12"	150#-RF
02-04910-19	13019	30TV 30107	1	30	1	21000	1"	300#-RF
02-04910-20	13020	30KV 30141	1	30	2	41000	4"x2"x4"	300#-RF

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
02-04910-21	13021	30KV 30142	1	30	1	Camflex	4"	300#-RF
02-04910-22	13022	30KV 30143	1	30	2	41000	4"x2"x4"	300#-RF
02-04910-23	13023	30KV 30144	1	30	1	Camflex	4"	300#-RF
02-04910-24	13024	30FV 30151	1	30	2	41000	6"x4"x6"	300#-RF
02-04910-25	13025	30LV 30151	1	30	1	21000	1"	300#-RF
02-04910-26	13026	30FV 30152	1	30	1	21000	3"	300#-RF
02-04910-27	13027	30LV 30153	1	30	1	21000	2"	600#-RF
02-04910-28	13028	30PDV 30153	1	30	2	41000	12"	300#-RF
02-04910-29	13029	30TV 30154	1	30	1	21000	3"	300#-RF
02-04910-30	13030	30TV 30155	1	30	2	41000	6"	300#-RF
02-04910-31	13031	30FV 30161	1	30	1	Camflex	1 1/2"	300#-RF
02-04910-32	13032	30LV 30161	1	30	1	Camflex	1"	300#-RF
02-04910-33	13033	30PV 30162	1	30	1	Camflex flangeless	2"	300#-RF
02-04910-34	13034	30LV 30164	1	30	1	Camflex flangeless	1"	300#-RF
02-04910-35	13035	30FV 30171	1	30	1	Camflex	1 1/2"	300#-RF
	13036	30LV 30701A CANCELLED		30		Camflex flangeless	4"	300#-RF
02-04910-37	13037	30LV 30701B	1	30	1	Camflex flangeless	3"	300#-RF
02-04910-38	13036	30 LV 30701A	1		3	Camflex	6"	
02-04911-01	14001	30HV 40033	1	40	2	41000	8"	300#-RF
02-04911-02	14002	30LV 40051	1	40	3	41000	4"x2"x4"	300#-RF
02-04911-03	14003	30TV 40053	1	40	2	Varimax	6"	300#-RF
02-04911-04	14004	30LV 40053	1	40	3	41000	6"x3"x6"	300#-RF
02-04911-05	14005	30LV 40061	1	40	3	21000	3"	300#-RF
02-04911-06	14006	30PV 40061C	1	40	3	41000	6"x3"x6"	300#-RF
02-04911-07	14007	30LV 40063	1	40	3	21000	2"	300#-RF
02-04911-08	14008	30LV 40065,	1	40	3	21000	2"	300#-RF
02-04911-09	14009	30PV 40071	1	40	3	Varimax	8"	300#-RF
02-04911-10	14010	30FV 40071A	1	40	2	Varimax	8"	300#-RF
02-04911-11	14011	30FV 40071B	1	40	3	41000	4"x2"x4"	300#-RF
02-04911-12	14012	30PV 40073	1	40	3	21000	2"	300#-RF

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
02-04911-13	14013	30TV 40075A	1	40	3	Butterfly Flangeless	12"	300#-RF
02-04911-14	14014	30TV 40075B	1	40	2	Varimax	6"	300#-RF
02-04911-15	14015	30FV 40093	1	40	1	Camflex	3"	300#-RF
02-04911-16	14016	30PV 40102	1	40	3	Butterfly Flangeless	14"	300#-RF
02-04911-17	14017	30LV 40103	1	40	1	Camflex	4"	300#-RF
02-04911-18	14018	30TV 40104	1	40	2	Varimax	10"	300#-RF
02-04911-19	14019	30FV 40108	1	40	1	21000	1 1/2"	300#-RF
02-04911-20	14020	30PV 40121	1	40	3	41000	2"x8"x12	300#-RF
02-04911-21	14021	30LV 40121	1	40	1	Camflex	6"	300#-RF
02-04911-22	14022	30FV 40121	1	40	3	Camflex	3"	300#-RF
02-04911-23	14023	30FV 40132	1	40	1	21000	1"	300#-RF
02-04911-24	14024	30FV 40135	1	40	2	41000	6"	300#-RF
02-04911-25	14025	30UV 40136	1	40	1	21000	4"	300#-RF
02-04911-26	14026	30PV 40136	1	40	1	Camflex	1"	300#-RF
02-04911-27	14027	30FV 40137	1	40	2	41000	10"	300#-RF
02-04911-28	14028	30TV 40137	1	40	1	Camflex	2"	300#-RF
02-04911-29	14029	30FV 40138	1	40	1	21000	1"	300#-RF
02-04911-30	14030	30FV 40139	1	40	2	Varimax flangeless	8"	300#-RF
02-04911-31	14031	30TV 40139	1	40	1	21000	1"	300#-RF
02-04911-32	14032	30FV 40151	1	40	2	41000	4"	300#-RF
02-04911-33	14033	30TV 40158	1	40	3	41000	4"	2500#-RTJ
02-04911-34	14034	30LV 40171	1	40	3	Camflex	3"	300#-RF
02-04911-35	14035	30FV 40181	1	40	2	Varimax	12"	300#-RF
02-04911-36	14036	30LV 40181	1	40	1	Camflex	6"	300#-RF
02-04911-37	14037	30FV 40182A	1	40	3	41000	6"x4"x6"	300#-RF
02-04911-38	14038	30FV 40182B	1	40	1	Camflex	6"	300#-RF
02-04911-39	14039	30PV 40184	1	40	3	41000	8"	300#-RF
02-04911-40	14040	30PV 40201	1	40	2	Varimax	12"	300#-RF
02-04911-41	14041	30LV 40207	1	40	2	Camflex	10"	300#-RF
02-04911-42	14042	30FV 40211A	1	40	2	Varimax	12"	300#-RF

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
02-04911-43	14043	30FV 40211B	1	40	2	Camflex	8"	300#-RF
02-04911-44	14044	30FV 40212	1	40	3	21000	1"	300#-RF
02-04911-45	14045	30LV 40222	1	40	3	21000	3"	300#-RF
02-04911-46	14046	30LV 40224	1	40	3	Camflex	8"	300#-RF
02-04911-47	14047	30LV 40226	1	40	3	Camflex	4"	300#-RF
02-04912-01	15001	30UV 50002	1	50	2	21000	3"	300#-RF
02-04912-02	15002	30LV 50021	1	50	2	Camflex	4"	300#-RF
02-04912-03	15003	30FV 50021	1	50	2	41000	6"	300#-RF
02-04912-04	15004	30PV 50022A	1	50	2	Varimax	10"	300#-RF
02-04912-05	15005	30PV 50022B	1	50	3	21000	6"	300#-RF
02-04912-06	15006	30PV 50023A	1	50	2	Camflex	6"	300#-RF
02-04912-07	15007	30PV 50023B	1	50	2	Camflex	6"	300#-RF
02-04912-08	15008	30PV 50031	1	50	3	41000	4"x2"x4"	300#-RF
02-04912-09	15009	30LV 50031	1	50	3	21000	4"	300#-RF
02-04912-10	15010	30LV 50033	1	50	2	Camflex	4"	300#-RF
02-04912-11	15011	30LV 50041	1	50	3	Camflex	3"	300#-RF
02-04912-12	15012	30LV 50043	1	50	3	Camflex	3"	300#-RF
02-04912-13	15013	30LV 50045	1	50	3	Camflex	2"	300#-RF
02-04912-14	15014	30LV 50051	1	50	3	21000	6"	300#-RF
02-04912-15	15015	30LV 50061	1	50	3	Camflex	4"	300#-RF
02-04912-16	15016	30TV 50062	1	50	3	21000	3"	300#-RF
02-04912-17	15017	30PV 50071	1	50	3	21000	4"	300#-RF
02-04912-18	15018	30TV 50072	1	50	3	21000	2"	300#-RF
02-04912-19	15019	30UV 50102	1	50	2	Camflex	3"	300#-RF
02-04912-20	15020	30PV 50105	1	50	2	Camflex	10"	300#-RF
02-04912-21	15021	30PV 50121	1	50	2	41000	8"	300#-RF
02-04912-22	15022	30LV 50122	1	50	2	41000	10"	300#-RF
02-04912-23	15023	30PV 50132A	1	50	3	Butterfly Flangeless	24"	150#-RF
02-04912-24	15024	30PV 50132B	1	50	3	Butterfly Flangeless	16"	150#-RF

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
02-04912-25	15025	30TV 50141	1	50	2	21000	4"	300#-RF
02-04912-26	15026	30LV 50143	1	50	2	Varimax	8"	300#-RF
02-04912-27	15027	30TV 50152	1	50	2	41000	8"	300#-RF
02-04912-28	15028	30LV 50701A	1	50	2	Camflex flangeless	6"	300#-RF
02-04912-29	15029	30LV 50701B	1	50	2	Camflex flangeless	4"	300#-RF
02-04913-01	16001	30LV 60001A	1	60	2	21000	6"	300#-RF
02-04913-02	16002	30LV 60001B	1	60	2	21000	4"	300#-RF
02-04913-03	16003	30PV 60007	1	60	2	Camflex flangeless	6"	300#-RF
02-04913-04	16004	30PV 60008A	1	60	2	21000	1"	300#-RF
02-04913-05	16005	30PV 60008B	1	60	2	21000	6"	300#-RF
02-04913-06	16006	30FV 60011	1	60	2	41000	3" x 2"	300#-RF
02-04913-07	16007	30LV 60021	1	60	2	21000	4"	300#-RF
02-04913-08	16008	30LV 60023	1	60	2	Camflex	6"	300#-RF
02-04913-09	16009	30LV 60031	1	60	3	Butterfly Flangeless	6"	150#-RF
02-04913-10	16010	30PV 60032	1	60	2	Varimax	12"	300#-RF
02-04913-11	16011	30LV 60034A	1	60	2	Camflex	2"	300#-RF
02-04913-12	16012	30LV 60034B	1	60	2	21000	1 1/2"	300#-RF
02-04913-13	16013	30PV 60061	1	60	3	New Valve		300#-RF
02-04913-14	16014	30PV 60102A	1	60	3	41000	8"x6"x8"	300#-RF
02-04913-15	16015	30PV 60102B	1	60	3	Camflex flangeless	2"	300#-RF
02-04913-16	16016	30LV 60121	1	60	2	41000	6"	300#-RF
02-04913-17	16017	30PV 60122A	1	60	3	Varimax	12"	300#-RF
02-04913-18	16018	30PV 60122B	1	60	2	Camflex flangeless	1 1/2"	300#-RF
02-04913-19	16019	30LV 60211	1	60	2	21000	1"	300#-RF
02-04913-20	16020	30PV 60211A	1	60	2	21000	1"	300#-RF
02-04913-21	16021	30PV 60211B	1	60	2	41000	12"	600#-RF
02-04913-22	16022	30PV 60401	1	60	3	78100	2"	1500#-RTJ
02-04913-23	16023	30TV 60402	1	60	3	78100	2"	1500#-RTJ
02-04913-24	16024	30TV 60406A	1	60	3	78100	2"	1500#-RTJ
02-04913-25	16025	30TV 60406B	1	60	3	78100	2"	1500#-RTJ

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
02-04913-26	16026	30PV 60411	1	60	3	21000	1"	600#-RF
02-04913-27	16027	30TV 60416	1	60	2	21000	1"	600#-RF
02-04913-28	16028	30TV 60426	1	60	2	41000	10"	300#-RF
02-04913-29	16029	30PV 60427	1	60	3	41000	8"x6"x8"	300#-RF
02-04913-31		30UV 60001	1	60	3	41000	10"	600#-RF
02-04913-33		30PCV 60063	1	60	3	28000	1/2"	300#-RF
02-04914-01	17001	30PV 70002	1	70	2	41000	4"x2"x4"	300#-RF
02-04914-02	17002	30FV 70021	1	70	3	21000	3"	300#-RF
02-04914-03	17003	30PV 70023A	1	70	3	41000	3"x 2"x3"	300#-RF
02-04914-04	17004	30PV 70023B	1	70	3	21014-2S	1"	300#-RF
02-04914-05	17005	30PV 70023C	1	70	3	Camflex	12"	300#-RF
02-04914-06	17006	30FV 70024	1	70	3	21000	3"	300#-RF
02-04914-07	17007	30LV 70041	1	70	3	41000	6"	300#-RF
02-04914-08	17008	30PV 70042	1	70	2	Camflex	4"	300#-RF
02-04914-09	17009	30TV 70048	1	70	2	Camflex	3"	300#-RF
02-04914-10	17010	30FV 70061	1	70	3	21000	3"	300#-RF
02-04914-11	17011	30PV 70063A	1	70	3	21000	1"	300#-RF
02-04914-12	17012	30PV 70063B	1	70	3	21000	1.5"	300#-RF
02-04914-13	17013	30PV 70063C	1	70	3	Camflex	12"	300#-RF
02-04914-14	17014	30FV 70064	1	70	3	21000	3"	300#-RF
02-04914-15	17015	30FV 70065	1	70	3	21000	3"	300#-RF
02-04914-16	17016	30PV 70081A	1	70	2	21000	1"	300#-RF
02-04914-17	17017	30PV 70081B	1	70	2	Camflex flangeless	1"	300#-RF
02-04914-18	17018	30FV 70082	1	70	2	21000	2"	300#-RF
02-04914-19	17019	30FV 70091	1	70	2	Camflex	2"	300#-RF
02-04914-20	17020	30PV 70091	1	70	3	21014-2S	1"	300#-RF
02-04914-21	17021	30PV 70094A	1	70	2	21000	1"	300#-RF

VENDOR NAME : DRESSER MASONEILAN

REQUIS N° 6465 C 30 MR 1541 01 9 th OLEFIN

SERIAL N°	ITEM	TAG	QTY	UNIT	BATCH	MODEL	SIZE	RATING
02-04914-22	17022	30PV 70094B	1	70	2	Camflex	1 1/2"	300#-RF
02-04915-01	18001	30PCV 80043	1	80	1	535V	1"	300#-RF
02-04915-02	18002	30PCV 80045	1	80	1	535V	1"	300#-RF
02-04915-03		30PCV 80029	1	80	2	21000-2S	1"	300#-RF
02-04915-04		30PCV 80049	1	80	2	21000-2S	1"	300#-RF

358

2.2 DRAWING

- Air & Power consumptions
- "FINAL" General assembly drawings
and detailed drawings




Air & Power Consumptions

ELECTRICAL POWER CONSUMPTION INSTRUMENT AIR CONSUMPTION

VENDOR DOCUMENT REVIEW <input type="checkbox"/> 1 REVISE AND RESUBMIT <input type="checkbox"/> 2 TO BE ISSUED AS FINAL RECEIVED COMMENTS ARE INCORPORATED <input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
 2003.04.08 10:22:04 +01'00'
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STATUS CERTIFIED "FINAL"
 ISSUED BY : S. LEGE
 DATE : 04/04/03

0	04/04/03	FIRST ISSUE
REV	DATE	DESCRIPTION
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007
		EQUIPMENT NAME:
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	Control valves
	DOCUMENT TITLE : Electrical power consumption Instrument air consumption	DOCUMENT CODE : A 3301
	PURCHASE ORDER : 02-4648 02-4909 to 02-4915	Sheet Rev. 01 of 02 0



CUSTOMER: TECHNIP-COFLEXIP
PROJECT: 09TH OLEFIN COMPLEX - CONTROL VALVES

AIR & POWER CONSUMPTIONS

AIR CONSUMPTIONS:

Air consumption for FVP Fieldbus positioners (stable status): 0.32 m³/hr at 1.4 bar supply pressure (0.37 Nm³/hr)

Air consumption for TZID Hart positioners (stable status): 0.02 Nm³/hr whatever the supply pressure.

POWER CONSUMPTIONS:

Power consumption for ASCO 317 series solenoid valves: 1.7 W

Power consumption for NORGREN-HERION solenoid valves model 2401112396202400 solenoid valves: 3.9 W

**- "FINAL" General assembly drawings
and detailed drawings**

DRAWINGS

Unit 10
Unit 20
Unit 30
Unit 40
Unit 50
Unit 60
Unit 70
Unit 80




UNIT 10

OUTLINE DRAWINGS

TECHNIP	
VENDOR DOCUMENT REVIEW	
<input type="checkbox"/>	1 REVERSE AND RESUBMIT
<input type="checkbox"/>	2 TO BE ISSUED AS FINAL PROCESSED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/>	3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
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STATUS CERTIFIED "FINAL"
ISSUED BY : C. DROUARD
DATE : 16/12/02

4	16/12/02	Up-dated drawings further to your comments	
3	11/10/02	Up-dated drawings with accessories	
2	28/08/02	Item 12 up-dated	
1	27/05/02	Items 01 and 04 to 18 up-dated	
0	07/03/02	FIRST ISSUE	
REV	DATE	DESCRIPTION	
TECHNIP		NATIONAL PETROCHEMICAL COMPANY	
		PARS PETROCHEMICAL COMPANY	
			
Project:		3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	
		TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007	
		EQUIPMENT NAME: Control valves	
DRESSER Flow Control		DOCUMENT TITLE : Outline drawings	
		DOCUMENT CODE : A 3201	
		PURCHASE ORDER : 02-4648 (Unit 10)	
		Sheet 01 of 35	Rev. 4



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

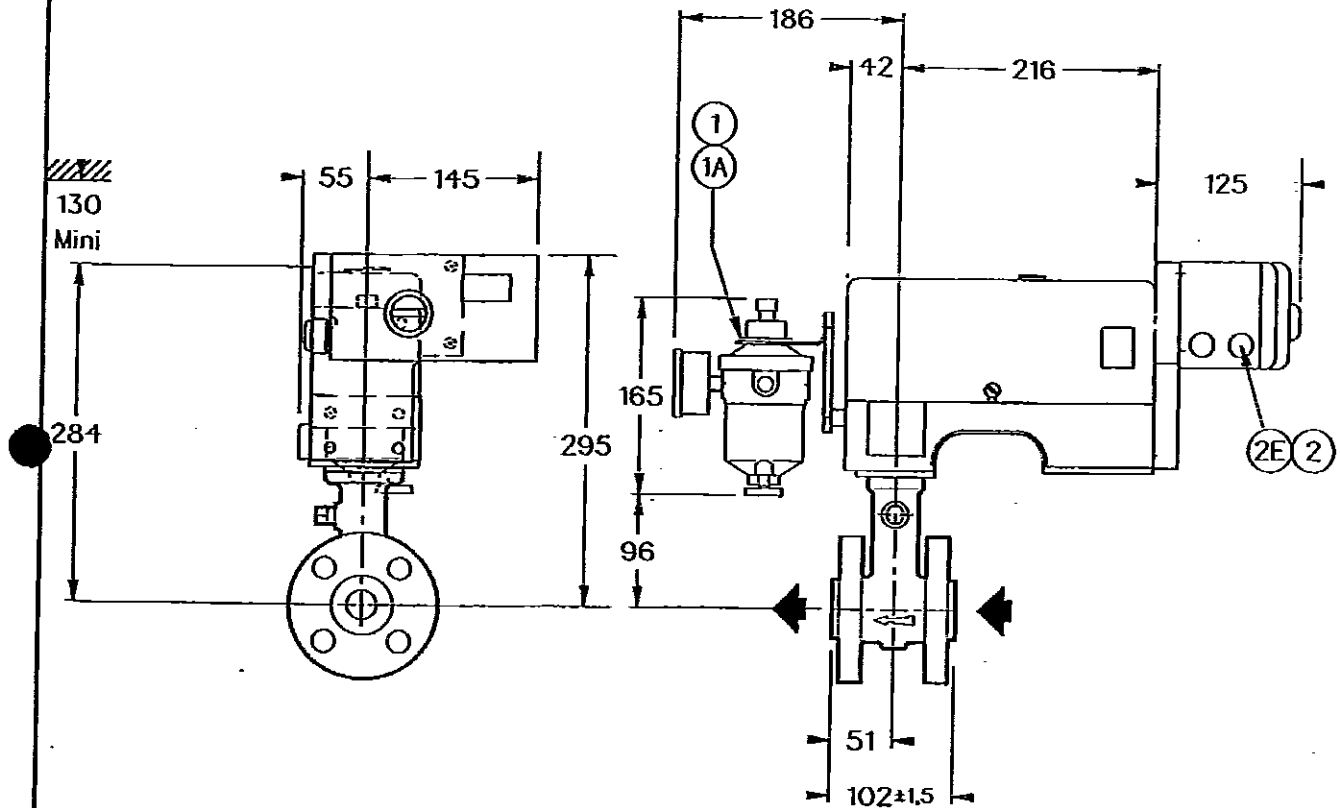
SERIES VALVE : 28-28270-59

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/B	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

15

ITEM : 001

MN SERIAL NUMBER : 02-04648-01

Rev. 1

DATE: 07/OCT/2002

DRAWN BY:

P.SEVESTRE

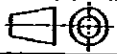
ISSUED BY:

C.DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 1007

TAG : 30 FV 10201 / 10401 / 10601 & 10801



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

GRASSER

SERIES VALVE : 28-28170-59

DN : 25 (1")

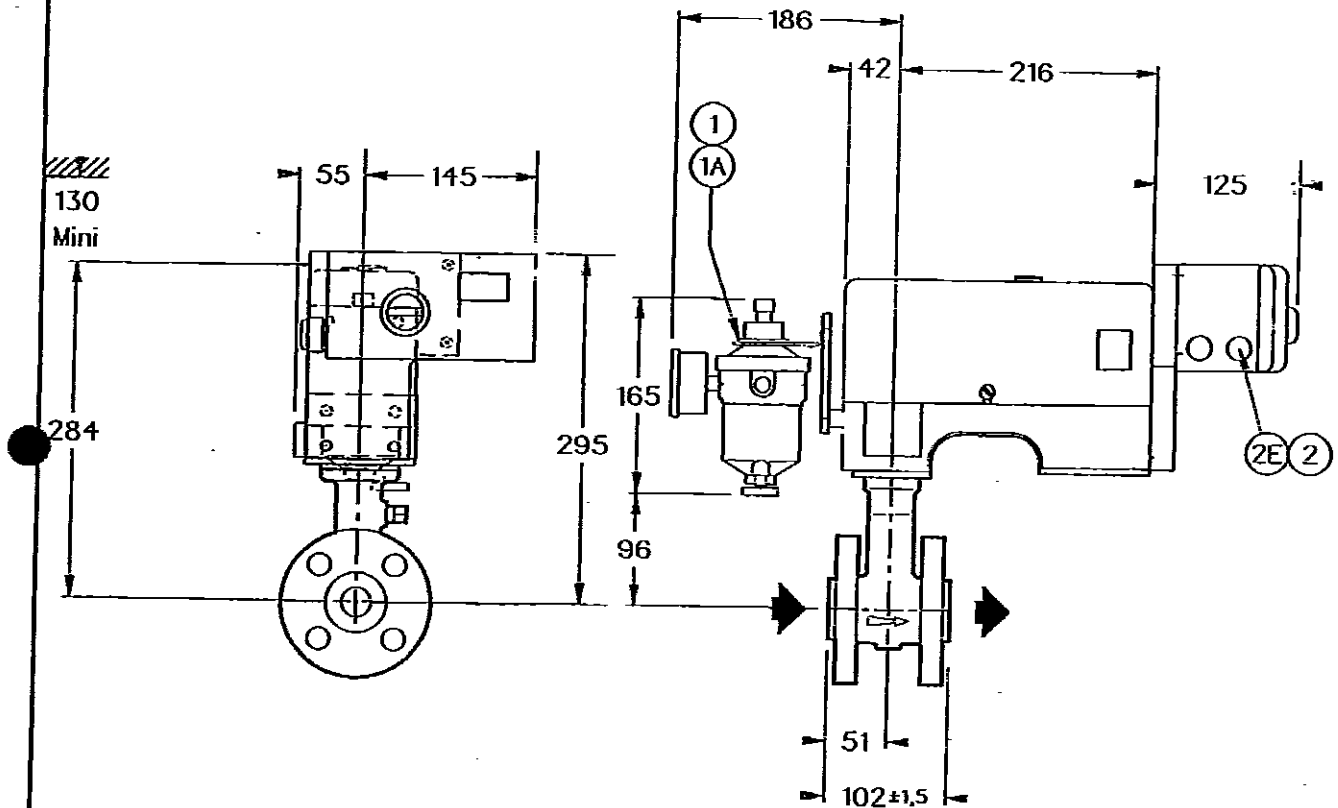
ON AIR FAILURE : CLOSED

FLOW TO

: OPEN

CONNECTION:

300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/B	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal
TOTAL WEIGHT (accessories + valve) in kg			15	ITEM : 001	WN SERIAL NUMBER : 02-04648-01
Rev. 1	DATE: 07/OCT/2002	DRAWN BY: P.SEVSTRE	ISSUED BY: C.DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C 30 1541 01 0 1007		
TAG : 30 FV 10101 / 10301 / 10501 / 10701 & 10901					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

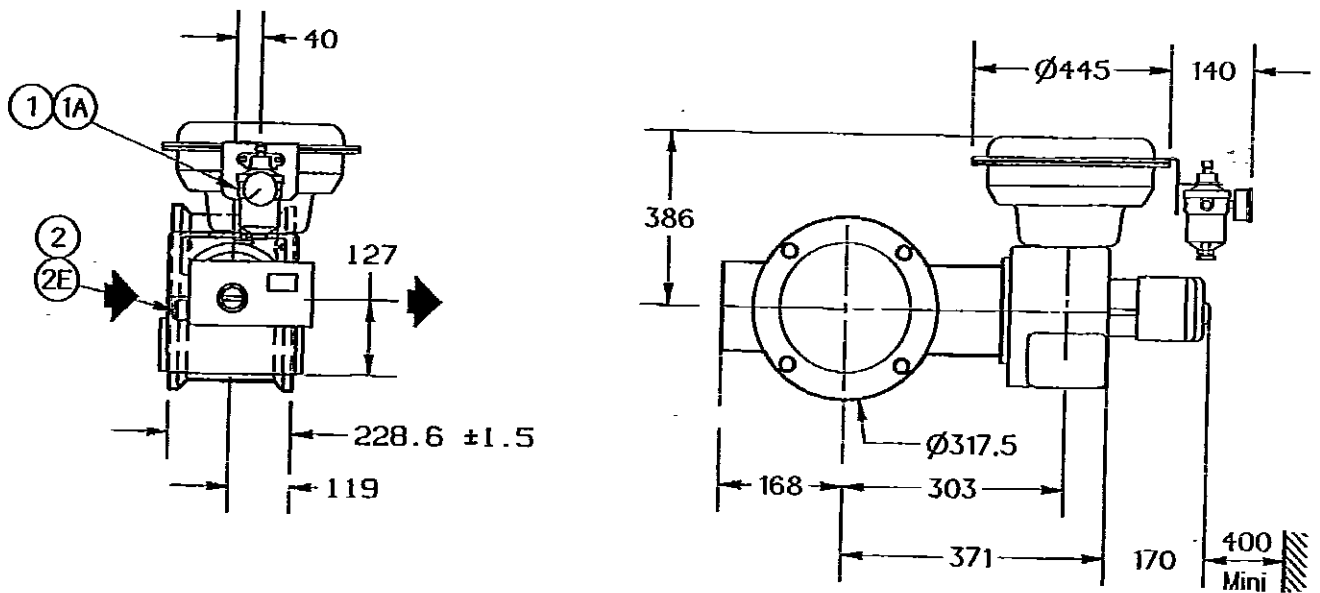
SERIES VALVE : 33-36424

DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : **

CONNECTION: 300 ANSI RF



** : FLOW DIRECTION : INTO SEAL RING SIDE

Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/B	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal
TOTAL WEIGHT (accessories + valve) in kg			145	ITEM : 002	DN SERIAL NUMBER : 02-04648-02
Rev. 1	DATE: 07/OCT/2002	DRAWN BY: P.SEVESTRE	ISSUED BY: C.DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30FV 10102 TO 30FV 10902					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

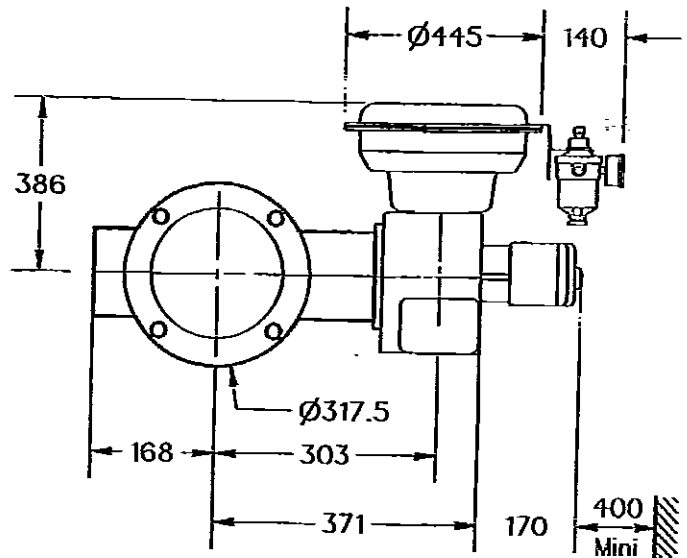
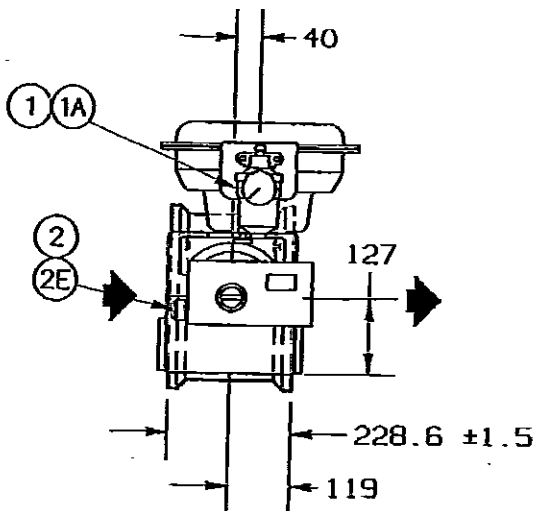
SERIES VALVE : 33-36424

DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : **

CONNECTION: 300 ANSI RF



** : FLOW DIRECTION : INTO SEAL RING SIDE

Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/B	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

145

ITEM : 003

MINI SERIAL NUMBER : 02-04648-03

Rev. 1

DATE: 07/OCT/2002

DRAWN BY:

P.SEVESTRE

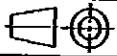
ISSUED BY:

CDROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30FV 10104 TO 30FV 10904



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



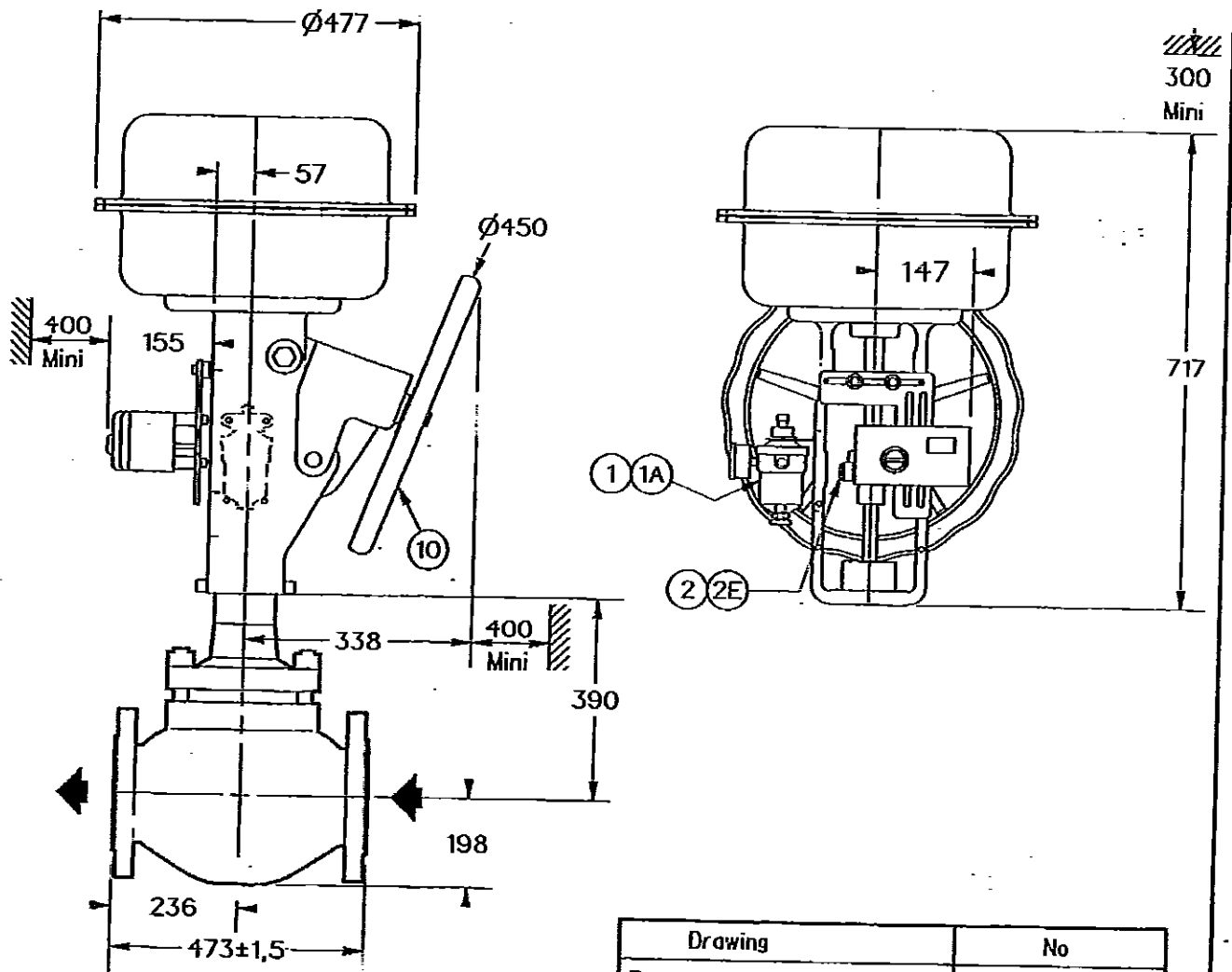
SERIES VALVE : 87-41935

DN : 6"

ON AIR FAILURE : OPEN.

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

NOTA : "Rotate the valve in the horizontal plane by 180° before installation".

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

304

ITEM : 004

UN SERIAL NUMBER : 02-04648-04

Rev. 1

DATE: 07/OCT/2002

DRAWN BY:

P.SEVESTRE

ISSUED BY:

C.DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER:

6465C 30 1541 01 0 1007

TAG : 30 FV 10106 TO 30 FV 10906



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

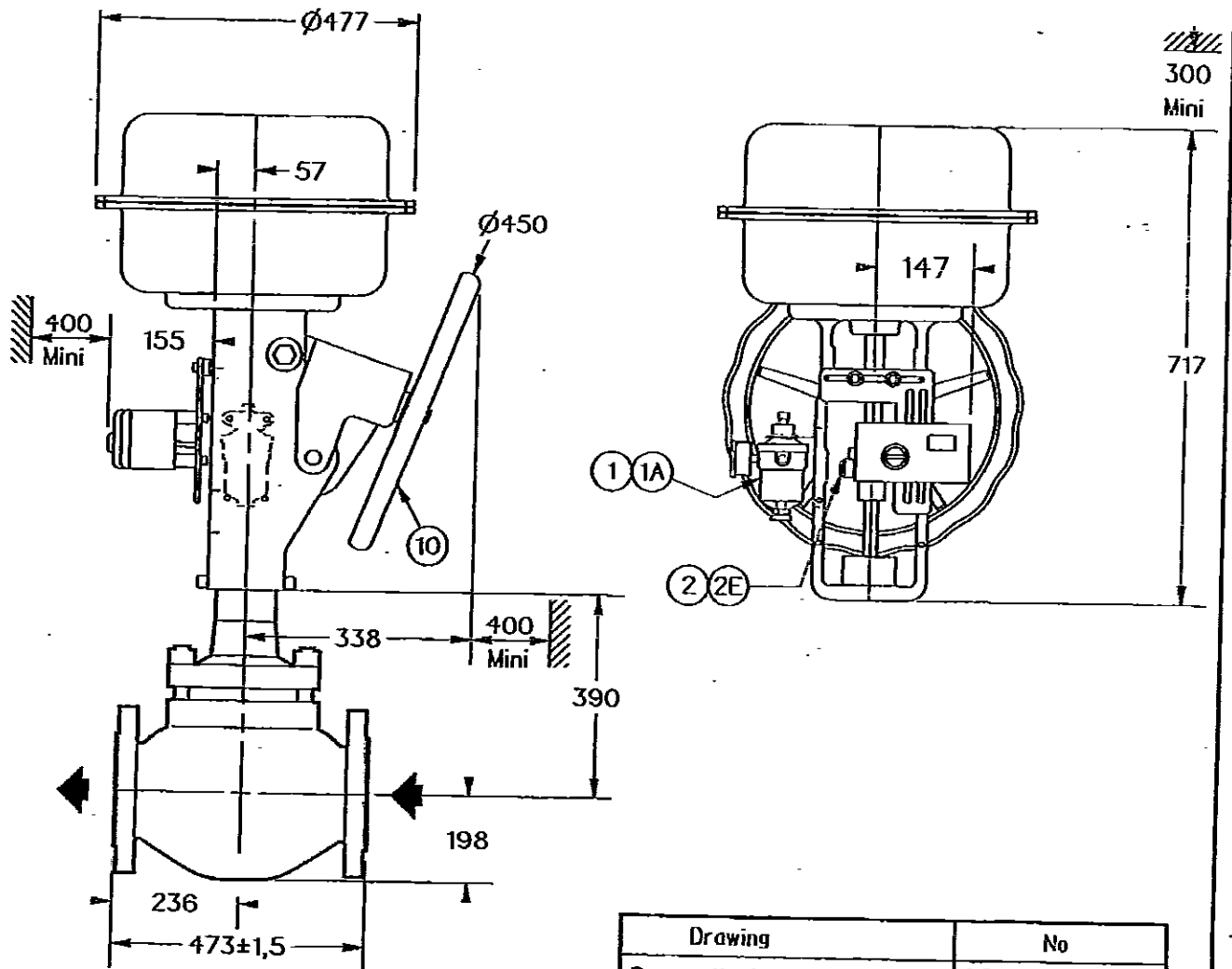
SERIES VALVE : 87-41935

DN : 6"

ON AIR FAILURE : OPEN.

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #81



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

NOTA : "Rotate the valve in the horizontal plane by 180° before installation".

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

304

ITEM : 005

MH SERIAL NUMBER : 02-04648-05

Rev. 1

DATE: 07/OCT/2002

DRAWN BY:

P.SEVESTRE

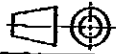
ISSUED BY:

C.DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 1007

TAG : 30 FV 10108 TO 30 FV 10908



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

ORASSER

SERIES VALVE : 87-41425

DN : 4"x2"

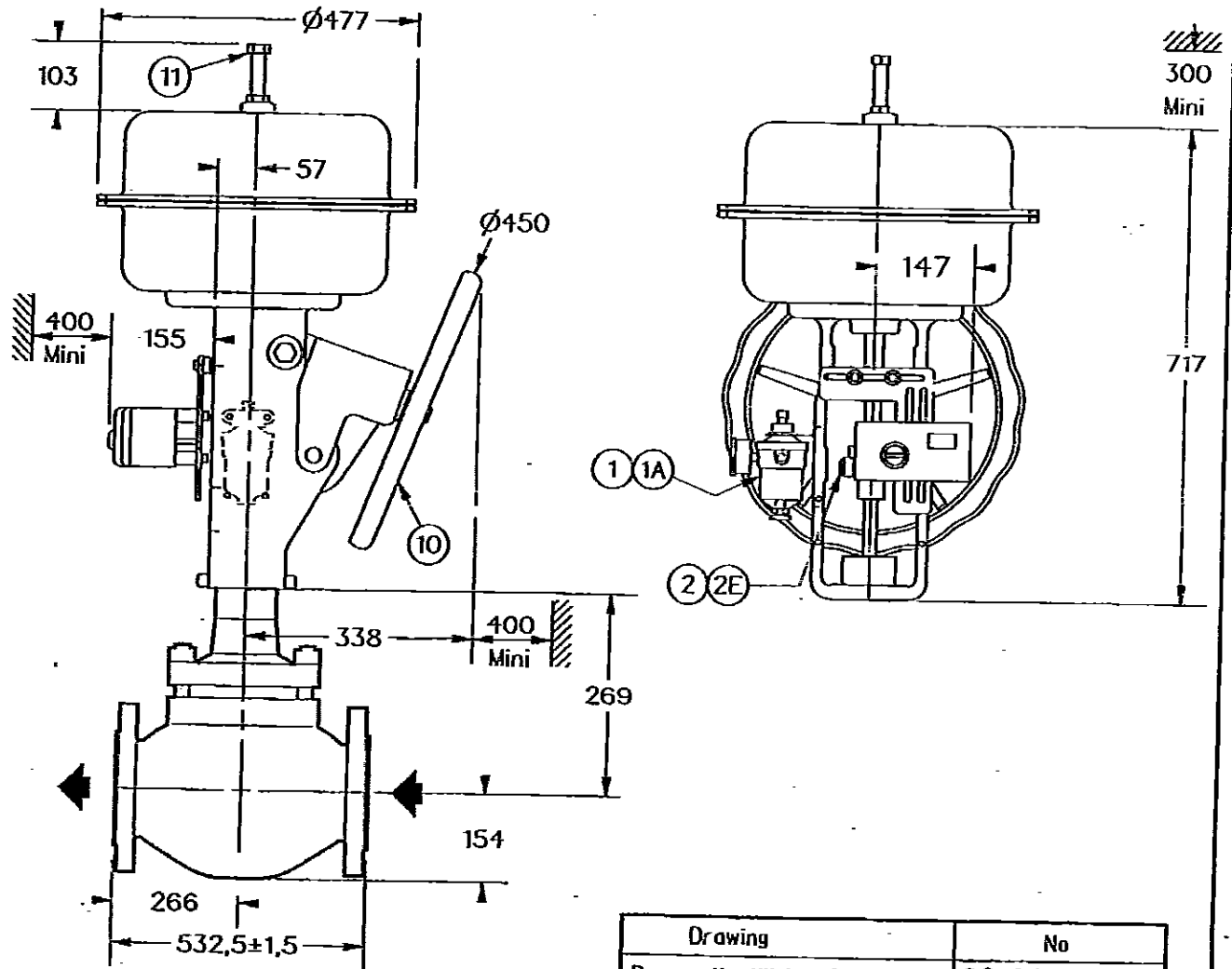
ON AIR FAILURE : OPEN

FLOW TO

: CLOSE

CONNECTION:

1500 ANSI RTJ-ISO PN 250 #J



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

NOTA : "Rotate the valve in the horizontal plane by 180° before installation".

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal
10 11		Handwheel Limit-Stop			(Limits Actuator Stem Retracting)
TOTAL WEIGHT (accessories + valve) in kg			274	ITEM : 006	MIN SERIAL NUMBER : 02-04648-06
Rev. 1	DATE : 07/OCT/2002	DRAWN BY : P.SEVESTRE		ISSUED BY : C.DROUARD	
CUSTOMER : TECHNIP FRANCE			CUSTOMER ORDER : 6465 C 30 1541 01		
TAG : 30FV 10212 / 10412 / 10612 & 10812					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

SERIES VALVE : 88-41335

DN : 8"

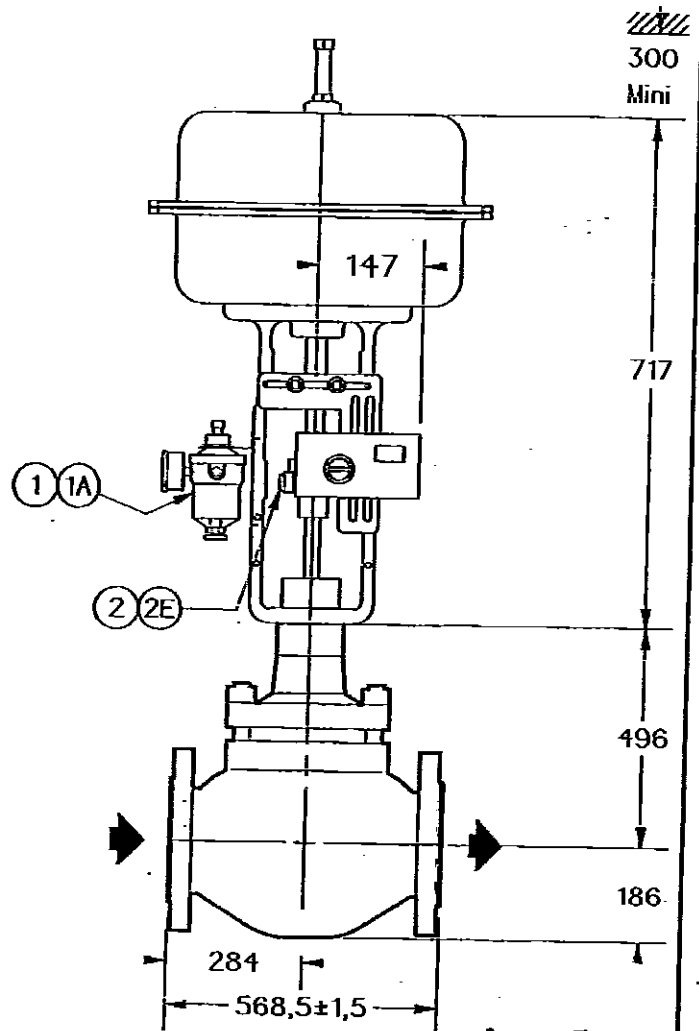
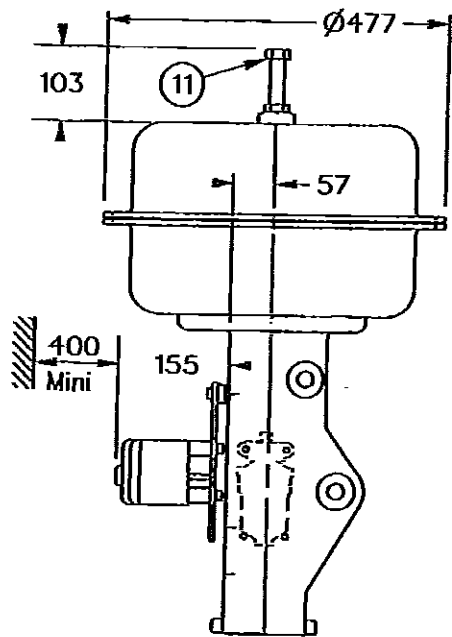
ON AIR FAILURE : CLOSED

FLOW TO

: OPEN

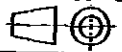
CONNECTION:

300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

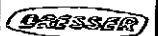
Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal
11		Limit-Stop			(Limits Actuator Stem Retracting)
TOTAL WEIGHT (accessories + valve) in kg			463	ITEM : 007	MN SERIAL NUMBER : 02-04648-07
Rev. 1	DATE: 07/OCT/2002	DRAWN BY: P.SEVESTRE	ISSUED BY: CDROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C 30 1541 01 0 1007		
TAG : 30 FV 10119A TO FV 10919A					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



SERIES VALVE : 88-21715

DN : 80 (3")

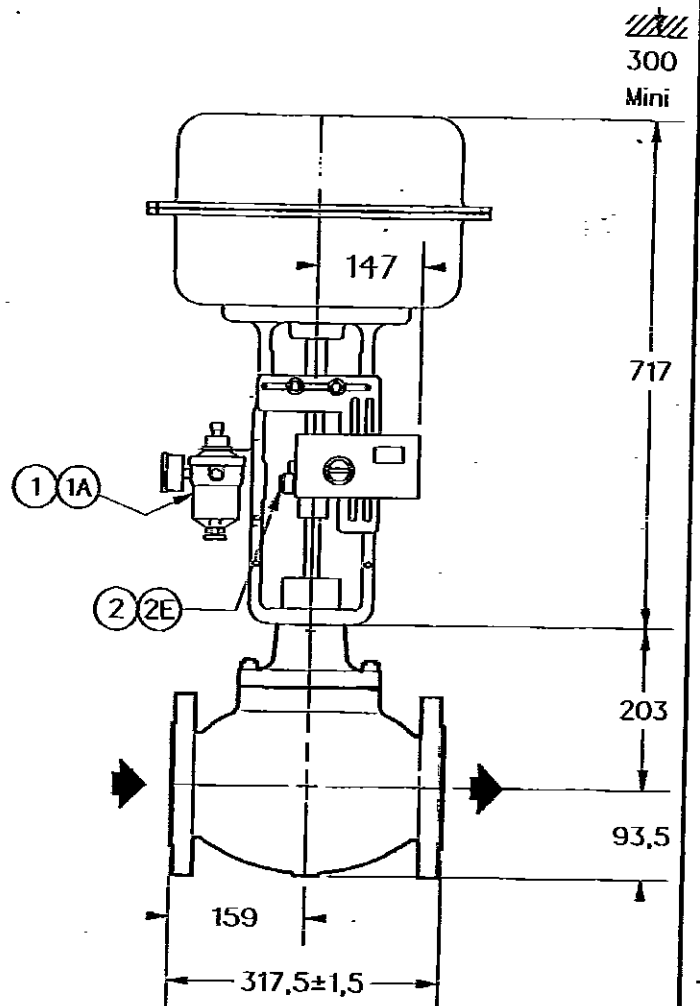
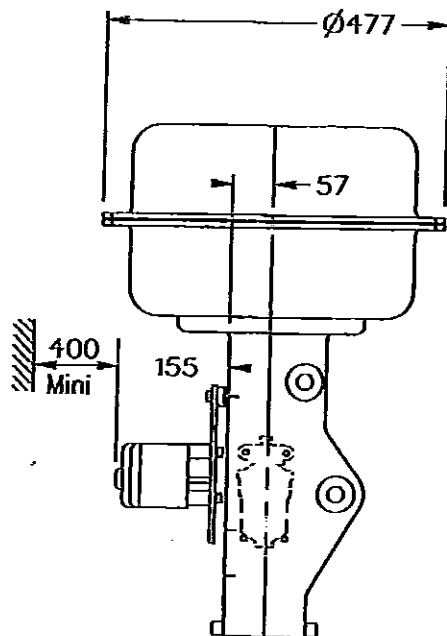
ON AIR FAILURE : CLOSED

FLOW TO

: OPEN

CONNECTION:

300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/B	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

147

ITEM : 008

WH SERIAL NUMBER : 02-04648-08

Rev. 1

DATE: 07/OCT/2002

DRAWN BY:

P.SEVESTRE

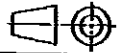
ISSUED BY:

C.DRQUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 1007

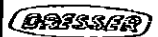
TAG : 30 FV 10119B TO FV 10919B



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



SERIES VALVE : 35-35202

DN : 100 (4")

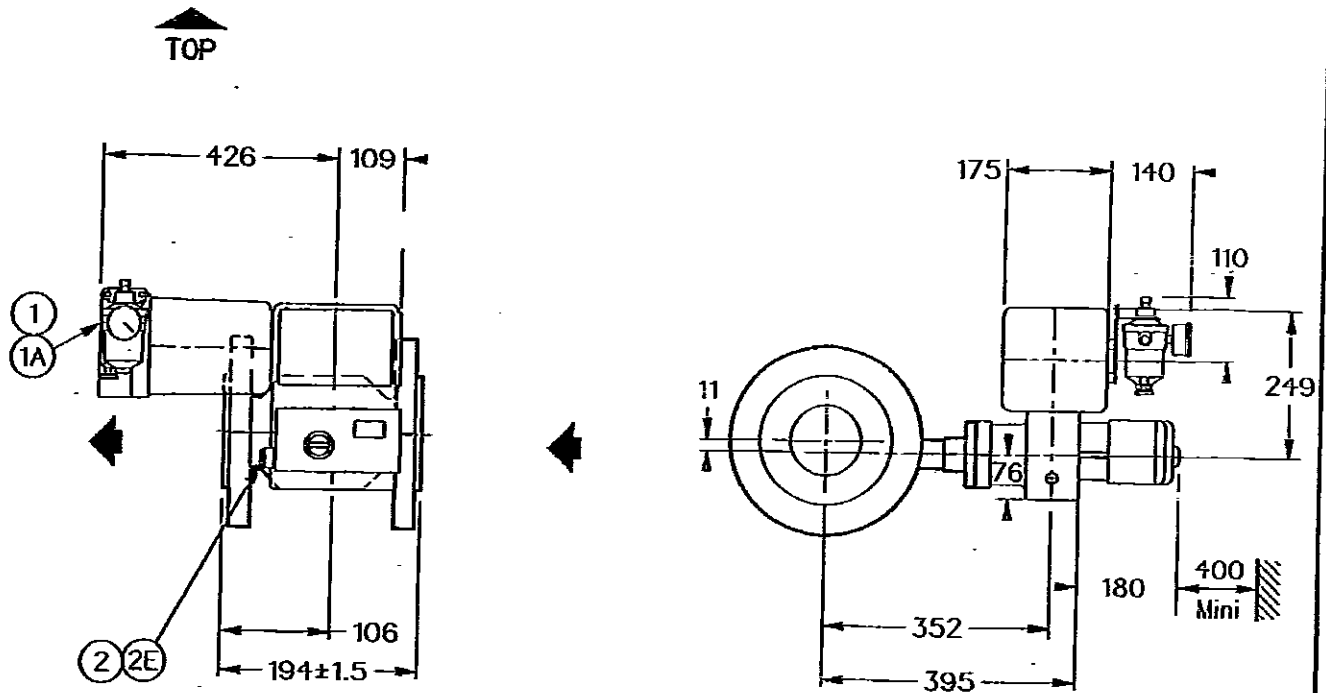
ON AIR FAILURE : CLOSED

FLOW TO

: CLOSE

CONNECTION:

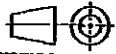
300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

NOTA : "Rotate the valve in the horizontal plane by 180° before installation".

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal
TOTAL WEIGHT(accessories + valve) in kg			62	ITEM : 009	MN SERIAL NUMBER : 02-04648-09
Rev. 1	DATE: 07/OCT/2002	DRAWN BY: P.SEVESTRE	ISSUED BY: CDROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C 30 1541 01 0 1007		
TAG : 30FV 10122 / 10322 / 10522 / 10722 & 10922					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonelan

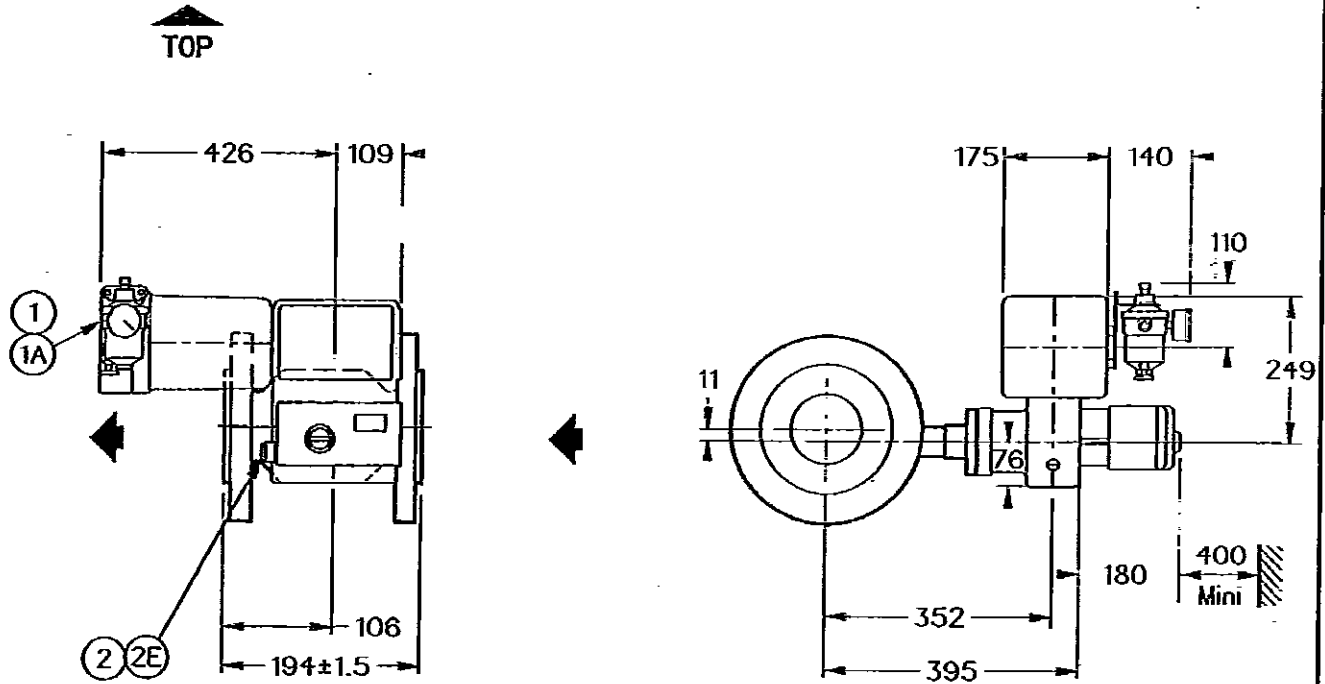


SERIES VALVE : 35-35202

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

NOTA : "Rotate the valve in the horizontal plane by 180° before installation".

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electro-pn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

62

ITEM : 009

MIN SERIAL NUMBER : 02-04648-09

Rev. 1

DATE: 07/OCT/2002

DRAWN BY:

P.SEVESTRE

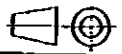
ISSUED BY:

CDROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 1007

TAG : 30FV 10222 / 10422 / 10622 & 10822



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



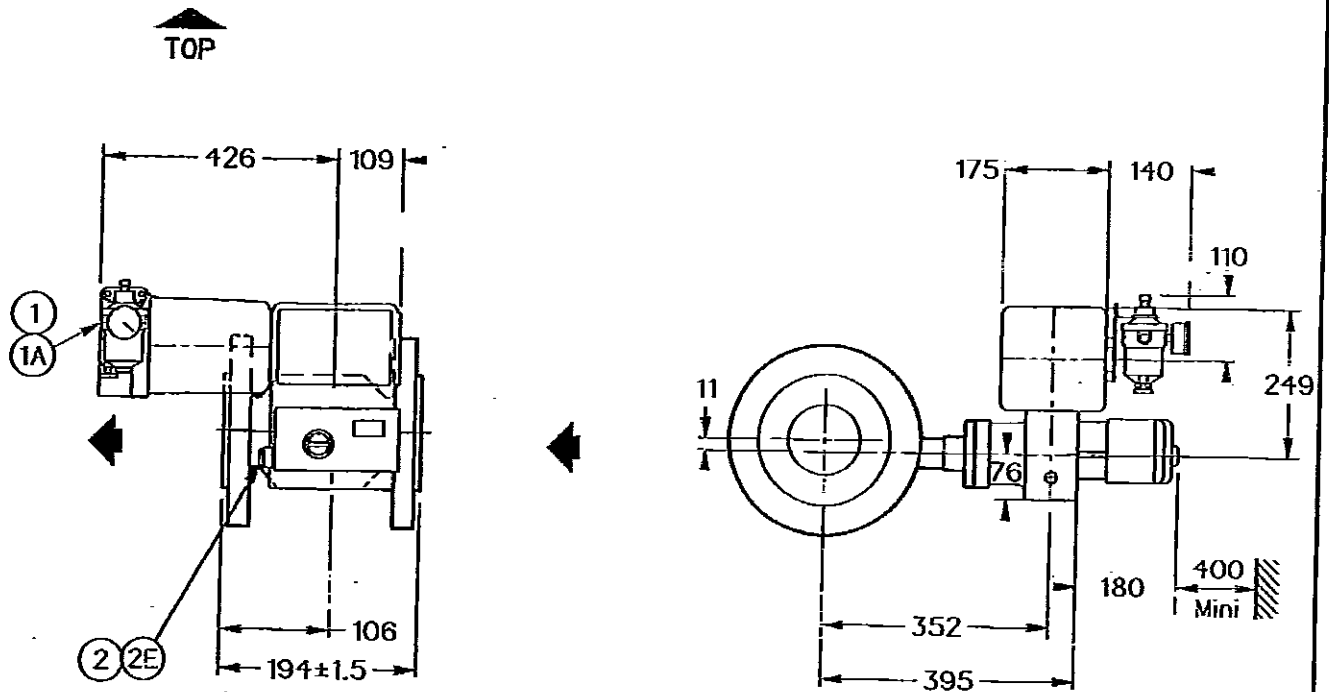
SERIES VALVE : 35-35202

DN : 100 (4")

ON AIR FAILURE : CLOSED

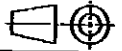
FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal
TOTAL WEIGHT (accessories + valve) in kg			62	ITEM : 010	WH SERIAL NUMBER : 02-04648-10
Rev. 1	DATE: 07/OCT/2002	DRAWN BY: P.SEVESTRE	ISSUED BY: C.DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C 30 1541 01 0 1007		
TAG : 30FV 10123 / 10323 / 10523 / 10723 & 10923					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masoneilan

DRESSER

SERIES VALVE : 35-35202

DN : 100 (4")

ON AIR FAILURE : CLOSED

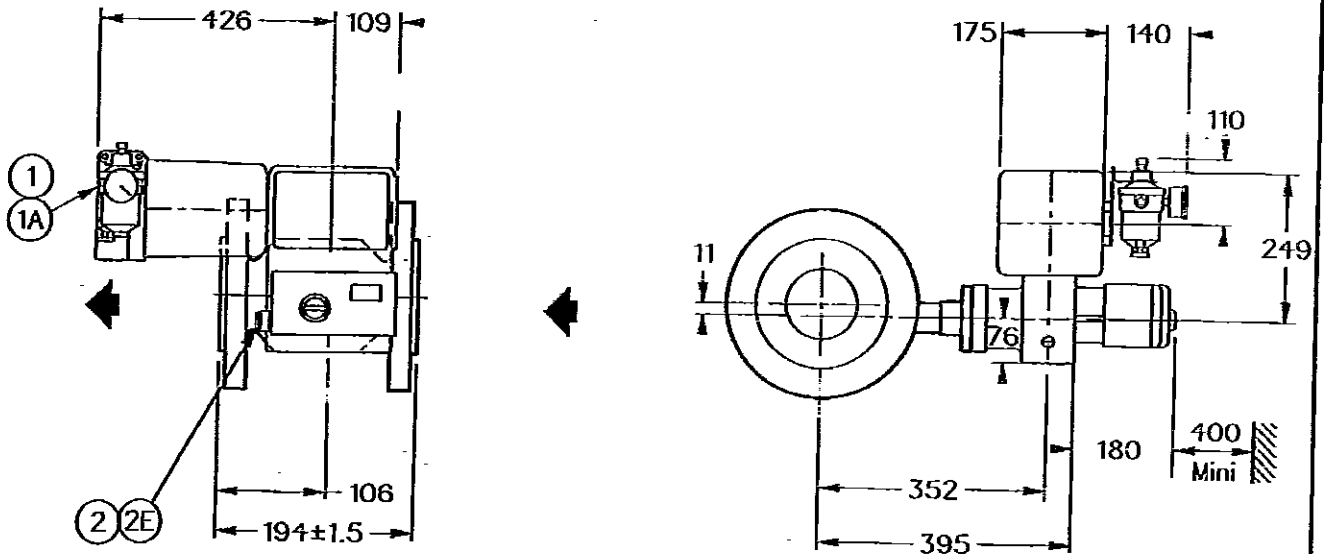
FLOW TO

: CLOSE

CONNECTION:

300 ANSI RF

TOP

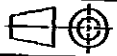


Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

NOTA : "Rotate the valve in the horizontal plane by 180° before installation".

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		62	ITEM : 010	MN SERIAL NUMBER : 02-04648-10
Rev. 1	DATE : 07/OCT/2002	DRAWN BY : P.SEVESTRE	ISSUED BY : C.DROUARD	
CUSTOMER : TECHNIP		CUSTOMER ORDER : 6465C 30 1541 01 0 1007		
TAG : 30FV 10223 / 10423 / 10623 & 10823				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

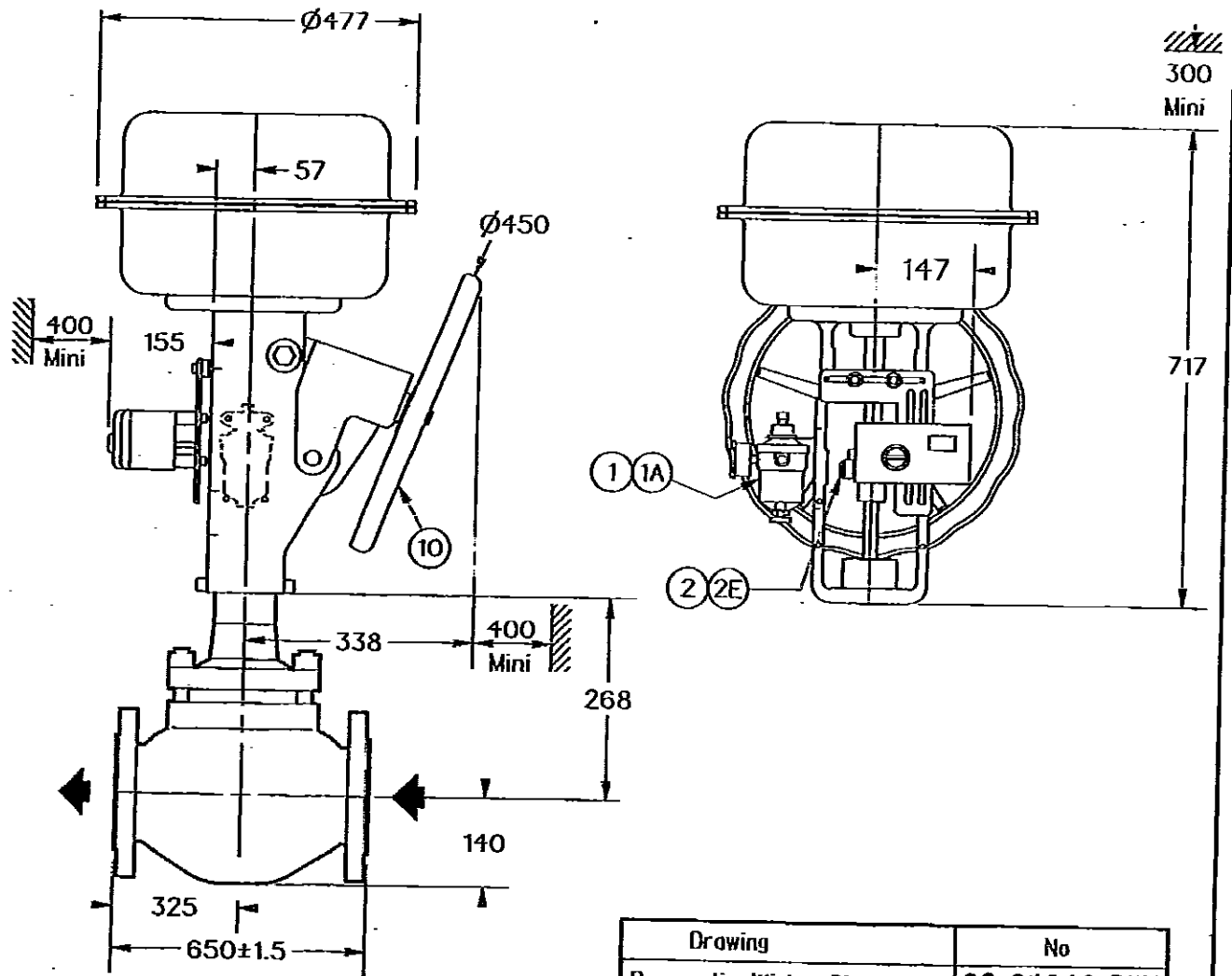


SERIES VALVE : 88-41055

DN : 6"x2"

ON AIR FAILURE : CLOSED

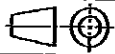
FLOW TO : CLOSE CONNECTION: 2500 ANSI RTJ-ISO PN 420 #J



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

NOTA : "Rotate the valve in the horizontal plane by 180° before installation".

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal
10		Handwheel			
TOTAL WEIGHT (accessories + valve) in kg			650	ITEM : 011	MN SERIAL NUMBER : 02-04648-11
Rev. 1	DATE: 07/OCT/2002	DRAWN BY: P.SEVESTRE	ISSUED BY: C.DROUARD		
CUSTOMER: TECHNIP FRANCE			CUSTOMER ORDER: 6465 C 30 1541 01		
TAG : 30HV 10125 TO 30HV 10925					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellam

DRESSER

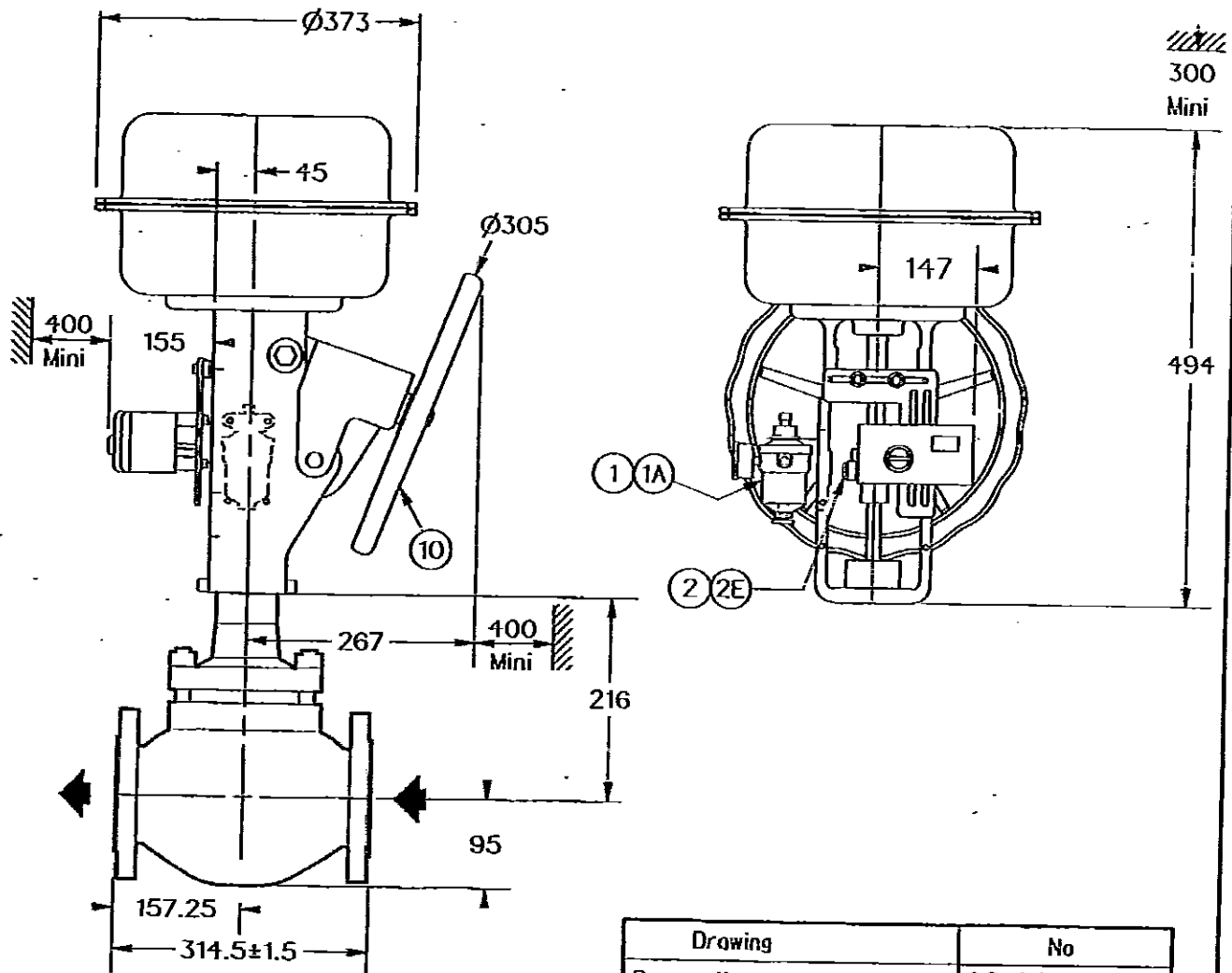
SERIES VALVE : 87-78103

DN : 50 (2")

ON AIR FAILURE : OPEN

FLOW TO : OPEN

CONNECTION: 1500 ANSI RTJ-ISO PN 250 #J



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

NOTA : "Rotate the valve in the horizontal plane by 180° before installation".

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

90

ITEM : 012

MN SERIAL NUMBER : 02-04648-12

Rev. 1

DATE: 07/OCT/2002

DRAWN BY:

P.SEVESTRE

ISSUED BY:

C.DROUARD

CUSTOMER: TECHNIP FRANCE

CUSTOMER ORDER: 6465 C 30 1541 01

TAG : 30HV 10126 TO 30HV 10926



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellam

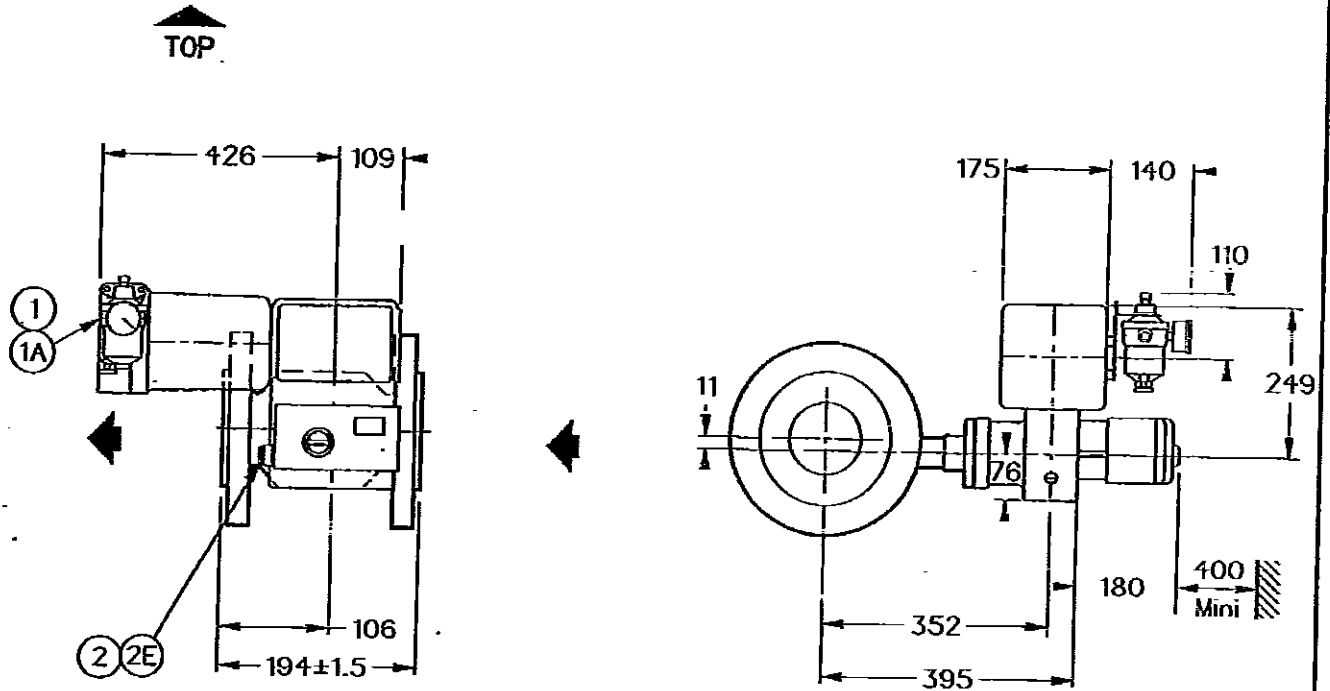
BRASSER

SERIES VALVE : 35-35202

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

NOTA : "Rotate the valve in the horizontal plane by 180° before installation".

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal
TOTAL WEIGHT(accessories + valve) in kg			62	ITEM : 013	MIN SERIAL NUMBER : 02-04648-13
Rev. 1	DATE: 07/OCT/2002	DRAWN BY: P.SEVESTRE	ISSUED BY: C.DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C 30 1541 01 0 1007		
TAG : 30TV 10117 / 10317 / 10517 / 10717 & 10917					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Gasonella

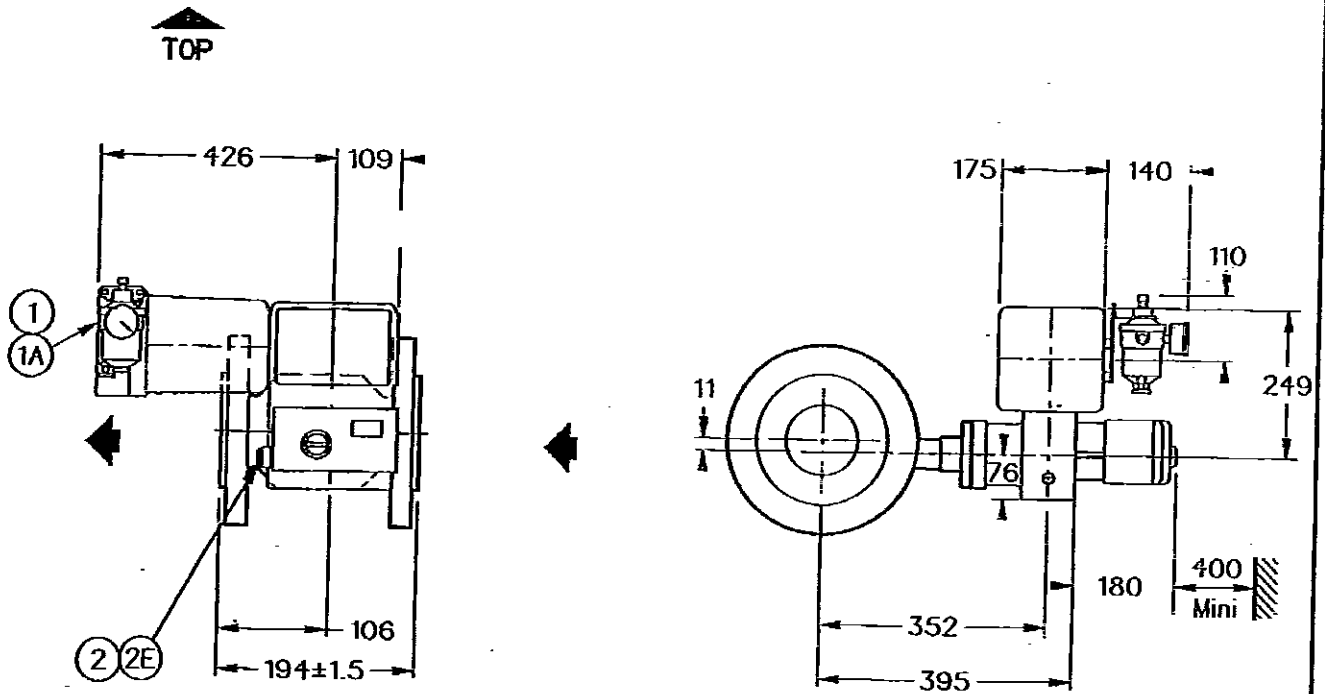
DRESSER

SERIES VALVE : 35-35202

DN : 100 (4")

ON AIR FAILURE : CLOSED

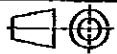
FLOW TO : CLOSE CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		62	ITEM : 013	MIN SERIAL NUMBER : 02-04648-13
Rev. 1	DATE: 07/OCT/2002	DRAWN BY: P.SEVESTRE	ISSUED BY: C.DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C 30 1541 01 0 1007		
TAG : 30TV 10217 / 10417 / 10617 & 10817				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

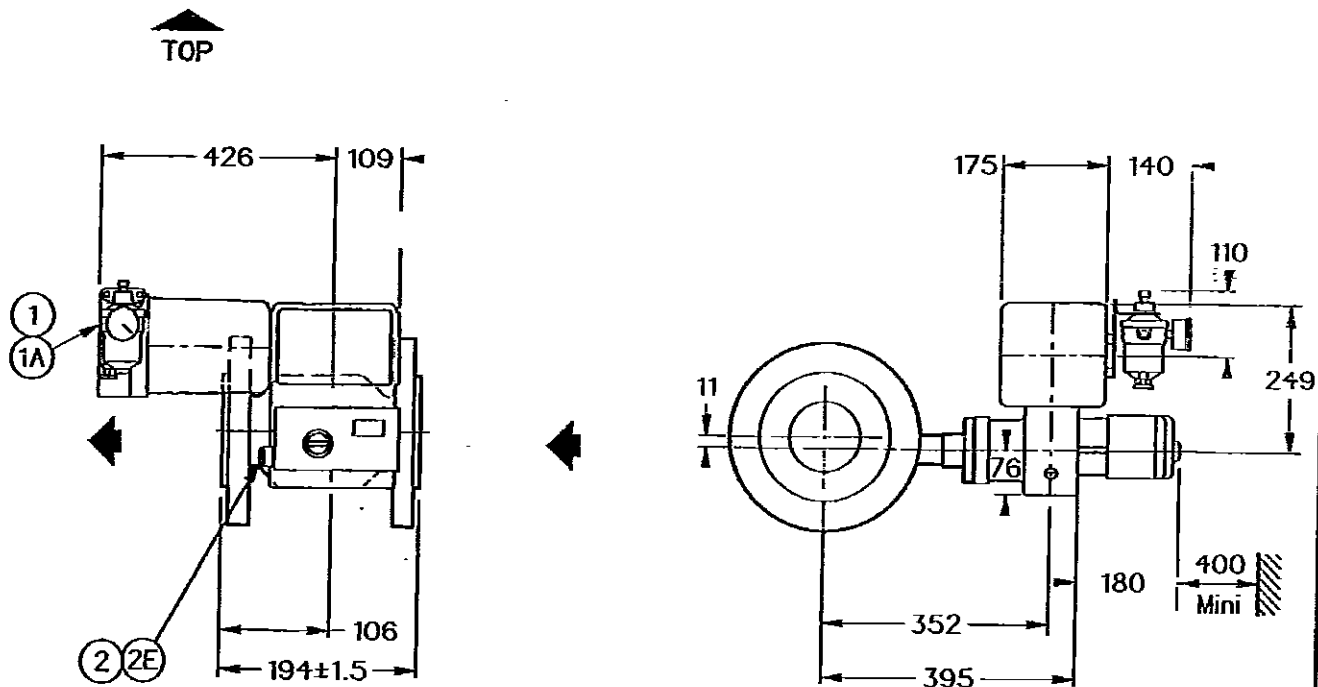
DRESSER

SERIES VALVE : 35-35202

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

NOTA : "Rotate the valve in the horizontal plane by 180° before installation".

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

62

ITEM : 014

MH SERIAL NUMBER : 02-04648-14

Rev. 1

DATE: 07/OCT/2002

DRAWN BY:

P.SEVESTRE

ISSUED BY:

C.DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 1007

TAG : 30TV 10222 / 10422 / 10622 & 10822



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



SERIES VALVE : 35-35202

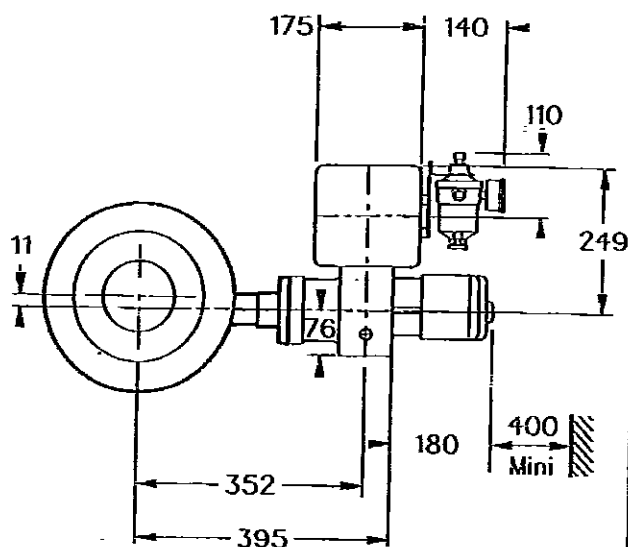
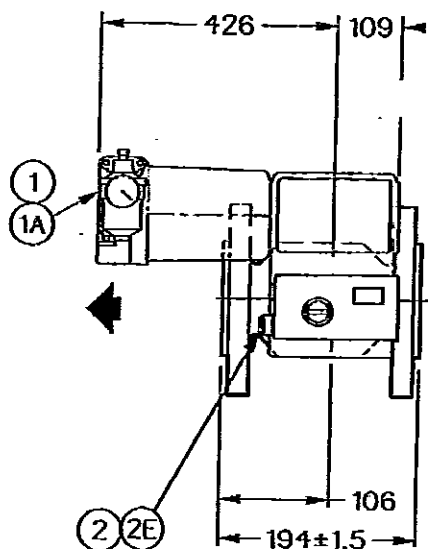
DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT(accessories + valve) in kg		62	ITEM : 014	MIN SERIAL NUMBER : 02-04648-14
Rev. 1	DATE: 07/OCT/2002	DRAWN BY: P.SEVESTRE	ISSUED BY: C.DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C 30 1541 01 0 1007		
TAG : 30TV 10122 / 10322 / 10522 / 10722 & 10922				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

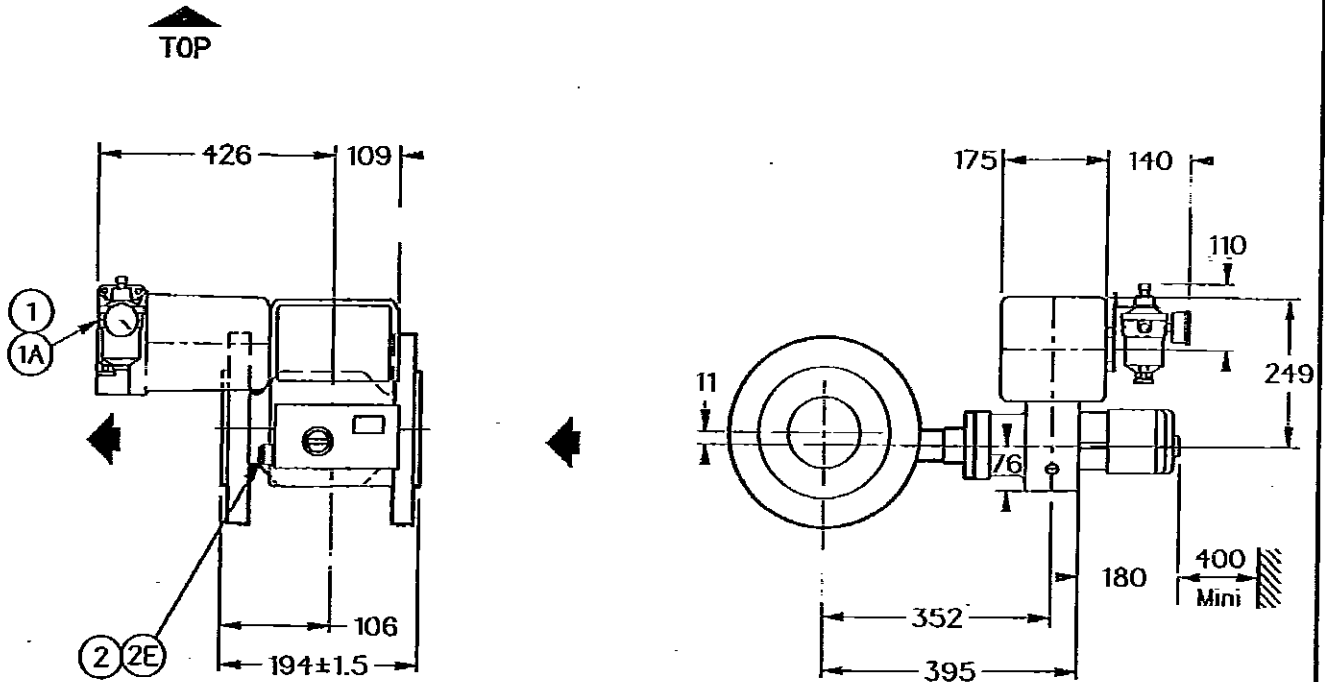
BRASSER

SERIES VALVE : 35-35202

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

NOTA : "Rotate the valve in the horizontal plane by 180° before installation".

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electro-pn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

62

ITEM : 015

WH SERIAL NUMBER : 02-04648-15

Rev. 1

DATE: 07/OCT/2002

DRAWN BY:

P.SEVESTRE

ISSUED BY:

C.DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 1007

TAG : 30TV 10127 / 10327 / 10527 / 10727 & 10927



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

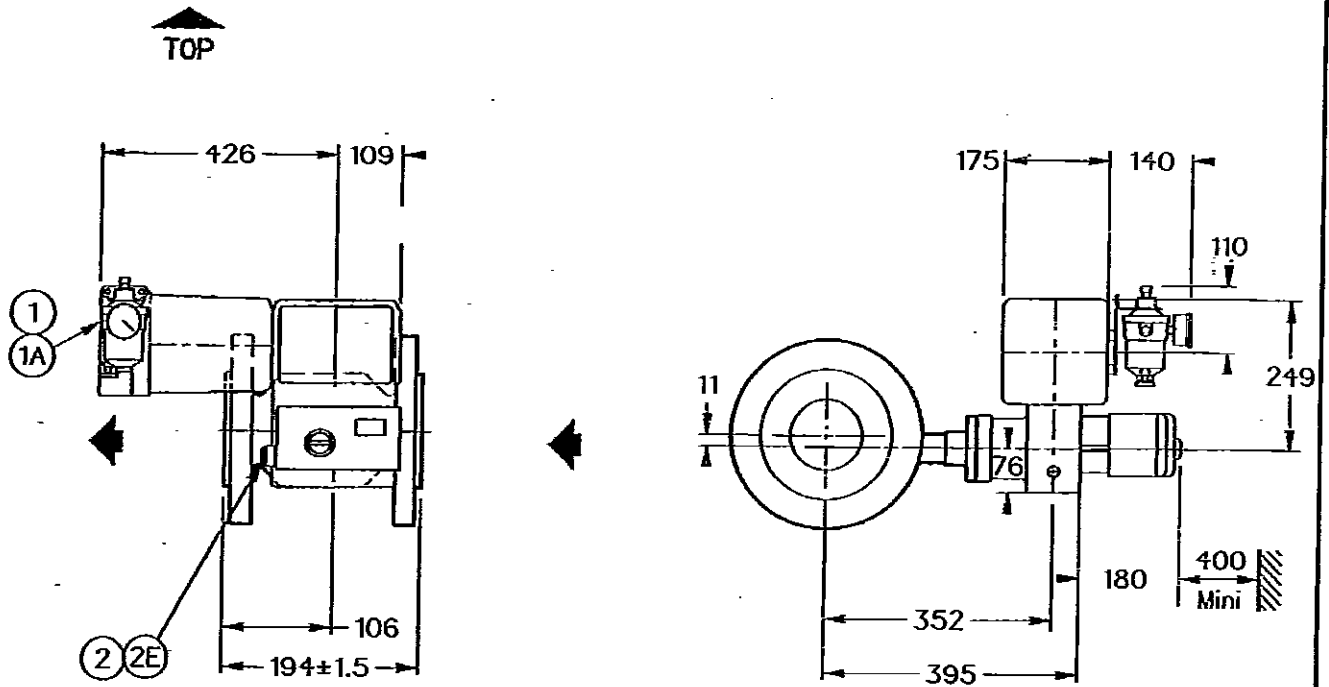
DRESSER

SERIES VALVE : 35-35202

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal
TOTAL WEIGHT (accessories + valve) in kg			62	ITEM : 015	MINI SERIAL NUMBER : 02-04648-15
Rev. 1	DATE: 07/OCT/2002	DRAWN BY: P.SEVESTRE	ISSUED BY: C.DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C 30 1541 01 0 1007		
TAG : 30TV 10227 / 10427 / 10627 & 10827					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

SERIES VALVE : 35-35202

DN : 100 (4")

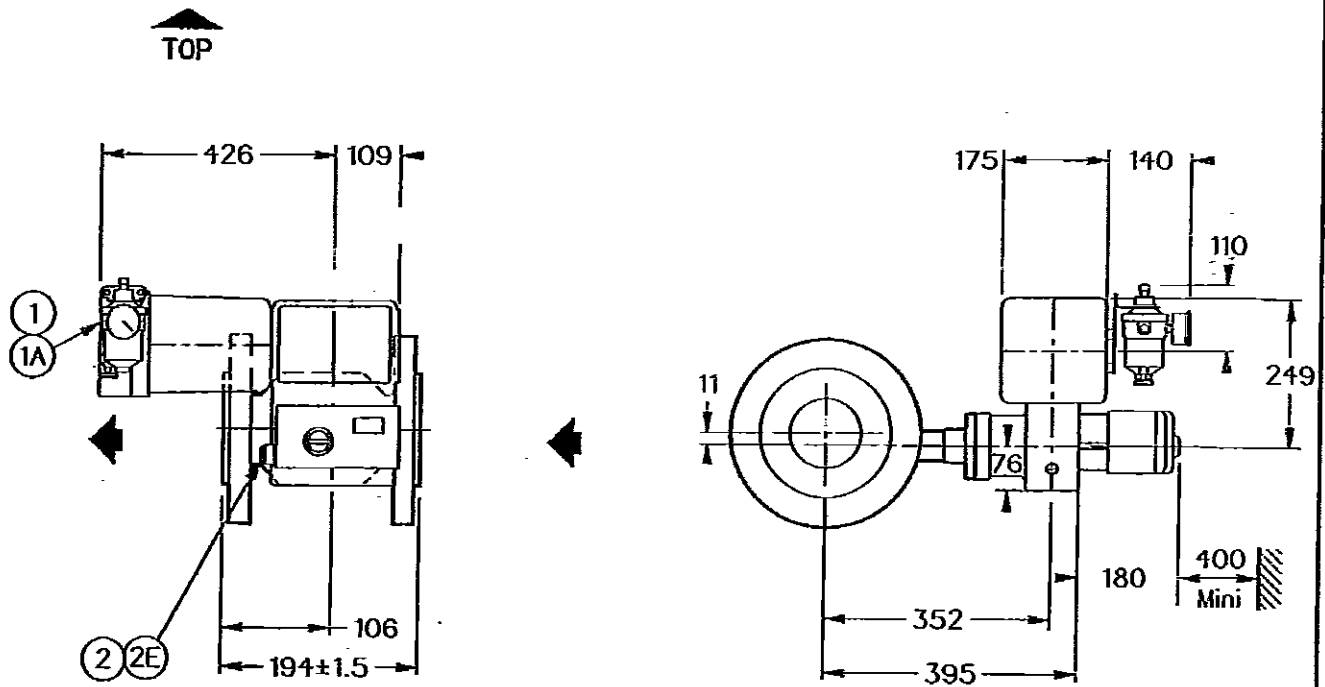
ON AIR FAILURE : CLOSED

FLOW TO

: CLOSE

CONNECTION:

300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

NOTA : "Rotate the valve in the horizontal plane by 180° before installation".

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

62

ITEM : 016

VN SERIAL NUMBER : 02-04648-16

Rev. 1

DATE: 07/OCT/2002

DRAWN BY:

P.SEVESTRE

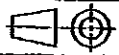
ISSUED BY:

C.DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 1007

TAG : 30TV 10132 / 10332 / 10532 / 10732 & 10932



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonella

BRASSER

SERIES VALVE : 35-35202

DN : 100 (4")

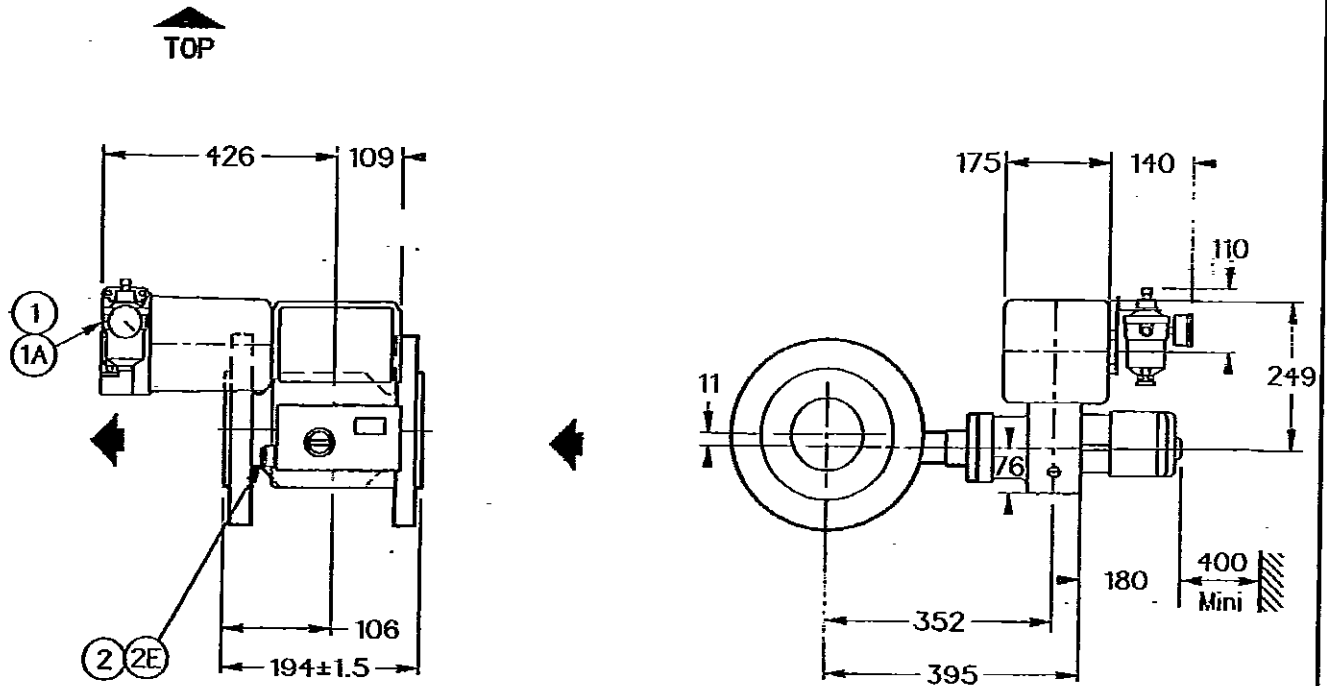
ON AIR FAILURE : CLOSED

FLOW TO

: CLOSE

CONNECTION:

300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

62

ITEM : 016

WH SERIAL NUMBER : 02-04648-16

Rev. 1

DATE: 07/OCT/2002

DRAWN BY:

P.SEVESTRE

ISSUED BY:

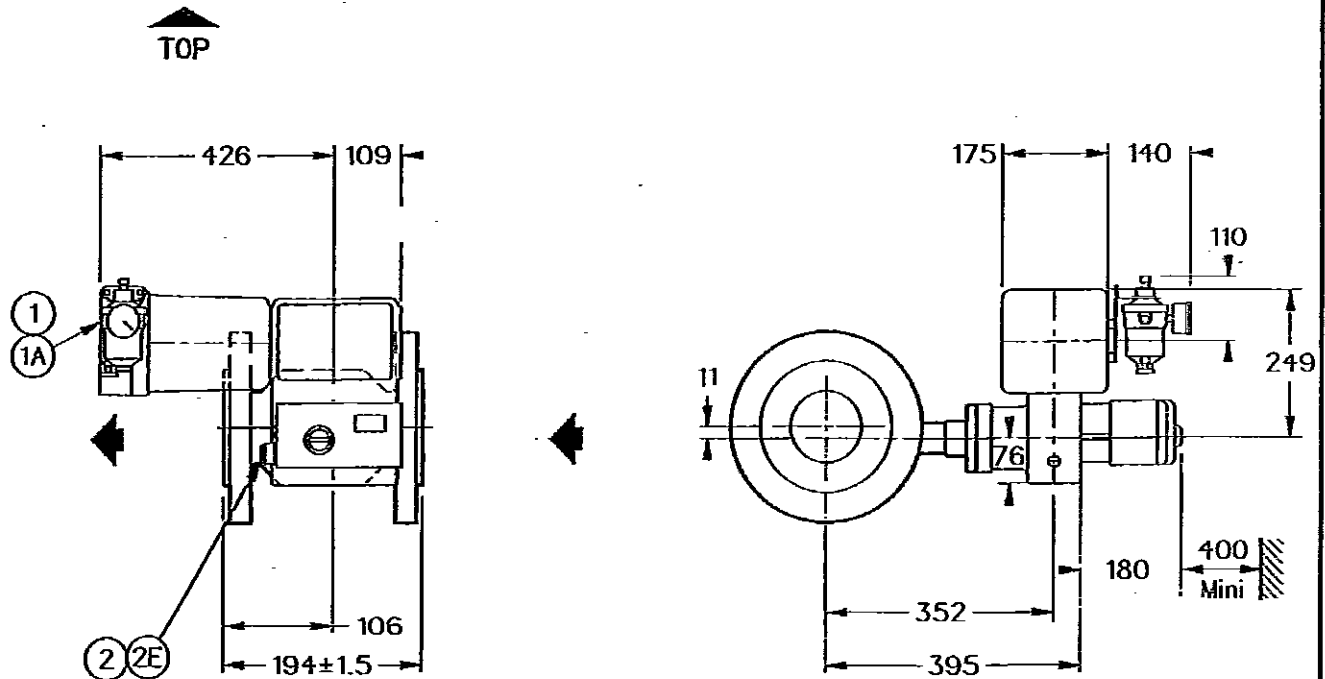
C.DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 1007

TAG : 30TV 10232 / 10432 / 10632 & 10832

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonella	
SERIES VALVE : 35-35202		DN : 100 (4")	ON AIR FAILURE : CLOSED	
FLOW TO : CLOSE		CONNECTION: 300 ANSI RF		

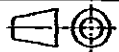


Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

NOTA : "Rotate the valve in the horizontal plane by 180° before installation".

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electro-pn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		62	ITEM : 017	MIN SERIAL NUMBER : 02-04648-17
Rev. 1	DATE: 07/OCT/2002	DRAWN BY: P.SEVESTRE	ISSUED BY: C.DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C 30 1541 01 0 1007		
TAG : 30TV 10137 / 10337 / 10537 / 10737 & 10937				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

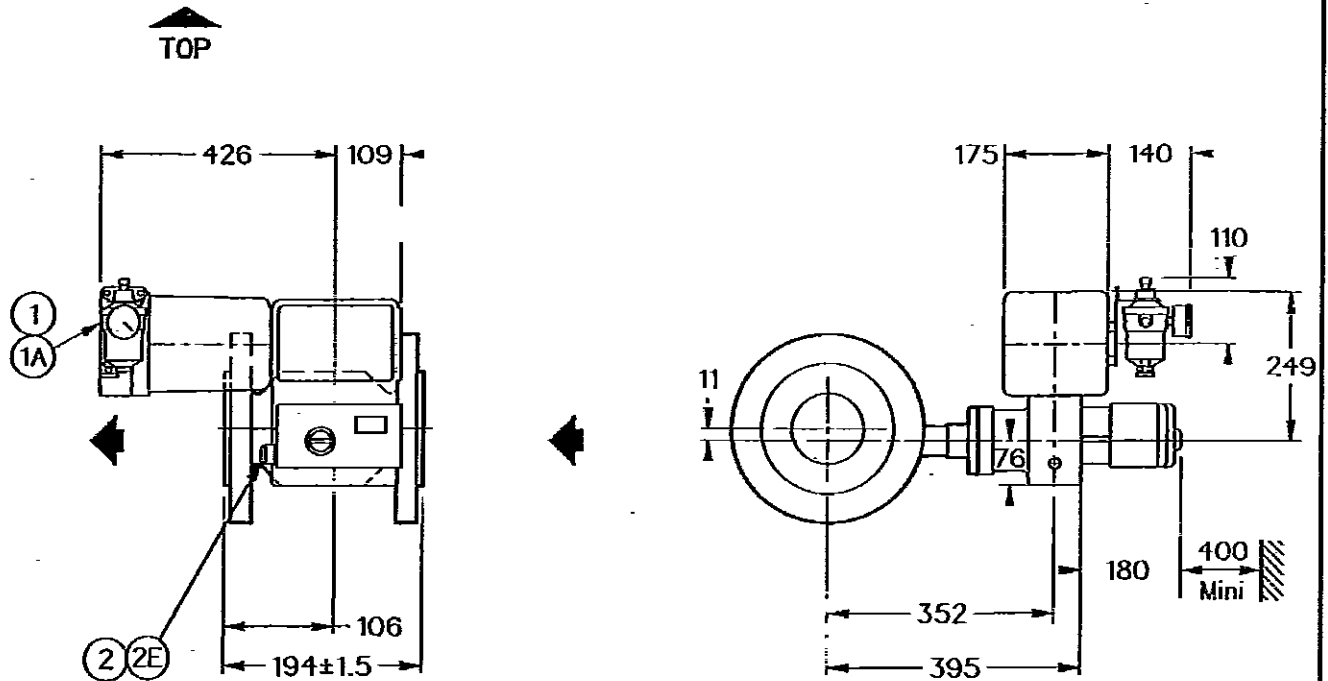
BRASSER

SERIES VALVE : 35-35202

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

62

ITEM : 017

MN SERIAL NUMBER : 02-04648-17

Rev. 1

DATE: 07/OCT/2002

DRAWN BY: P.SEVESTRE

ISSUED BY: C.DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 1007

TAG : 30TV 10237 / 10437 / 10637 & 10837



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

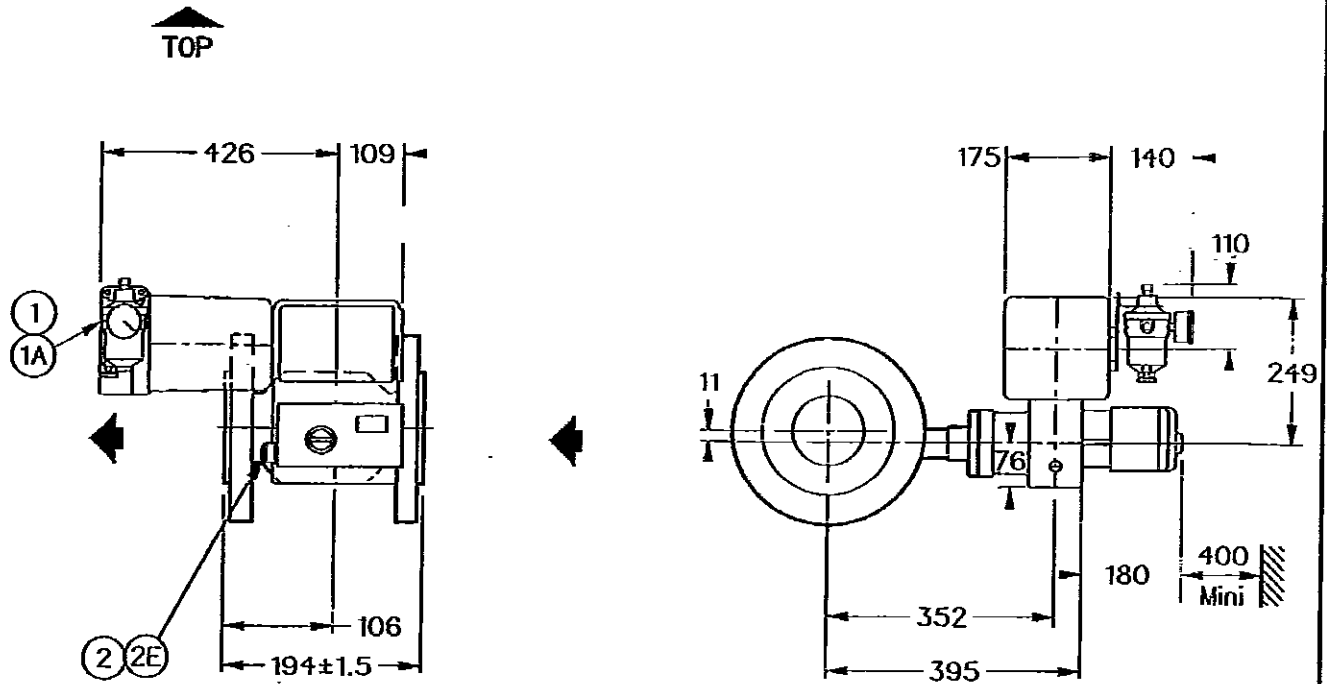
SERIES VALVE : 35-35202

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

62

ITEM : 018

UN SERIAL NUMBER : 02-04648-18

Rev. 1

DATE: 07/OCT/2002

DRAWN BY:

P.SEVESTRE

ISSUED BY:

C.DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 1007

TAG : 30TV 10242 / 10442 / 10642 & 10842



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

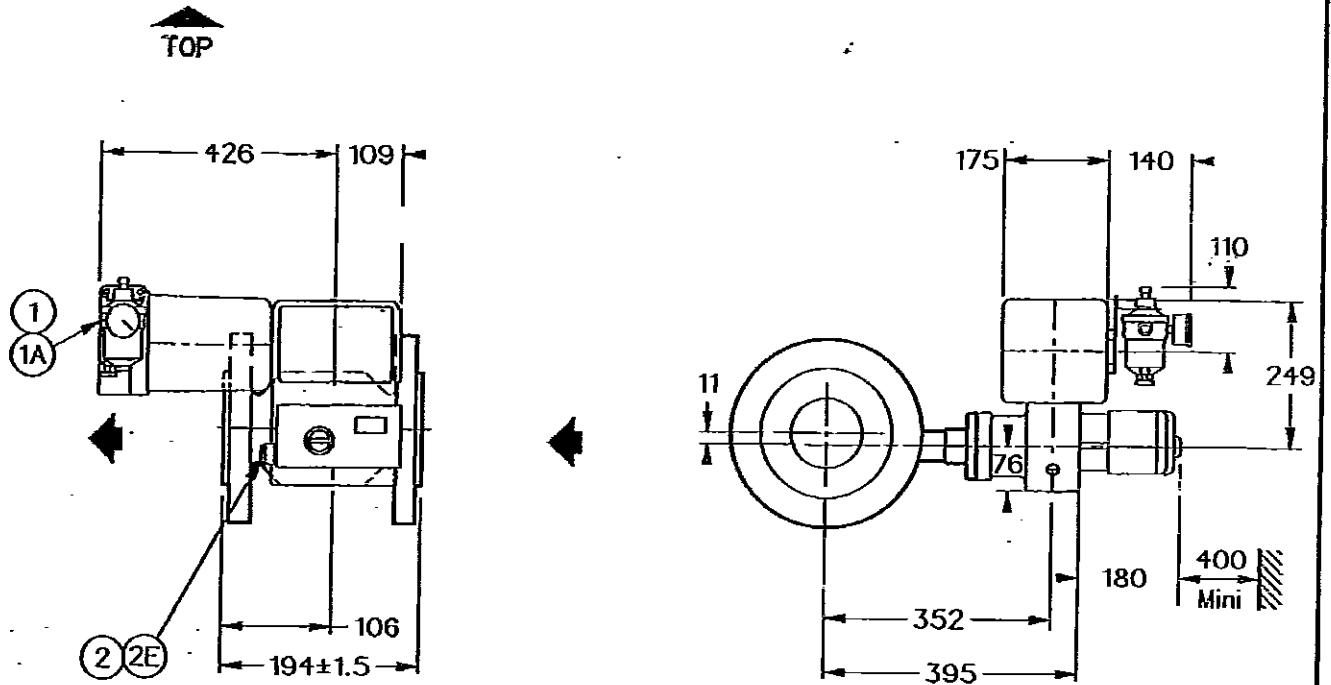
BRASSER

SERIES VALVE : 35-35202

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW1
Electrical Connections Detail	02-04648-EC1

NOTA : "Rotate the valve in the horizontal plane by 180° before installation".

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal
TOTAL WEIGHT (accessories + valve) in kg			62	ITEM : 018	UN SERIAL NUMBER : 02-04648-18
Rev. 1	DATE: 07/OCT/2002	DRAWN BY: P.SEVESTRE	ISSUED BY: C.DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C 30 1541 01 0 1007		
TAG : 30TV 10142 / 10342 / 10542 / 10742 & 10942					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

GRASSER

SERIES VALVE : 88-41415

DN : 100 (4")

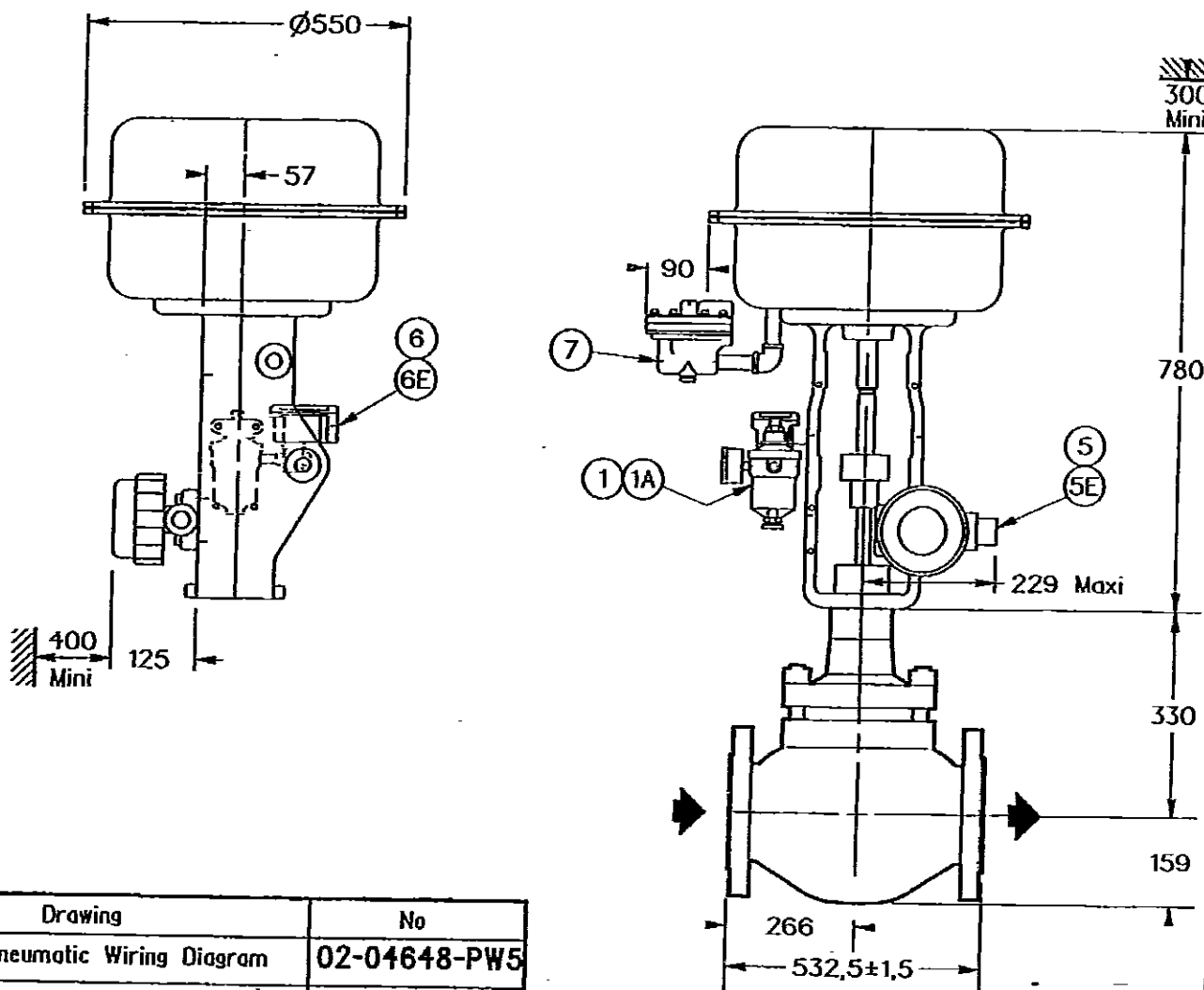
ON AIR FAILURE : CLOSED

FLOW TO

: CLOSE

CONNECTION:

1500 ANSI RTJ-ISO PN 250 #J



Drawing	No
Pneumatic Wiring Diagram	02-04648-PW5
Electrical Connections Detail	02-04648-EC3 02-04648-LD1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
5	496/4	Closing Detector	2.5	5E	M20
6	WS..B317..	Solenoid Valve	1.0	6E	M20
7	BR 400	Booster Relay	1.5		

TOTAL WEIGHT (accessories + valve) in kg

344

ITEM : 019

MIN SERIAL NUMBER : 02-04648-19

Rev. 1

DATE: Dec-10-2002

DRAWN BY:

P SEVESTRE

ISSUED BY:

C DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 1007

TAG : 30UV 10127 TO 30UV 10927

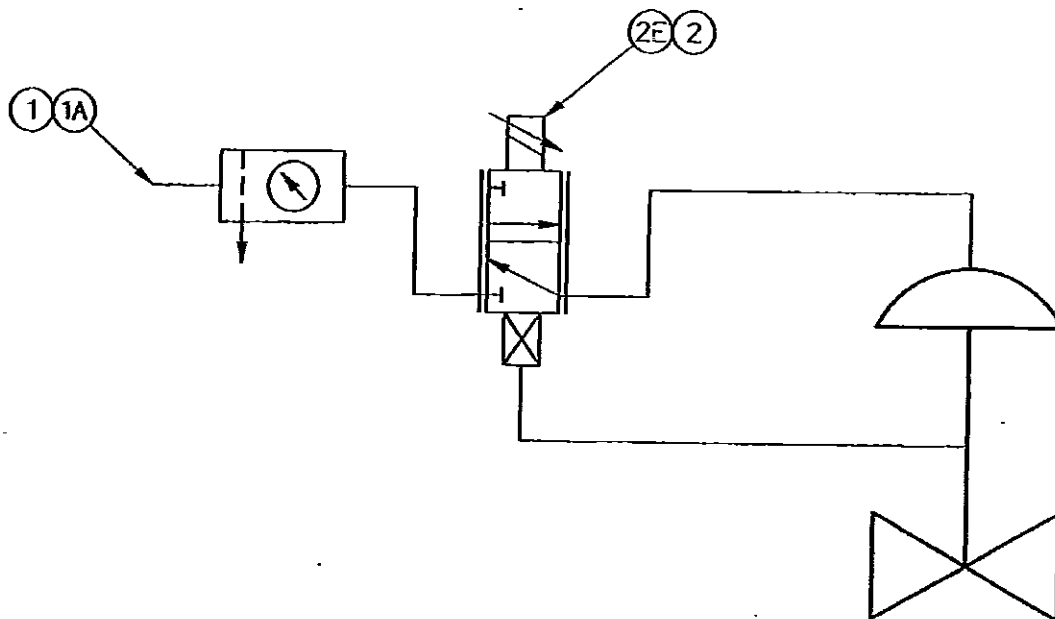


DRAWING No : 02-04648-PW1

Masonellan

DRESSER

PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10

Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal

Rev. 0	DATE: 07/OCT/2002	DRAWN BY: P. SEVESTRE	ISSUED BY: C. DROUARD	ITEM : /	MN SERIAL NUMBER : 02-04648-PW1
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6485C 30 1541 01 0 1007		
TAG : _____					



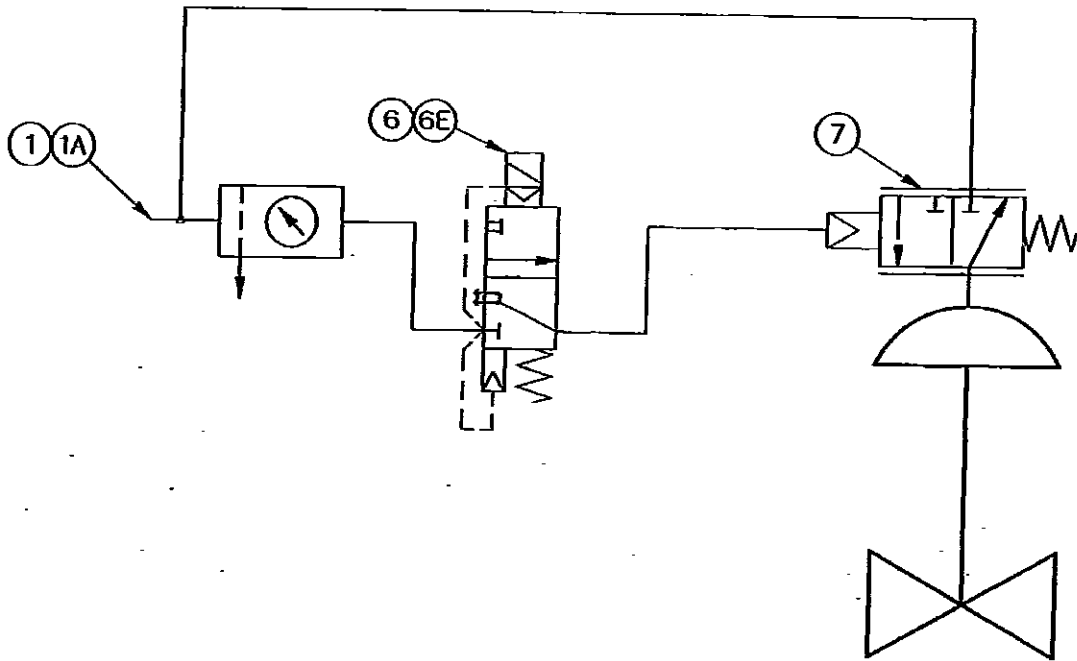
DRAWING No : 02-04648-PW5

Masonellan



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : NF ISO 1219-1
USAS Y32.10



Ref.	DESCRIPTION	Ref.	CONNECTION / FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal
6	Solenoid Valve	6E	
7	Volume Booster		

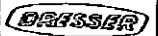
Rev. 0	DATE: 07/OCT/2002	DRAWN BY: P. SEVESTRE	ISSUED BY: C. DROUARD
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C 30 1541 01 0 1007	
TAG : _____			

ITEM : _____ MN SERIAL NUMBER : 02-04648-PW5



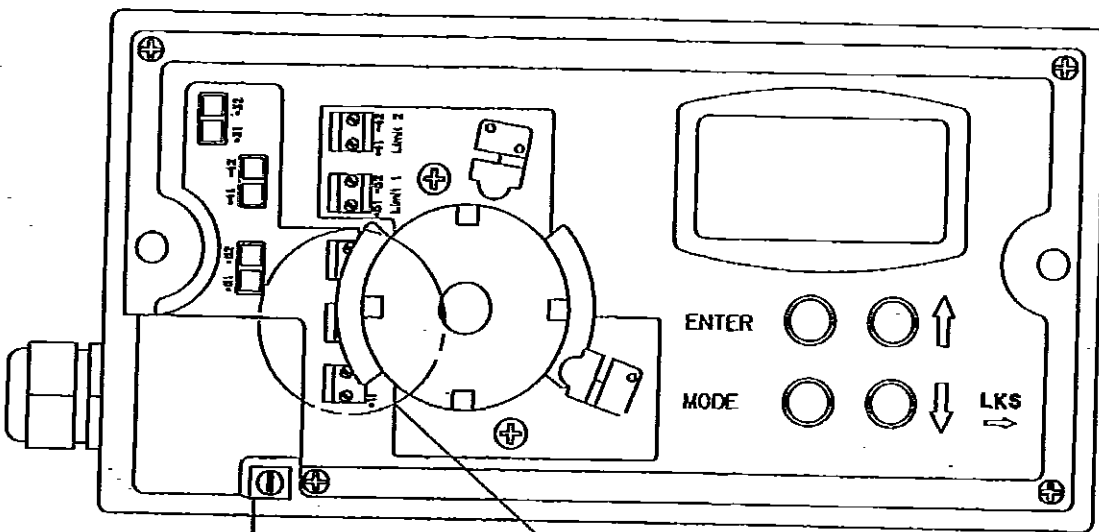
DRAWING No : 02-04648-EC1

Masonellan

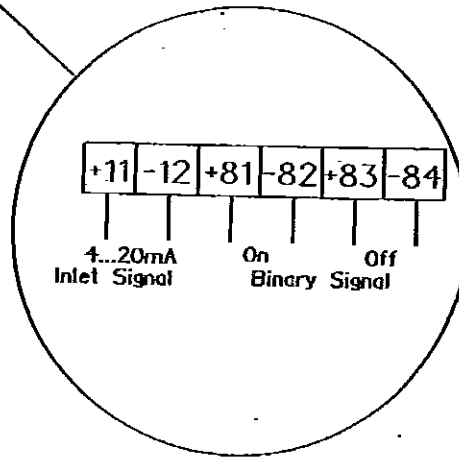


ELECTRICAL CONNECTIONS DETAIL

ELECTROPNEUMATIC POSITIONER TZID-C



Earth Terminal



Rev. 0

DATE: 07/OCT/2002

DRAWN BY: P. SEVESTRE

ITEM :

WH SERIAL NUMBER : 02-04648-EC1

CUSTOMER: TECHNIP

ISSUED BY: C. DROUARD

CUSTOMER ORDER: 6465C 30 1541 01 0 1007

TAG :



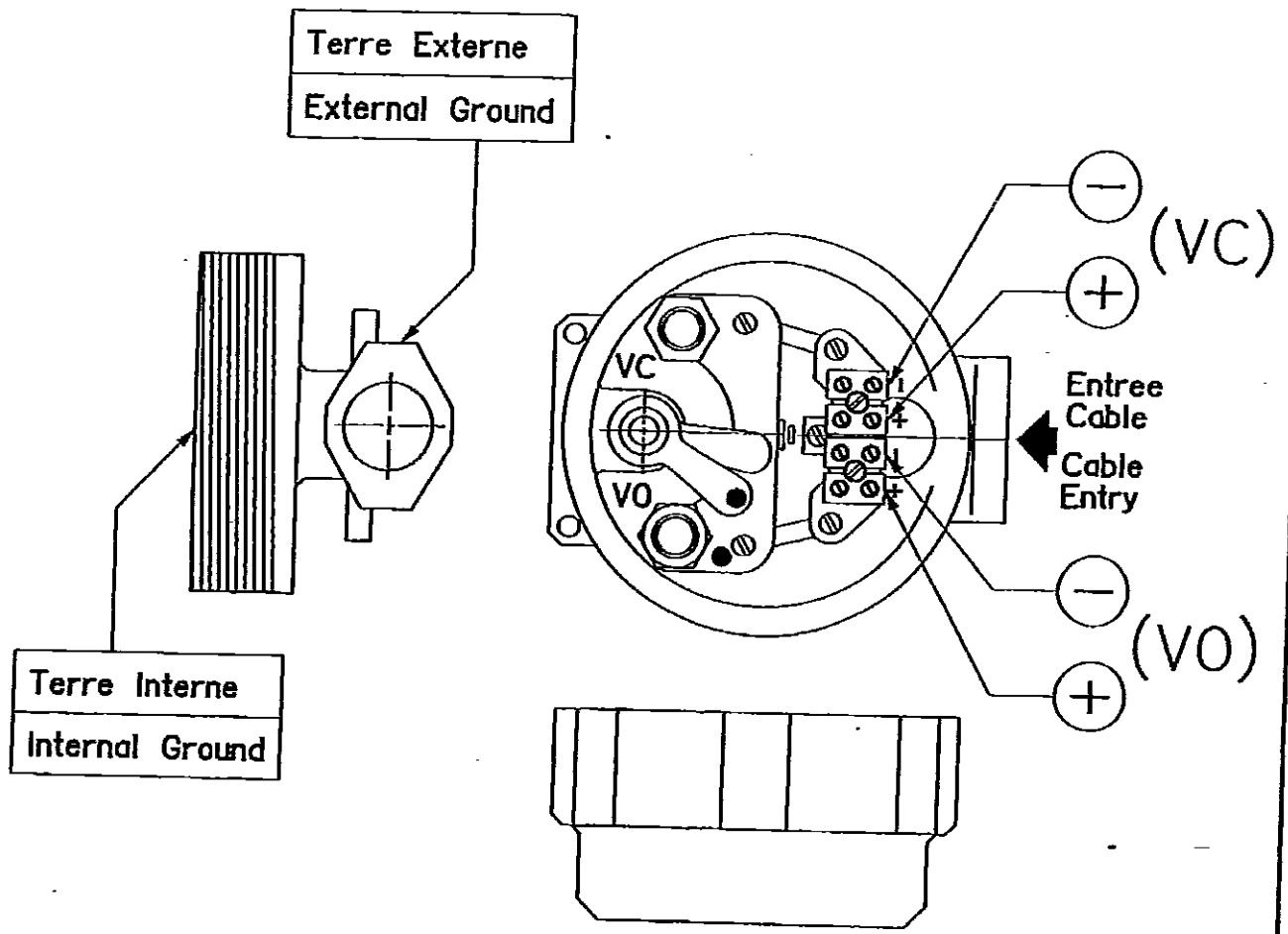
PLAN/DRWG : 02-04648-LD1

Masonellan



DETAIL RACCORDEMENTS ELECTRIQUES
ELECTRICAL CONNECTIONS DETAIL

DETECTEUR FIN DE COURSE 496-4 & 5
LIMIT DETECTOR 496-4 & 5



- VO : Detecteur Vanne OUVERTE
: OPEN Valve Detector
- VC : Detecteur Vanne FERMEE
: CLOSED Valve Detector

ITEM: _____

N° DE SERIE : 02-04648-LD1
SERIAL NUMBER:



Rev: 1 | DAT.: Dec-11-2002 | DESS. PAR/DRAWN BY: P. SEVESTRE

EMIS PAR/ISSUED BY: C. DROUARD

CLIENT/CUSTOMER: TECHNIP

Cde CLIENT/CUST. ORDER: 6465C30 154: 01 0 10007

REPERE/TAG No: _____

Society and address of Works Raison sociale et adresse de l'usine  Sri Ranganathan Industries Pvt. Ltd. 12/45, THADAGAM ROAD, EDAYAPALAYAM, COIMBATORE - 641 025, INDIA. Phone : 0422 - 400141 Fax : +91 - 422 - 400733 +91 - 422 - 400645		 DRESSER PRODUITS INDUSTRIELS DIVISION - MASONEILAN 14110 CONDE SUR NOIREAU FRANCE	Initials of works Sigle de l'usine productrice <p style="text-align: center;">SRI</p> <p style="text-align: right; font-size: 1.2em;">31 JAN. 2001</p>
--	--	---	---

INSPECTION CERTIFICATE - INSPECTION REPORT
 NF - EN - 10204 3.1.B

MN Purchase Order and date N° et Date de commande MN	81161 30/03/2000	MN part number N° de Repere MN	4001181921040008
Description and Size Designation et Dimension nominale du material	4"600# RF 41K5 FULLY MACH BODY	MN QUANTITY MN QUANTITE	2 Nos
Material specification Designation normalisee du Matériau	ASTM A216 GR:WCC-93	MN drawing number N° de plan MN	370394 / 400118192 B
Certificate number & Date	007809 27/04/2000	Suppliers Booking Number Enregistrement Fournisseur	W.O.No.010 04/04/2000

CHEMICAL ANALYSIS (%)
Analyse Chimique

C	Si	Mn	S	P	Cr	NI	Mo	Cu	V	Heat Number N° de coulées
0.190	0.440	0.960	0.026	0.020	0.220	0.065	0.034	0.023	0.006	


MECHANICAL PROPERTIES
-Caracteristiques Mecaniques-


TENSILE Traction				IMPACT TEST : Joules Resilience			HARDNESS Durete	
Specification Norme				Specification Norme			CVN - 2mm (10 x 10 x 55 mm)	
Yield Strength E Mpa	Tensile Strength R Mpa	Elongation A% sur	Reduction of area Σ %				Specification Norme	BHN
301.000	636.000	31.200	53.010					163

HEAT TREATMENT Raised to 920°C soaked for 2 hrs and then air cooled.
TRAITMENT THERMIQUE :

Treatment(s) carried out Traitement(s) effectue(s)	Temperature use Montee en temperature	Sustained Maintien	Cooling Refroidissement	Temperature when leaving furnace Temperature de sortie du four
	Gradient and duration Gradient et duree	Temperature and duration Temperature et duree	Gradient and duration Gradient et duree	
	920°C	2.00 Hrs	AIR COOL	

SPECIAL TESTS Essais speciaux	VISUAL AND DIMENSIONAL INSPECTION RECORD Certificate de controle visuel et dimensionnel - Attached WE CERTIFY THAT THE ABOVE MENTIONED MATERIALS ARE IN COMPLIANCE WITH REQUIREMENTS OF ORDER Nous certifions que la fourniture de la commande ci - dessus Referencee est conforme aux exigences de la commande
OBSERVATIONS Observations	

1. WORKS APPOINTED INSPECTOR Agent de l'usine mandate	2. APPOINTED INSPECTOR Inspecteur mandate	3. SRI CONTROL Contrôle SRI
	N° 4 QUALITÉ 29 JAN. 2001	 27-04-2000

Society and address of Works Raison sociale et adresse de l'usine  Sri Ranganathan Industries Pvt. Ltd. 12/45, THADAGAM ROAD, EDAYAPALAYAM, COIMBATORE - 641 025. INDIA. Phone : 0422 - 400141 Fax : +91 - 422 - 400773 E-mail : sri@md3.vsnl.net.in +91 - 422 - 400645		DRESSER PRODUITS INDUSTRIELS DIVISION - MASONIELAN 14110 CONDE SUR NOIREAU FRANCE	Infirmary of works Siège de l'usine productrice SRI Application No : 2003
--	--	---	--

Certificate de reception - Proces-Verbal de reception	INSPECTION CERTIFICATE - INSPECTION REPORT NF - EN - 10204 3.1.B
--	---

MN Purchase Order and date N° et Date de commande MN	44280 10-Oct-2002	MN part number N° de Repere MN	204000909551040000
---	------------------------------------	---	---------------------------

Description and Size Designation et Dimension nominale du materiel	4" 600# 40K BONNET FMC WOL	QUANTITY QUANTITE	1 No(s)
---	-----------------------------------	------------------------------------	----------------

Material specification Designation normalisee du Materiau	ASTM A216 WCC/EN 1.0619/1.0625 & SA 067 REV.R	MN drawing number N° de plan MN	463627 E 00/040004-161
--	--	--	-------------------------------

Certificate number & Date N° du certificat et date	033198A 30-Nov-2002	Suppliers Booking Number Enregistrement Fournisseur	735 15-Oct-2002
---	--------------------------------------	--	----------------------------------

CHEMICAL ANALYSIS (%)
Analyse Chimique

C	Si	Mn	S	P	Cr	Ni	Mo	Cu	V	Heat Number N° de coulee IQ0789
0.219	0.409	0.894	0.016	0.025	0.045	0.000	0.014	0.010	0.001	
								RE	CE*	
								0.070	0.381	

MECHANICAL PROPERTIES
-Caracteristiques Mecaniques-

TENSILE Traction				IMPACT TEST : Joules Resilience				HARDNESS Durete			
Specification Norme				AT				-20 °C			
Yield Strength E Mpa	Tensile Strength R Mpa	Elongation A% sur	Reduction of area Σ %	Specification Norme				CVN - 2mm (10 x 10 x 55 mm)			
0.2% 309	516	26.430	56.760	(46+48+ 40)/3=45				Specification Norme BHN			
								143			

HEAT TREATMENT **RAISED TO 920°C SOAKED FOR 3 HRS AND THEN AIR COOLED.**
TRAITEMENT THERMIQUE :

Treatment(s) carried out Traitement effectue(s)	Temperature use Montee en temperature	Sustained Maintien	Cooling Refroidissement	Temperature when leaving furnace Temperature de sortie du four
	Gradient and duration Gradient et duree	Temperature and duration Temperature et duree	Gradient and duration Gradient et duree	
	920 °C	3.00 Hrs	AIR COOLED	

SPECIAL TESTS Essais speciaux CE* = C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15	VISUAL AND DIMENSIONAL INSPECTION RECORD Certificat de controle visuel et dimensionnel WE CERTIFY THAT THE ABOVE MENTIONED MATERIALS ARE IN COMPLIANCE WITH REQUIREMENTS OF ORDER Nous certifions que la fourniture de la commande ci - dessus Referencee est conforme aux exigences de la commande
OBSERVATIONS Observations HYDRO TEST AT 156 BAR, 600 SECS AND FOUND OK. HYDRO TESTED COMPONENTS ARE STAMPED WITH LETTER H	

1. WORKS APPOINTED INSPECTOR Agent de l' usine mandate	2. APPOINTED INSPECTOR Inspecteur mandate N° 4 QUALITÉ 20 FEB, 2003 MASONEILAN	3. SRI CONTROL Controle SRI  03-12-2002
---	---	--

UNIT 20

TECHNIP

VENDOR DOCUMENT REVIEW

1 REVISE AND RESUBMIT

2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED




3 NO COMMENT - FINAL ISSUE

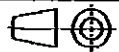
OUTLINE DRAWINGS

THIERRY GRANDRY - TECHNIP
 2002.12.23 13:55:49 +01'00'
 <none>

STATUS CERTIFIED "FINAL"
 ISSUED BY : G.DROUARD
 DATE : 16/12/2002

REV	DATE	DESCRIPTION
4	16/12/02	Up-dated drawings further to your comments
3	23/10/02	Up-dated drawings further to accessories modifications
2	16/10/02	Up-dated drawings with accessories
1	25/06/02	Addition items 01 and 15
0	27/05/02	FIRST ISSUE

TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007	
 NARGAN		EQUIPMENT NAME: <p style="text-align: center;">Control valves</p>	
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant		
 DRESSER Flow Control	DOCUMENT TITLE :	DOCUMENT CODE :	
	Outline drawings	A 3201	
	PURCHASE ORDER :	Sheet	Rev.
	02-4909 (Unit 20)	01 of 25	4



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



SERIES VALVE : 35-35202

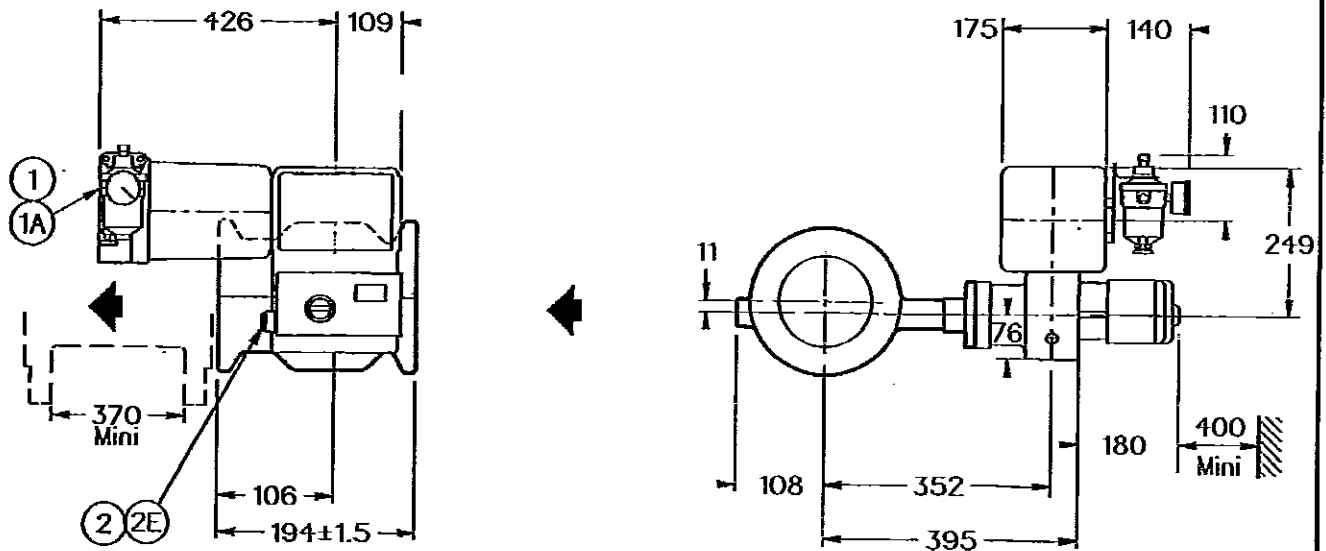
DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW1
Electrical Connections Detail	02-04909-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

54

ITEM : 12002

MIN SERIAL NUMBER : 02-04909-02

Rev. 1

DATE: Oct-10-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 20001



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

SERIES VALVE : 35-35102

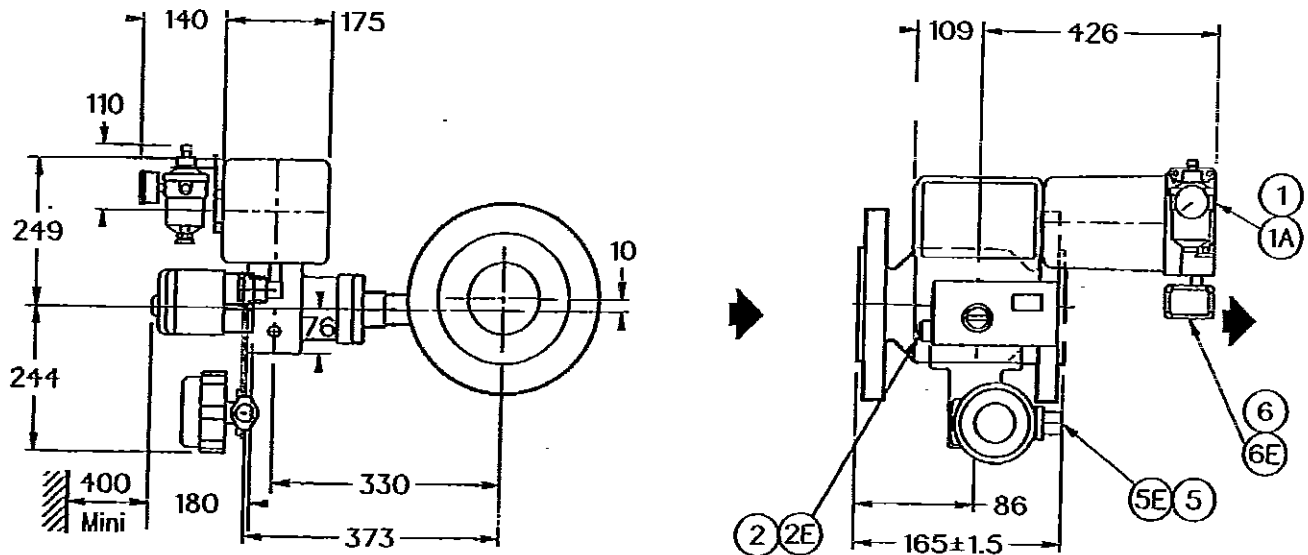
DN : 80 (3")

ON AIR FAILURE : OPEN.

FLOW TO : OPEN

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW2
Electrical Connections Detail	02-04909-EC1
Electrical Connections Detail	02-04909-EC3
Electrical Connections Detail	02-04909-LD1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
5	496/4	Closing Detector	2.5	5E	M20
6	WS..B317..	Solenoid Valve	1.0	6E	M20

TOTAL WEIGHT(accessories + valve) in kg

48

ITEM : 12003

MN SERIAL NUMBER : 02-04909-03

Rev. 2

DATE: Dec-11-2002

DRAWN BY:

P-ROUELLE

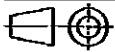
ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 1007

TAG : 30 PV 20001



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

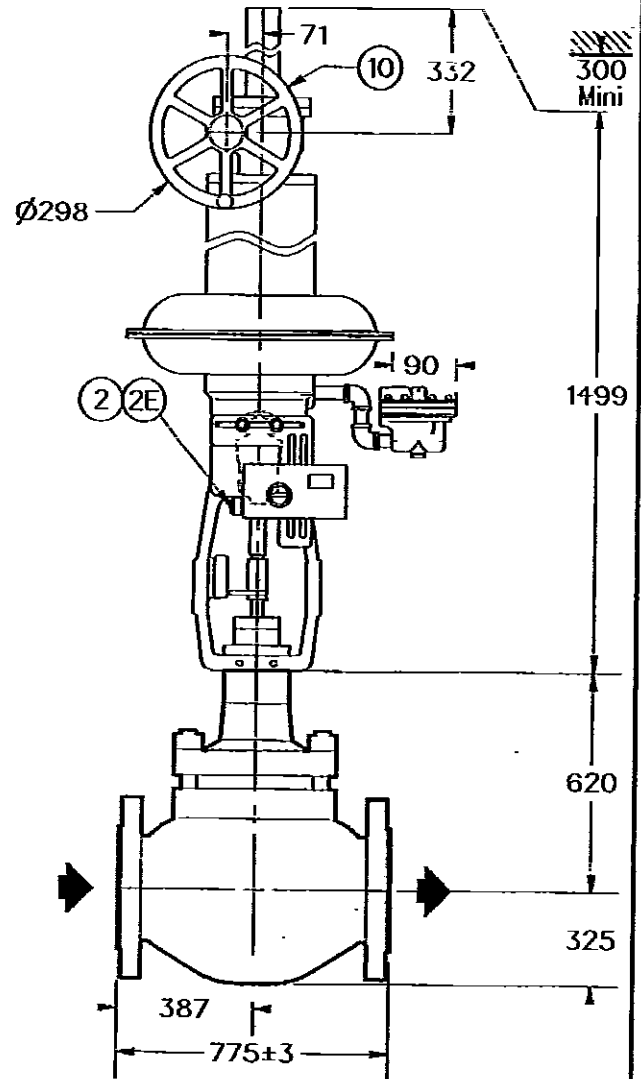
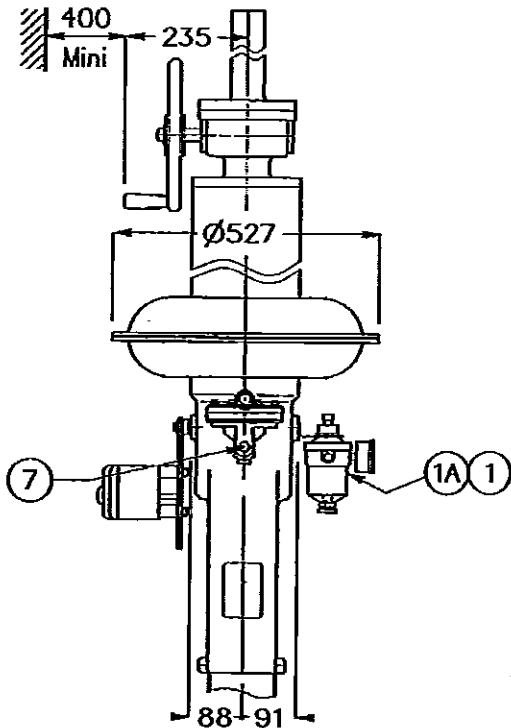
SERIES VALVE : 38-41335

DN : 12"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW3
Electrical Connections Detail	02-04909-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
7	BR400	Booster	1.0		
10	8A	Handwheel			

TOTAL WEIGHT(accessories + valve) in kg

1140

ITEM : 12004

MIN SERIAL NUMBER : 02-04909-04

Rev. 1

DATE: Oct-03-2002

DRAWN BY:

P. ROUELLE

ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 20022 A



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



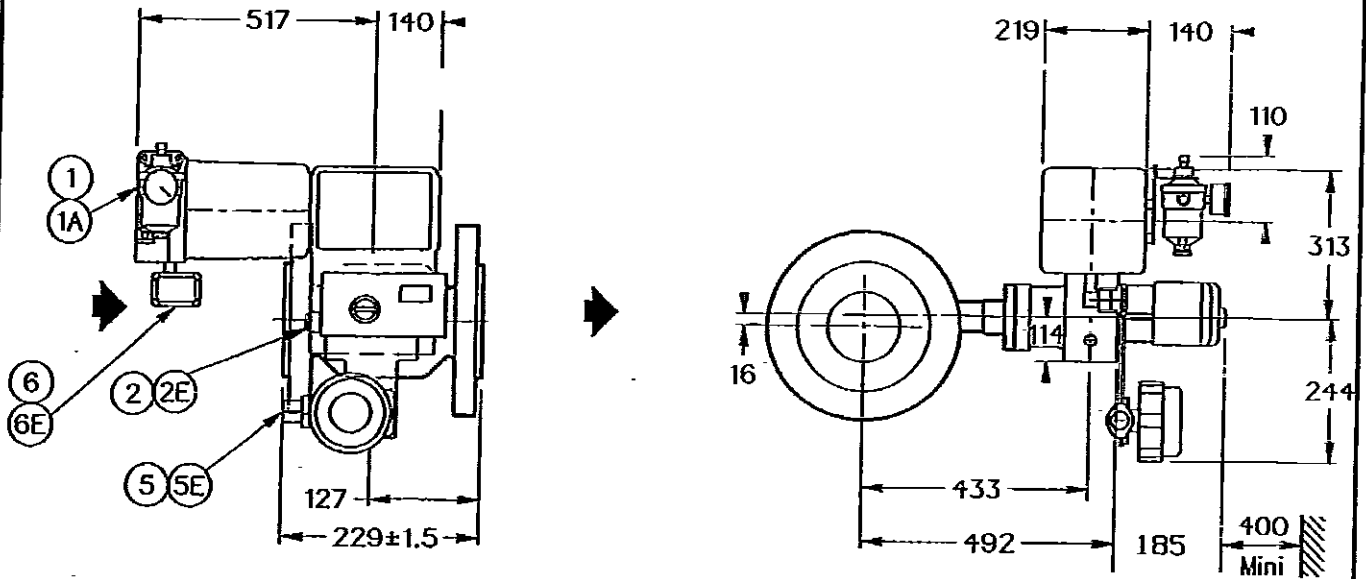
SERIES VALVE : 35-35602

DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW2
Electrical Connections Detail	02-04909-EC1
Electrical Connections Detail	02-04909-EC3
Electrical Connections Detail	02-04909-LD4

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M20 - Signal
5	496/4	Closing Detector	2.5	5E	M20
6	WS..B317..	Solenoid Valve	1.0	6E	M20

TOTAL WEIGHT(accessories + valve) in kg

127

ITEM : 12005

MIN SERIAL NUMBER : 02-04909-05

Rev. 2

DATE: Dec-11-2002

DRAWN BY:

P. ROUELLE

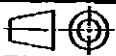
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 20022B



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

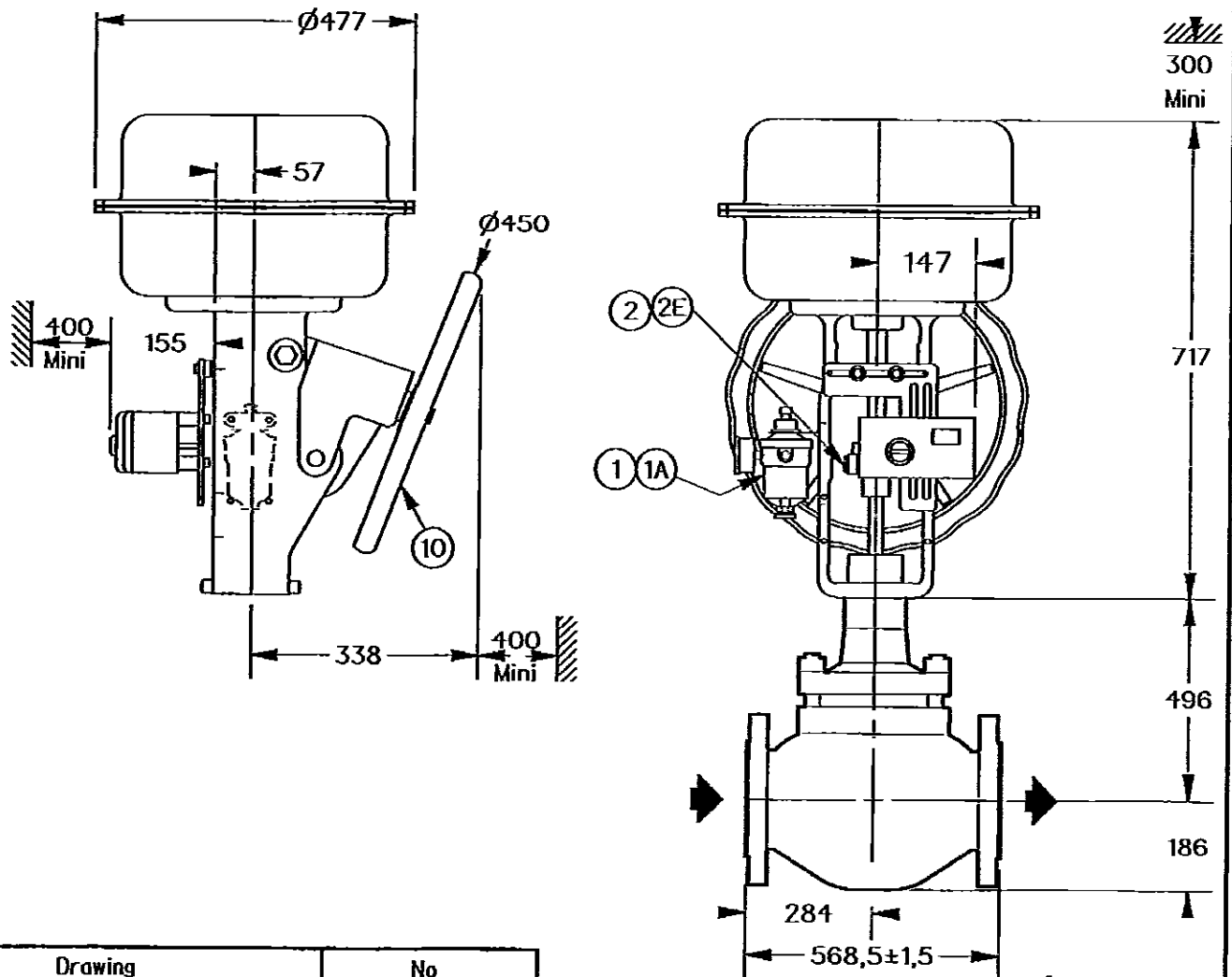
SERIES VALVE : 88-41355

DN : 8"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW1
Electrical Connections Detail	02-04909-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	Electroprn. positioner	1.0	2E	M20 - Signal
10		Handwheel			

TOTAL WEIGHT(accessories + valve) in kg

529

ITEM :12006

MN SERIAL NUMBER : 02-04909-06

Rev. 2

DATE: Oct-21-2002

DRAWN BY:

P-ROUELLE



ISSUED BY:

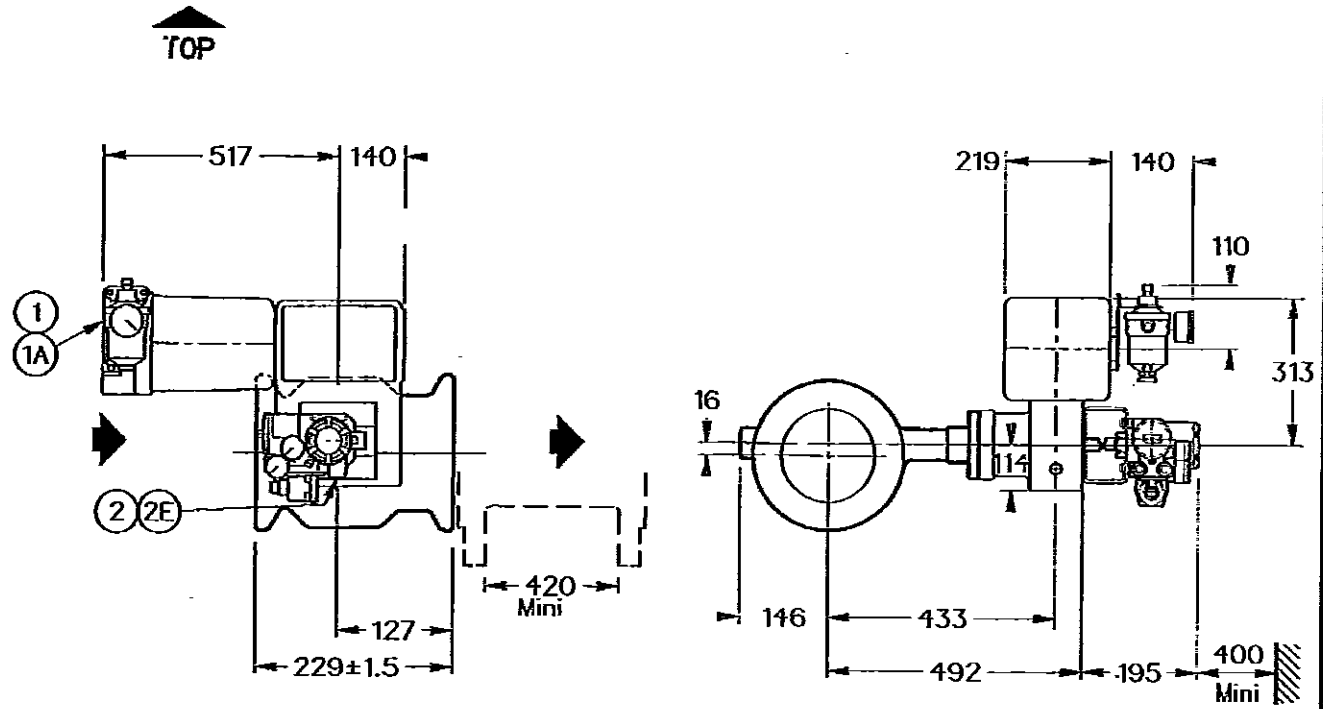
C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 20024

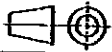
	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonella	
SERIES VALVE : 35-35602		DN : 150 (6")	ON AIR FAILURE : CLOSED	
FLOW TO : CLOSE		CONNECTION: 300 ANSI RF		



Drawing	No.
Pneumatic Wiring Diagram	02-04909-PW1
Electrical Connections Detail	02-04909-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		105	ITEM : 12007	MN SERIAL NUMBER : 02-04909-07
Rev. 1	DATE: Oct-3-2002	DRAWN BY: P. ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 TV 20024				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



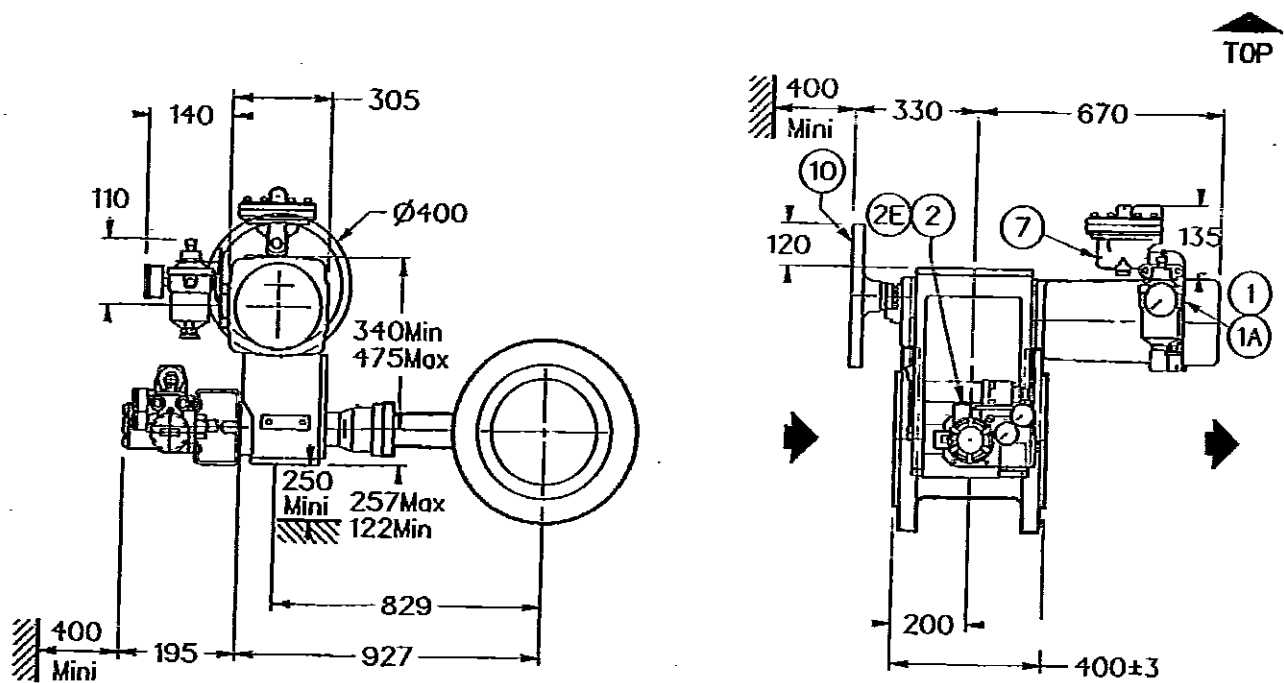
SERIES VALVE : 30-30122-/HW

DN : 400 (16")

ON AIR FAILURE : OPEN

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW3
Electrical Connections Detail	02-04909-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply M20 - Signal
2	FVP	E/P Positioner	4.0	2E	
7	BR400	Booster	1.0		
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

480

ITEM : 1200B

WH SERIAL NUMBER : 02-04909-08

Rev. 2

DATE: Dec-06-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PDV 20031



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

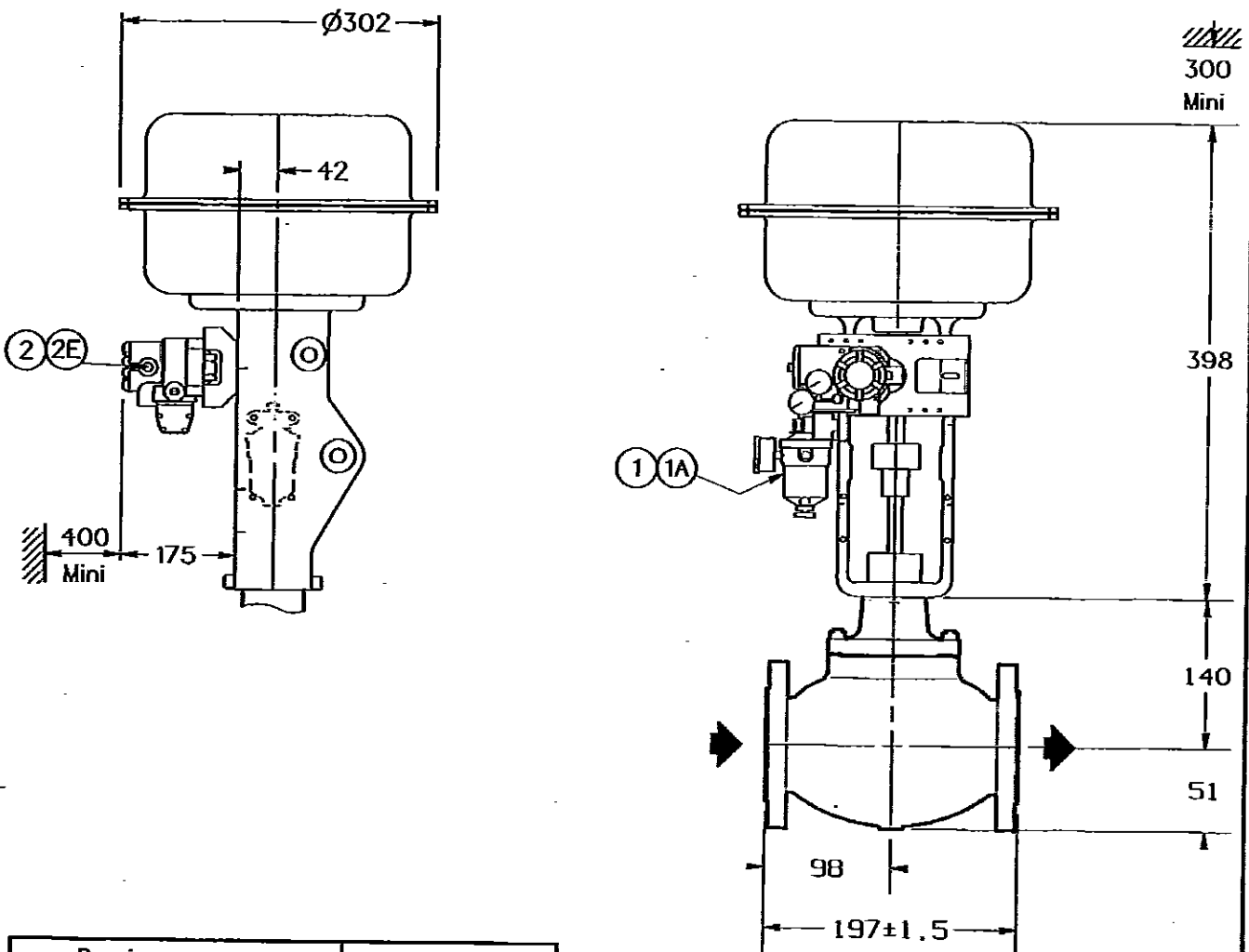
SERIES VALVE : 88-21125

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW1
Electrical Connections Detail	02-04909-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

38

ITEM : 12009

MIN SERIAL NUMBER : 02-04909-09

Rev. 1

DATE: Oct-04-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LDV 20051



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSAR

SERIES VALVE : 35-35202

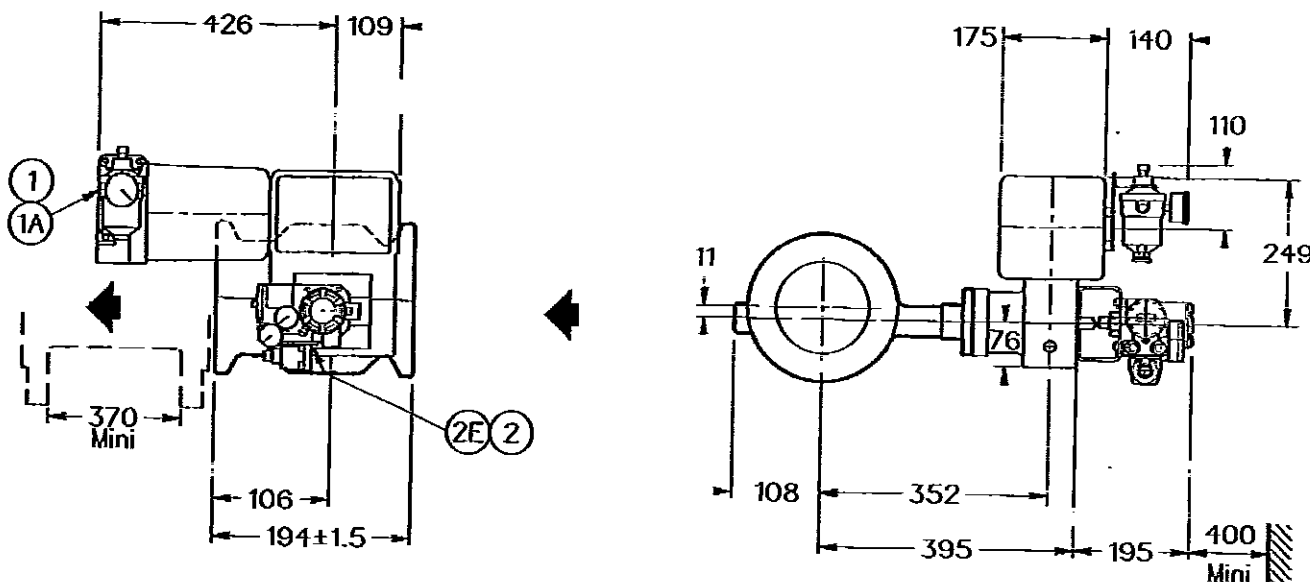
DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW1
Electrical Connections Detail	02-04909-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

49

ITEM : 12010

MN SERIAL NUMBER : 02-04909-10

Rev. 1

DATE: Oct-3-2002

DRAWN BY:

P. ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 FV 20061



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

SERIES VALVE : 35-35202

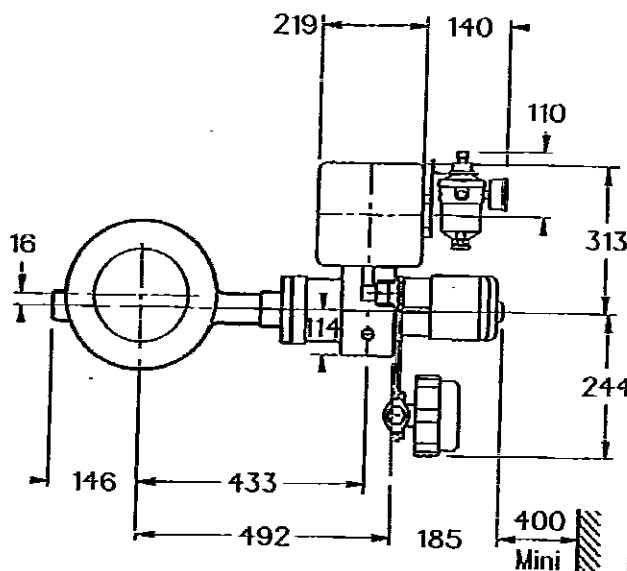
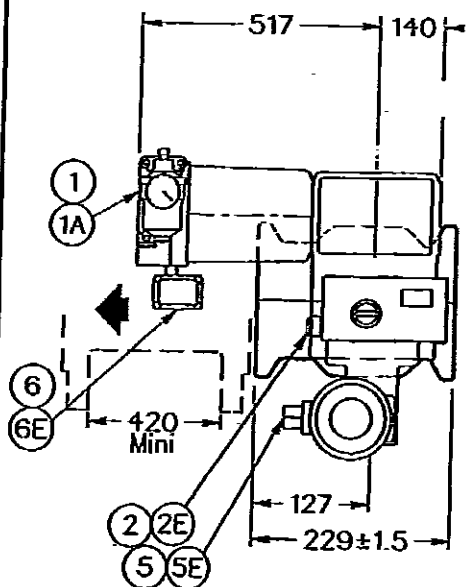
DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW2
Electrical Connections Detail	02-04909-EC1
Electrical Connections Detail	02-04909-EC3
Electrical Connections Detail	02-04909-LD4

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ1D-C	E/P Positioner	4.0	2E	M 20 - Signal
5	496/4	Closing Detector	2.5	5E	M20
6	WS..B317..	Solenoid Valve	1.0	6E	M20

TOTAL WEIGHT (accessories + valve) in kg

100

ITEM : 12011

M/N SERIAL NUMBER : 02-04909-11

Rev. 2 DATE: Dec-11-2002


DRAWN BY: P-ROUELLE

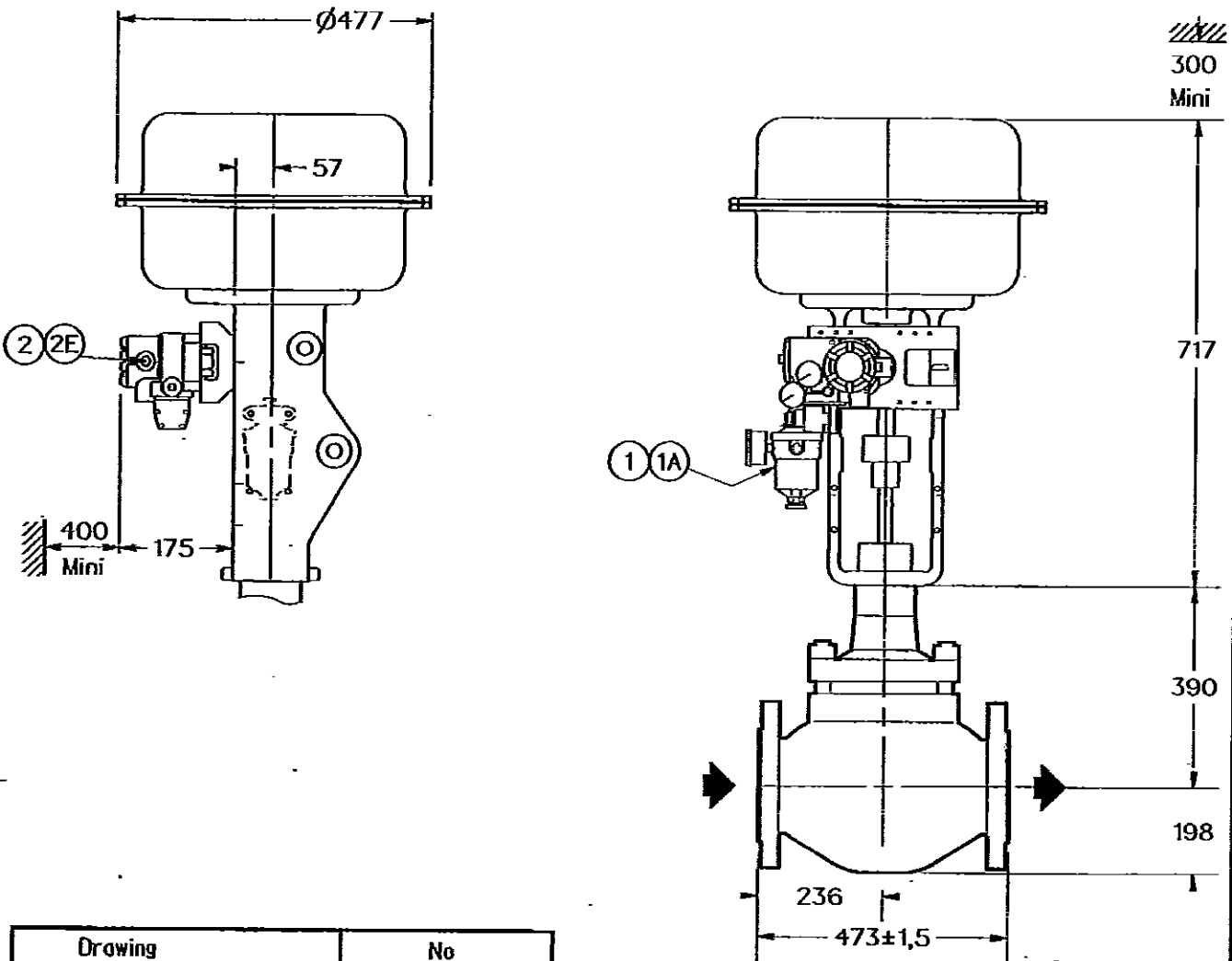
ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 20071

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	DRESSER
SERIES VALVE : 88-41935		DN : 150 (6")	ON AIR FAILURE : CLOSED	
FLOW TO : OPEN		CONNECTION: 300 ANSI RF		

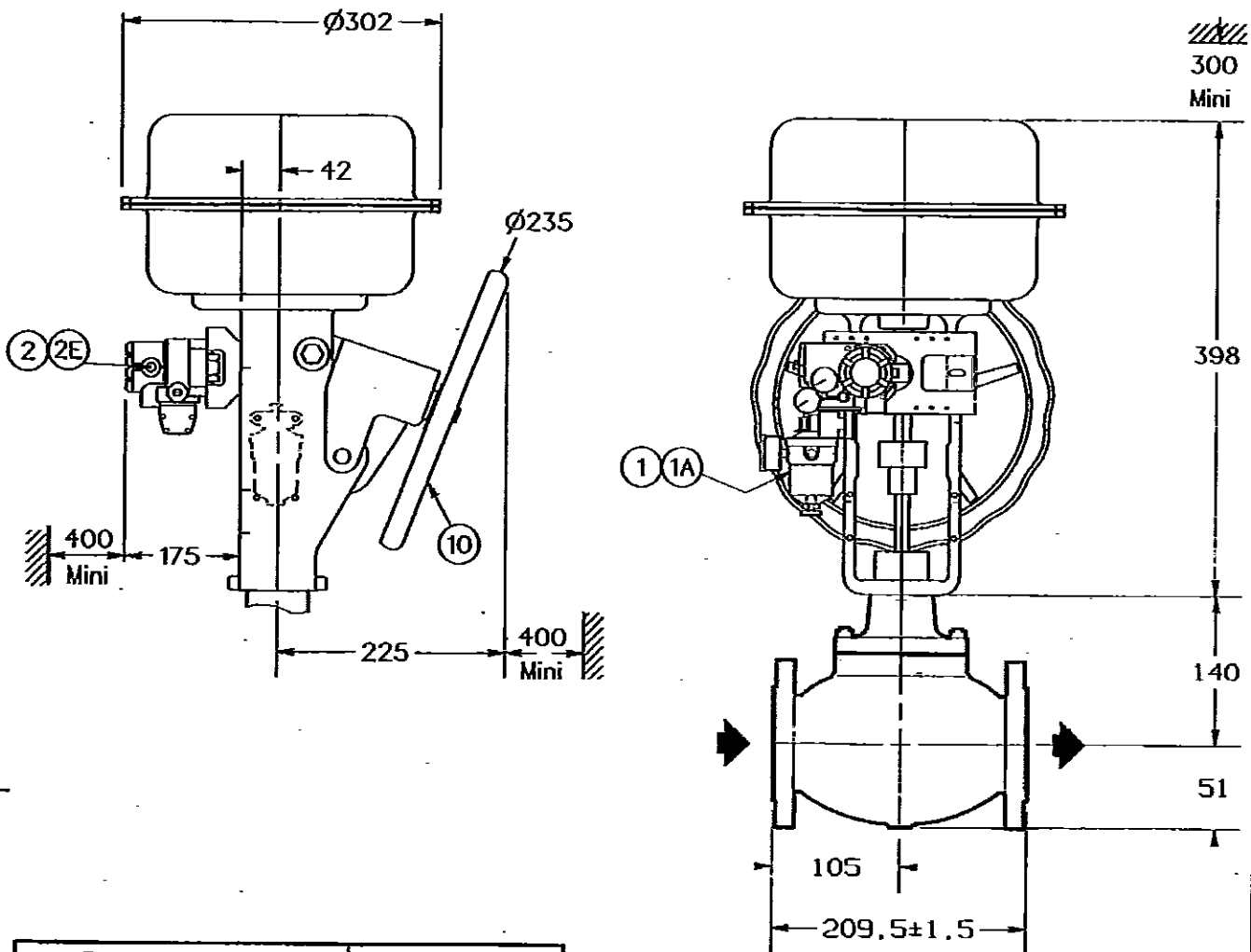


Drawing	No
Pneumatic Wiring Diagram	02-04909-PW1
Electrical Connections Detail	02-04909-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		279	ITEM : 12012	MN SERIAL NUMBER : 02-04909-12
Rev. 1	DATE: Oct-04-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 FV 20071				

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellam	
SERIES VALVE : 88-21014-2S/		DN : 25 (1")	ON AIR FAILURE : CLOSED	
FLOW TO : OPEN		CONNECTION: 600 ANSI RF		



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW1
Electrical Connections Detail	02-04909-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electron. positioner	1.0	2E	M20 - Signal
10		Handwheel			

TOTAL WEIGHT(accessories + valve) in kg		44	ITEM : 12013	MIN SERIAL NUMBER : 02-04909-13
Rev. 1	DATE: Oct-04-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007	
TAG : 30 LV 20081				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellam

BRESSER

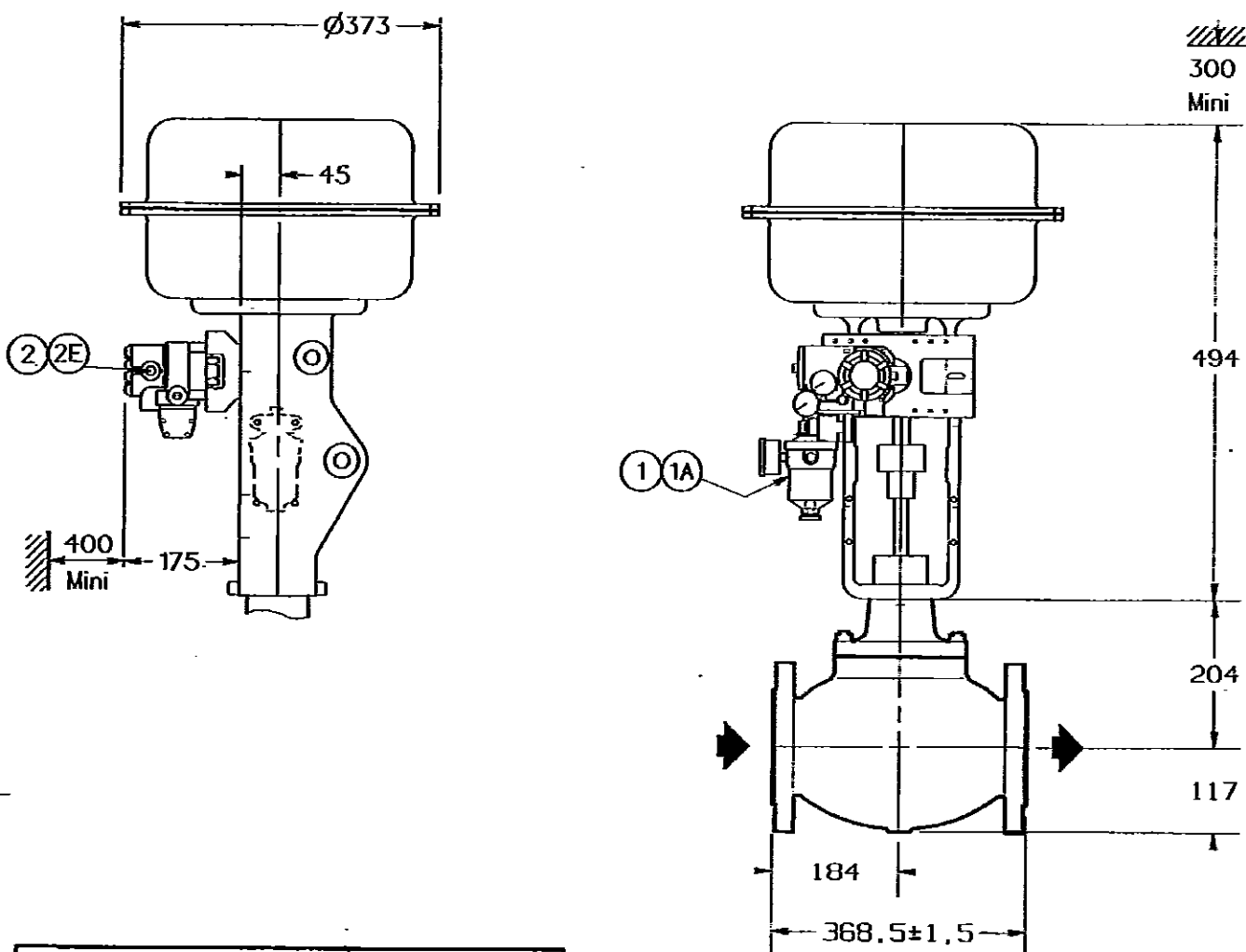
SERIES VALVE : 88-21125

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW1
Electrical Connections Detail	02-04909-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

128

ITEM : 12014

VN SERIAL NUMBER : 02-04909-14

Rev. 1

DATE: Oct-04-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6485C30 1541 01 0 10007

TAG : 30 FV 20081



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

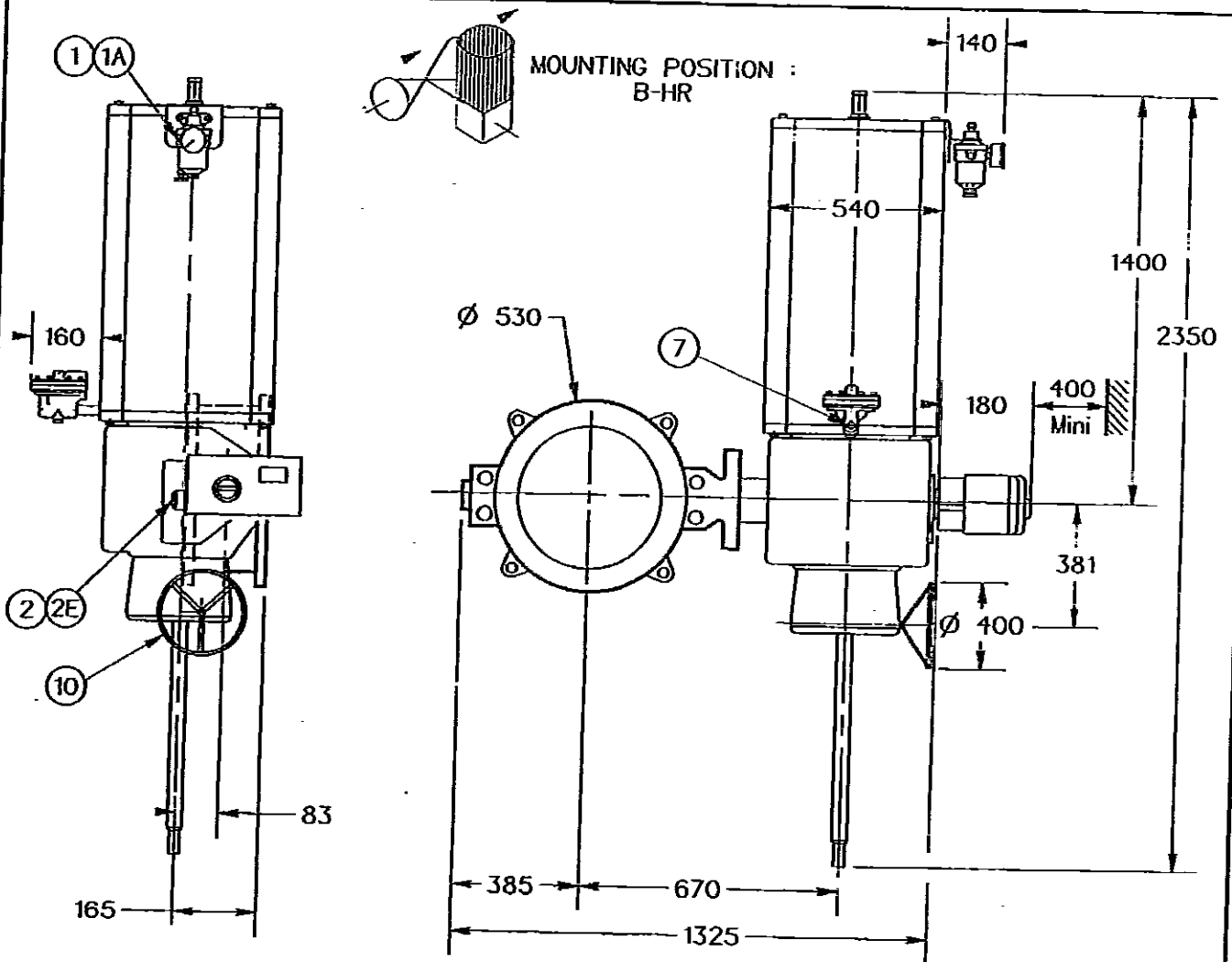
SERIES VALVE : L1DMH16PACAF

DN : 400 (16")

ON AIR FAILURE : OPEN

FLOW TO :

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW3
Electrical Connections Detail	02-04909-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M 20 - Signal
7	BR400	Booster	1.0		
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

970

ITEM : 12015

MN SERIAL NUMBER : 02-04909-15

Rev. 2

DATE: Dec-06-2002

DRAWN BY:

P. ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 20083 A



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



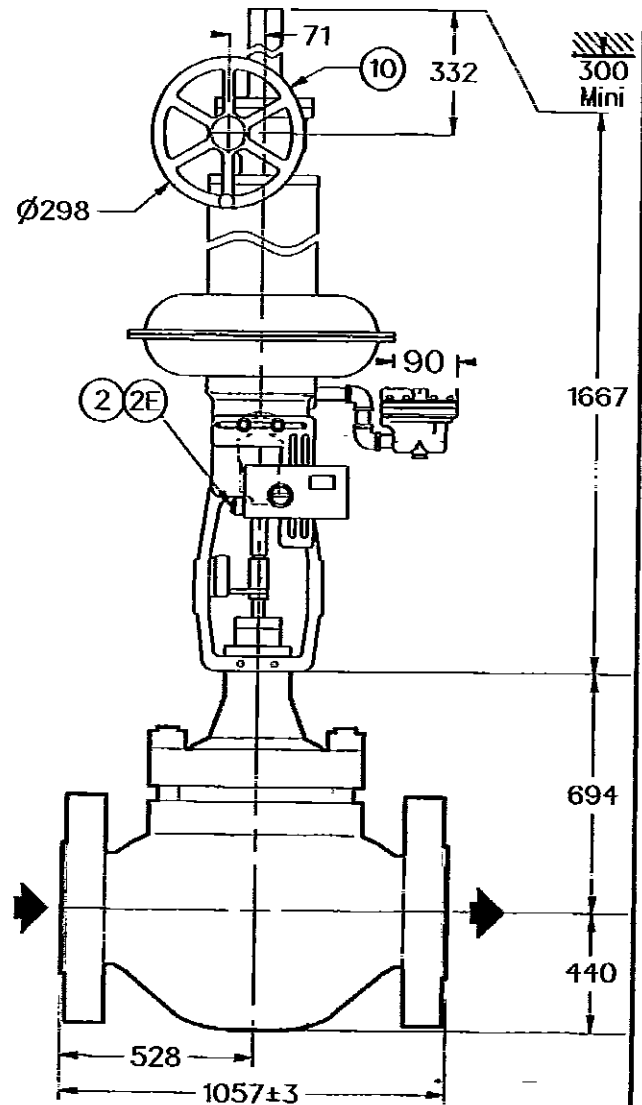
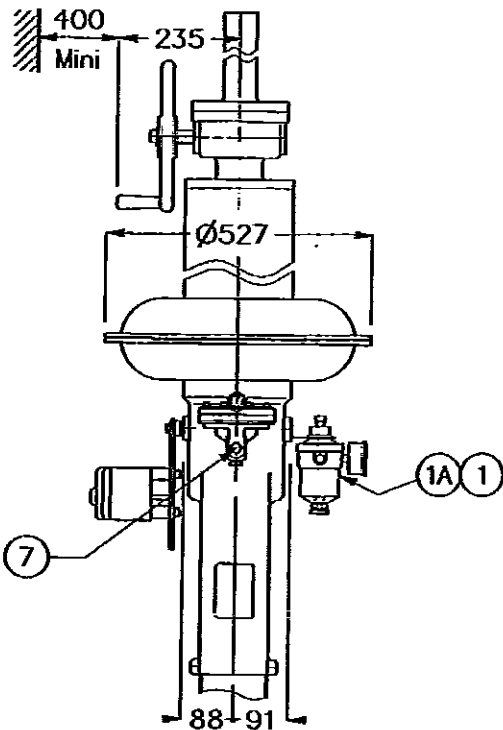
SERIES VALVE : 38-41935

DN : 16"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW3
Electrical Connections Detail	02-04909-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
7	BR400	Booster	1.0		
10	8A	Handwheel			
TOTAL WEIGHT(accessories + valve) in kg			1614	ITEM : 12016	MN SERIAL NUMBER : 02-04909-16
Rev. 1	DATE: Oct-03-2002	DRAWN BY: P. ROUELLE		ISSUED BY: C. DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 PV 20083 B					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

SERIES VALVE : 35-35602

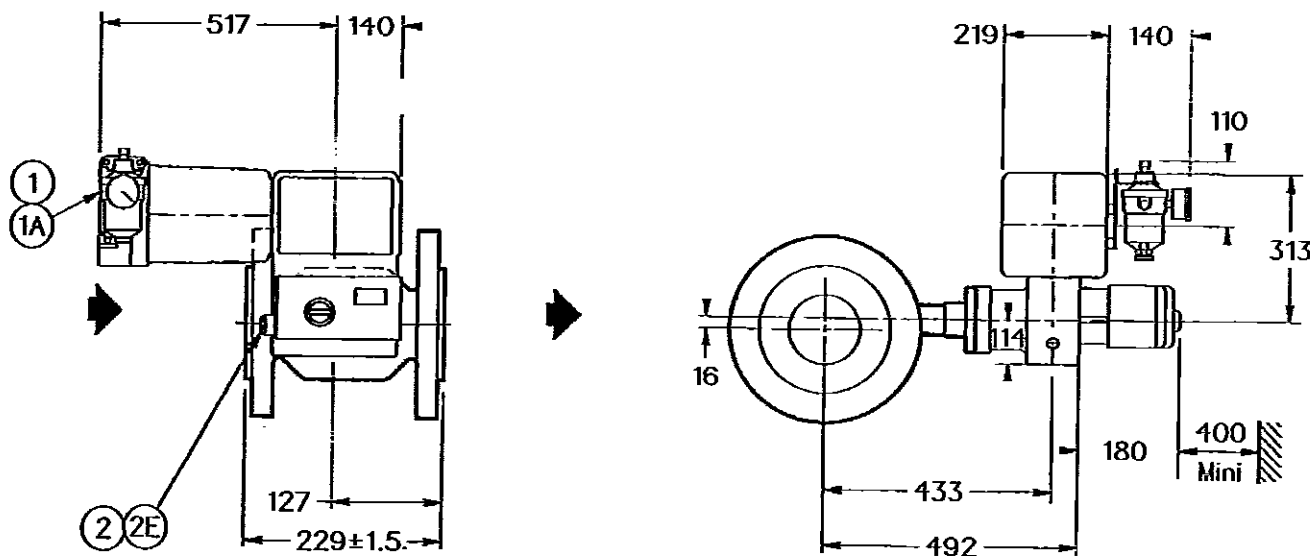
DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW1
Electrical Connections Detail	02-04909-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

120

ITEM : 12017

MN SERIAL NUMBER : 02-04909-17

Rev. 1

DATE: Oct-10-2002

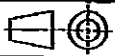
DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

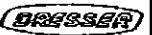
CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 20091



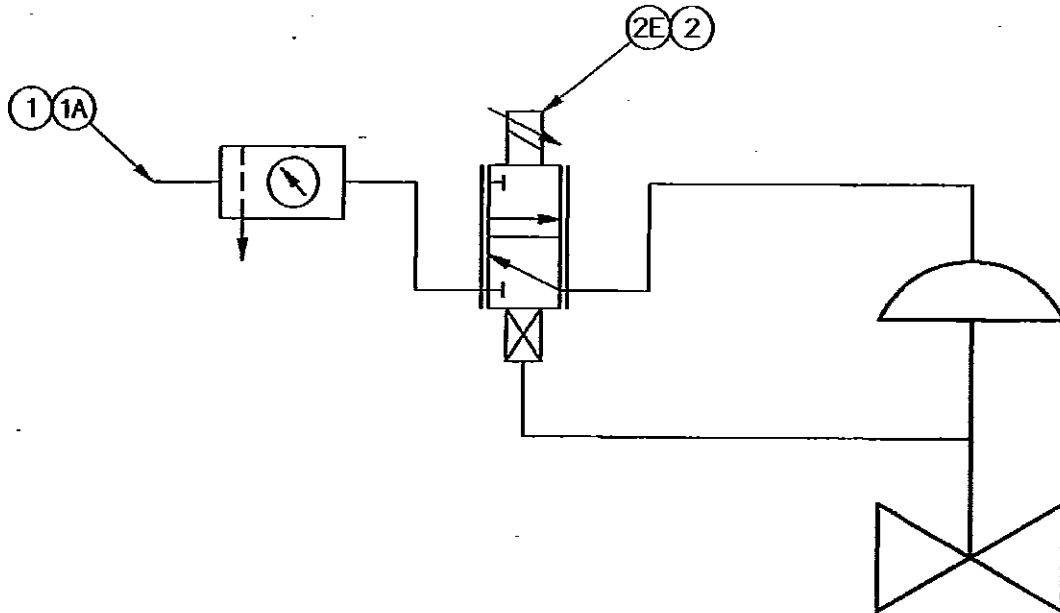
DRAWING No : 02-04909-PW1

Masonellan



PNEUMATIC WIRING DIAGRAM

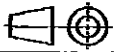
Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10²



Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal

Rev. 0	DATE: 11/OCT/2002	DRAWN BY: P. SEVESTRE	ISSUED BY: C. DROUARD
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C 30 1541 01 0 10007	
TAG : _____			

ITEM : _____ MN SERIAL NUMBER : 02-04909-PW1

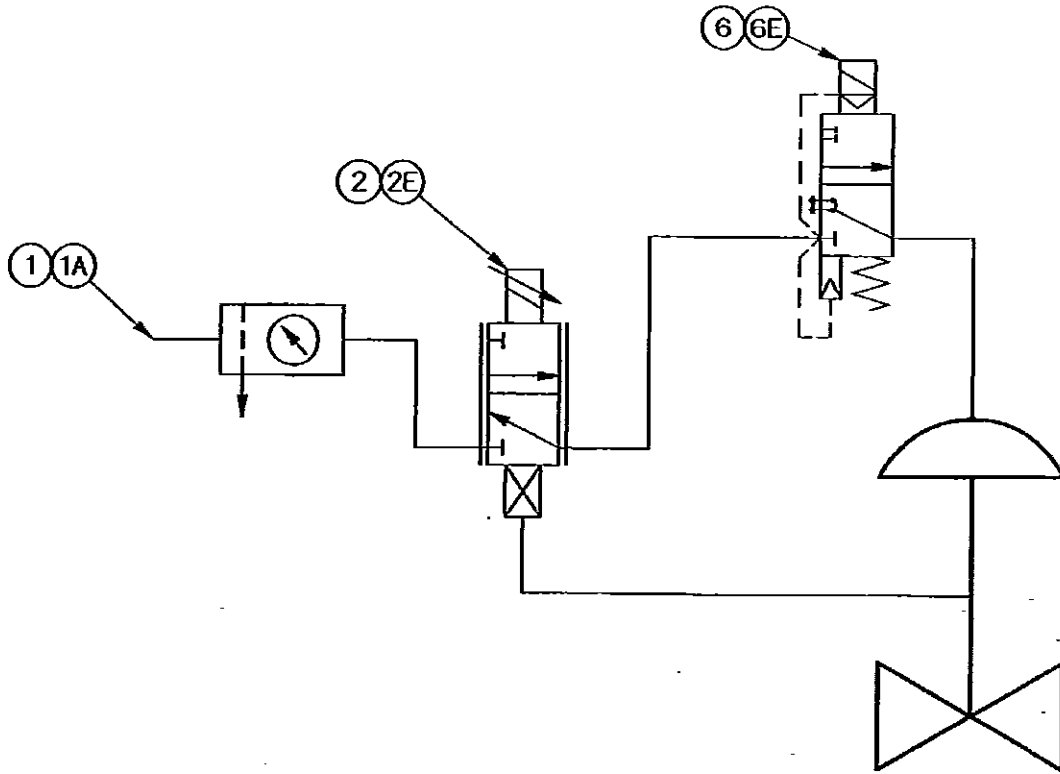


DRAWING No : 02-04909-PW2

Masonellan

DRESSER

PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10

Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal
6	Solenoid Valve	6E	

ITEM : /

MH SERIAL NUMBER : 02-04909-PW2

Rev. 0

DATE: 11/OCT/2002

DRAWN BY: P. SEVESTRE

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 10007

TAG : /

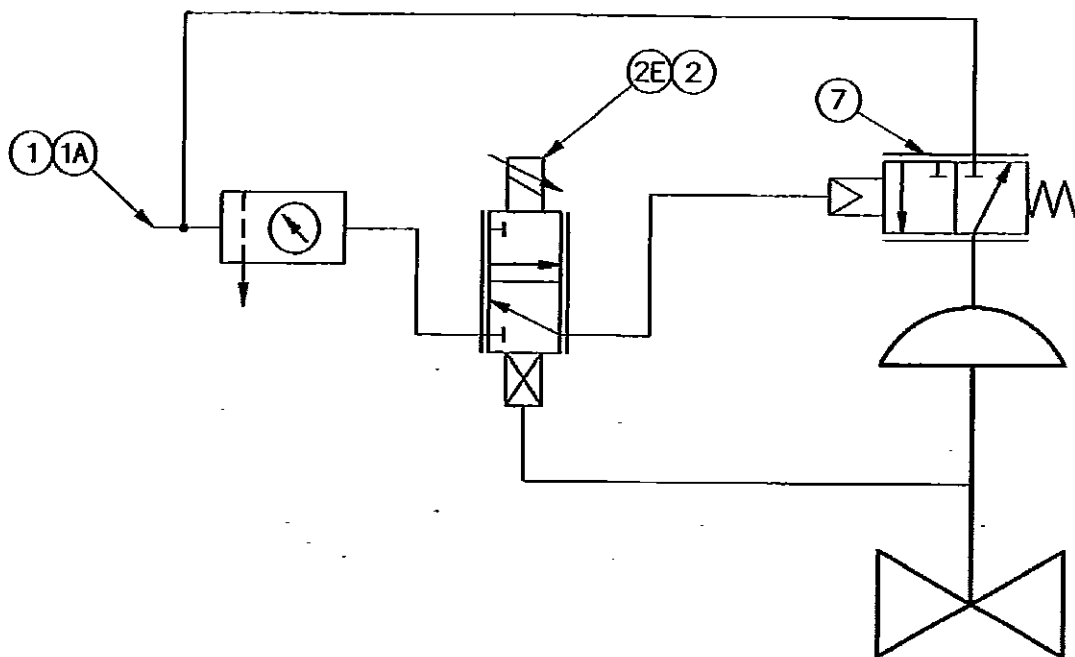


DRAWING No : 02-04909-PW3

Masonellan

DRESSER

PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
USAS Y32.10¹

Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal
7	Volume Booster		

ITEM : / MN SERIAL NUMBER : 02-04909-PW3

Rev. 0 | DATE: 11/OCT/2002 | DRAWN BY: P. SEVESTRE | ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP | CUSTOMER ORDER: 6465C 30 1541 01 0 10007

TAG : /



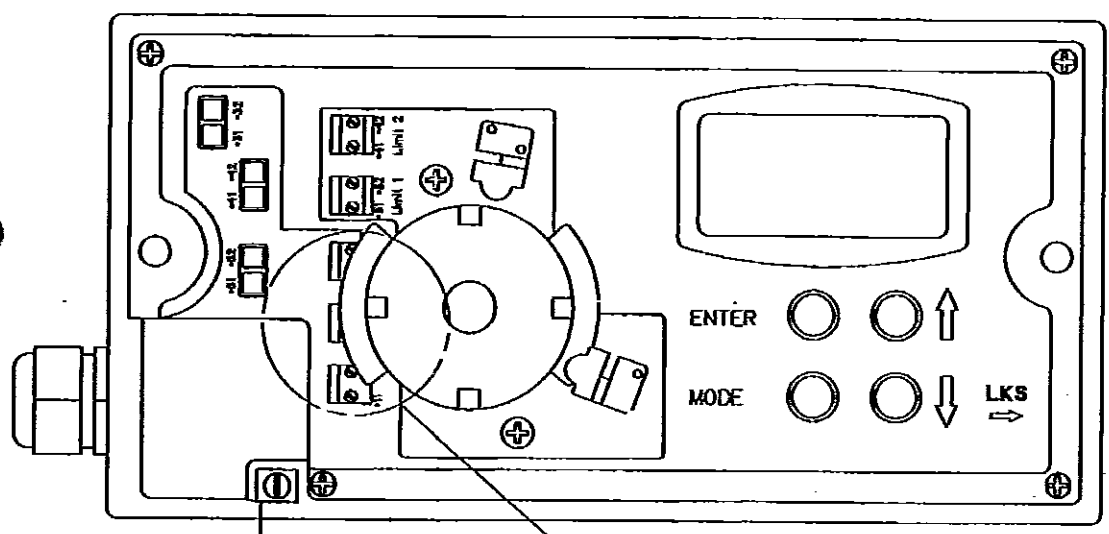
DRAWING No : 02-04909-EC1

Masonellan

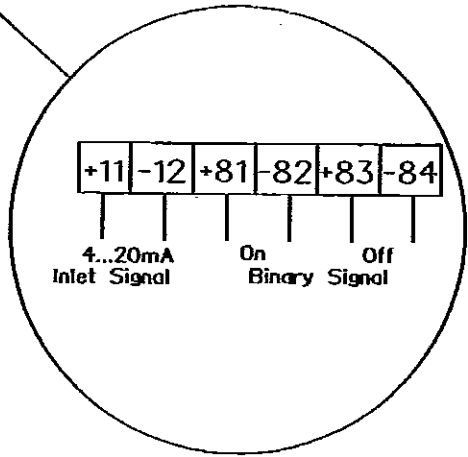


ELECTRICAL CONNECTIONS DETAIL

ELECTROPNEUMATIC POSITIONER TZID-C



Earth Terminal



Rev. 0	DATE: 11/OCT/2002	DRAWN BY: P. SEVESTRE	ITEM : _____	MIN SERIAL NUMBER : 02-04909-EC1
CUSTOMER: TECHNIP		ISSUED BY: C. DROUARD		
TAG : _____		CUSTOMER ORDER: 6465C 30 1541 01 0 10007		



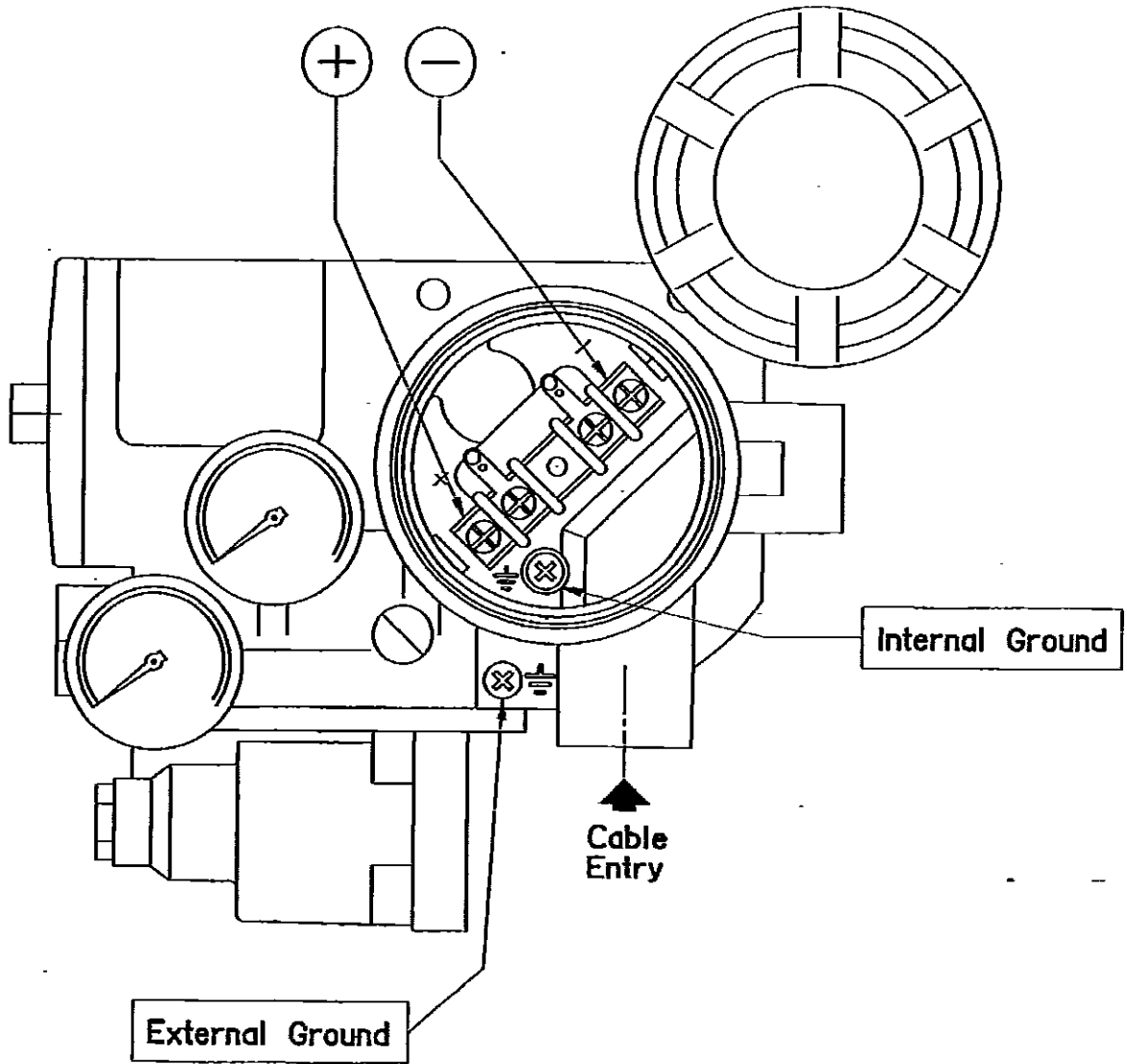
DRAWING No : 02-04909-EC2

Masonellan



ELECTRICAL CONNECTIONS DETAIL

ELECTROPNEUMATIC POSITIONER FVP



Rev. 0	DATE: 11/OCT/2002	DRAWN BY: P. SEVESTRE	ITEM : /	MN SERIAL NUMBER : 02-04909-EC2
CUSTOMER: TECHNIP		ISSUED BY: C. DROUARD		
TAG : /		CUSTOMER ORDER: 6465C 30 1541 01 0 10007		



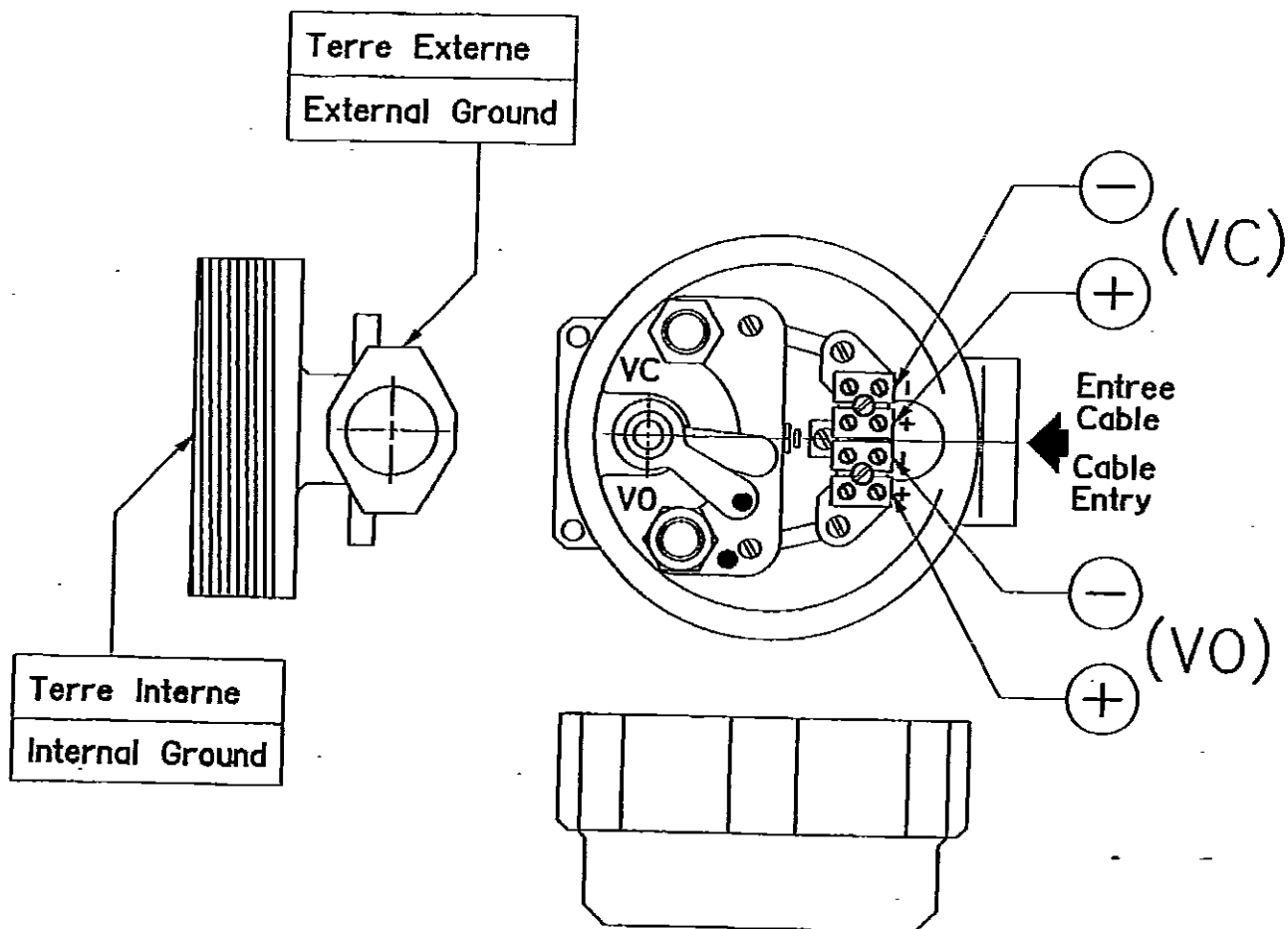
PLAN/DRWG : 02-04909-LD1

Masonellam



DETAIL RACCORDEMENTS ELECTRIQUES
ELECTRICAL CONNECTIONS DETAIL

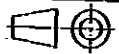
DETECTEUR FIN DE COURSE 496-4 & 5
LIMIT DETECTOR 496-4 & 5



VO : Detecteur Vanne OUVERTE
OPEN Valve Detector

VC : Detecteur Vanne FERMEE
CLOSED Valve Detector

Rev: 1		DAT.: Dec-11-2002		DESS. PAR/DRAWN BY: P. SEVESTRE		ITEM: /		N° DE SERIE : 02-04909-LD1	
CLIENT/CUSTOMER: TECHNIP		Cde CLIENT/CUST. ORDER: 6465C30 1541 01 0 10007		EMIS PAR/ISSUED BY: C. DROUARD					
REPERE/TAG No: /									



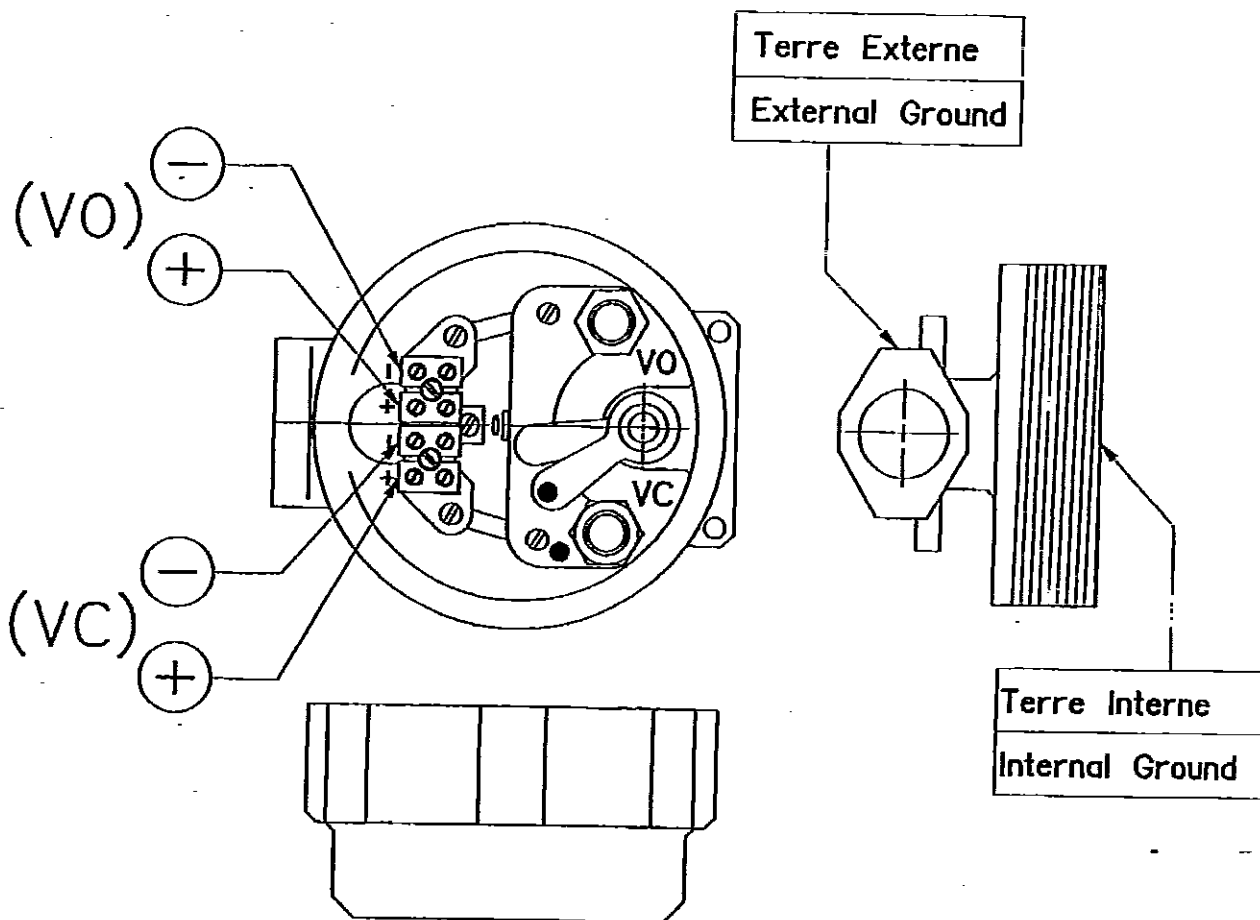
PLAN/DRWG : 02-04909-LD4

Masonellan



DETAIL RACCORDEMENTS ELECTRIQUES
ELECTRICAL CONNECTIONS DETAIL

DETECTEUR FIN DE COURSE 496-4 & 5
LIMIT DETECTOR 496-4 & 5



VO : Detecteur OUVERTURE
 : OPENING Detector

VC : Detecteur FERMETURE
 : CLOSING Detector

Rev: 1		DATE: Dec-11-2002	DESS. PAR/DRAWN BY: P. SEVESTRE	ITEM: /	N° DE SERIE : 02-04909-LD4 SERIAL NUMBER:
CLIENT/CUSTOMER: TECHNIP			Cde CLIENT/CUST. ORDER: 6465C30 1541 01 0 10007	EMIS PAR/ISSUED BY: C. ORCIARD	
REPERE/TAG No: /					








UNIT 30

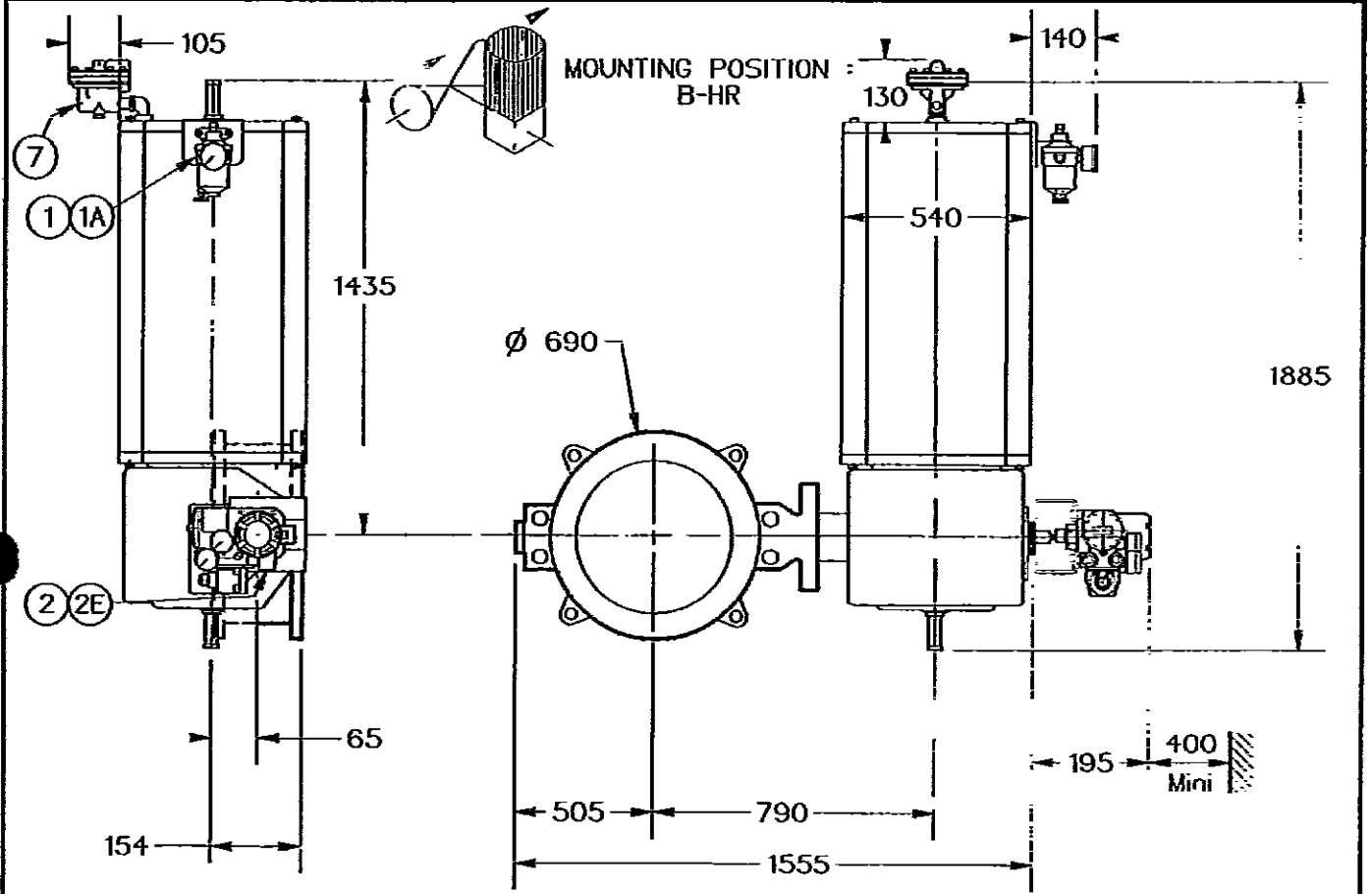
OUTLINE DRAWINGS

TECHNIP
VENDOR DOCUMENT REVIEW
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<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
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THIERRY GRANDRY - TECHNIP
2003.03.25 11:21:59 +01'00'
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STATUS CERTIFIED "FINAL"
ISSUED BY : C. DROUARD
DATE : 19/12/2002

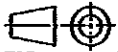
6	24/03/03	Up-dated drawings items 13015 / 13018 / 13037	
5	19/12/02	Up-dated drawings LD1 /LD4	
4	16/12/02	Up-dated drawings further to your comments	
3	23/10/02	Up-dated drawings further to accessories modifications	
2	16/10/02	Up-dated drawings with accessories	
1	25/06/02	Addition items 01 and 18	
0	27/05/02	FIRST ISSUE	
REV	DATE	DESCRIPTION	
TECHNIP		NATIONAL PETROCHEMICAL COMPANY	
		PARS PETROCHEMICAL COMPANY	
			
Project: 3930 - 9TH-OLEFIN COMPLEX		TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007	
Ethane cracking plant		PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007	
		EQUIPMENT NAME: Control valves	
		DOCUMENT TITLE : Outline drawings	
		DOCUMENT CODE : A 3201	
		PURCHASE ORDER : 02-4910 (Unit 30)	Sheet 01 of 49
		Rev. 6	



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW3
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal
7	BR400	Booster	1.0		

TOTAL WEIGHT (accessories + valve) in kg		1020	ITEM : 13001	MIN SERIAL NUMBER : 02-04910-01
Rev. 1	DATE: Oct-04-2002	DRAWN BY: P. ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007	
TAG : 30 PV 30002				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

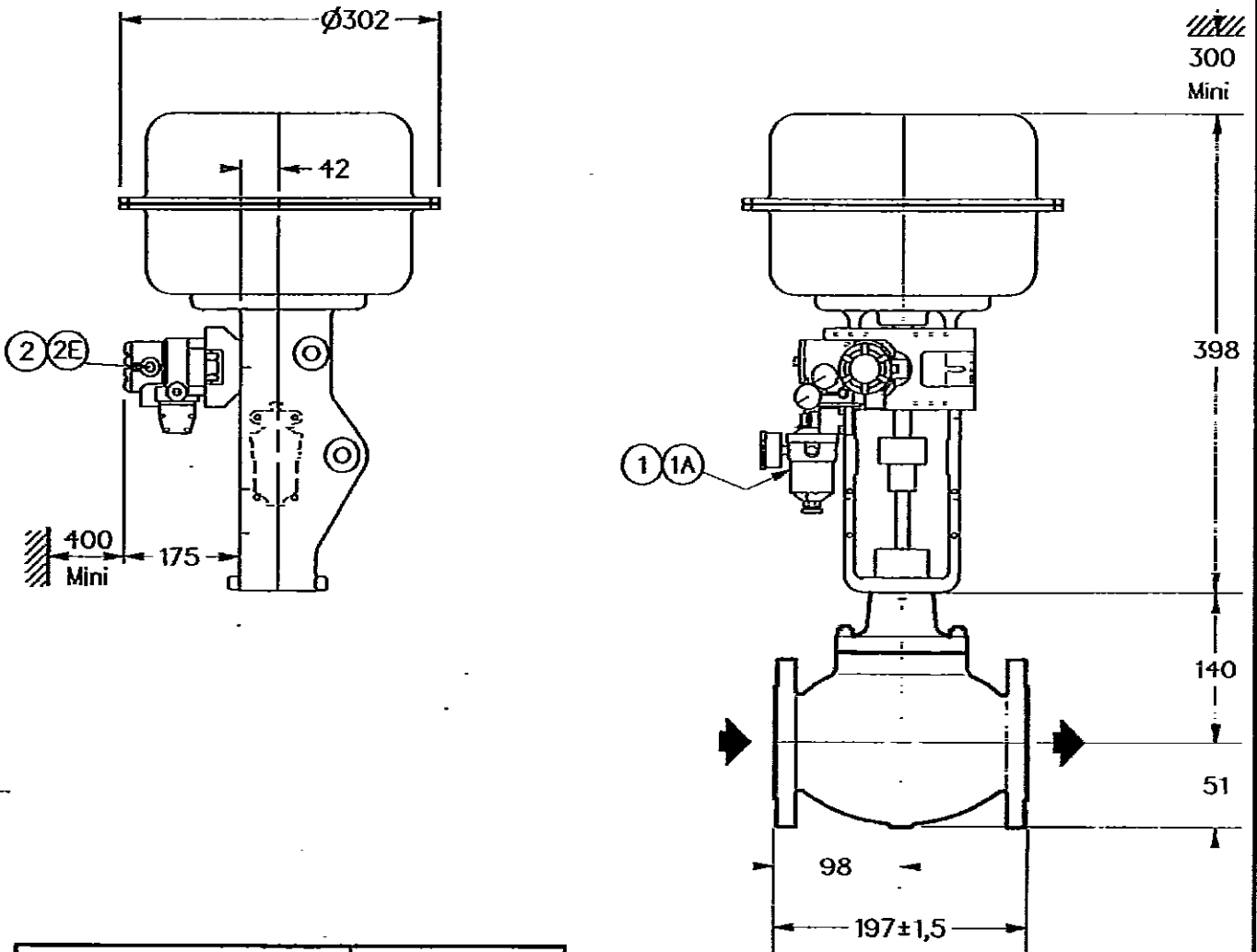
SERIES VALVE : 88-21125

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

39

ITEM : 13002

WH SERIAL NUMBER : 02-04910-02

Rev. 1

DATE: Oct-04-2002

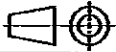
DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP FRANCE

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 30004



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

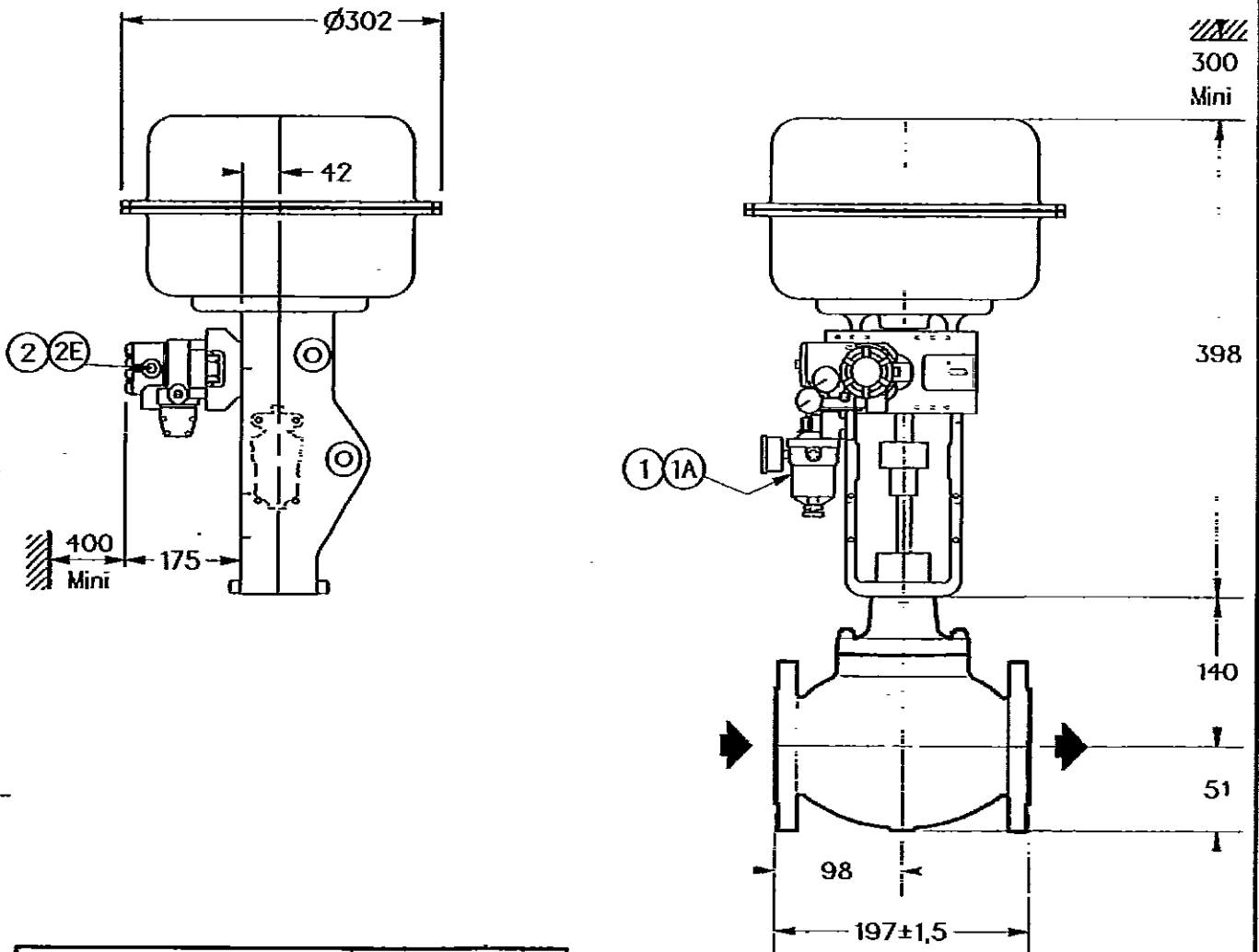
SERIES VALVE : 88-21125

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

39

ITEM : 13003

MIN SERIAL NUMBER : 02-04910-03

Rev. 1

DATE: Oct-04-2002

DRAWN BY:

P-ROUELLE

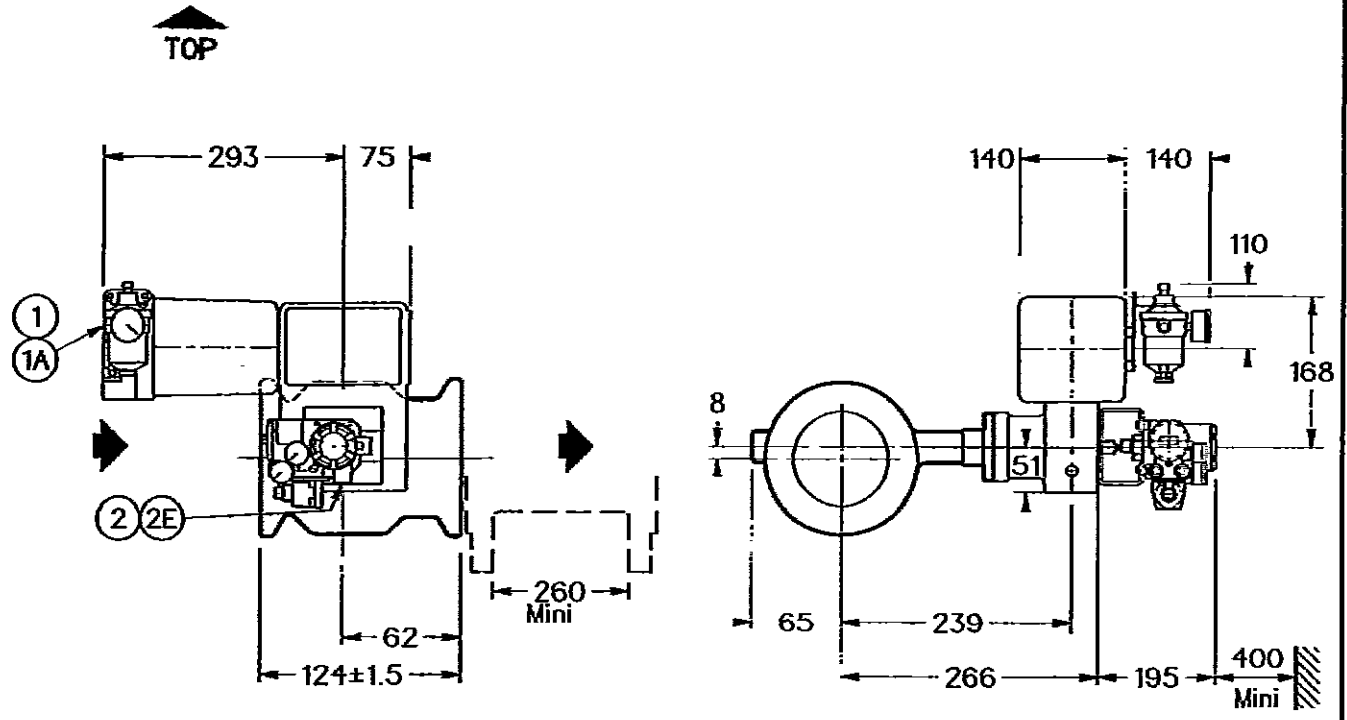
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP FRANCE

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 30022



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	H2O - Signal

TOTAL WEIGHT (accessories + valve) in kg	17	ITEM : 13004	MIN SERIAL NUMBER : 02-04910-04
Rev. 1	DATE: Oct-04-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007	
TAG : 30 LDV 30024			



DIMENSIONS in mm 15%

OUTLINE DRAWING

Masonellan

DRESSER

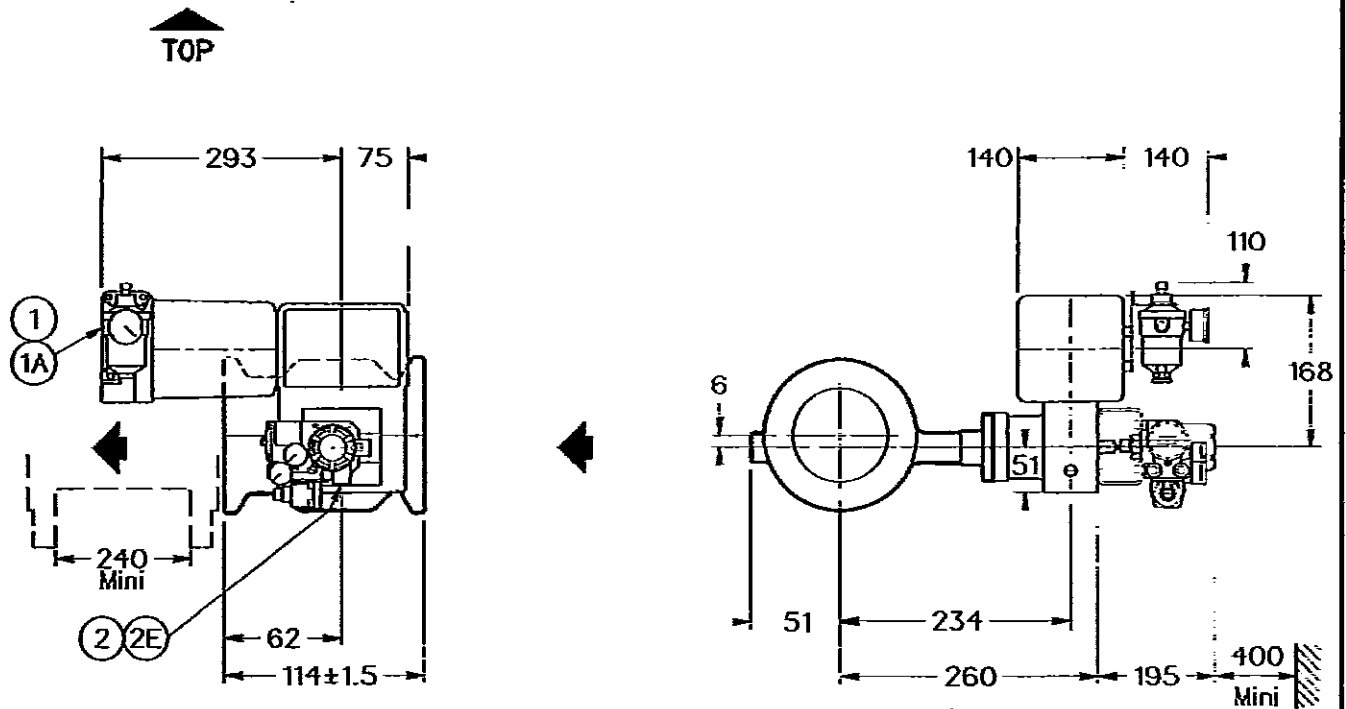
SERIES VALVE : 35-35202

DN : 40 (1.5")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

15

ITEM : 13005

M/N SERIAL NUMBER : 02-04910-05

Rev. 1

DATE: Oct-04-2002

DRAWN BY: PROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 30032



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

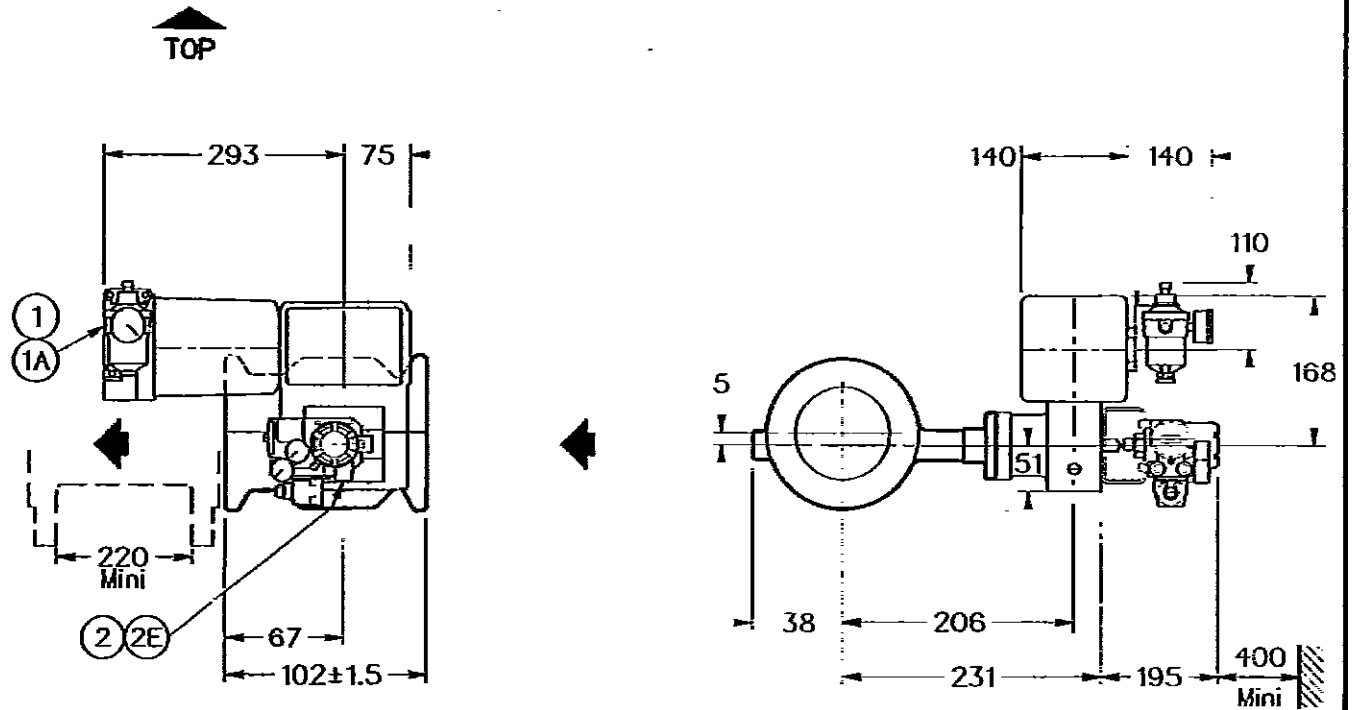
SERIES VALVE : 35-35202

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

14

ITEM : 13006

MINI SERIAL NUMBER : 02-04910-08

Rev. 1

DATE: Oct-04-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 30042



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

SERIES VALVE : 35-35502

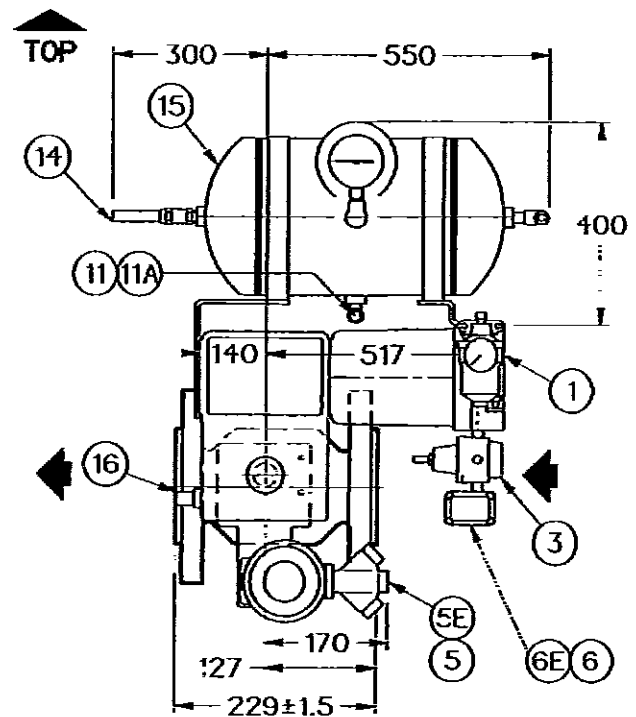
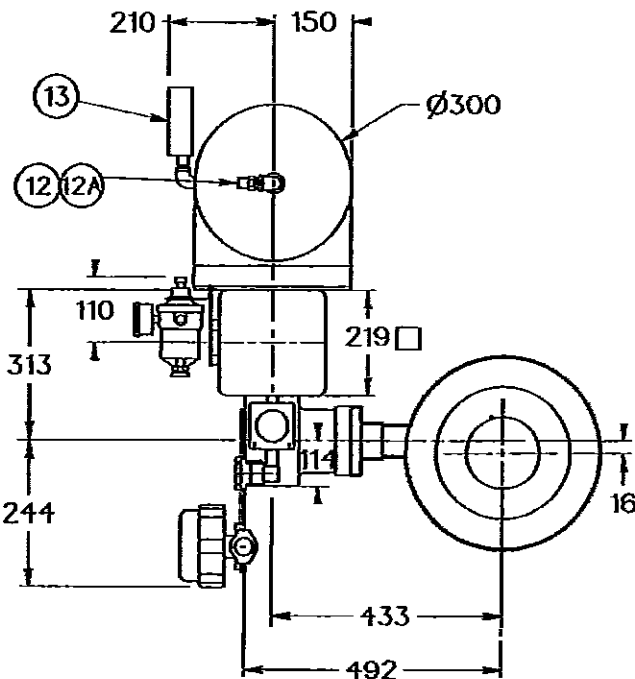
DN : 150 (6")

ON AIR FAILURE : STAY-PUT (*)

FLOW TO : OPEN

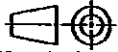
CONNECTION: 300 ANSI RF

(*) : Tends to Open



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW7
Electrical Connections Detail	02-04910-EC2
Electrical Connections Detail	02-04910-EC3
Electrical Connections Detail	02-04910-LD1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0		
3	77-6	Air Lock-up valve	0.8		
5	496/5	Detectors	2.5	5E	M20x2
6	MS..8317..	Solenoid Valve	1.0	6E	M20
11	521	Drain Valve		11A	1/4" NPTF - Drain
12	2259B4MH	No Return Valve		12A	1/2" NPTM - Air Supply
13	100-T5500S L04L	Pressure Gauge(0-16bar)			
14	5159B4M140	Relief Valve			
15		Volume Tank(Ø300-36 liters)			
16		Limit-Stop			
				Limits opening (Locked by set cable)	
TOTAL WEIGHT(accessories + valve) in kg			140	ITEM : 13007	UN SERIAL NUMBER : 02-04910-07
Rev. 3	DATE: Dec-11-2002	DRAWN BY: H. VICTORE		ISSUED BY: C. DRUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 10007		
TAG : 30 UV 30051					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



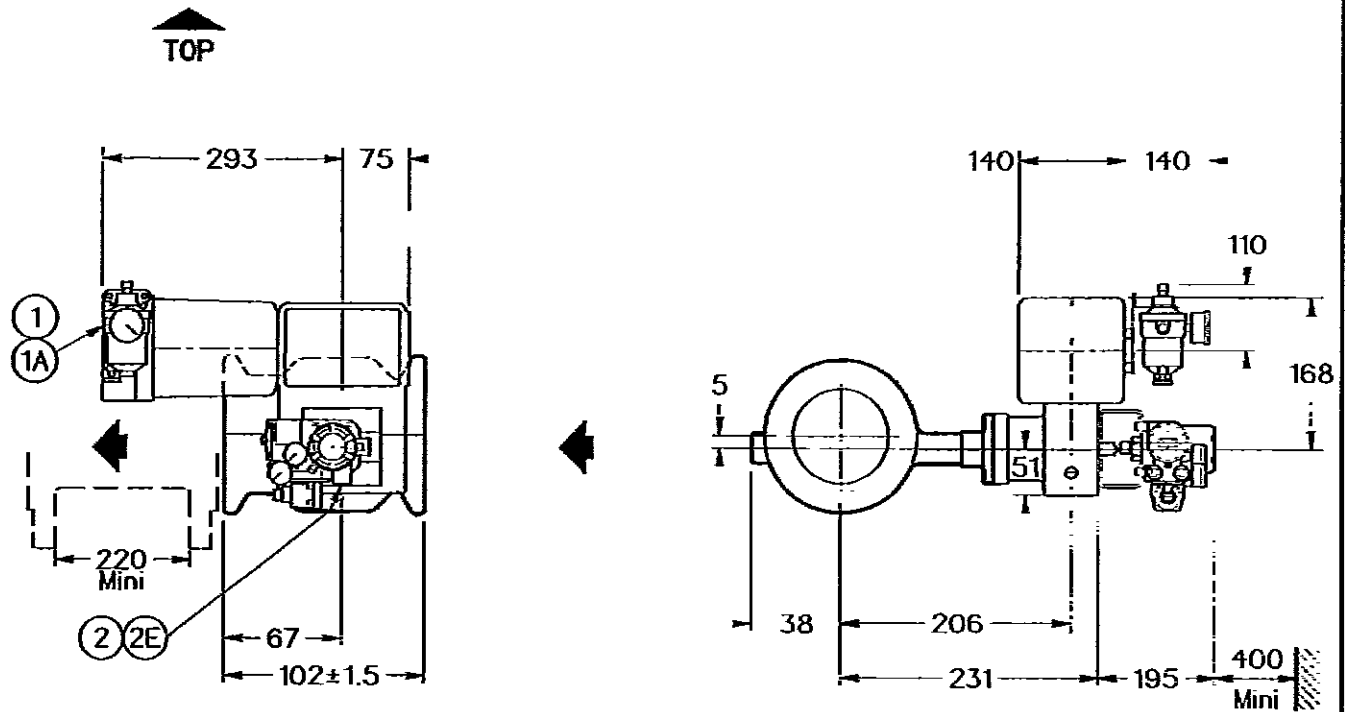
SERIES VALVE : 35-35202

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

14

ITEM : 13008 | SERIAL NUMBER : 02-04910-08

Rev. 1 | DATE: Oct-04-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 30052



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



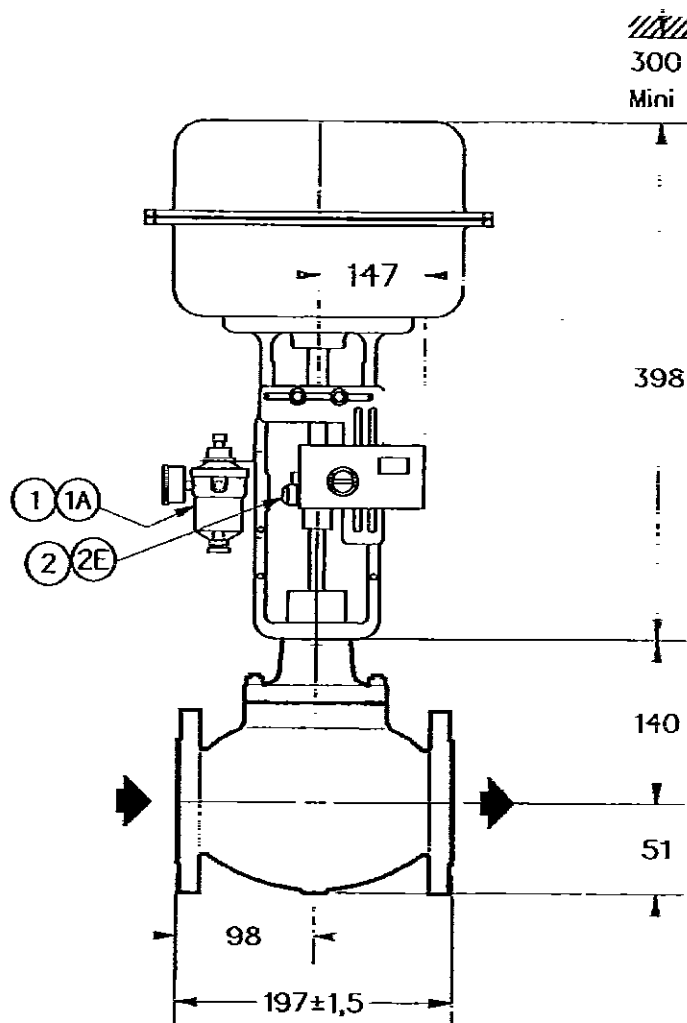
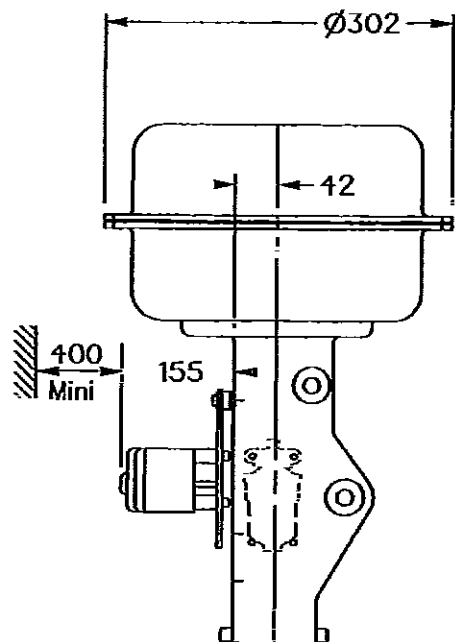
SERIES VALVE : 88-21125

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

39

ITEM : 13009

MINI SERIAL NUMBER : 02-04910-09

Rev. 1

DATE: Oct-07-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP FRANCE

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 FV 30071



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

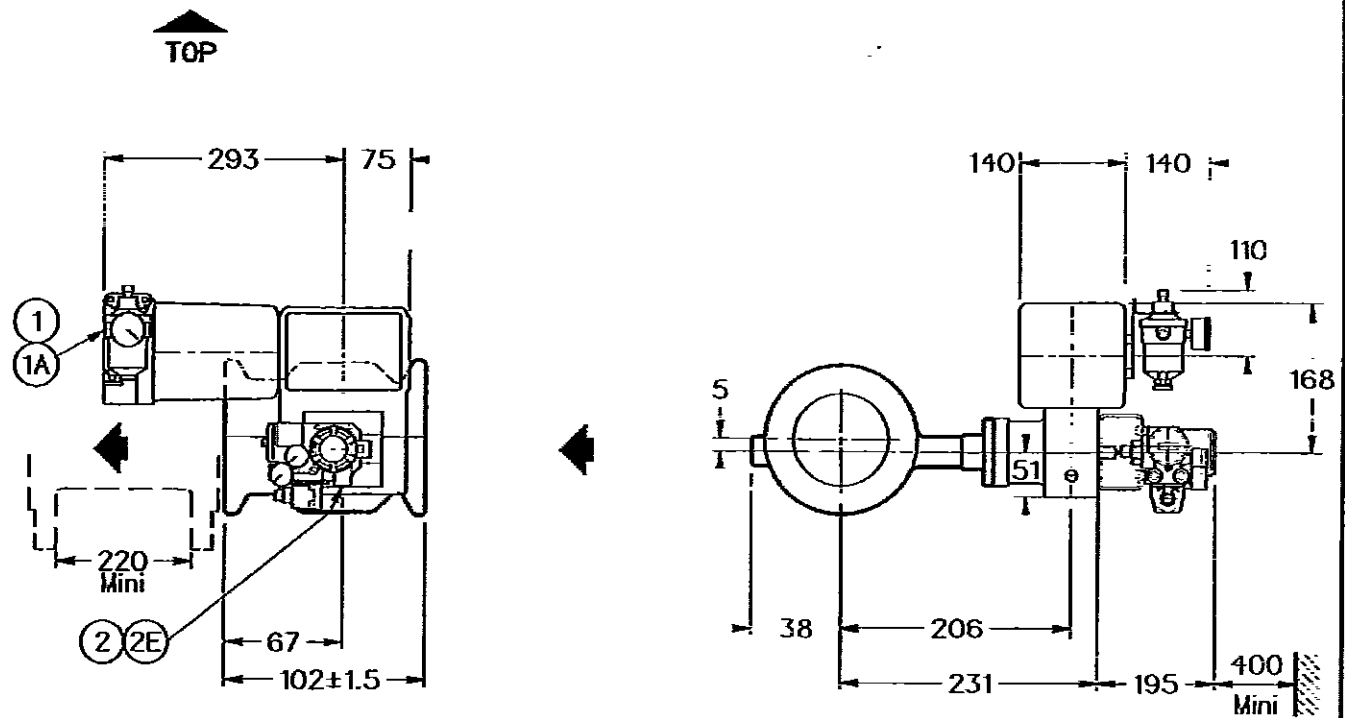
SERIES VALVE : 35-35202

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

14

ITEM : 13010 MN SERIAL NUMBER : 02-04910-10

Rev. 1

DATE: Oct-04-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

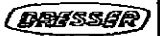
TAG : 30 LV 30071



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellam



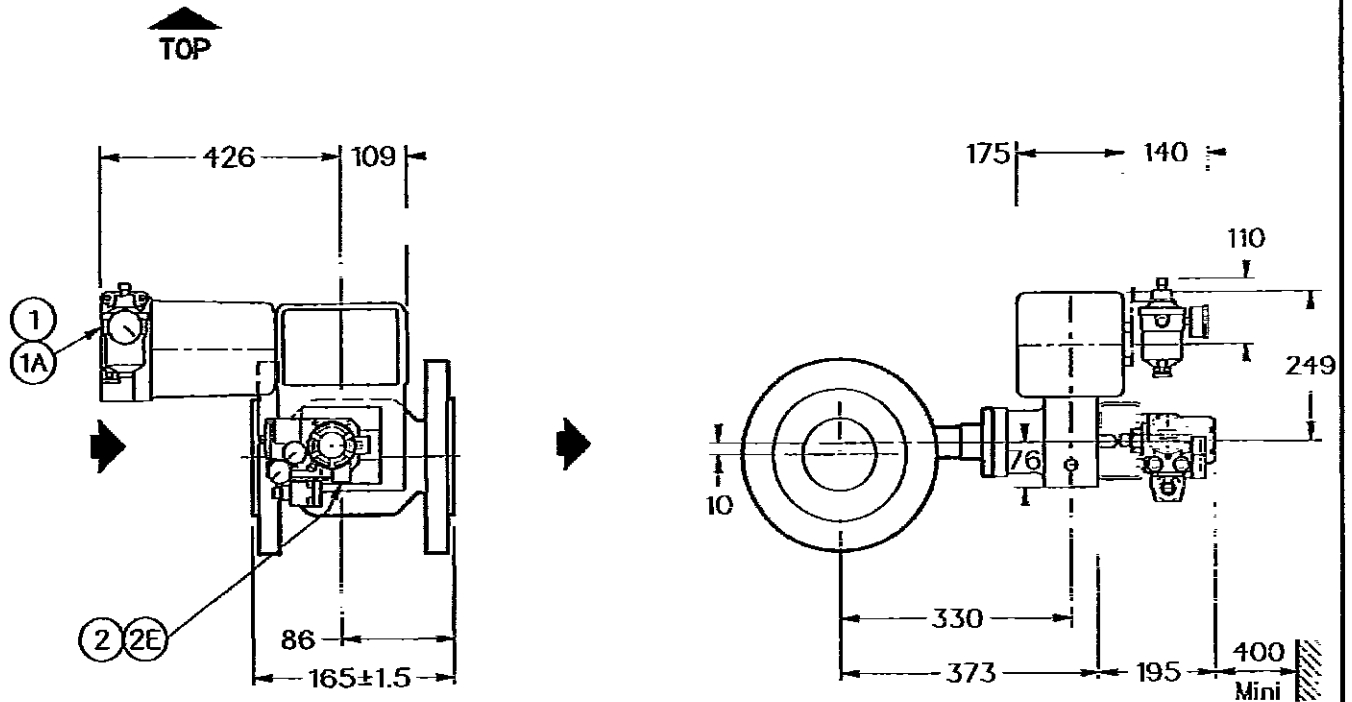
SERIES VALVE : 35-35602

DN : 80 (3")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.*Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

48

ITEM : 13011

WN SERIAL NUMBER : 02-04910-11

Rev. 1

DATE: Oct-04-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 TV 30071



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

SERIES VALVE : 35-35602

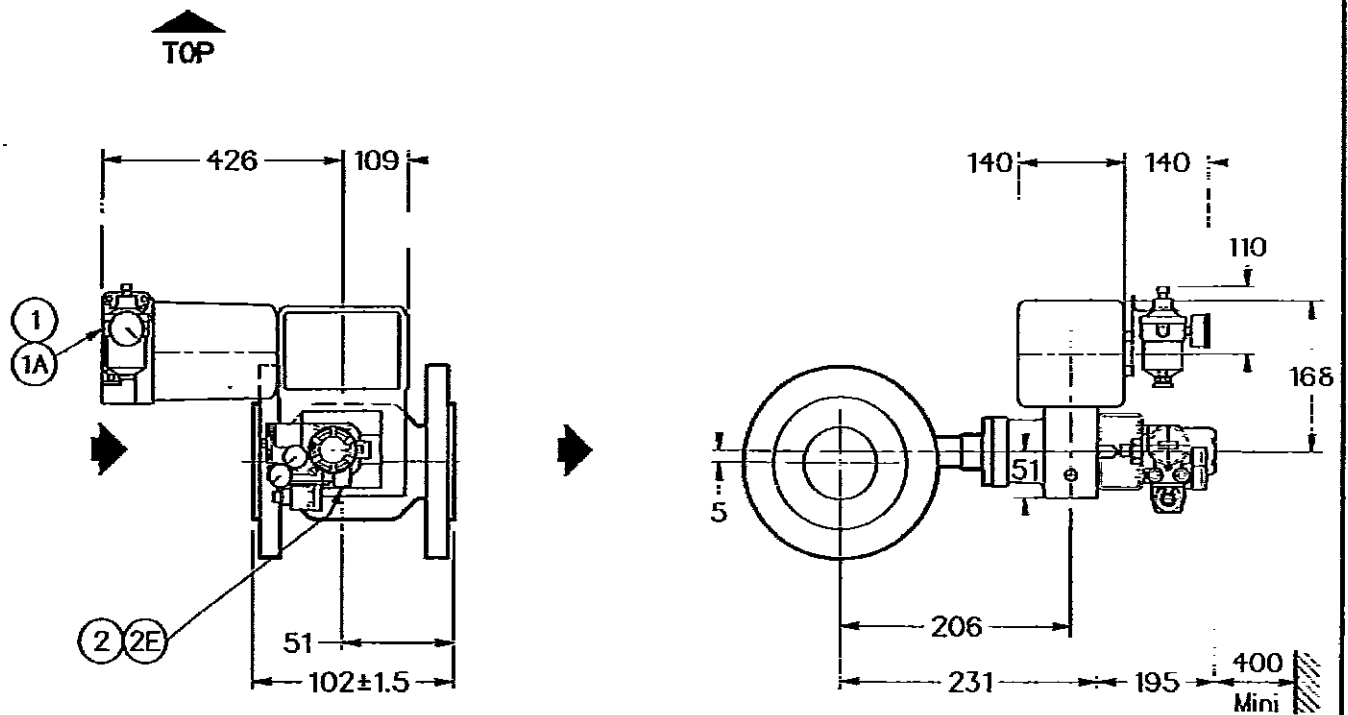
DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF

N°1



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

16

ITEM : 13012 MN SERIAL NUMBER : 02-04910-12

Rev. 1

DATE: Oct-04-2002

DRAWN BY:

P-ROUELLE

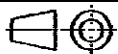
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 30073



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellian

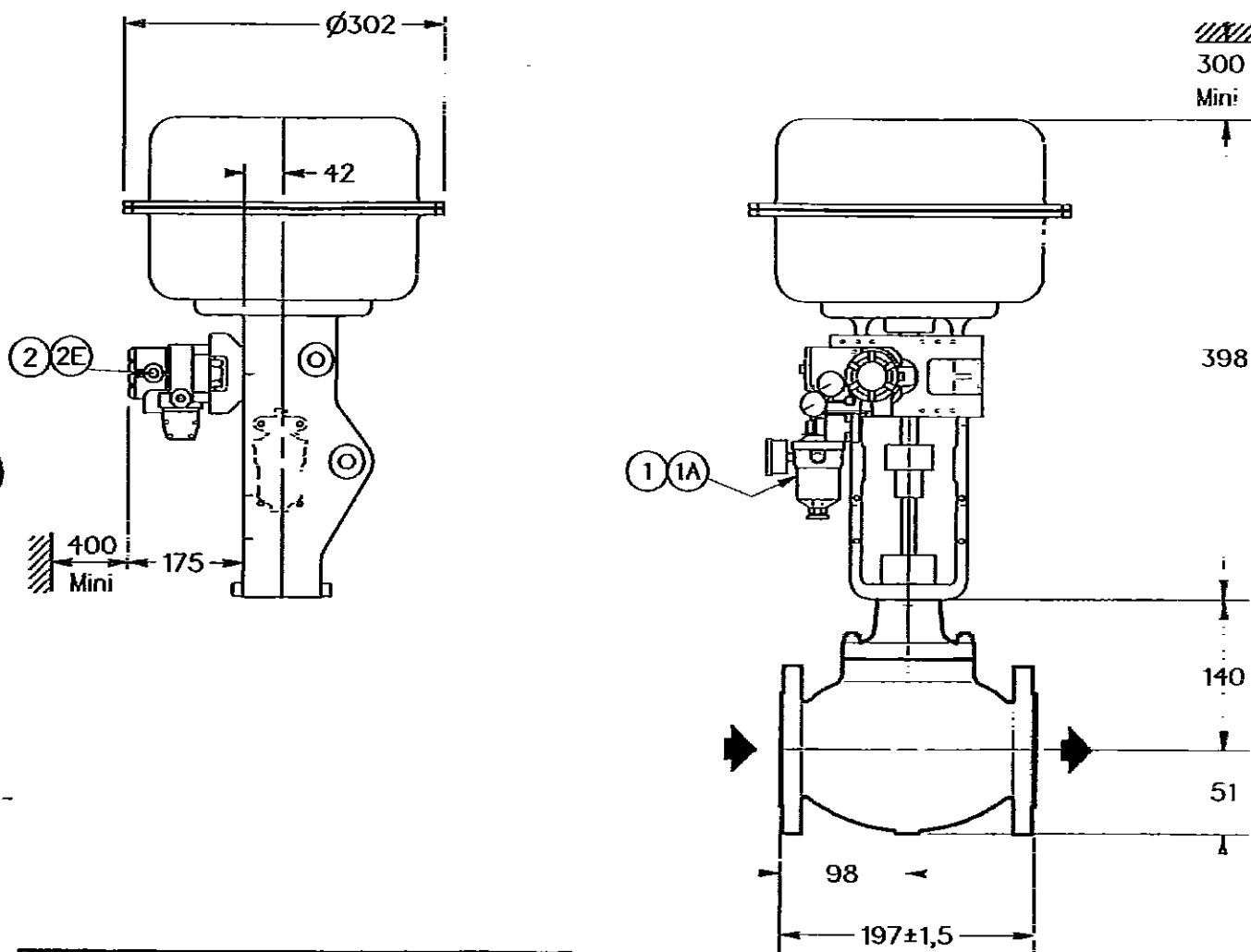
DRESSER

SERIES VALVE : 88-21715

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FYP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

39

ITEM : 13013

MIN SERIAL NUMBER : 02-04910-13

Rev. 1

DATE: Oct-07-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP FRANCE

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 30075



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellam

BRESSER

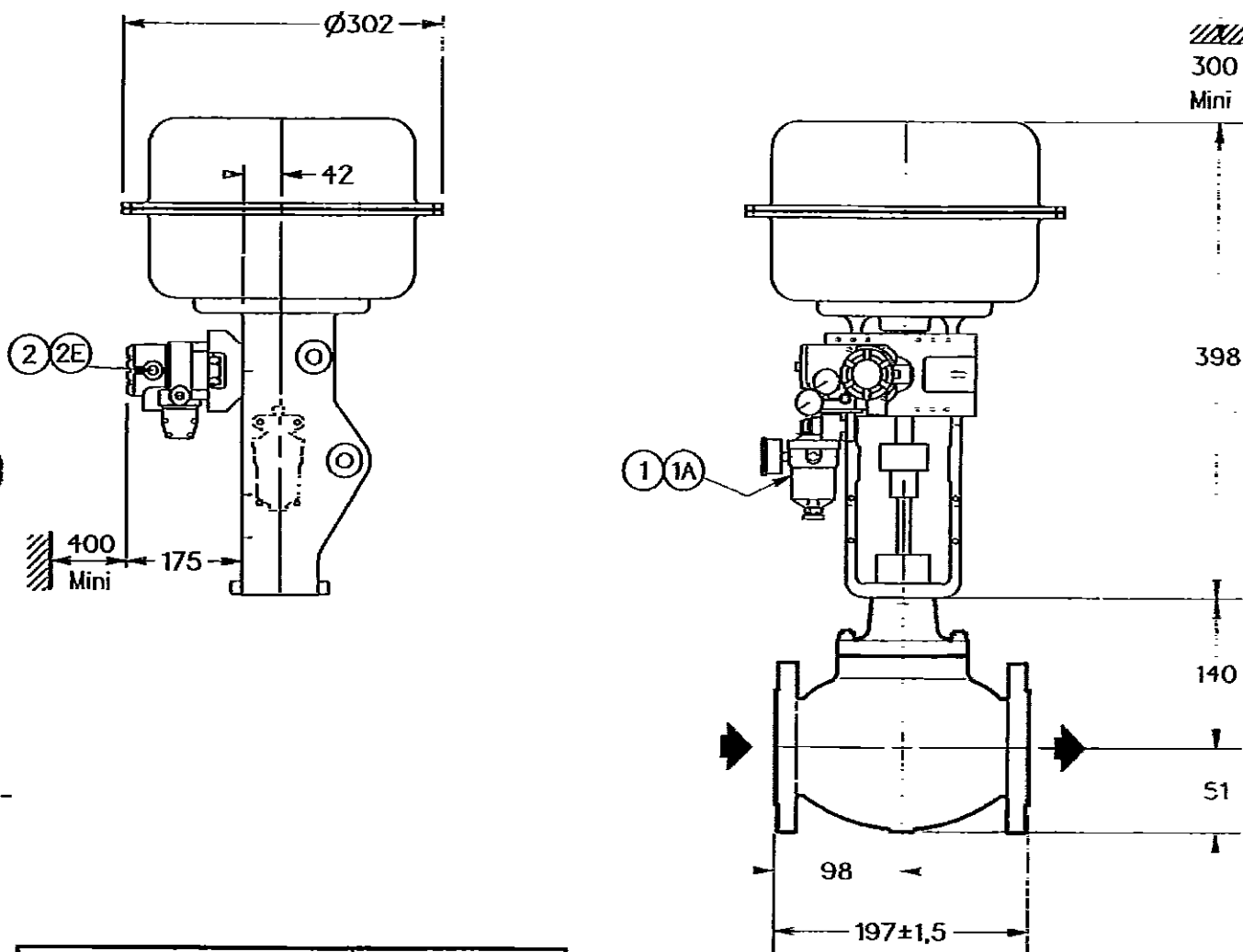
SERIES VALVE : 88-21125

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

39

ITEM : 13014

MINI SERIAL NUMBER : 02-04910-14

Rev. 1

DATE: Oct-07-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP FRANCE

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 30093



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

SERIES VALVE : 87-21115

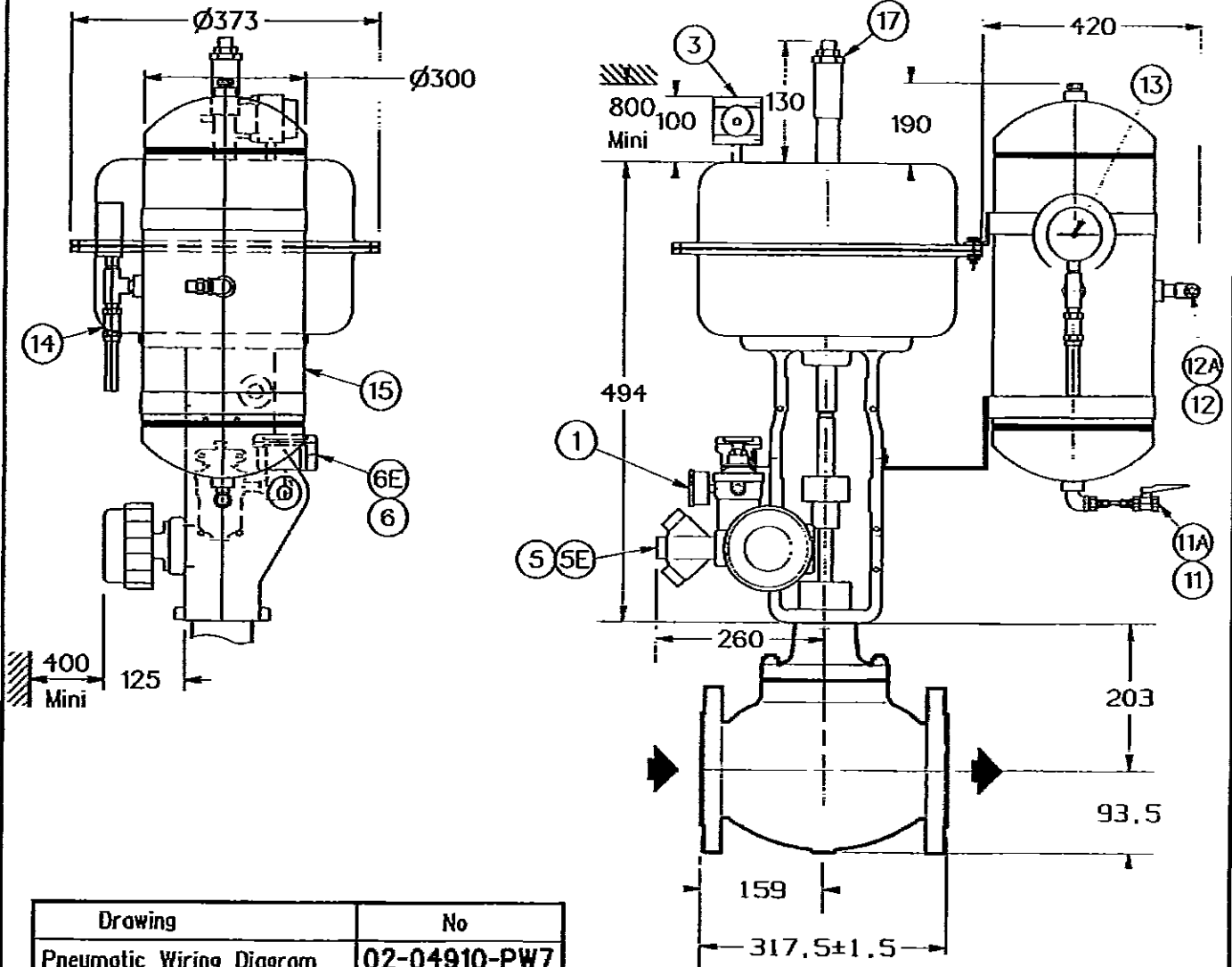
DN : 80 (3")

ON AIR FAILURE : STAY-PUT (*)

FLOW TO : OPEN

CONNECTION: 300 ANSI RF

(*) : Tends to Open



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW7
Electrical Connections Detail	02-04910-EC3
Electrical Connections Detail	02-04910-LD3

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0		
3	77-6	Air Lock-up valve	0.8		
5	496/5	Detectors	2.5	5E	M20x2
6	WS..B317..	Solenoid Valve	1.0	6E	M20
11	521	Drain Valve		11A	1/4" NPTF - Drain
12	2259B4MM	No Return Valve		12A	1/2" NPTM - Air Supply
13	100-T5500S L04L	Pressure Gauge(0-16bar)			
14	5159B4M140	Relief Valve			
15		Volume Tank($\varnothing 300$ -36 liters)			
17		Limit-Stop			
TOTAL WEIGHT(accessories + valve) in kg			125	ITEM : 13015	MIN SERIAL NUMBER : 02-04910-15
Rev. 4	DATE: Feb-04-2003	DRAWN BY: H. VICTORE		ISSUED BY: C. DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 UV 30101					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

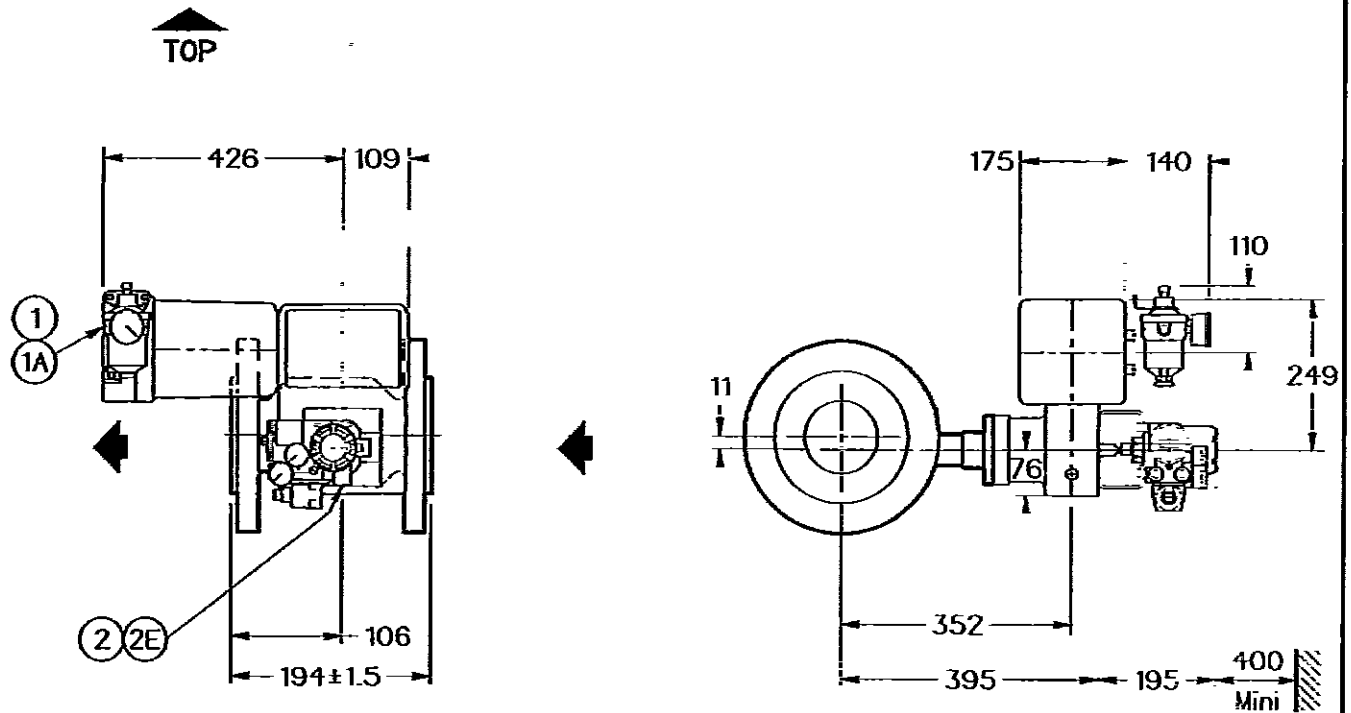
SERIES VALVE : 35-35202

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

62

ITEM : 13016

MINI SERIAL NUMBER : 02-04910-16

Rev. 1

DATE: Oct-04-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 30102



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

SERIES VALVE : 88-21125

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

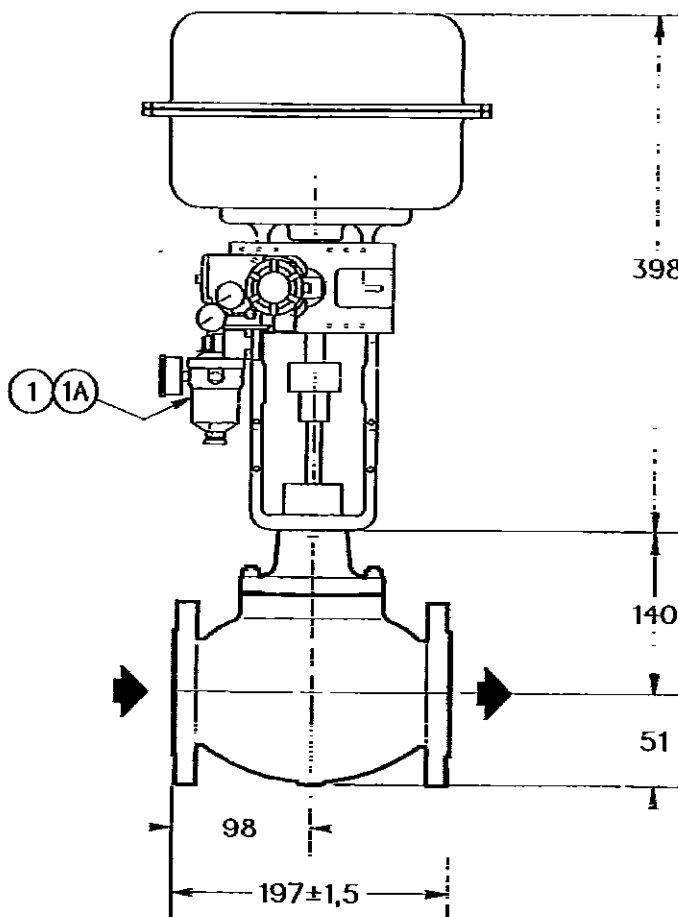
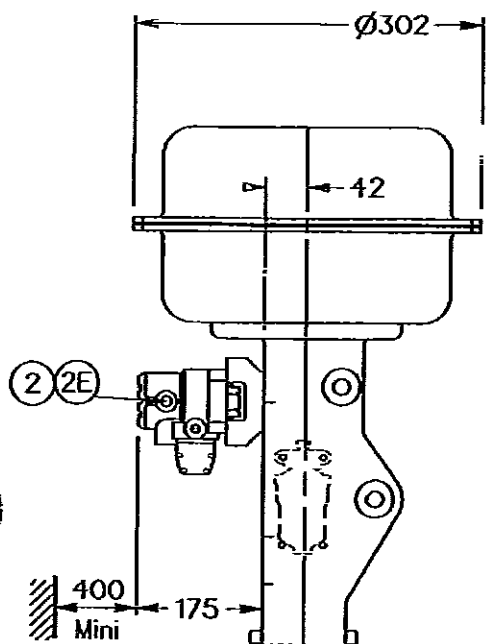
CONNECTION: 300 ANSI RF

300
Mini

398

140

51



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	H2O - Signal

TOTAL WEIGHT(accessories + valve) in kg

39

ITEM : 13017

MN SERIAL NUMBER : 02-04910-17

Rev. 1

DATE: Oct-07-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP FRANCE

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 30103



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

SERIES VALVE : LW5CBA12AACAT

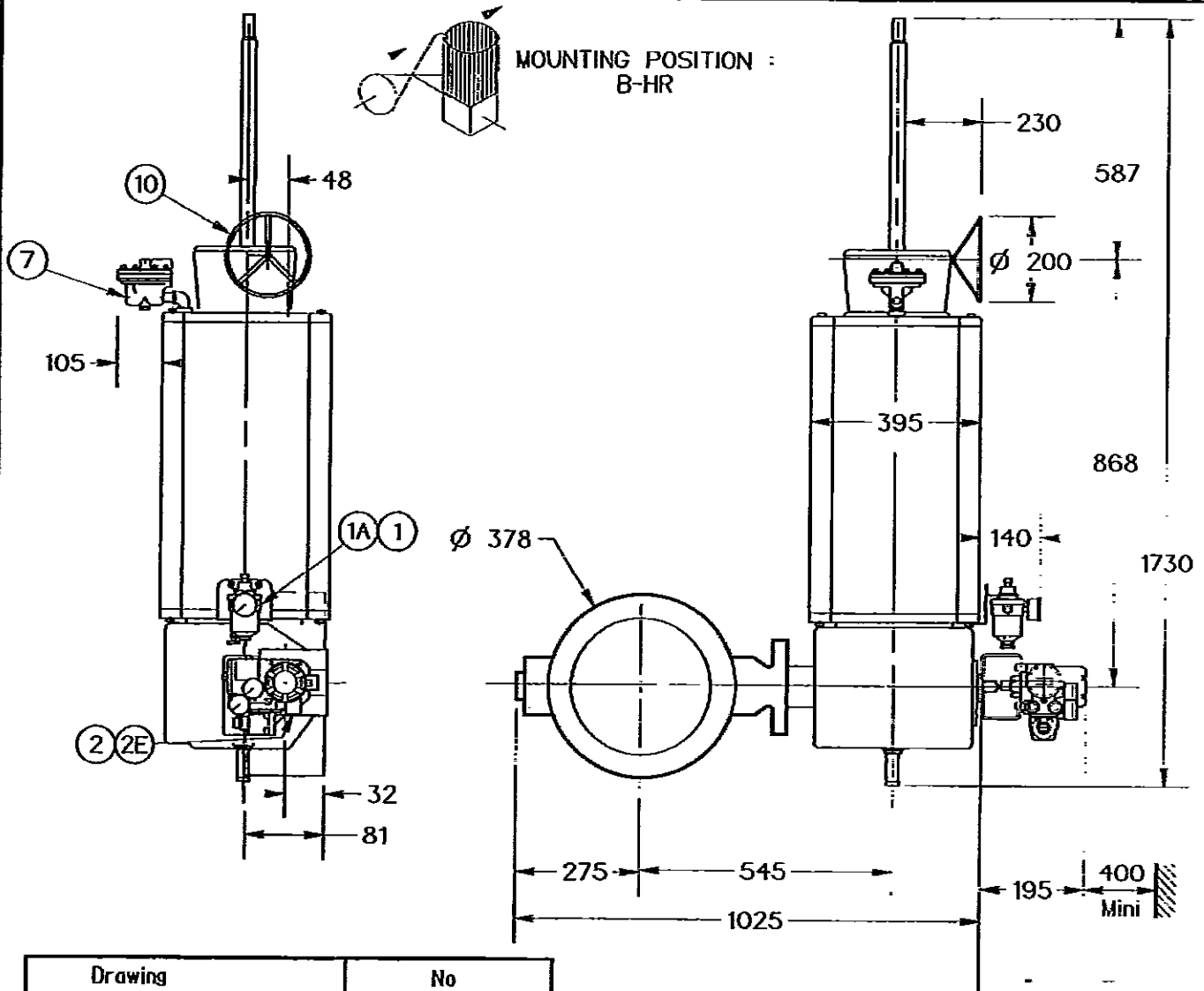
DN : 300 (12")

ON AIR FAILURE :

CLOSE



FLOW TO :

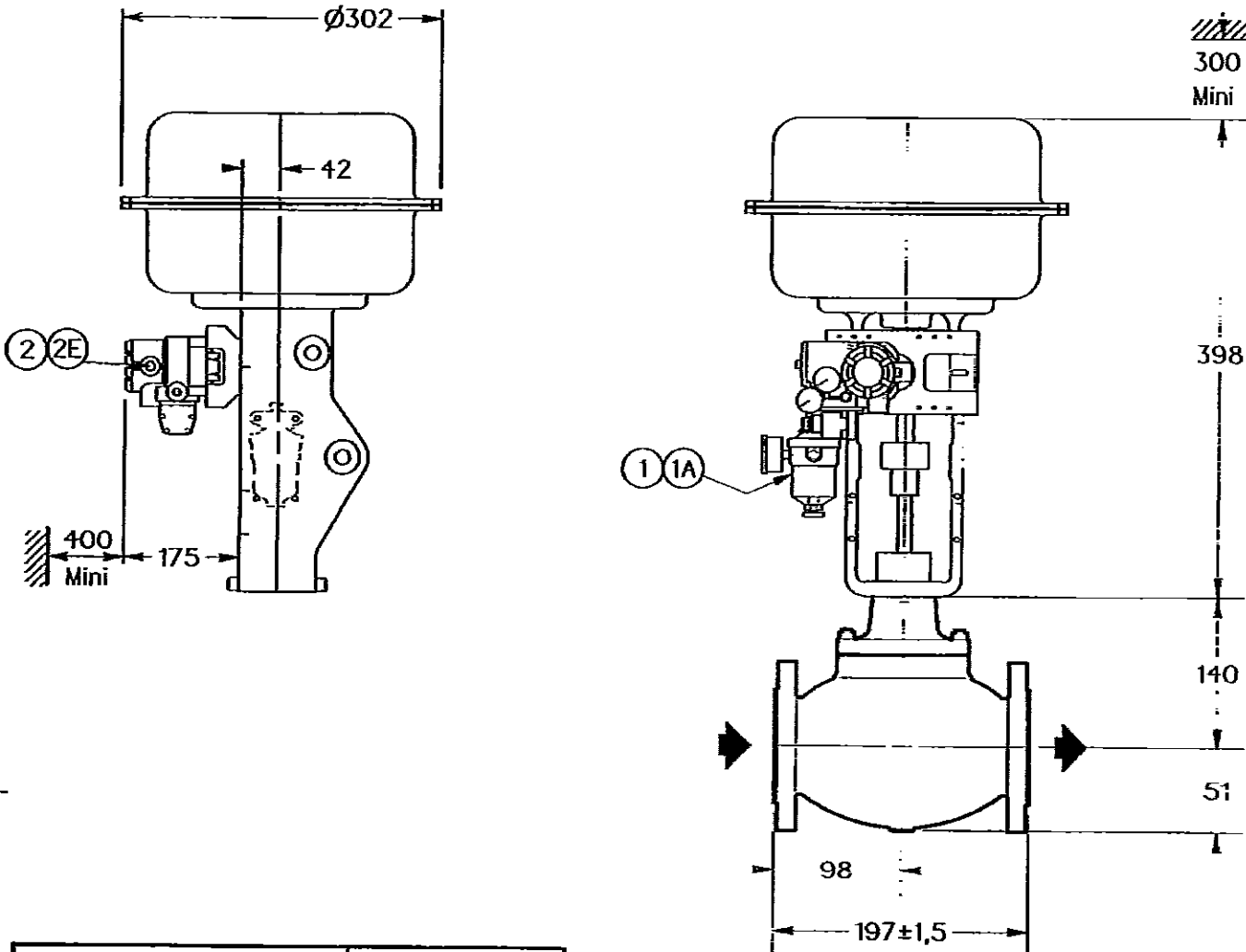
CONNECTION: 150 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW3
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal
7	BR400	Booster	1.0		
10		Handwheel			
TOTAL WEIGHT (accessories + valve) in kg			240	ITEM 13018	MIN SERIAL NUMBER : 02-04910-18
Rev. 3	DATE: Feb-04-2003	DRAWN BY: P. ROUELLE	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 TV 30104					

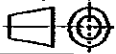
	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 88-21125		DN : 25 (1")	ON AIR FAILURE : CLOSED	
FLOW TO : OPEN		CONNECTION: 300 ANSI RF		



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg		39	ITEM : 13019	WN SERIAL NUMBER : 02-04910-19
Rev. 1	DATE: Oct-07-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP FRANCE			CUSTOMER ORDER: 6465C30 1541 01 0 10007	
TAG : 30 TV 30107				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellian

DRESSER

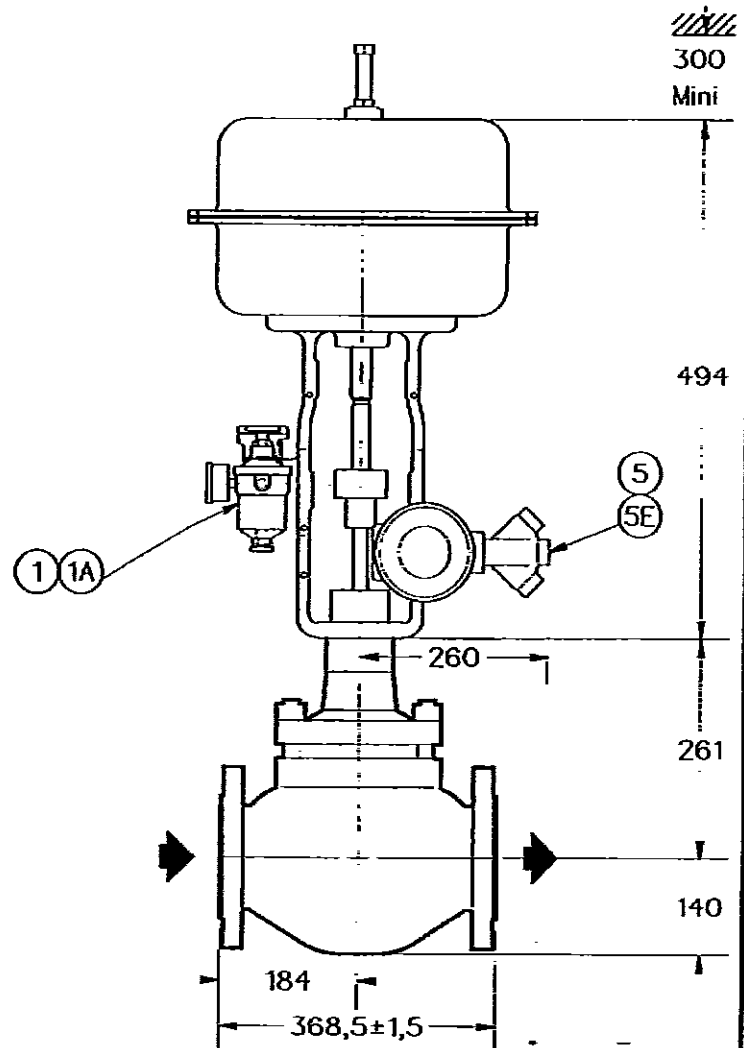
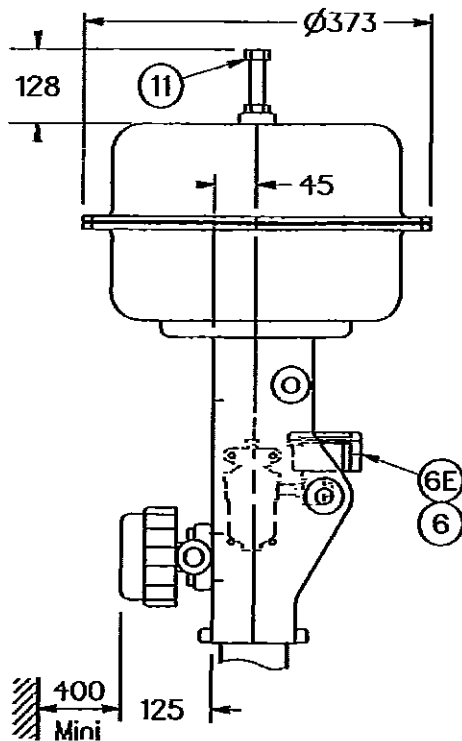
SERIES VALVE : 88-41315

DN : 4"x2"x4"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW4
Electrical Connections Detail	02-04910-EC3
Electrical Connections Detail	02-04910-LD1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
5	496/5	Detectors	2.5	5E	M20x2
6	WS..B317..	Solenoid Valve	1.0	6E	M20
11		Limit-Stop			(Limits Actuator Stem Retracting) (Locked by set cable)

TOTAL WEIGHT (accessories + valve) in kg

134

ITEM : 13020

UN SERIAL NUMBER : 02-04910-20

Rev. 3 DATE: Dec-10-2002

DRAWN BY: H. VICTORE

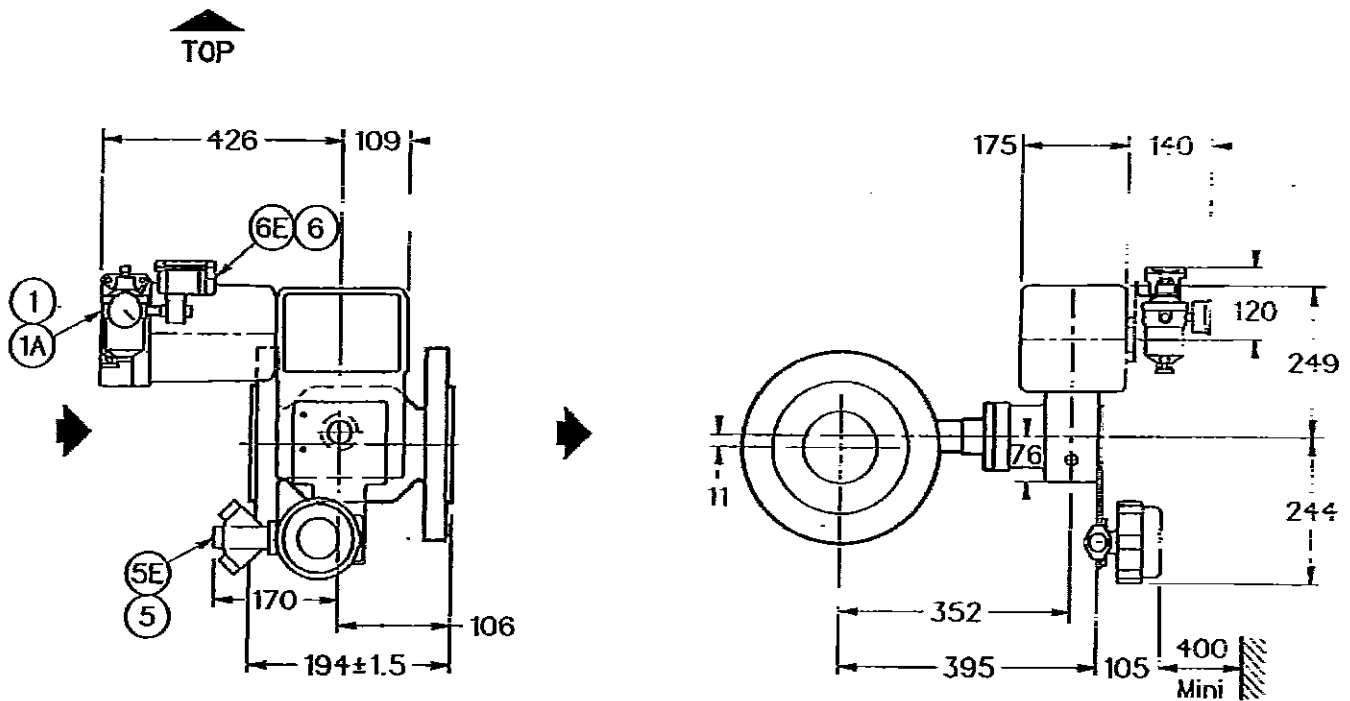
ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 KV 30141

	DIMENSIONS in mm ±0.2	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 35-35602		DN : 100 (4")	ON AIR FAILURE : CLOSED	
FLOW TO : CLOSE	CONNECTION: 300 ANSI RF			



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW4
Electrical Connections Detail	02-04910-EC3
Electrical Connections Detail	02-04910-LD4

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
5	496/5	Detectors	2.5	5E	M20x2
6	WS..8317..	Solenoid Valve	1.0	6E	M20

TOTAL WEIGHT (accessories + valve) in kg		62	ITEM : 13021	MIN SERIAL NUMBER : 02-04910-21
Rev. 3	DATE: Dec-11-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10C07		
TAG : 30 KV 30142				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRESSER

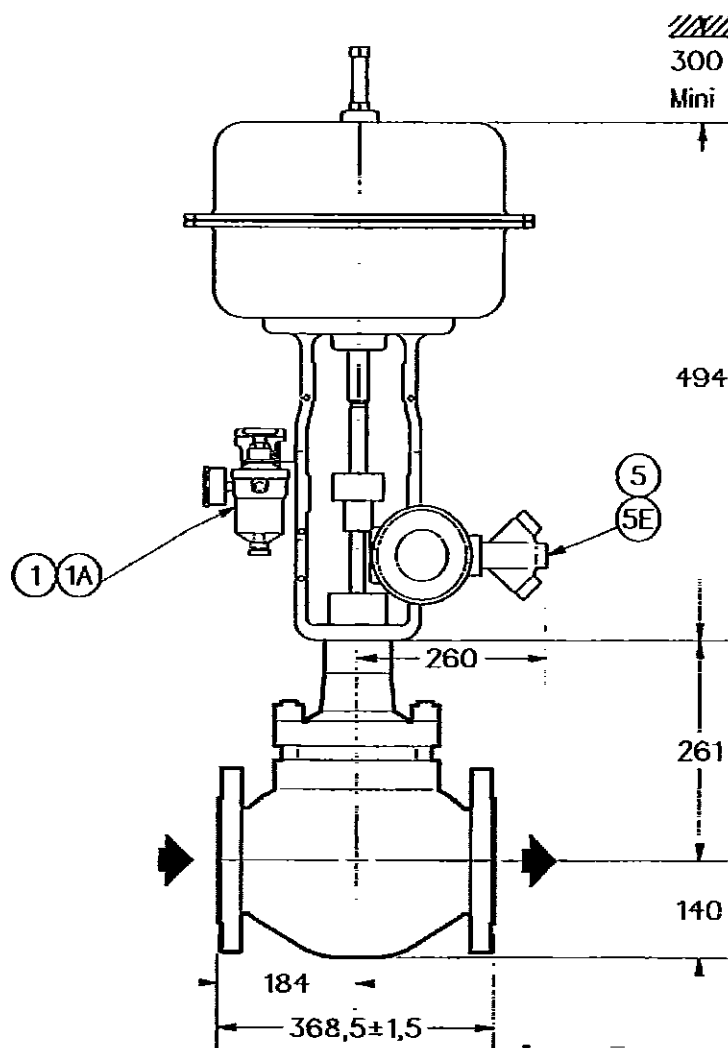
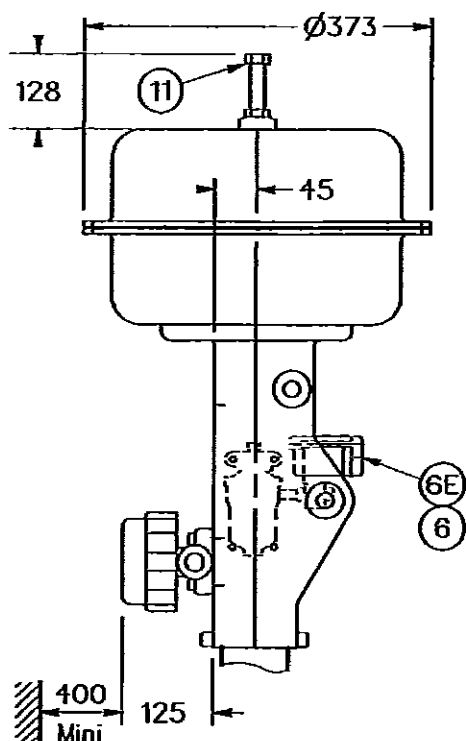
SERIES VALVE : 88-41315

DN : 4"x2"x4"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW4
Electrical Connections Detail	02-04910-EC3
Electrical Connections Detail	02-04910-LD1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
5	496/5	Detectors	2.5	5E	M20x2
6	WS..B317..	Solenoid Valve	1.0	6E	M20
11		Limit-Stop			(Limits Actuator Stem Retracting) (Locked by set cable)

TOTAL WEIGHT(accessories + valve) in kg

134

ITEM : 13022

MN SERIAL NUMBER : 02-04910-22

Rev. 3

DATE: Dec-10-2002

DRAWN BY:

H. VICTOIRE

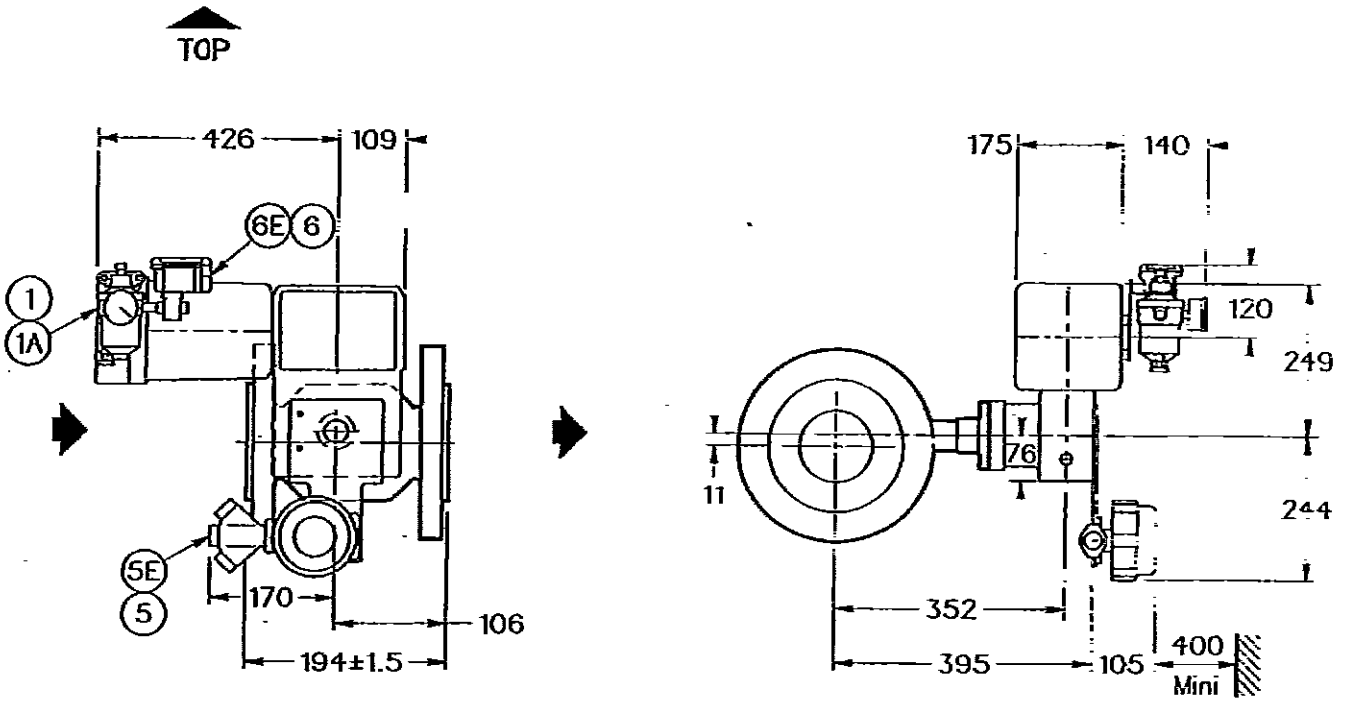
ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 KV 30143



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW4
Electrical Connections Detail	02-04910-EC3
Electrical Connections Detail	02-04910-L04

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
5	496/5	Detectors	2.5	5E	M20x2
6	WS..B317..	Solenoid Valve	1.0	6E	M20



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

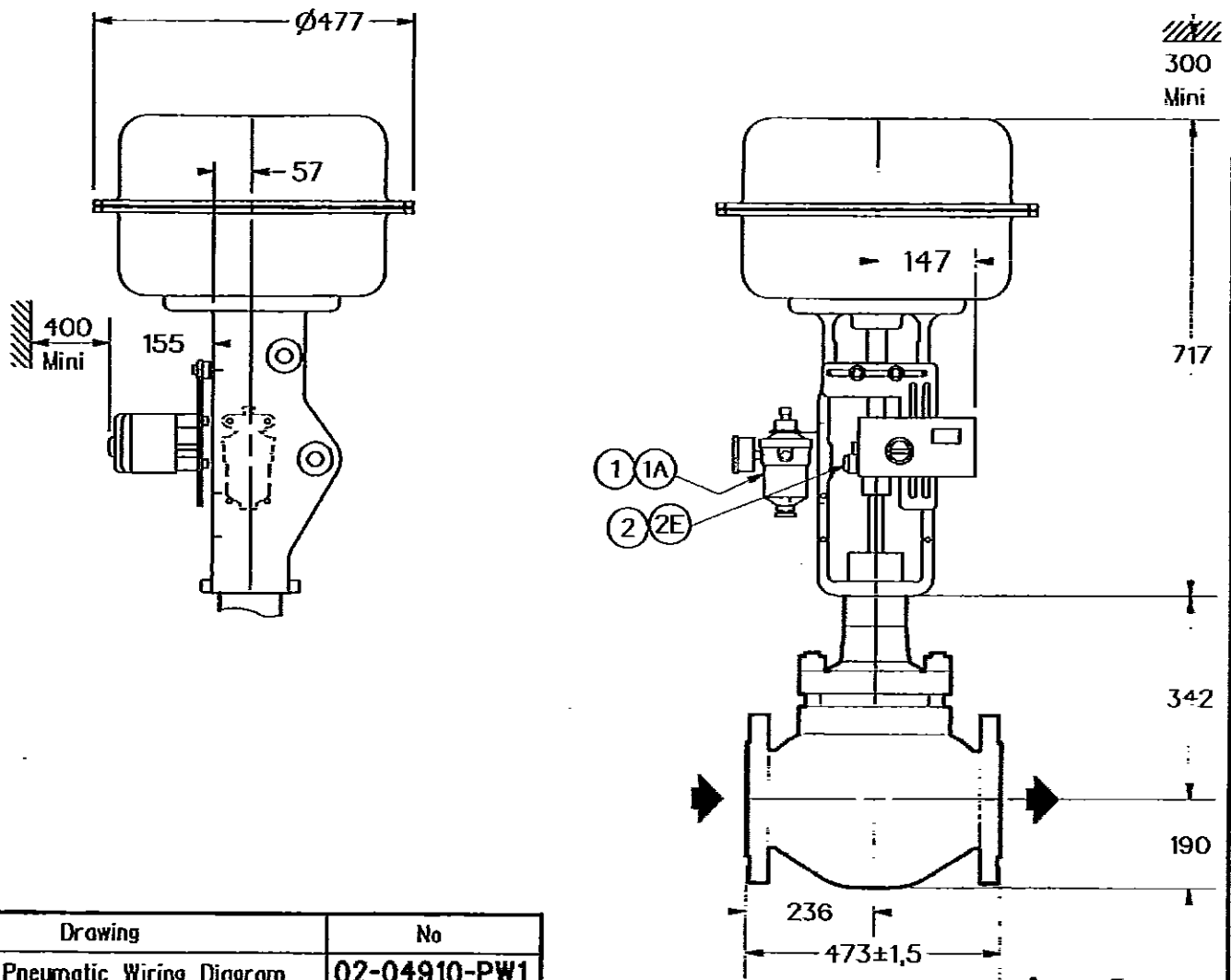
SERIES VALVE : 88-41335

DN : 6"x4"x6"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

259

ITEM : 13024 SERIAL NUMBER : 02-04910-24

Rev. 1

DATE: Oct-07-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 FV 30151



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masoneilan

DRESSER

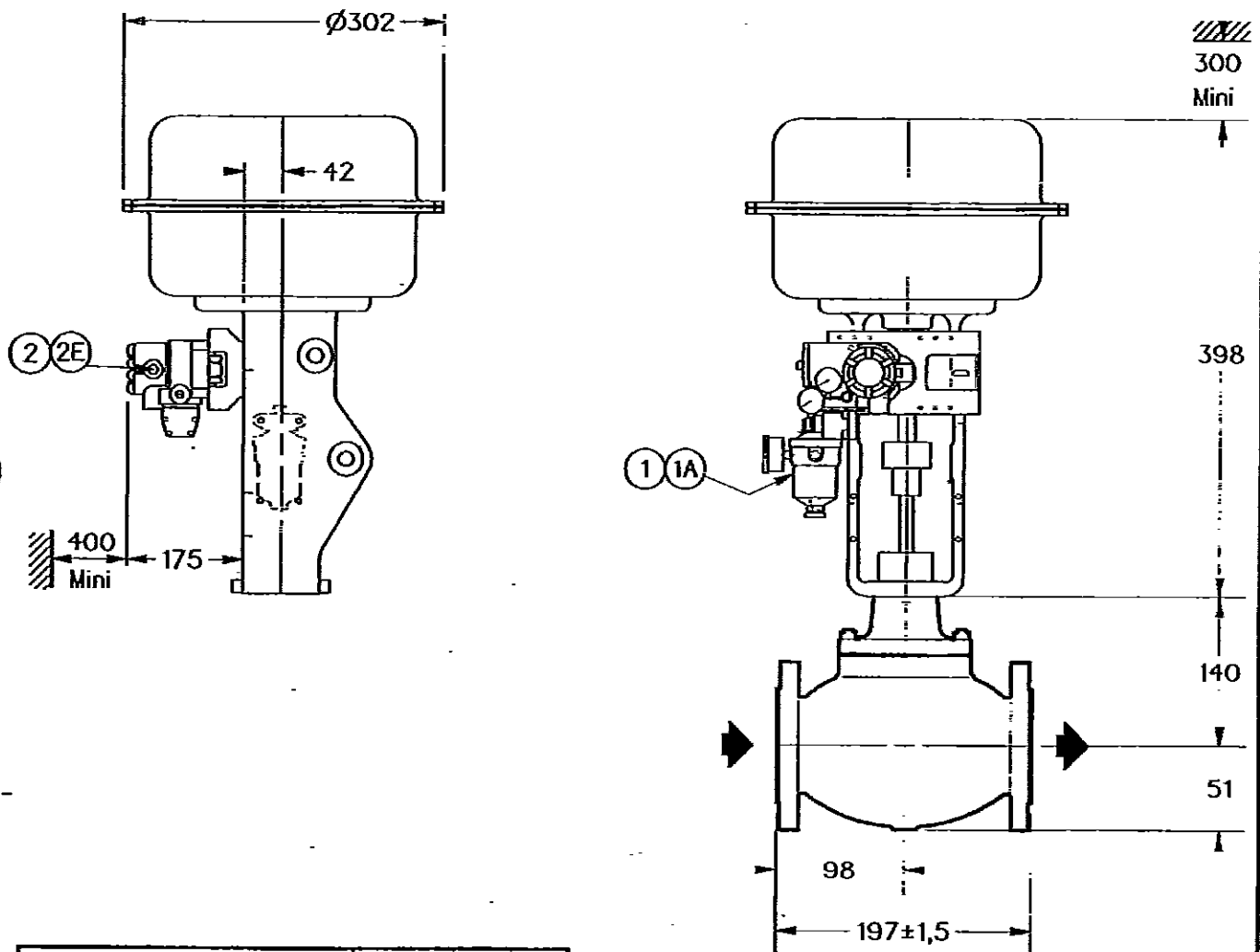
SERIES VALVE : 88-21125

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

39

ITEM : 13025

MN SERIAL NUMBER : 02-04910-25

Rev. 1

DATE: Oct-08-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP FRANCE

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 30151



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



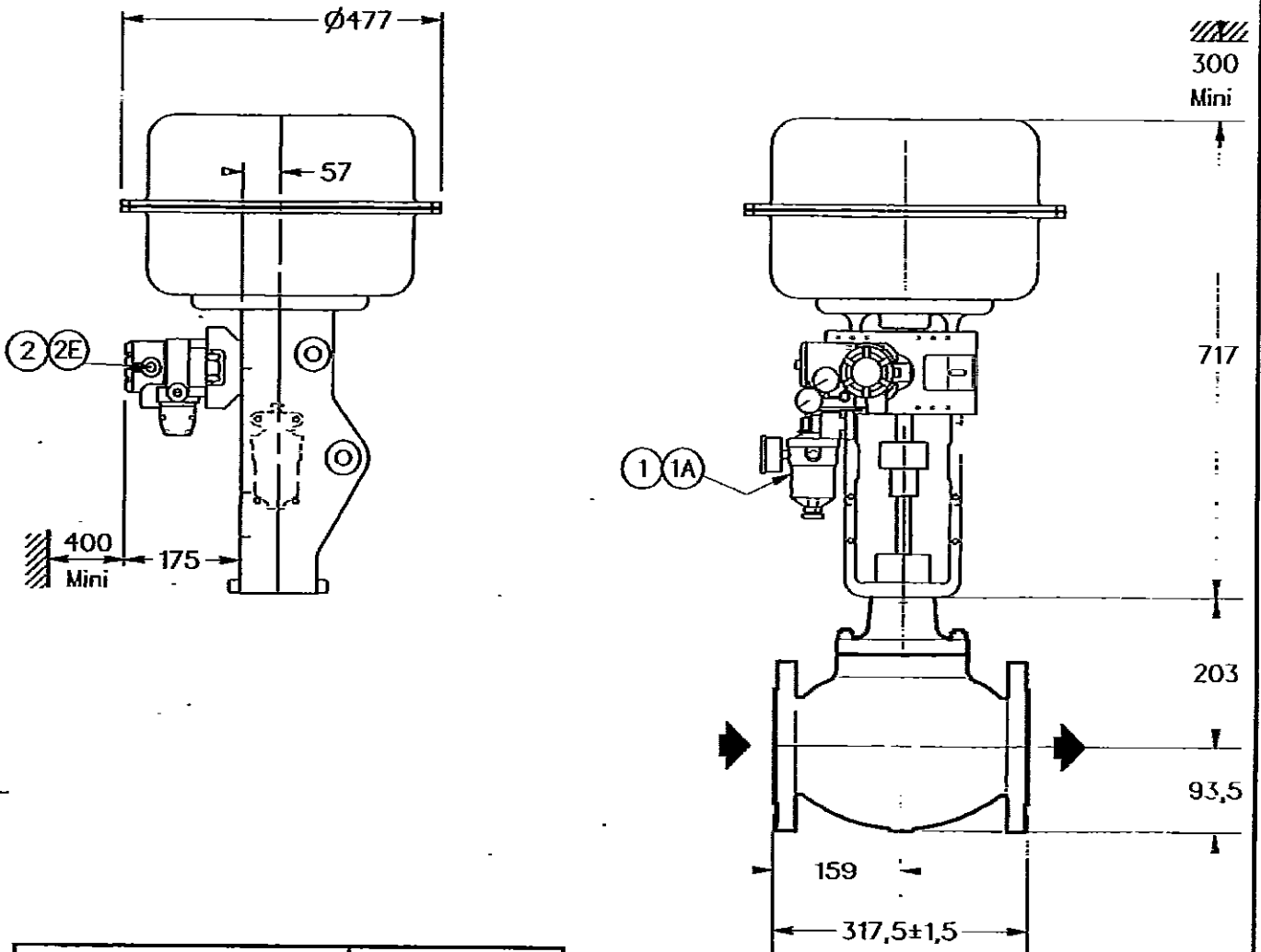
SERIES VALVE : 88-21715

DN : 80 (3")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

148

ITEM : 13026

MIN SERIAL NUMBER : 02-04910-26

Rev. 1

DATE: Oct-08-2002

DRAWN BY:

P-ROUELLE

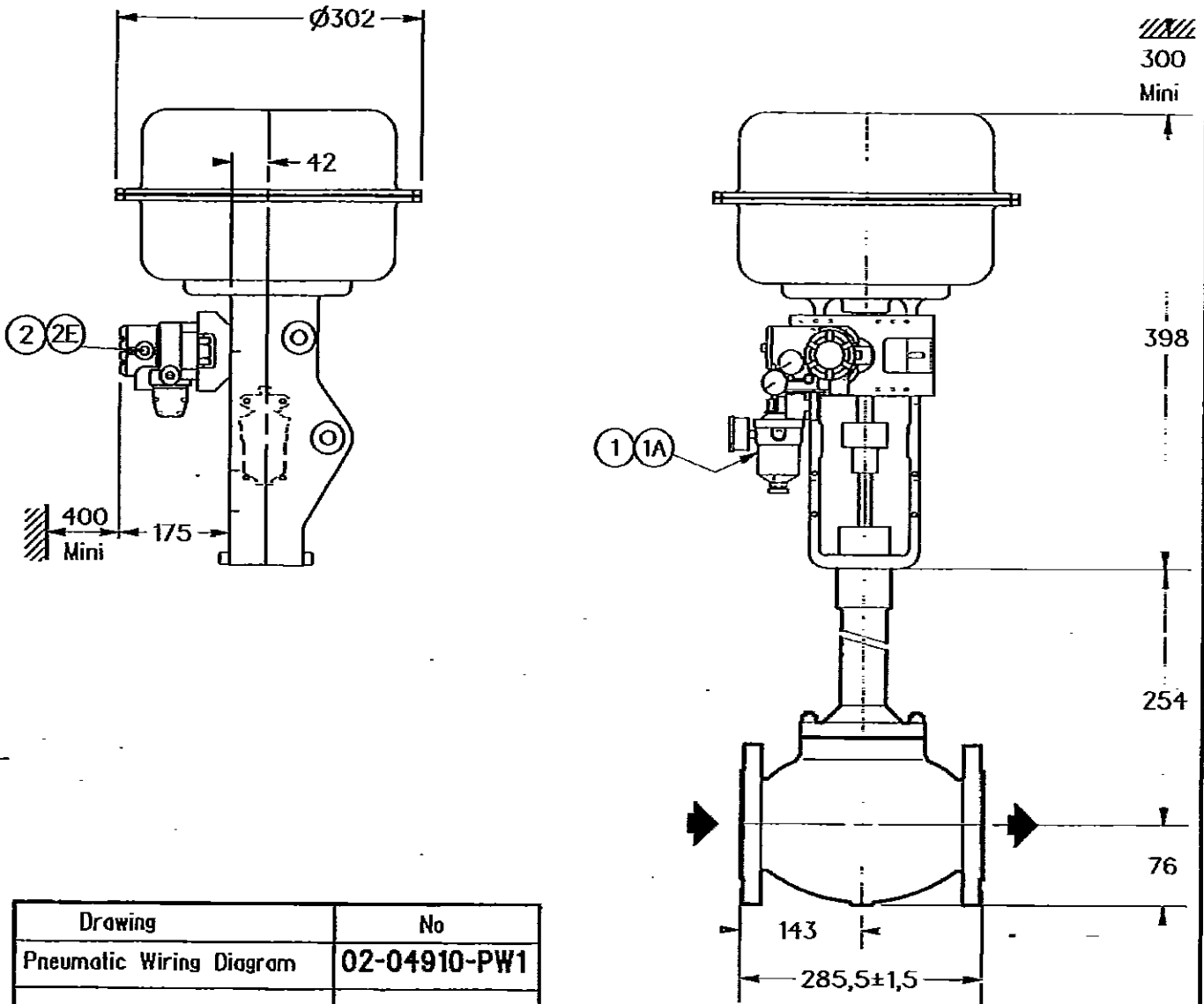
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP FRANCE

CUSTOMER ORDER: 6465C30 1541 01 0 10007

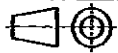
TAG : 30 FV 30152



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		52	ITEM : 13027	MIN SERIAL NUMBER : 02-04910-27
Rev. 1	DATE: Oct-08-2002	DRAWN BY: P-ROUELLE		ISSUED BY: C-DROUARD
CUSTOMER: TECHNIP FRANCE			CUSTOMER ORDER: 6465C30 1541 01 0 10007	
TAG : 30 LV 30153				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



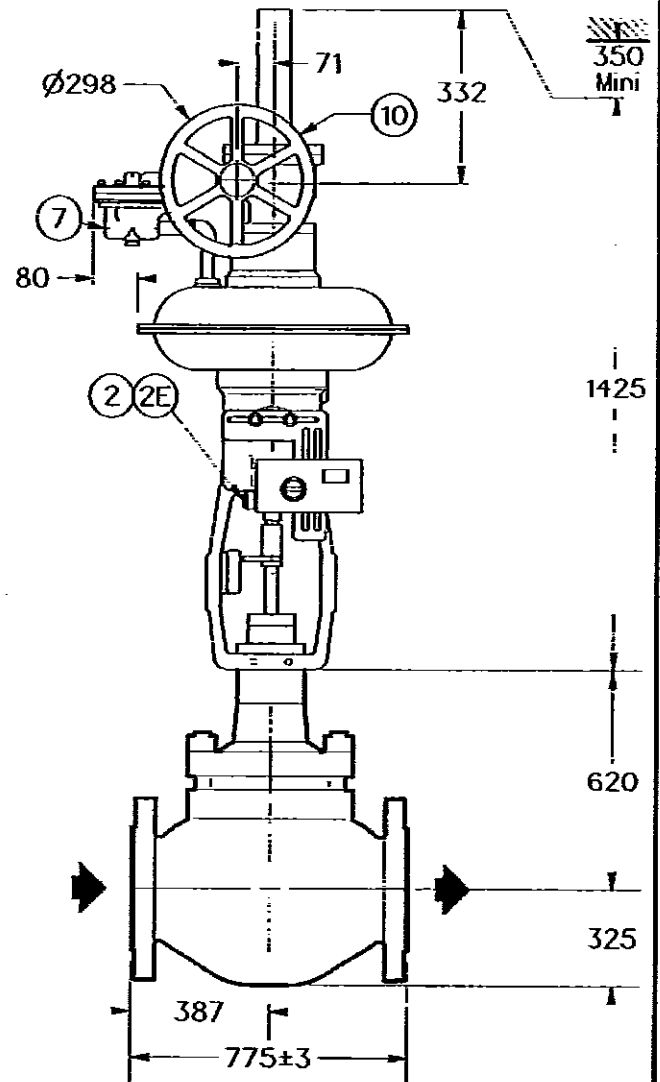
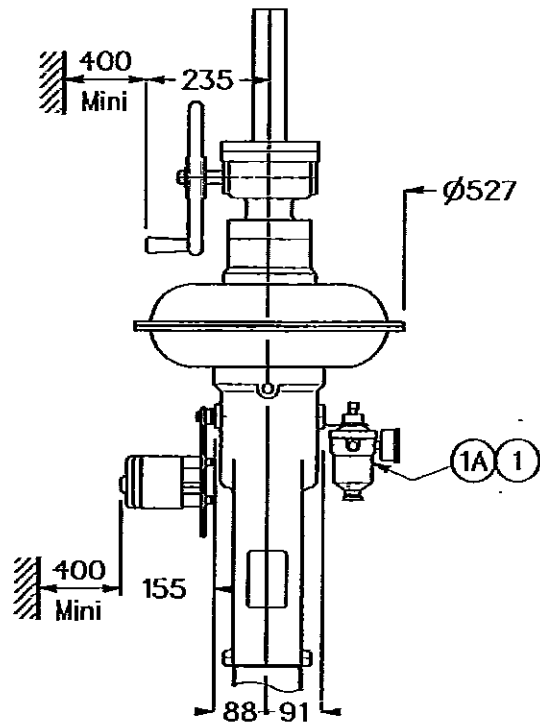
SERIES VALVE : 37-41355

DN : 12"

ON AIR FAILURE : OPEN.

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW3
Electrical Connections Detail	02-04909-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M 20 - Signal
7	BR400	Booster	1.0		
10	8A	Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

1087

ITEM : 13028

WH SERIAL NUMBER : 02-04910-28

Rev. 1

DATE: Oct-08-2002

DRAWN BY:

P. ROUELLE

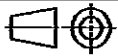
ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 30153



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

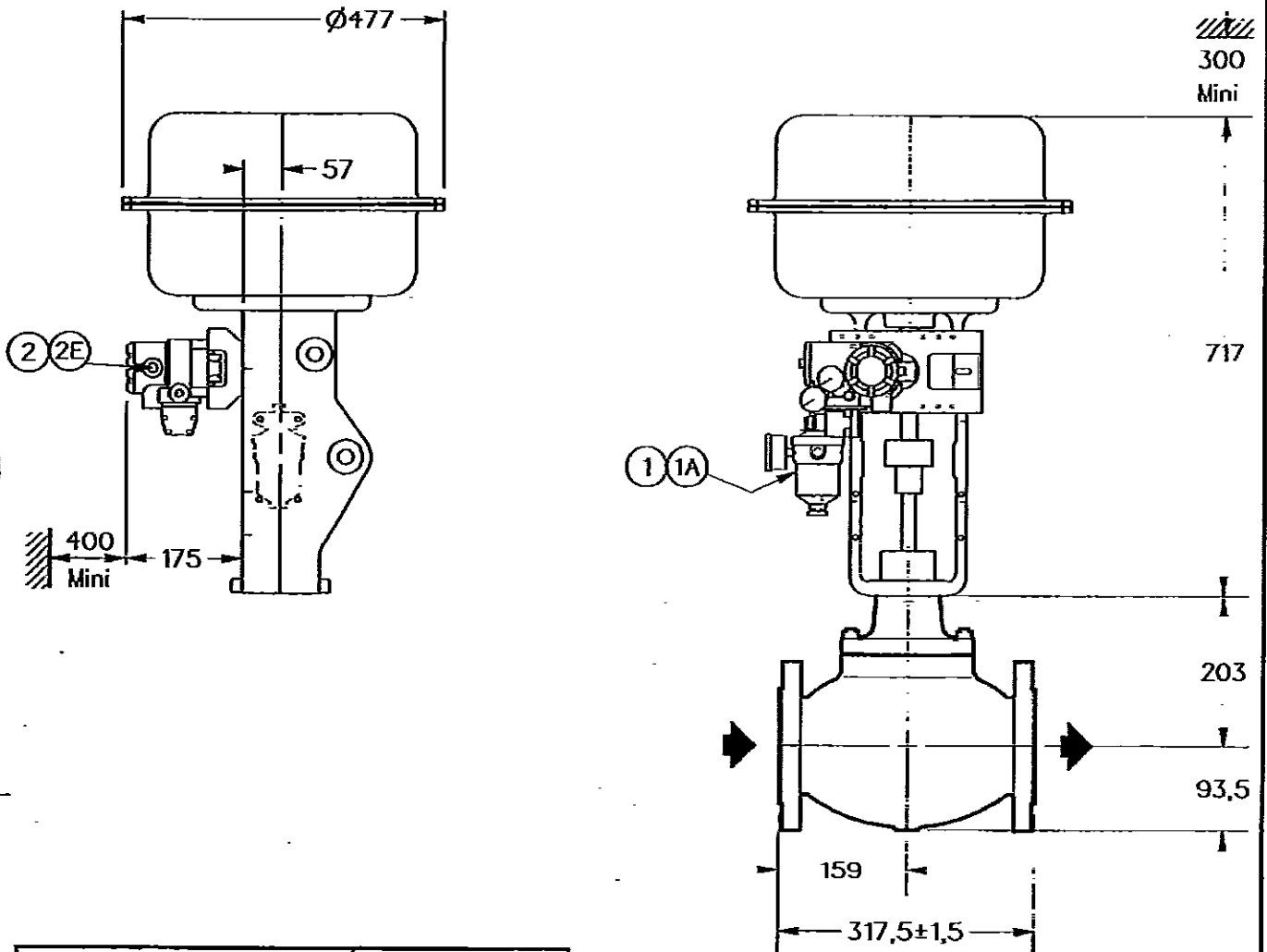
SERIES VALVE : 88-21715

DN : 80 (3")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		148	ITEM : 13029	MIN SERIAL NUMBER : 02-04910-29
Rev. 1	DATE: Oct-08-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP FRANCE		CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 TV 30154				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

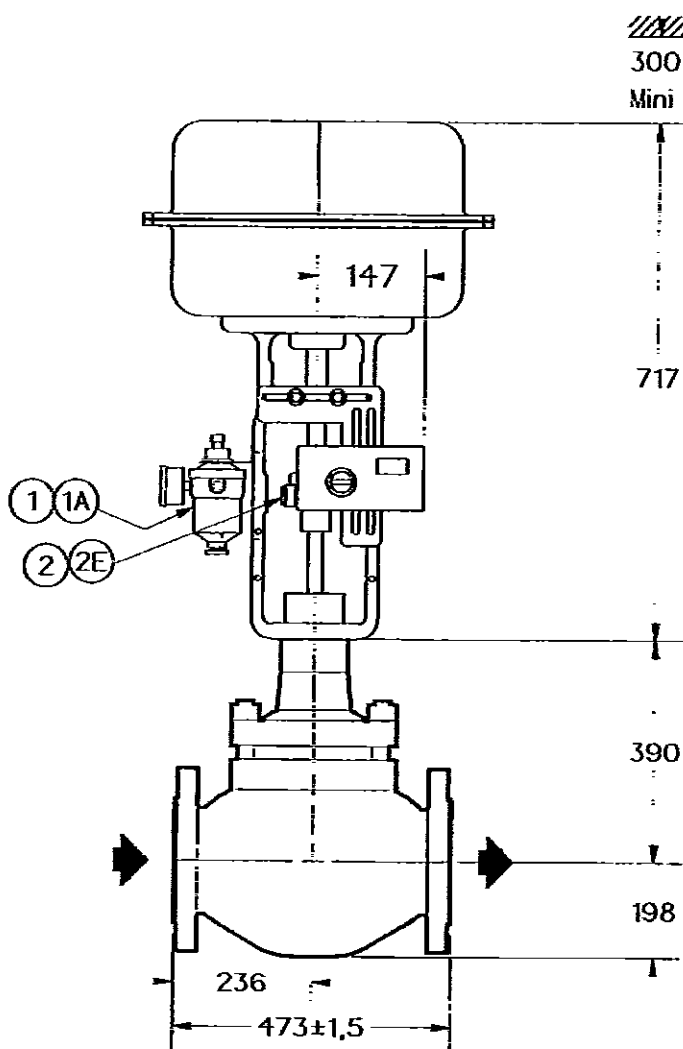
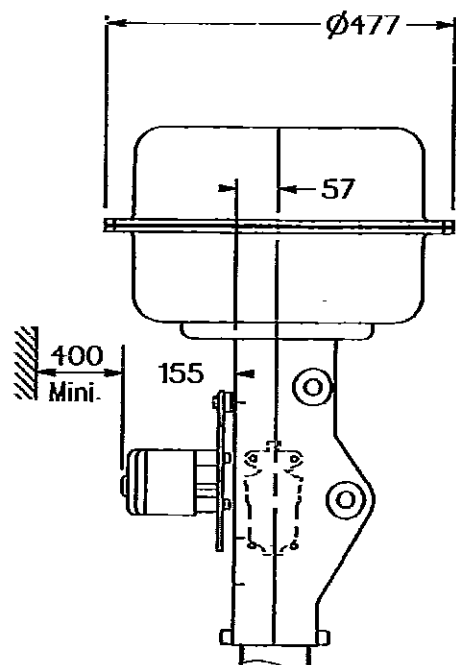
SERIES VALVE : 88-41935

DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

279

ITEM : 13030

MN SERIAL NUMBER : 02-04910-30

Rev. 1

DATE: Oct-08-2002

DRAWN BY:

P-ROUELLE

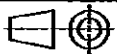
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 TV 30155



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

SERIES VALVE : 35-35602

DN : 40 (1.5")

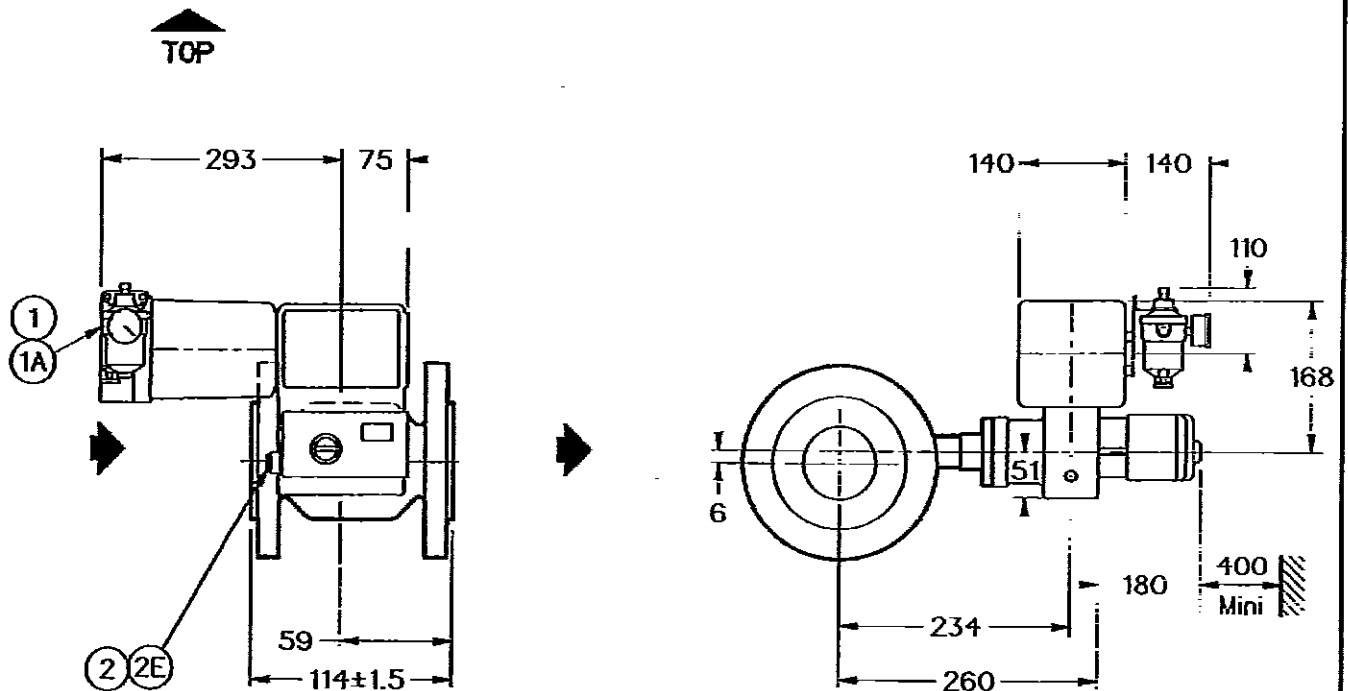
ON AIR FAILURE : CLOSED

FLOW TO

: CLOSE

CONNECTION:

300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

19

ITEM : 13031

MIN SERIAL NUMBER : 02-04910-31

Rev. 1

DATE: Oct-08-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

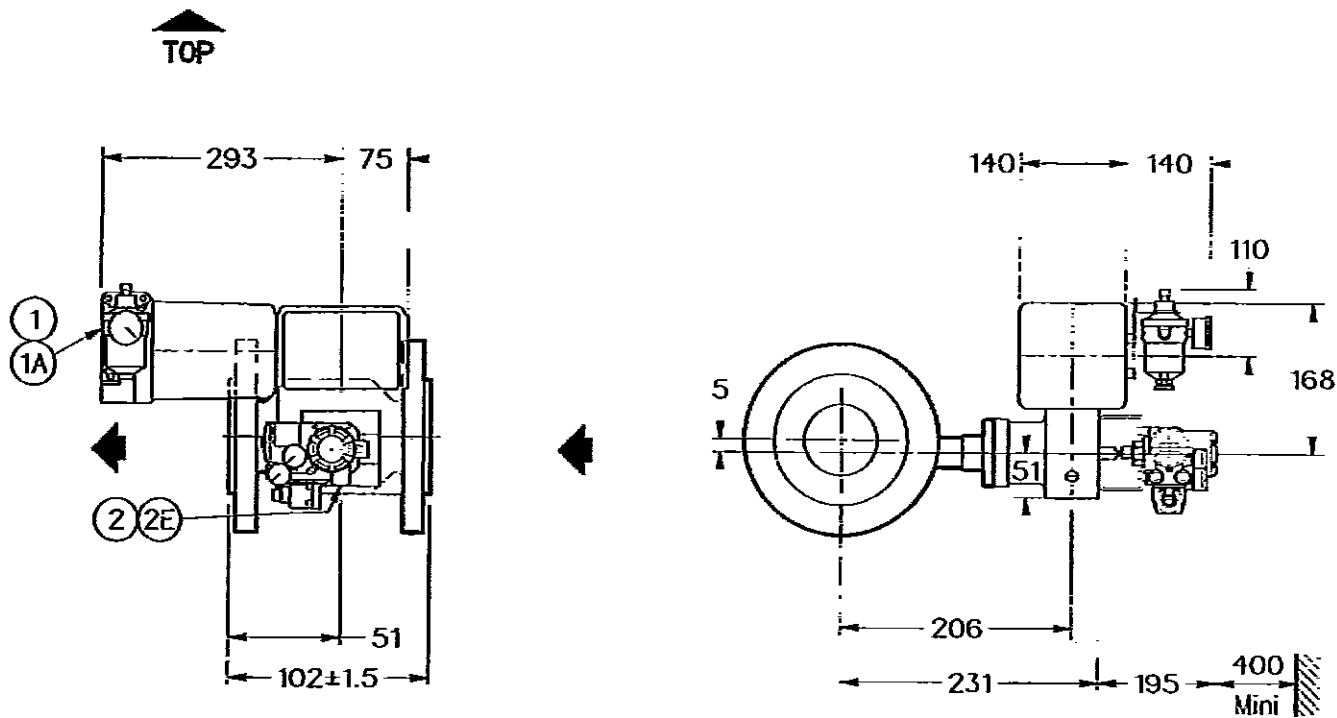
C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 FV 30161

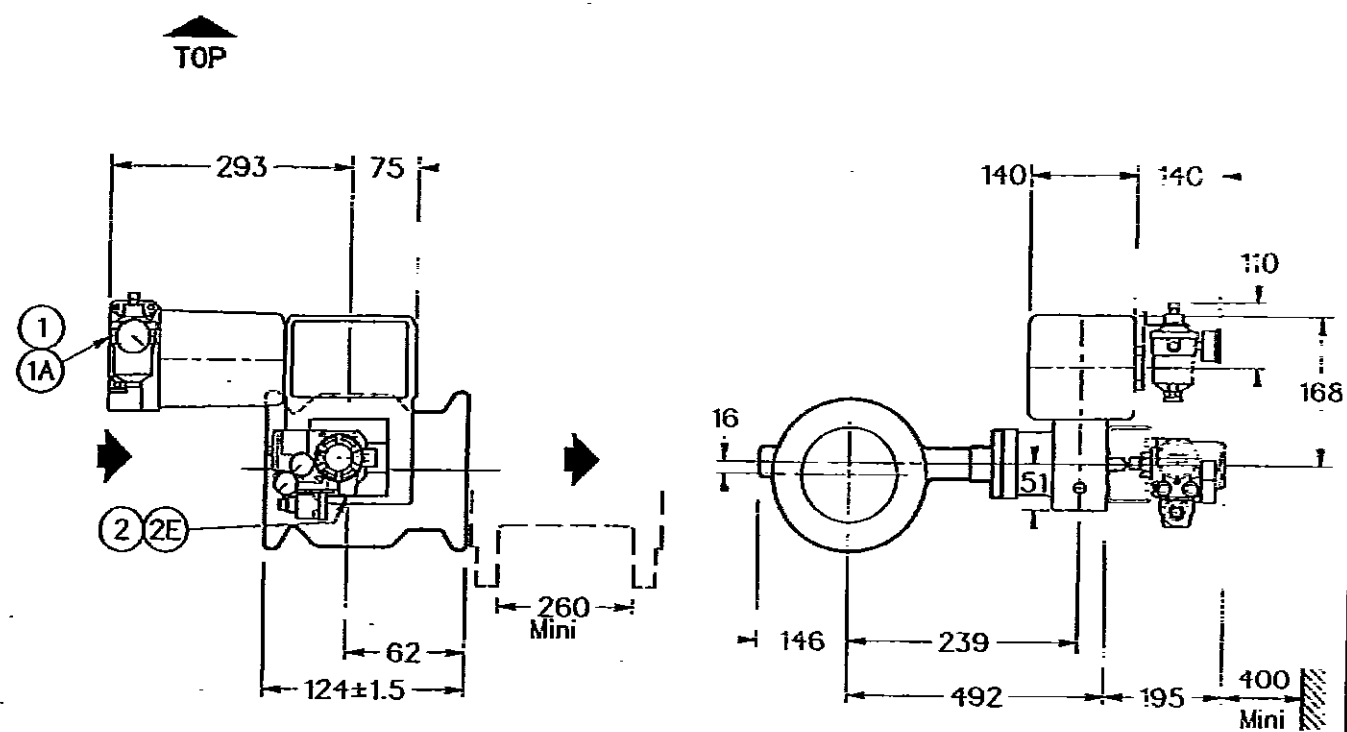
	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan
SERIES VALVE : 35-35202		DN : 25 (1")	ON AIR FAILURE : CLOSED
FLOW TO : CLOSE	CONNECTION: 300 ANSI RF		



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FRI0/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

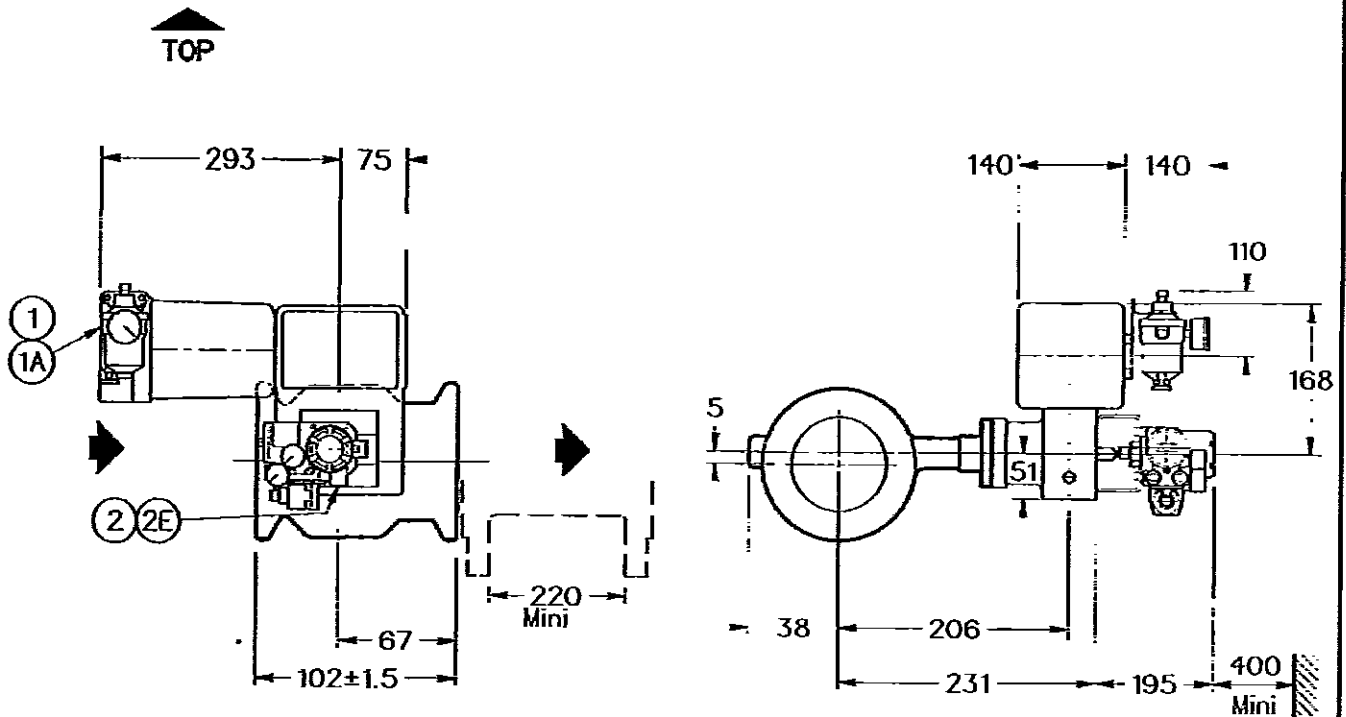
TOTAL WEIGHT (accessories + valve) in kg		16	ITEM : 13032	MIN SERIAL NUMBER : 02-04910-32
Rev. 1	DATE: Oct-08-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 LV 30161				



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg		17	ITEM : 1303	MIN SERIAL NUMBER : 02-04910-33
Rev. 2	DATE: Dec-11-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 PV 30162				



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply M20 - Signal
2	FVP	E/P Positioner	4.0	2E	

TOTAL WEIGHT (accessories + valve) in kg		17	ITEM : 13034	WH SERIAL NUMBER : 02-04910-34
Rev. 1	DATE: Oct-08-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007	
TAG : 30 LV 30164				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

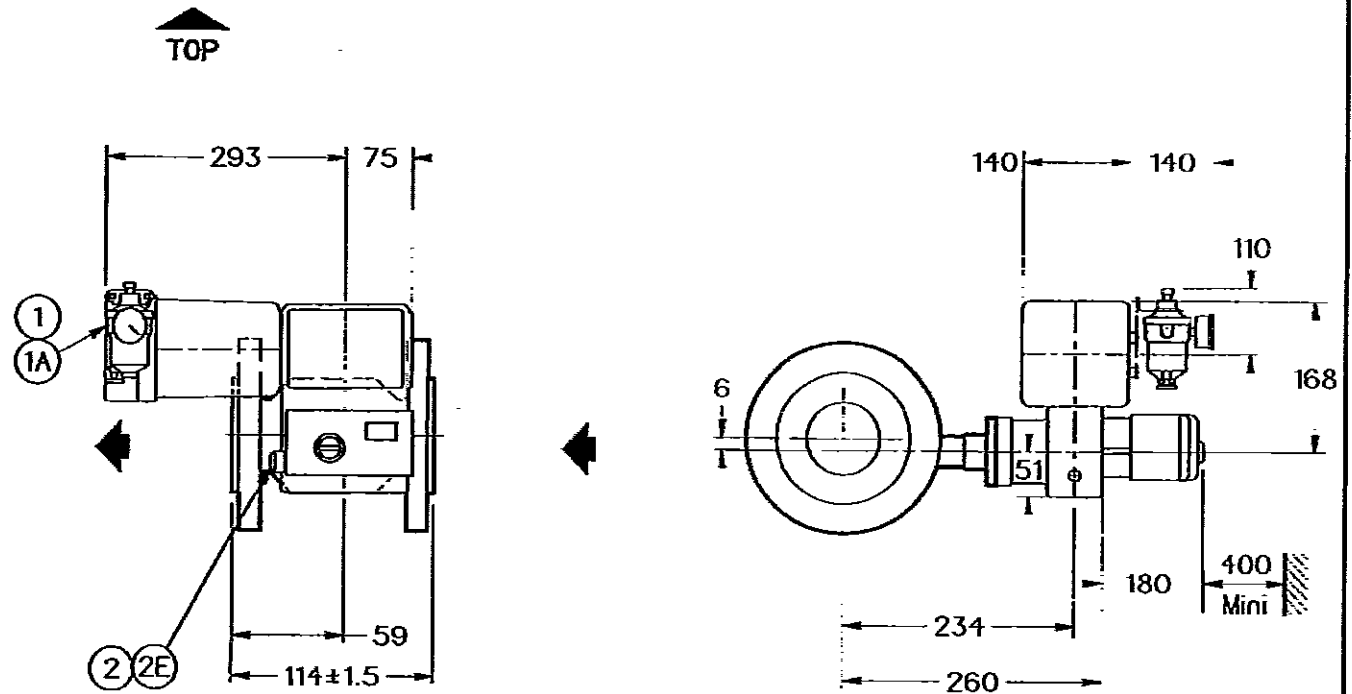
SERIES VALVE : 35-35202

DN : 40 (1.5")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

19

ITEM : 13035 WH SERIAL NUMBER : 02-04910-35

Rev. 1

DATE: Oct-08-2002

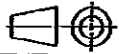
DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 FV 30171



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

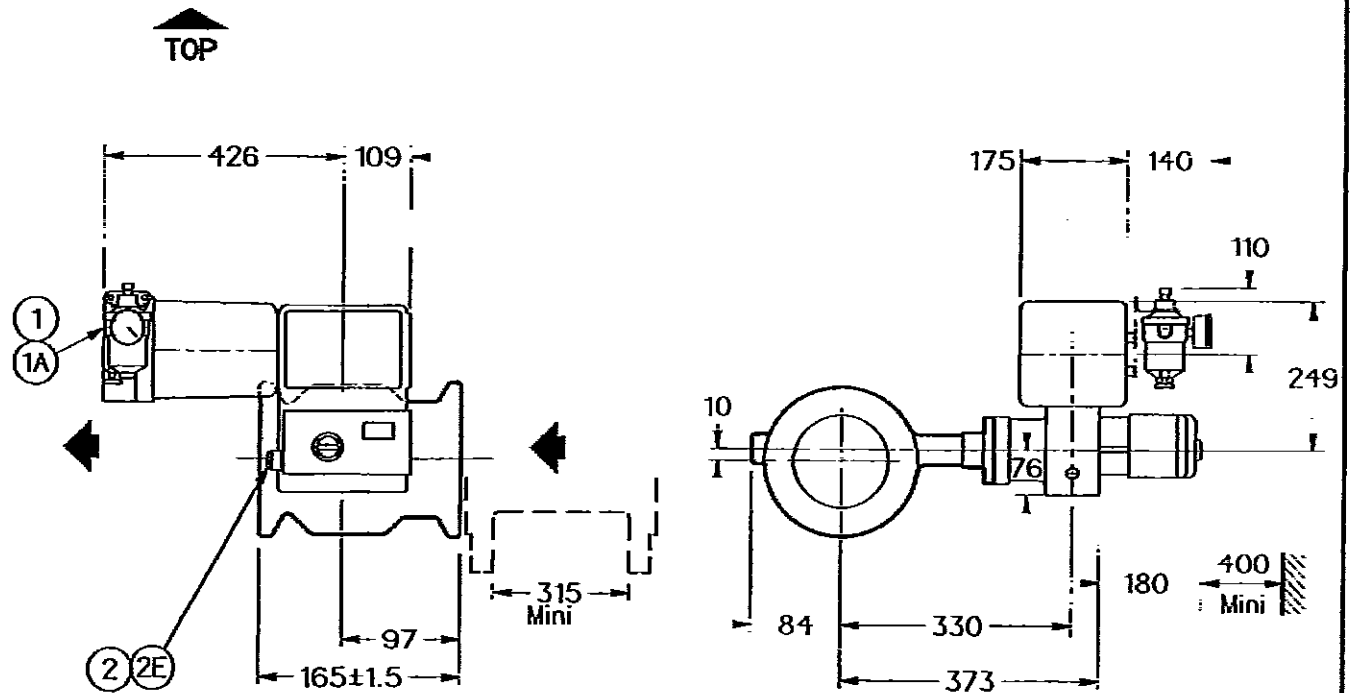
SERIES VALVE : 35-35602

DN : 80 (3")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

40

ITEM : 13037

MIN SERIAL NUMBER : 02-04910-37

Rev. 2

DATE: Feb-04-2003

DRAWN BY:

P-ROUELLE

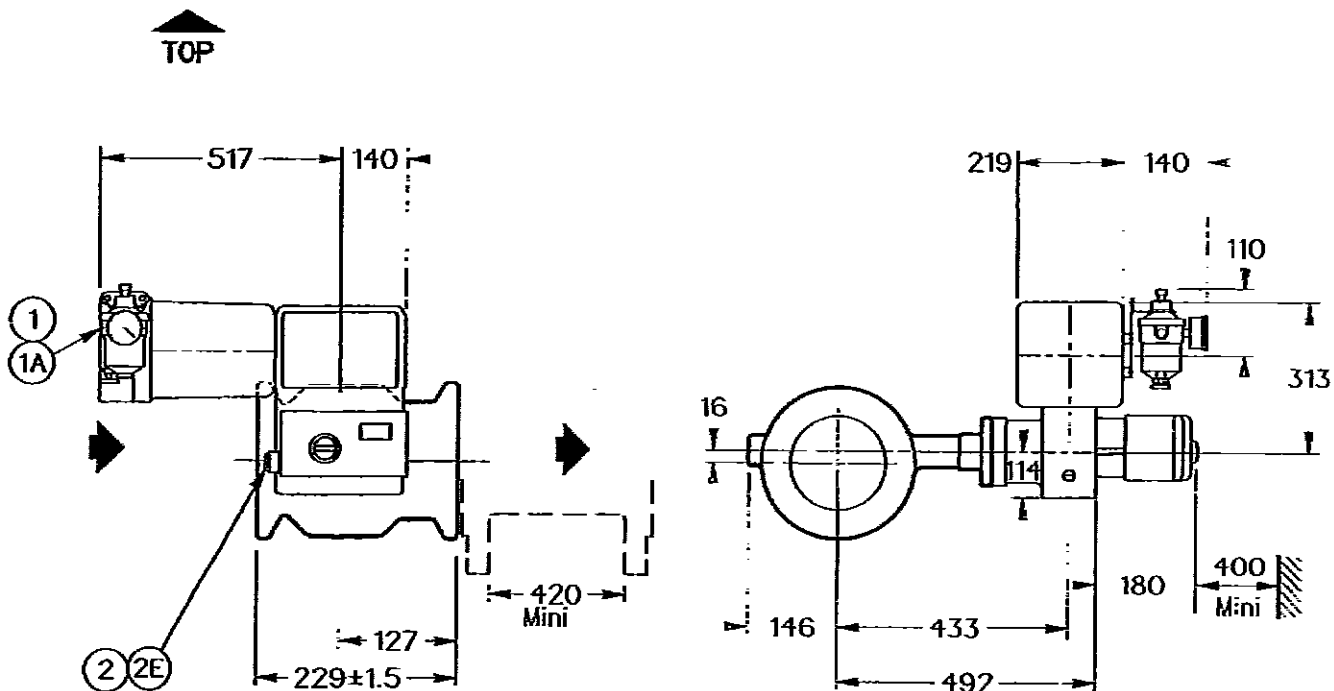
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 30701B



Drawing	No
Pneumatic Wiring Diagram	02-04910-PW1
Electrical Connections Detail	02-04910-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

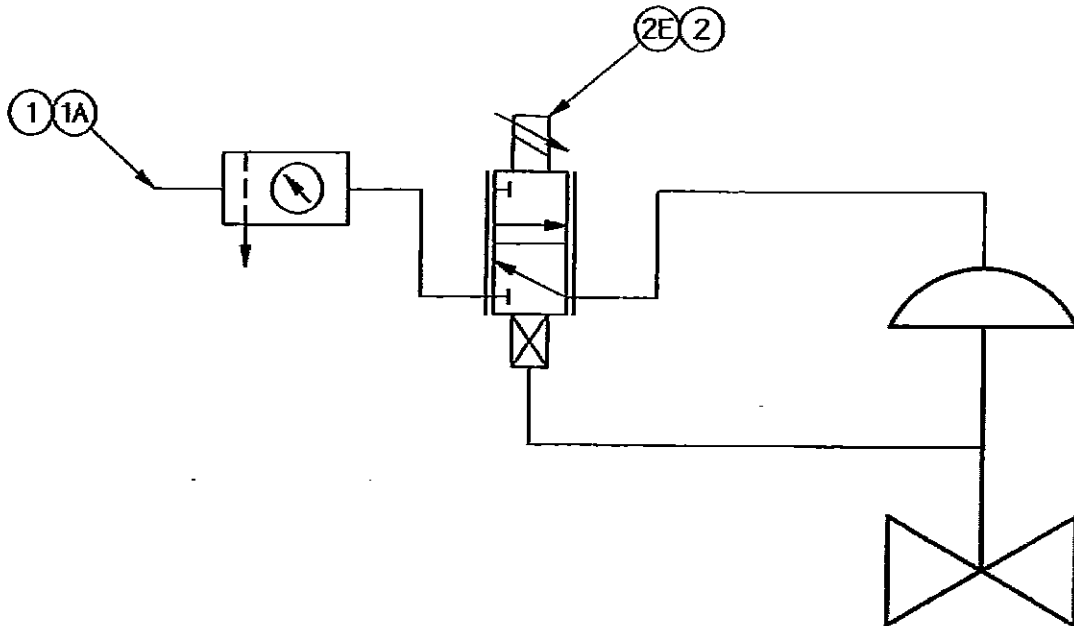
TOTAL WEIGHT (accessories + valve) in kg		101	ITEM : 13036	WN SERIAL NUMBER : 02-04910-38
Rev. 1	DATE: Oct-08-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP FRANCE		CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 LV 30701A				



DRAWING No : 02-04910-PW1

Masonellan

PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.1Q

Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filler Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal

ITEM : _____ WN SERIAL NUMBER : 02-04910-PW1

Rev. 0 || DATE: 11/OCT/2002 || DRAWN BY: P. SEVESTRE || ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP || CUSTOMER ORDER: 6465C 30 1541 01 0 10007

TAG : _____



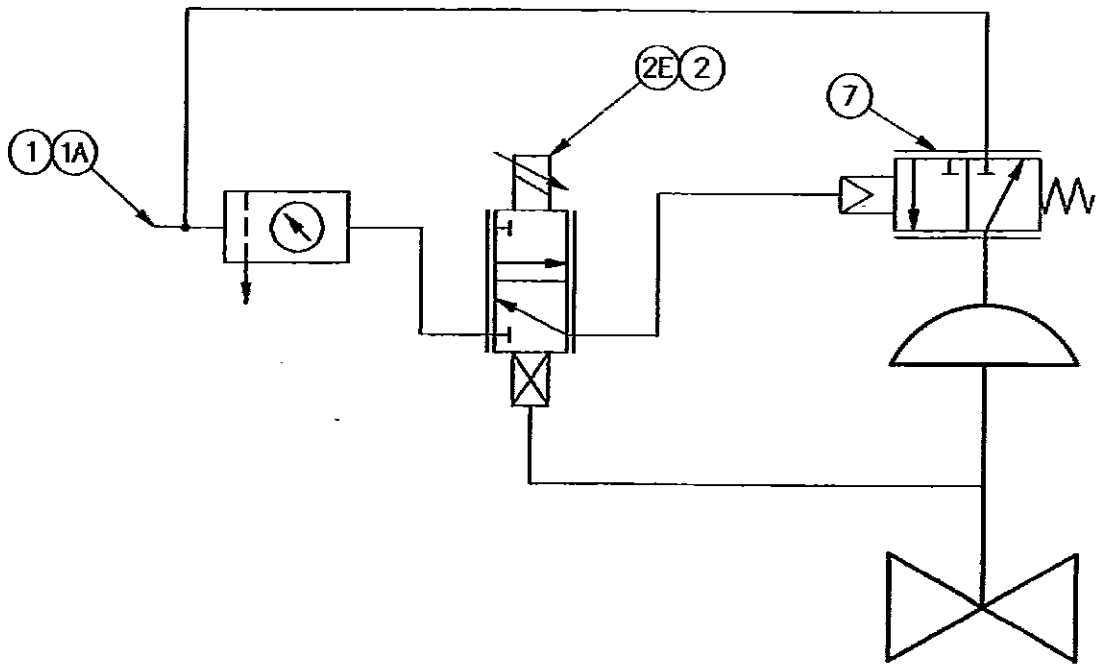
DRAWING No : 02-04910-PW3

Masonellan



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10



Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal
7	Volume Booster		

ITEM : / MN SERIAL NUMBER : 02-04910-PW3

Rev. 0 | DATE: 11/OCT/2002 | DRAWN BY: P. SEVESTRE | ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP | CUSTOMER ORDER: 6465C 30 1541 01 0 10007

TAG : _____



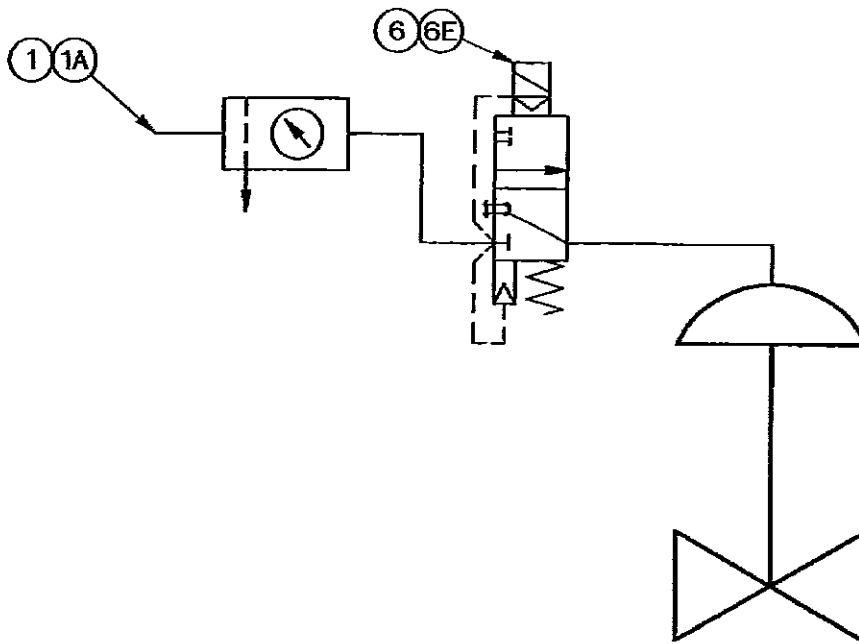
DRAWING No : 02-04910-PW4

Masonellan



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.1Q



Ref.	DESCRIPTION	Ref.	CONNECTION / FUNCTION
1	Air Filler Regul. +Gauge	1A	Air Supply
6	Solenoid Valve	6E	

ITEM : / MN SERIAL NUMBER : 02-04910-PW4

Rev. 0 | DATE: 11/OCT/2002 | DRAWN BY: P. SEVESTRE | ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP | CUSTOMER ORDER: 6465C 30 1541 01 0 1007

TAG : /

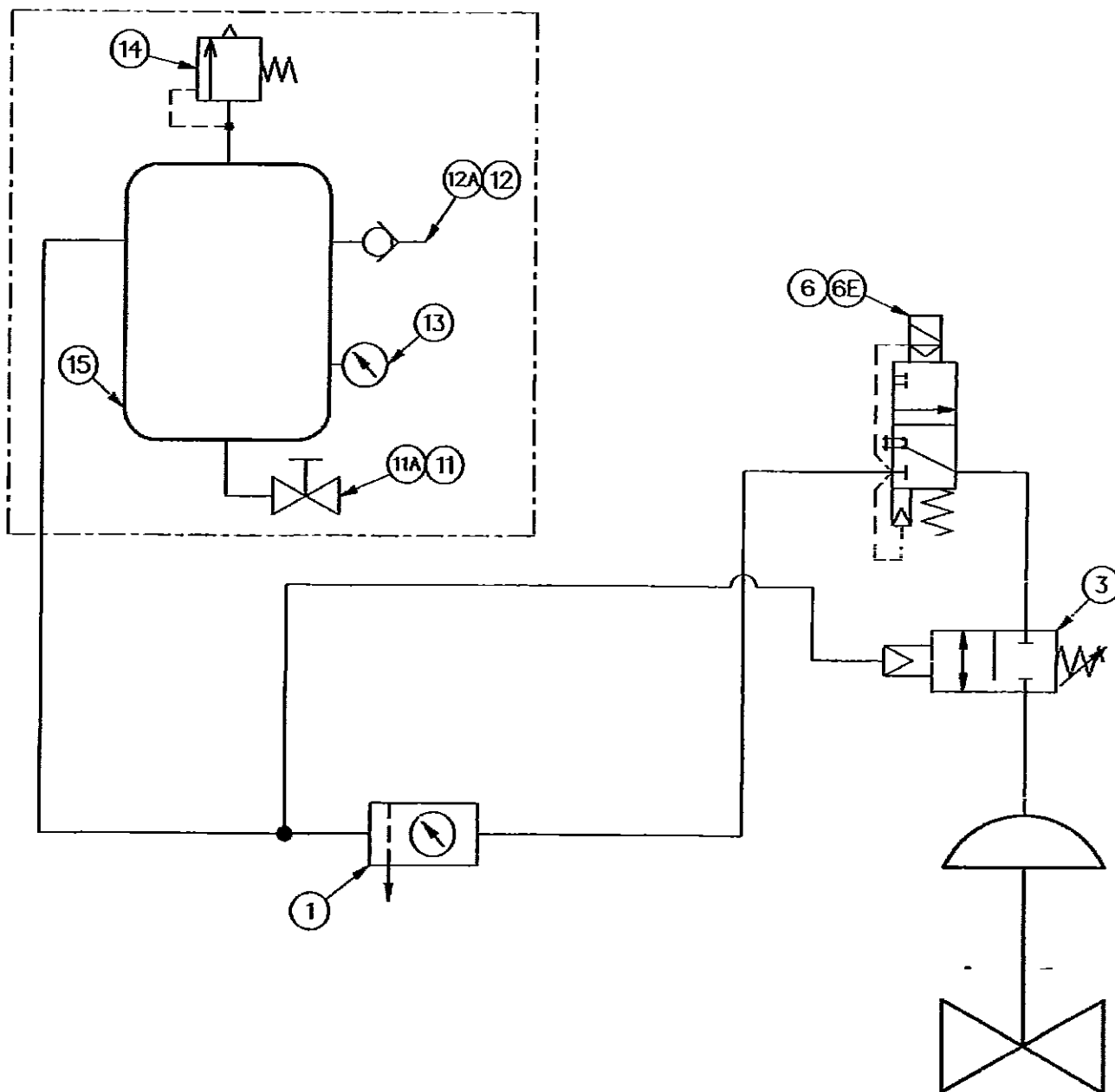


DRAWING No : 02-04910-PW7

Masonellan

DRESSER

PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10

Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filler Regul. +Gauge		
3	Air Lock-up Valve		
6	Solenoid Valve	6E	
11	Drain Valve	11A	1/4 NPTF - Drain
12	No Return Valve	12A	1/2 NPTM - Air Supply
13	Pressure Gauge		
14	Relief Valve		
15	Volume Tank		

ITEM : / MN SERIAL NUMBER : 02-04910-PW7

Rev. 0 | DATE: 11/OCT/2002 | DRAWN BY: P. SEVESTRE | ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP | CUSTOMER ORDER: 6465C 30 1541 01 0 10007

TAG : /

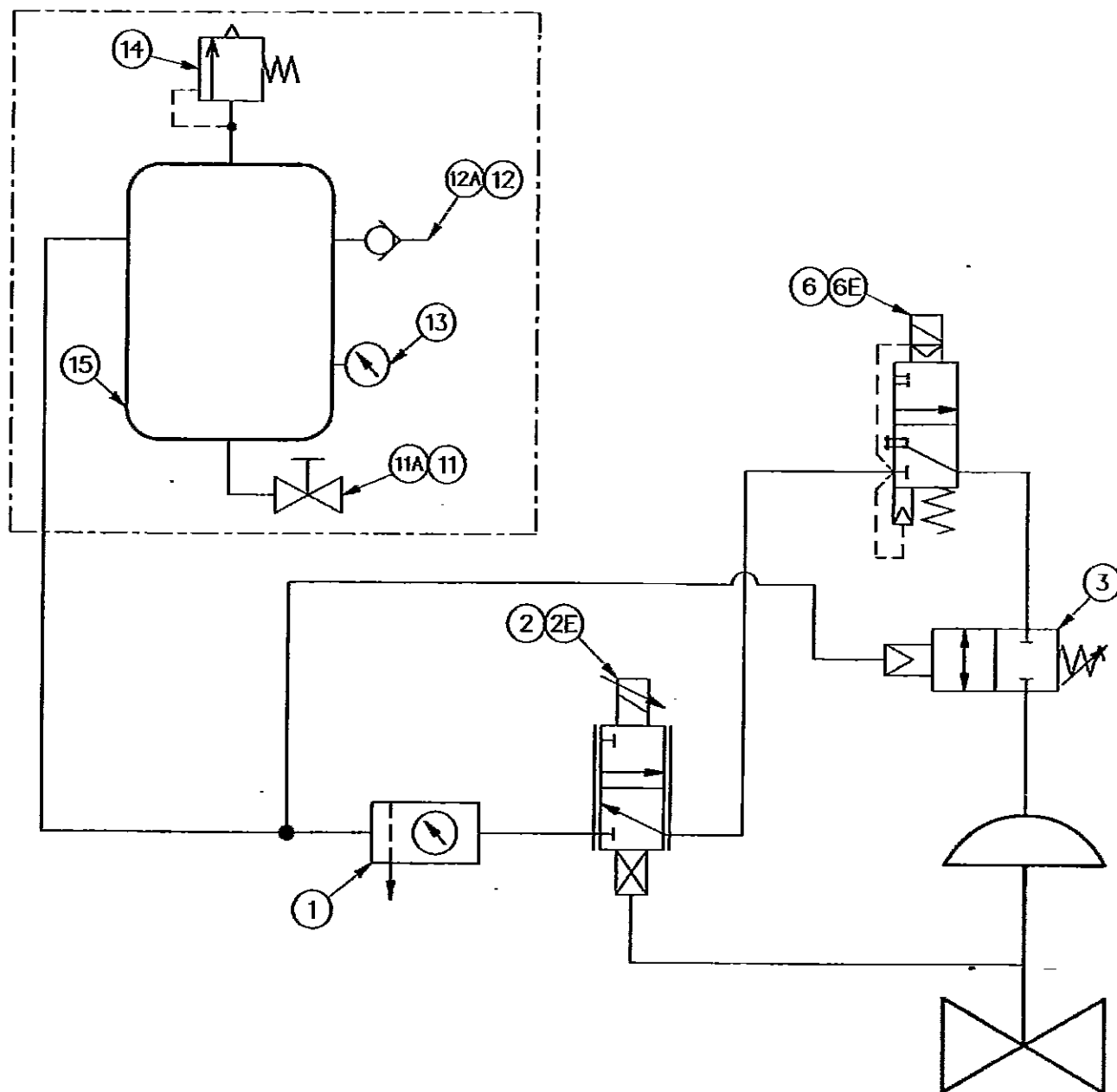


DRAWING No : 02-04910-PW8

Masonellan



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10

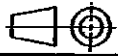
Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge		
2	Electropneumatic Positioner	2E	Signal
3	Air Lock-up Valve		
6	Solenoid Valve	6E	
11	Drain Valve	11A	1/4 NPTF - Drain
12	No Return Valve	12A	1/2 NPTM - Air Supply
13	Pressure Gauge		
14	Relief Valve		
15	Volume Tank		

ITEM : / MW SERIAL NUMBER : 02-04910-PW8

Rev. 0 | DATE: 11/OCT/2002 | DRAWN BY: P. SEVESTRE | ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP | CUSTOMER ORDER: 6465C 30 1541 01 0 10007

TAG : /



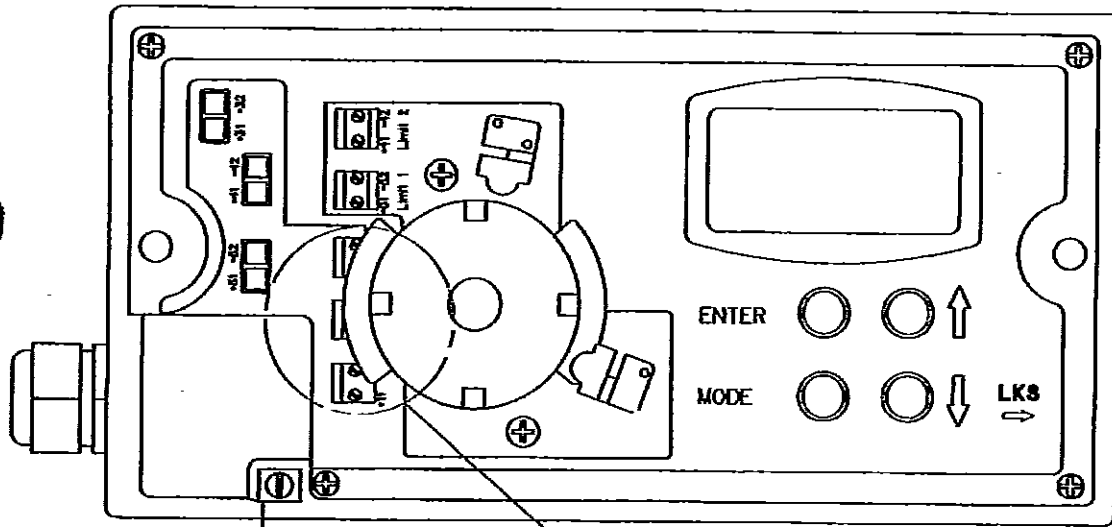
DRAWING No : 02-04910-EC1

Masonella

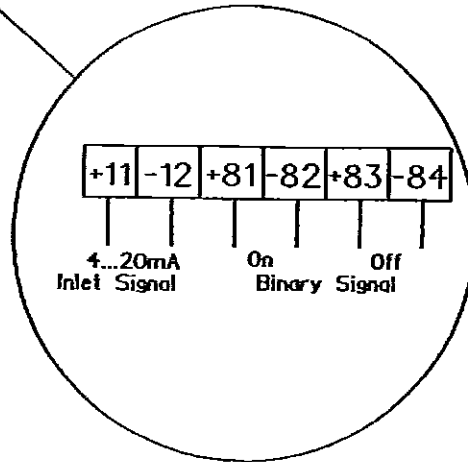


ELECTRICAL CONNECTIONS DETAIL

ELECTROPNEUMATIC POSITIONER TZID-C



Earth Terminal



Rev. 0

DATE: 11/OCT/2002

DRAWN BY: P. SEVESTRE

ITEM :

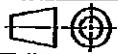
UN SERIAL NUMBER : 02-04910-EC1

CUSTOMER: TECHNIP

ISSUED BY: C. DROUARD

CUSTOMER ORDER: 6465C 30 1541 01 0 10007

TAG :



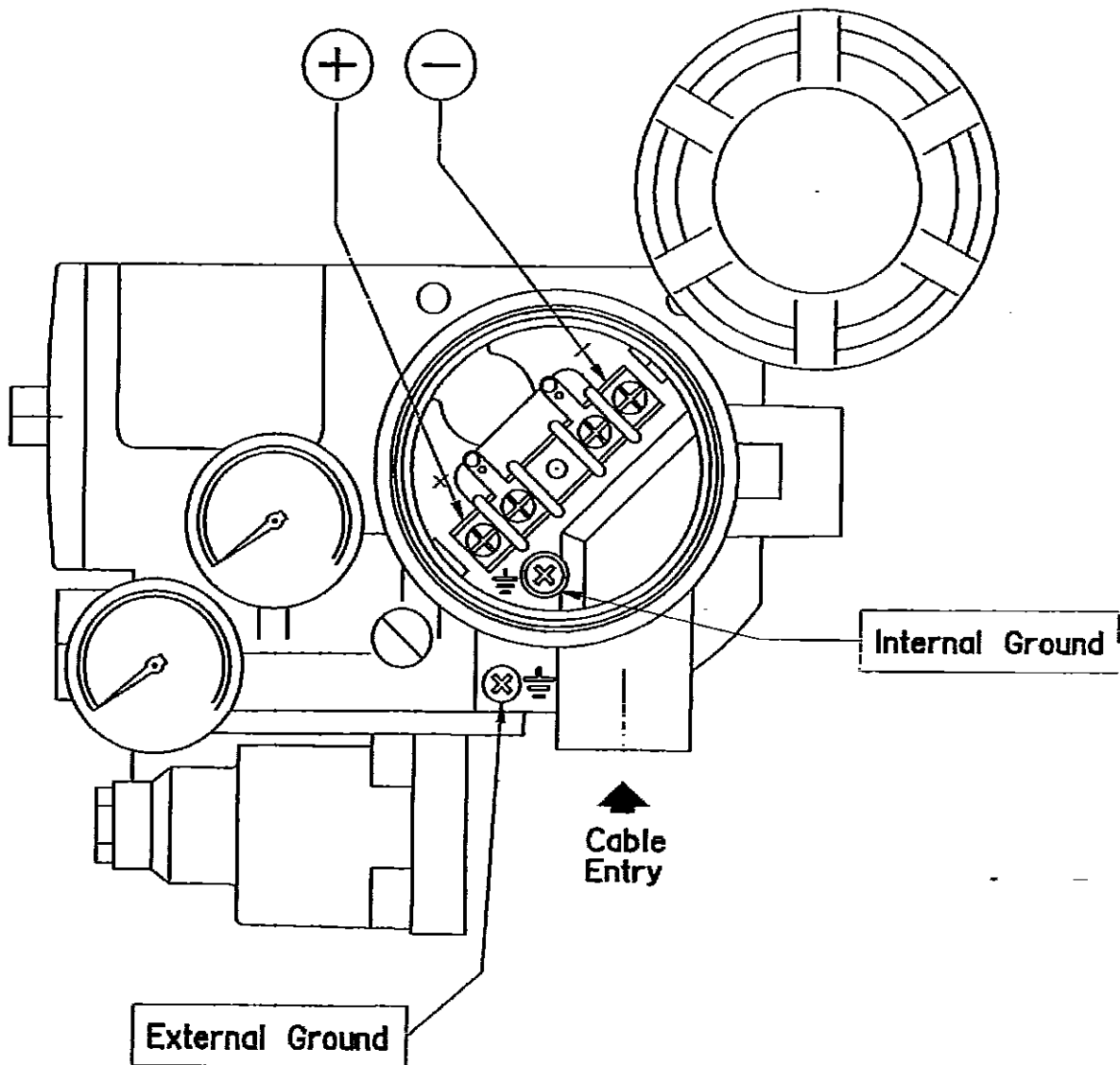
DRAWING No : 02-04910-EC2

Masonellan



ELECTRICAL CONNECTIONS DETAIL

ELECTROPNEUMATIC POSITIONER FVP



Rev. 0	DATE: 11/OCT/2002	DRAWN BY: P. SEVESTRE	ITEM : /	MIN SERIAL NUMBER : 02-04910-EC2
CUSTOMER: TECHNIP		ISSUED BY: C. DROUARD		
TAG : /		CUSTOMER ORDER: 6465C 30 1541 01 0 10007		



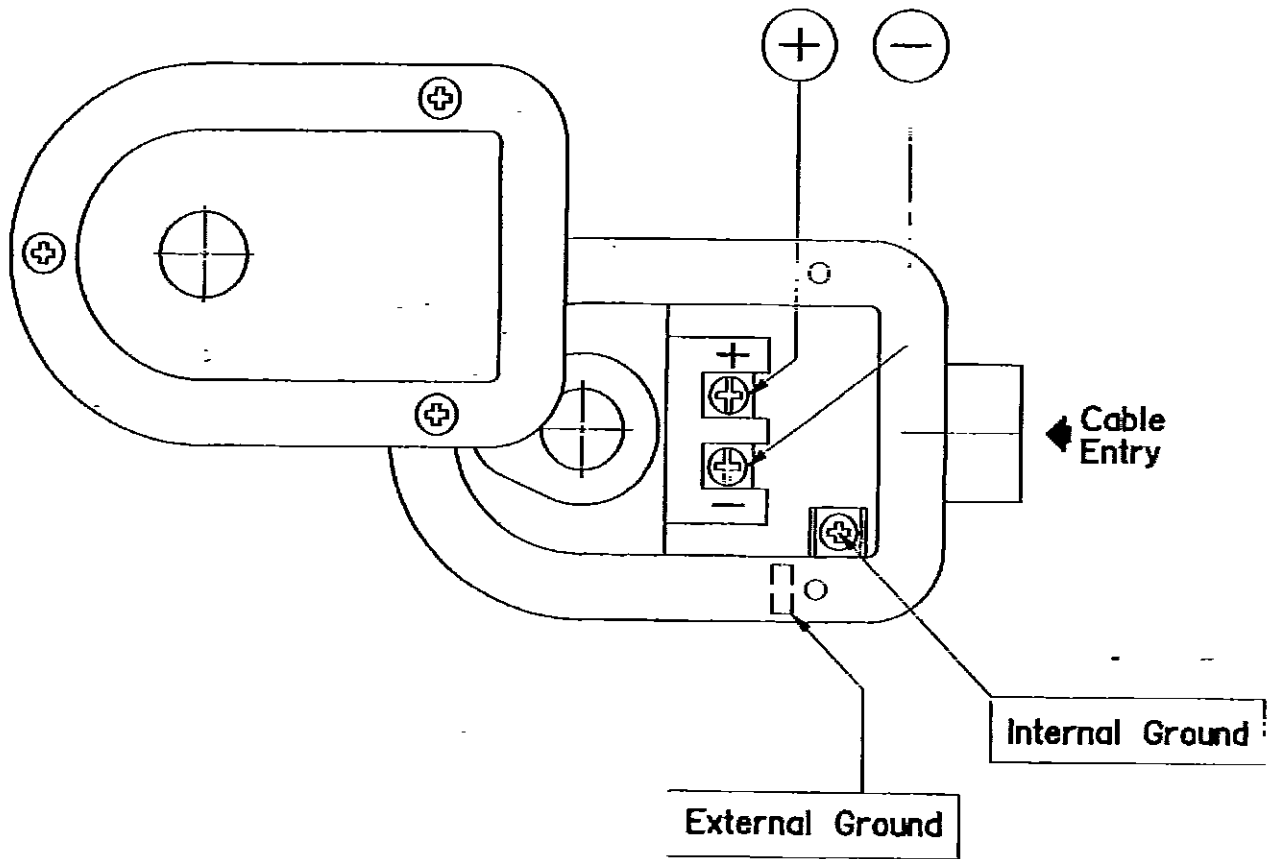
DRAWING No : 02-04910-EC3

Masonellan

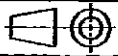


ELECTRICAL CONNECTIONS DETAIL

WSTIS B317A308 SOLENOID VALVE



Rev. 0	DATE: 11/OCT/2002	DRAWN BY:	ITEM : /	UN SERIAL NUMBER : 02-04910-EC3
CUSTOMER: TECHNIP		P. SEVESTRE	ISSUED BY:	C. DROUARD
TAG :		CUSTOMER ORDER: 6465C 30 1541 01 0 10007		



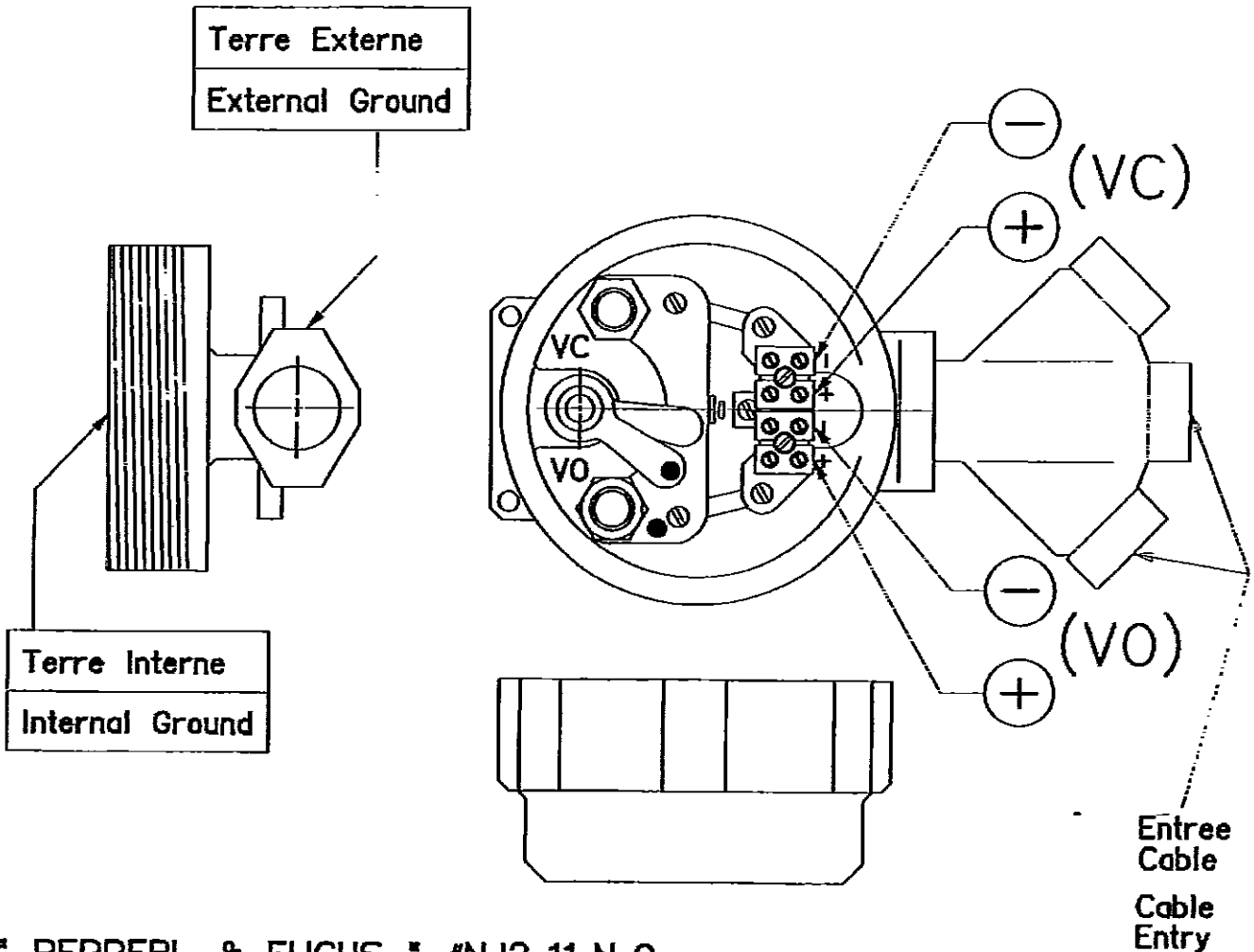
PLAN/DRWG : 02-04910-LD1

Masonellan



DETAIL RACCORDEMENTS ELECTRIQUES
ELECTRICAL CONNECTIONS DETAIL

DETECTEUR FIN DE COURSE 496-4 & 5
LIMIT DETECTOR 496-4 & 5



* PEPPERL & FUCHS * #NJ2-11-N-G

VO : Detecteur Vanne OUVERTE
VO : OPEN Valve Detector

VC : Detecteur Vanne FERMEE
VC : CLOSED Valve Detector

ITEM: _____

N° DE SERIE : 02-04910-LD1
SERIAL NUMBER:

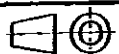
Rev: 2 | DAT.: Dec-19-2002 | DESS.PAR/DRAWN BY: P. SEVESTRE

EMIS PAR/ISSUED BY: C. DROUARD

CLIENT/CUSTOMER: TECHNIP

Cde CLIENT/CUST.ORDER: 6465C30 1541 01 0 10007

REPERE/TAG No: _____



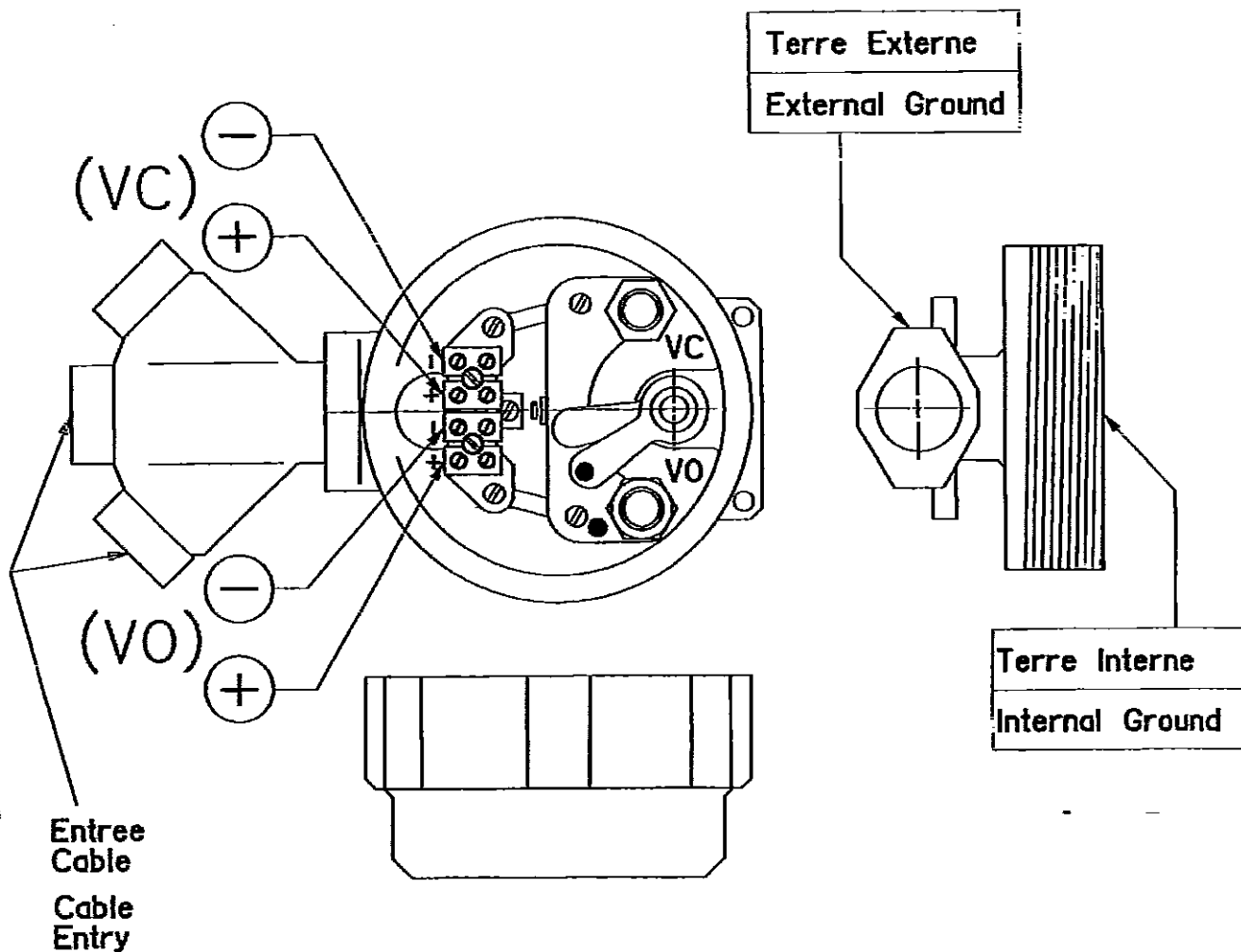
PLAN/DRWG : 02-04910-LD3

Masonflan



DETAIL RACCORDEMENTS ELECTRIQUES
ELECTRICAL CONNECTIONS DETAIL

DETECTEUR FIN DE COURSE 496-4 & 5
LIMIT DETECTOR 496-4 & 5



* PEPPERL & FUCHS * #NJ2-11-N-G

VO : Detecteur OUVERTURE
: OPENING Detector

VC : Detecteur FERMETURE
: CLOSING Detector

Rev: 0			DATE: Jan-28-2003	DESS. PAR/DRAWN BY: P. SEVESTRE	ITEM: _____	N° DE SERIE : 02-04910-LD3 SERIAL NUMBER:
CLIENT/CUSTOMER: TECHNIP				EMIS PAR/ISSUED BY: C. DROUARD		
REPERE/TAG No: _____				Cde CLIENT/CUST. ORDER: 6465C30 1541 01 0 10007		

1

100




UNIT 40

OUTLINE DRAWINGS

VENDOR DOCUMENT REVIEW	
<input type="checkbox"/>	1. REVISE AND REISSUE
<input type="checkbox"/>	2. TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/>	3. NO COMMENT - FINAL ISSUE

THIERRY GRANDRY | TECHNIP
2003.04.11 11:45:04 +01'00'
<none>

STATUS CERTIFIED "FINAL"
ISSUED BY : C. DROUARD
DATE : 11/04/03

5	11/04/03	Up-dated drawings 02-4911-01/13/16/25/37/PW7	
4	19/12/02	Up-dated drawings 02-4911-01/LD1	
3	16/12/02	Up-dated drawings further to your comments	
2	23/10/02	Up-dated drawings with accessories	
1	25/06/02	Addition items 13 and 16	
0	27/05/02	FIRST ISSUE	
REV	DATE	DESCRIPTION	
TECHNIP 		NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY 	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007 EQUIPMENT NAME: Control valves
Project: 3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant			
		DOCUMENT TITLE : Outline drawings	DOCUMENT CODE : A 3201
PURCHASE ORDER : 02-4911 (Unit 40)		Sheet 01 of 61	Rev. 5



DIMENSIONS in mm ±5%

OUTLINE DRAWING

DRESSER Masonellan

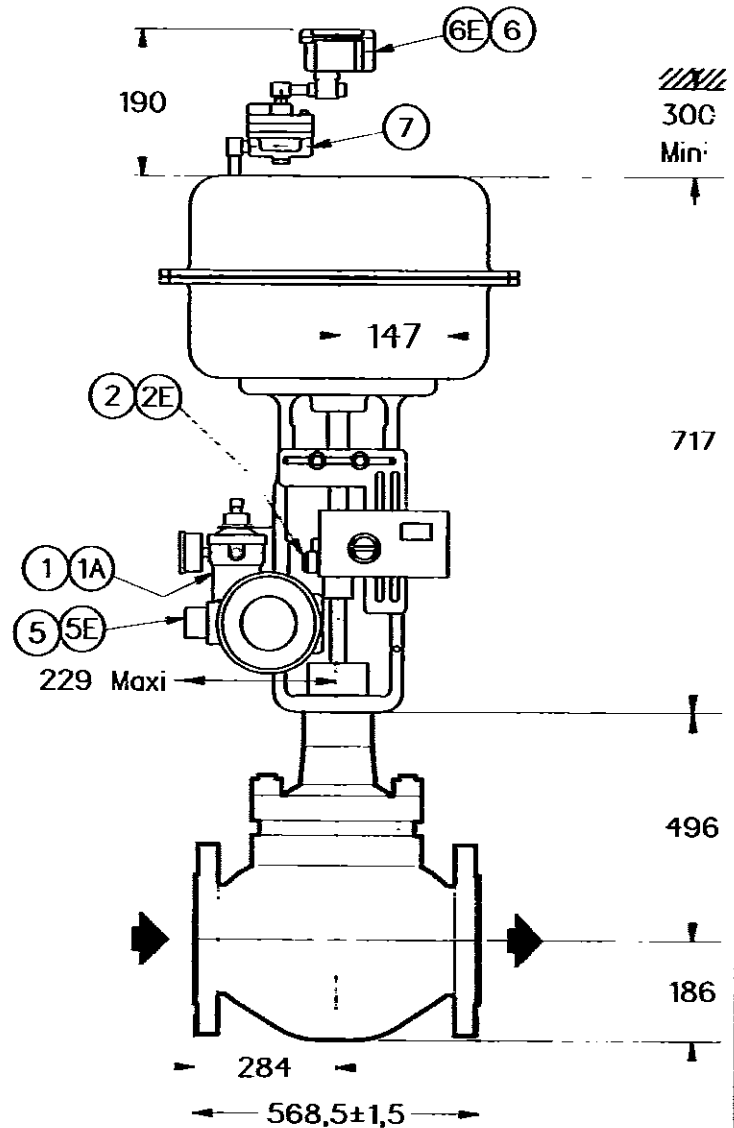
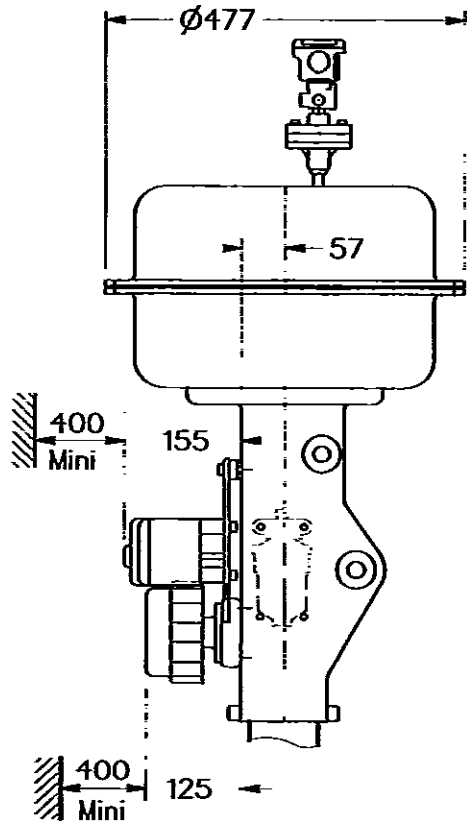
SERIES VALVE : 87-41315

DN : 200 (8")

ON AIR FAILURE : OPEN

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW6
Electrical Connections Detail	02-04911-EC1
Electrical Connections Detail	02-04911-EC3
Electrical Connections Detail	02-04911-LD3

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electroprn. Positioner	3.5	2E	M 20 - Signal
5	496/4	Closing Detector	2.5	5E	M20
6	WS..B317..	Solenoid Valve	1.0	6E	M20
7	BR 200	Booster Relay	1.5		

TOTAL WEIGHT (accessories + valve) in kg

507

ITEM : 14001

M/N SERIAL NUMBER : 02-04911-01

Rev. 4

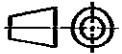
DATE: Feb-04-2003

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

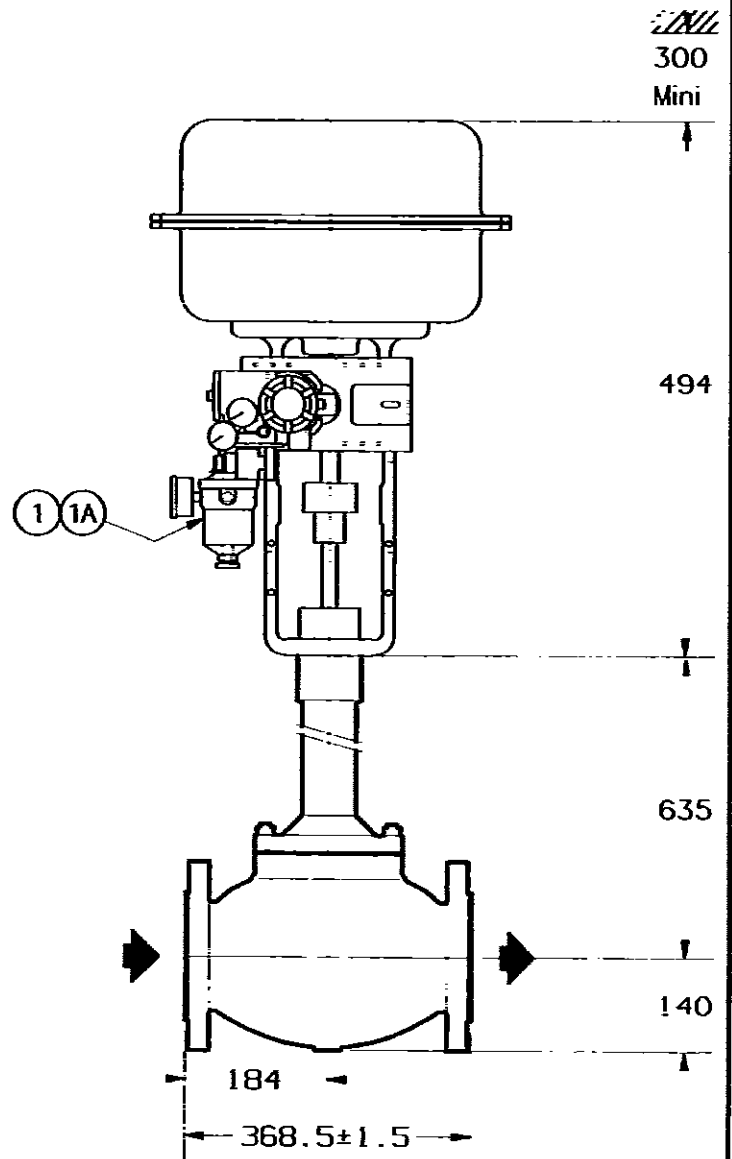
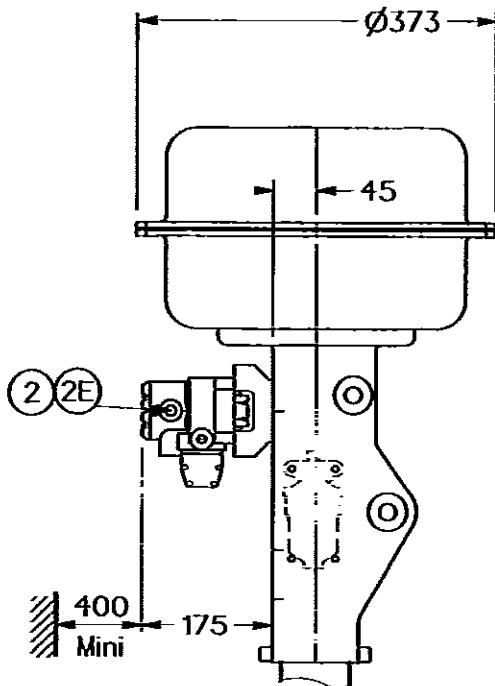
SERIES VALVE : 88-41515-EB

DN : 4"x2"x4"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

150

ITEM : 14002

MN SERIAL NUMBER : 02-04911-02

Rev. 1

DATE: Oct-08-2002

DRAWN BY:

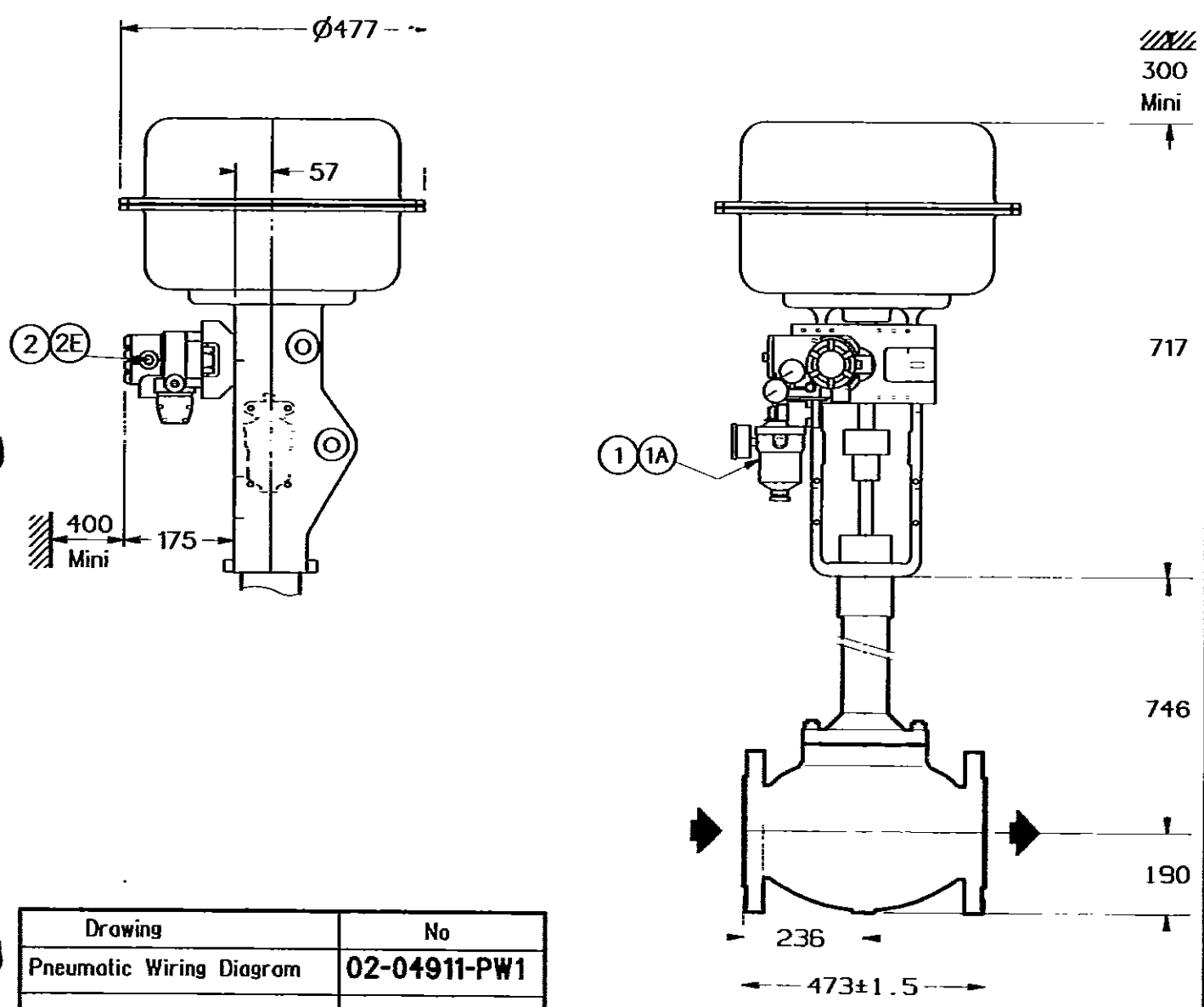
P-ROUELLE

ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electro-pn. positioner	1.0	2E	M20 - Signal



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



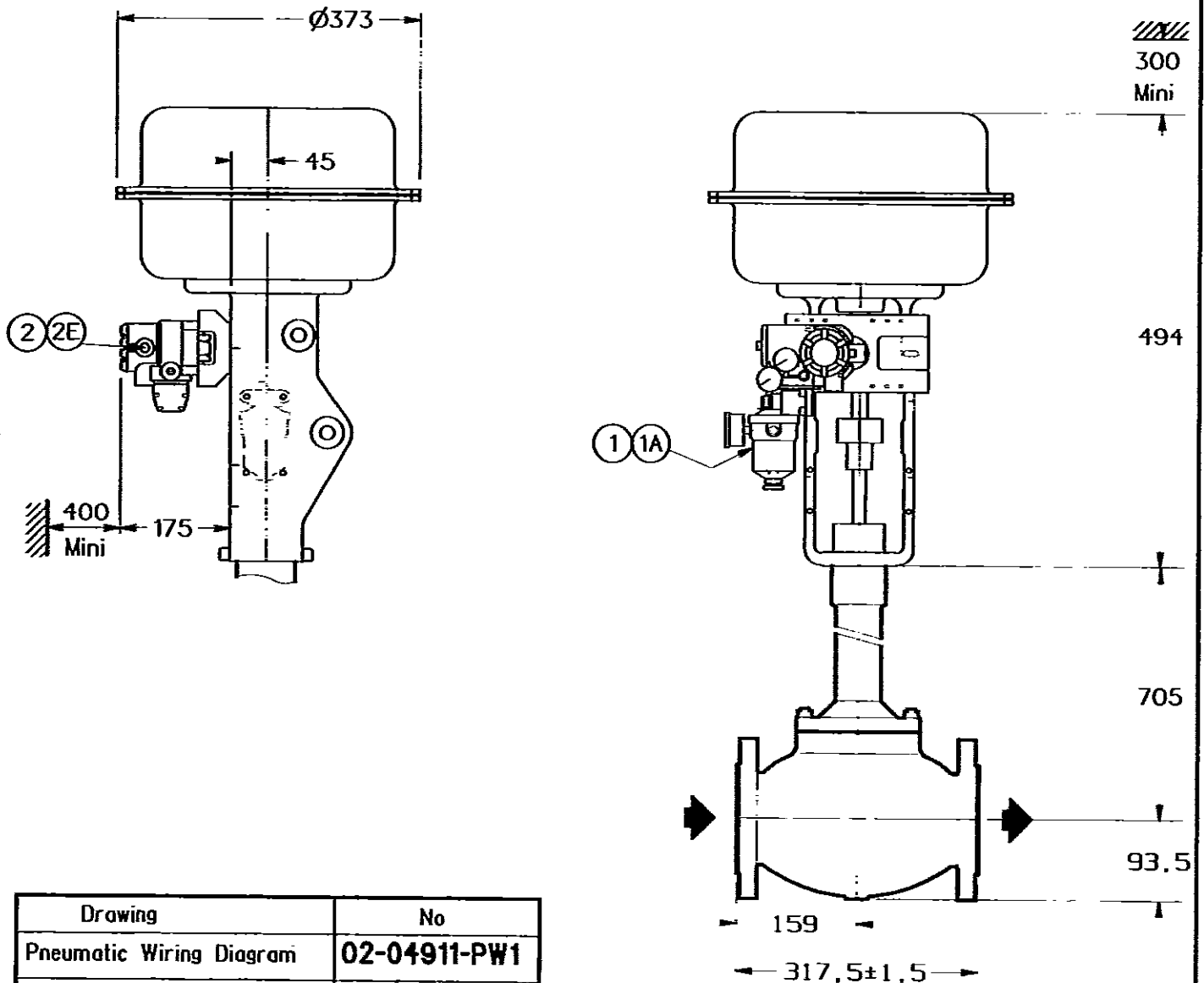
SERIES VALVE : 88-2115-EB

DN : 80 (3")

ON AIR FAILURE : CLOSED

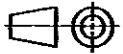
FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal
TOTAL WEIGHT(accessories + valve) in kg			97	ITEM : 14005	MN SERIAL NUMBER : 02-04911-05
Rev. 1	DATE: Oct-08-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C. DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



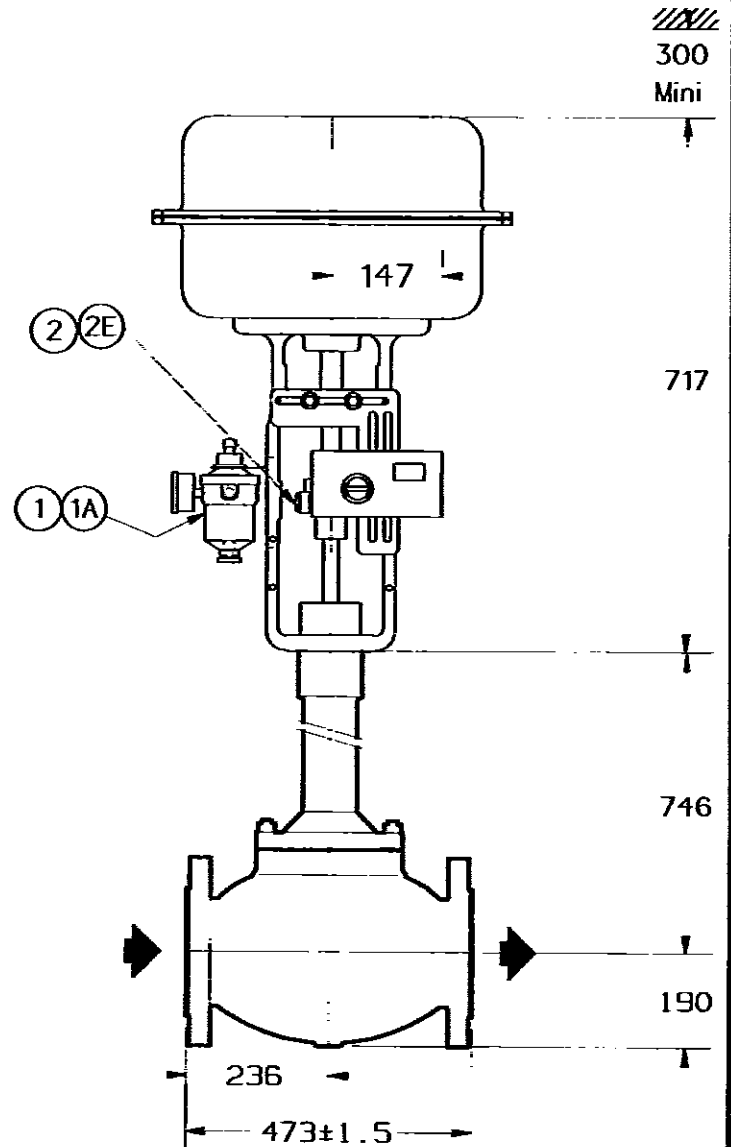
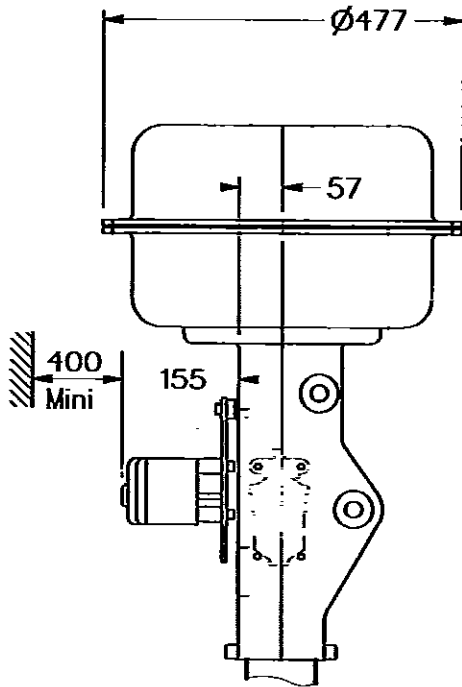
SERIES VALVE : 88-41435-EB

DN : 6" x 3"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-150 PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	Electroprn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

270

ITEM : 14006

M/N SERIAL NUMBER : 02-04911-06

Rev. 1

DATE: Oct-09-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



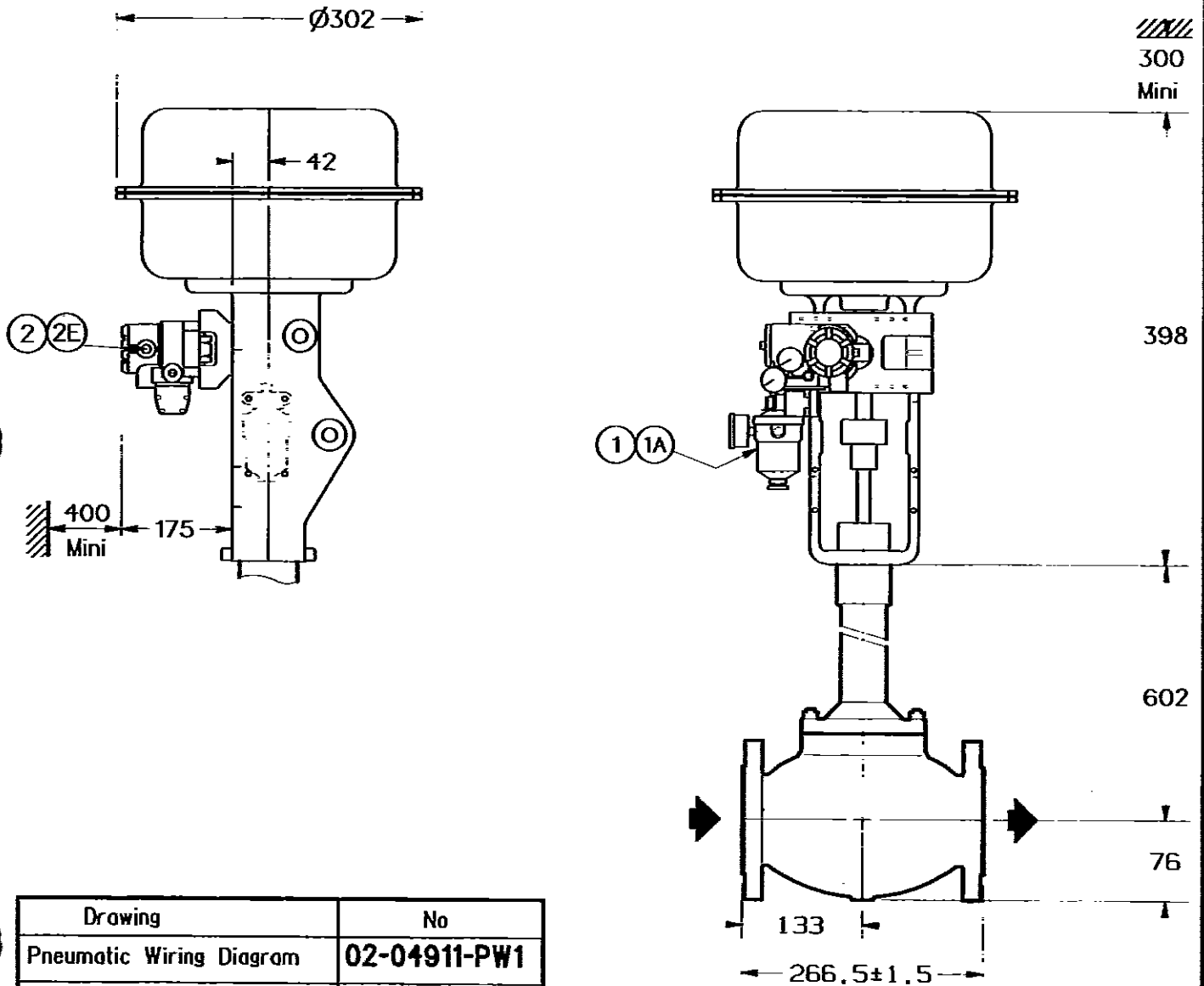
SERIES VALVE : 88-21125-EB

DN : 50 (2")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

51

ITEM : 14007/MN SERIAL NUMBER : 02-04911-07

Rev. 1 DATE: Oct-09-2002

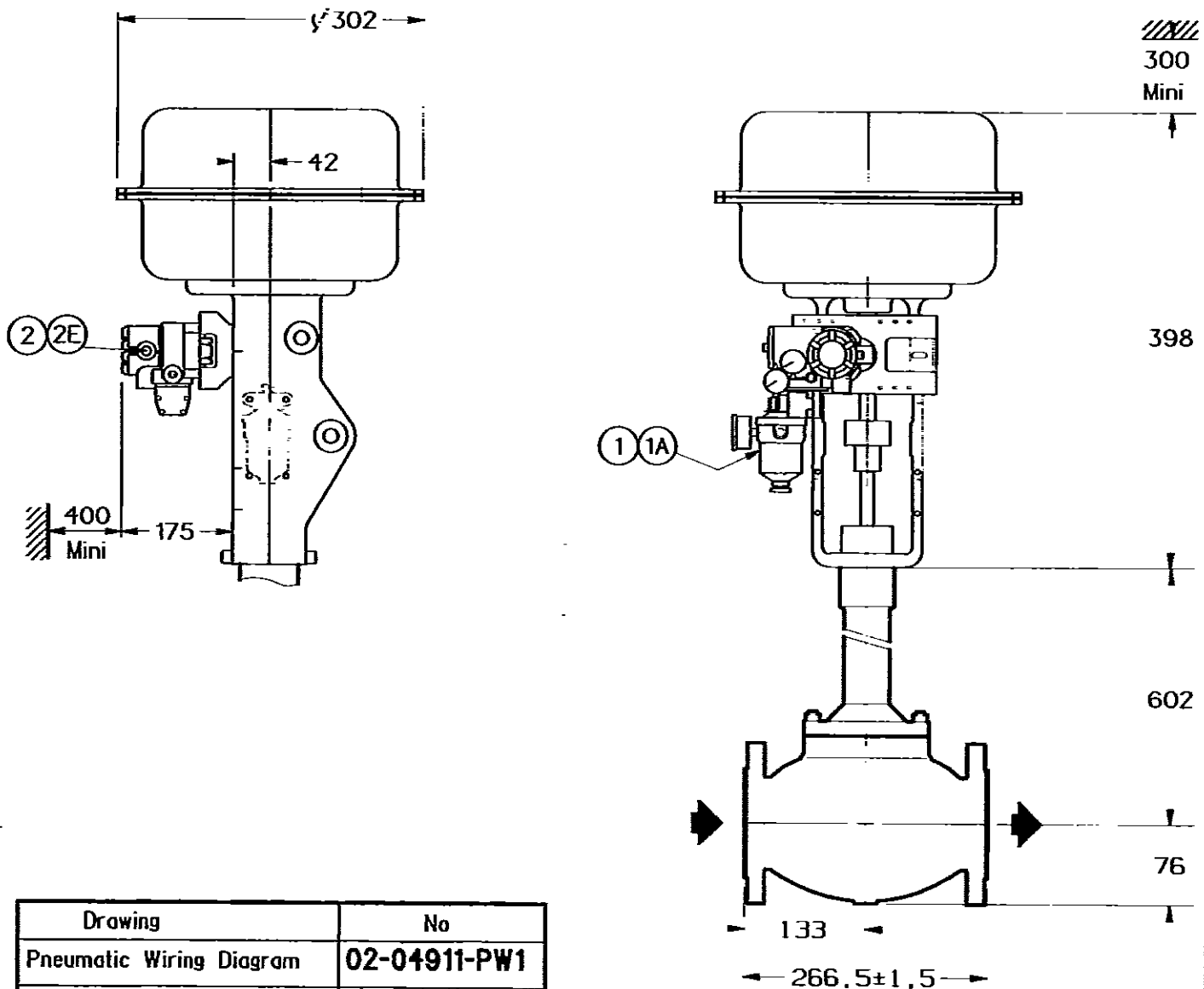
DRAWN BY: P-ROUELLE

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007



	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 88-2115-EB		DN : 50 (2")	ON AIR FAILURE : CLOSED	
FLOW TO : OPEN	CONNECTION: 300 ANSI RF-ISO PN 50 #B1			

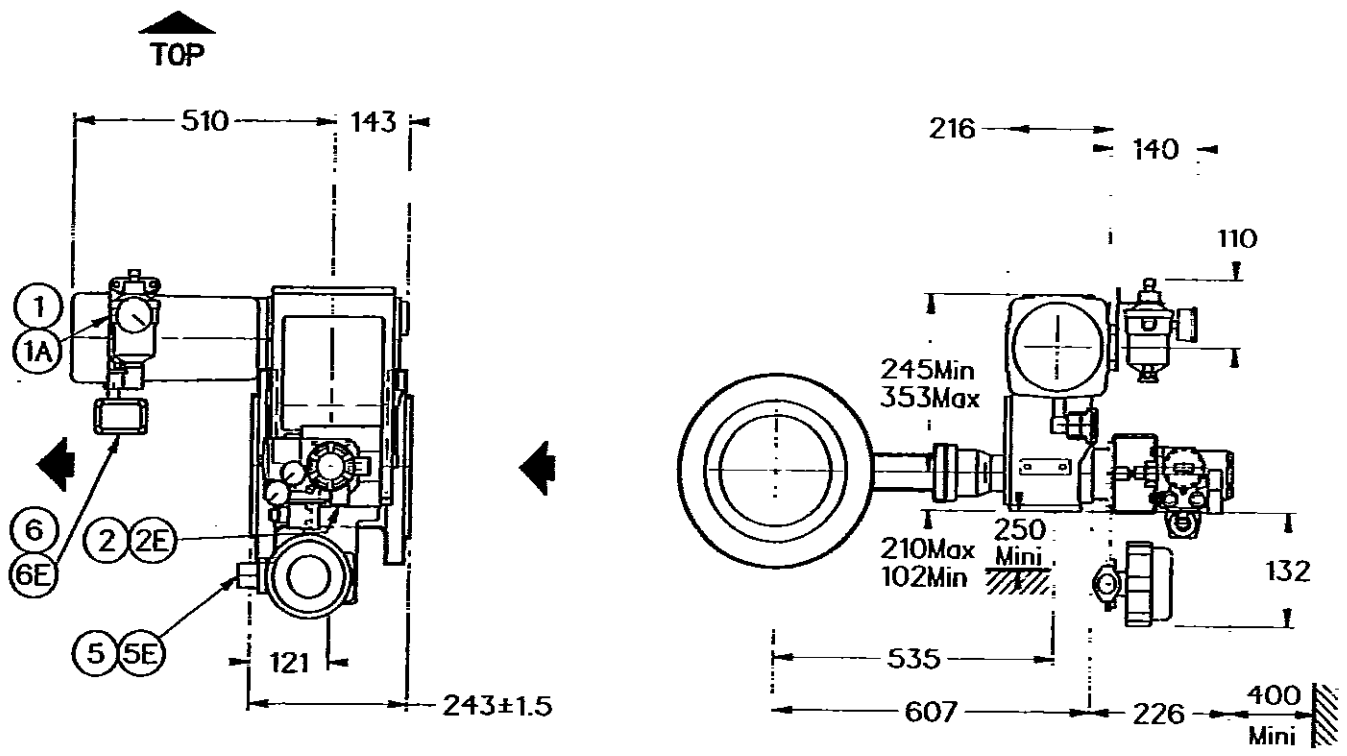


Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electro-pn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg		51	ITEM : 1400B	MIN SERIAL NUMBER : 02-04911-08
Rev. 1	DATE: Oct-09-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C. DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007	

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 30-30222		DN : 200 (8")	ON AIR FAILURE : CLOSED	
FLOW TO : CLOSE		CONNECTION: 300 ANSI RF		



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW2
Electrical Connections Detail	02-04911-EC2
Electrical Connections Detail	02-04911-EC3
Electrical Connections Detail	02-04911-LD4

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal
5	496/4	Closing Detector	2.5	5E	M20
6	WS..B317..	Solenoid Valve	1.0	6E	M20

TOTAL WEIGHT (accessories + valve) in kg		113	ITEM : 14009	MN SERIAL NUMBER : 02-04911-09
Rev. 2	DATE: Dec-06-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C. DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465030 1541 01 0 : 0007		



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

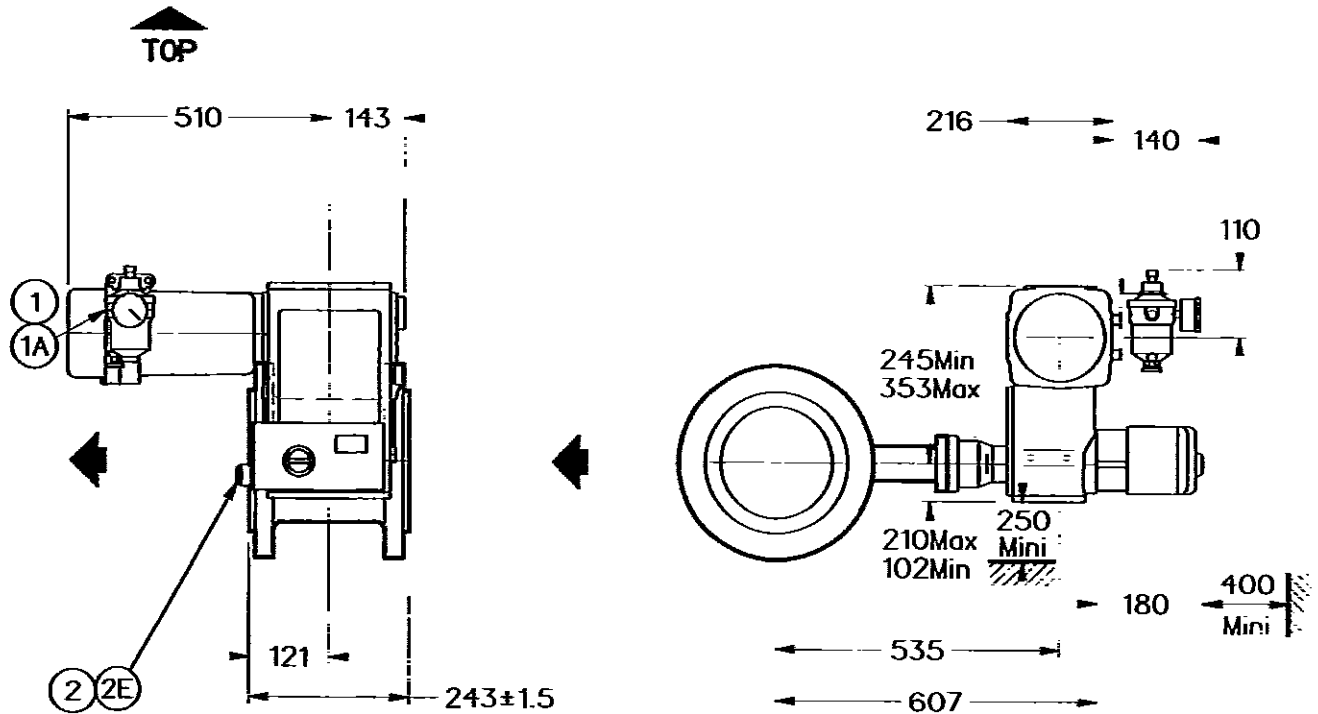
SERIES VALVE : 30-30222

DN : 200 (8")

ON AIR FAILURE : CLOSED

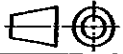
FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

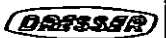
Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
TOTAL WEIGHT (accessories + valve) in kg			113	ITEM : 14010	MN SERIAL NUMBER : 02-04911-10
Rev. 1	DATE: Oct-09-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellam



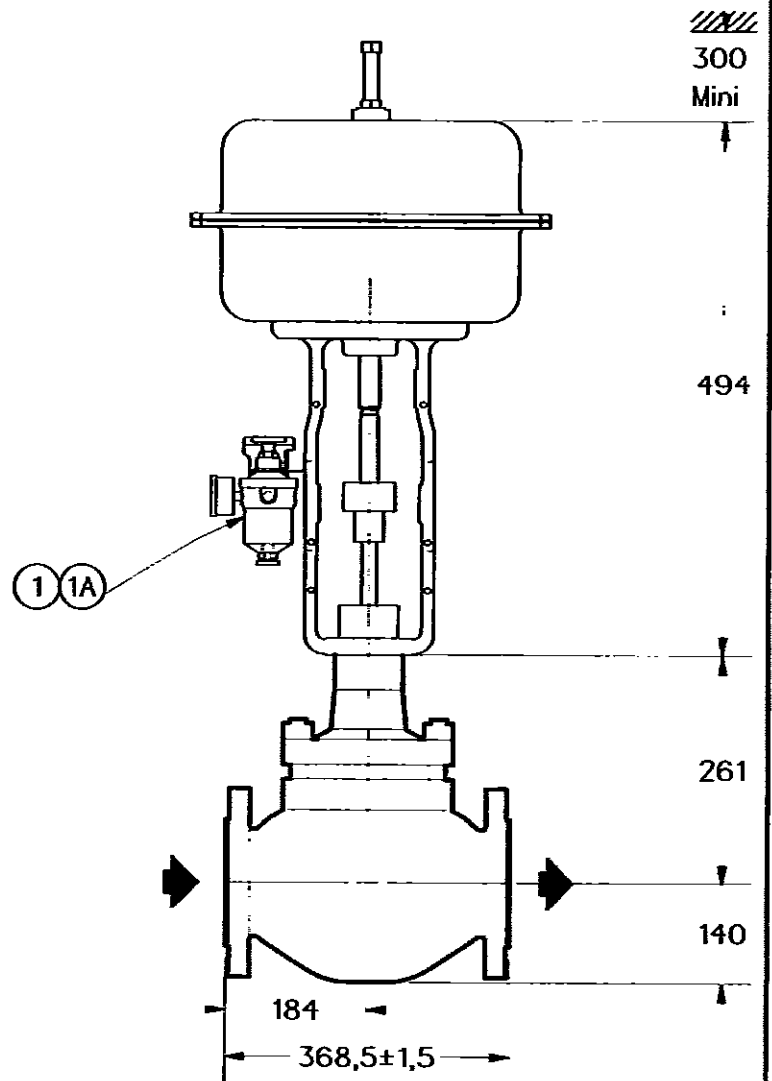
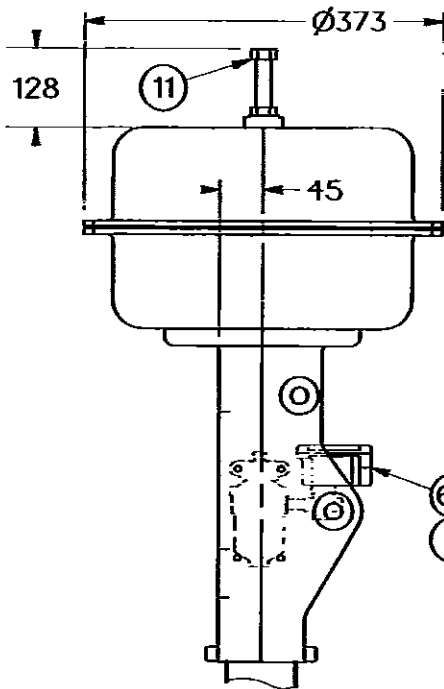
SERIES VALVE : 87-41355

DN : 4"x2"

ON AIR FAILURE : OPEN

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW4
Electrical Connections Detail	02-04911-EC3

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
6	WS..B317..	Solenoid Valve	1.0	6E	M20
11		Limit-Stop			(Limits Actuator Stem Retracting) (Locked by set cable)

TOTAL WEIGHT(accessories + valve) in kg

134

ITEM : 14011

MN SERIAL NUMBER : 02-04911-11

Rev. 2

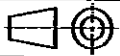
DATE: Nov-13-2002

DRAWN BY: H. VICTORE

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

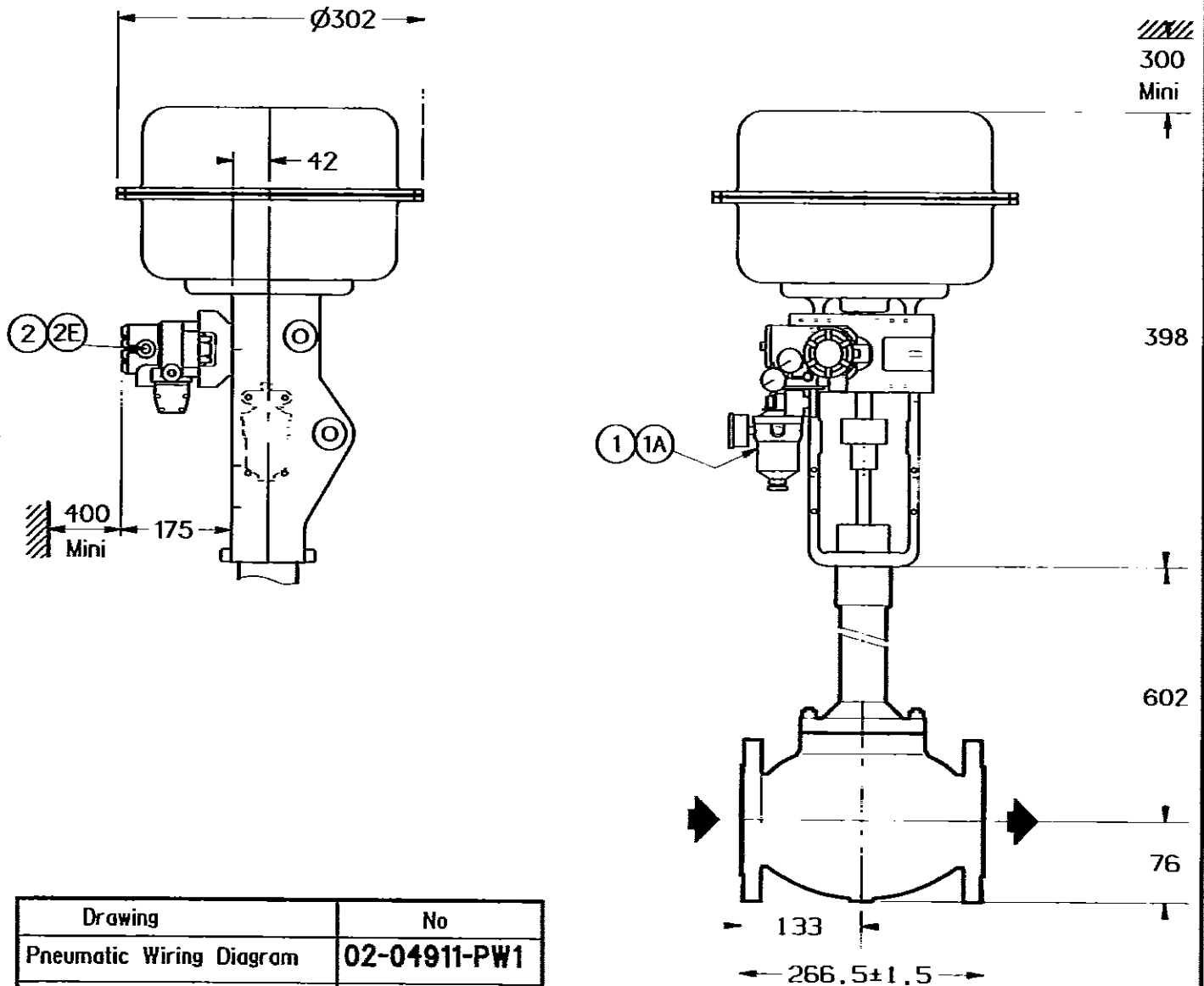
SERIES VALVE : 88-21914-EB

DN : 50 (2")

ON AIR FAILURE : CLOSED

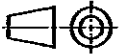
FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal
TOTAL WEIGHT(accessories + valve) in kg			51	ITEM : 14012	MN SERIAL NUMBER : 02-04911-12
Rev. 1	DATE: Oct-08-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C. DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

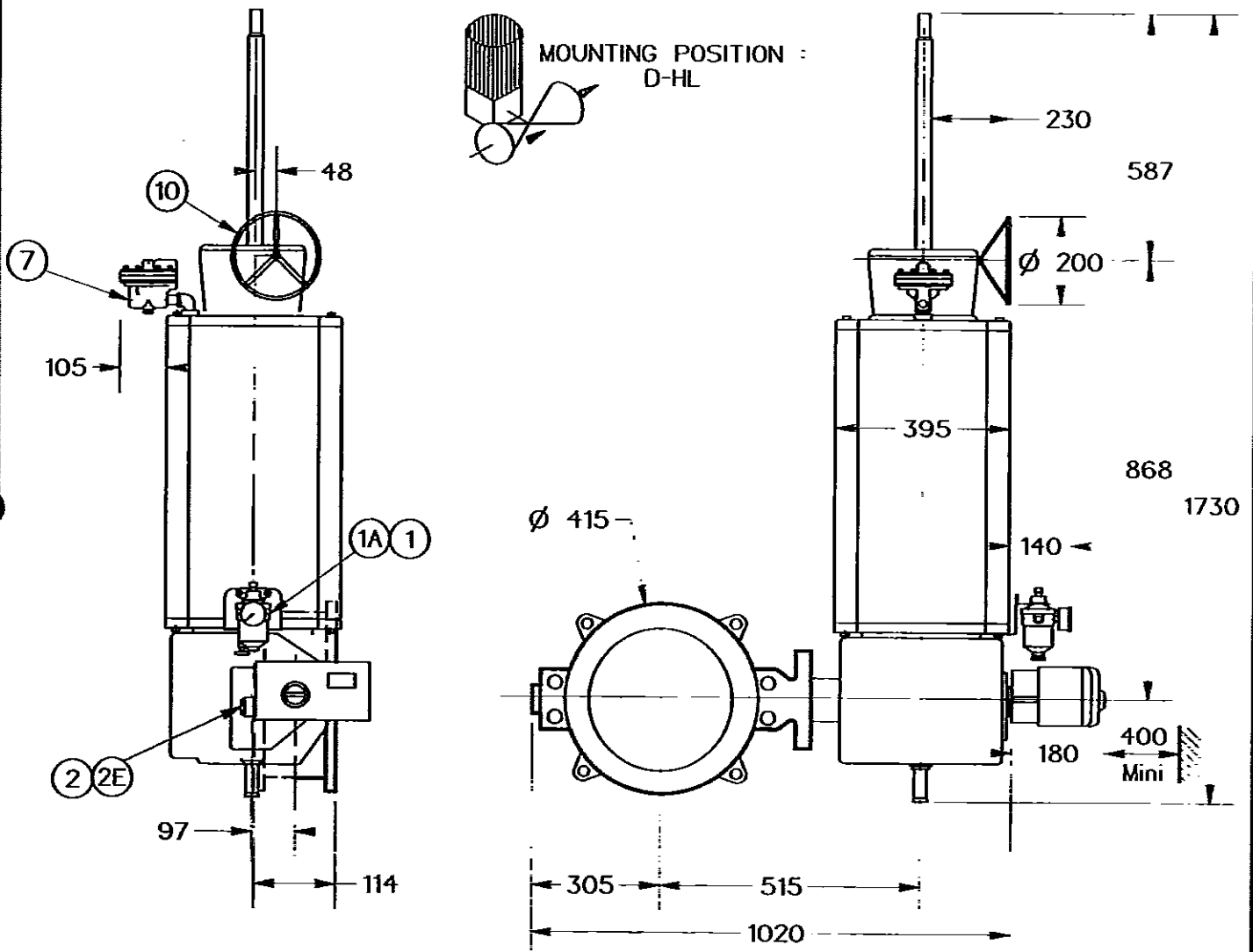
SERIES VALVE : L1DMA12AACA

DN : 300 (12")

ON AIR FAILURE : CLOSE

FLOW TO :

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW3
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FRI0/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M20 - Signal
7	BR400	Booster	1.0		
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

280

ITEM 14013

MN SERIAL NUMBER : 02-04911-13

Rev. 3

DATE: Feb-04-2003

DRAWN BY:

P. ROUELLE

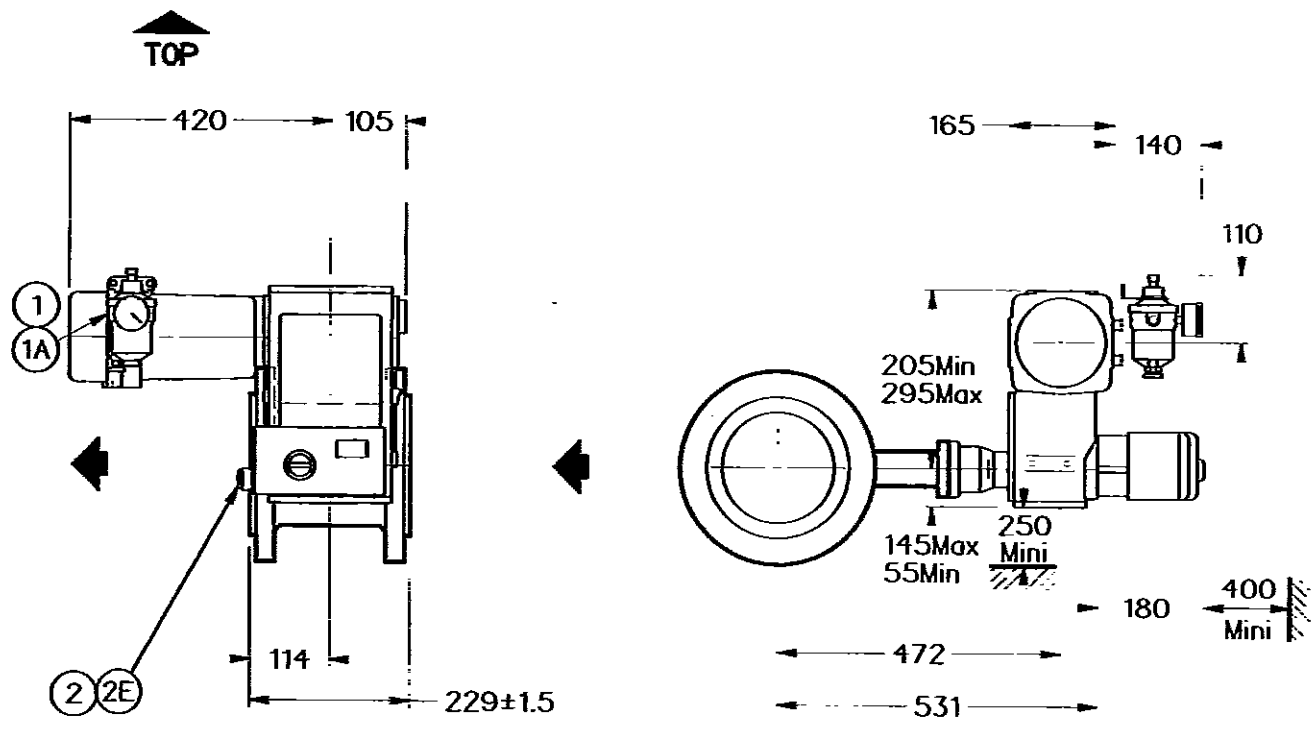
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 30-30222		DN : 150 (6")	ON AIR FAILURE : CLOSED	
FLOW TO : CLOSE	CONNECTION: 300 ANSI RF			

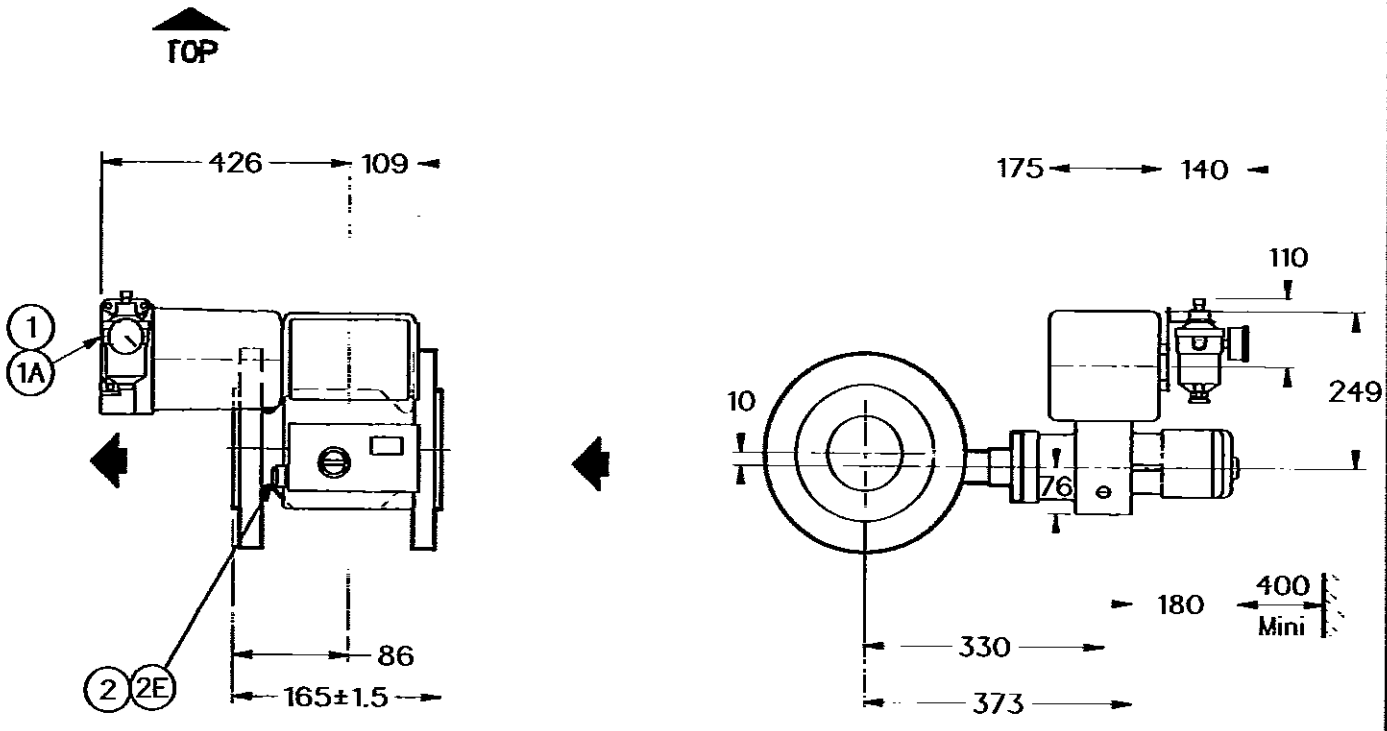


Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		71	ITEM : 14014	MIN SERIAL NUMBER : 02-04911-14
Rev. 1	DATE: Oct-09-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007	

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellam	
SERIES VALVE : 35-35202		DN : 80 (3")	ON AIR FAILURE : CLOSED	
FLOW TO : CLOSE	CONNECTION: 300 ANSI RF			



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg			48	ITEM : 14015	WN SERIAL NUMBER : 02-04911-15
Rev. 1	DATE: Oct-09-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		



DIMENSIONS in mm ±5%

OUTLINE DRAWING

DRESSER Masoneilan

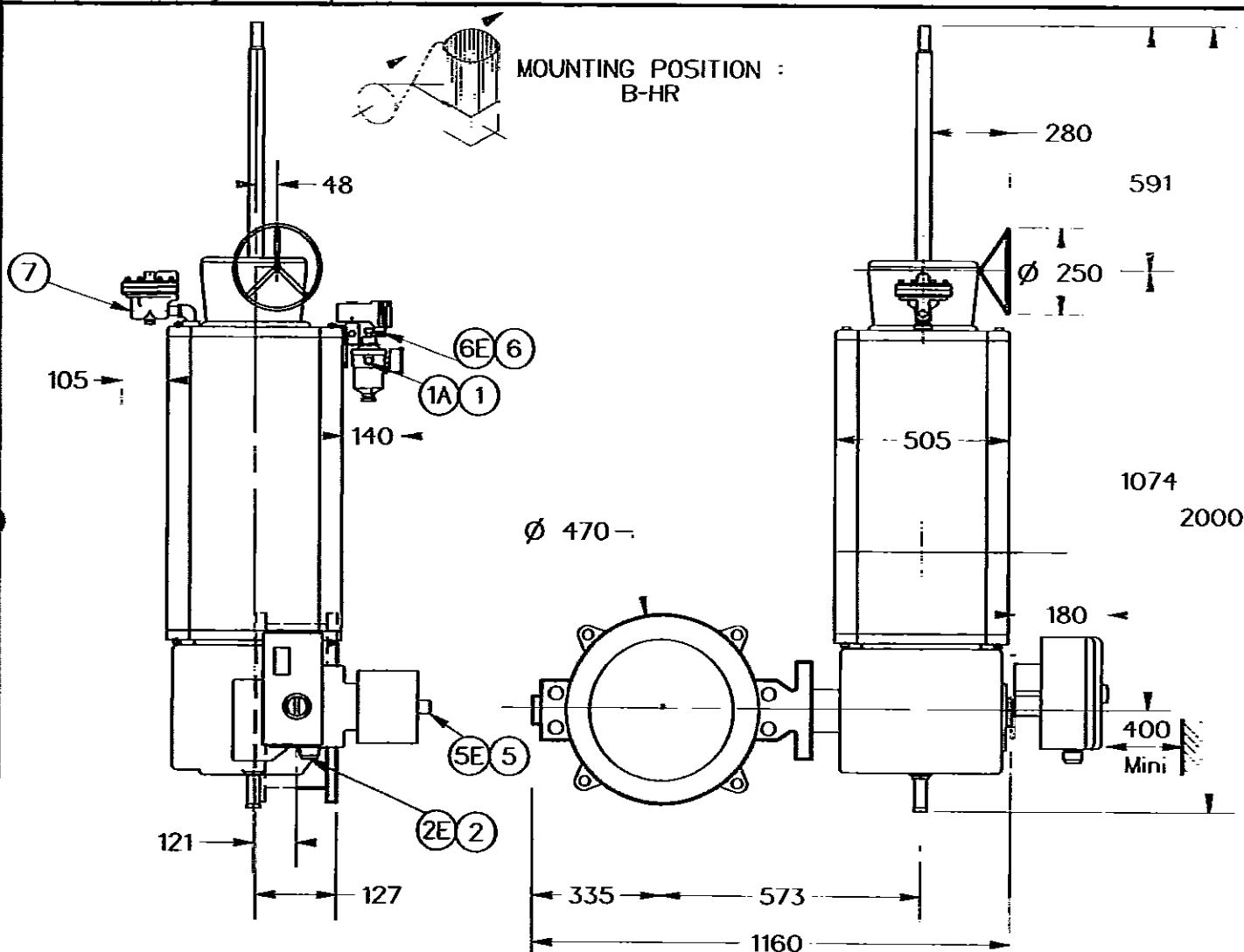
SERIES VALVE : L1DMA14ACA

DN : 350 (14")

ON AIR FAILURE : CLOSE

FLOW TO :

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW6
Electrical Connections Detail	02-04911-EC1
Electrical Connections Detail	02-04911-EC5
Electrical Connections Detail	02-04911-EC6

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M20 - Signal
5	Detector	PPF/NAMUR #NI 7201/XS1	1.0	5E	M20
6	HERION	Solenoid Valve #2401112396202400	1.0	6E	M20
7	BR400	Booster	1.0		
10		Handwheel			

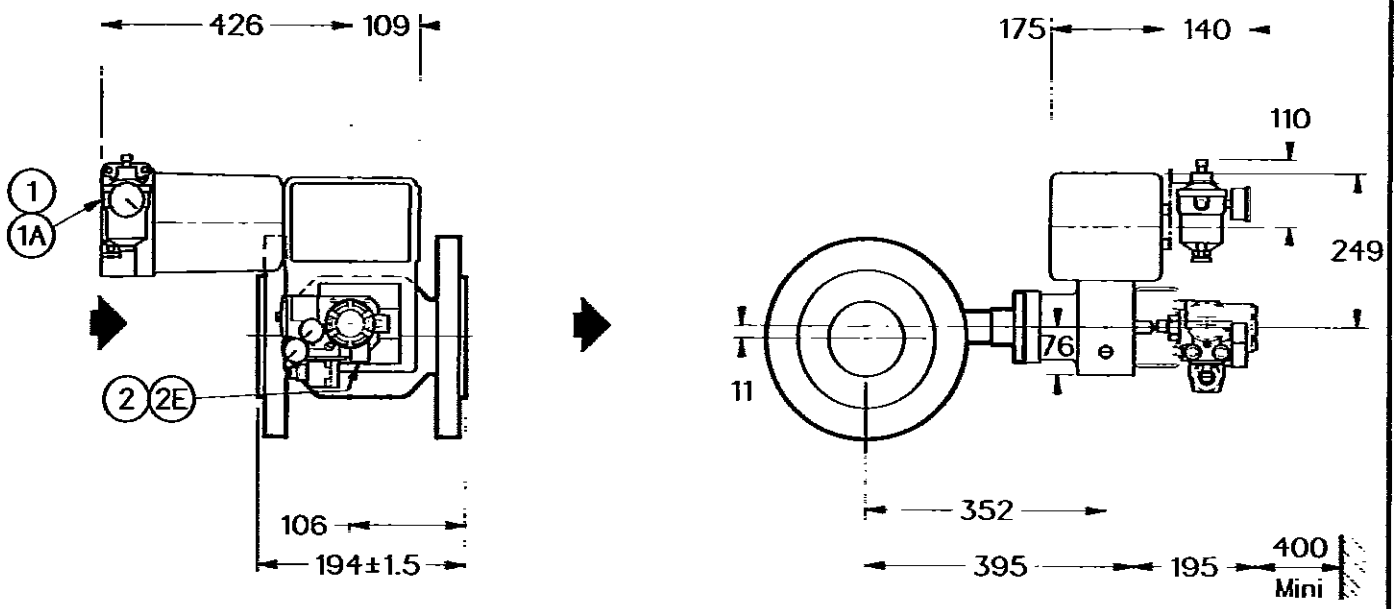
TOTAL WEIGHT (accessories + valve) in kg 120 ITEM : 14016 UN SERIAL NUMBER : 02-04911-16

Rev. 3 DATE: Mar-10-2003 DRAWN BY: P. ROUELLE ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP CUSTOMER ORDER: 6465C30 1541 01 0 10007

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan
SERIES VALVE : 35-35602		DN : 100 (4")	ON AIR FAILURE : CLOSED
FLOW TO : CLOSE	CONNECTION: 300 ANSI RF		

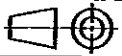
TOP



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

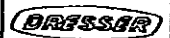
TOTAL WEIGHT (accessories + valve) in kg		62	ITEM : 14017	MN SERIAL NUMBER : 02-04911-17
Rev. 1	DATE: Oct-09-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



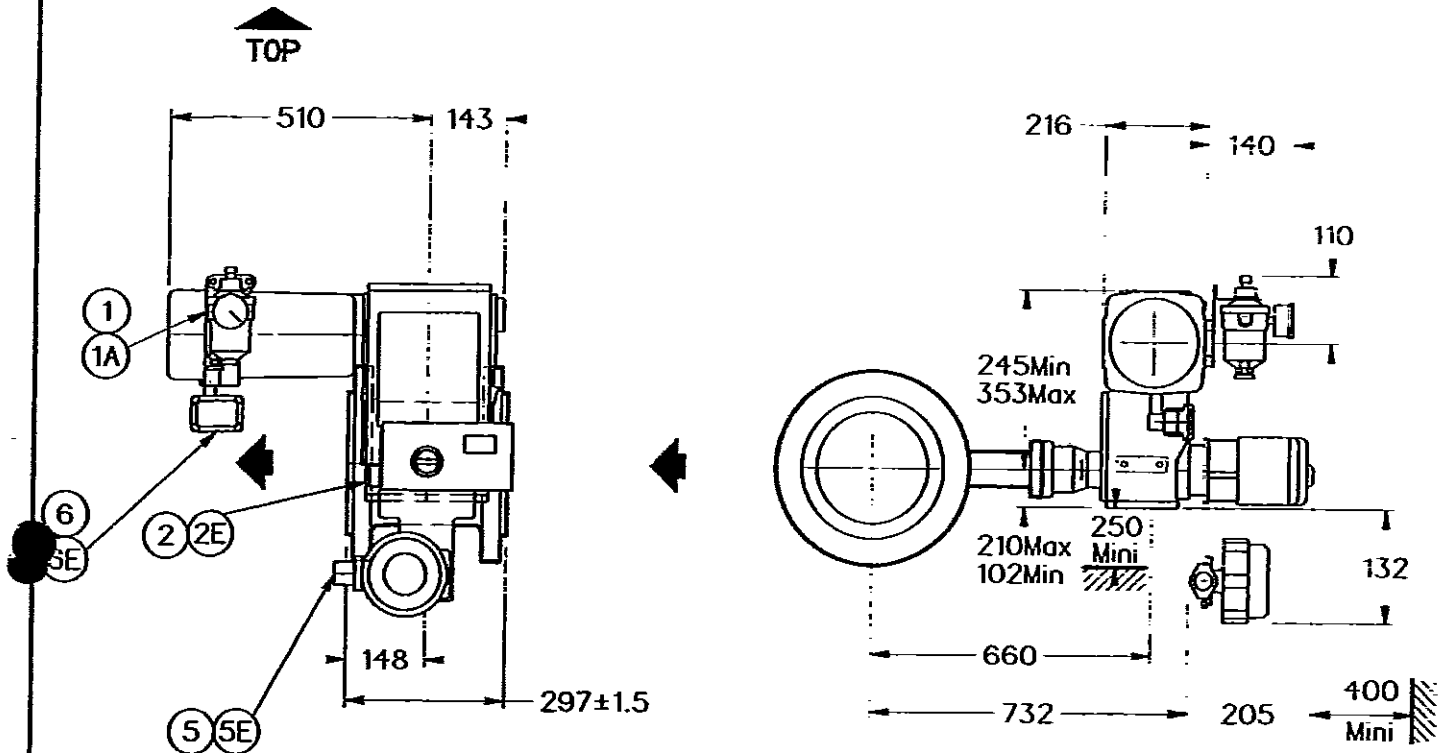
SERIES VALVE : 30-30252

DN : 250 (10")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW2
Electrical Connections Detail	02-04911-EC1
Electrical Connections Detail	02-04911-EC3
Electrical Connections Detail	02-04911-LD4

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M 20 - Signal
5	496/4	Closing Detector	2.5	5E	M20
6	WS..B317..	Solenoid Valve	1.0	6E	M20

TOTAL WEIGHT (accessories + valve) in kg

166

ITEM : 14018

MN SERIAL NUMBER : 02-04911-18

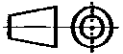
Rev. 2 DATE: Dec-11-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

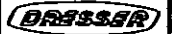
CUSTOMER ORDER: 6465C30 1541 01 0 10007



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



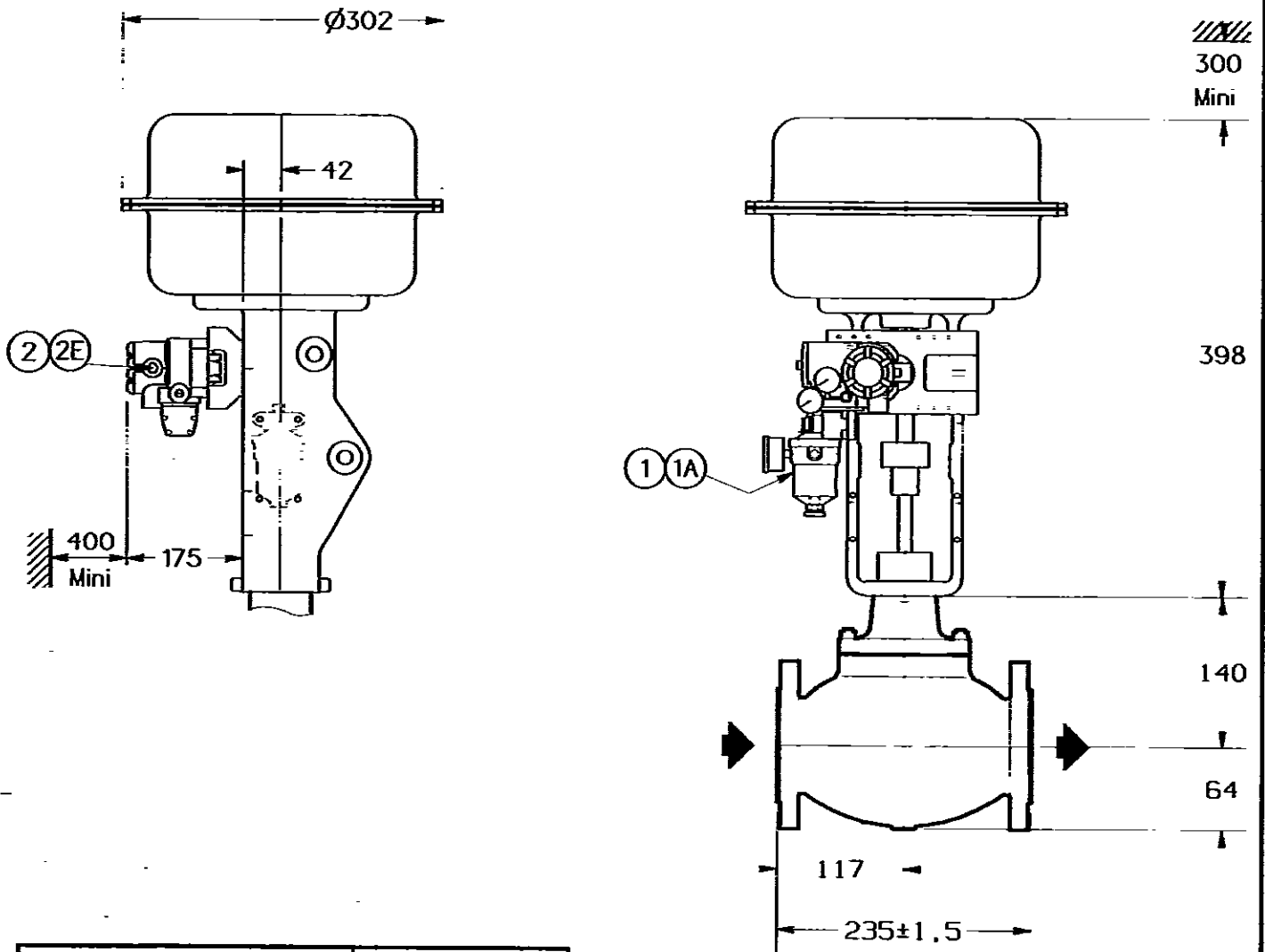
SERIES VALVE : 88-2115

DN : 40 (1.5")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

47

ITEM : 1401 MN SERIAL NUMBER : 02-04911-19

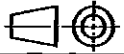
Rev. 1 DATE: Oct-09-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 1007



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masoneilan

DRESSER

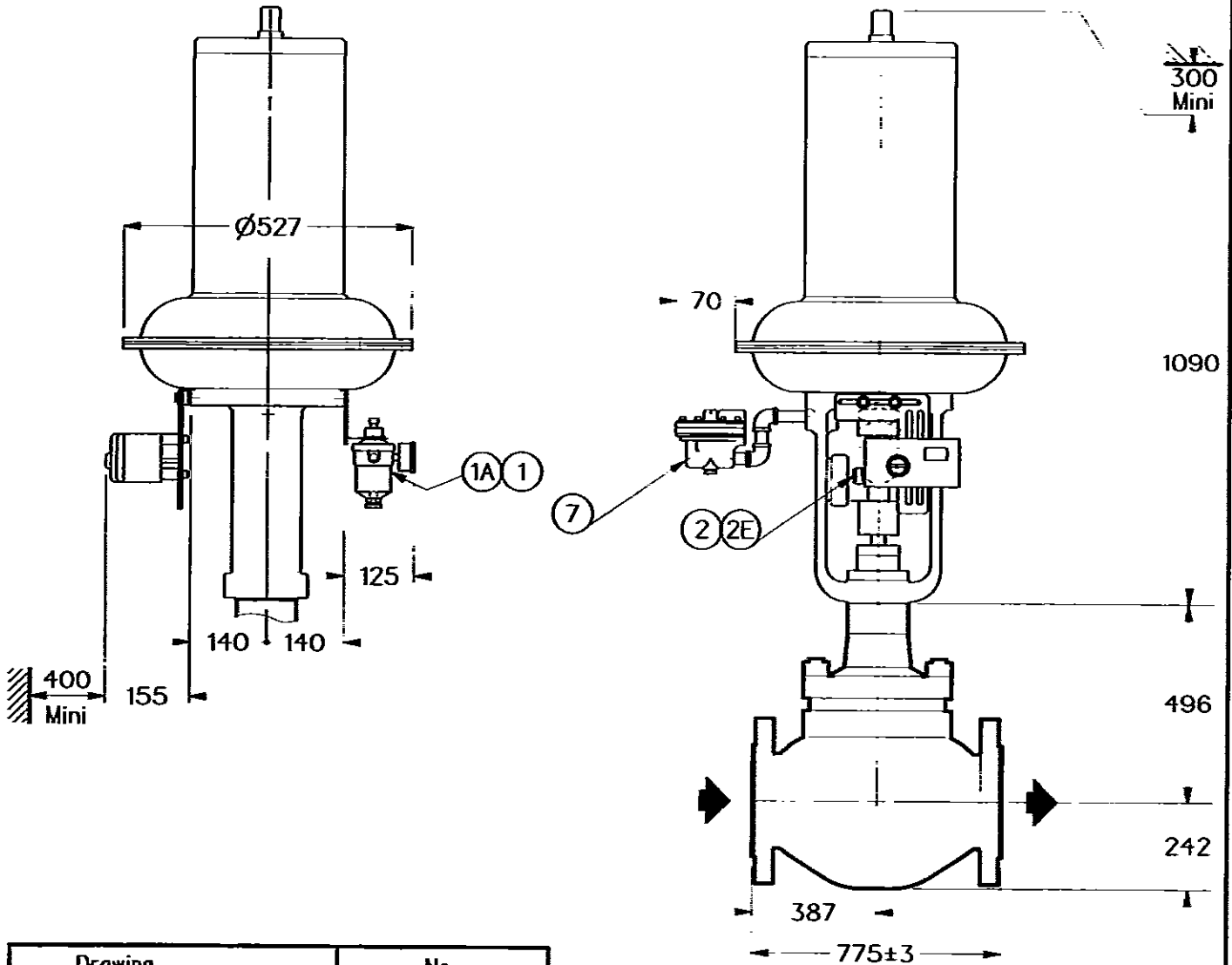
SERIES VALVE : 38-41355

DN : 12"x 8"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-150 PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW3
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
7	BR400	Booster	1.0		

TOTAL WEIGHT(accessories + valve) in kg

1135

ITEM : 14020

MN SERIAL NUMBER : 02-04911-20

Rev. 1

DATE: Oct-09-2002

DRAWN BY:

P. ROUELLE

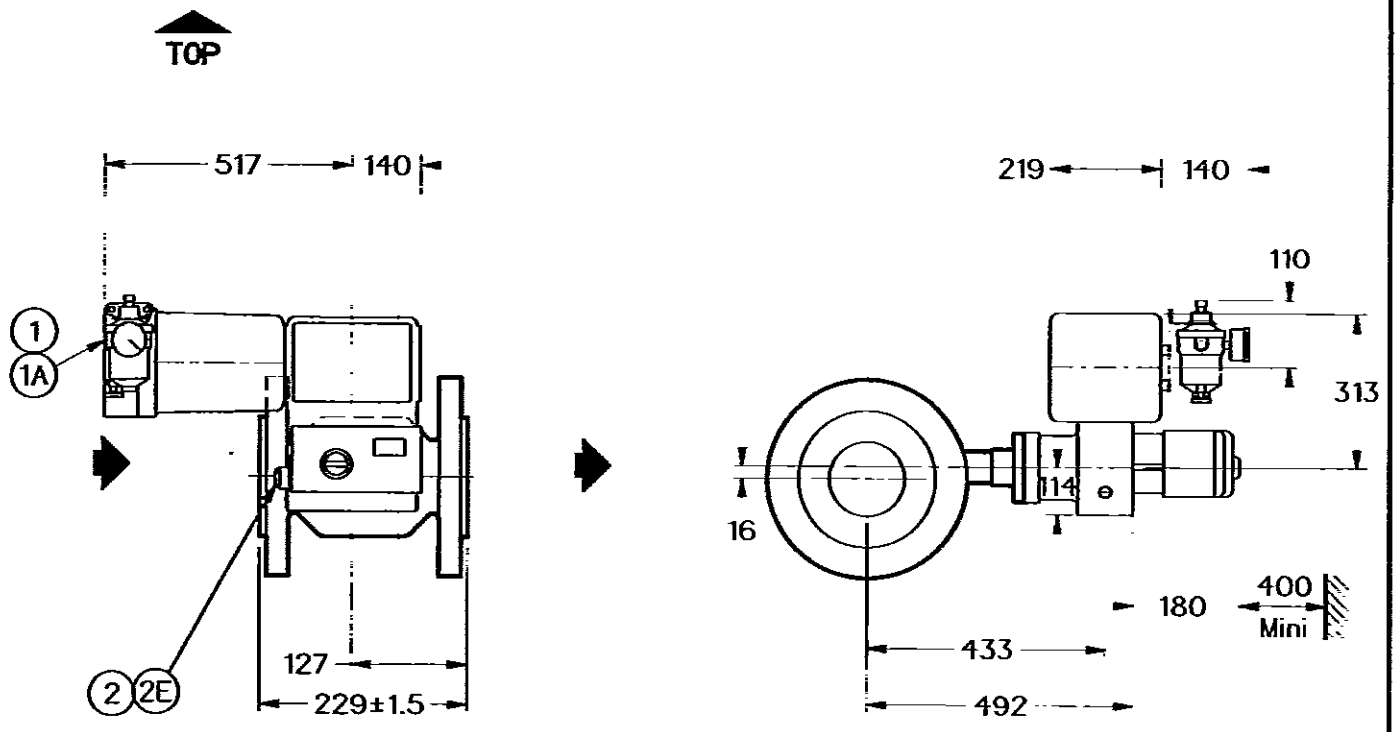
ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 35-35602		DN : 150 (6")	ON AIR FAILURE : CLOSED	
FLOW TO : CLOSE		CONNECTION: 300 ANSI RF		



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT(accessories + valve) in kg		120	ITEM : 14021	MN SERIAL NUMBER : 02-04911-21
Rev. 1	DATE: Oct-10-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007	



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

SERIES VALVE : 35-35502

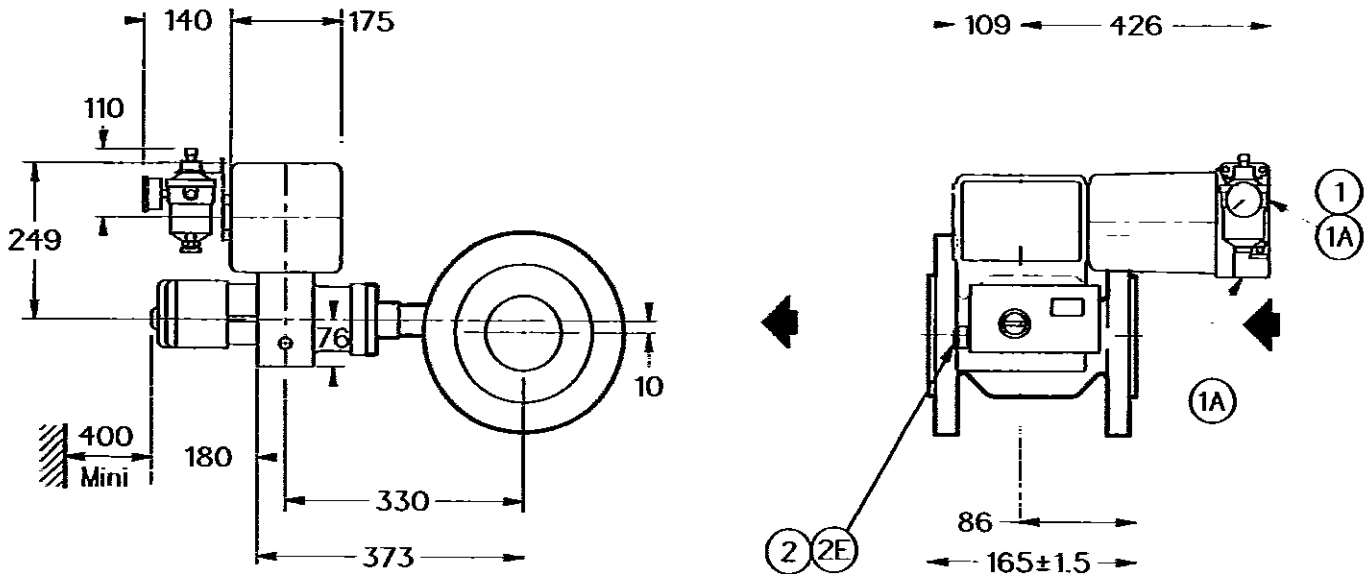
DN : 80 (3")

ON AIR FAILURE : OPEN

FLOW TO : OPEN

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

48

ITEM : 14022

MN SERIAL NUMBER : 02-04911-22

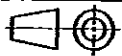
Rev. 1 DATE: Oct-10-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

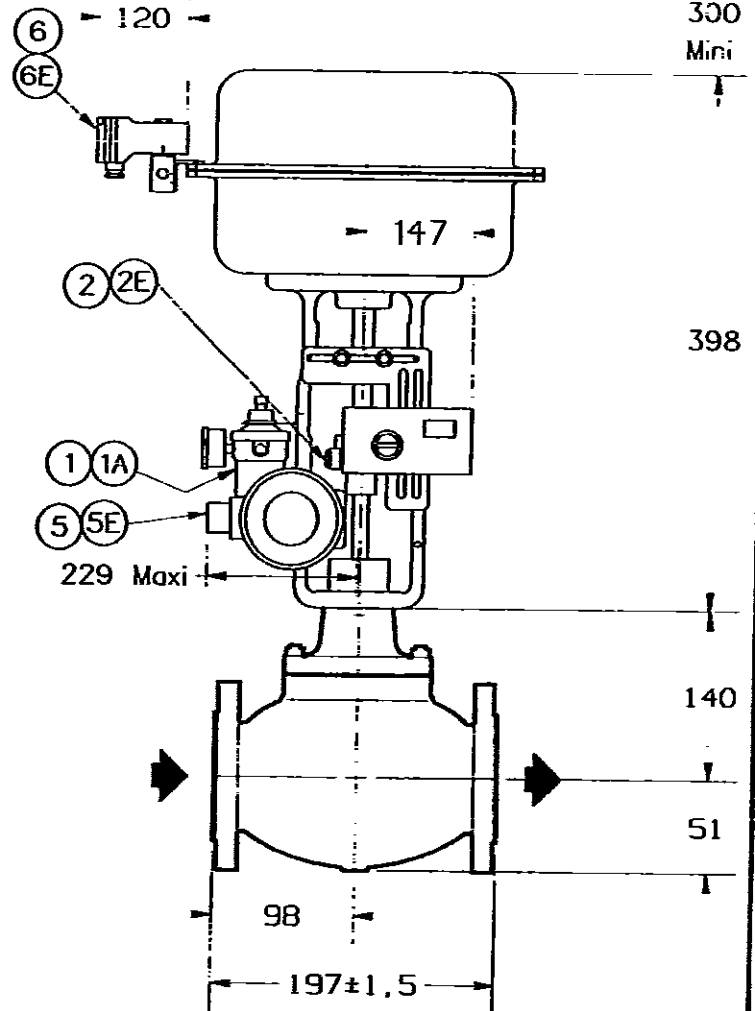
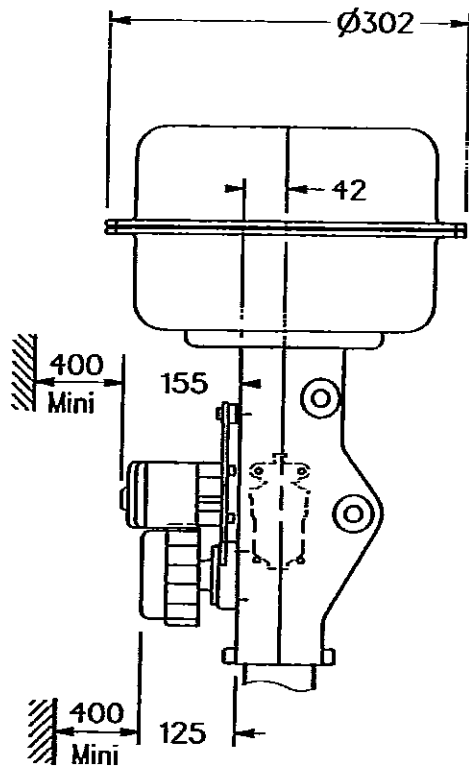
SERIES VALVE : 88-21125

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW9
Electrical Connections Detail	02-04911-EC1
Electrical Connections Detail	02-04911-LD3
Electrical Connections Detail	02-04911-EC5

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M20 - Signal
5	496/4	Closing Detector	2.5	5E	M20
6	HERION	Solenoid Valve #2401112396202400	1.0	6E	M20

TOTAL WEIGHT (accessories + valve) in kg

38

ITEM : 14023

MN SERIAL NUMBER : 02-04911-23

Rev. 2 DATE: Dec-10-2002

DRAWN BY: P. ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 646530 1541 01 0 10007



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellam

BRASSER

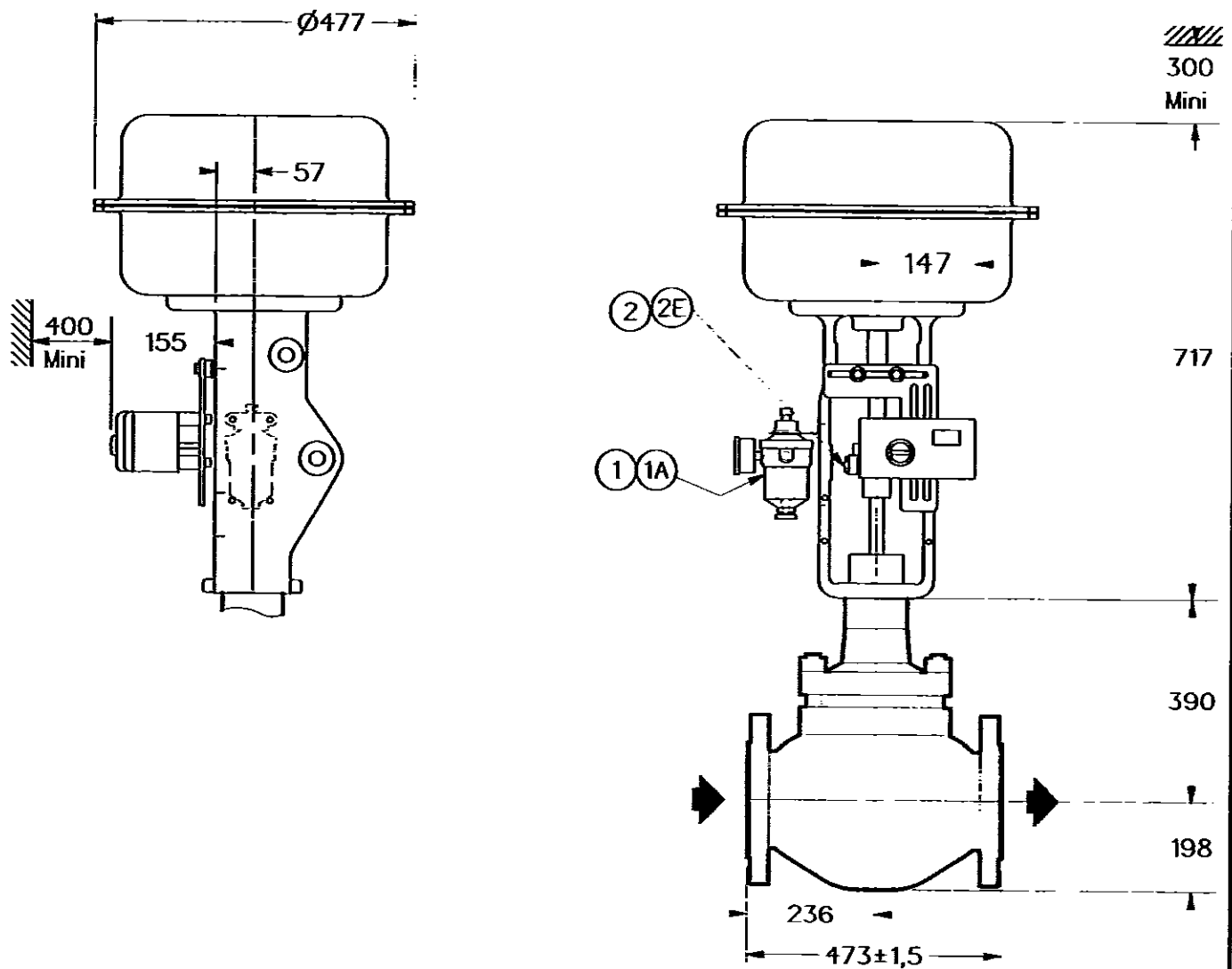
SERIES VALVE : 88-41355

DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

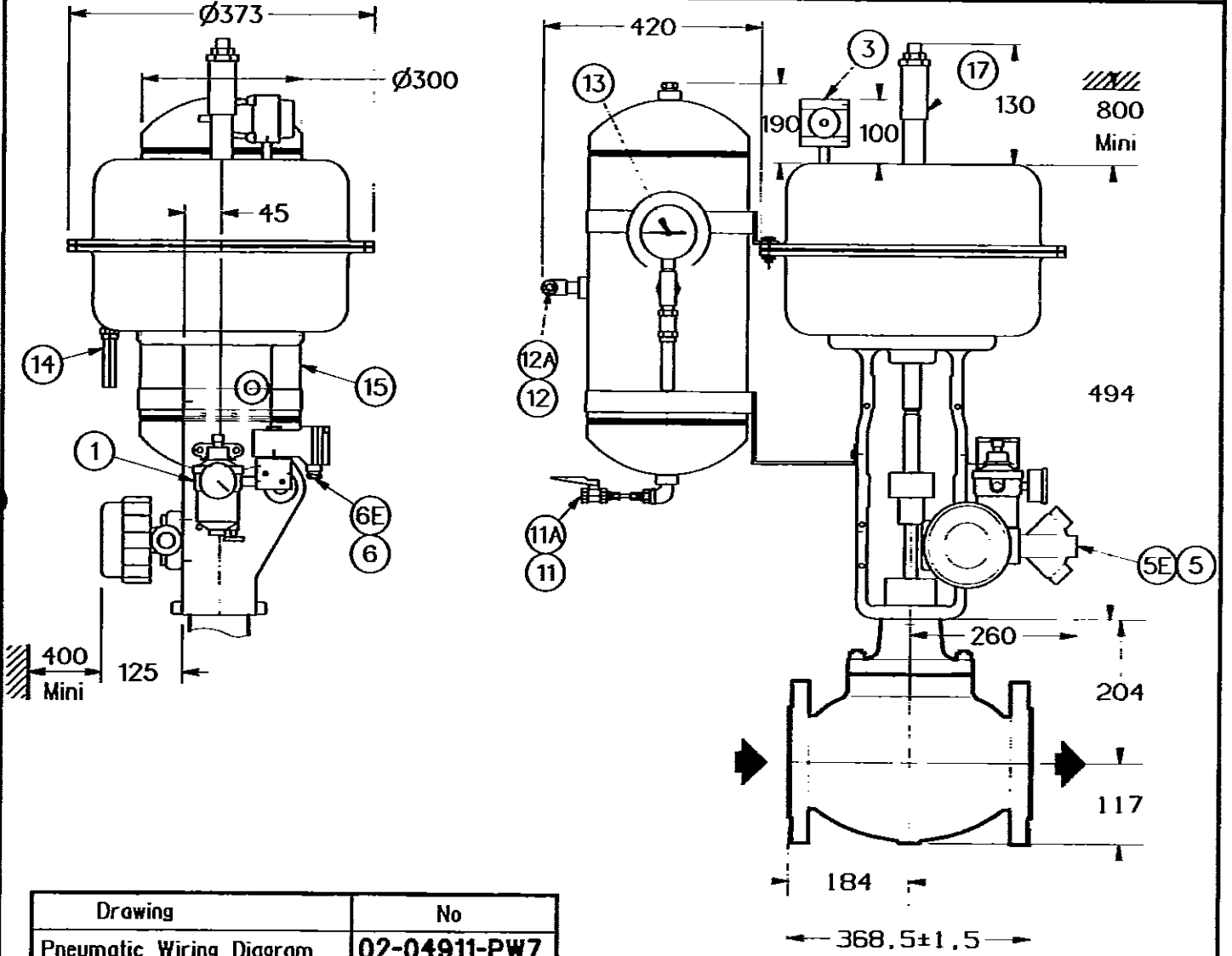
CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M20 - Signal
TOTAL WEIGHT (accessories + valve) in kg			279	ITEM : 14024	MIN SERIAL NUMBER : 02-04911-24
Rev. 1	DATE: Oct-10-2002	DRAWN BY: P. ROUELLE	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	
SERIES VALVE : 87-21105		DN : 100 (4")	ON AIR FAILURE : STAY-PUT (*)
FLOW TO : OPEN	CONNECTION: 300 ANSI RF	(*) : Tends to Open	

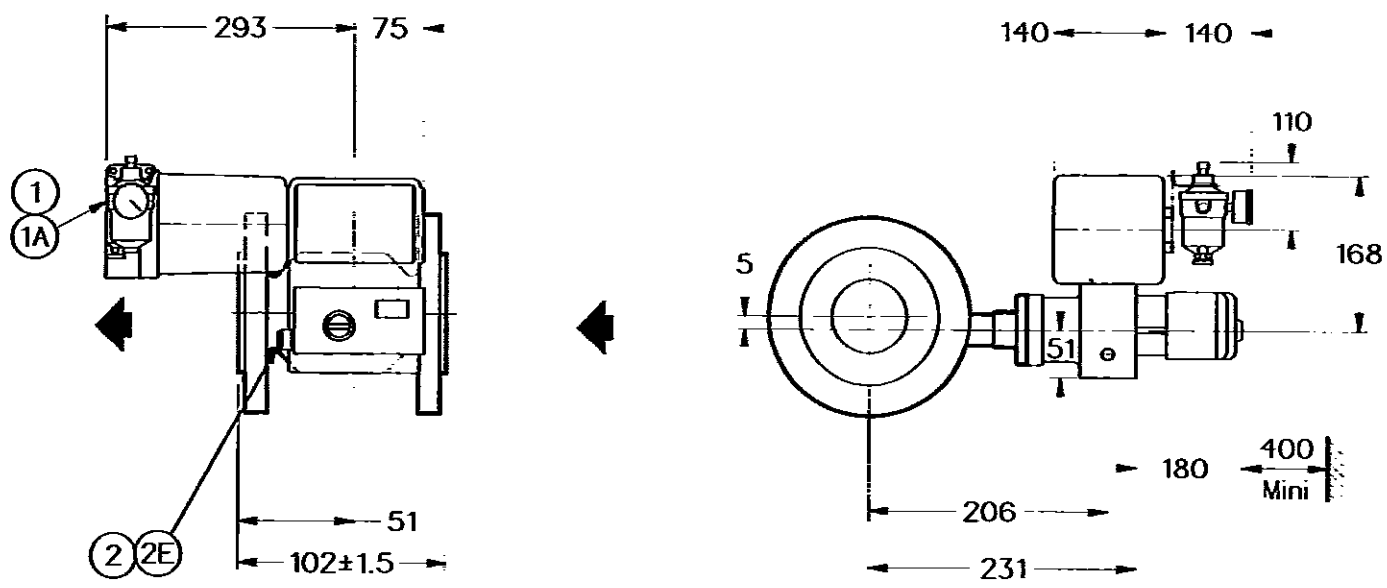


Drawing	No
Pneumatic Wiring Diagram	02-04911-PW7
Electrical Connections Detail	02-04911-EC5
Electrical Connections Detail	02-04911-LD1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0		
3	77-6	Air Lock-up valve	0.8		
5	496/5	Detectors	2.5	5E	M20x2
6	HERION	Solenoid Valve #2401112396202400	1.0	6E	M20
11	521	Drain Valve		11A	1/4" NPTF - Drain
12	2259B4MM	No Return Valve		12A	1/2" NPTM - Air Supply
13	100-T5500S L04L	Pressure Gauge(0-16bar)			
14	5159B4M140	Safety Valve			
15		Volume Tank($\varnothing 300-60$ liters)			
17		Limit-Stop			(Limit-Stop Locked by set cable) (Limits Actuator Stem Extending)

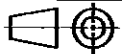
TOTAL WEIGHT(accessories + valve) in kg		160	ITEM : 14025	WN SERIAL NUMBER : 02-04911-25
Rev. 3	DATE: Mar-17-2003	DRAWN BY: H. VICTORE	ISSUED BY: C. DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		

▲
TOP



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

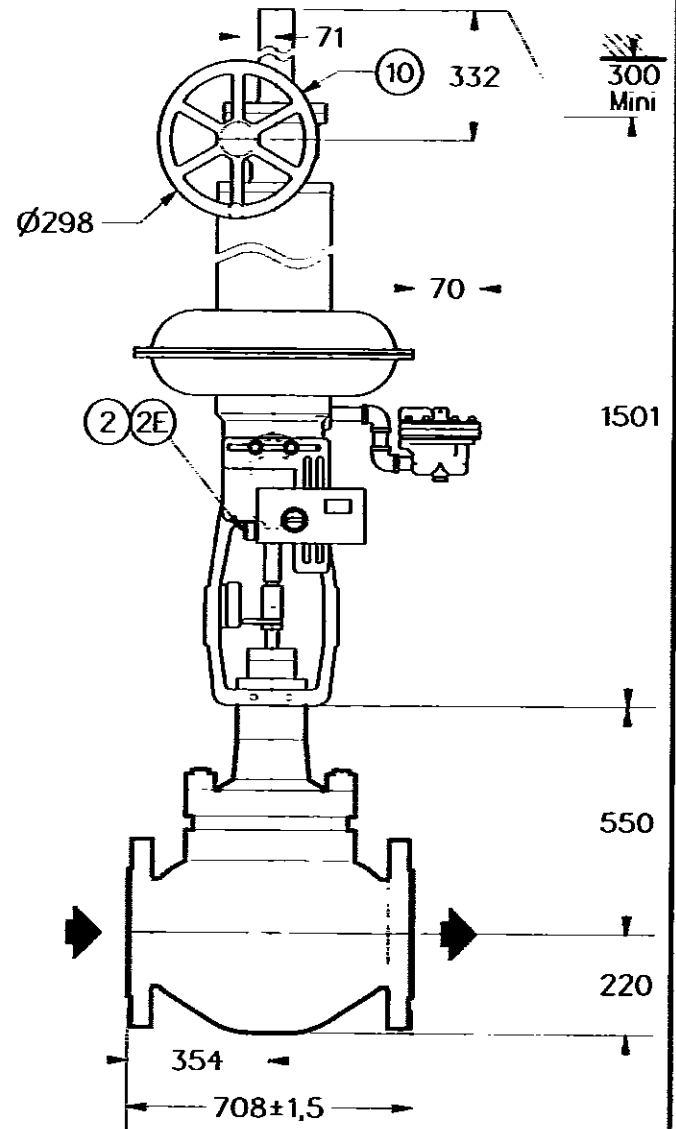
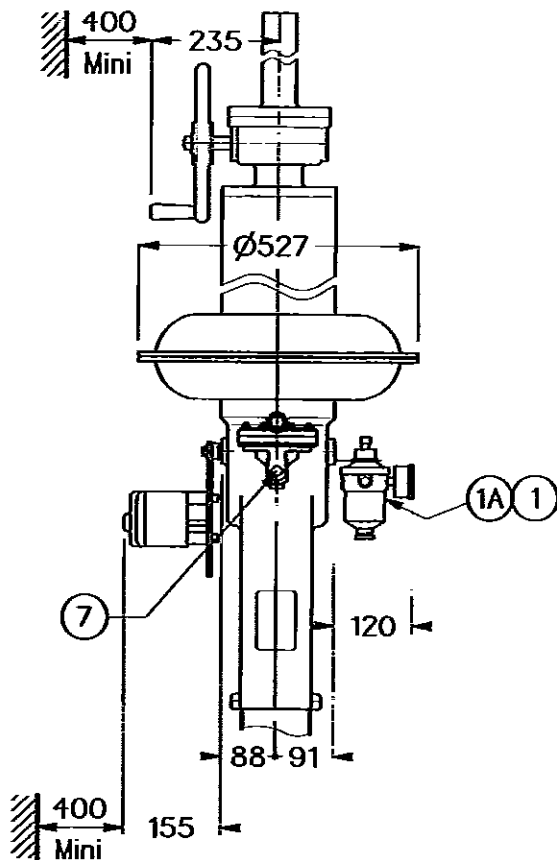
SERIES VALVE : 38-41355

DN : 10"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-150 PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW3
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
7	BR400	Booster	1.0		
10	8A	Handwheel			

TOTAL WEIGHT(accessories + valve) in kg

790

ITEM : 14027

MIN SERIAL NUMBER : 02-04911-27

Rev. 1

DATE: Oct-10-2002

DRAWN BY:

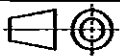

P. ROUELLE

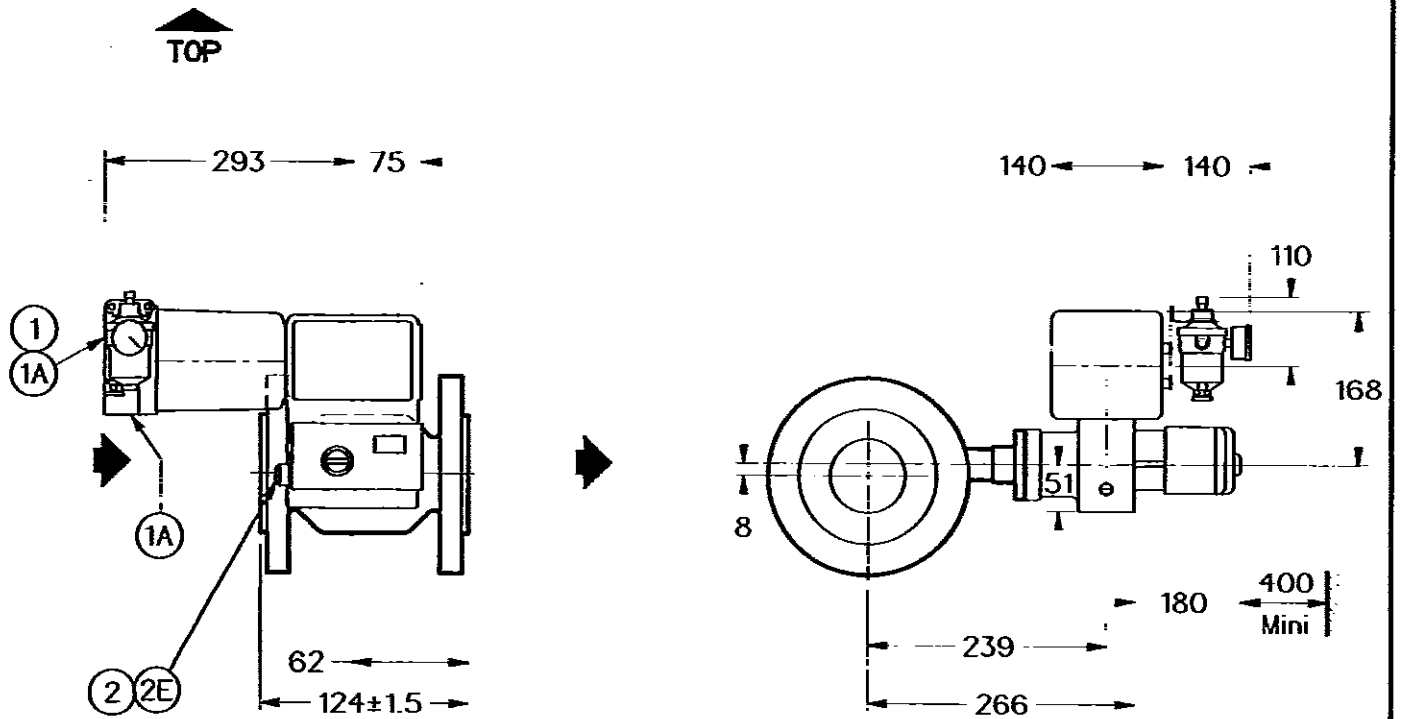
ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 35-35602		DN : 50 (2")	ON AIR FAILURE : CLOSED	
FLOW TO : CLOSE	CONNECTION: 300 ANSI RF			



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		20	ITEM : 14028	MIN SERIAL NUMBER : 02-04911-28	
Rev. 1	DATE: Oct-10-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellam



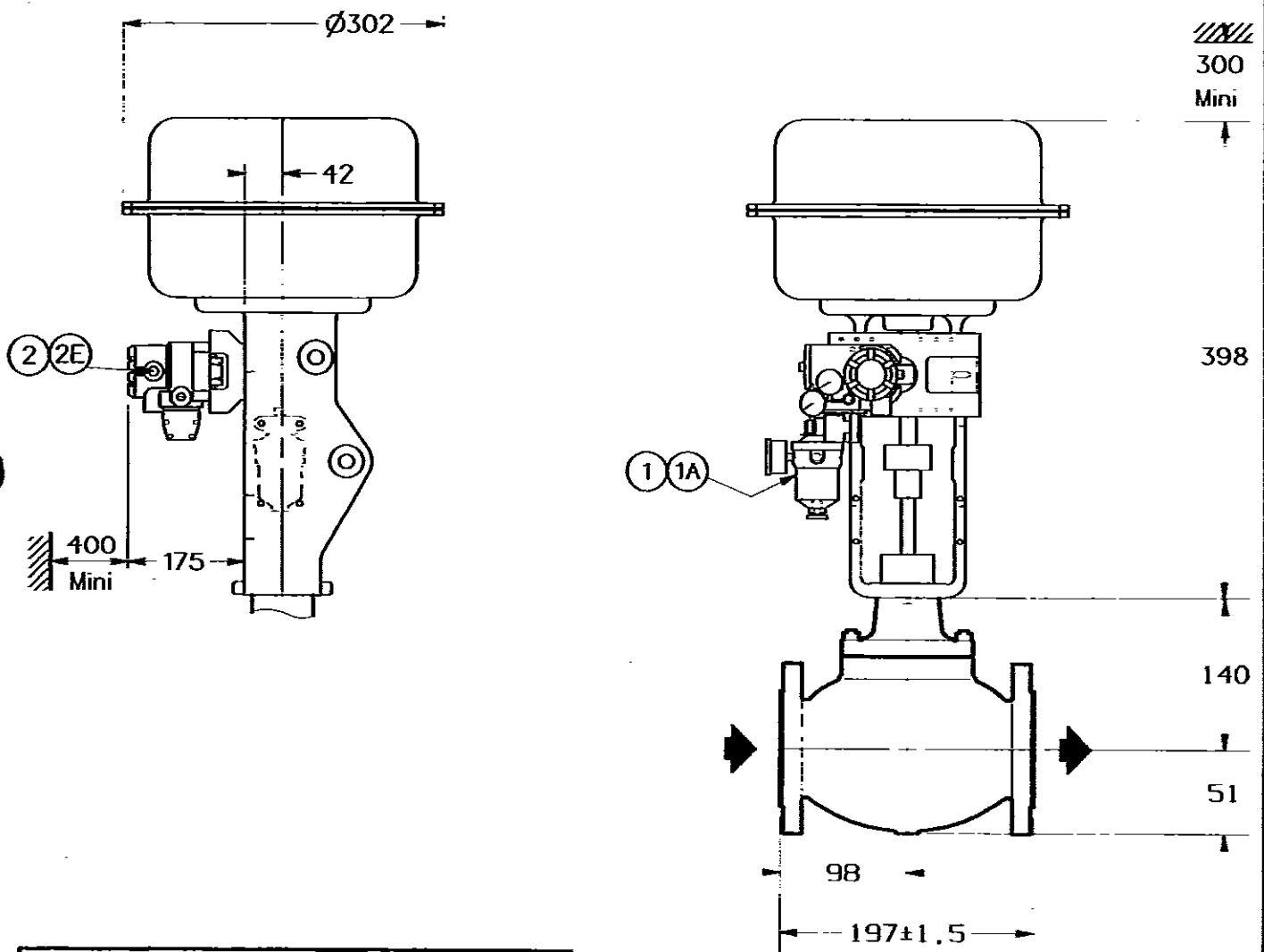
SERIES VALVE : 88-21125

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

38

ITEM : 14029 MIN SERIAL NUMBER : 02-04911-29

Rev. 1

DATE: Oct-10-2002

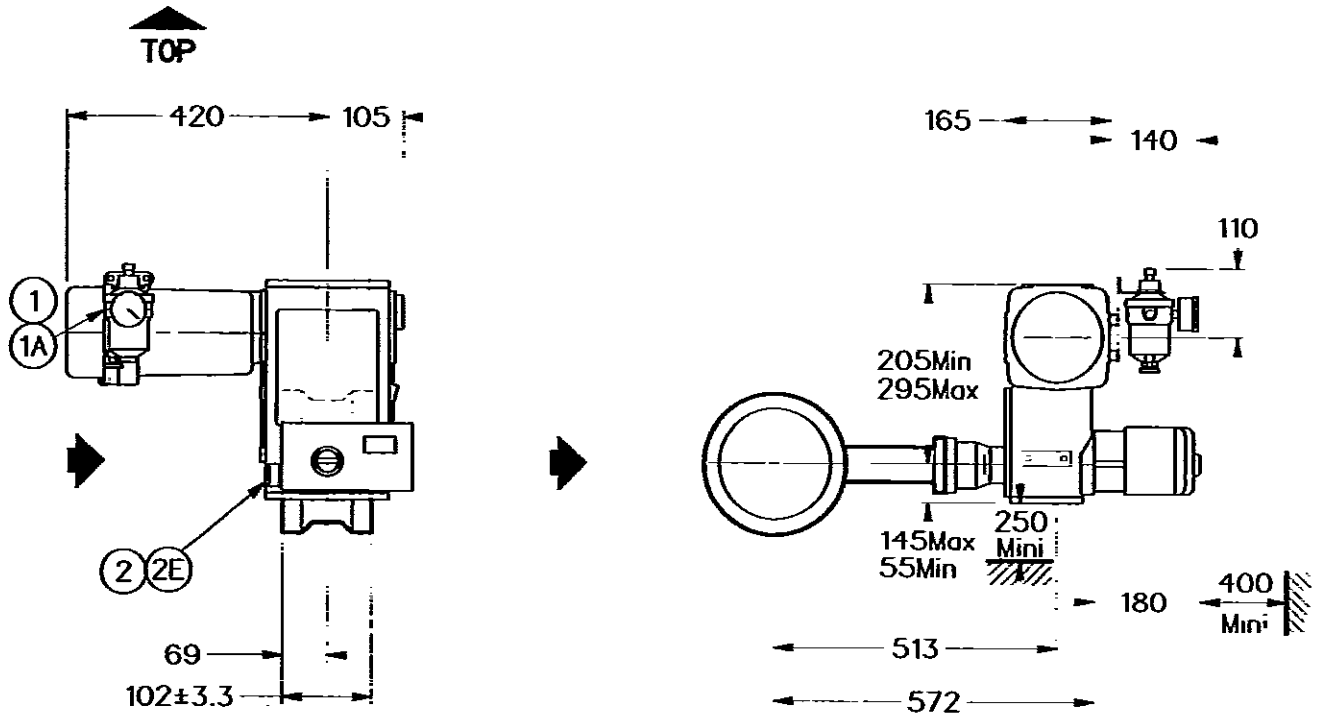
DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan
SERIES VALVE : 30-30623		DN : 200 (8")	ON AIR FAILURE : CLOSED
FLOW TO : CLOSE	CONNECTION: 300 ANSI RF		

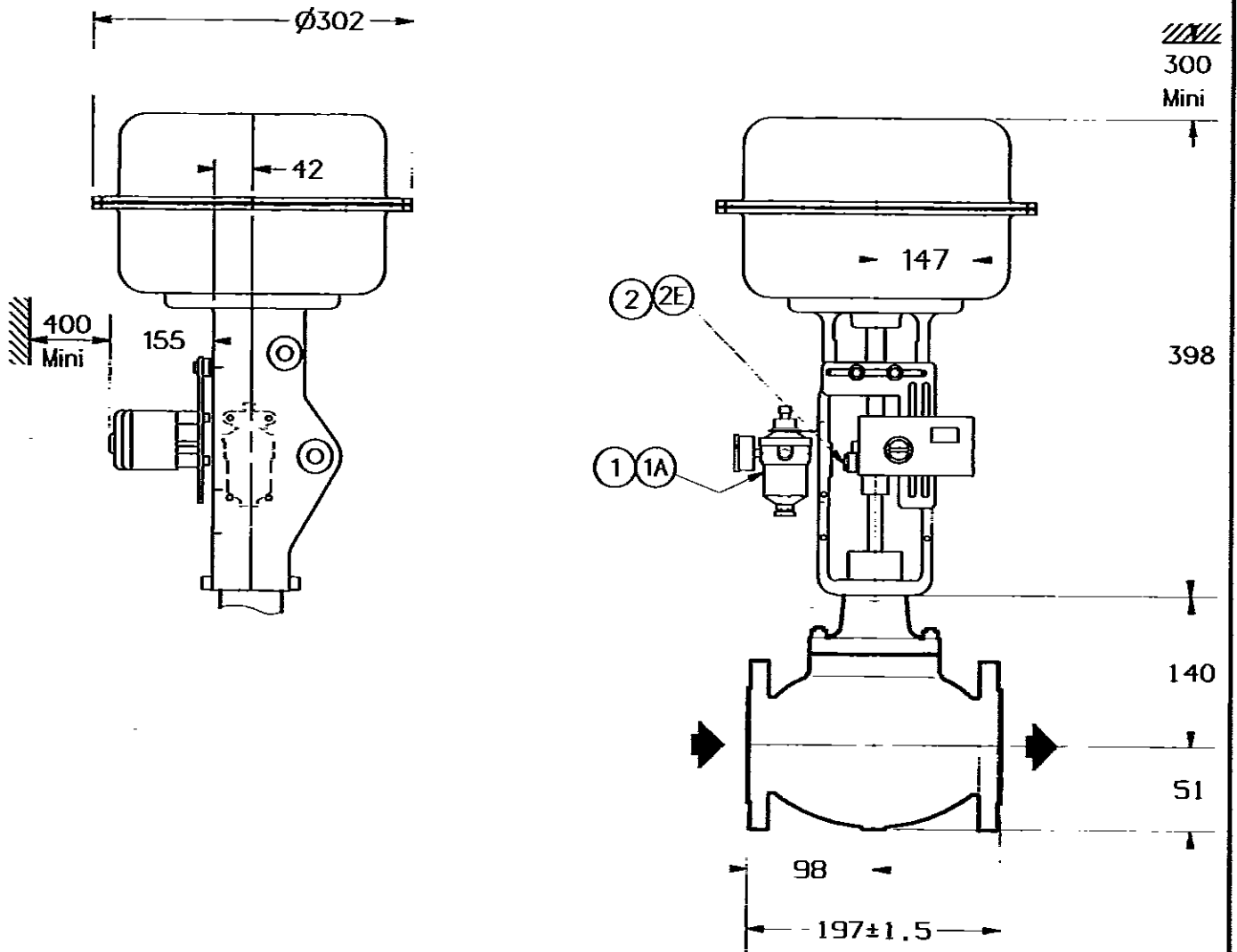


Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.*Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		46	ITEM : 14030	MN SERIAL NUMBER : 02-04911-30
Rev. 1	DATE: Oct-10-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 88-21114		DN : 25 (1")	ON AIR FAILURE : CLOSED	
FLOW TO : OPEN	CONNECTION: 300 ANSI RF			



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		38	ITEM : 14031	MN SERIAL NUMBER : 02-04911-31
Rev. 1	DATE: Oct-10-2002	DRAWN BY: P. ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



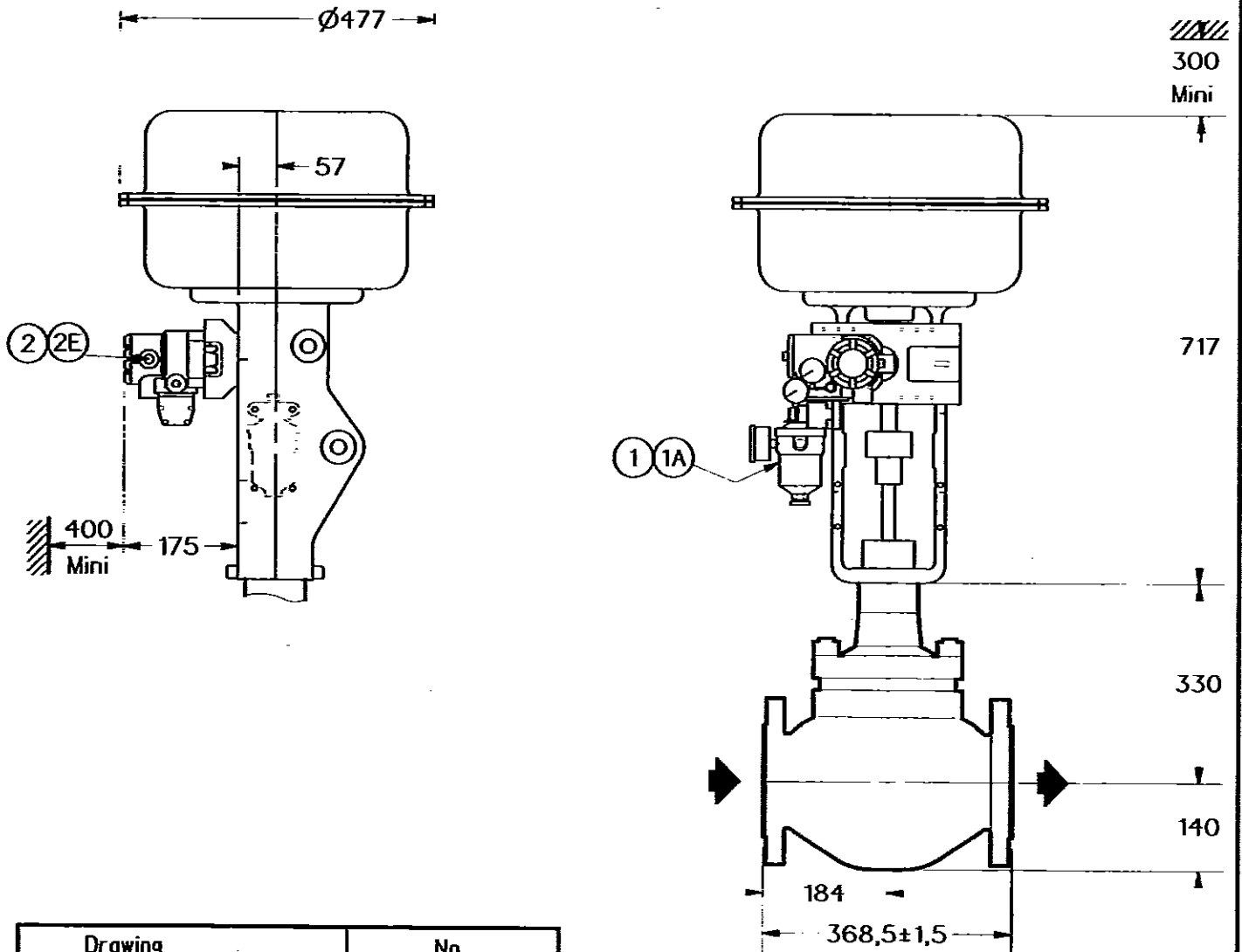
SERIES VALVE : 88-41935

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

201

ITEM : 14032

MN SERIAL NUMBER : 02-04911-32

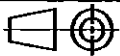
Rev. 1 DATE: Oct-10-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



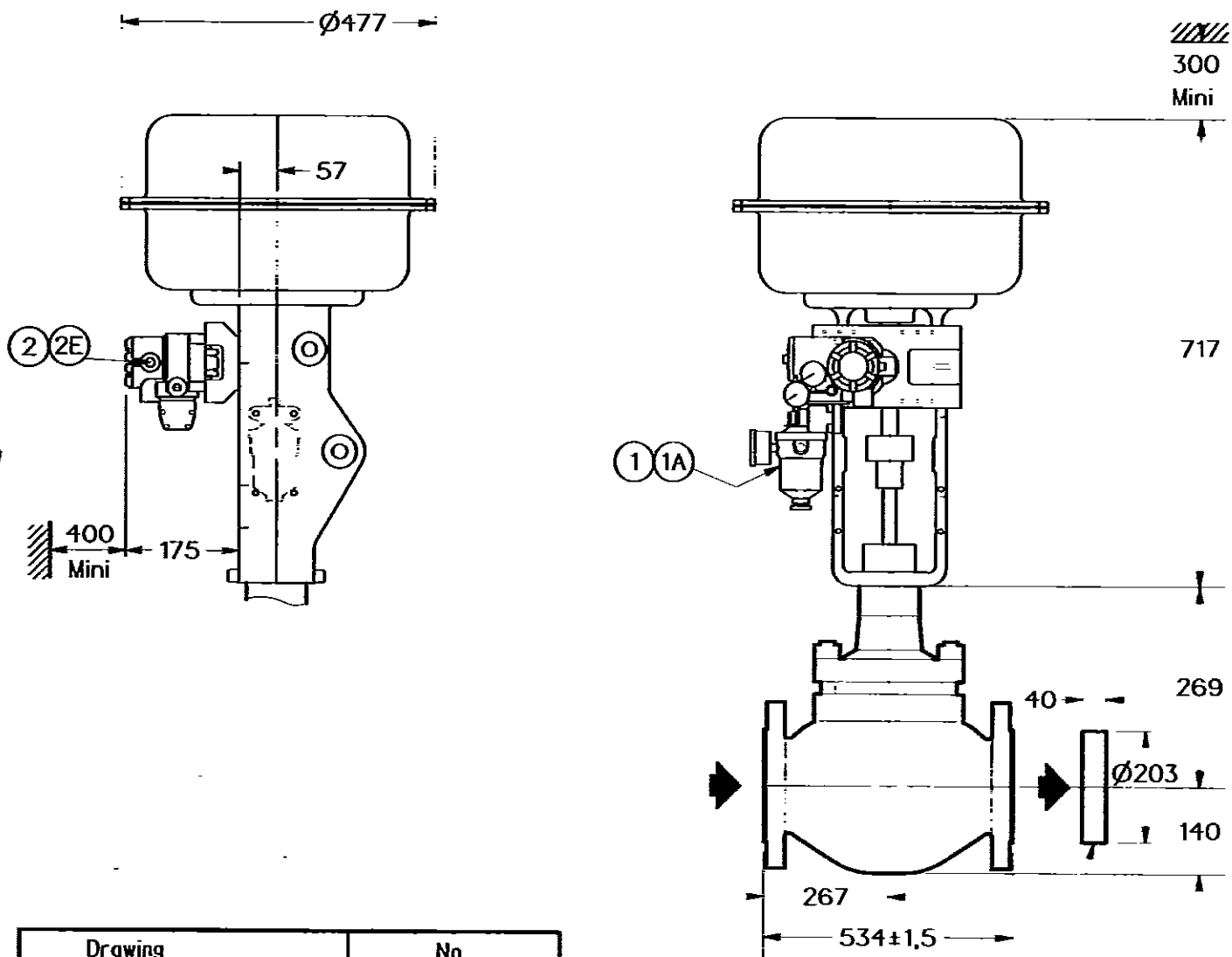
SERIES VALVE : 88-41555

DN : 4"x2"x4"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 2500 ANSI RTJ-ISO PN 420 #J

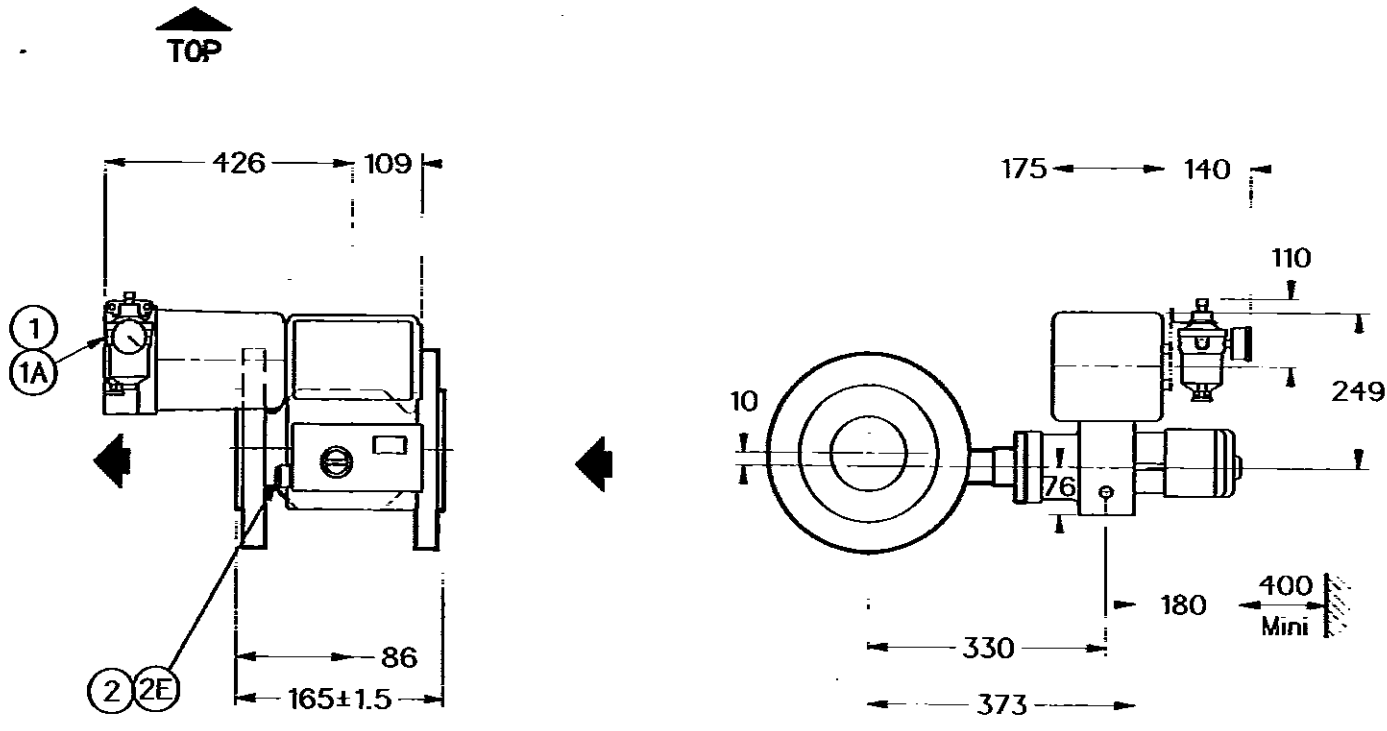


Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC2

Multiholes Plate
4" ANSI 2500 RTJ
Cv = 95
(To be mounted
downstream the valve)

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electron. positioner	1.0	2E	M20 - Signal
TOTAL WEIGHT (accessories + valve) in kg			350	ITEM : 14033	MN SERIAL NUMBER : 02-04911-33
Rev. 1	DATE: Oct-10-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		

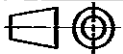
	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellam	
SERIES VALVE : 35-35202		DN : 80 (3")	ON AIR FAILURE : CLOSED	
FLOW TO : CLOSE	CONNECTION: 300 ANSI RF			



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		48	ITEM : 14034	MIN SERIAL NUMBER : 02-04911-34
Rev. 1	DATE: Oct-10-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007	



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRISER

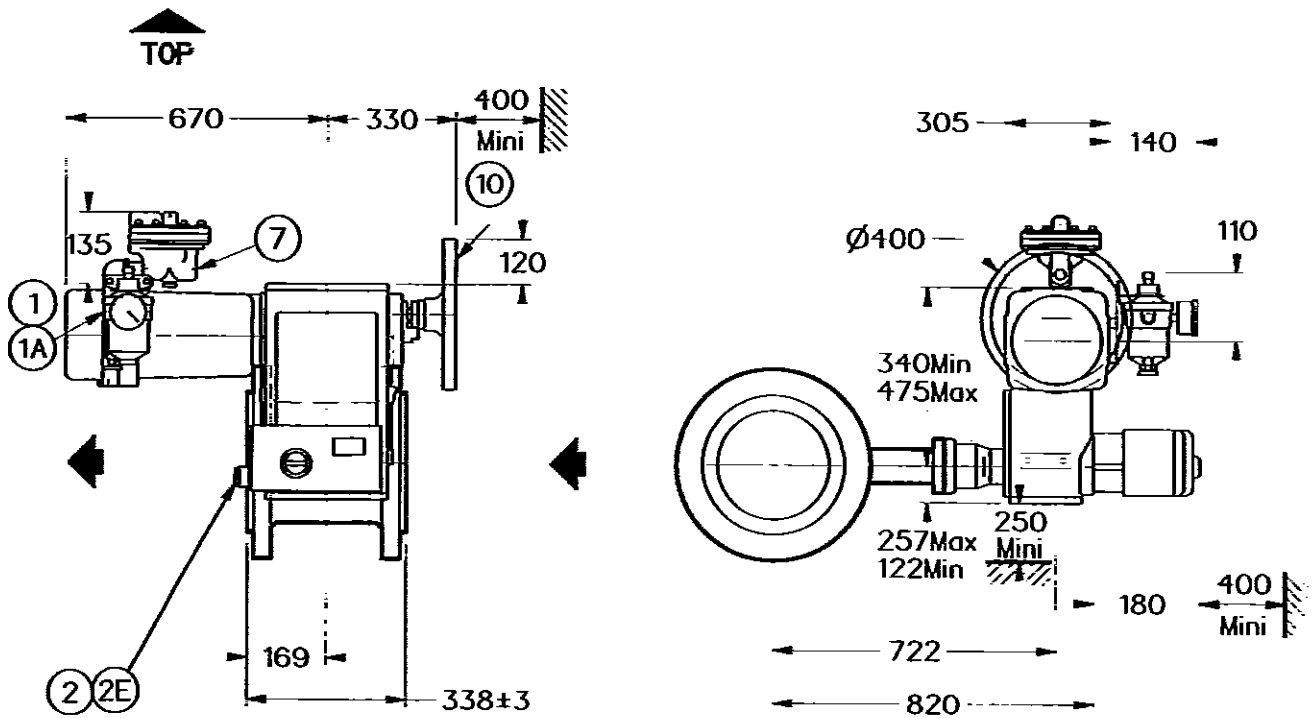
SERIES VALVE : 30-30222-/HW

DN : 300 (12")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW3
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M 20 - Signal
7	BR400	Booster	1.0		
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

267

ITEM : 14035

MN SERIAL NUMBER : 02-04911-35

Rev. 1

DATE: Oct-09-2002

DRAWN BY:

P-ROUELLE

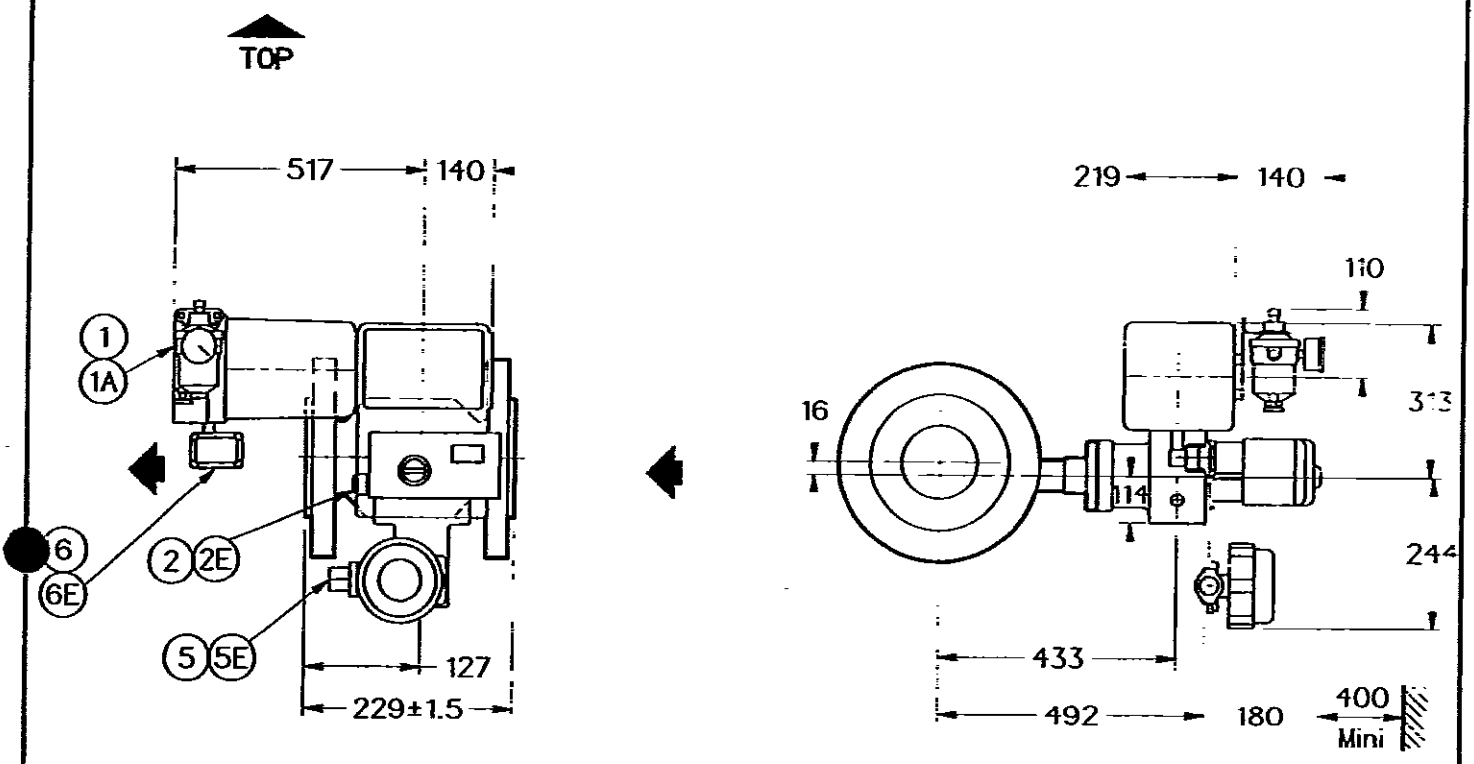
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

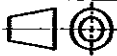
	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 35-35202		DN : 150 (6")	ON AIR FAILURE : CLOSED	
FLOW TO : CLOSE	CONNECTION: 300 ANSI RF			



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW2
Electrical Connections Detail	02-04911-EC1
Electrical Connections Detail	02-04911-EC3
Electrical Connections Detail	02-04911-LD4

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M20 - Signal
5	496/4	Closing Detector	2.5	5E	M20
6	WS..B317..	Solenoid Valve	1.0	6E	M20

TOTAL WEIGHT (accessories + valve) in kg		120	ITEM : 14036	MIN SERIAL NUMBER : 02-04911-36
Rev. 2	DATE: Dec-11-2002	DRAWN BY: P. ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



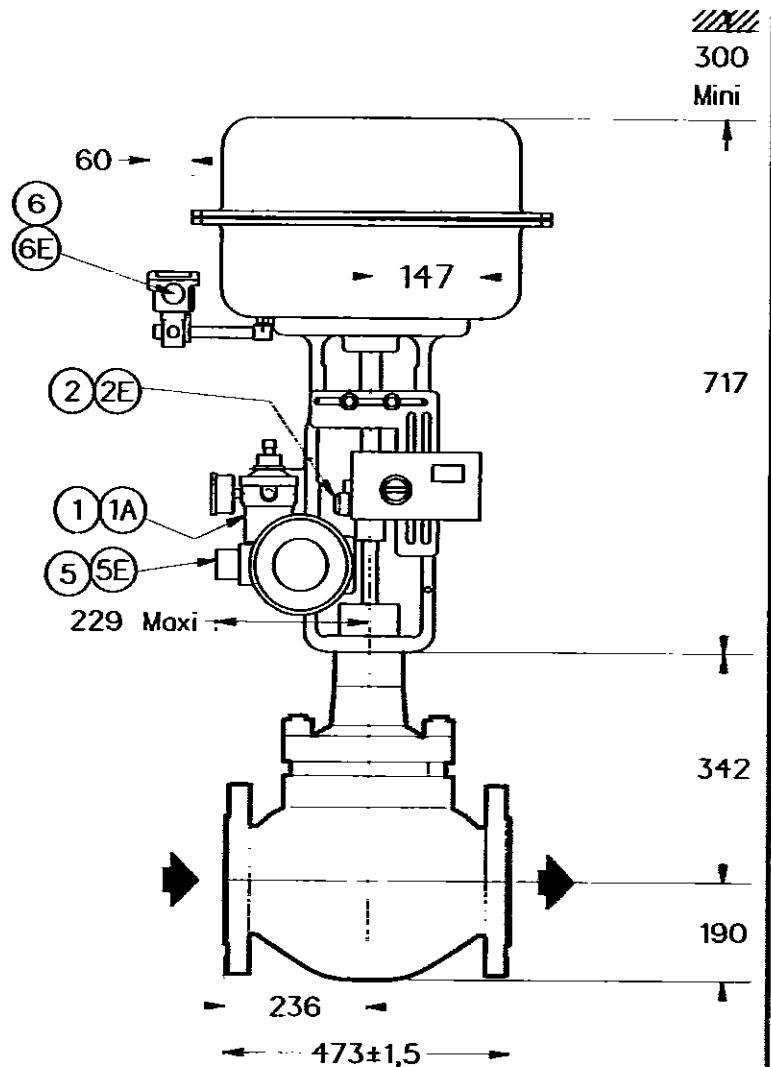
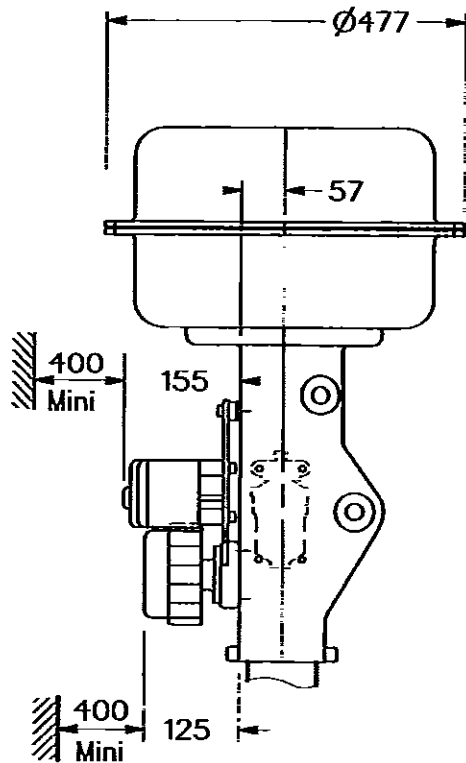
SERIES VALVE : 88-41325

DN : 6"x4"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW2
Electrical Connections Detail	02-04911-EC1
Electrical Connections Detail	02-04911-EC3
Electrical Connections Detail	02-04911-LD3

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal
5	496/4	Closing Detector	2.5	5E	M20
6	WS..B317..	Solenoid Valve	1.0	6E	M20

TOTAL WEIGHT (accessories + valve) in kg

259

ITEM : 14037

MIN SERIAL NUMBER : 02-04911-37

Rev. 3 DATE: Feb-04-2003

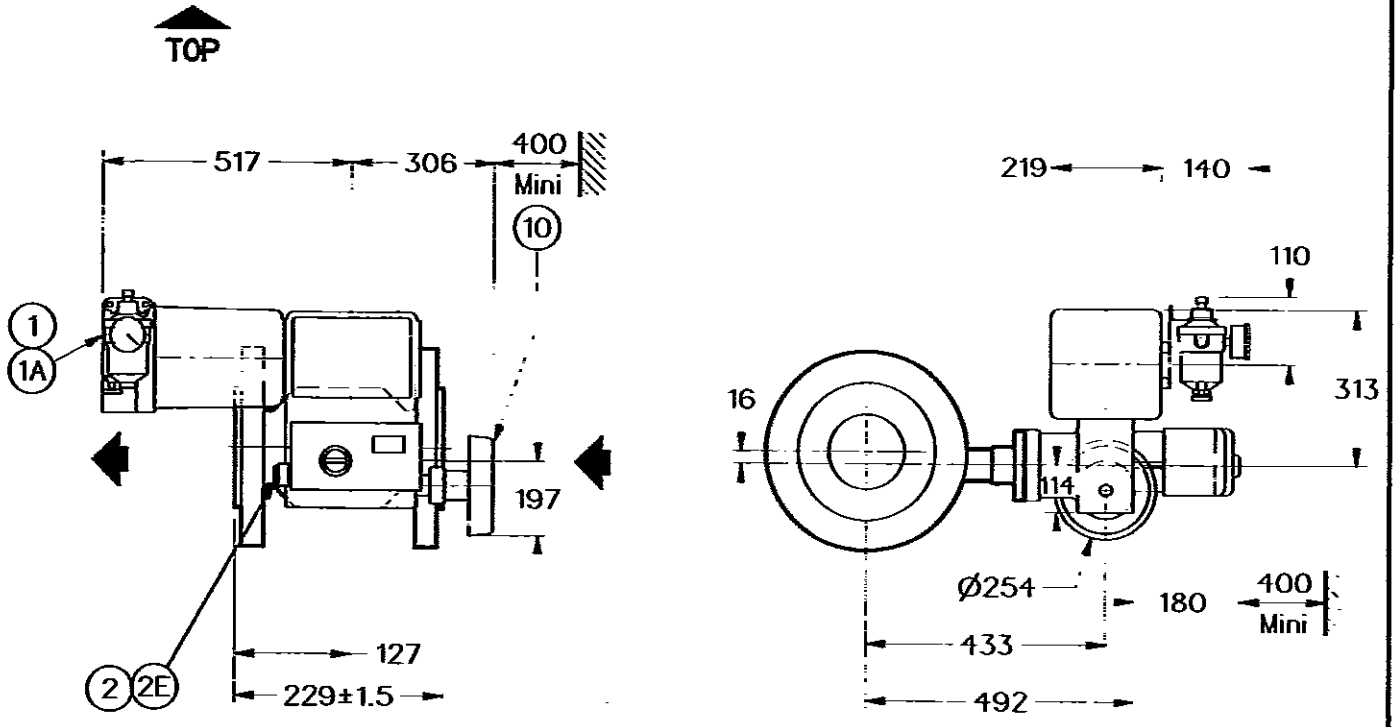
DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 35-35202-/HW		DN : 150 (6")	ON AIR FAILURE : CLOSED	
FLOW TO : CLOSE		CONNECTION: 300 ANSI RF		



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
10		Handwheel			
TOTAL WEIGHT (accessories + valve) in kg			120	ITEM : 14038	MIN SERIAL NUMBER : 02-04911-38
Rev. 1	DATE: Oct-11-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

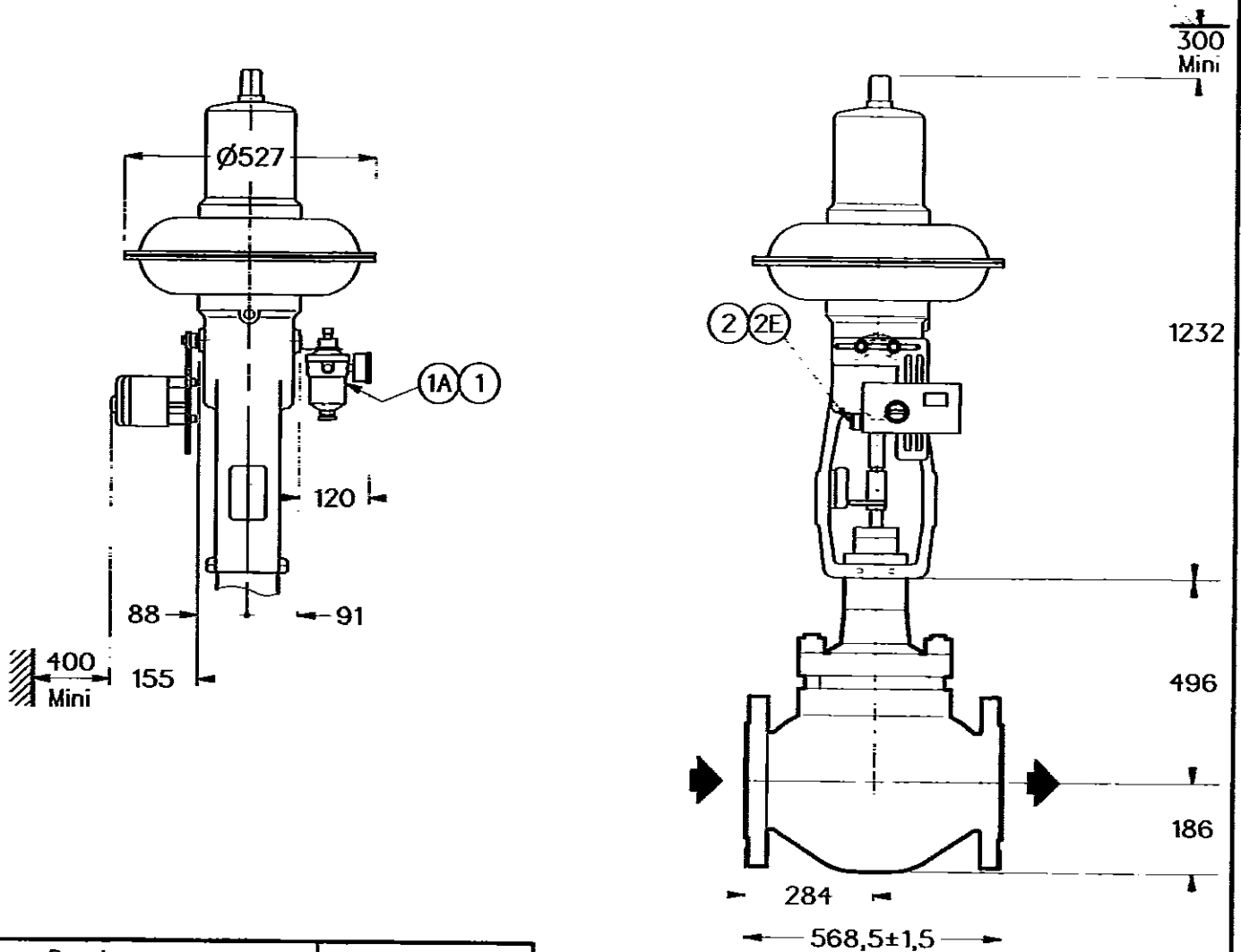
SERIES VALVE : 38-41355

DN : 8"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

548

ITEM : 14039

MN SERIAL NUMBER : 02-04911-39

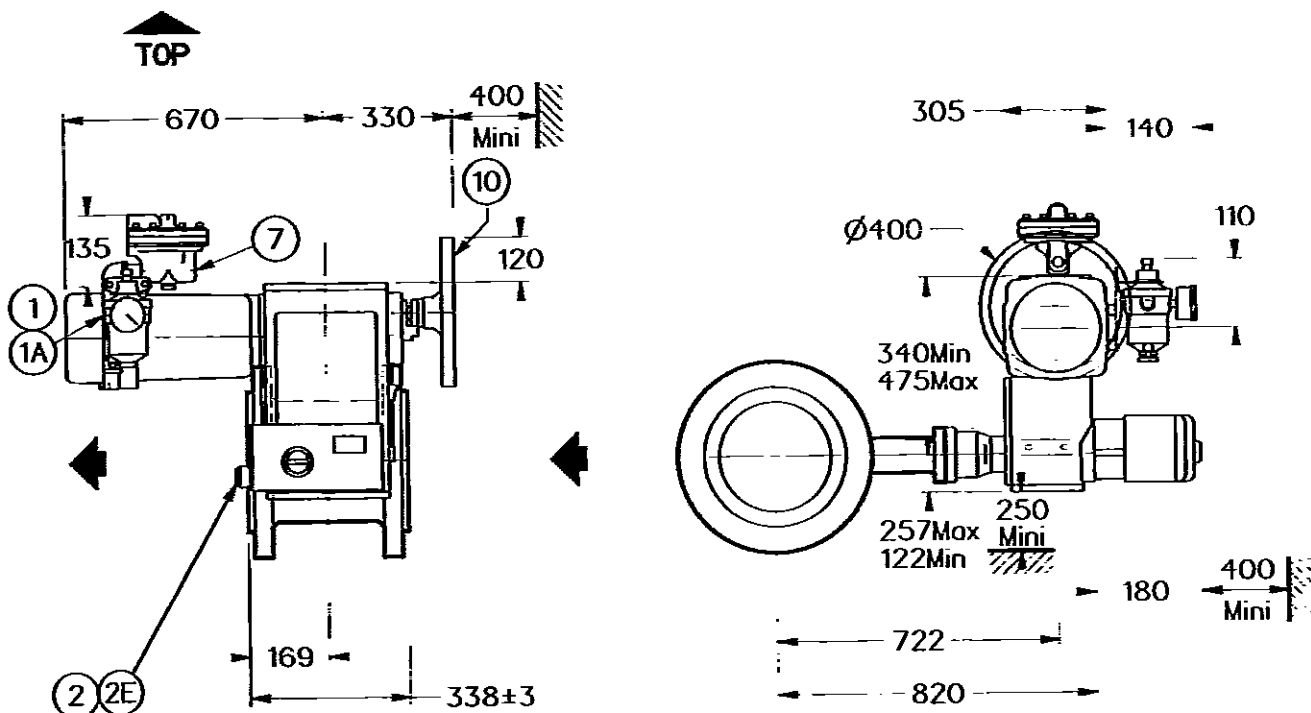
Rev. 1 DATE: Oct-11-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD



CUSTOMER: TECHNIP

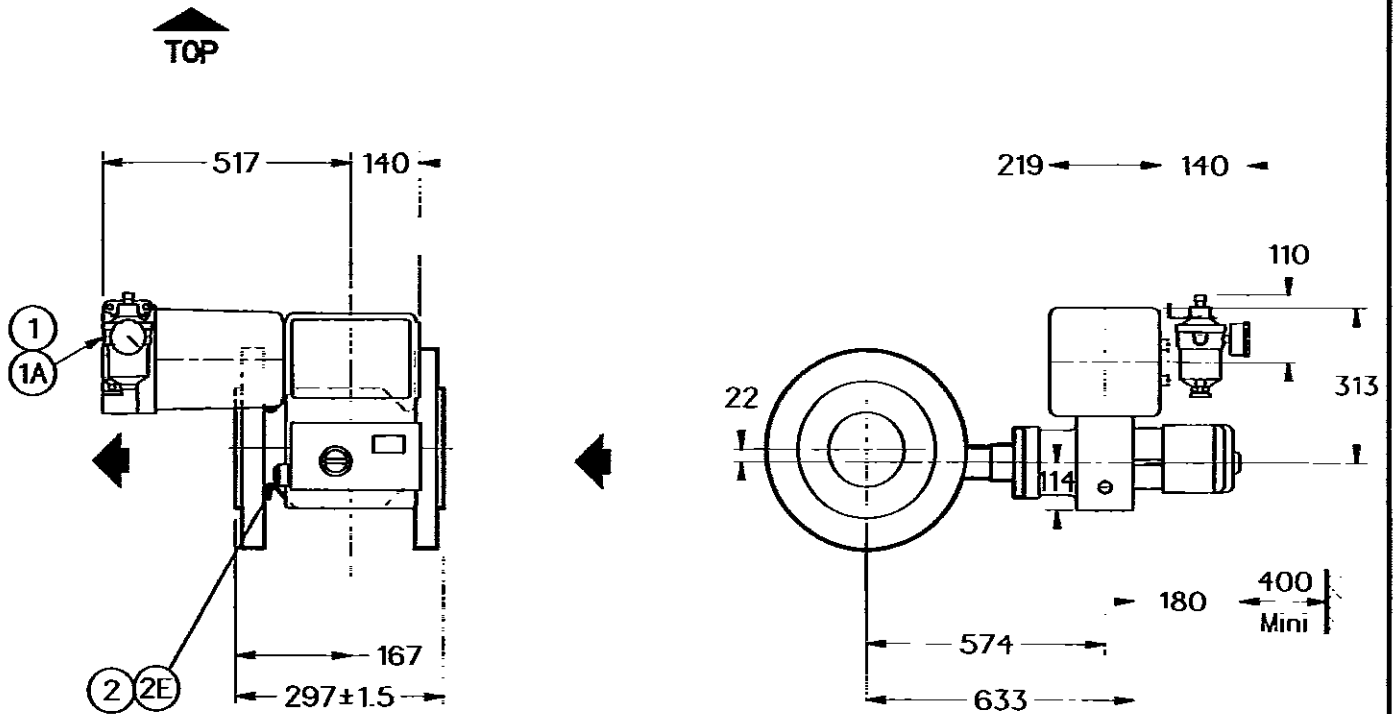
CUSTOMER ORDER: 6465C30 1541 01 0 10007



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW3
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
7	BR400	Booster	1.0		
10		Handwheel			
TOTAL WEIGHT(accessories + valve) in kg			267	ITEM : 14040	MN SERIAL NUMBER : 02-04911-40
Rev. 1	DATE: Oct-11-2002	DRAWN BY: P-ROUELLE		ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellam	
SERIES VALVE : 35-35202		DN : 250 (10")	ON AIR FAILURE : CLOSED	
FLOW TO : CLOSE	CONNECTION: 300 ANSI RF			

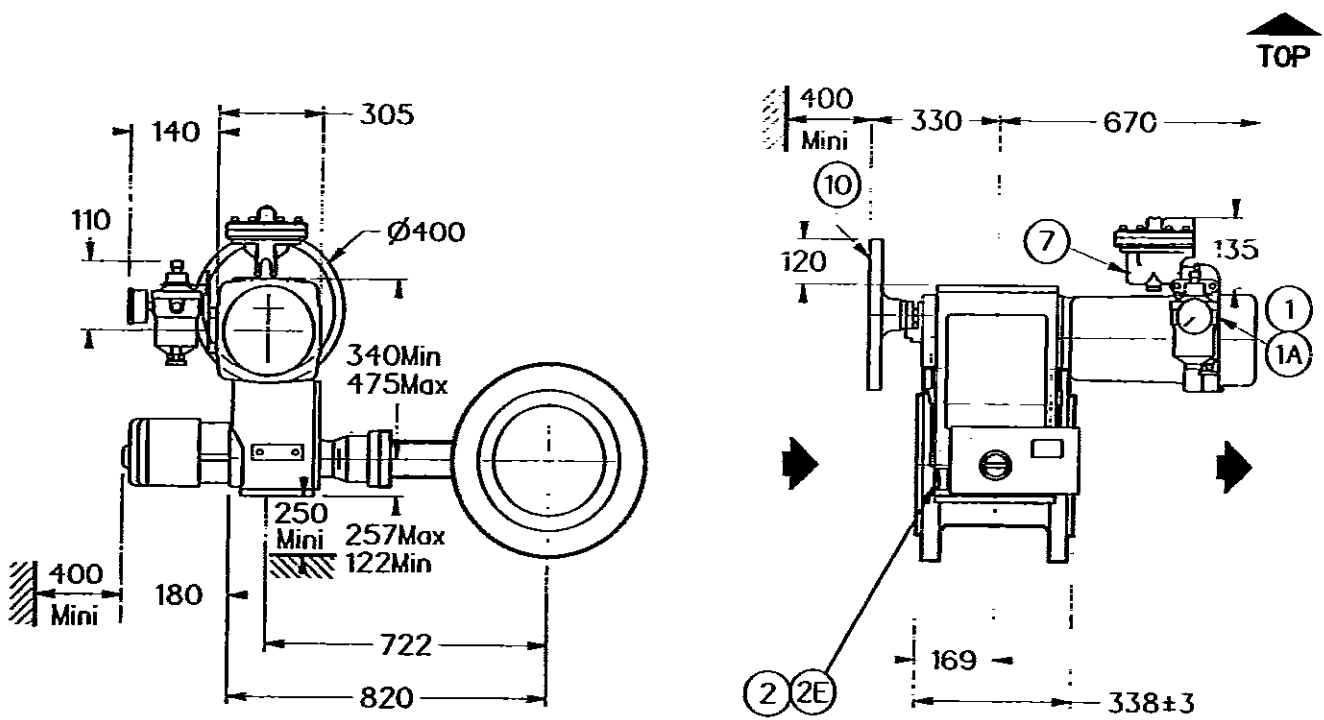


Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		210	ITEM : 14041	MIN SERIAL NUMBER : 02-04911-41
Rev. 1	DATE: Oct-11-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007	

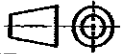
	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 30-30122		DN : 300 (12")	ON AIR FAILURE : OPEN	
FLOW TO : OPEN		CONNECTION: 300 ANSI RF		



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW3
Electrical Connections Detail	02-04909-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal
7	BR400	Booster	1.0		
10		Handwheel			

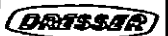
TOTAL WEIGHT (accessories + valve) in kg	267	ITEM : 14042	MN SERIAL NUMBER : 02-04911-42
Rev. 2	DATE: Dec-06-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007	



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masoneilan



SERIES VALVE : 35-35102

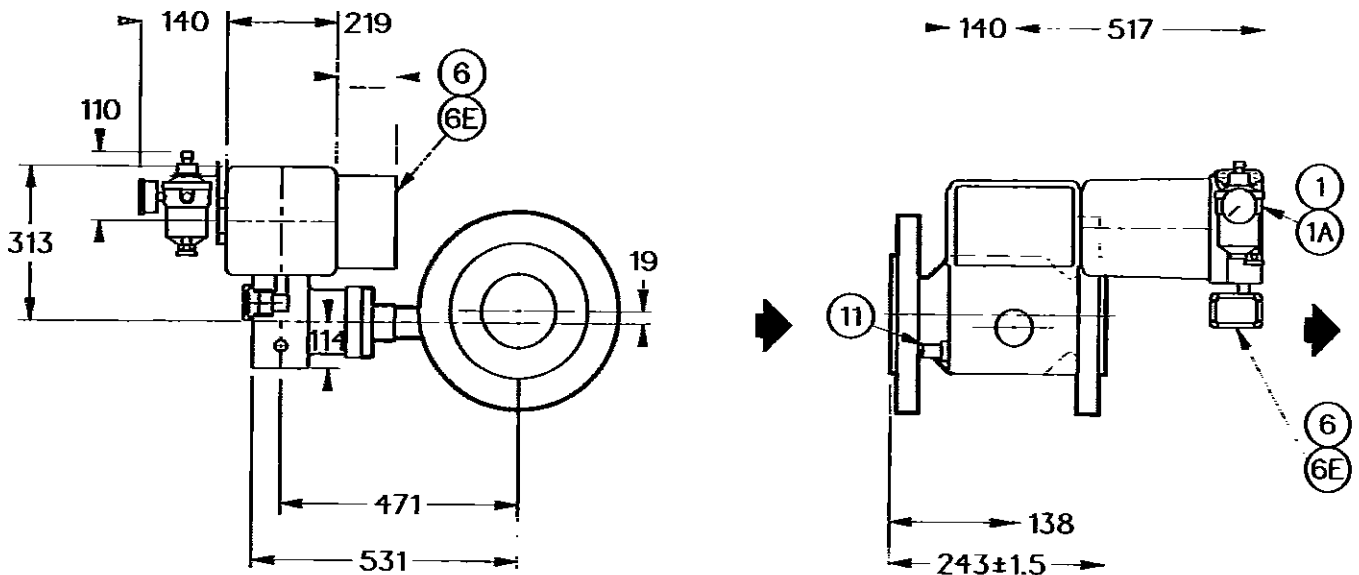
DN : 200 (8")

ON AIR FAILURE : OPEN.

FLOW TO : OPEN

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04909-PW4
Electrical Connections Detail	02-04909-EC3

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
6	WS..B317..	Solenoide Valve	1.0	6E	M20
11		Limit-Stop			Limits opening (Locked by sel cable)

TOTAL WEIGHT (accessories + valve) in kg

171

ITEM : 14043

MN SERIAL NUMBER : 02-04911-43

Rev. 2

DATE: Nov-13-2002

DRAWN BY:

H. VICTOIRE

ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

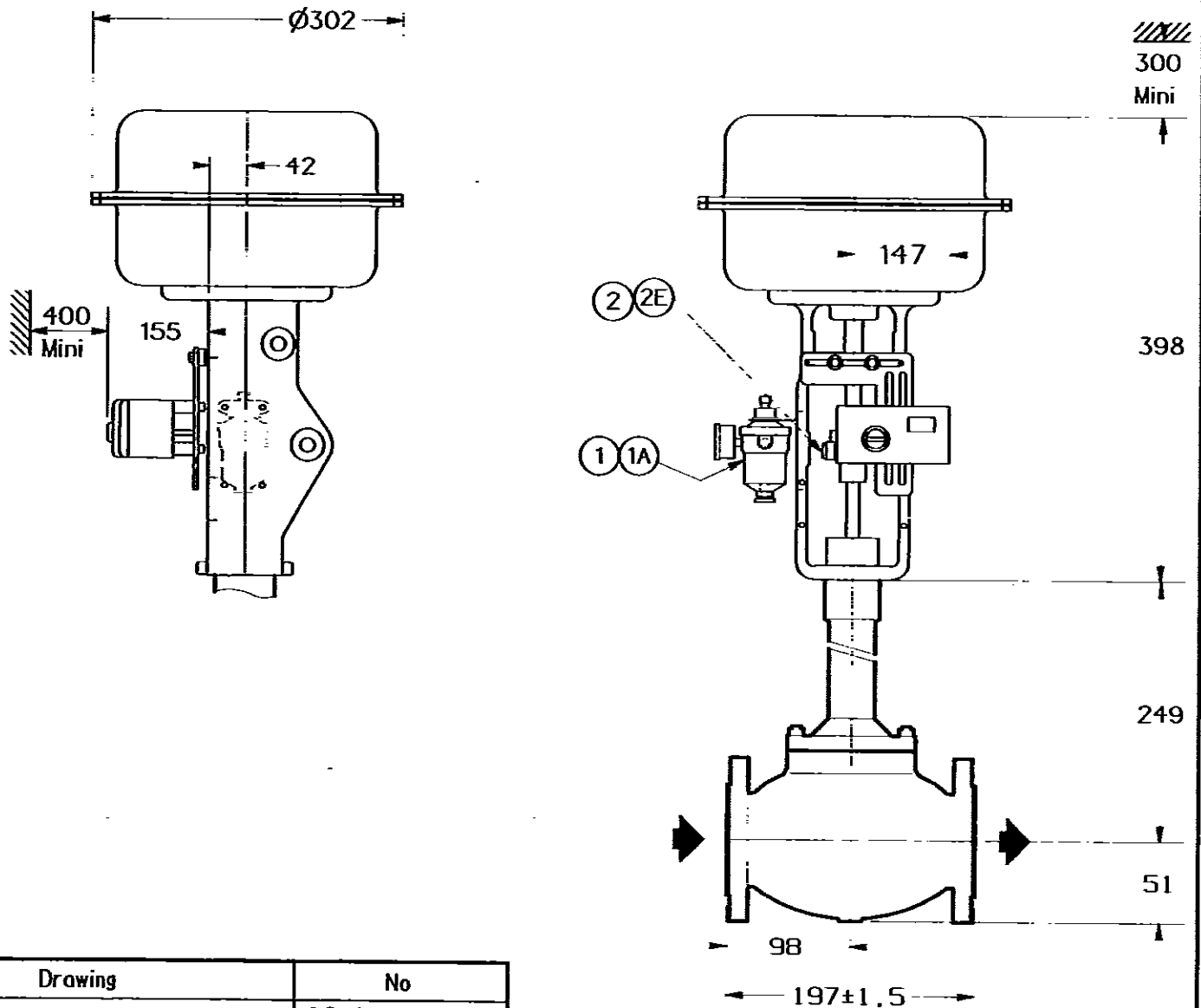
SERIES VALVE : 88-2114

DN : 25 (1")

ON AIR FAILURE : CLOSED

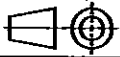
FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC1

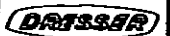
Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M20 - Signal
TOTAL WEIGHT (accessories + valve) in kg			38	ITEM : 14044	UN SERIAL NUMBER : 02-04911-44
Rev. 1	DATE: Oct-11-2002	DRAWN BY: P. ROUELLE	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



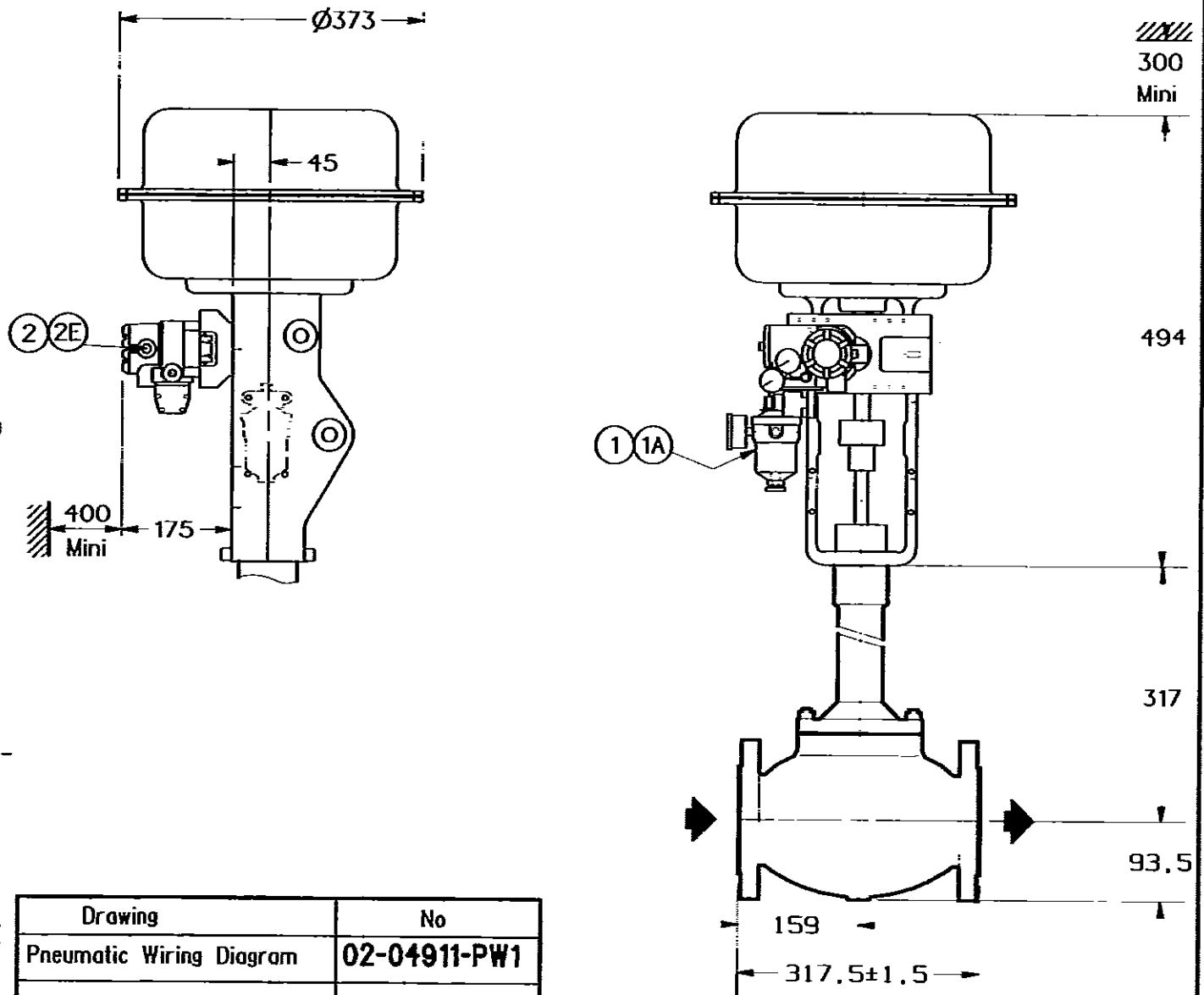
SERIES VALVE : 88-21115

DN : 80 (3")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

97

ITEM : 14045

MN SERIAL NUMBER : 02-04911-45

Rev. 1

DATE: Oct-11-2002

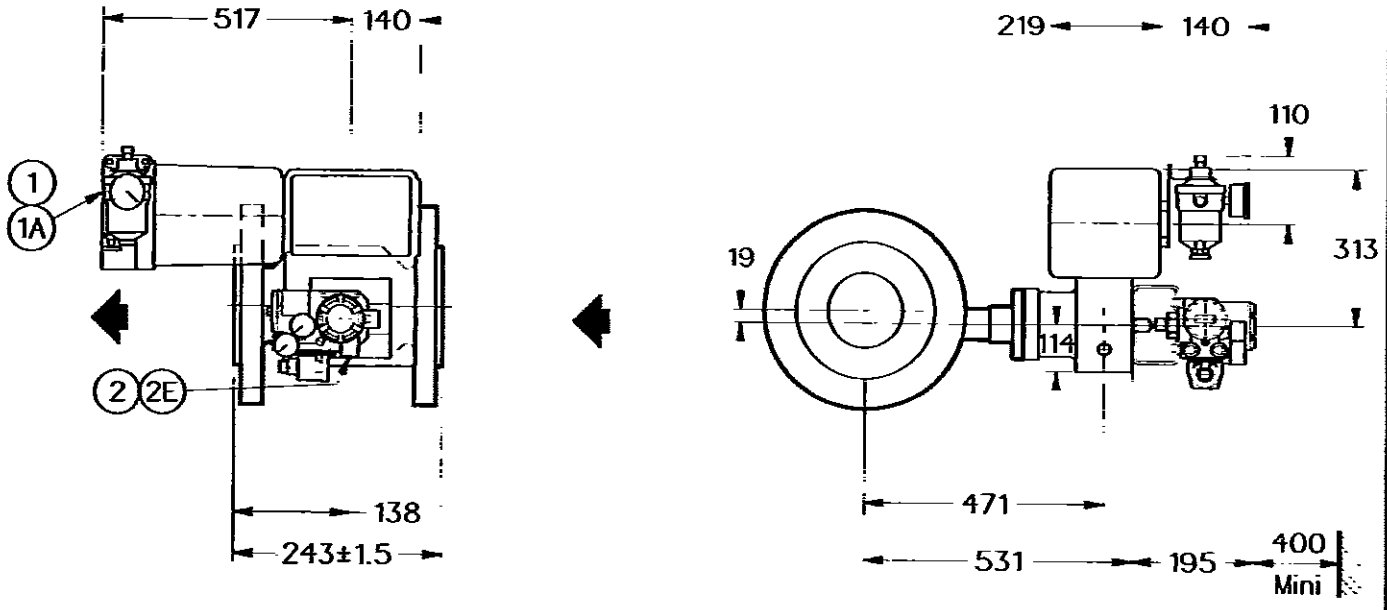
DRAWN BY: P-ROUELLE

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

▲
TOP



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC2

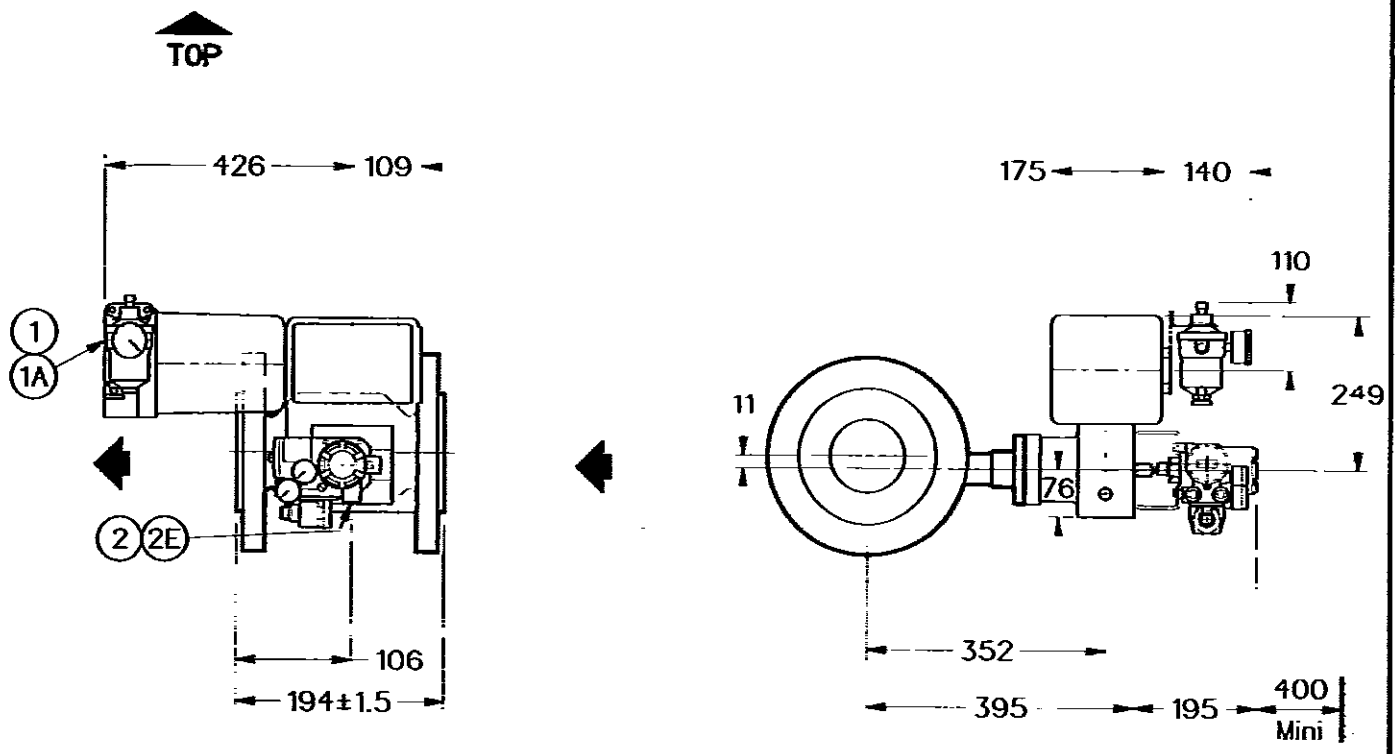
Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg 170 ITEM : 14046 MN SERIAL NUMBER : **02-04911-46**

Rev. 1 DATE: Oct-11-2002 DRAWN BY: P-ROUELLE ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP CUSTOMER ORDER: 6465C30 1541 01 0 10007

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan
SERIES VALVE : 35-35202		DN : 100 (4")	ON AIR FAILURE : CLOSED
FLOW TO : CLOSE	CONNECTION: 300 ANSI RF		



Drawing	No
Pneumatic Wiring Diagram	02-04911-PW1
Electrical Connections Detail	02-04911-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		62	ITEM : 14047	WN SERIAL NUMBER : 02-04911-47
Rev. 1	DATE: Oct-11-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		



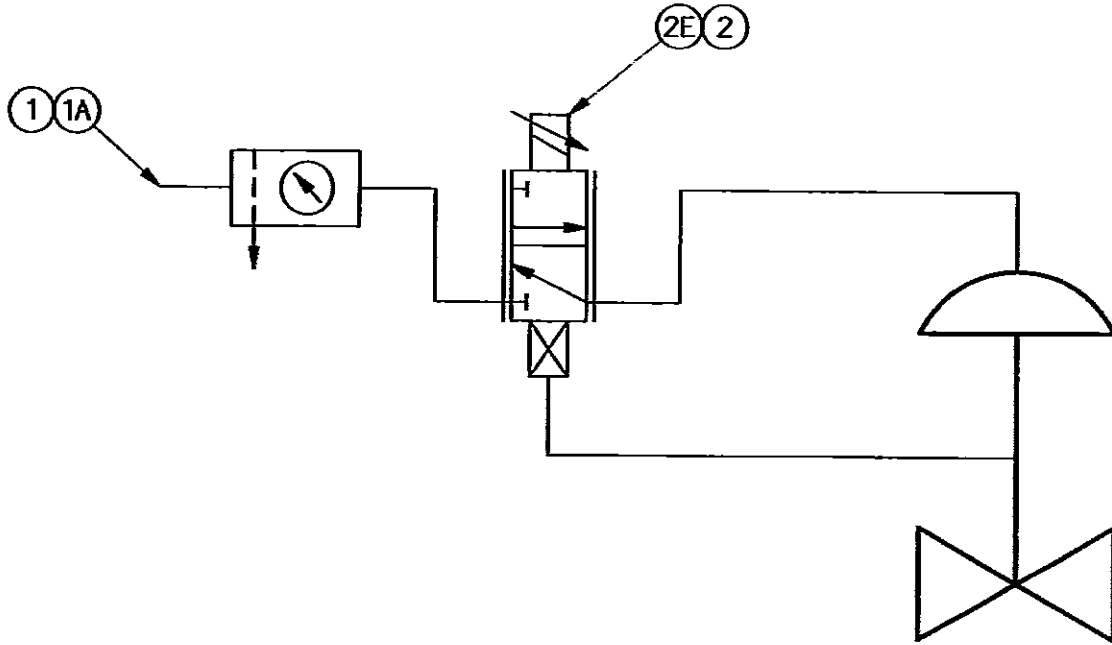
DRAWING No : 02-04911-PW1

Masonella



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10



Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal

ITEM : / MN SERIAL NUMBER : 02-04911-PW1

Rev. 0 | DATE: 11/OCT/2002 | DRAWN BY: P. SEVESTRE | ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP | CUSTOMER ORDER: 6465C 30 1541 01 0 10007



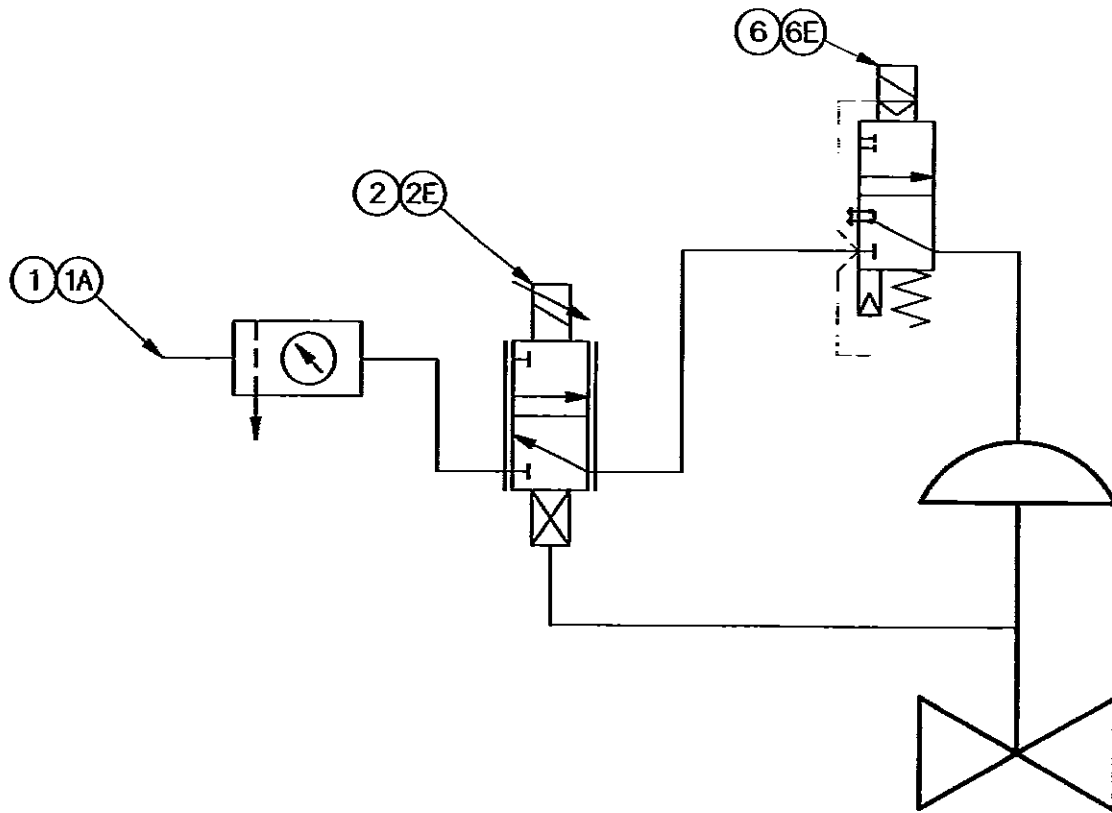
DRAWING No : 02-04911-PW2

Masonellam



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10



Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal
6	Solenoid Valve	6E	

ITEM : / MW SERIAL NUMBER : 02-04911-PW2

Rev. 0 | DATE: 11/OCT/2002 | DRAWN BY: P. SEVESTRE | ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP | CUSTOMER ORDER: 6465C 30 1541 01 0 10007

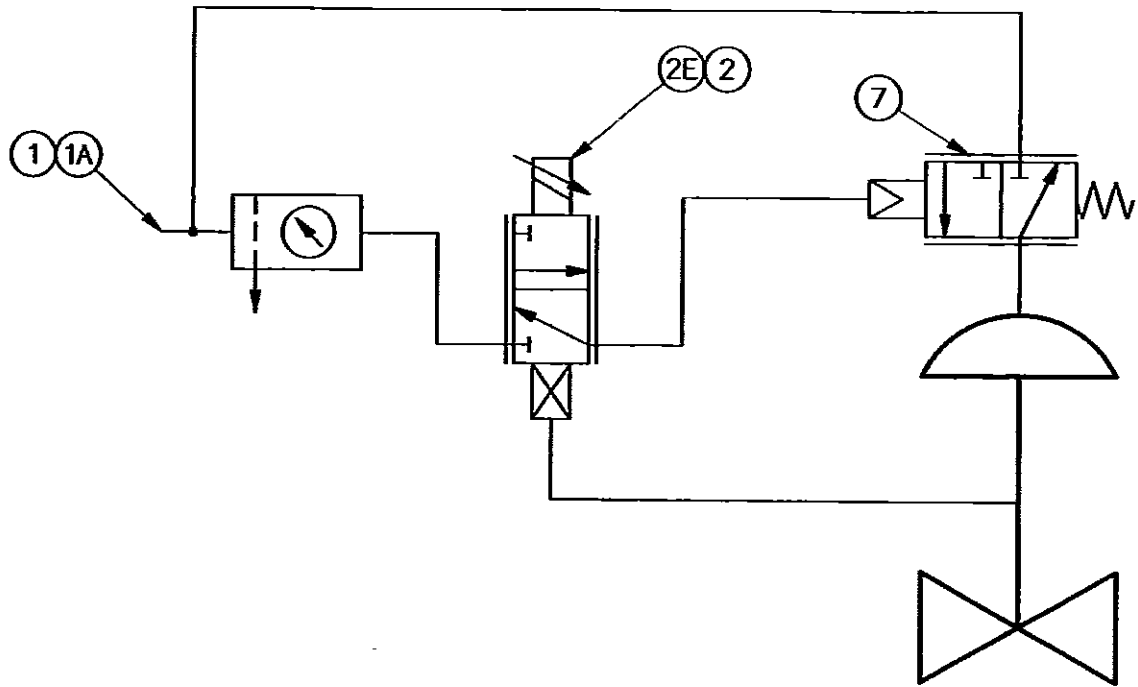


DRAWING No : 02-04911-PW3

Masonellan

DRESSER

PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10

Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal
7	Volume Booster		

ITEM : /

MN SERIAL NUMBER : 02-04911-PW3

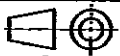
Rev. 0 DATE: 11/OCT/2002

DRAWN BY: P. SEVESTRE

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 10007



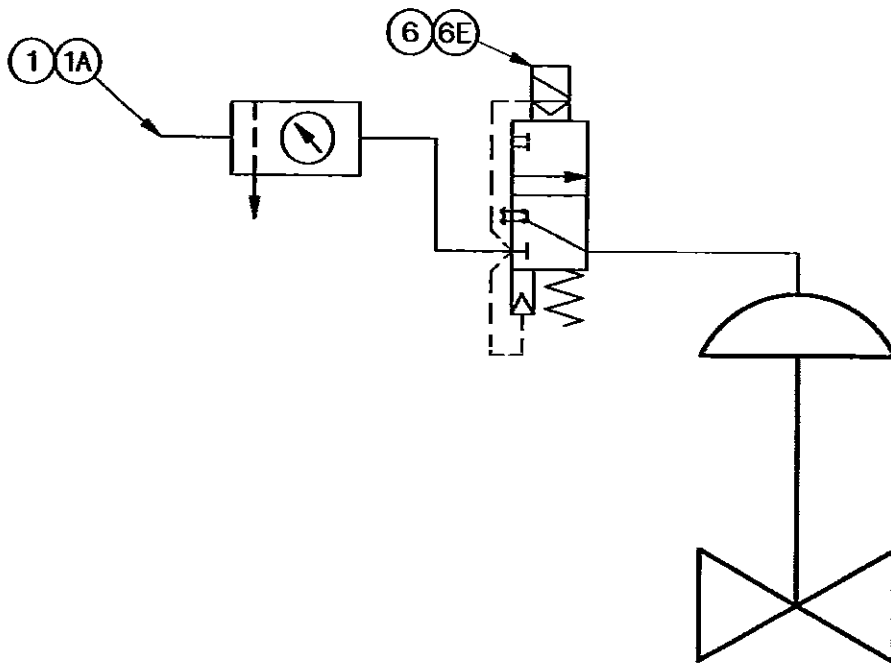
DRAWING No : 02-04911-PW4

Masonellan



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10

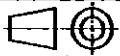


Ref.	DESCRIPTION	Ref.	CONNECTION / FUNCTION
1	Air Filler Regul. +Gauge	1A	Air Supply
6	Solenoid Valve	6E	

ITEM : / MN SERIAL NUMBER : 02-04911-PW4

Rev. 0 || DATE: 11/OCT/2002 || DRAWN BY: P. SEVESTRE || ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP || CUSTOMER ORDER: 6465C 30 1541 01 0 1007



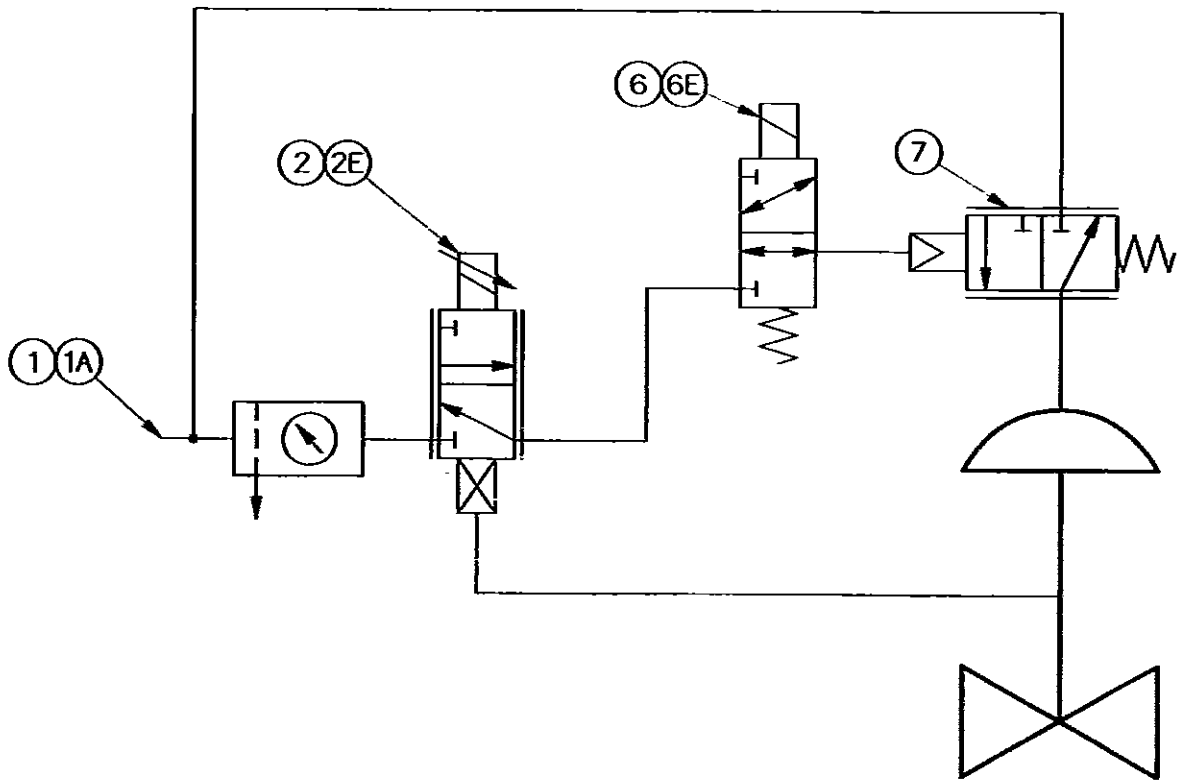
DRAWING No : 02-04911-PW6

Masonellan



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10

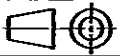


Ref.	DESCRIPTION	Ref.	CONNECTION / FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal
6	Solenoid Valve	6E	
7	Volume Booster		

ITEM : / MN SERIAL NUMBER : 02-04911-PW6

Rev. 0 | DATE: Oct-15-2002 | DRAWN BY: P. SEVESTRE | ISSUED BY: C. DROUARD

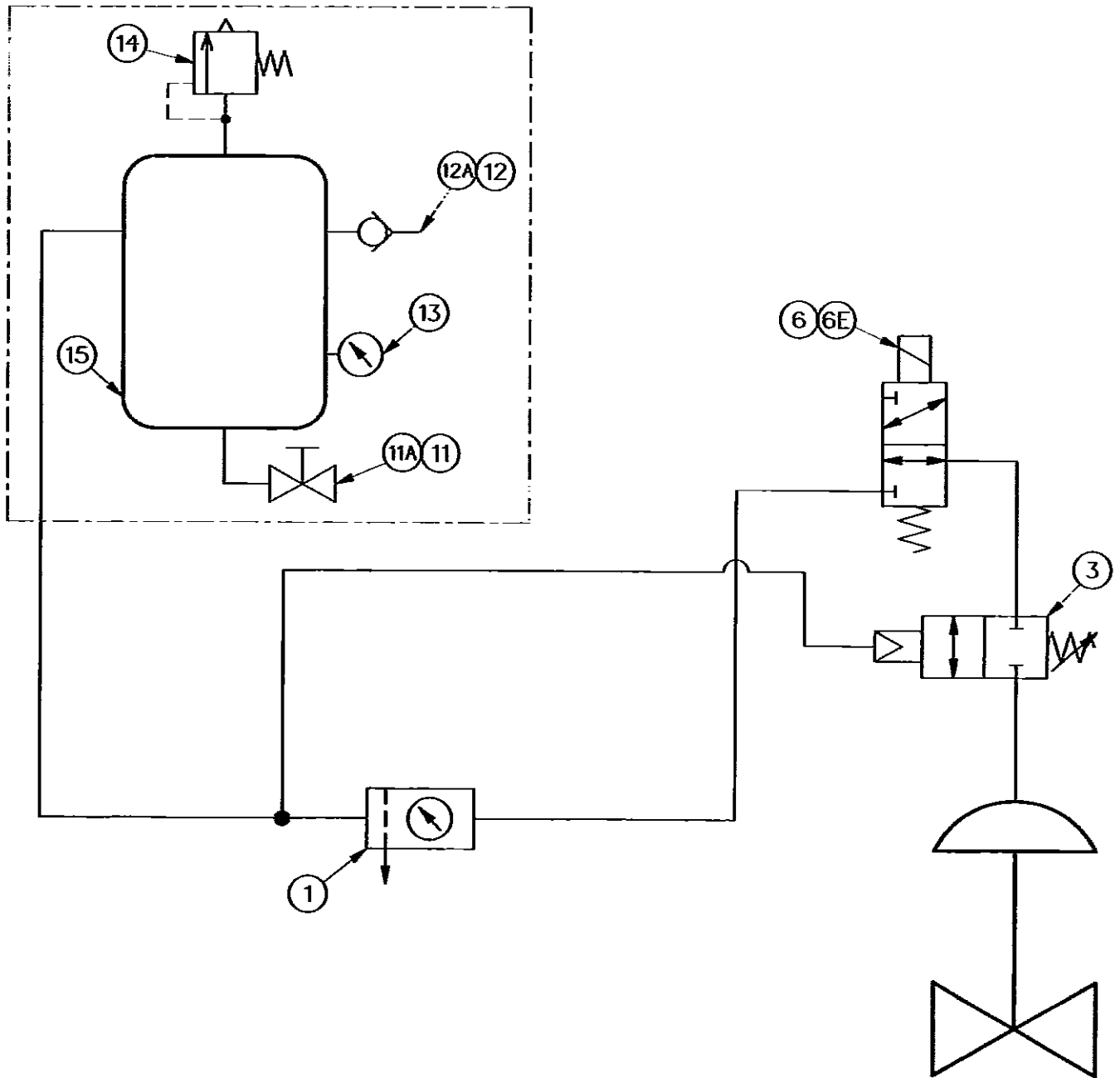
CUSTOMER: TECHNIP | CUSTOMER ORDER: 6465C 30 1541 01 0 10007



DRAWING No : 02-04911-PW7

DRESSER Masrelat

PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10

Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge		
3	Air Lock-up Valve		
6	Solenoid Valve	6E	
11	Drain Valve	11A	1/4 NPTF - Drain
12	No Return Valve	12A	1/2 NPTM - Air Supply
13	Pressure Gauge		
14	Relief Valve		
15	Volume Tank		

ITEM : / MN SERIAL NUMBER : 02-04911-PW7

Rev. 1 | DATE: Mar-17-2003 | DRAWN BY: P. SEVESTRE | ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 10007

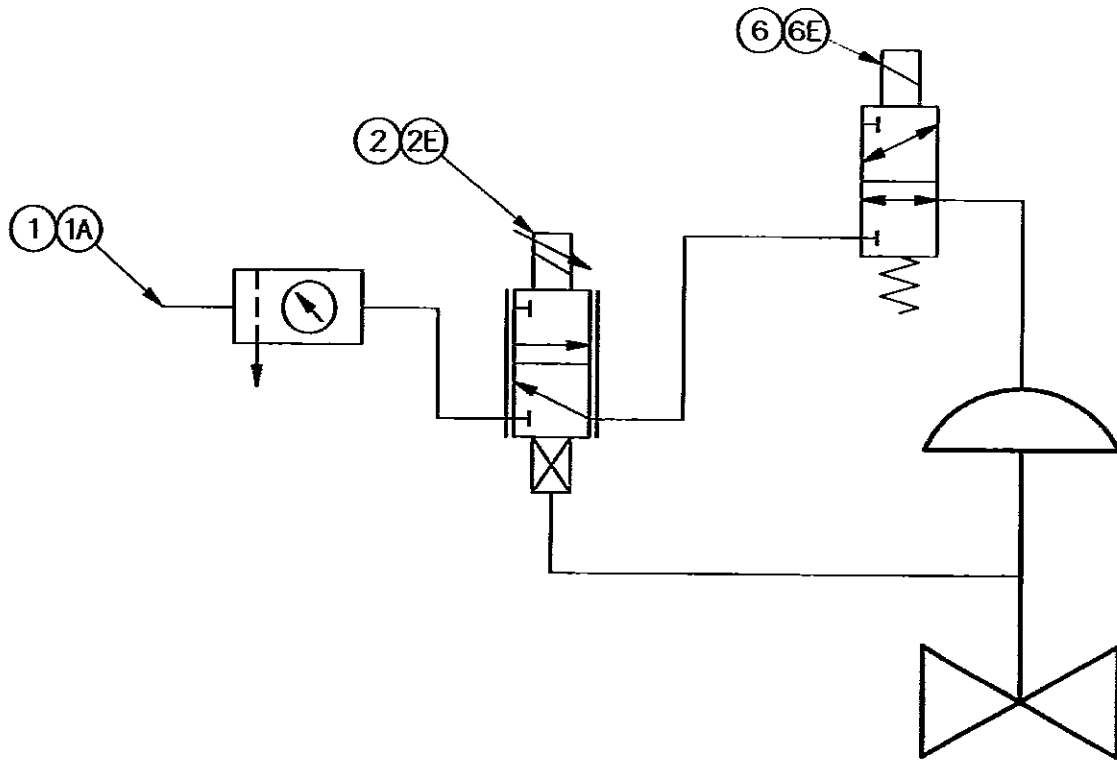


DRAWING No : 02-04911-PW9

Masonellan



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10

Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal
6	Solenoid Valve	6E	

ITEM : / MN SERIAL NUMBER : 02-04911-PW9

Rev. 0 || DATE: 16/OCT/2002 || DRAWN BY: P. SEVESTRE || ISSUED BY: C. DROUARD

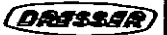
CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 10007



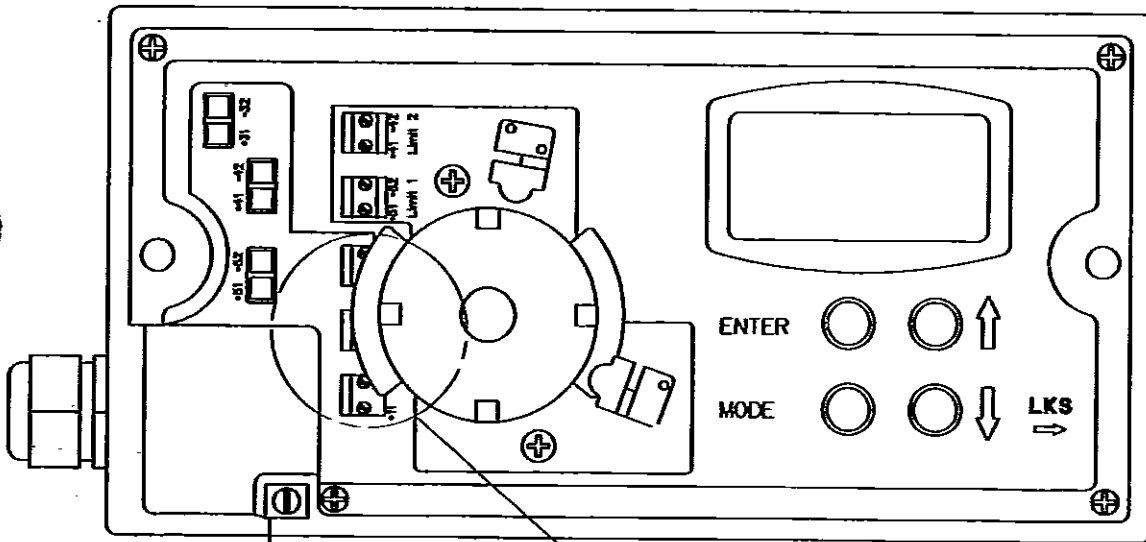
DRAWING No : 02-04911-EC1

Masonellan

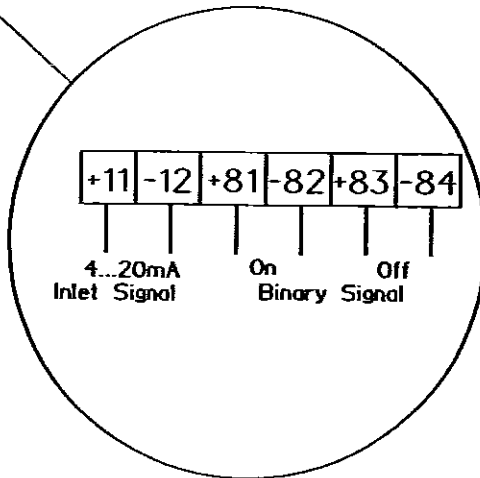


ELECTRICAL CONNECTIONS DETAIL

ELECTROPNEUMATIC POSITIONER TZID-C



Earth Terminal



Rev. 0

DATE: 11/OCT/2002

DRAWN BY: P. SEVESTRE

ITEM :

SN SERIAL NUMBER : 02-04911-EC1

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 10007



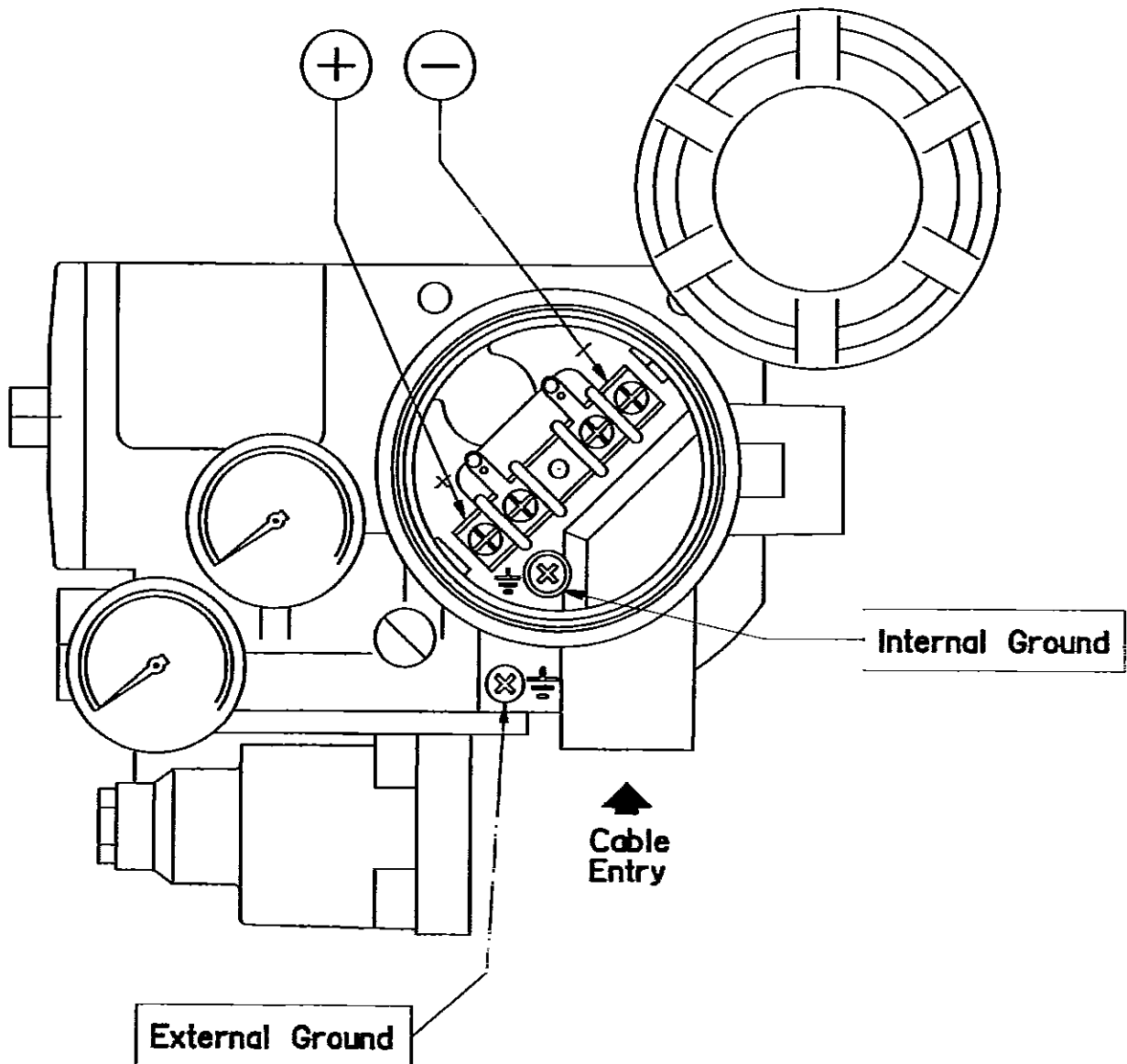
DRAWING No : 02-04911-EC2

Masonellan



ELECTRICAL CONNECTIONS DETAIL

ELECTROPNEUMATIC POSITIONER FVP



Rev. 0

DATE: 11/OCT/2002

DRAWN BY: P. SEVESTRE

ITEM :

MN SERIAL NUMBER : 02-04911-EC2

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 10007



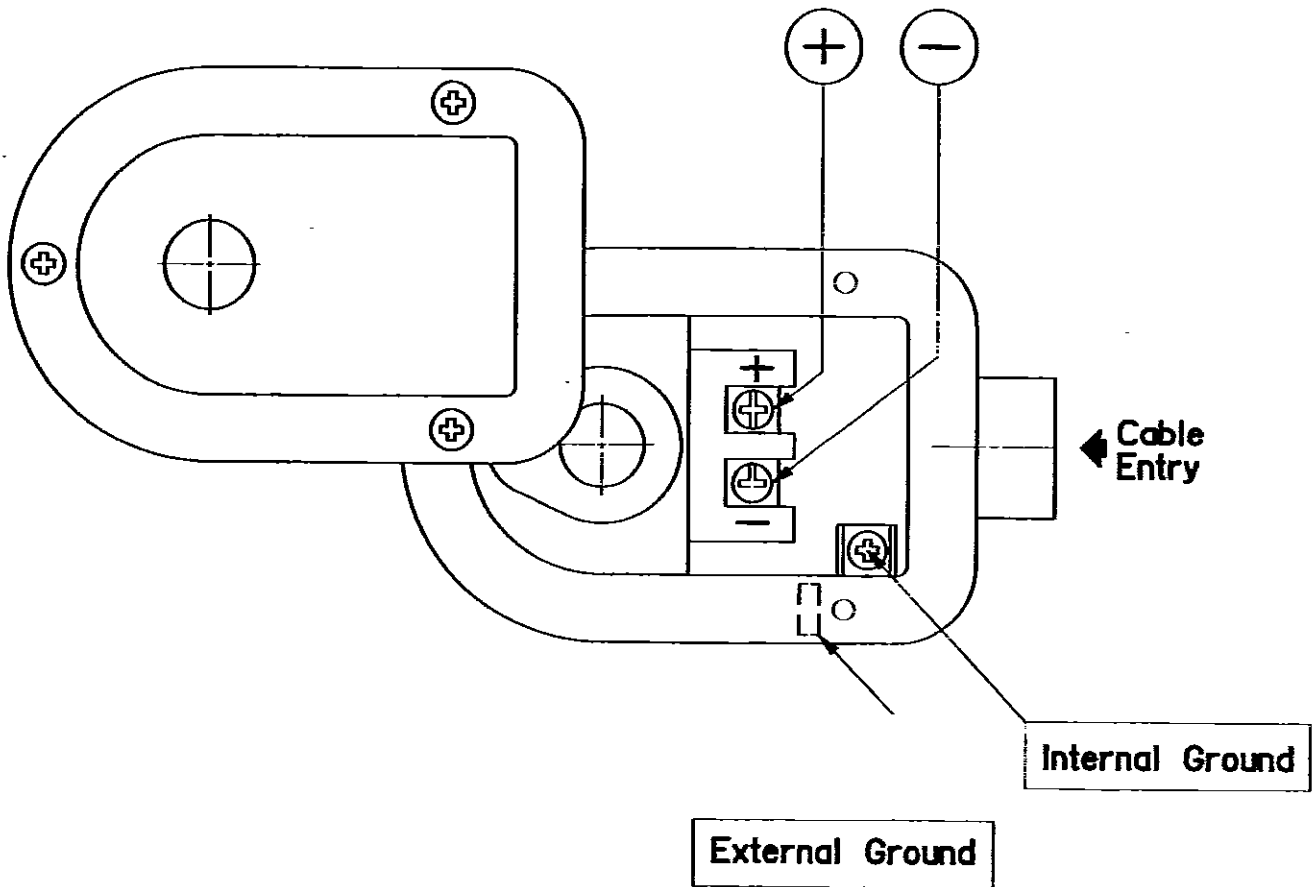
DRAWING No : 02-04911-EC3

Masonellan



ELECTRICAL CONNECTIONS DETAIL

WSTIS B317A308 SOLENOID VALVE



Rev. 0

DATE: 11/OCT/2002

DRAWN BY:

P. SEVESTRE

ITEM : / MN SERIAL NUMBER : 02-04911-EC3

ISSUED BY:

C. DROUARD

CUSTOMER:

TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 10007



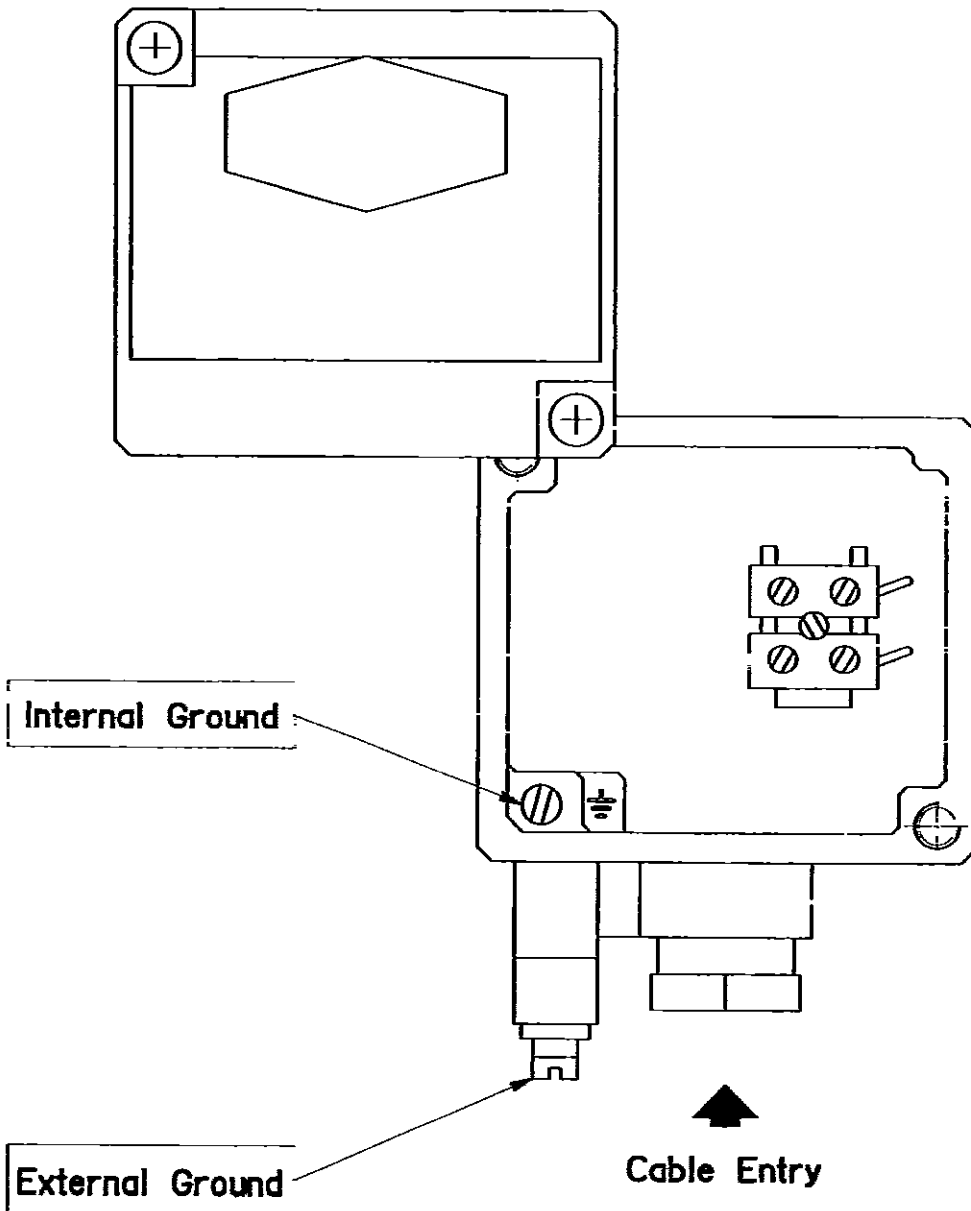
DRAWING No : 02-04911-EC5

Masonellan

DRISER

ELECTRICAL CONNECTIONS DETAIL

240 1112 3962 SOLENOID VALVE



ITEM : /

WN SERIAL NUMBER : 02-04911-EC5

Rev. 0 | DATE: Oct-15-2002

DRAWN BY:

P. SEVESTRE

ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007



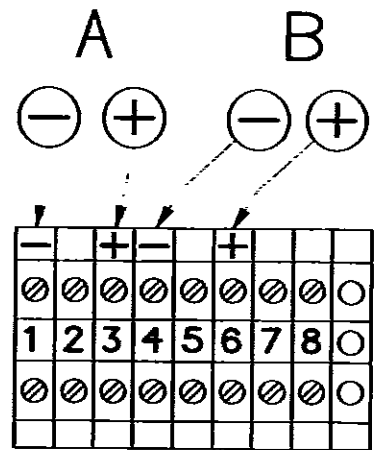
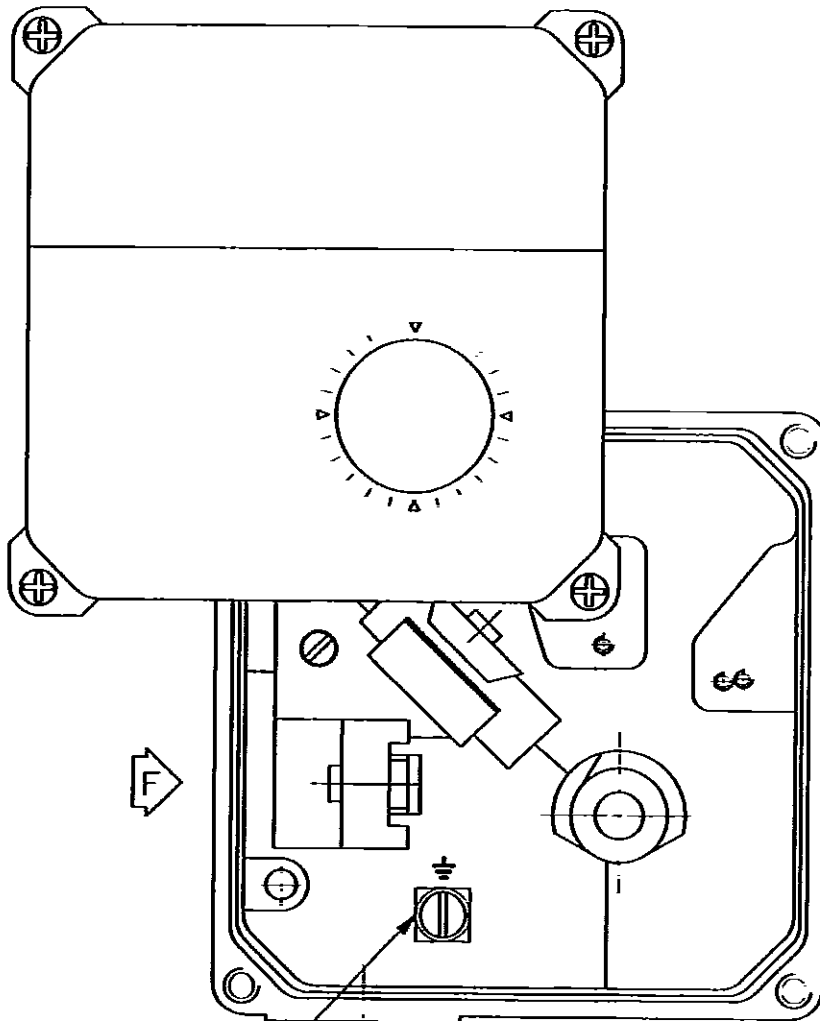
DRAWING No : 02-04911-EC6

Masonellan



ELECTRICAL CONNECTIONS DETAIL

LIMIT SWITCHES NI 7201/XS1



Detail View F

Internal Ground

Cable Entry

- A : LIMIT SWITCH (Opening)
- B : LIMIT SWITCH (Closing)

Rev. 0

DATE: Oct-16-2002

DRAWN BY:

ITEM : / P. SEVESTRE

WIN SERIAL NUMBER : 02-04911-EC6

ISSUED BY:

C. DROUARD

CUSTOMER:

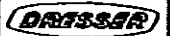
TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007



PLAN/DRWG : 02-04911-LD1

Masonellan

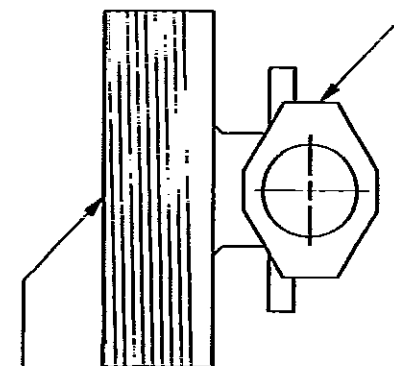


DETAIL RACCORDEMENTS ELECTRIQUES
ELECTRICAL CONNECTIONS DETAIL

DETECTEUR FIN DE COURSE 496-4 & 5
LIMIT DETECTOR 496-4 & 5

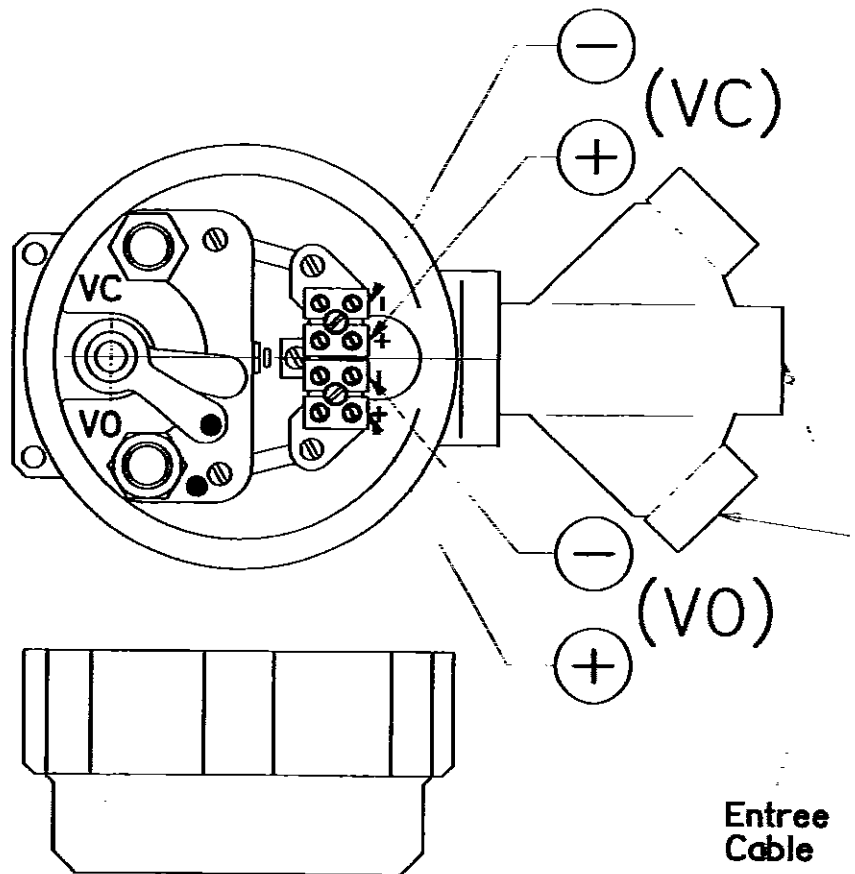
Terre Externe

External Ground



Terre Interne

Internal Ground



Entree
Cable
Cable
Entry

* PEPPERL & FUCHS * #NJ2-11-N-G

VO : Detecteur Vanne OUVERTE
: OPEN Valve Detector

VC : Detecteur Vanne FERMEE
: CLOSED Valve Detector

ITEM: /

N° DE SERIE : 02-04911-LD1
SERIAL NUMBER:

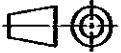
Rev: 2 | DAT.: Dec-19-2002

DESS. PAR/DRAWN BY: P. SEVESTRE

EMIS PAR/ISSUED BY: C. DROUARD

CLIENT/CUSTOMER: TECHNIP

Cde CLIENT/CUST. ORDER: 6465C30 1541 01 0 10007



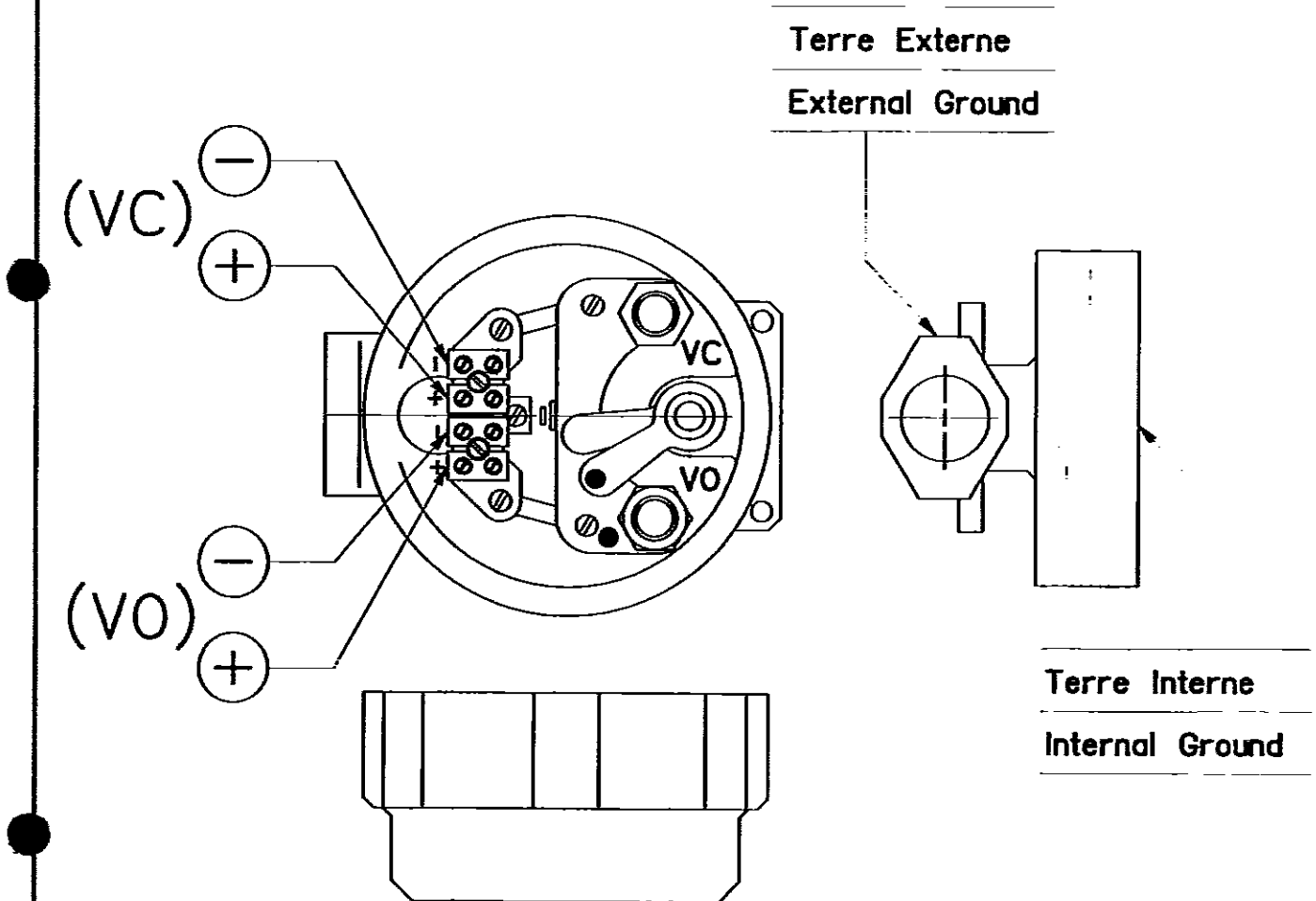
PLAN/DRWG : 02-04911-LD3

Masonellan



DETAIL RACCORDEMENTS ELECTRIQUES
ELECTRICAL CONNECTIONS DETAIL

DETECTEUR FIN DE COURSE 496-4 & 5
LIMIT DETECTOR 496-4 & 5



PEPPERL & FUCHS * #NJ2-11-N-G

VO • Detecteur OUVERTURE
• OPENING Detector

VC • Detecteur FERMETURE
• CLOSING Detector

ITEM: /

N° DE SERIE : 02-04911-LD3
SERIAL NUMBER:

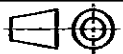
Rev: 1 | DAT.: Dec-11-2002

DESS.PAR/DRAWN BY: P. SEVESTRE

EMIS PAR/ISSUED BY: C. DROUARD

CLIENT/CUSTOMER: TECHNIP

Cde CLIENT/CUST.ORDER: 6465C30 1541 01 0 10007



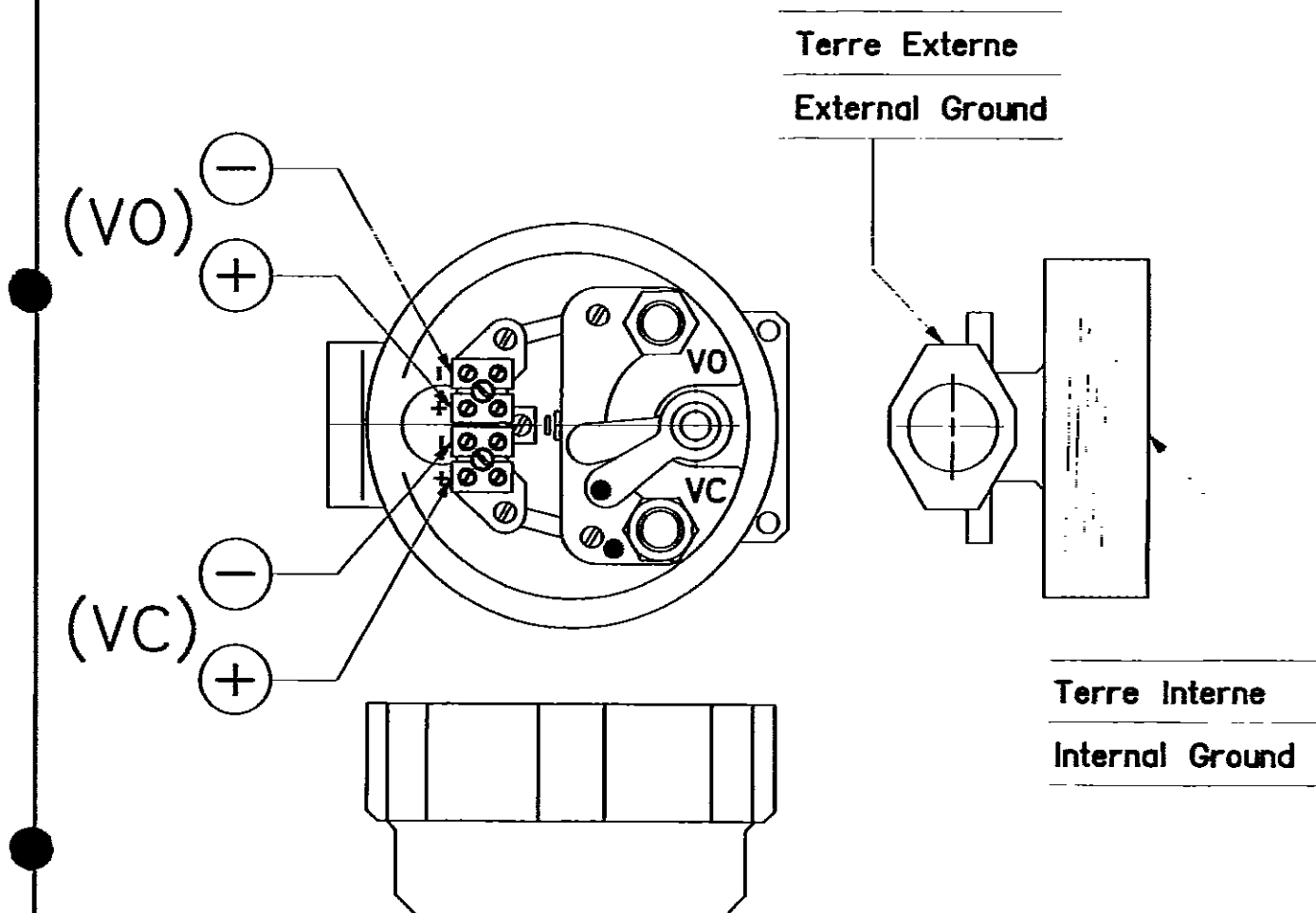
PLAN/DRWG : 02-04911-LD4

Masonellan



DETAIL RACCORDEMENTS ELECTRIQUES
ELECTRICAL CONNECTIONS DETAIL

DETECTEUR FIN DE COURSE 496-4 & 5
LIMIT DETECTOR 496-4 & 5



▪ PEPPERL & FUCHS ▪ #NJ2-11-N-G

VO : Detecteur OUVERTURE
: OPENING Detector

VC : Detecteur FERMETURE
: CLOSING Detector

ITEM: /

N° DE SERIE : 02-04911-LD4
SERIAL NUMBER:

Rev: 1 | DAT.: Dec-11-2002

DESS.PAR/DRAWN BY: P. SEVESTRE

EMIS PAR/ISSUED BY: C. DROUARD

CLIENT/CUSTOMER: TECHNIP

Cde CLIENT/CUST.ORDER:

6465C30 1541 01 0 10007



UNIT 50

OUTLINE DRAWINGS

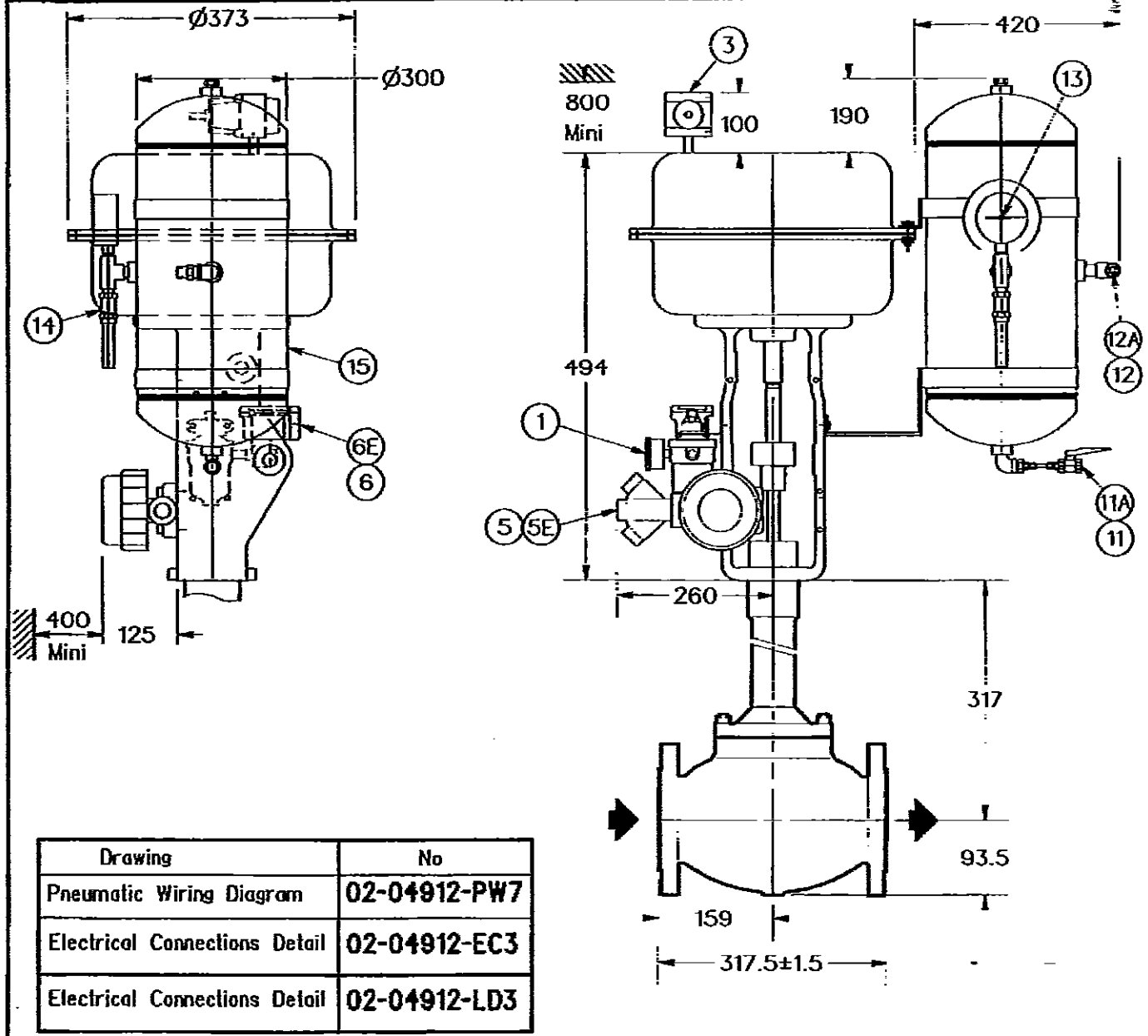
TECHNIP
VENDOR DOCUMENT REVIEW
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<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
2003.03.25 10:18:41 +01'00'
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STATUS CERTIFIED FINAL
ISSUED BY : C. DROUARD
DATE : 19/12/02

6	24/03/03	Up-dated drawings item 15001
5	19/12/02	Up-dated drawings 02-4912-01/22/LD1
4	16/12/02	Up-dated drawings with accessories
3	23/10/02	Up-dated drawings with accessories
2	03/09/02	Addition item 24 (LodB plate)
1	25/06/02	Addition items 23 and 24
0	27/05/02	FIRST ISSUE
REV	DATE	DESCRIPTION
TECHNIP	NATIONAL PETROCHEMICAL COMPANY	TP REQUISITION NUMBER
	PARS PETROCHEMICAL COMPANY	6465C-30-MR-1541-01-0-1007
		PPC REQUISITION NUMBER
		3930-30-MR-1541-01-0-1007
		EQUIPMENT NAME:
Project:	3930 - 9TH-OLEFIN COMPLEX	Control valves
	Ethane cracking plant	
DRESSER Flow Control	DOCUMENT TITLE :	DOCUMENT CODE :
	Outline drawings	A 3201
	PURCHASE ORDER :	Sheet
	02-4912 (Unit 50)	01 of 38
		Rev.
		6

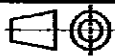
SERIES VALVE : 87-21115-EB **DN : 80 (3")** **ON AIR FAILURE : STAY-PUT (*)**
FLOW TO : OPEN **CONNECTION: 300 ANSI RF** **(*) : Tends to Open**



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW7
Electrical Connections Detail	02-04912-EC3
Electrical Connections Detail	02-04912-LD3

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0		
3	77-6	Air Lock-up valve	0.8		
5	496/5	Detectors	2.5	5E	M20x2
6	HS..B317..	Solenoid Valve	1.0	6E	M20
11	521	Drain Valve		11A	1/4" NPTF - Drain
12	2259B4MM	No Return Valve		12A	1/2" NPTM - Air Supply
13	100-T5500S L04L	Pressure Gauge(0-16bar)			
14	515984M140	Safety Valve			
15		Volume Tank(Ø300-36 liters)			

TOTAL WEIGHT(accessories + valve) in kg 125 **ITEM : 15001** **WH SERIAL NUMBER : 02-04912-01**
Rev. 5 **DATE: Feb-04-2003** **DRAWN BY: H. VICTORE** **ISSUED BY: C. DROUARD**
CUSTOMER: TECHNIP **CUSTOMER ORDER: 6465C30 1541 01 0 10007**
TAG : 30 UV 50002



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellm



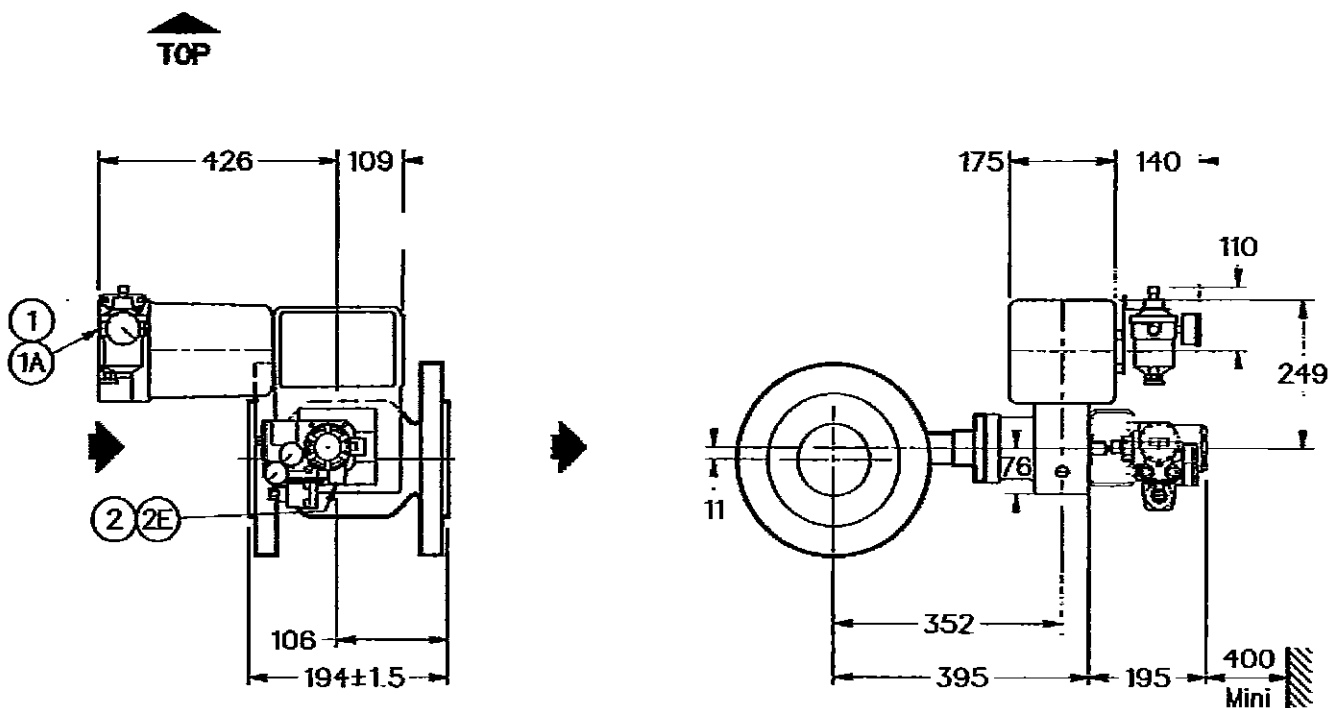
SERIES VALVE : 35-35602

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.*Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

62

ITEM : 15002

MIN SERIAL NUMBER : 02-04912-02

Rev. 1

DATE: Oct-14-2002

DRAWN BY:

P. ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 50021



DIMENSIONS in mm ±0.2

OUTLINE DRAWING

Masonellan



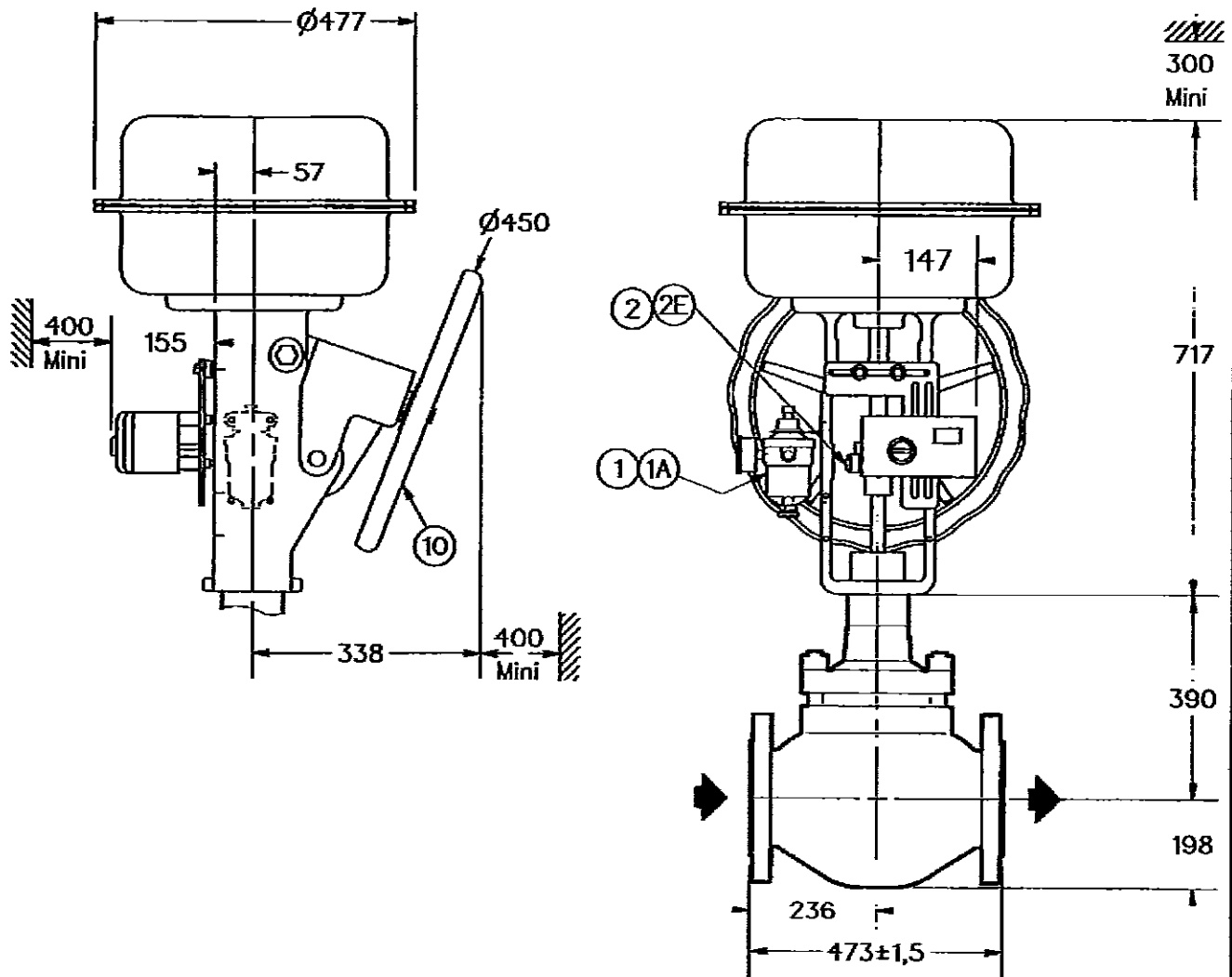
SERIES VALVE : 88-41355-/HW

DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

301

ITEM : 15003

MH SERIAL NUMBER : 02-04912-03

Rev. 1 DATE: Oct-14-2002

DRAWN BY: P. ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 FV 50021



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellam

DRESSER

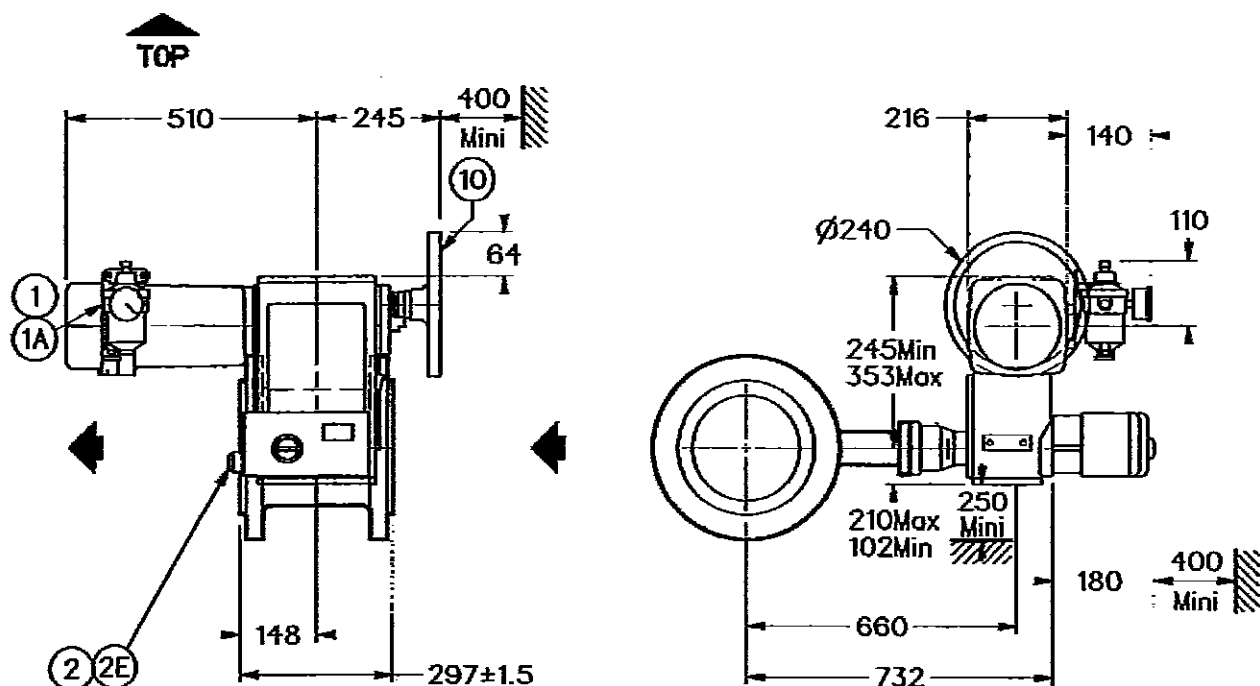
SERIES VALVE : 30-30222-/HW

DN : 250 (10")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

166

ITEM : 15004

MIN SERIAL NUMBER : 02-04912-04

Rev. 1

DATE: Oct-14-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 50022 A



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellian

DRESSER

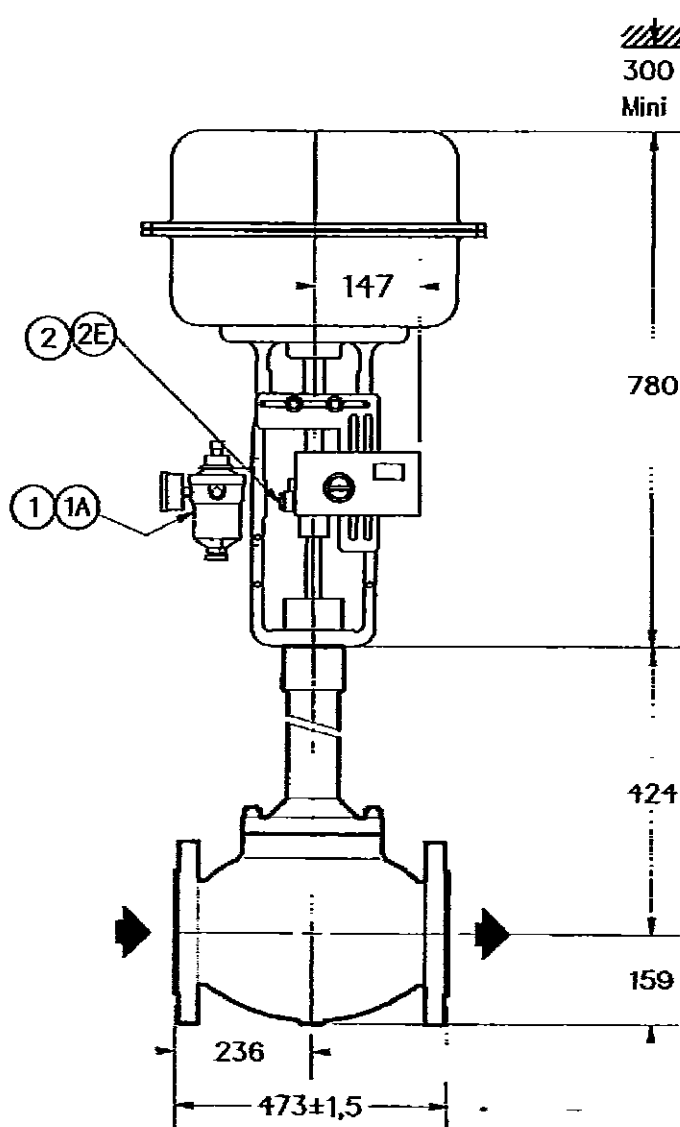
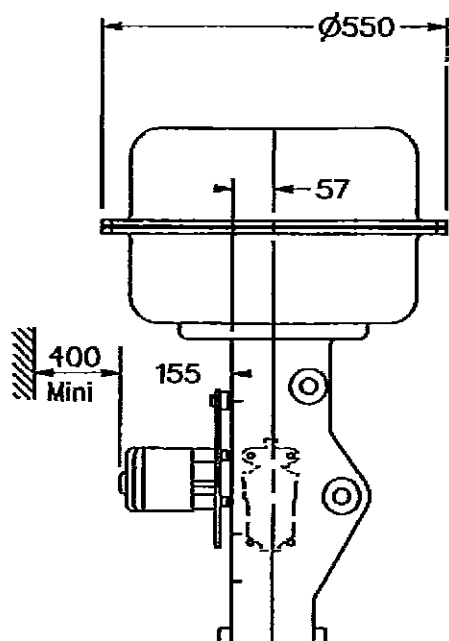
SERIES VALVE : 88-21125-EB

DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

283

ITEM : 15005

MN SERIAL NUMBER : 02-04912-05

Rev. 1

DATE: Oct-14-2002

DRAWN BY:

P. ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 50022B



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



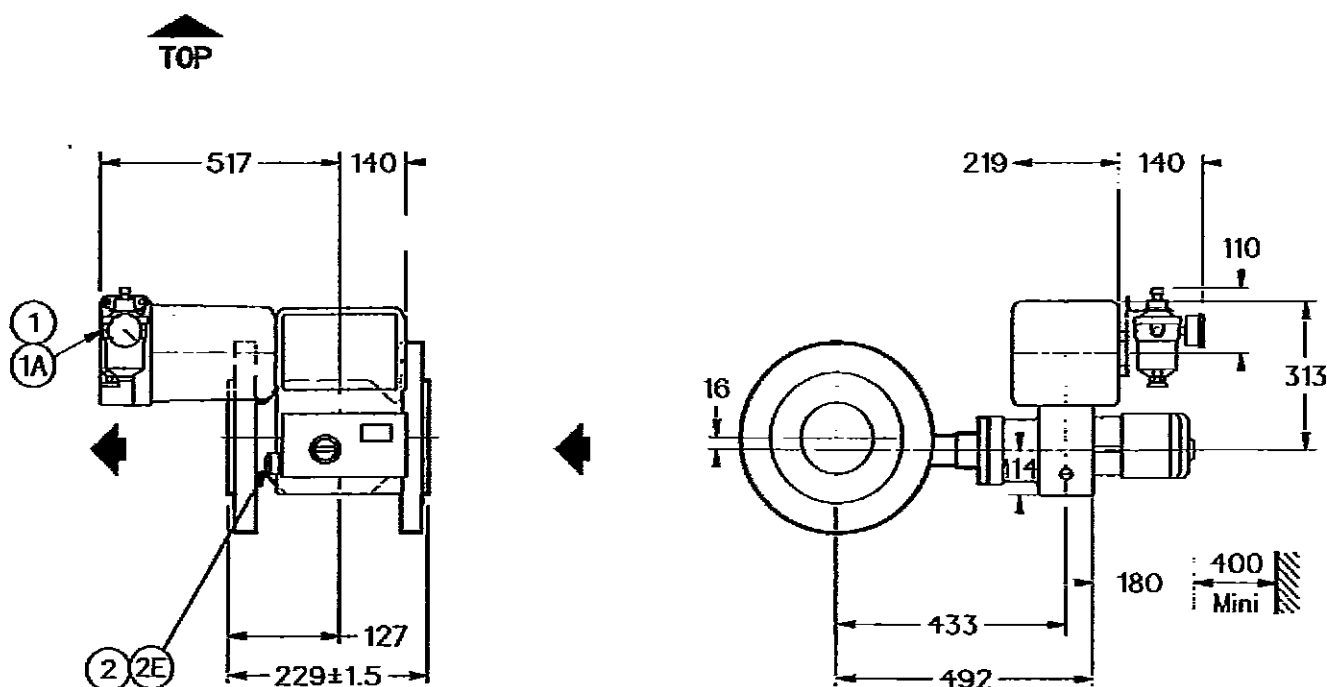
SERIES VALVE : 35-35202

DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gouge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

120

ITEM : 15006

WH SERIAL NUMBER : 02-04912-06

Rev. 1 | DATE: Oct-14-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 50023 A



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



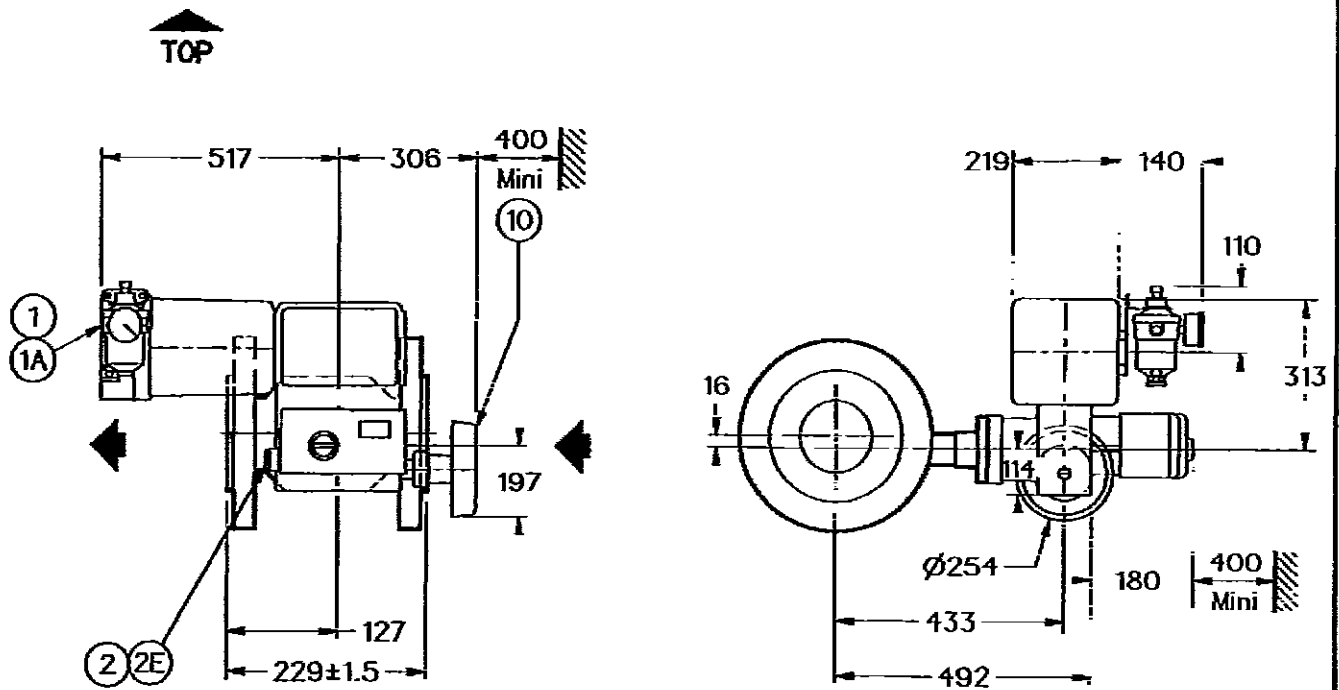
SERIES VALVE : 35-35202-/HW

DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

120

ITEM : 15007

MN SERIAL NUMBER : 02-04912-07

Rev. 1

DATE: Oct-14-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 50023 B



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



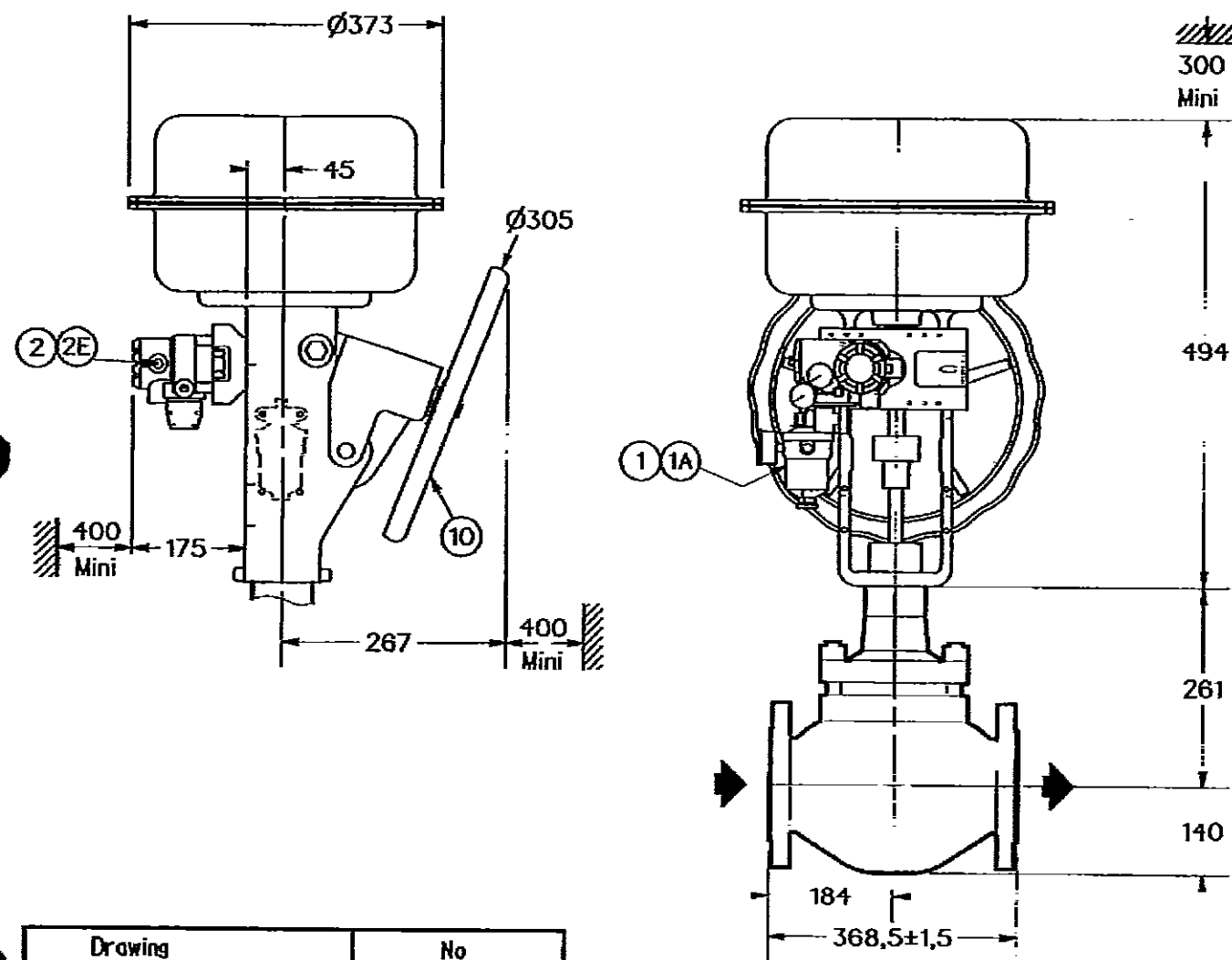
SERIES VALVE : 88-41355-/HW

DN : 4"x2"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

141

ITEM : 15008

LN SERIAL NUMBER : 02-04912-08

Rev. 1

DATE: Oct-14-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

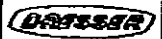
TAG : 30 PV 50031



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



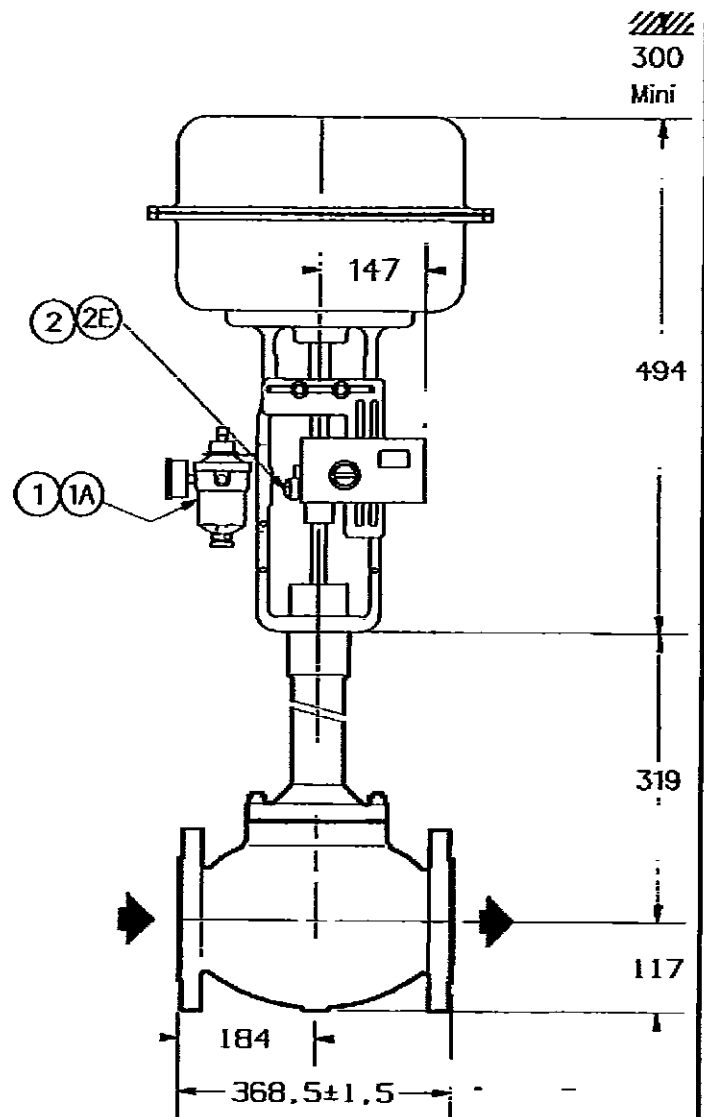
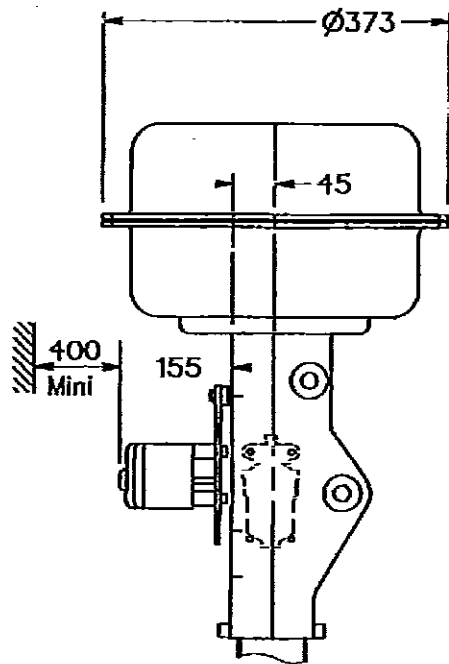
SERIES VALVE : 88-21115-EB

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

128

ITEM : 15009

M/N SERIAL NUMBER : 02-04912-09

Rev. 1

DATE: Oct-14-2002

DRAWN BY:

P. ROUELLE

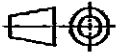
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

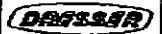
TAG : 30 LV 50031



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



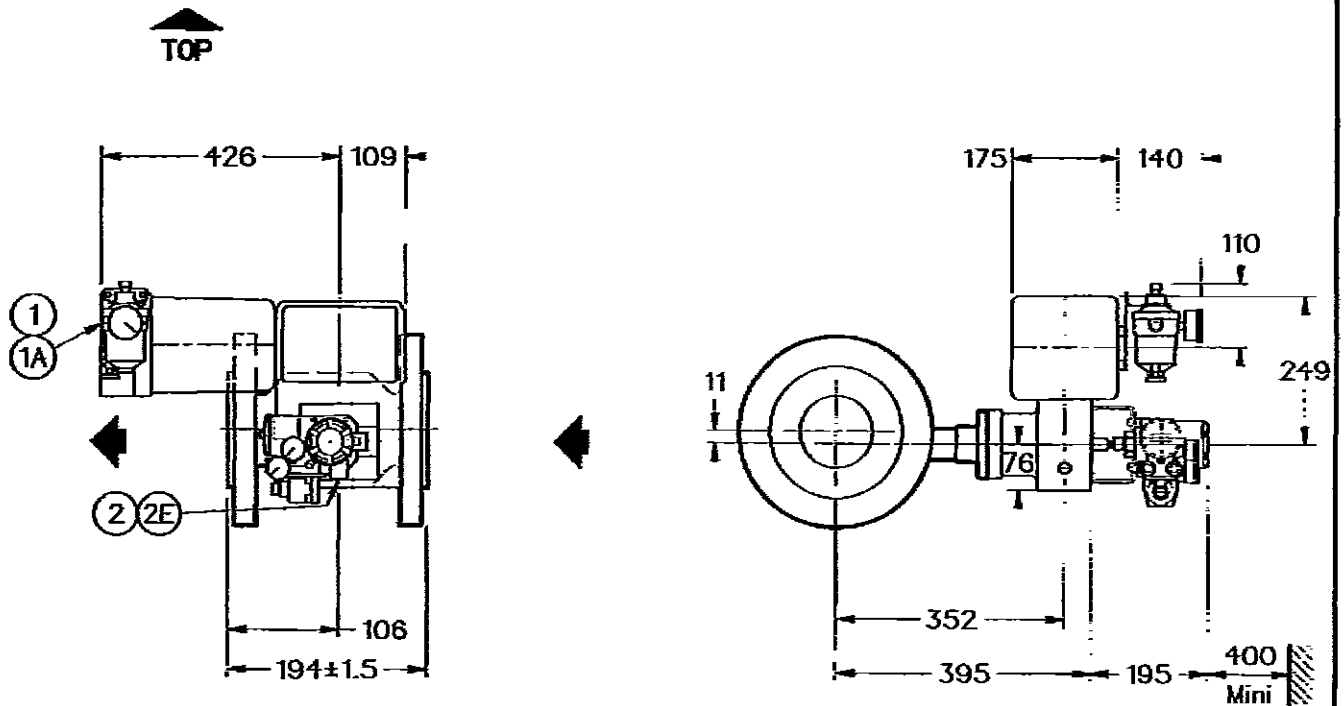
SERIES VALVE : 35-35202

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

62

ITEM : 15010

MH SERIAL NUMBER : 02-04912-10

Rev. 1

DATE: Oct-14-2002

DRAWN BY:

P. ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 50033



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



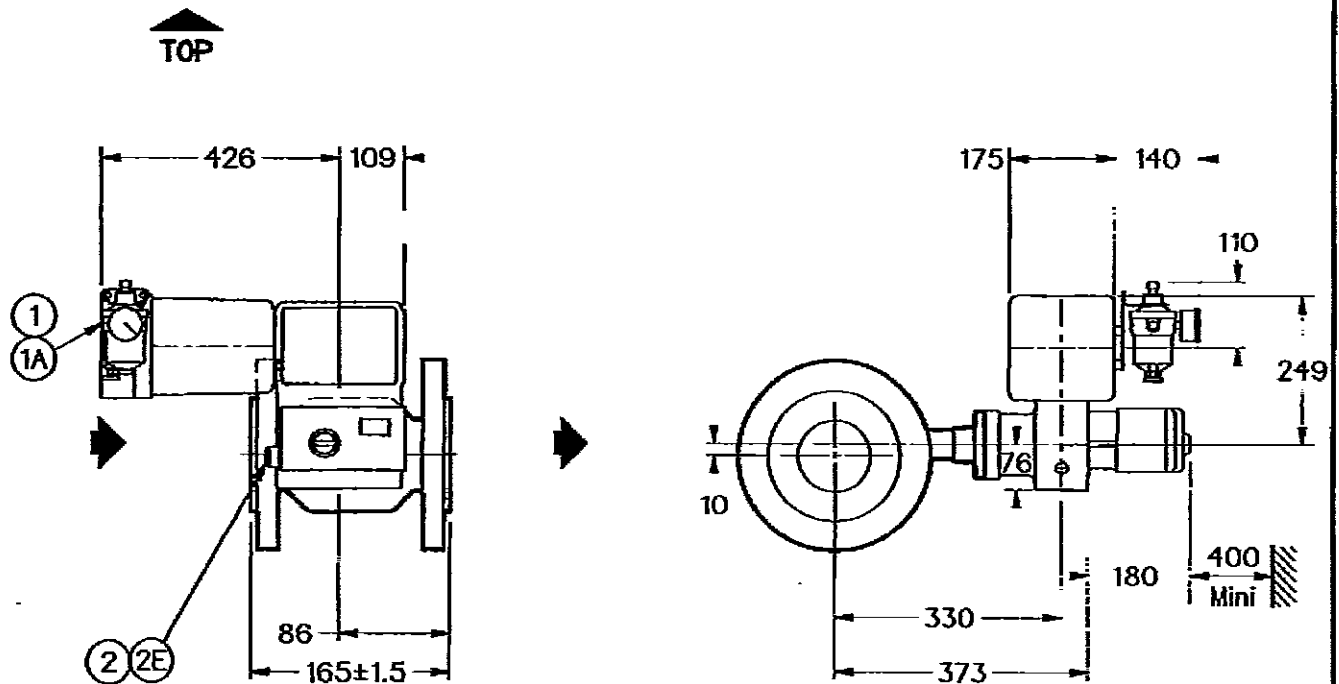
SERIES VALVE : 35-35602

DN : 80 (3")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

48

ITEM : 15011

MN SERIAL NUMBER : 02-04912-11

Rev. 1 DATE: Oct-14-2002

DRAWN BY: P-ROUELLE

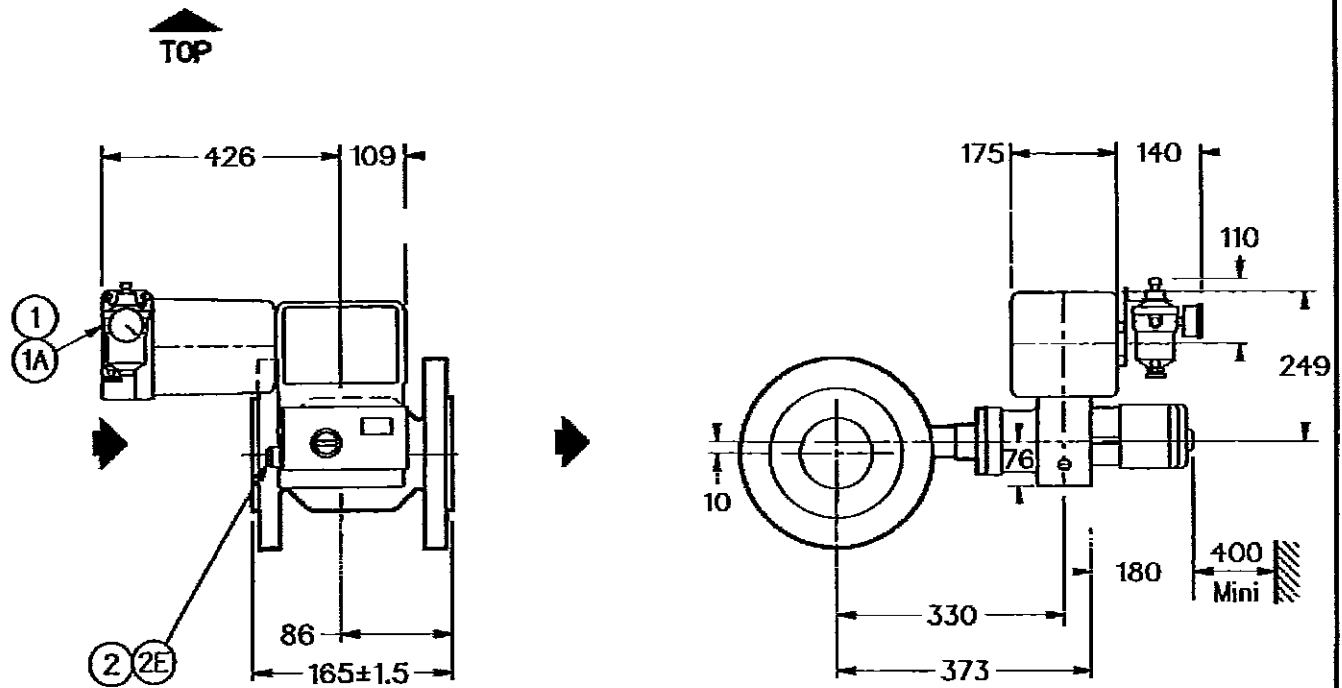
ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 50041

DIMENSIONS in mm ±5%
 SERIES VALVE : **35-35602** DN : **80 (3")** ON AIR FAILURE : **CLOSED**
 FLOW TO : **CLOSE** CONNECTION: **300 ANSI RF**



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M 20 - Signal

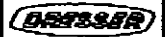
TOTAL WEIGHT (accessories + valve) in kg 48 ITEM : 15012 WN SERIAL NUMBER : **02-04912-12**
 Rev. 1 DATE: Oct-14-2002 DRAWN BY: P-ROUELLE ISSUED BY: C-DROUARD
 CUSTOMER: **TECHNIP** CUSTOMER ORDER: 6465C30 1541 01 0 10007
 TAG : **30 LV 50043**



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonell



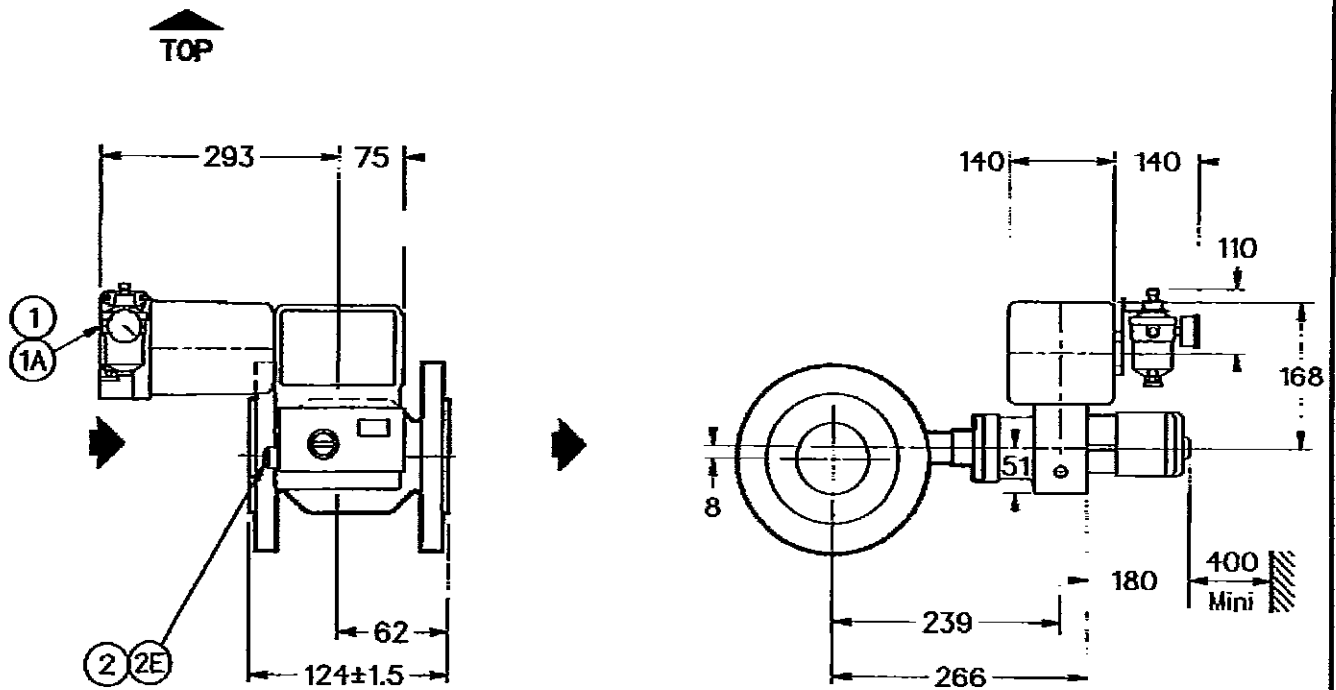
SERIES VALVE : 35-35602

DN : 50 (2")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

20

ITEM : 15013

MH SERIAL NUMBER : 02-04912-13

Rev. 1 | DATE: Oct-14-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 50045



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



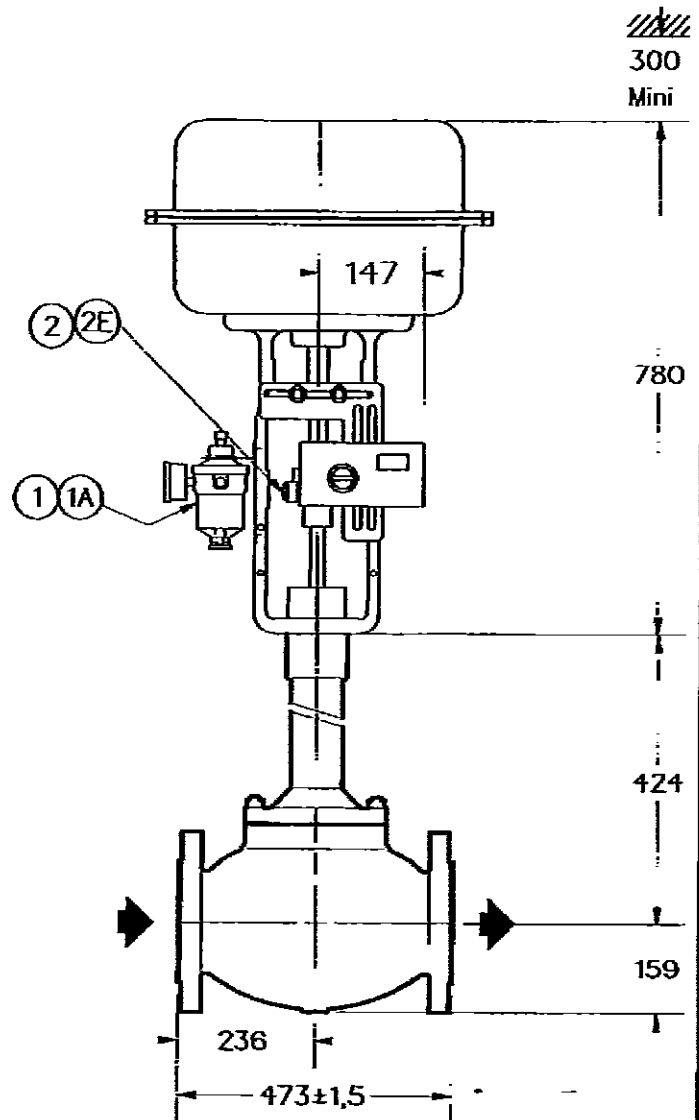
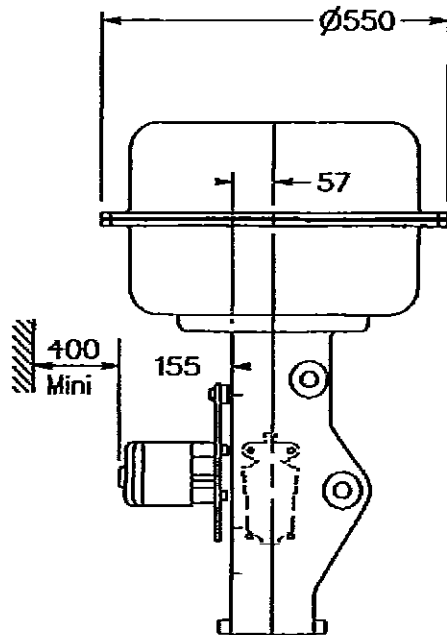
SERIES VALVE : 88-21125-EB

DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

283

ITEM : 15014

MIN SERIAL NUMBER : 02-04912-14

Rev. 1

DATE: Oct-14-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 50051



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellam



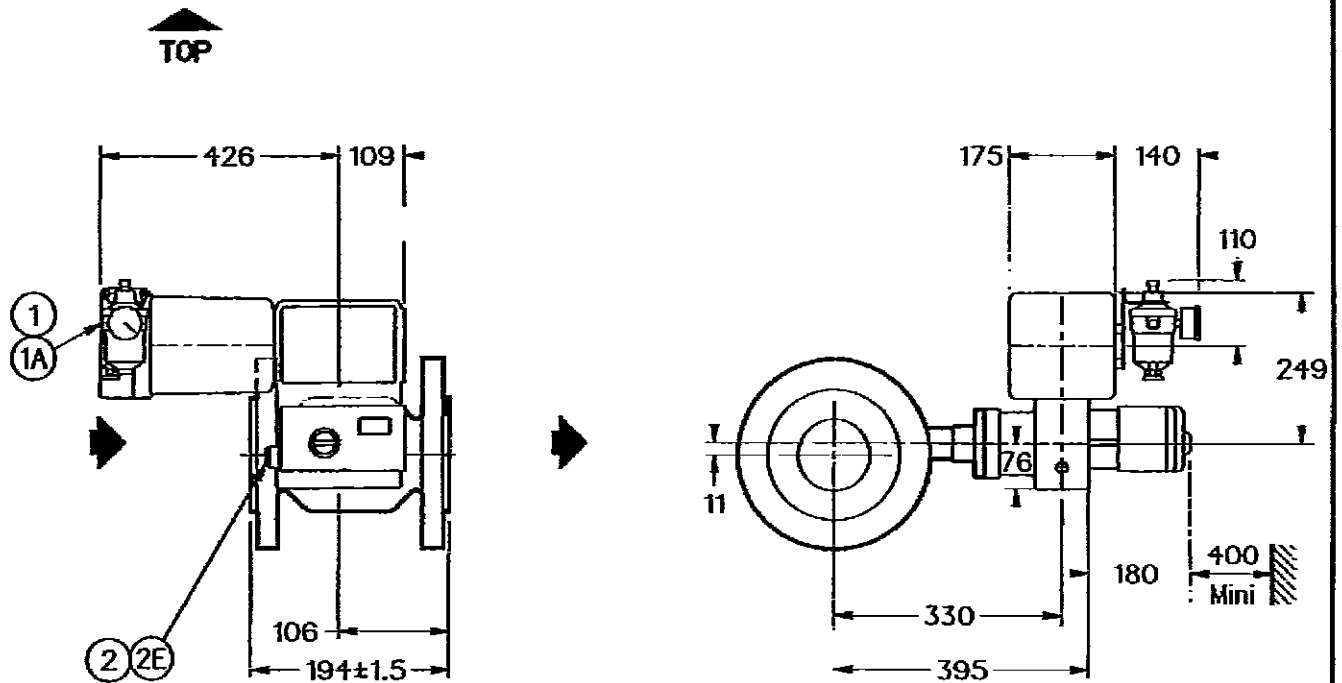
SERIES VALVE : 35-35602

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

62

ITEM : 15015

MIN SERIAL NUMBER : 02-04912-15

Rev. 1

DATE: Oct-14-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

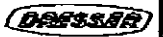
TAG : 30 LV 50061



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



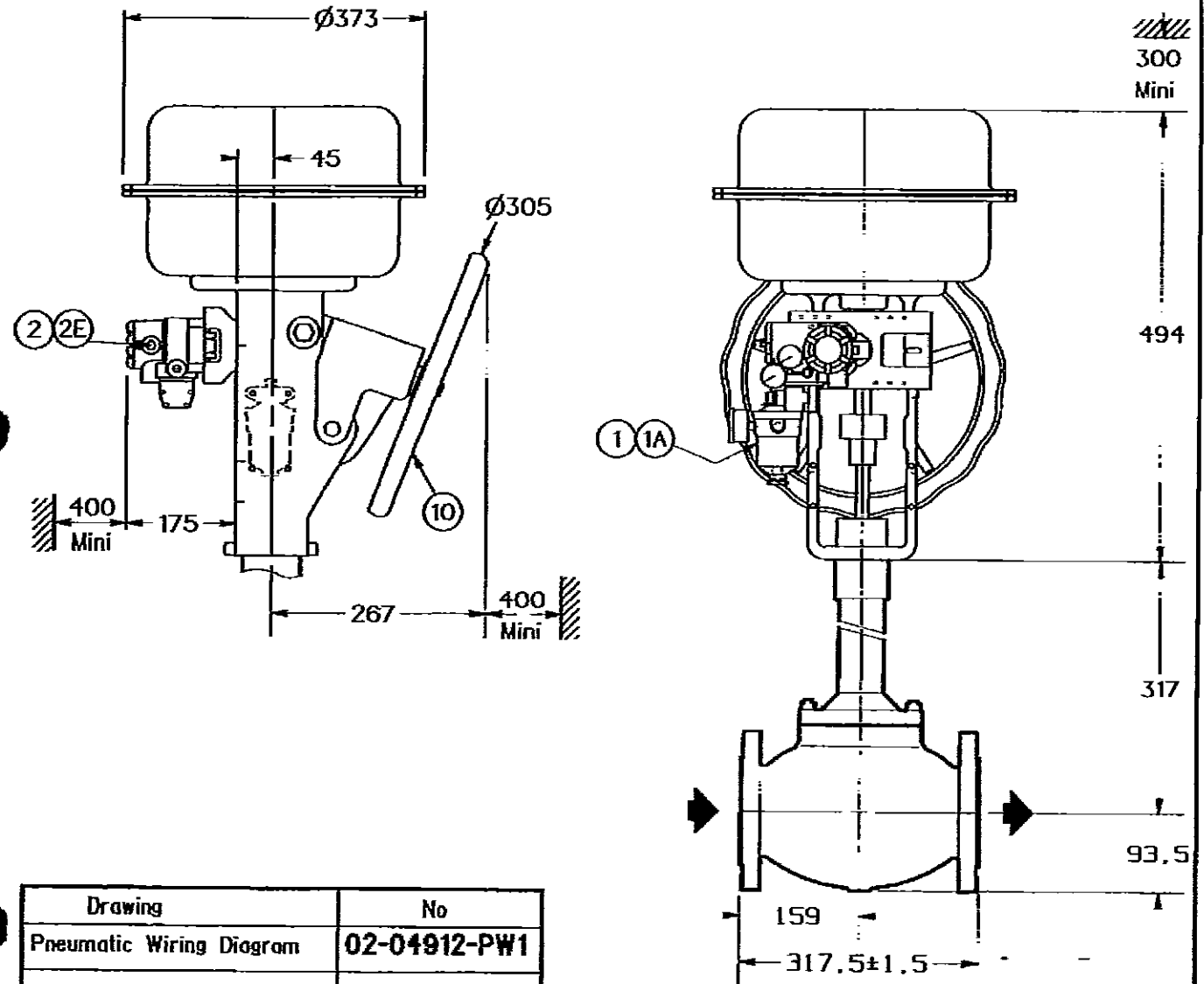
SERIES VALVE : 88-21115-EB

DN : 80 (3")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

104

ITEM : 15016

MIN SERIAL NUMBER : 02-04912-16

Rev. 1

DATE: Oct-14-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

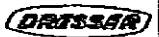
TAG : 30 TV 50062



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellam



SERIES VALVE : 88-21914-EB

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

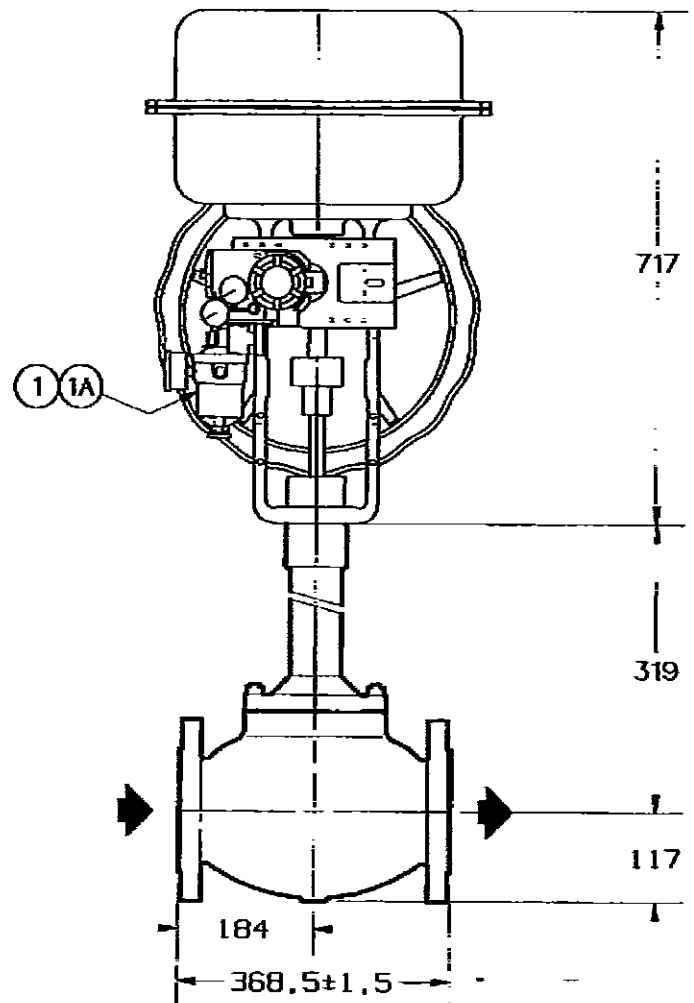
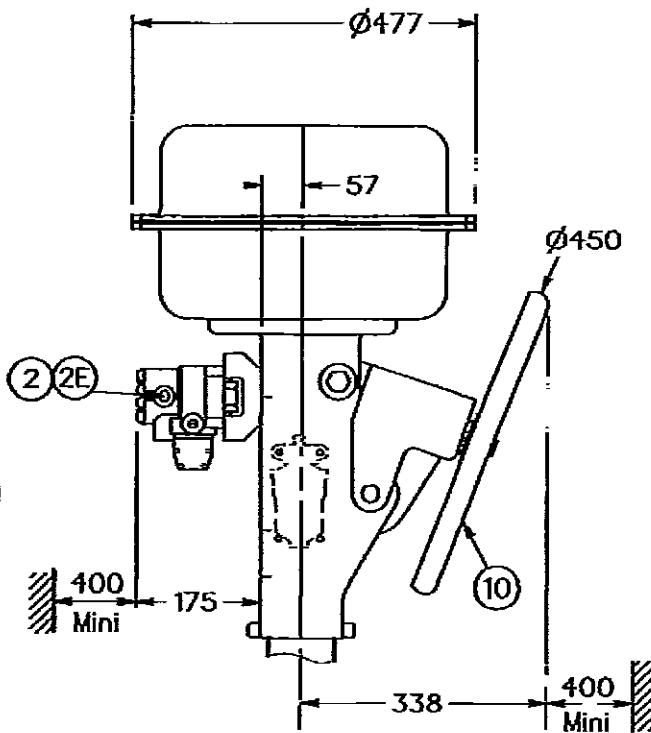
CONNECTION: 300 ANSI RF

300
Mini

717

319

117



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	H2O - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

200

ITEM : 15017

WH SERIAL NUMBER : 02-04912-17

Rev. 1 DATE: Oct-14-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 50071



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



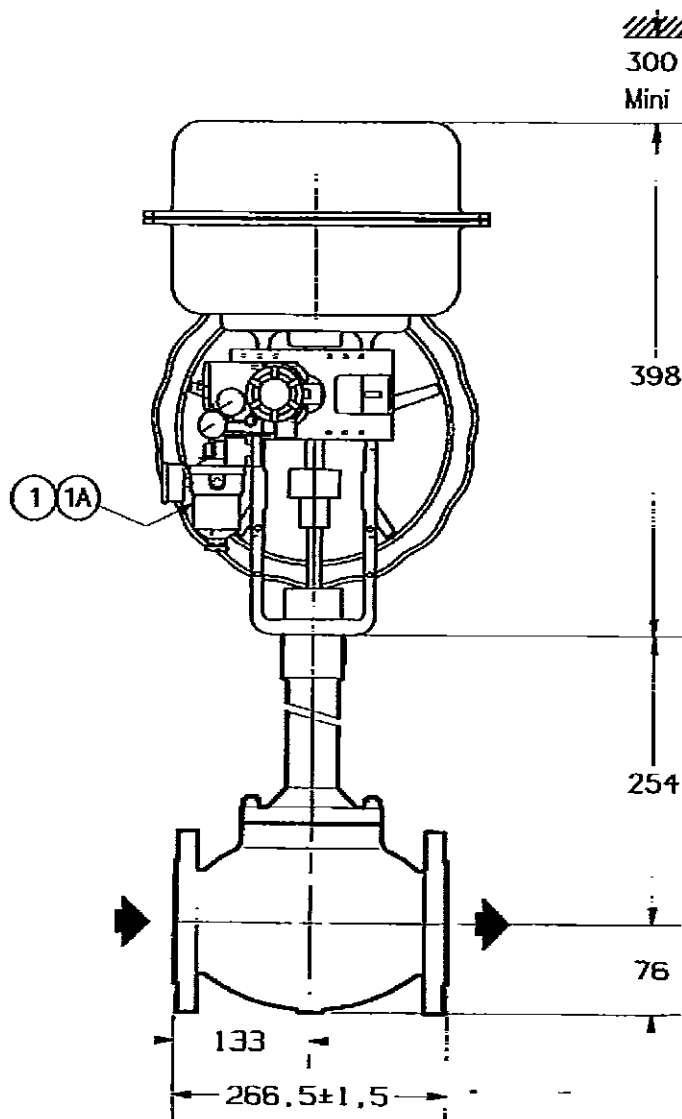
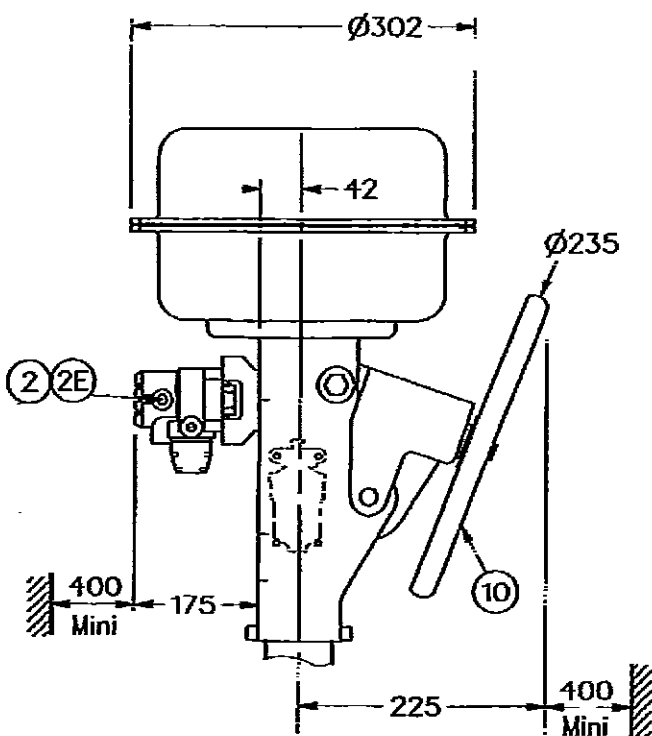
SERIES VALVE : 88-21115-EB

DN : 50 (2")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

57

ITEM : 15018

WH SERIAL NUMBER : 02-04912-18

Rev. 1

DATE: Oct-14-2002

DRAWN BY:

P-ROUELLE

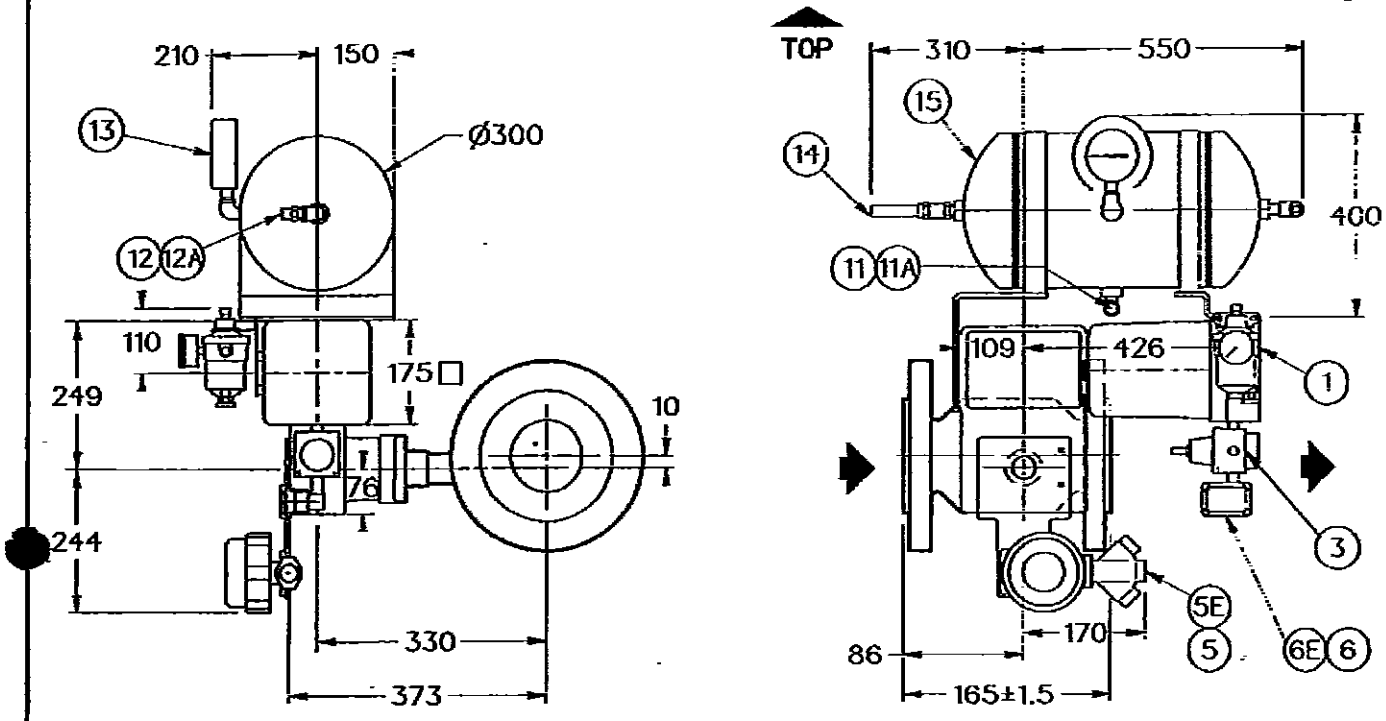
ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 TV 50072



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW7
Electrical Connections Detail	02-04912-EC3
Electrical Connections Detail	02-04912-LD1

Ref.	TYPE	DESCRIPTION	Wt	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.*Gauge	1.0		
3	77-6	Air Lock-up valve	0.8		
5	49G/5	Detectors	2.5	5E	M20x2
6	WS..B317..	Solenoid Valve	1.0	6E	M20
11	521	Drain Valve		11A	1/4" NPTF - Drain
12	225984MM	No Return Valve		12A	1/2" NPTM - Air Supply
13	100-T5500S L04L	Pressure Gauge(0-16bar)			
14	515984H140	Relief Valve			
15		Volume Tank(Ø300-36 liters)			

TOTAL WEIGHT(accessories + valve) in kg		70	ITEM : 15015	MN SERIAL NUMBER : 02-04912-19
Rev. 2	DATE: Dec-06-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C3C 1541 01 10007		
TAG : 30 UV 50102				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DANSAGER

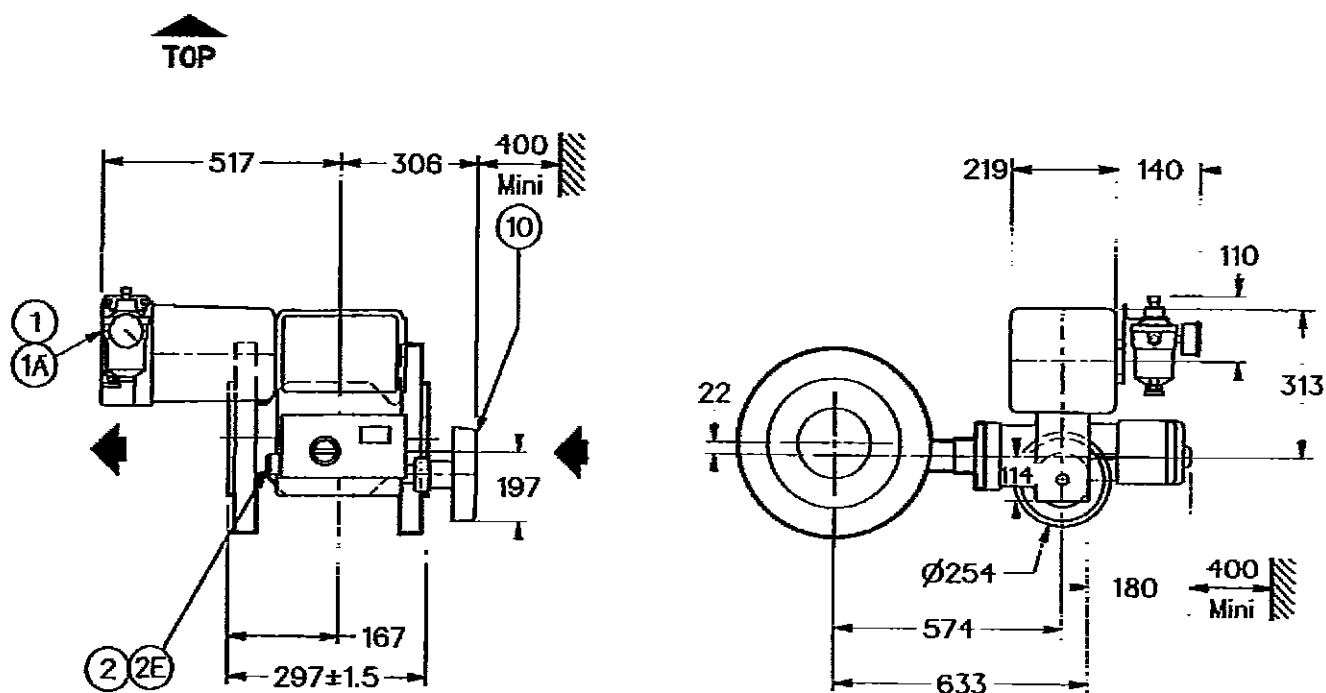
SERIES VALVE : 35-35202-/HW

DN : 250 (10")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT(accessories + valve) in kg

210

ITEM : 15020

WH SERIAL NUMBER : 02-04912-20

Rev. 1

DATE: Oct-14-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 50105



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

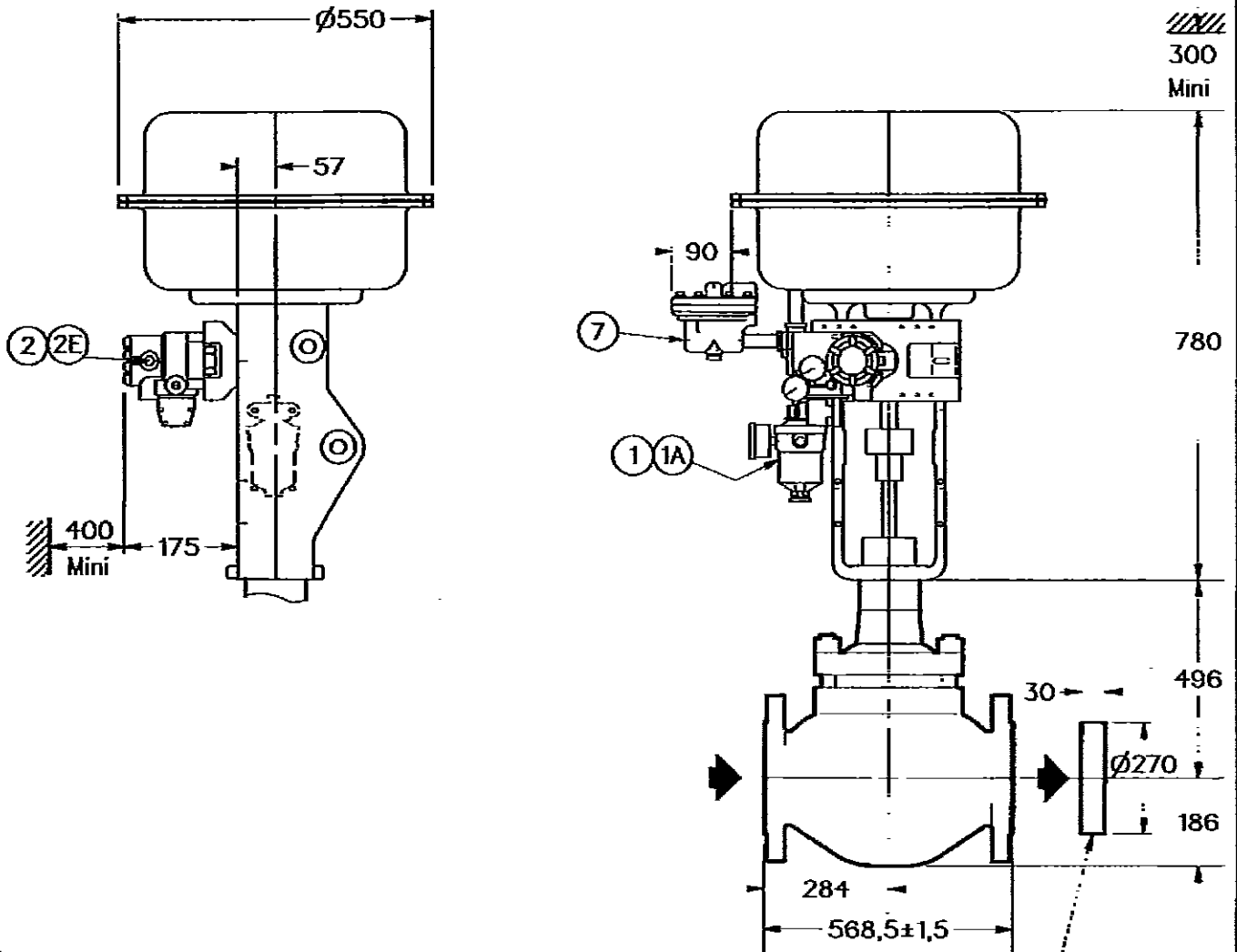
SERIES VALVE : 88-41355

DN : 8"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #81

300
Mini

780

496

186

Multiholes Plate
8" ANSI 300 RF
Cv : 650
(To be mounted
downstream the valve)

Drawing	No
Pneumatic Wiring Diagram	02-04912-PW3
Electrical Connections Detail	02-04912-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal
7	BR 400	Booster Relay	1.5		

TOTAL WEIGHT (accessories + valve) in kg

536

ITEM : 15021

MIN SERIAL NUMBER : 02-04912-21

Rev. 1 DATE: Oct-10-2002

DRAWN BY: P. ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 50121



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



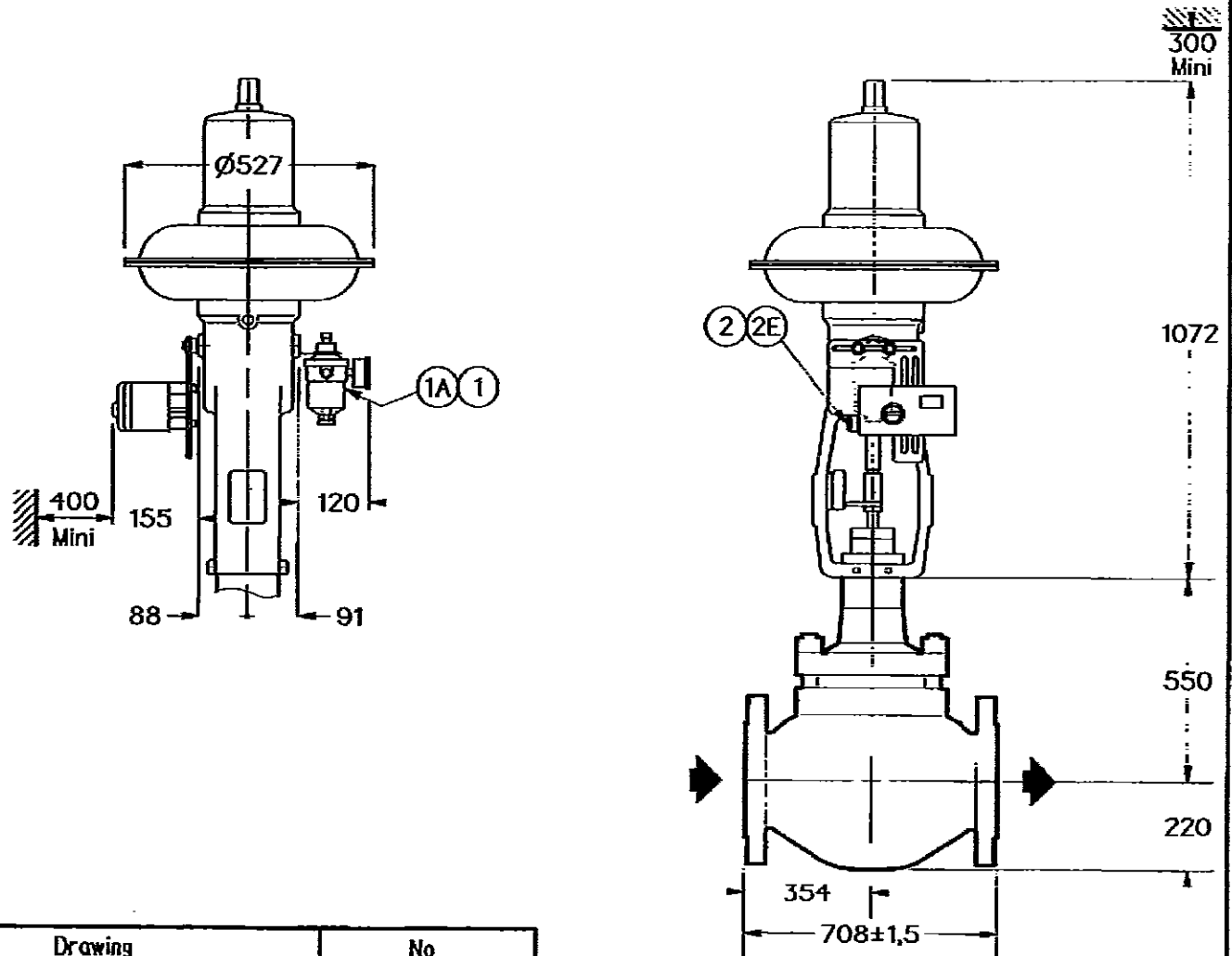
SERIES VALVE : 38-41325

DN : 10"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

760

ITEM : 15022

MIN SERIAL NUMBER : 02-04912-22

Rev. 2

DATE: Dec-19-2002

DRAWN BY:

P. ROUELLE

ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 50122



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellian

DRESSER

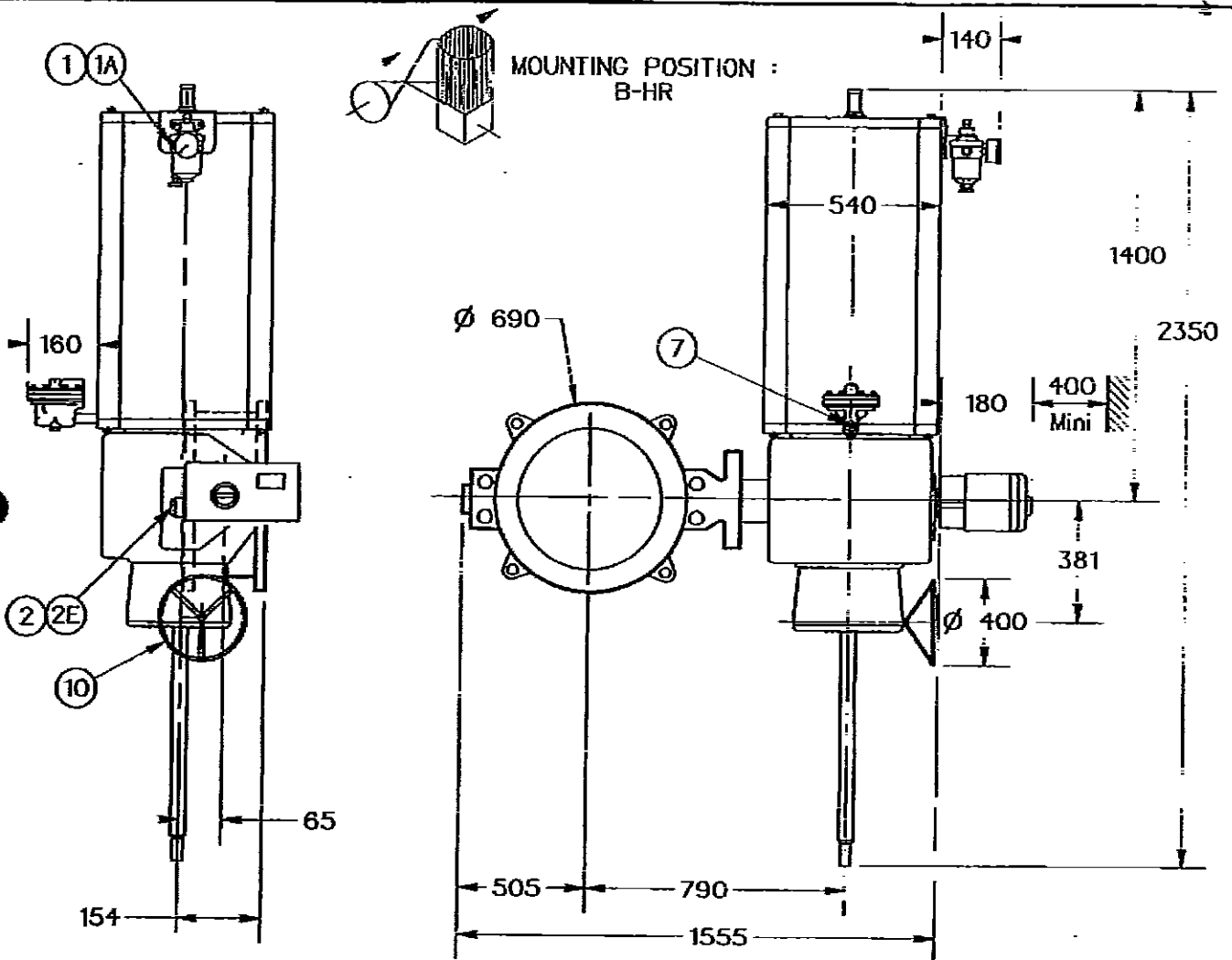
SERIES VALVE : L1DMA24AACA

DN : 600 (24")

ON AIR FAILURE : OPEN.

FLOW TO :

CONNECTION: 150 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW3
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul. + Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
7	BR400	Booster	1.0		
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

1300

ITEM : 15023

MN SERIAL NUMBER : 02-04912-23

Rev. 2

DATE: Dec-06-2002

DRAWN BY:

P. ROUELLE

ISSUED BY:

C-DROUARD

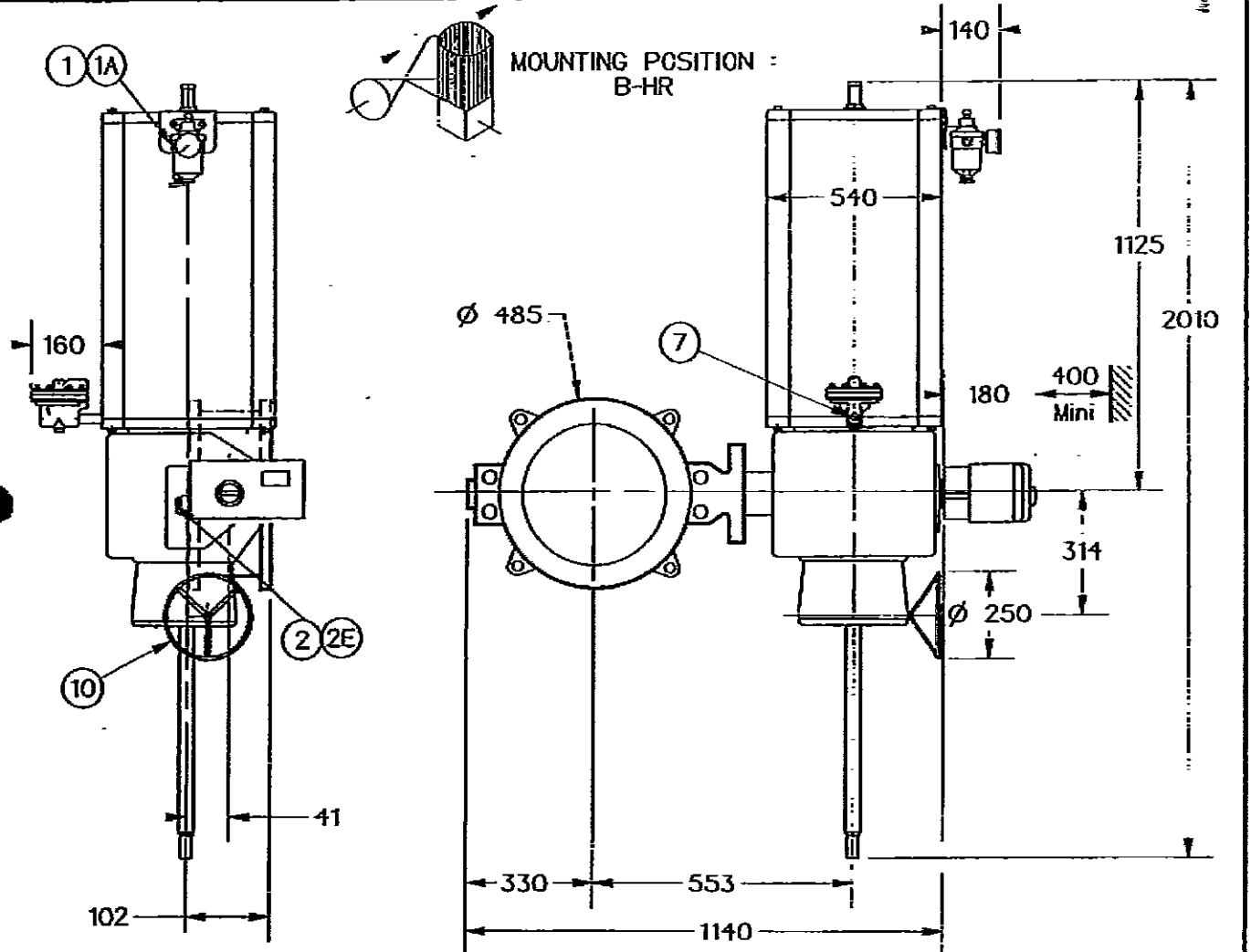
CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 50132 A

SERIES VALVE : L1DMA16AACAA DN : 400 (16") ON AIR FAILURE : OPEN.

FLOW TO : CONNECTION: 150 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW3
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Qty	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul. + Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
7	BR400	Booster	1.0		
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg: 970 ITEM: 15024 S/N SERIAL NUMBER: 02-04912-24
 Rev. 2 DATE: Dec-06-2002 DRAWN BY: P. ROUELLE ISSUED BY: C-DROUARD
 CUSTOMER: TECHNIP CUSTOMER ORDER: 6465C30 1541 01 0 10007
 TAG : 30 PV 50132 B



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

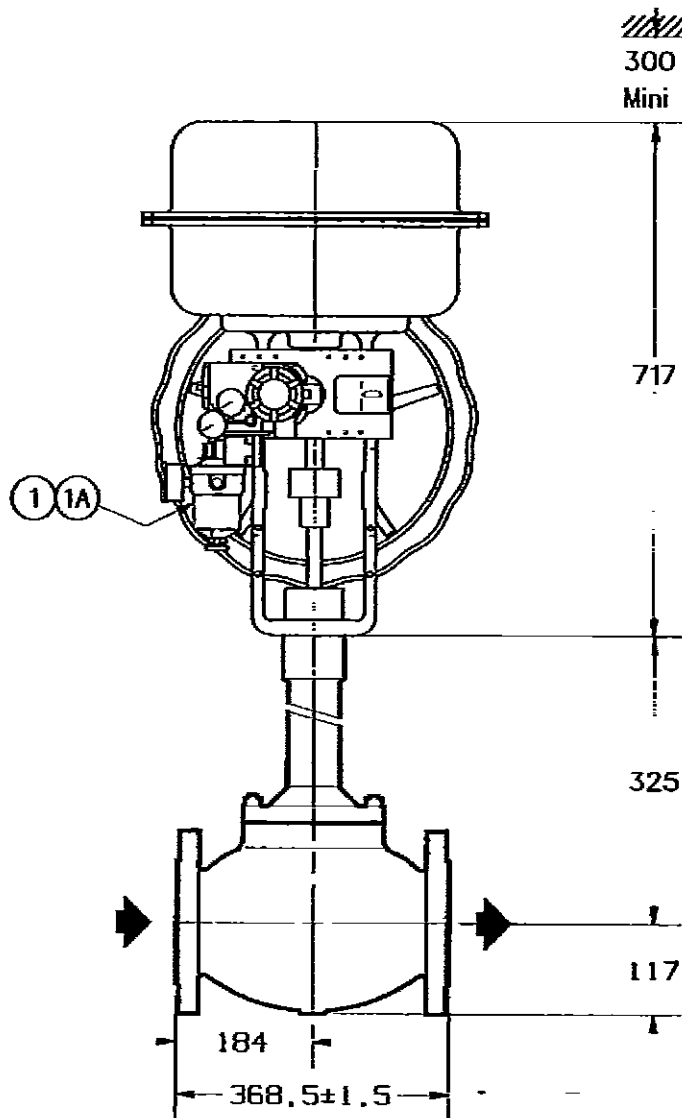
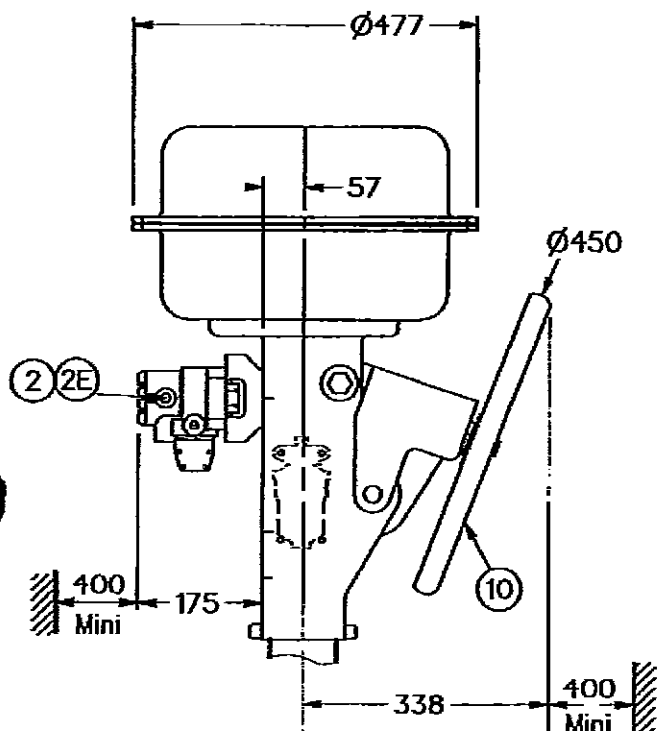


SERIES VALVE : 88-21115-EB/HW DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electron. positioner	1.0	2E	M20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

200

ITEM : 15025

MIN SERIAL NUMBER : 02-04912-25

Rev. 1 DATE: Oct-14-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

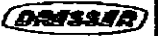
TAG : 30 TV 50141



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



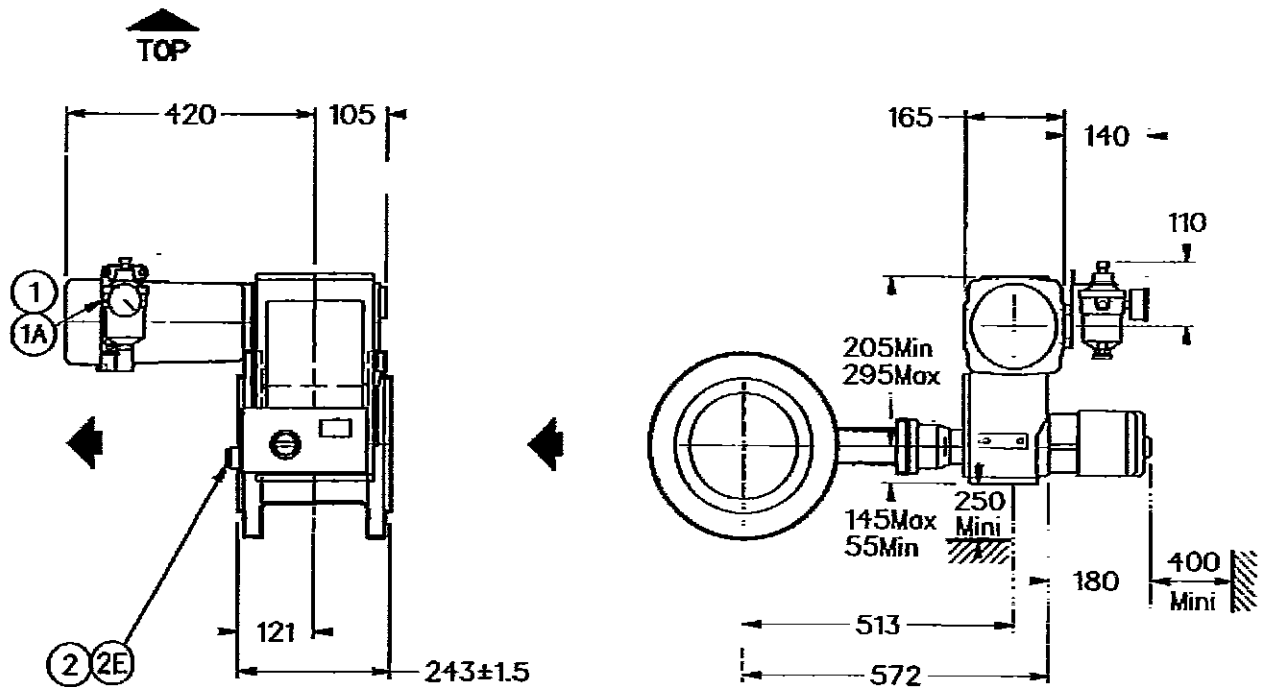
SERIES VALVE : 30-30222

DN : 200 (8")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

95

ITEM : 15026

MIN SERIAL NUMBER : 02-04912-26

Rev. 1 DATE: Oct-14-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 50143



DIMENSIONS in mm 352

OUTLINE DRAWING

Masonellen

DRESSER

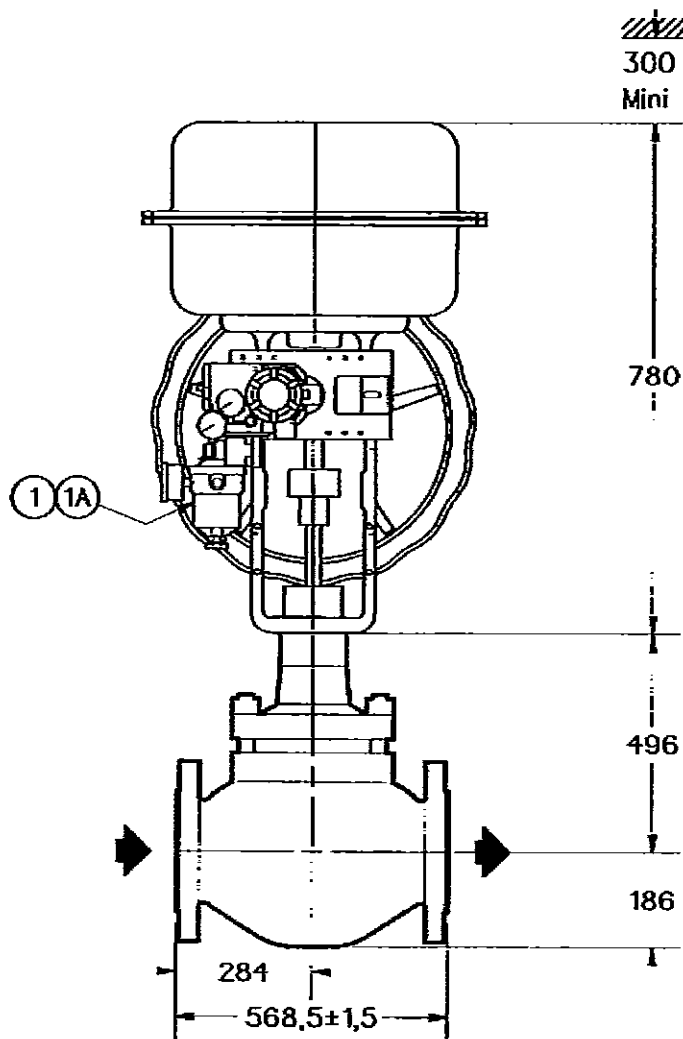
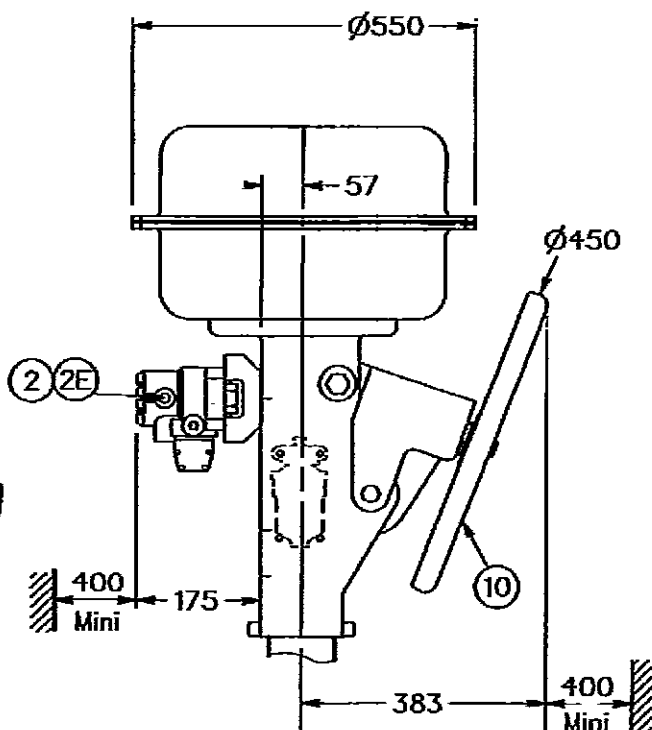
SERIES VALVE : 88-41325-/HW

DN : 200 (8")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

563

ITEM : 15027

MIN SERIAL NUMBER : 02-04912-27

Rev. 1

DATE: Oct-14-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 TV 50152



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellian

DAFSSOR

SERIES VALVE : 35-35602

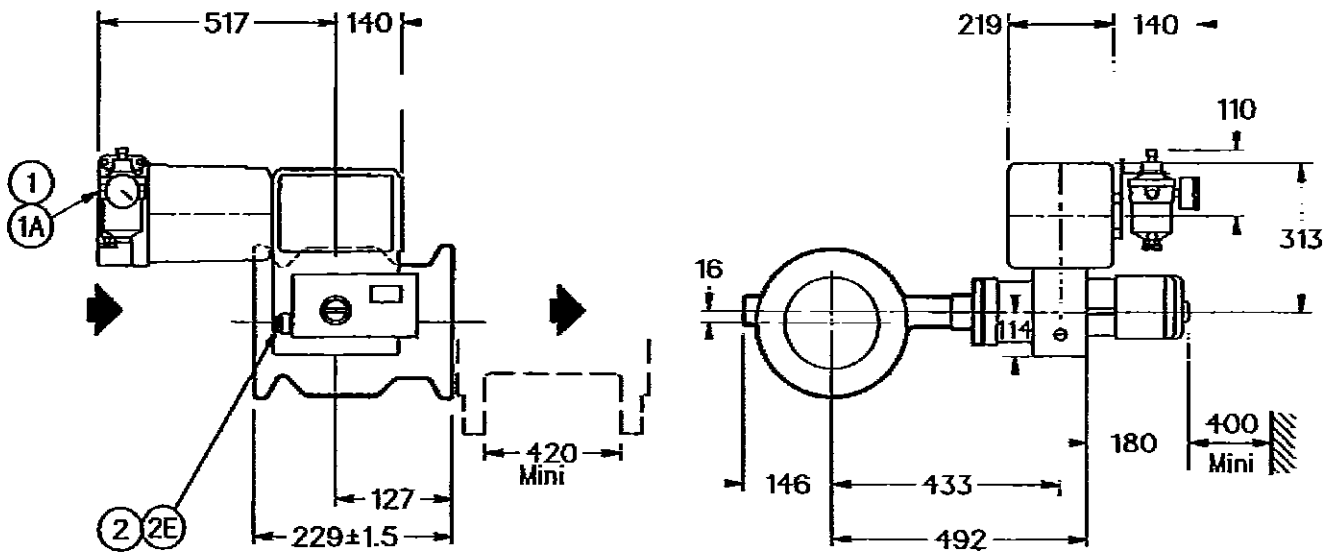
DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

100

ITEM : 15028

WH SERIAL NUMBER : 02-04912-28

Rev. 1

DATE: Oct-14-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

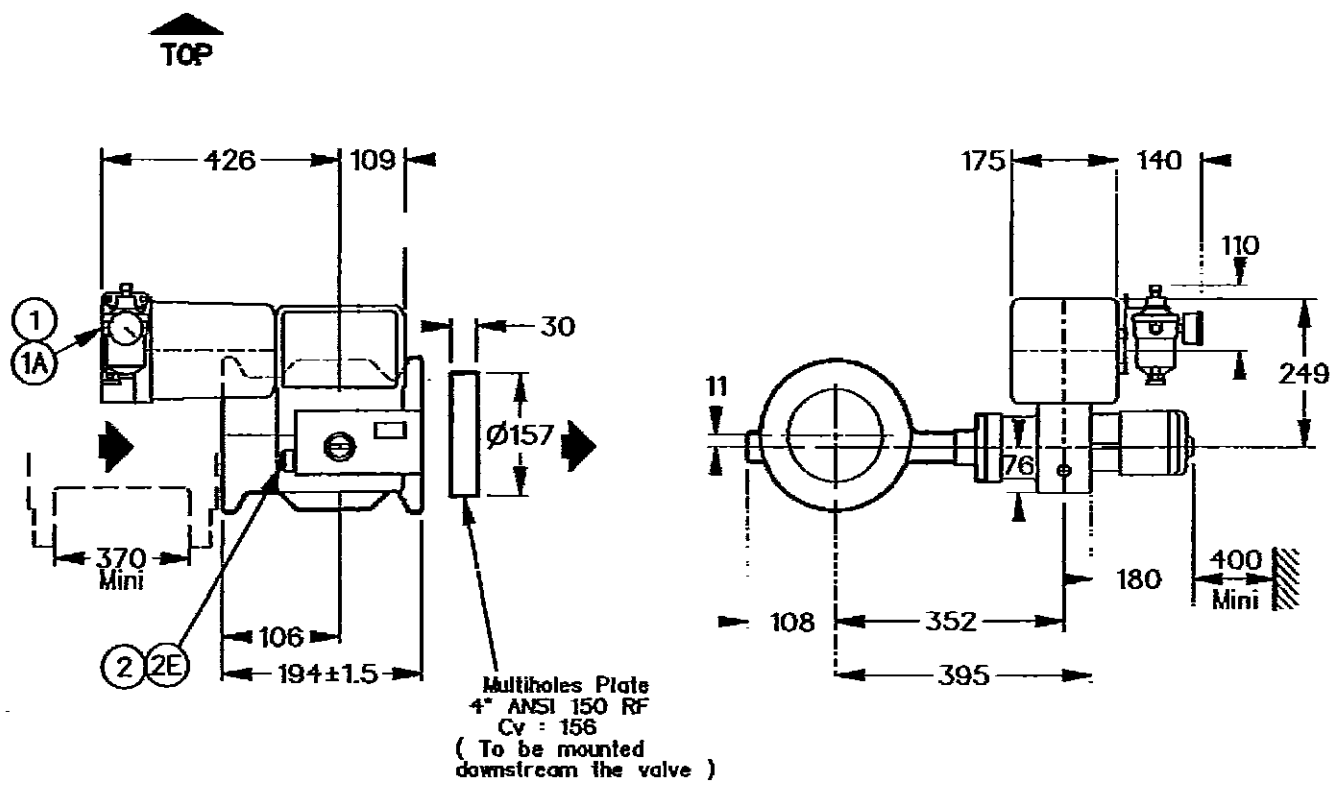
CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 50701A

SERIES VALVE : 35-35202
DN : 100 (4")
ON AIR FAILURE : CLOSED

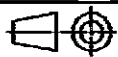
FLOW TO : OPEN
CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04912-PW1
Electrical Connections Detail	02-04912-EC1

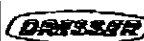
Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		49	ITEM : 15029	MIN SERIAL NUMBER : 02-04912-29	
Rev. 1	DATE: Oct-14-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 8465C30 1541 01 0 10007		
TAG : 30 LV 50701B					



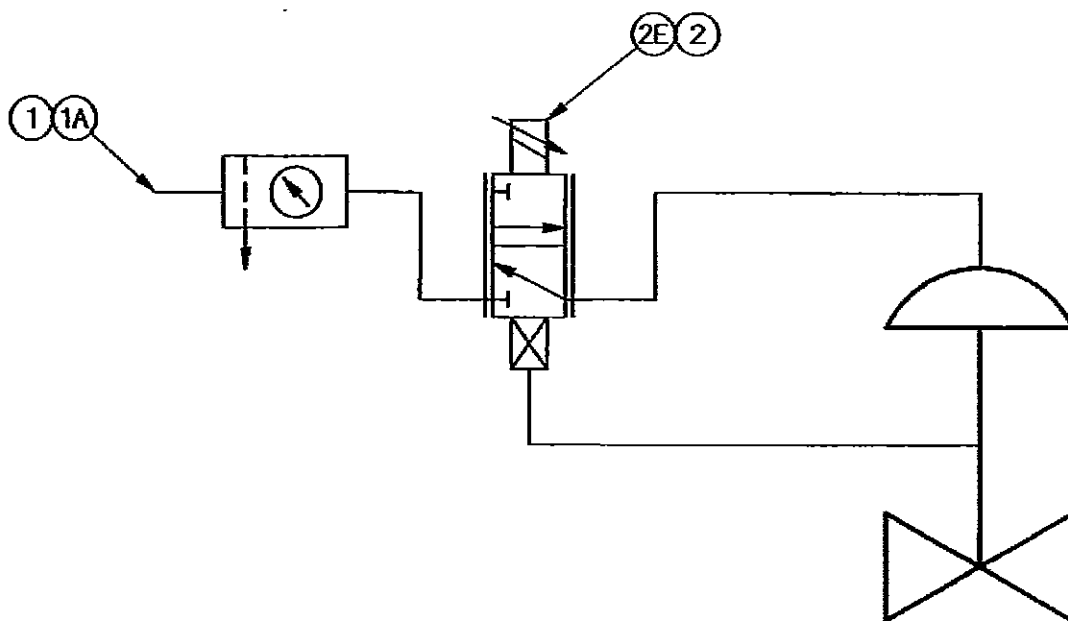
DRAWING No : 02-04912-PW1

Masonellam



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10



Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal

ITEM : _____ MN SERIAL NUMBER : 02-04912-PW1

Rev. 0 DATE: 12/OCT/2002 DRAWN BY: P. SEVESTRE ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP CUSTOMER ORDER: 6465C 30 1541 01 0 10007

TAG : _____



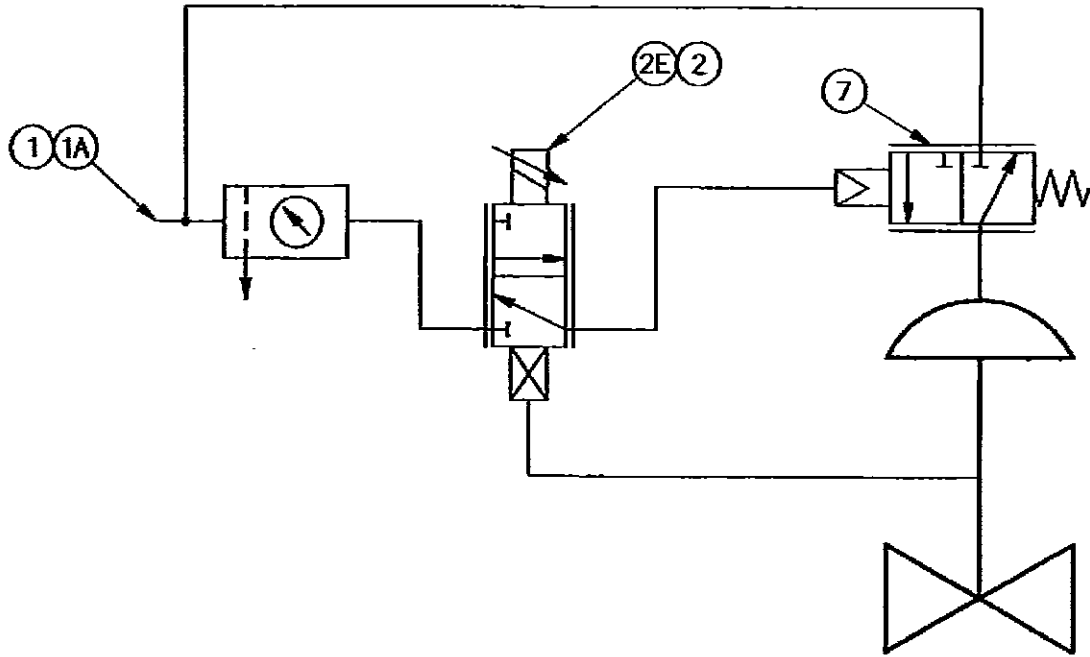
DRAWING No : 02-04912-PW3

Masonellian



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10



Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal
7	Volume Booster		

ITEM : _____ NH SERIAL NUMBER : 02-04912-PW3

Rev. 0 DATE: 14/OCT/2002 DRAWN BY: P. SEVESTRE ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP CUSTOMER ORDER: 6465C 30 1541 01 0 10007

TAG : _____

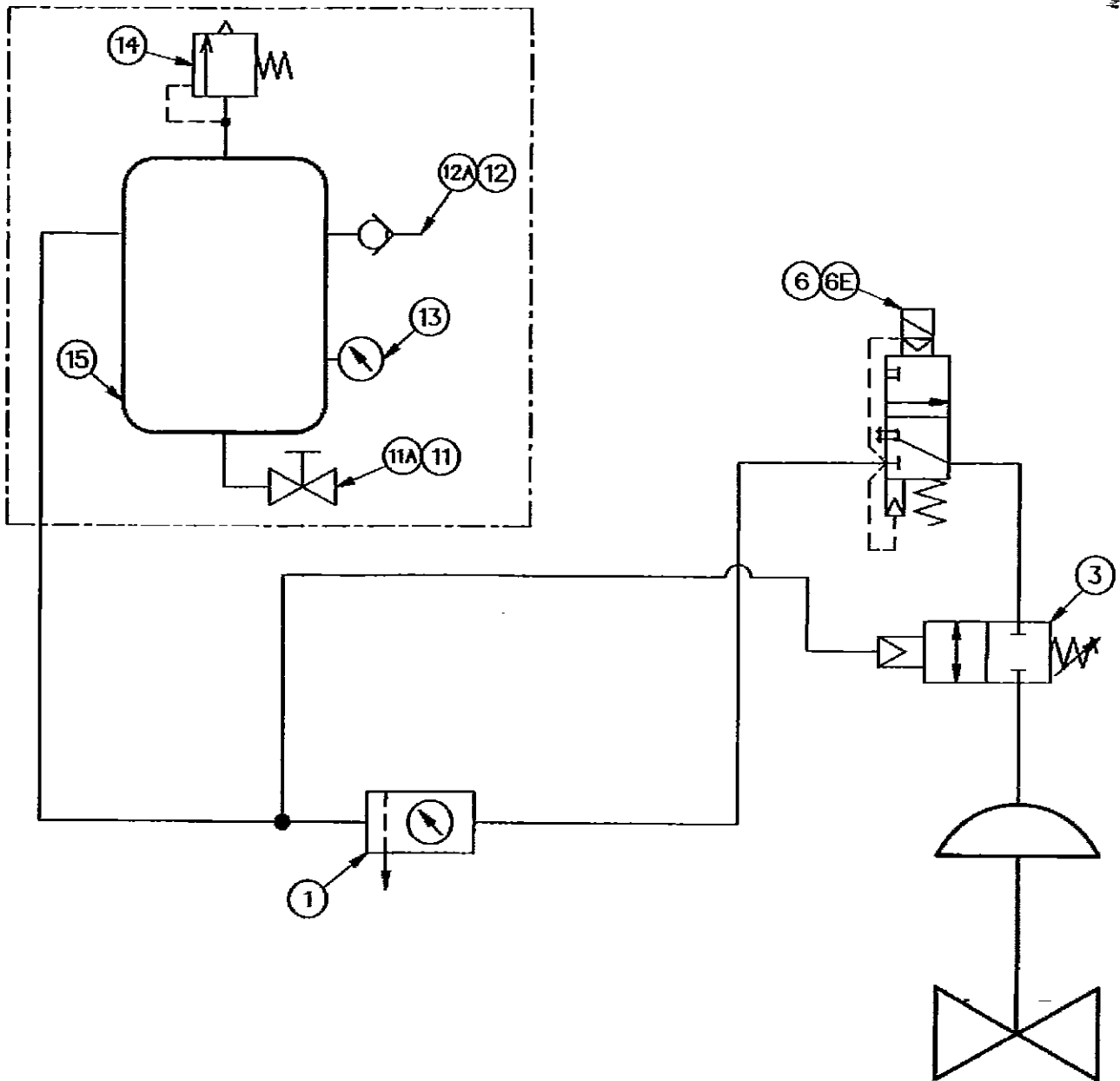


DRAWING No : 02-04912-PW7

Masonellan

DRESSER

PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10

Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge		
3	Air Lock-up Valve		
6	Solenoid Valve	6E	
11	Drain Valve	11A	1/4 NPTF - Drain
12	No Return Valve	12A	1/2 NPTM - Air Supply
13	Pressure Gauge		
14	Relief Valve		
15	Volume Tank		

ITEM : / MN SERIAL NUMBER : 02-04912-PW7

Rev. 0 DATE: 14/OCT/2002

DRAWN BY: P. SEVESTRE

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C 30 1541 01 0 10007

TAG : /



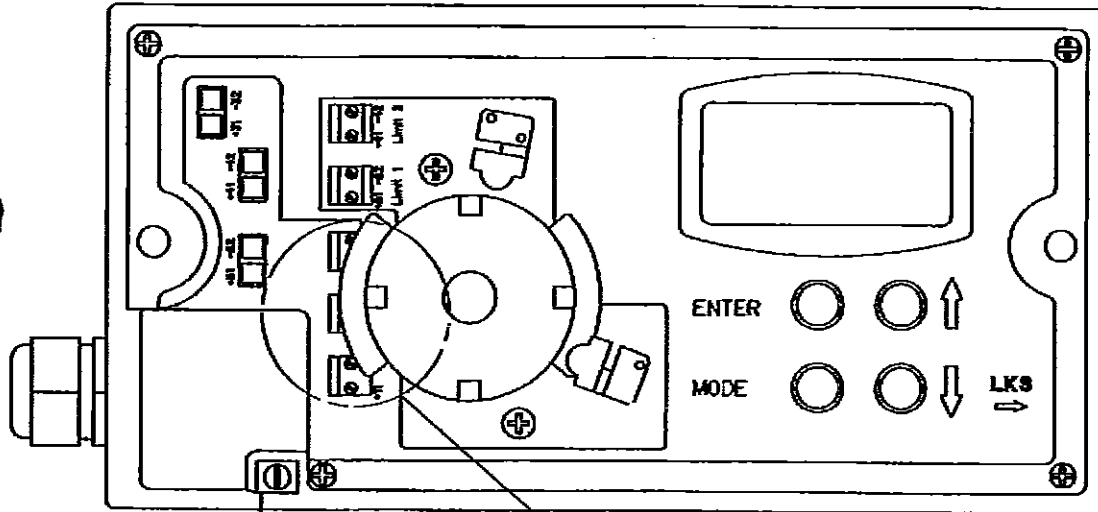
DRAWING No : 02-04912-EC1

Masonellan

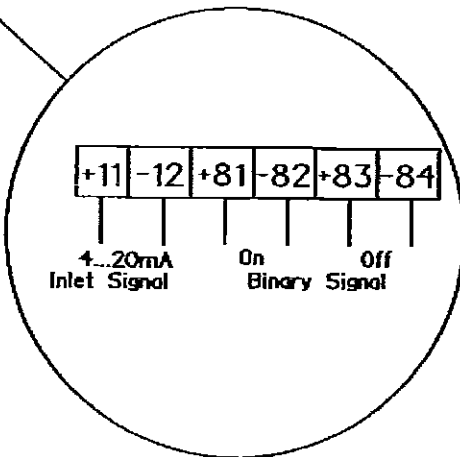


ELECTRICAL CONNECTIONS DETAIL

ELECTROPNEUMATIC POSITIONER TZID-C



Earth Terminal



Rev. 0	DATE: 14/OCT/2002	DRAWN BY: P. SEVSTRE	ITEM : /	MN SERIAL NUMBER : 02-04912-EC1
CUSTOMER: TECHNIP		ISSUED BY: C. DROUARD		
TAG :		CUSTOMER ORDER: 6465C 30 1541 01 0 10007		



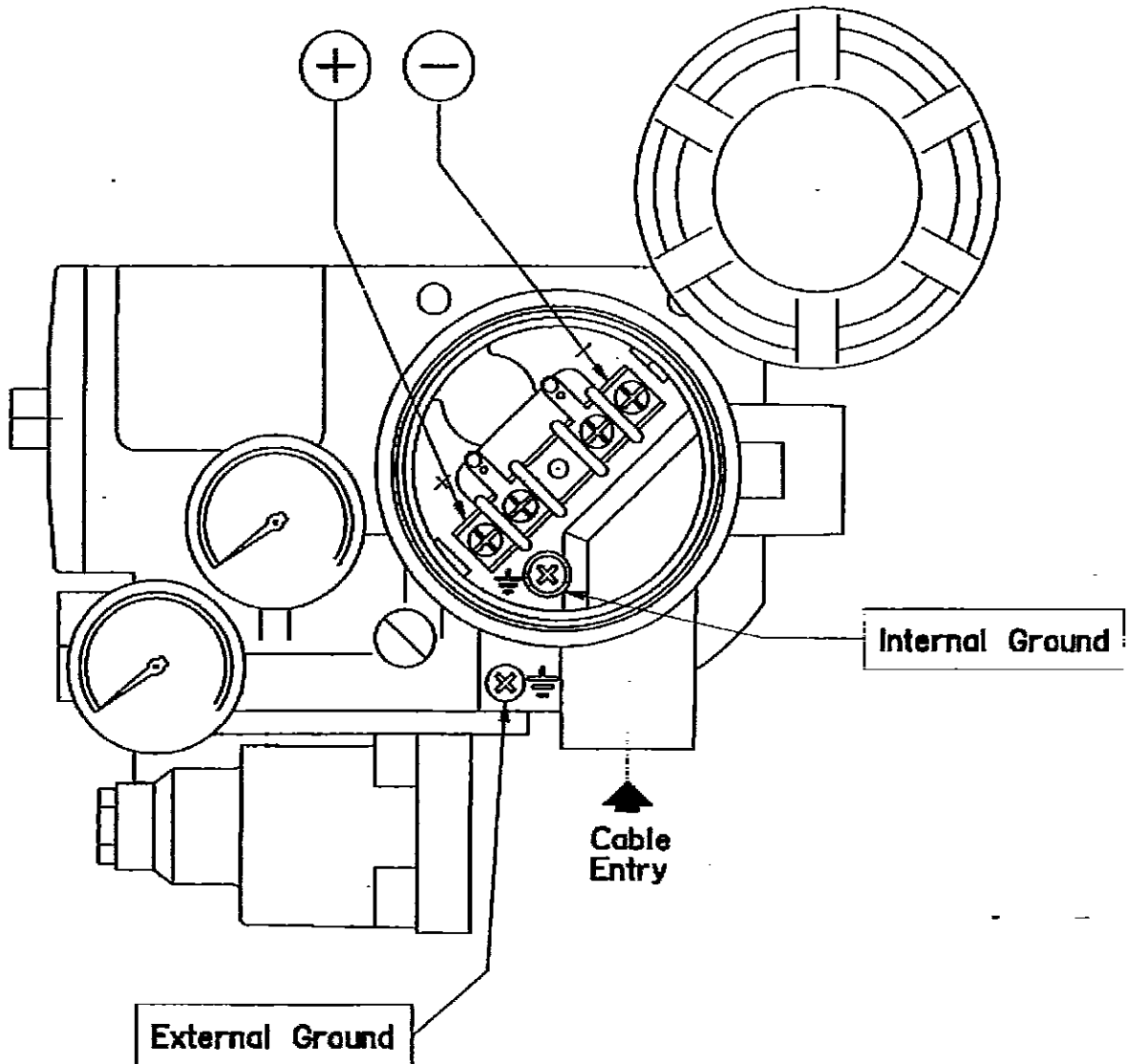
DRAWING No : 02-04912-EC2

Masonellan



ELECTRICAL CONNECTIONS DETAIL

ELECTROPNEUMATIC POSITIONER FVP



Rev. 0		DATE: 14/OCT/2002	DRAWN BY: P. SEVESTRE	ITEM : /	WH SERIAL NUMBER : 02-04912-EC2
CUSTOMER: TECHNIP			ISSUED BY: C. DROUARD		
TAG : /			CUSTOMER ORDER: 6465C 30 1541 01 0 10007		



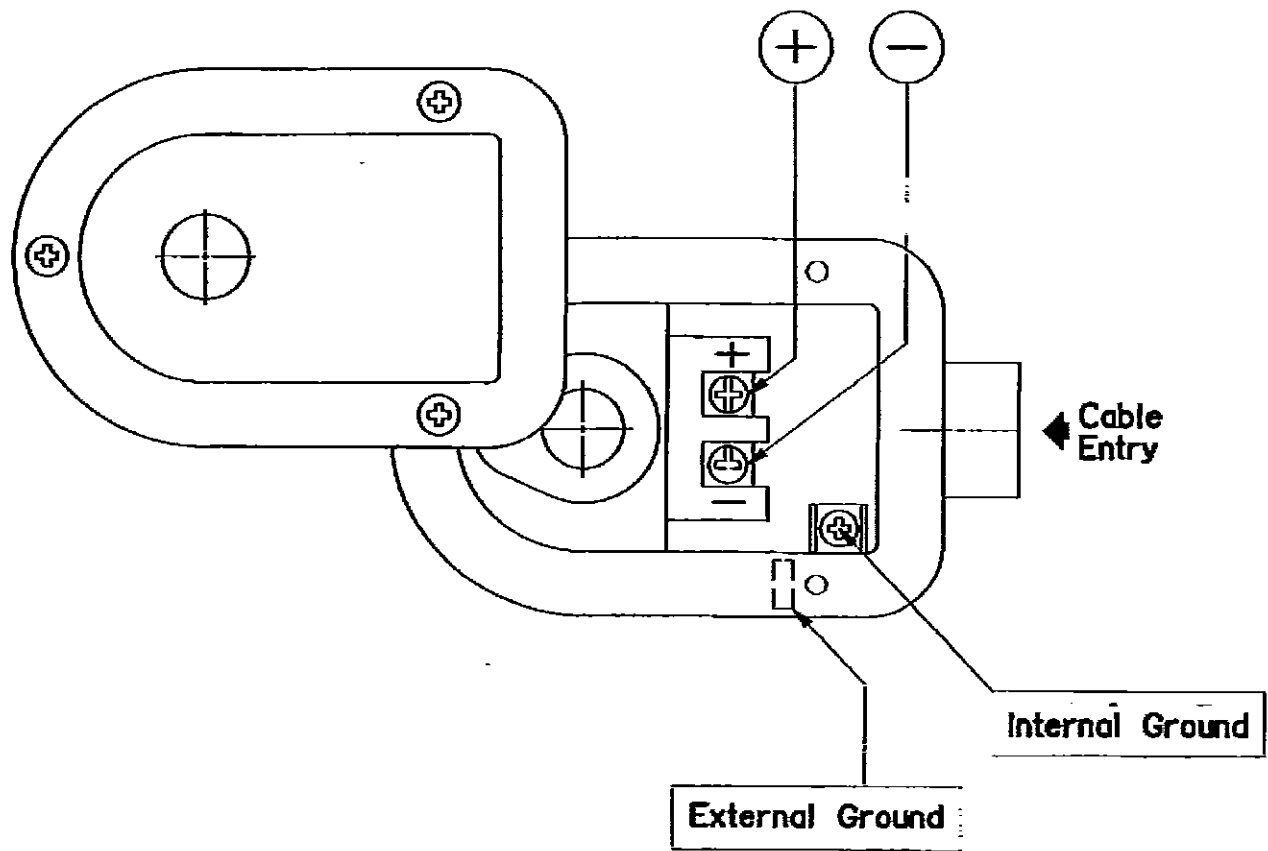
DRAWING No : 02-04912-EC3

Masonellian



ELECTRICAL CONNECTIONS DETAIL

WSTIS B317A308 SOLENOID VALVE

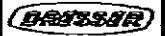


Rev. 0		DATE: 14/OCT/2002	DRAWN BY: P. SEVESTRE	ITEM : /	WH SERIAL NUMBER : 02-04912-EC3
CUSTOMER: TECHNIP			ISSUED BY: C. DROUARD		
TAG :			CUSTOMER ORDER: 6465C 30 1541 01 0 10007		



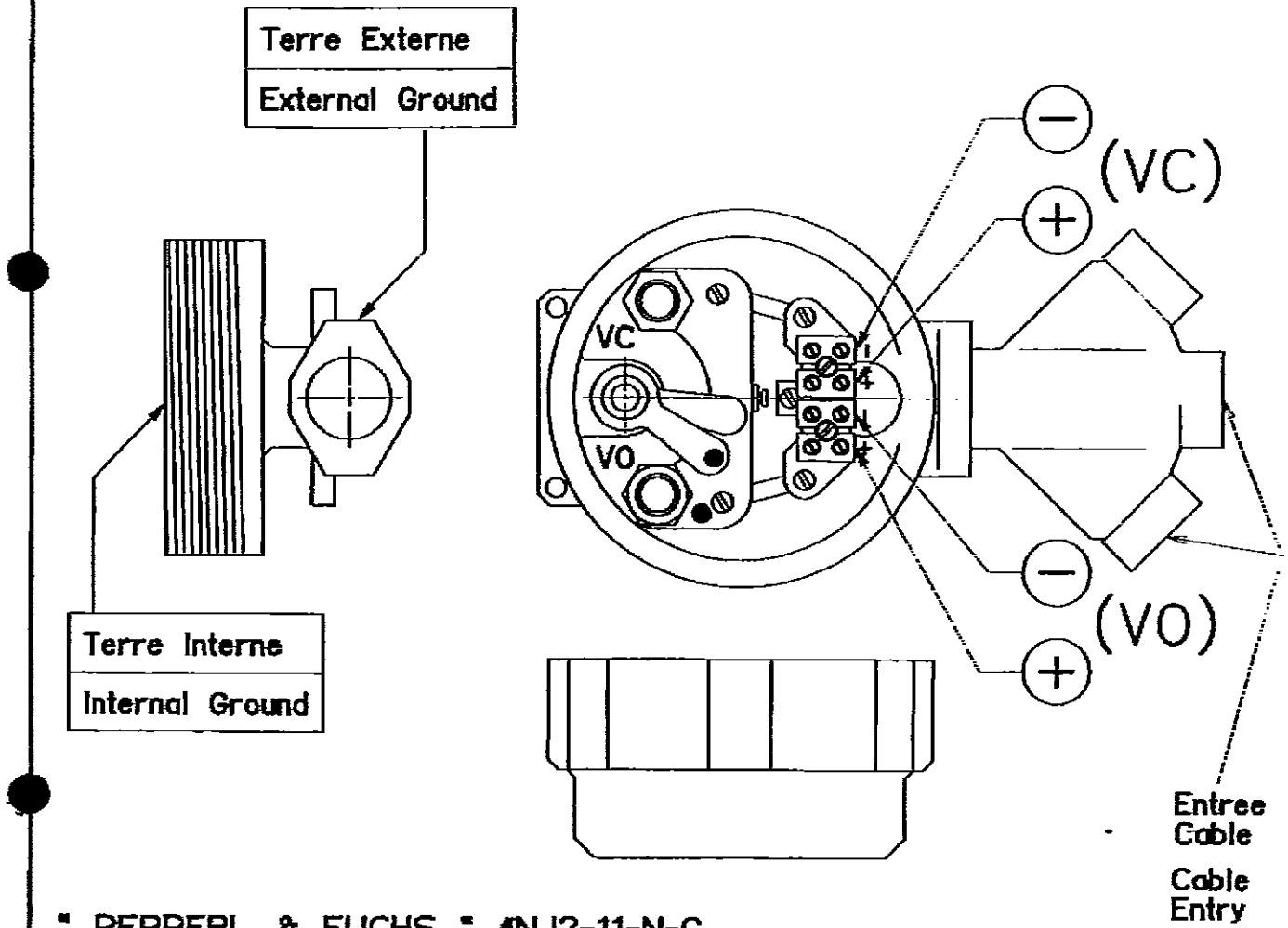
PLAN/DRWG : 02-04912-LD1

Masonellan



DETAIL RACCORDEMENTS ELECTRIQUES
ELECTRICAL CONNECTIONS DETAIL

DETECTEUR FIN DE COURSE 496-4 & 5
LIMIT DETECTOR 496-4 & 5



• PEPPERL & FUCHS • #NJ2-11-N-G

VO : Detecteur Vanne OUVERTE
: OPEN Valve Detector

VC : Detecteur Vanne FERMEE
: CLOSED Valve Detector

			ITEM: /	N° DE SERIE : 02-04912-LD1 SERIAL NUMBER:
Rev: 2	DATE: Dec-19-2002	DESS. PAR/DRAWN BY: P. SEVESTRE	EMIS PAR/ISSUED BY: C. DROUARD	
CLIENT/CUSTOMER: TECHNIP		Cde CLIENT/CUST. ORDER: 6465C30 1541 01 0 10007		
REPERE/TAG No: /				



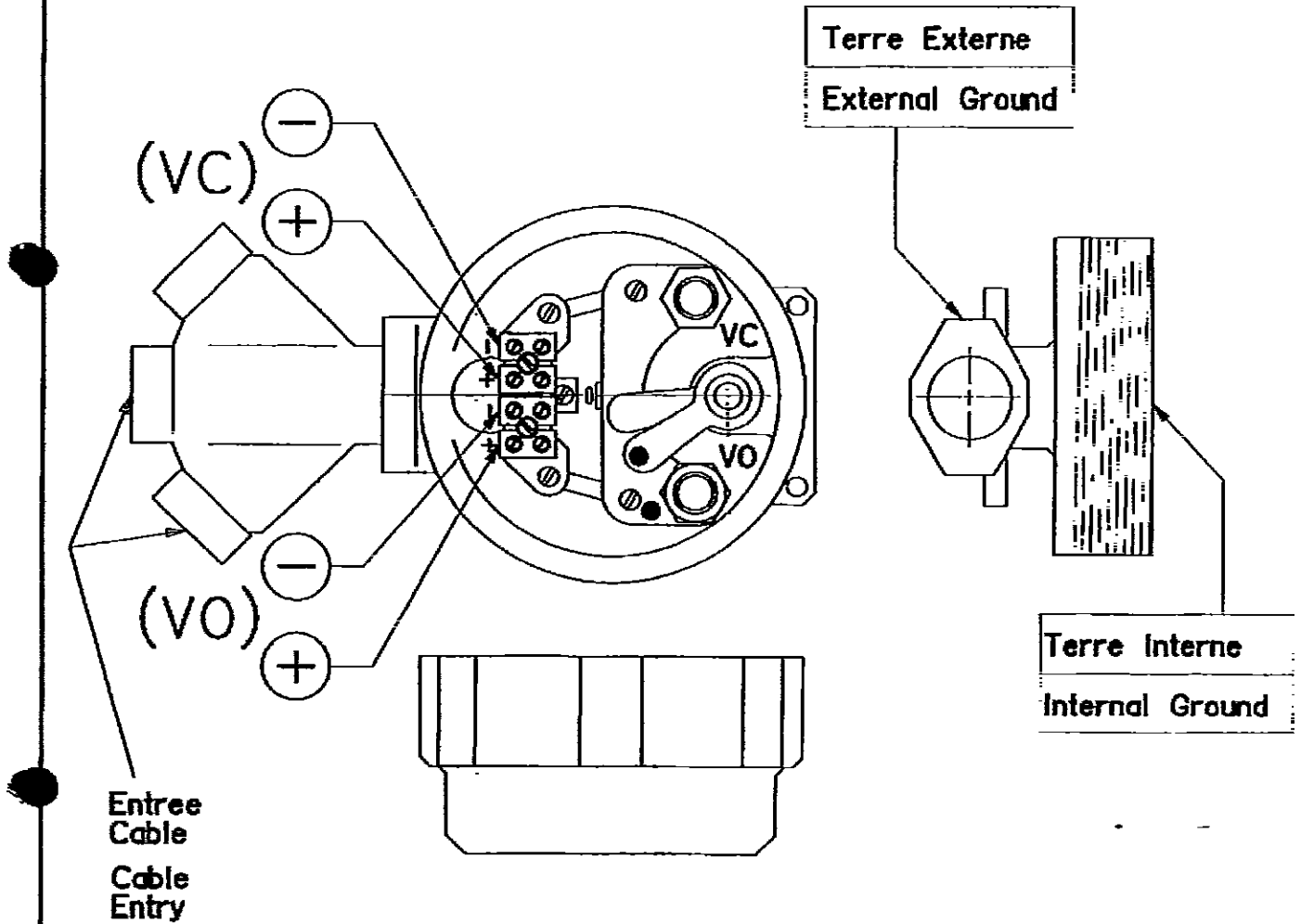
PLAN/DRWG : 02-04912-LD3

Masonellan



DETAIL RACCORDEMENTS ELECTRIQUES
ELECTRICAL CONNECTIONS DETAIL

DETECTEUR FIN DE COURSE 496-4 & 5
LIMIT DETECTOR 496-4 & 5



▪ PEPPERL & FUCHS ▪ #NJ2-11-N-G

VO : Detecteur OUVERTURE
: OPENING Detector

VC : Detecteur FERMETURE
: CLOSING Detector

Rev: 0		DATE: Jan-28-2003	DESS. PAR/DRAWN BY: P. SEVESTRE	ITEM: _____	N° DE SERIE : 02-04912-LD3 SERIAL NUMBER:
CLIENT/CUSTOMER: TECHNIP			EMIS PAR/ISSUED BY: C. DROUARD		
REPERE/TAG No: _____			Cde CLIENT/CUST.ORDER: 6465C30 1541 01 0 10007		

UNIT 60




OUTLINE DRAWINGS

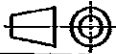
CATEGORIES
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REUSE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
2003.03.25 10:14:54 +01'00'
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STATUS CERTIFIED "FINAL"
ISSUED BY : C. DROUARD
DATE : 19/12/02

5	24/03/03	Up-dated drawings items 16014/16015/16019
4	19/12/02	Up-dated drawings 02-4913-31/LD1/LD3
3	16/12/02	Up-dated drawings further to your comments
2	23/10/02	Up-dated drawings with accessories
1	25/06/02	Addition item 09
0	27/05/02	FIRST ISSUE

REV	DATE	DESCRIPTION	
TECHNIP 		NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY 	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007
Project: 3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant		EQUIPMENT NAME: Control valves	
		DOCUMENT TITLE : Outline drawings	DOCUMENT CODE : A 3201
PURCHASE ORDER : 02-4913 (Unit 60)		Sheet 01 of 43	Rev. 5



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

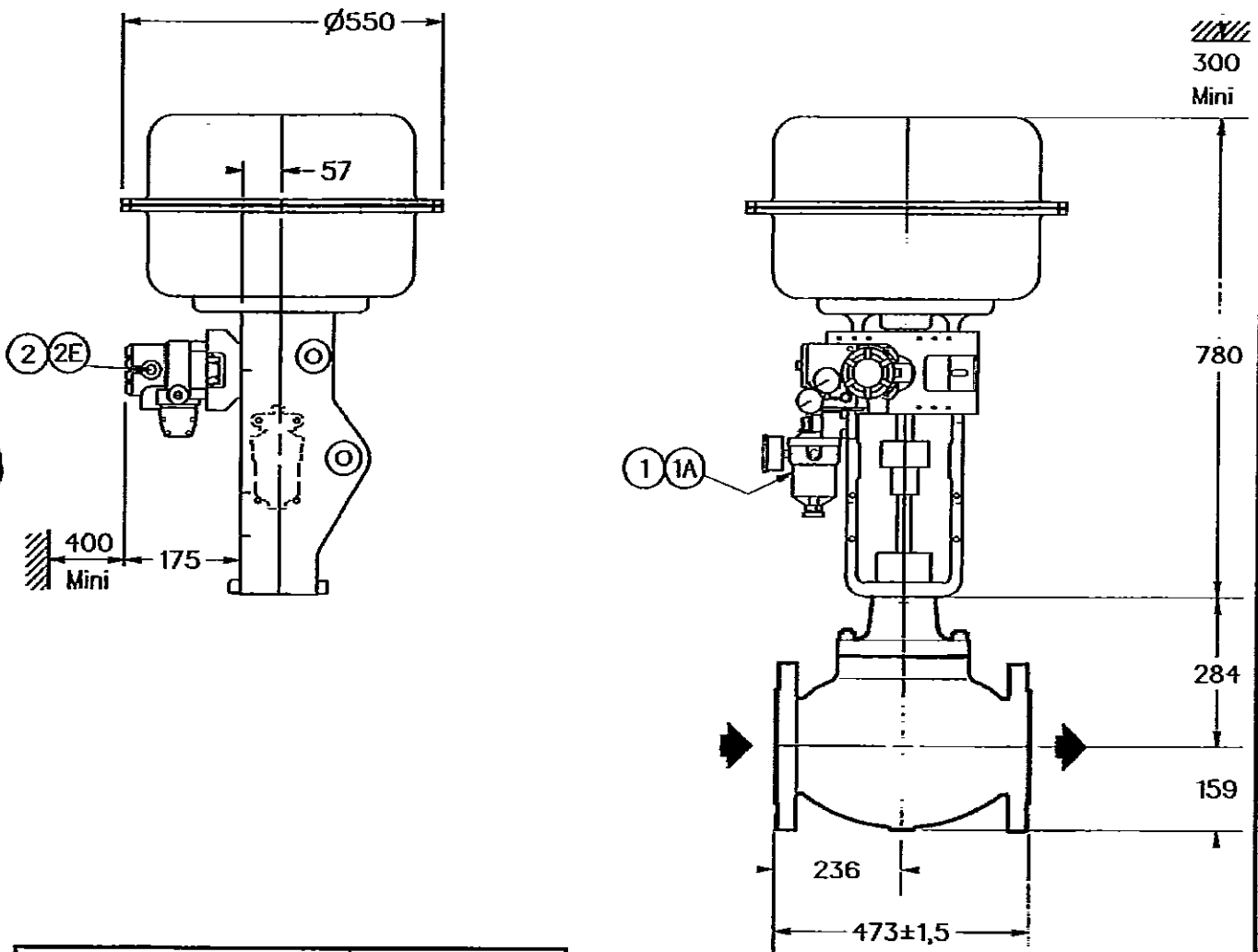
SERIES VALVE : 88-21125

DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

283

ITEM : 16001

MIN SERIAL NUMBER : 02-04913-01

Rev. 1

DATE: Oct-15-2002

DRAWN BY:

P-ROUELLE

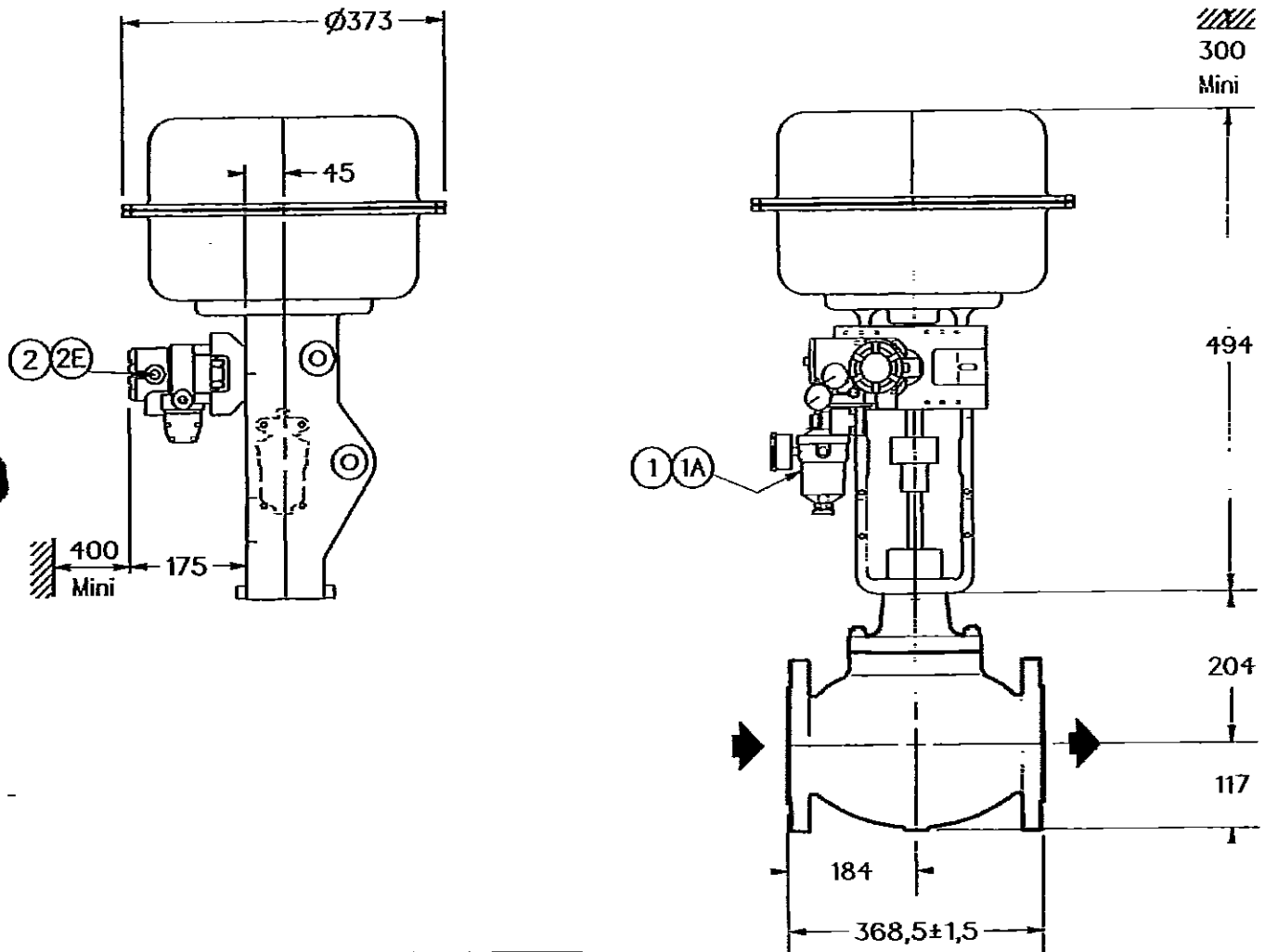
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 60001 A



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		128	ITEM : 16002	MN SERIAL NUMBER : 02-04913-02
Rev. 1	DATE: Oct-15-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 LV 60001B				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masoneilan

DRESSER

SERIES VALVE : 35-35502

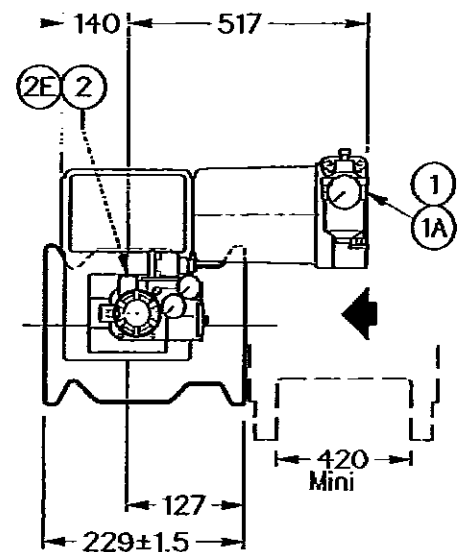
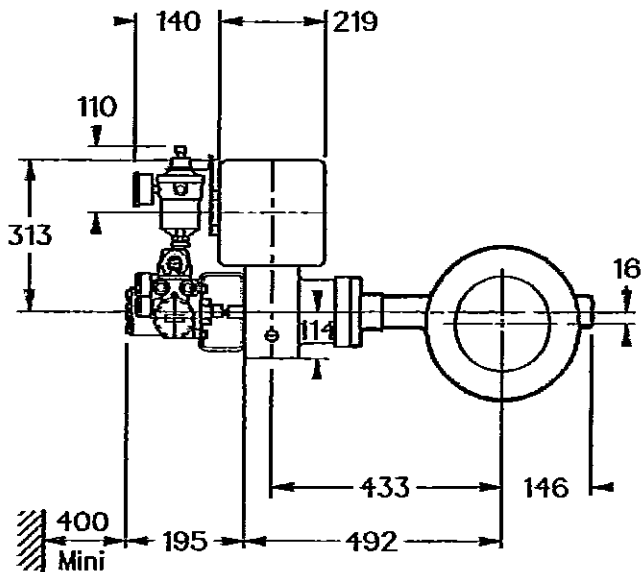
DN : 150 (6")

ON AIR FAILURE : OPEN.

FLOW TO : OPEN

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

105

ITEM : 16003

MN SERIAL NUMBER : 02-04913-03

Rev. 1

DATE: Oct-15-2002

DRAWN BY:

P. ROUELLE

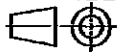
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 60007



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masoneilan

BRASSER

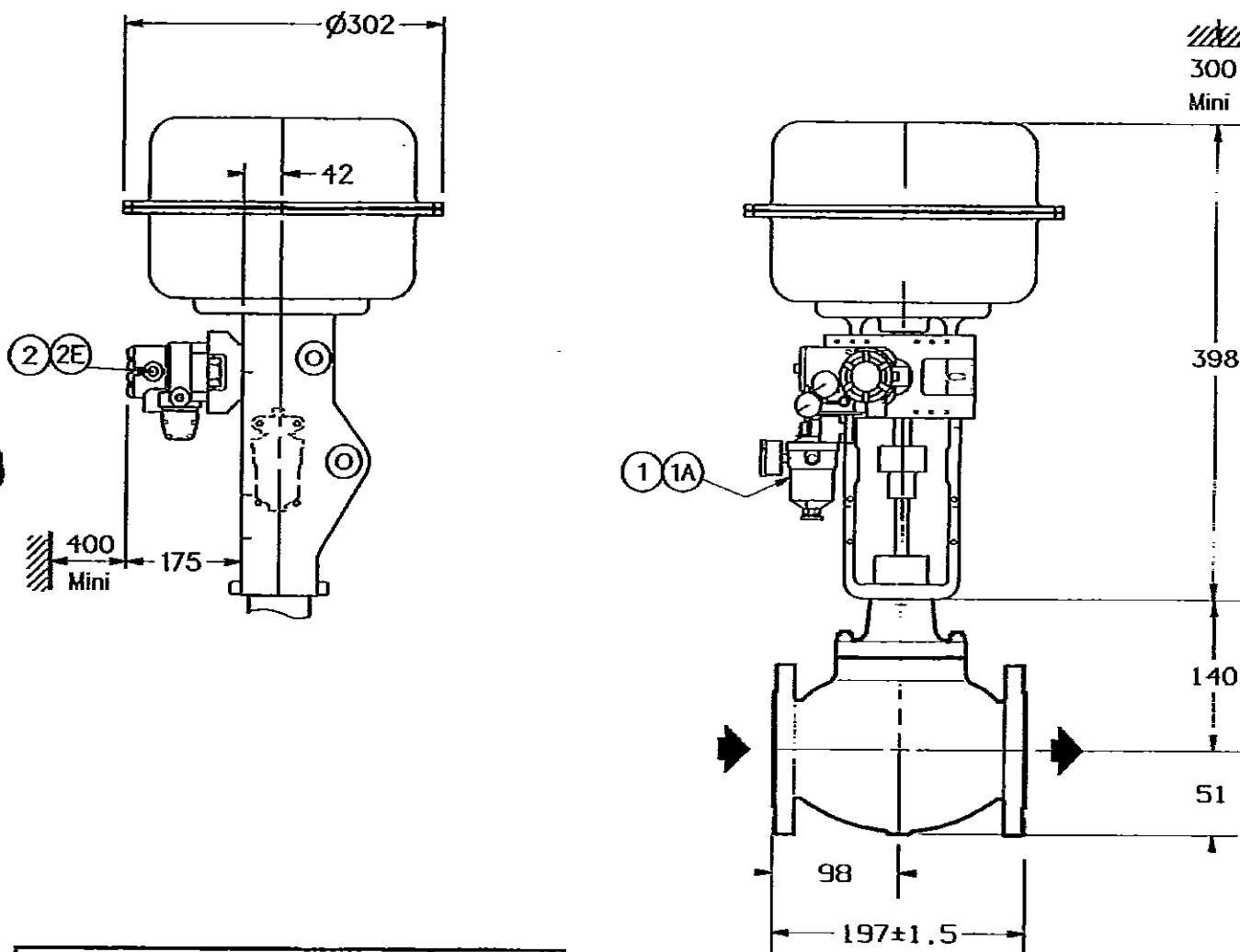
SERIES VALVE : 88-21125

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

38

ITEM : 16004

MIN SERIAL NUMBER : 02-04913-04

Rev. 1

DATE: Oct-15-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 60008A



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

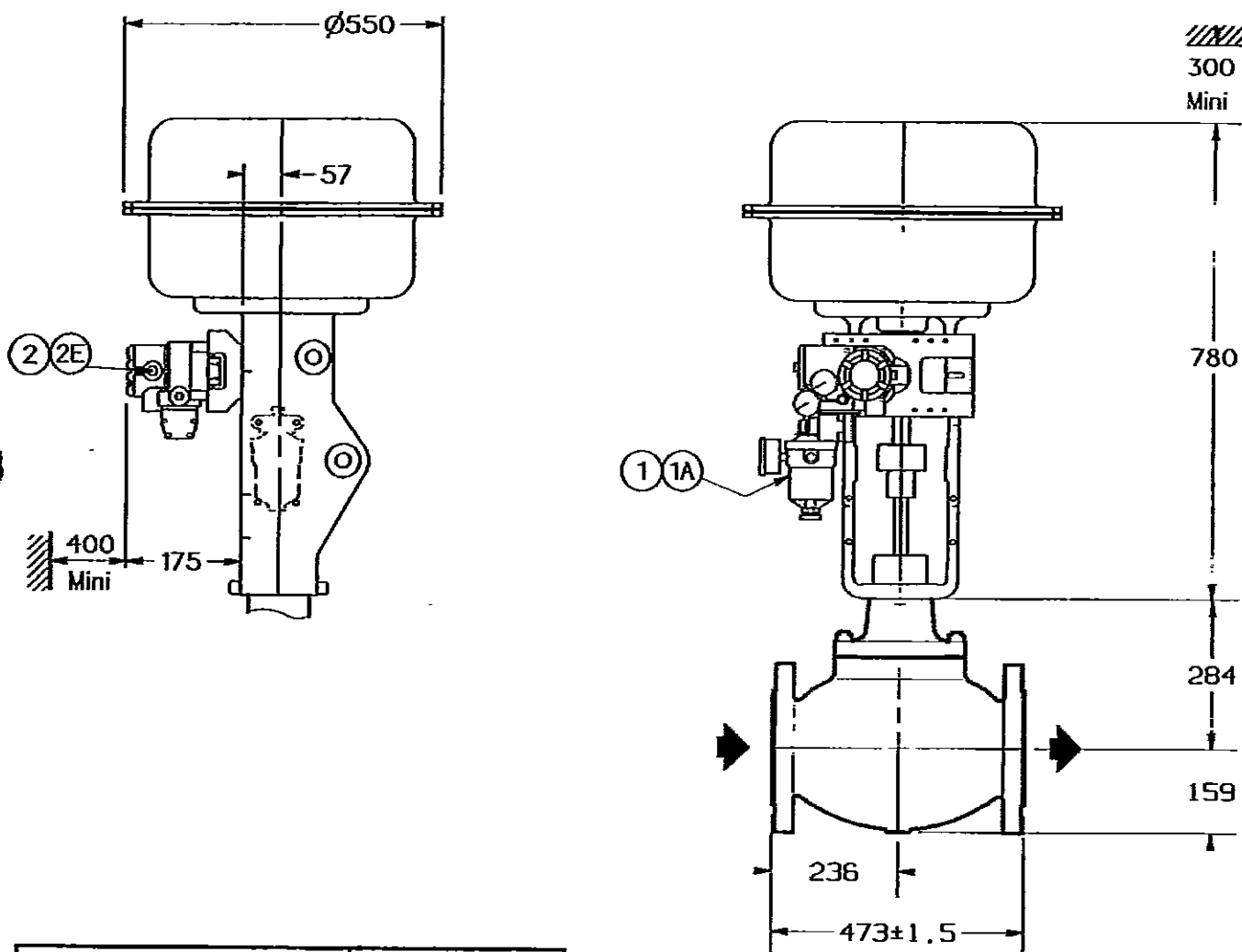
SERIES VALVE : 88-21125

DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electro-pn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

283

ITEM : 16005

VN SERIAL NUMBER : 02-04913-05

Rev. 1

DATE: Oct-15-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 60008B



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masoneilan

DRESSER

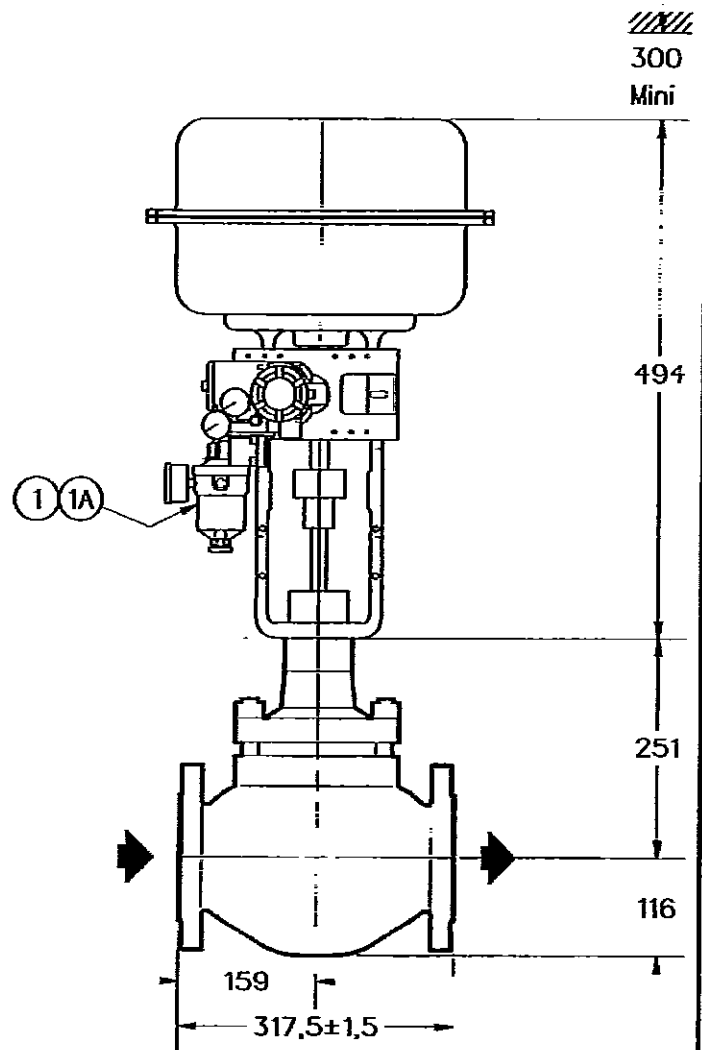
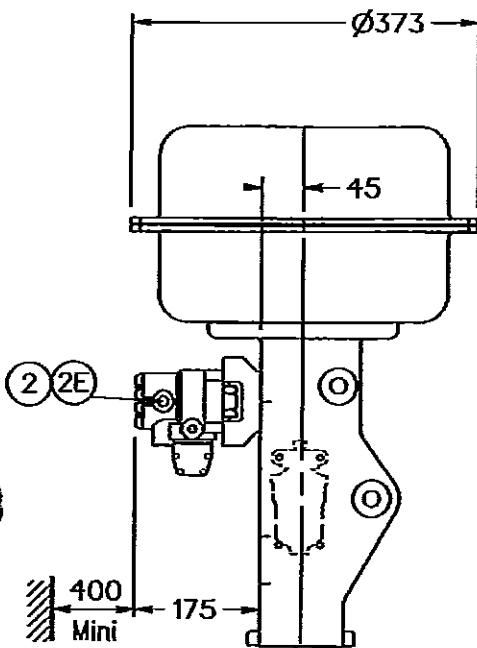
SERIES VALVE : 87-41355

DN : 3" x 2"

ON AIR FAILURE : OPEN.

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electrpn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

107

ITEM : 1600E UN SERIAL NUMBER : 02-04913-06

Rev. 1

DATE: Oct-15-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-CROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 FV 60011



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellian



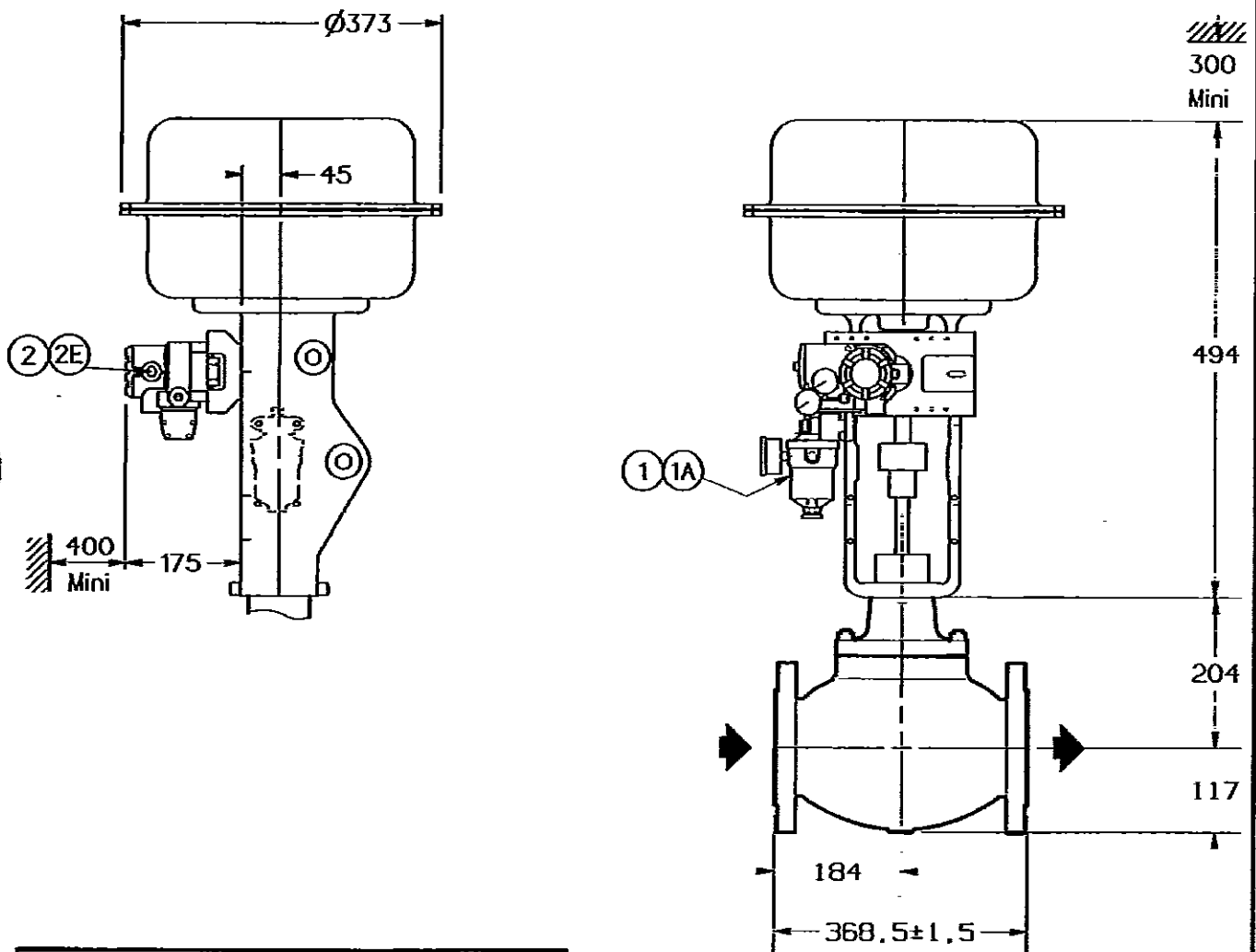
SERIES VALVE : 88-21125

DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

128

ITEM : 16007 / MN SERIAL NUMBER : 02-04913-07

Rev. 1 | DATE: Oct-15-2002

DRAWN BY: P-ROUELLE

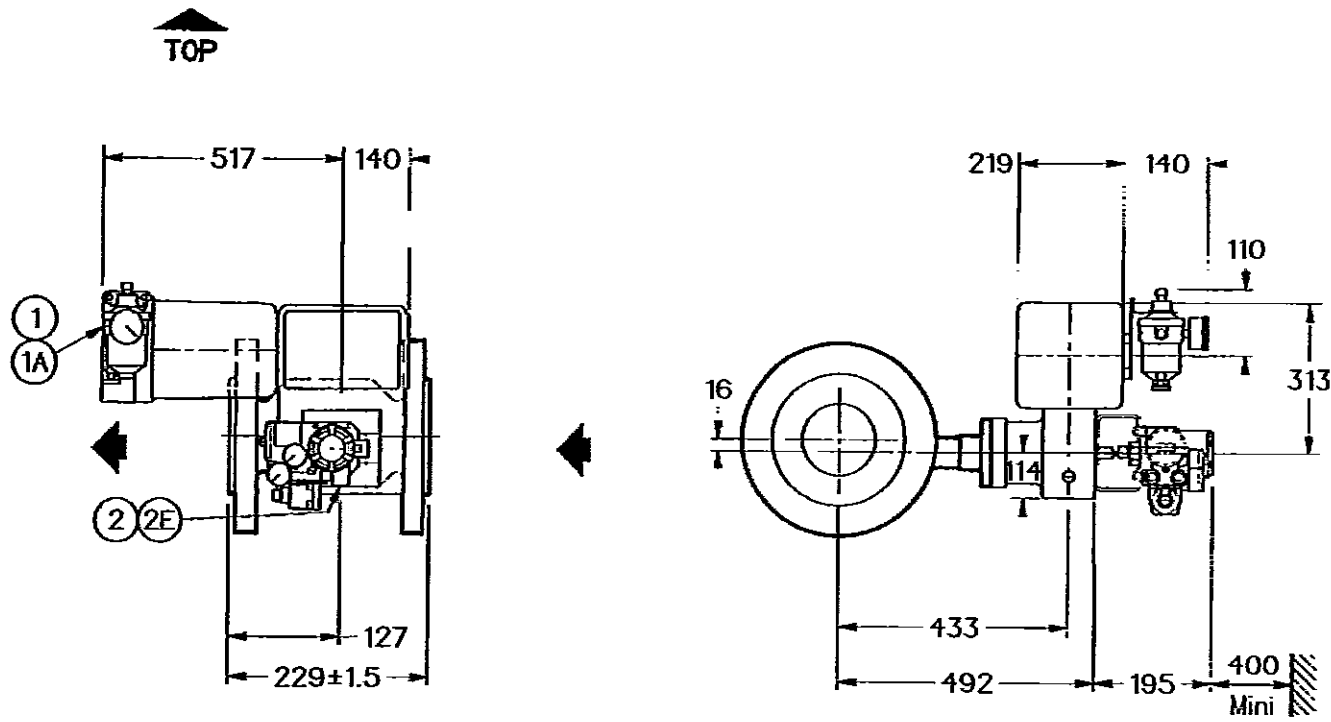
ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 60021

	DIMENSIONS in mm 15%	OUTLINE DRAWING	Masonellan
SERIES VALVE : 35-35202		DN : 150 (6")	ON AIR FAILURE : CLOSED
FLOW TO : CLOSE	CONNECTION: 300 ANSI RF		

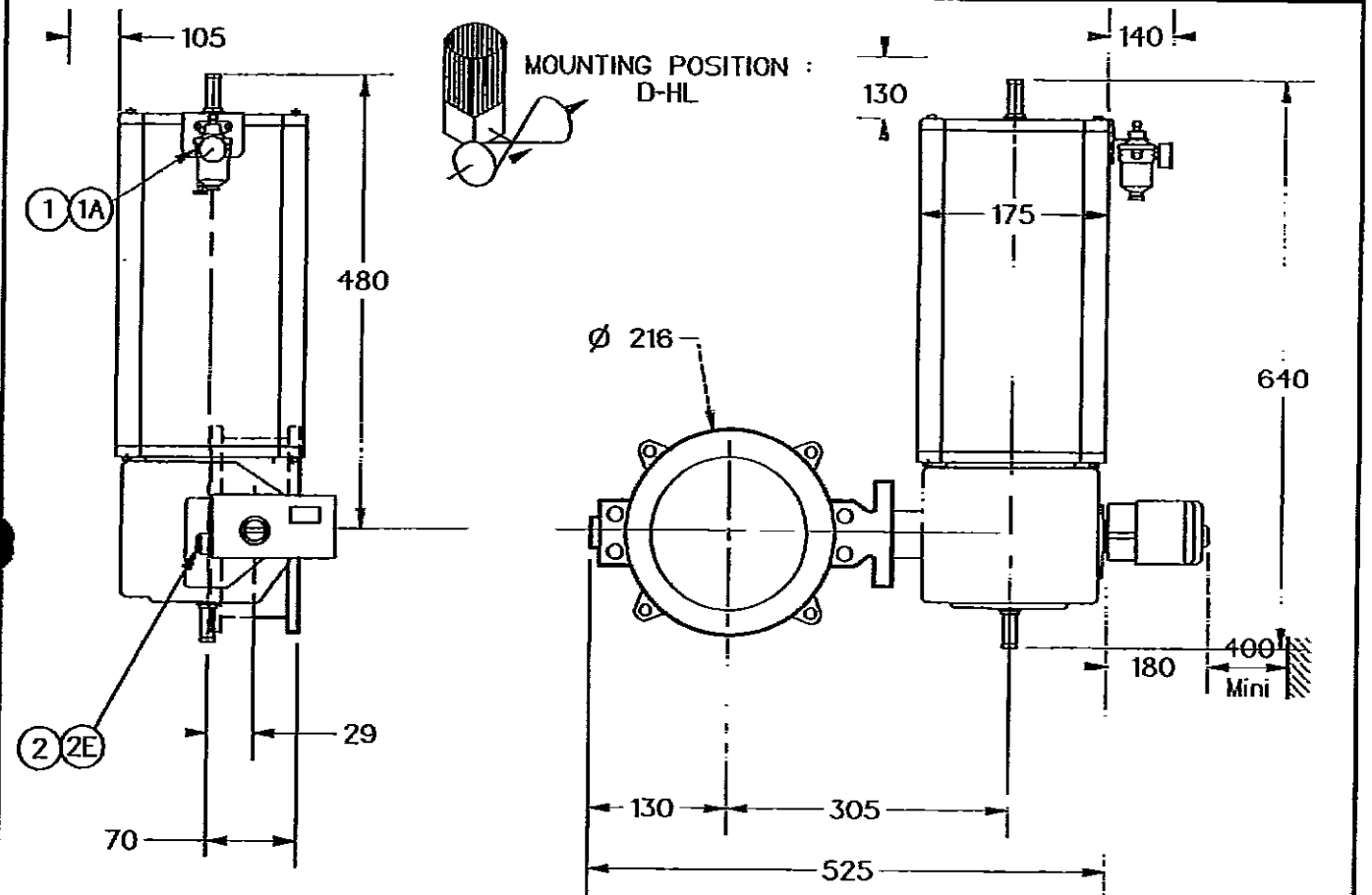


Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electron. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		120	ITEM : 16008	WH SERIAL NUMBER : 02-04913-08
Rev. 1	DATE: Oct-15-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007	
TAG : 30 LV 60023				

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masomellan	
SERIES VALVE : L1CMA06ACA		DN : 150 (6")	ON AIR FAILURE : CLOSE	
FLOW TO :		CONNECTION: 150 ANSI RF		



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		120	ITEM : 16009	MN SERIAL NUMBER : 02-04913-09	
Rev. 1	DATE: Oct-15-2002	DRAWN BY: P. ROUELLE		ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 LV 60031					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

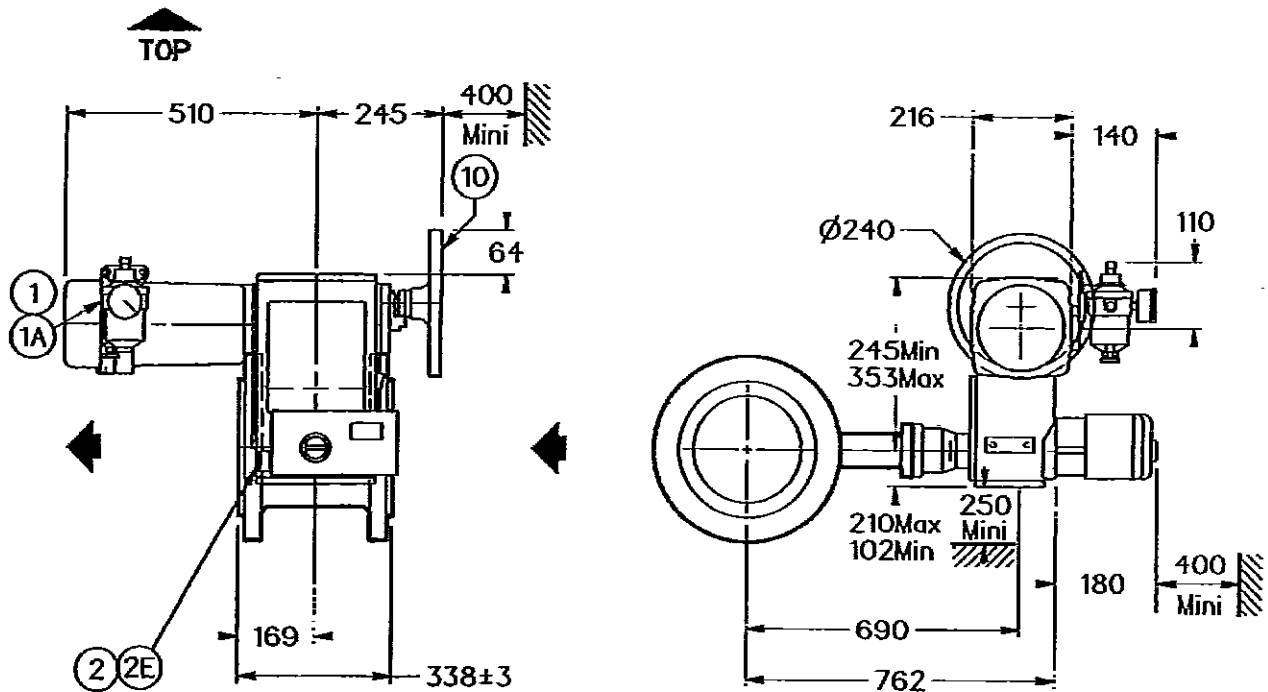
SERIES VALVE : 30-30242-/HW

DN : 300 (12")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

221

ITEM : 16010

WN SERIAL NUMBER : 02-04913-10

Rev. 1

DATE: Oct-15-2002

DRAWN BY:

P-ROUELLE


ISSUED BY:

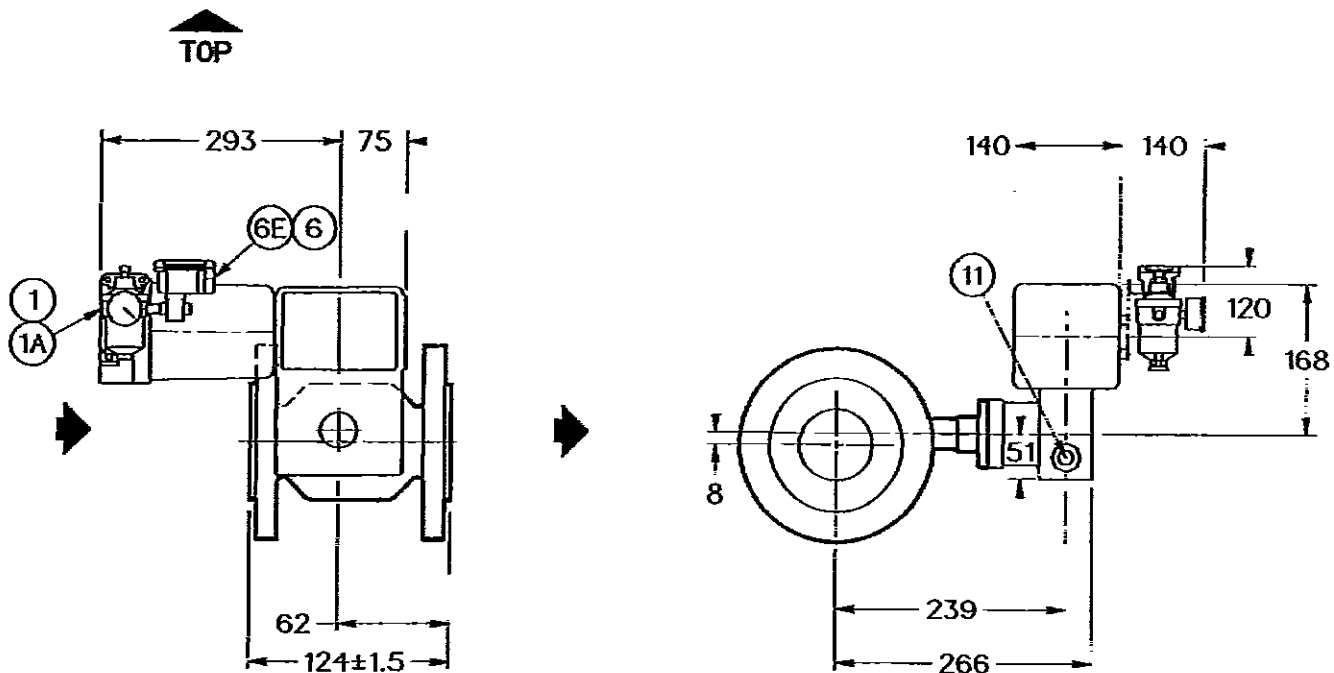
C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 60032

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellam DRESSER
SERIES VALVE : 35-35602		DN : 50 (2")	ON AIR FAILURE : CLOSED
FLOW TO : CLOSE	CONNECTION: 300 ANSI RF		



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW4
Electrical Connections Detail	02-04913-EC3

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
6	WS..B317..	Solenoid Valve	1.0	6E	M20
11		Limit-Stop			Limits opening (Locked by sel cable)

TOTAL WEIGHT (accessories + valve) in kg		20	ITEM : 16011	MIN SERIAL NUMBER : 02-04913-11
Rev. 2	DATE: Nov-13-2002	DRAWN BY: H. VICTORE	ISSUED BY: C. DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 LV 60034A				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonella

DRESSER

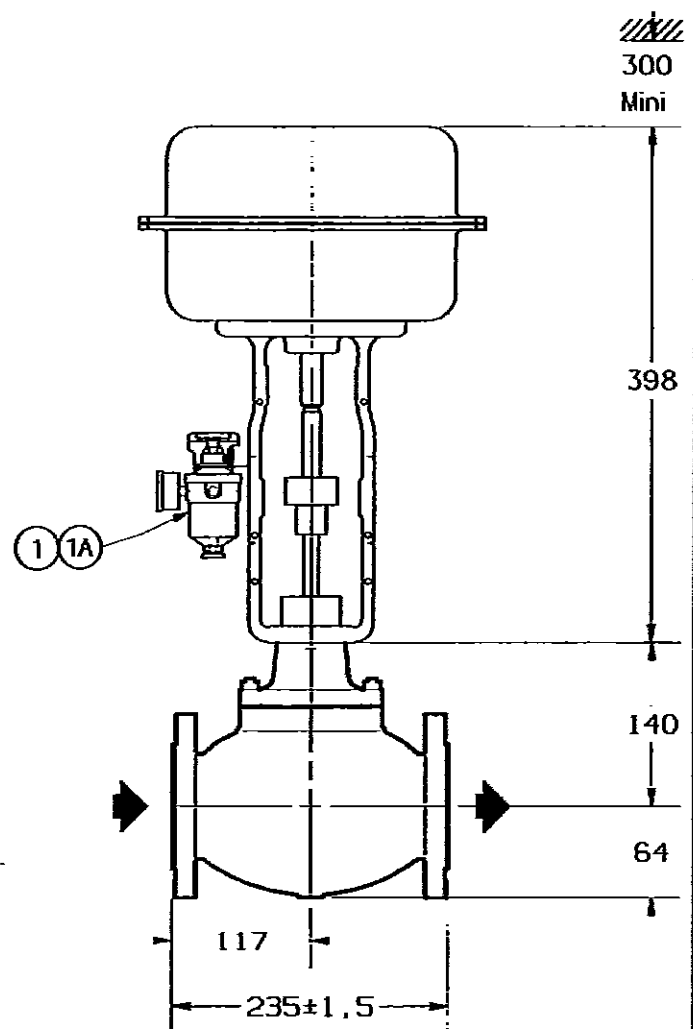
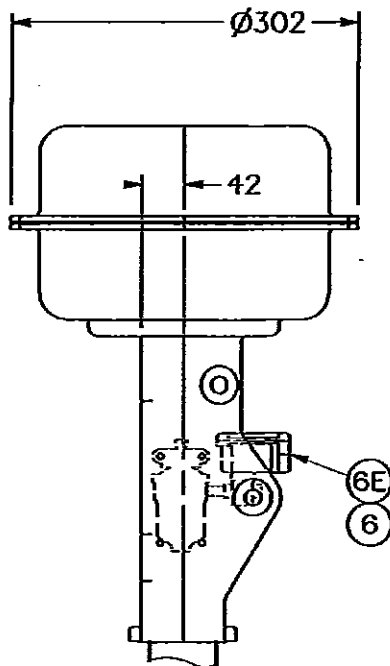
SERIES VALVE : 88-21105

DN : 40 (1.5")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF

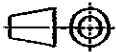


 300
Mini

Drawing	No
Pneumatic Wiring Diagram	02-04913-PW4
Electrical Connections Detail	02-04913-EC3

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
6	WS..B317..	Solenoid Valve	1.0	6E	M20

TOTAL WEIGHT(accessories + valve) in kg			47	ITEM : 16012	MN SERIAL NUMBER : 02-04913-12
Rev. 1	DATE: Oct-15-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 LV 60034B					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellam

DRESSER

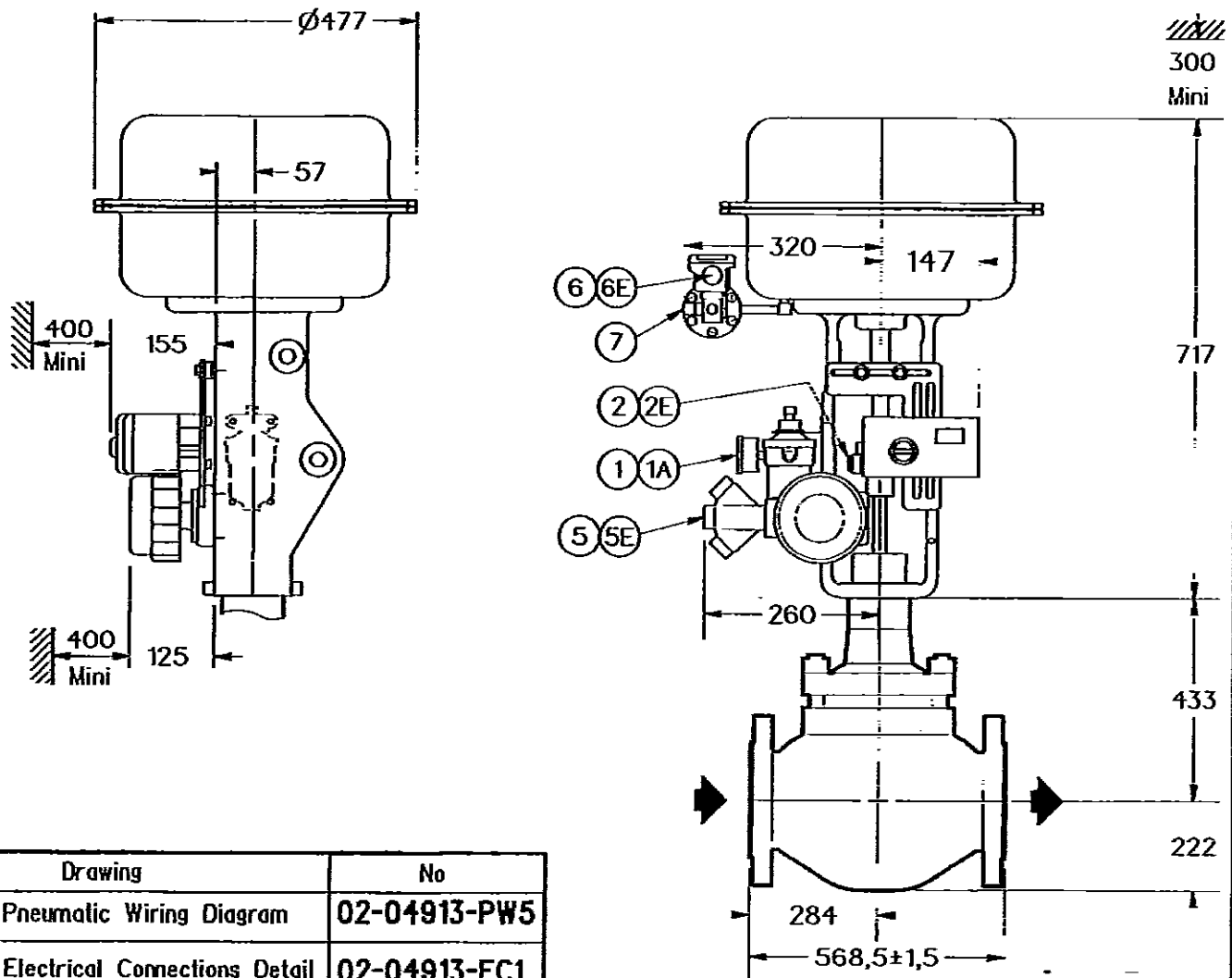
SERIES VALVE : 88-41355

DN : 8"x6"x8"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW5
Electrical Connections Detail	02-04913-EC1
Electrical Connections Detail	02-04913-EC3
Electrical Connections Detail	02-04913-LD3

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal
5	496/5	Detectors	2.5	5E	M20x2
6	MS..8317..	Solenoid Valve	1.0	6E	M20
7	BR 200	Booster Relay	1.5		

TOTAL WEIGHT (accessories + valve) in kg

S07

ITEM : 16014

VIN SERIAL NUMBER : 02-04913-14

Rev. 3

DATE: Feb-04-2003

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 60102 A



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

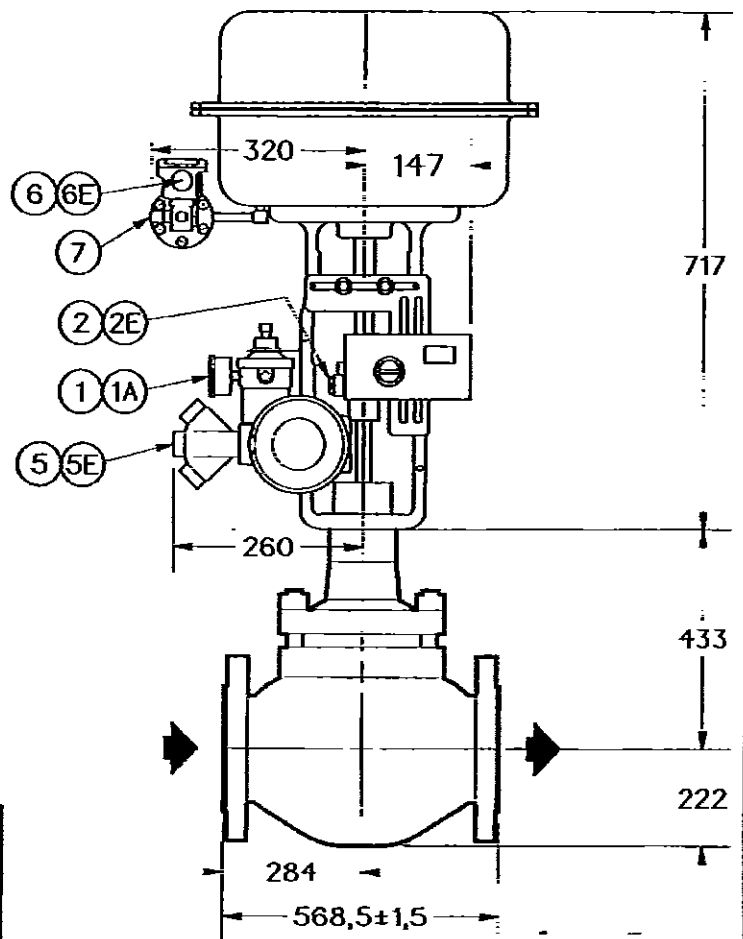
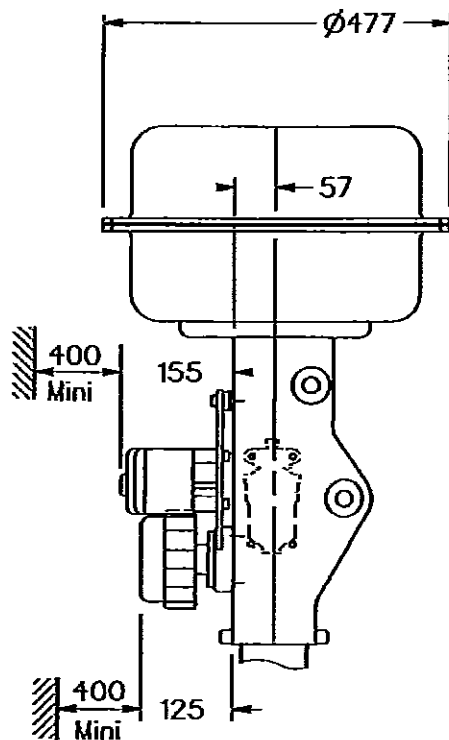
SERIES VALVE : 88-41355

DN : 8"x6"x8"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW5
Electrical Connections Detail	02-04913-EC1
Electrical Connections Detail	02-04913-EC3
Electrical Connections Detail	02-04913-LD3

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal
5	496/5	Detectors	2.5	5E	M20x2
6	MS..8317..	Solenoid Valve	1.0	6E	M20
7	BR 200	Booster Relay	1.5		

TOTAL WEIGHT (accessories + valve) in kg

507

ITEM : 16015

MN SERIAL NUMBER : 02-04913-15

Rev. 3

DATE: Feb-04-2003

DRAWN BY: P-ROUELLE

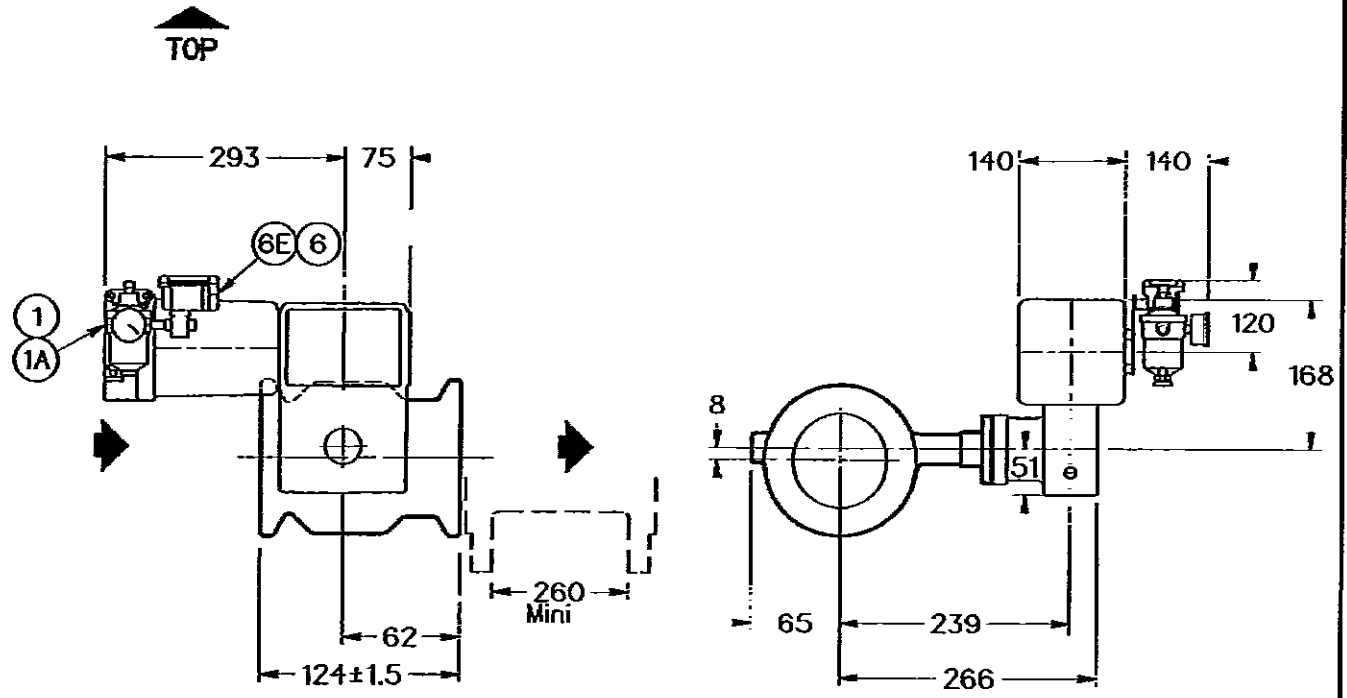
ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 60102 B

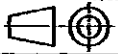
	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 35-35602		DN : 50 (2")	ON AIR FAILURE : CLOSED	
FLOW TO : CLOSE	CONNECTION: 300 ANSI RF			



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW4
Electrical Connections Detail	02-04913-EC3

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
6	NS..B317..	Solenoid Valve	1.0	6E	M20

TOTAL WEIGHT (accessories + valve) in kg		17	ITEM : 16016	MN SERIAL NUMBER : 02-04913-16	
Rev. 1	DATE: Oct-15-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 LV 60121					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

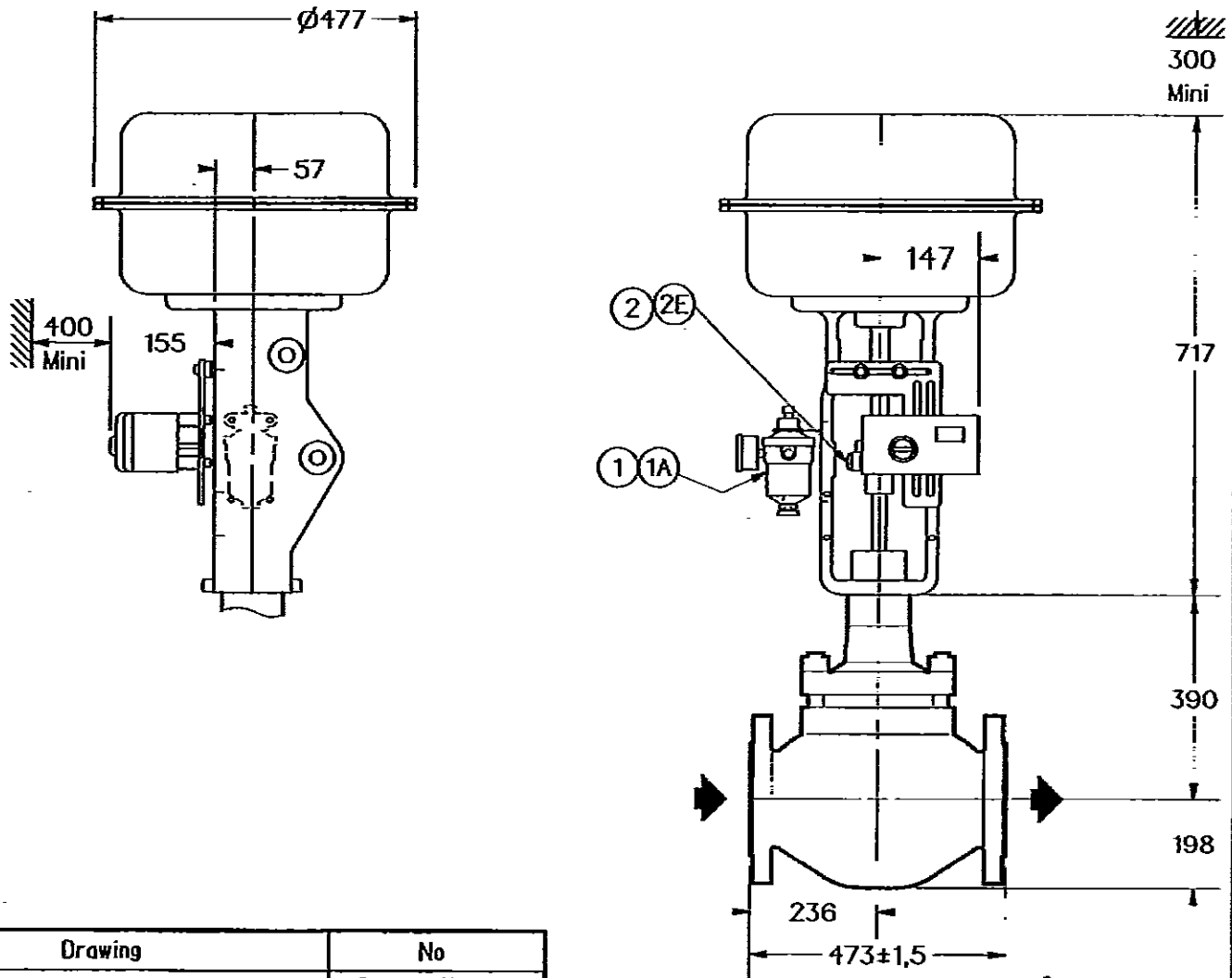
SERIES VALVE : 88-41335

DN : 150 (6")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF

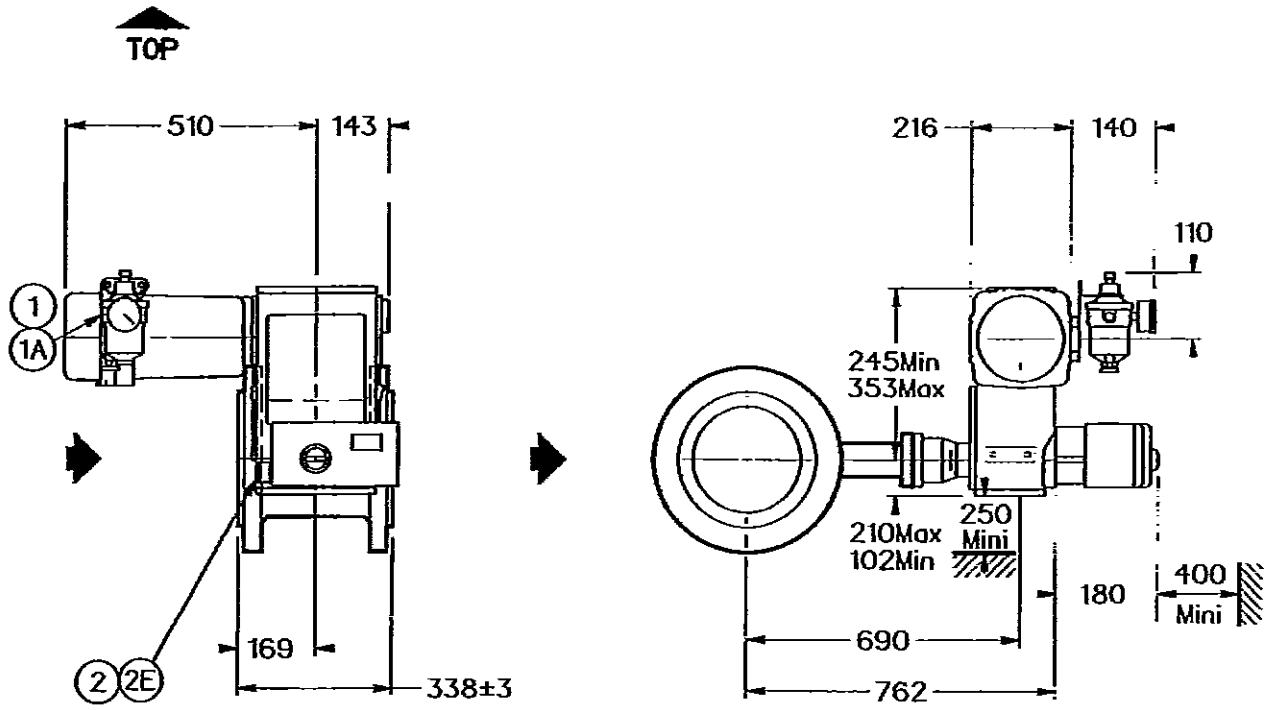


Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg			279	ITEM : 18017	MN SERIAL NUMBER : 02-04913-17
Rev. 1	DATE: Oct-15-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 PV 60122 A					

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 30-30662		DN : 300 (12")	ON AIR FAILURE : CLOSED	
FLOW TO : CLOSE		CONNECTION: 300 ANSI RF		



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		221	ITEM : 16018	MIN SERIAL NUMBER : 02-04913-18
Rev. 1	DATE: Oct-15-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007	
TAG : 30 PV 60122 B				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

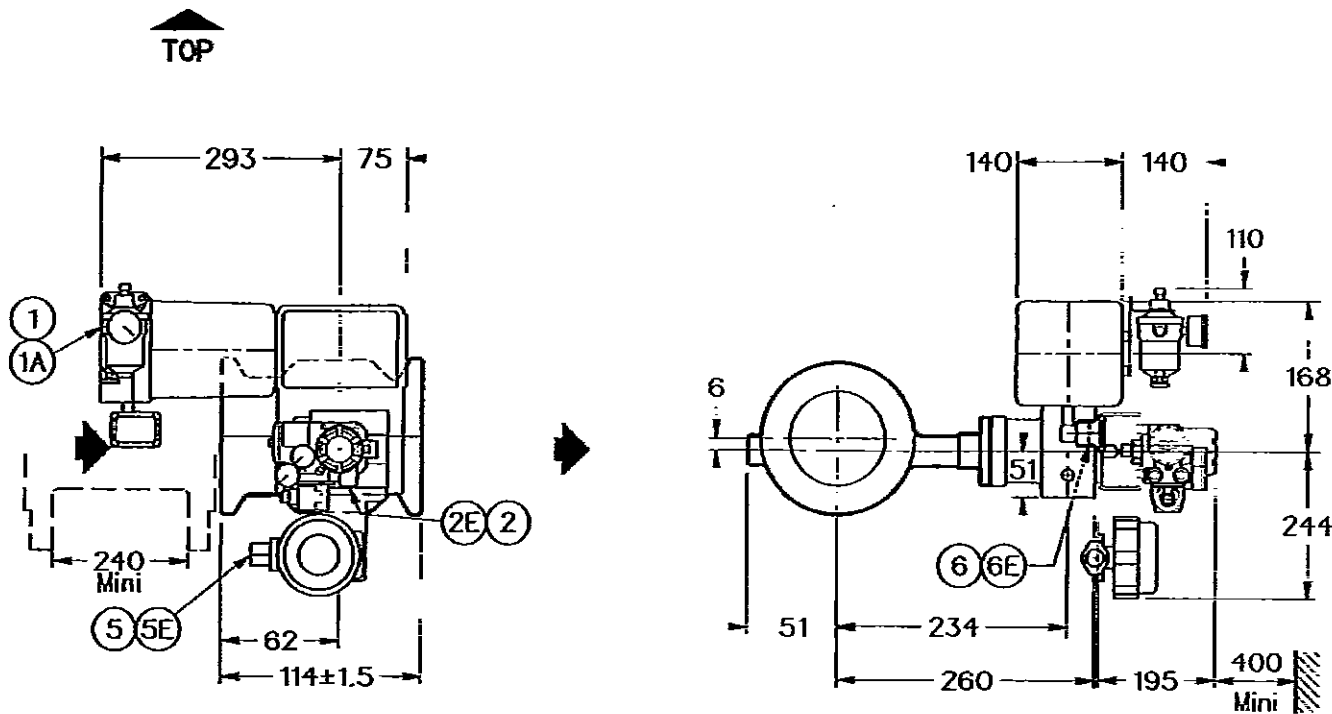
SERIES VALVE : 35-35202

DN : 40 (1.5")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW2
Electrical Connections Detail	02-04913-EC2
Electrical Connections Detail	02-04913-EC3
Electrical Connections Detail	02-04913-LD4

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal
5	496/4	Closing Detector	2.5	5E	M20
6	WS..8317..	Solenoid Valve	1.0	6E	M20

TOTAL WEIGHT (accessories + valve) in kg

15

ITEM : 16019

UN SERIAL NUMBER : 02-04913-19

Rev. 3

DATE: Feb-04-2003

DRAWN BY:

P-ROUELLE

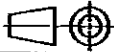
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 1007

TAG : 30 LV 60211



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



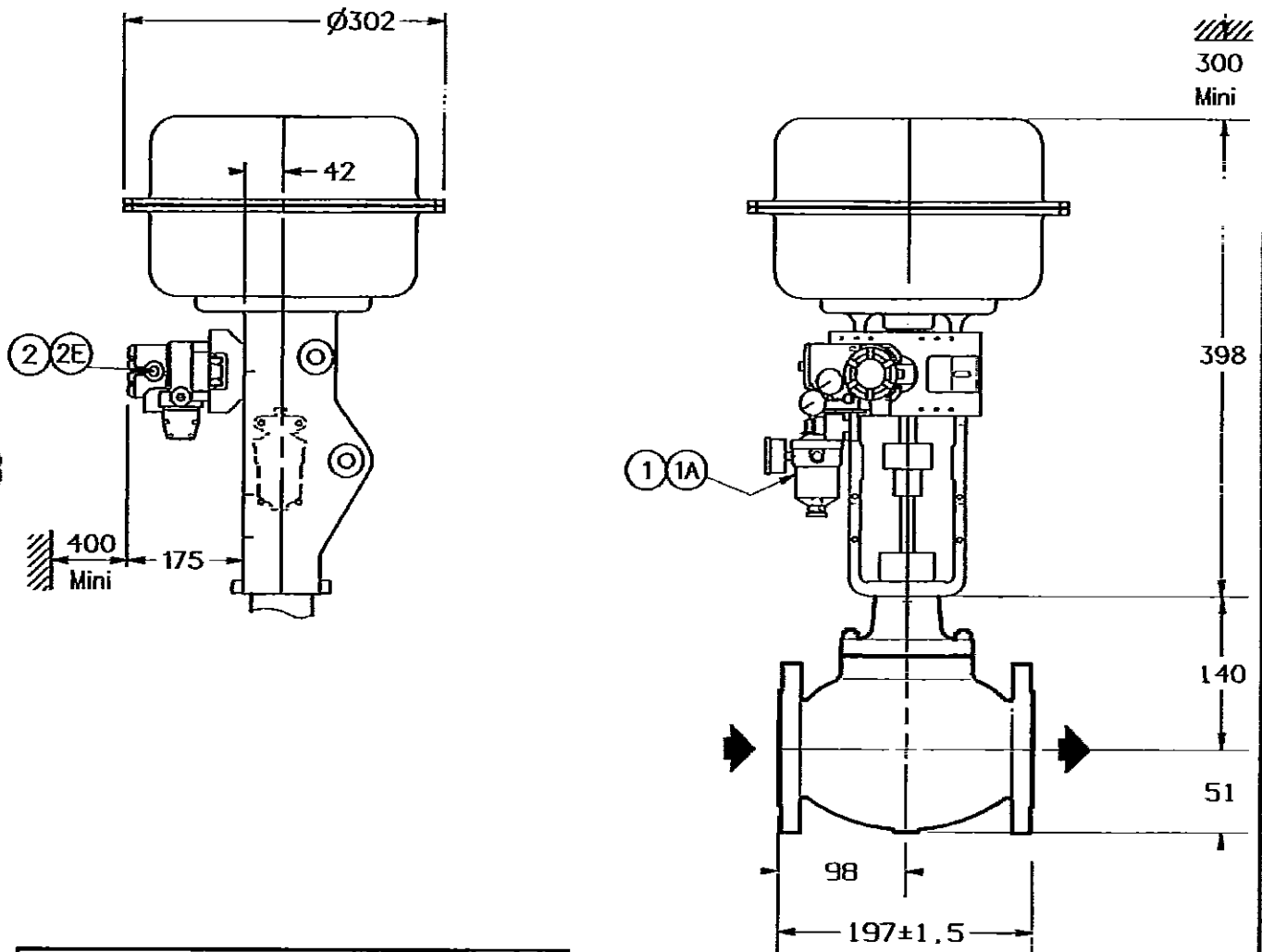
SERIES VALVE : 88-21125

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

38

ITEM : 16020/MI SERIAL NUMBER : 02-04913-20

Rev. 1 DATE: Oct-15-2002

DRAWN BY: P-ROUELLE

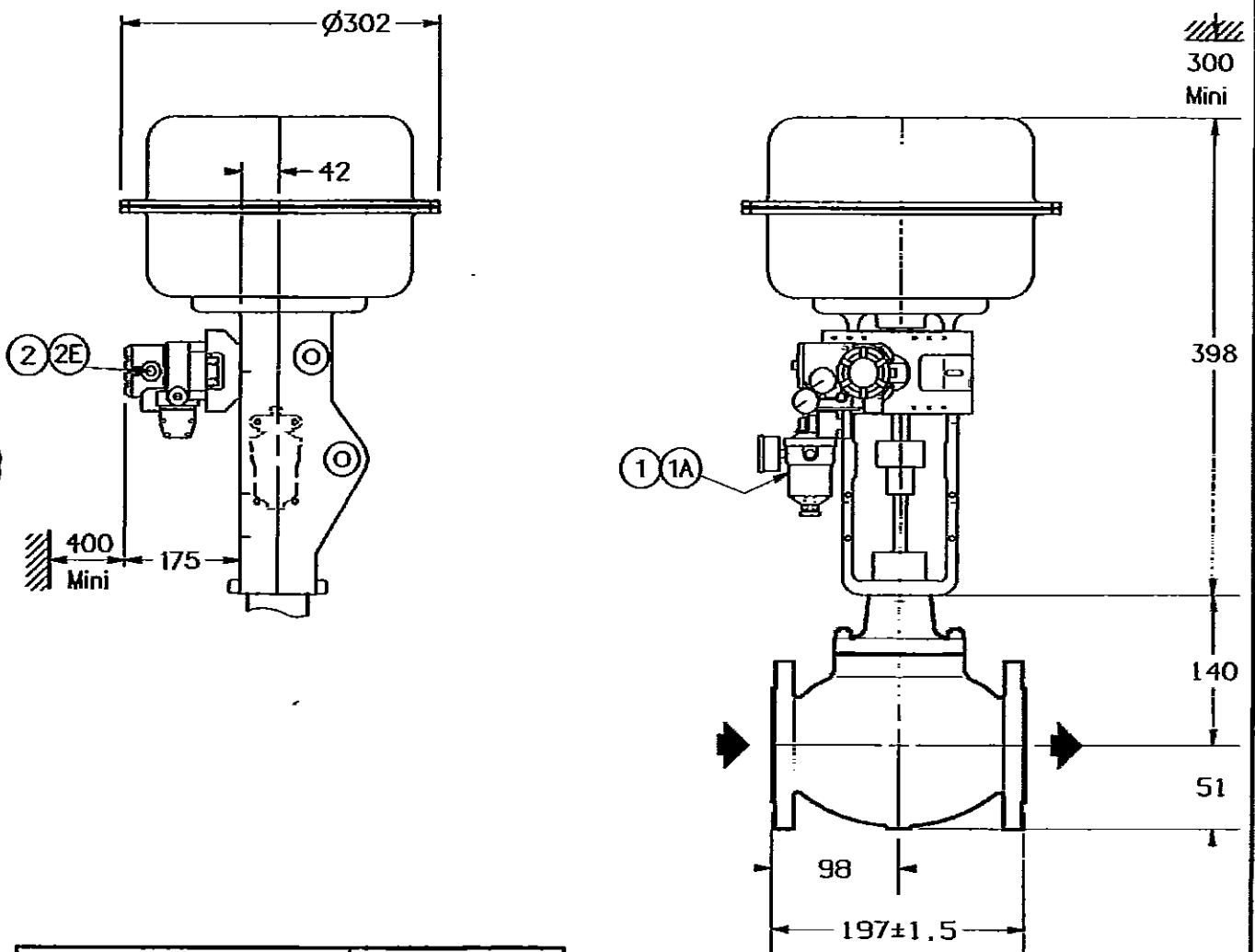
ISSUED BY: C-BROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 60211 A

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan
SERIES VALVE : 88-21125		DN : 25 (1")	ON AIR FAILURE : CLOSED
FLOW TO : OPEN	CONNECTION: 300 ANSI RF		



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg		38	ITEM : 16021	MIN SERIAL NUMBER : 02-04913-21
Rev. 1	DATE: Oct-15-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 LV 60211B				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

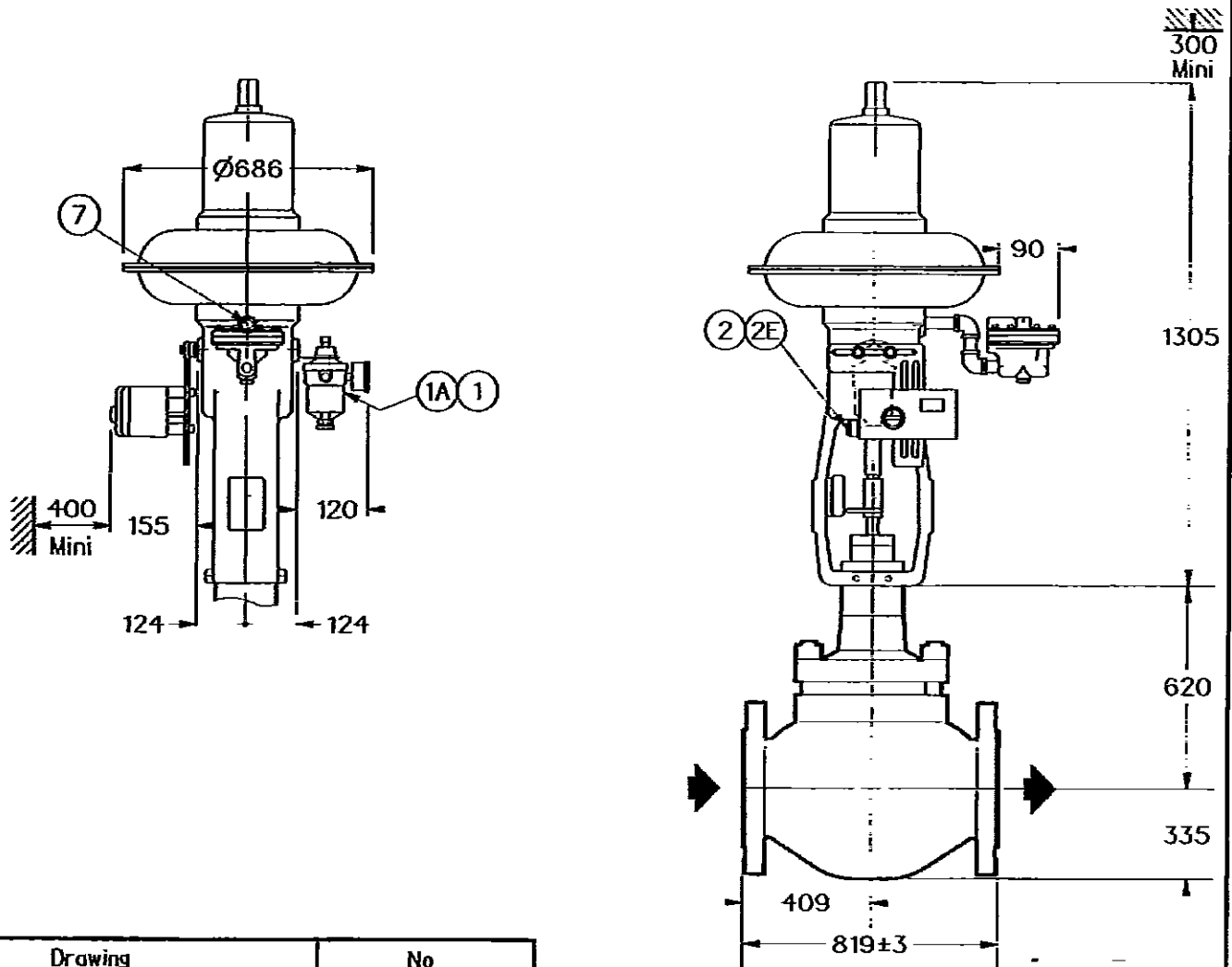
SERIES VALVE : 38-41915

DN : 12"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 600 ANSI RF-ISO PN 100 #B2



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW3
Electrical Connections Detail	02-04913-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
7	BR400	Booster	1.0		

TOTAL WEIGHT (accessories + valve) in kg

1210

ITEM : 16022

UN SERIAL NUMBER : 02-04913-22

Rev. 1

DATE: Oct-15-2002

DRAWN BY:

P. ROUELLE

ISSUED BY:

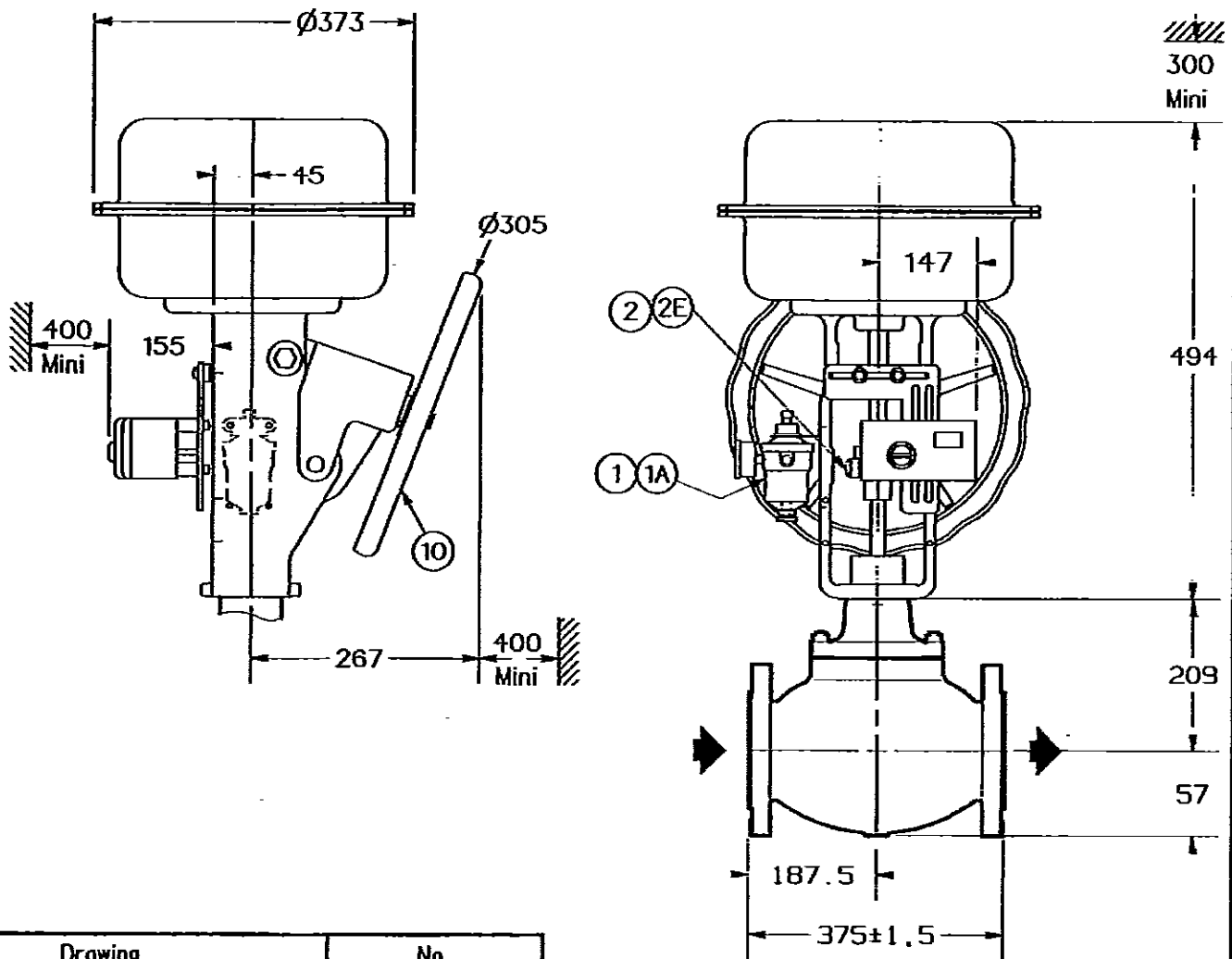
C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 60404

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 88-78121		DN : 50 (2")	ON AIR FAILURE : CLOSED	
FLOW TO : OPEN	CONNECTION: 1500 ANSI RTJ-ISO PN 250 #J			



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT(accessories + valve) in kg		85	ITEM : 16023	MI SERIAL NUMBER : 02-04913-23
Rev. 1	DATE: Oct-15-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 TV 60402				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



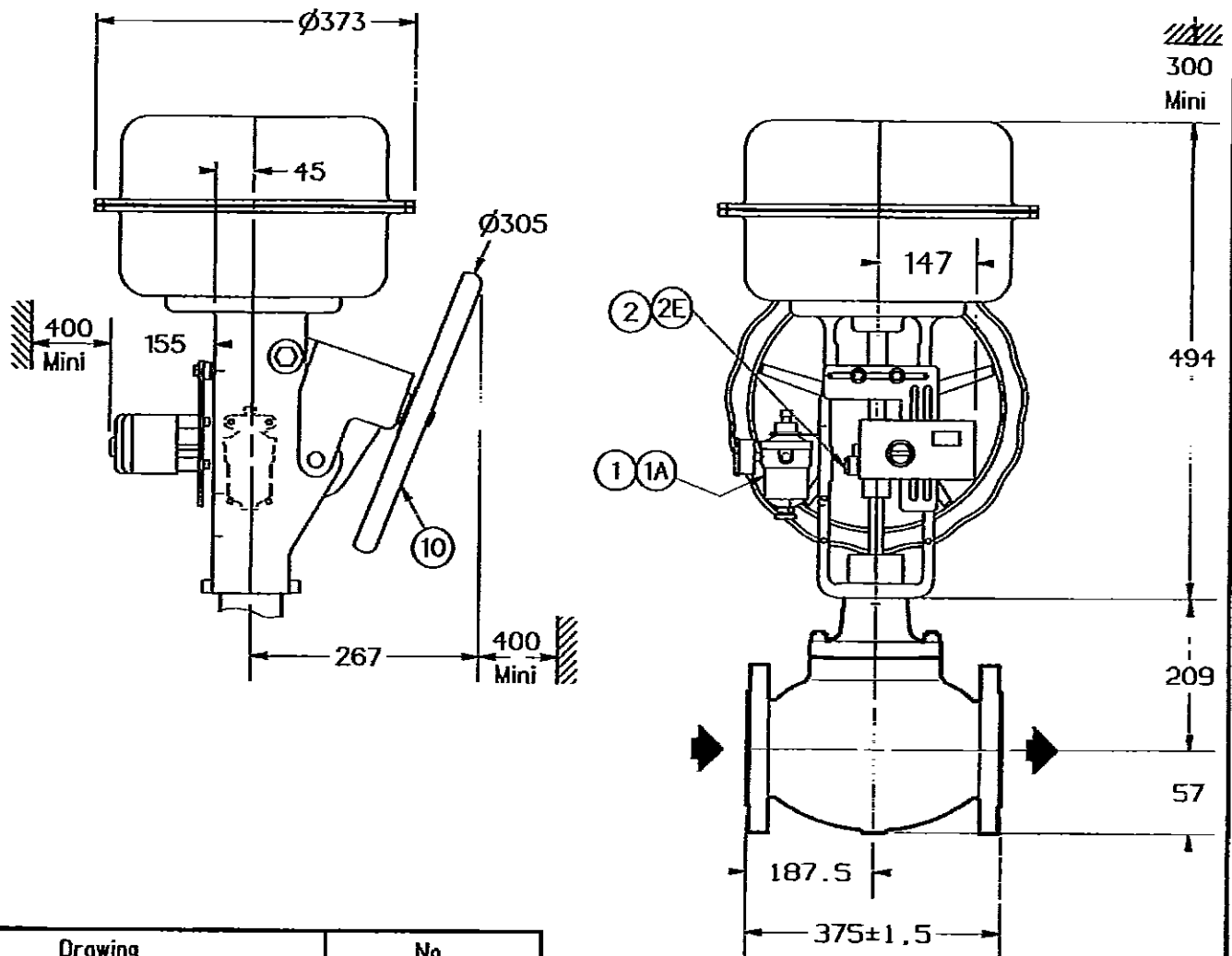
SERIES VALVE : 88-78128

DN : 50 (2")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 1500 ANSI RTJ-ISO PN 250 #J



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

85

ITEM : 16024

MN SERIAL NUMBER : 02-04913-24

Rev. 1

DATE: Oct-15-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

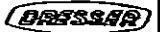
TAG : 30 TV 60406 A



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellam



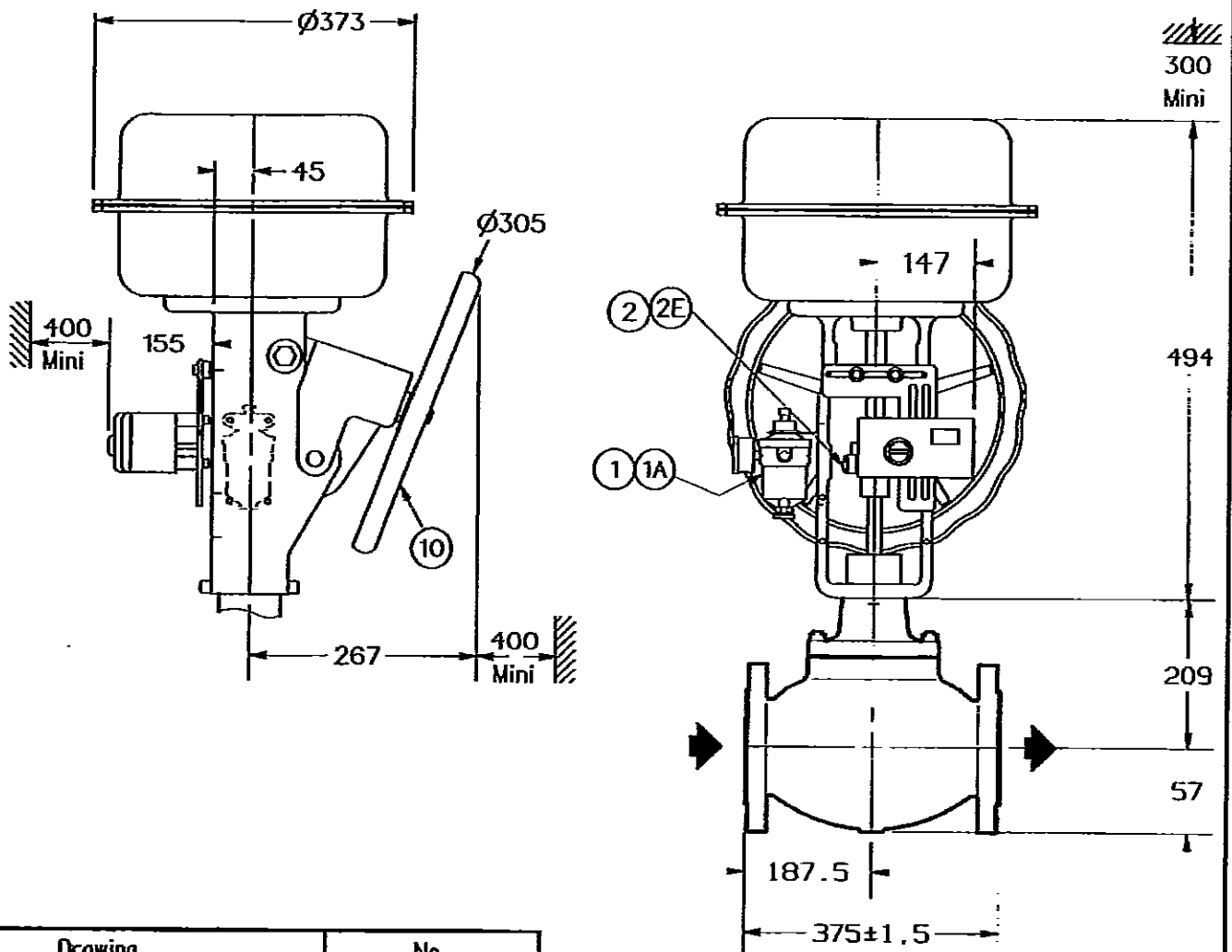
SERIES VALVE : 88-78128

DN : 50 (2")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 1500 ANSI RTJ-ISO PN 250 #J



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

85

ITEM : 16025

MIN SERIAL NUMBER : 02-04913-25

Rev. 1

DATE: Oct-15-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DRCUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 TV 60406 B



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

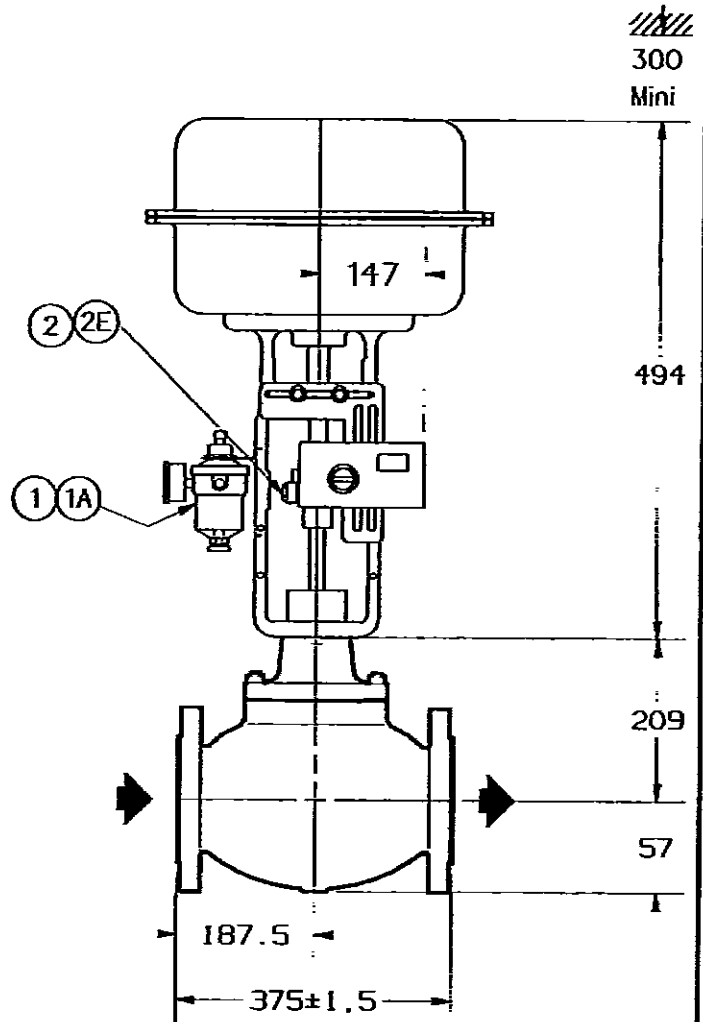
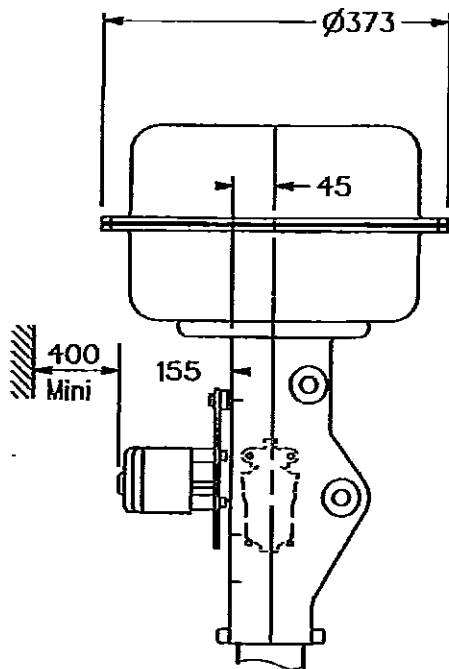
SERIES VALVE : 88-78128

DN : 50 (2")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 1500 ANSI RTJ-ISO PN 250 #J



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ1D-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

85

ITEM : 16026

MN SERIAL NUMBER : 02-04913-28

Rev. 1

DATE: Oct-15-2002

DRAWN BY:

P-ROUELLE

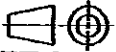
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 60411



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

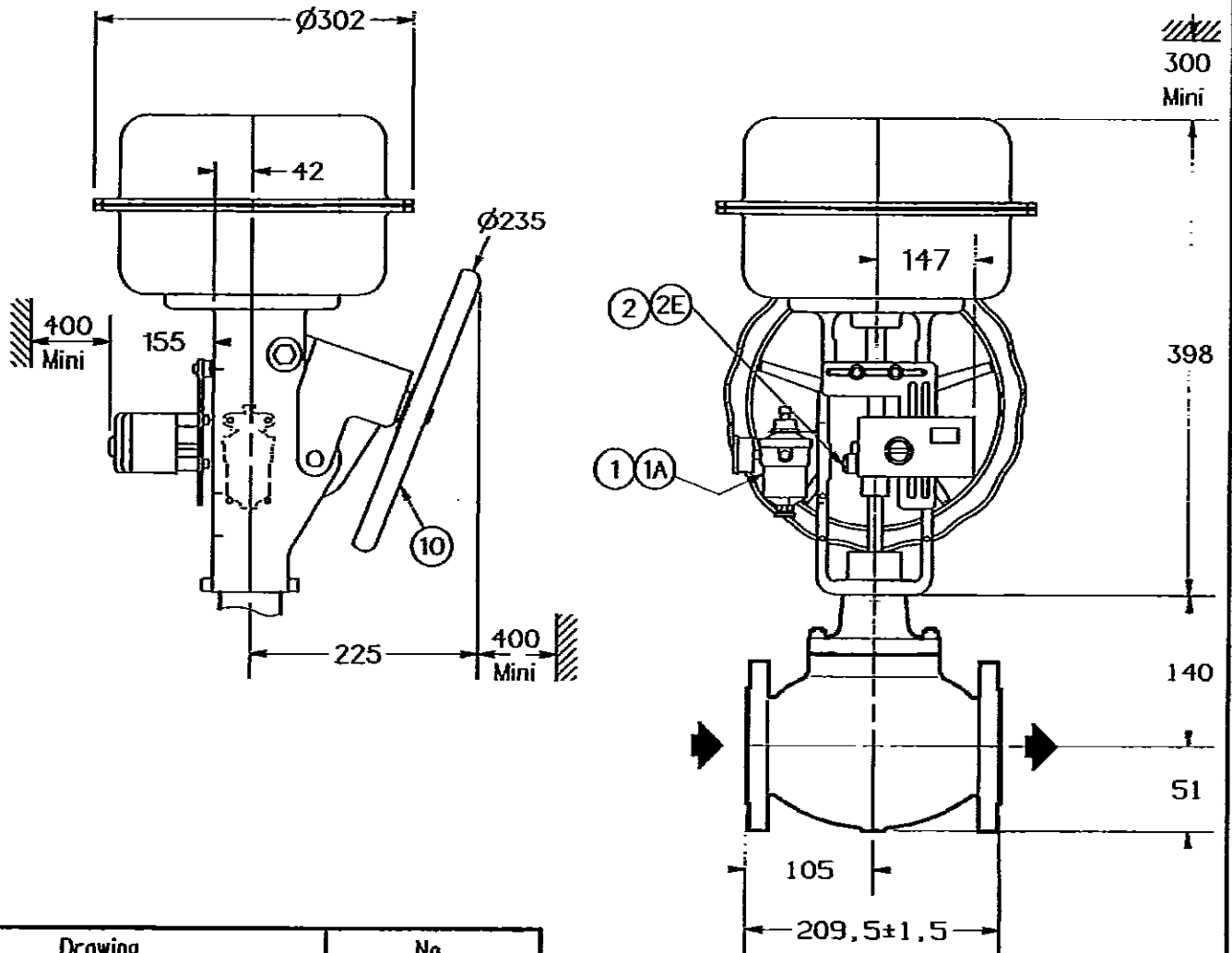
SERIES VALVE : 88-21125-/HW

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 600 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

44

ITEM : 16027

VIN SERIAL NUMBER : 02-04913-27

Rev. 1

DATE: Oct-15-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 TV 60416



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

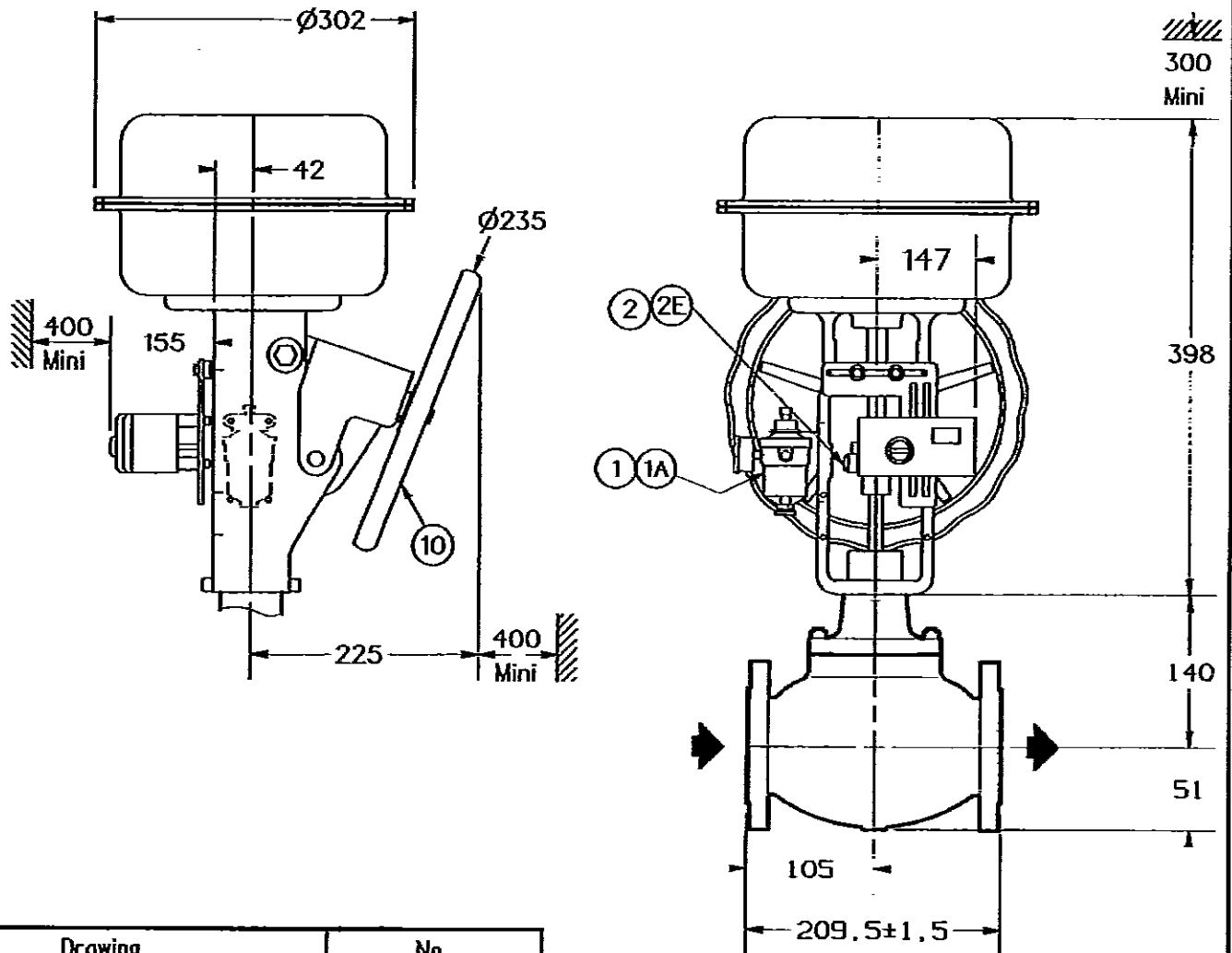
SERIES VALVE : 88-21014-2S/

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 600 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04913-PW1
Electrical Connections Detail	02-04913-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

44

ITEM : 16028

MIN SERIAL NUMBER : 02-04913-28

Rev. 1

DATE: Oct-15-2002

DRAWN BY:

P-ROELLE

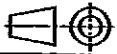
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 TV 60426



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonella

DRESSER

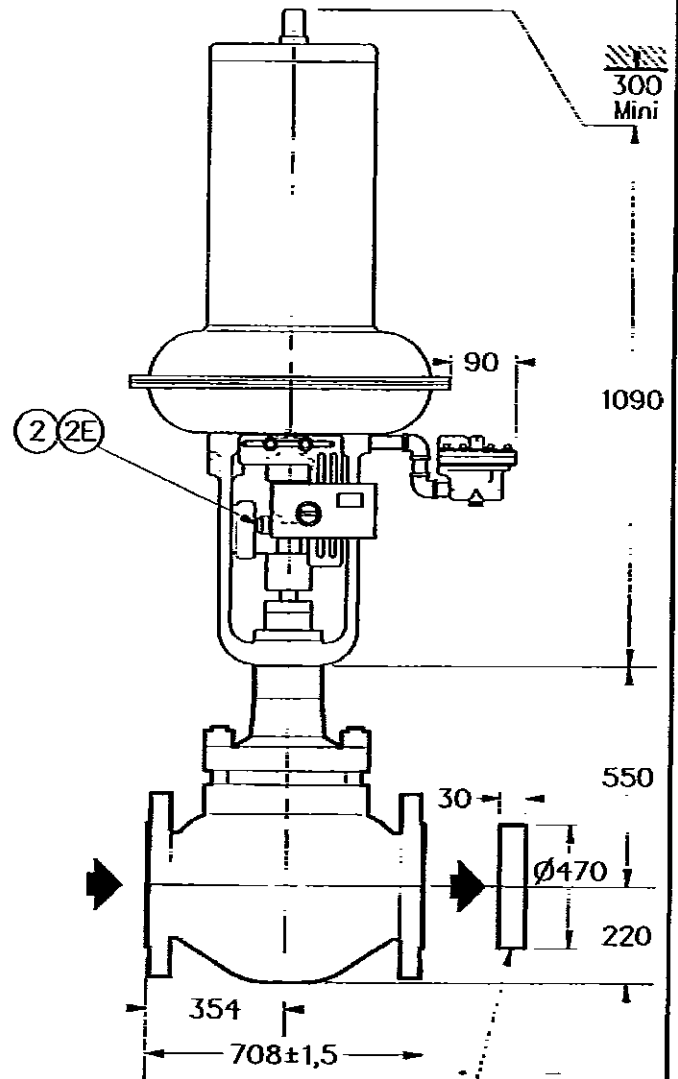
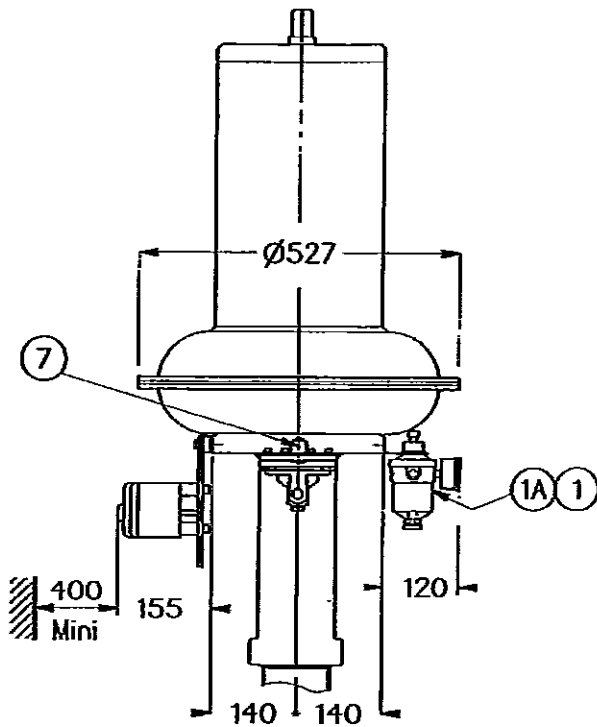
SERIES VALVE : 38-41315

DN : 10"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-150 PN 50 #B1



Multiholes Plate
16" ANSI 150 RF
Cv : 2000
(To be mounted
downstream the valve)

Drawing	No
Pneumatic Wiring Diagram	02-04913-PW3
Electrical Connections Detail	02-04913-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M 20 - Signal
7	BR400	Booster	1.0		

TOTAL WEIGHT (accessories + valve) in kg

760

ITEM : 16029

UN SERIAL NUMBER : 02-04913-29

Rev. 1 | DATE: Oct-14-2002

DRAWN BY: P. ROUELLE

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 60427



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellian

BRASSER

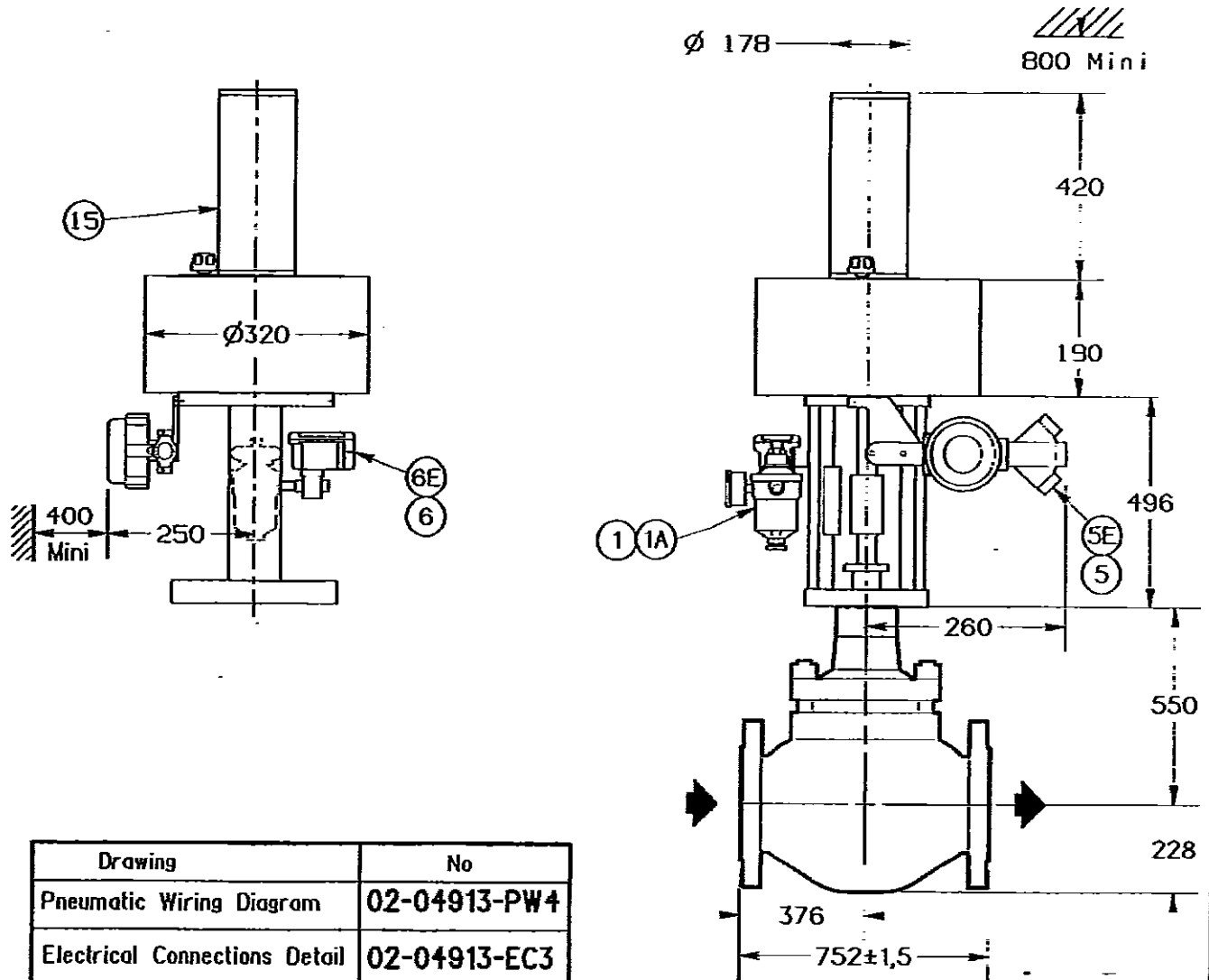
SERIES VALVE : 68-41915

DN : 10"

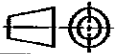
ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 600 ANSI RF-150 PN 100 #B2



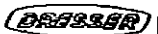
Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
5	496/5	Detectors	2.5	5E	M20x2
6	WS..8317..	Solenoid Valve	1.0	6E	M20
15	L 300/76	CA Linear Actuator	100		
TOTAL WEIGHT (accessories + valve) in kg			725	ITEM : 031	UN SERIAL NUMBER : 02-04913-31
Rev. 1	DATE: Dec-19-2002	DRAWN BY: JLELOVER	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 UV 60001					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



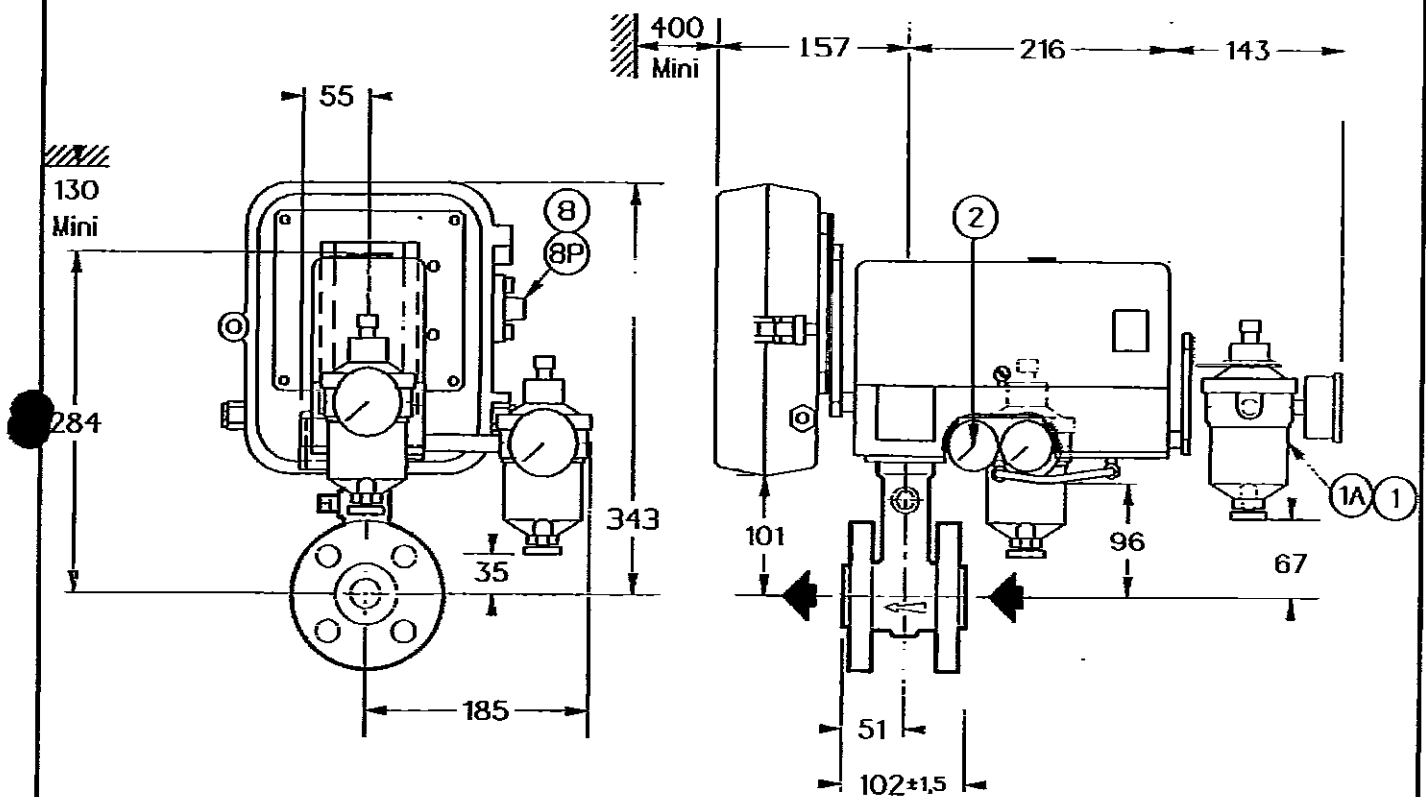
SERIES VALVE : 27-28260-51

DN : 15 (1/2")

ON AIR FAILURE : OPEN.

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04915-PW.10

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filter Regul. +Gauge	1.0	1A	1/4" NPT - Air Supply
2	7700	Pneumatic Positioner	1.0		
8	2700 + FR10/C	Pressure Regulator + Air Filter Regul. +Gauge	6.0	8P	1/4" NPTF-Controlled Pressure

TOTAL WEIGHT (accessories + valve) in kg

11

ITEM : 033

WH SERIAL NUMBER : 02-04913-33

Rev. 1

DATE: Oct-14-2002

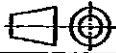
DRAWN BY: P. ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP 9TH OLEFIN

CUSTOMER ORDER: 6465C30 1541 01 0 1007

TAG : 30 PCV 60063



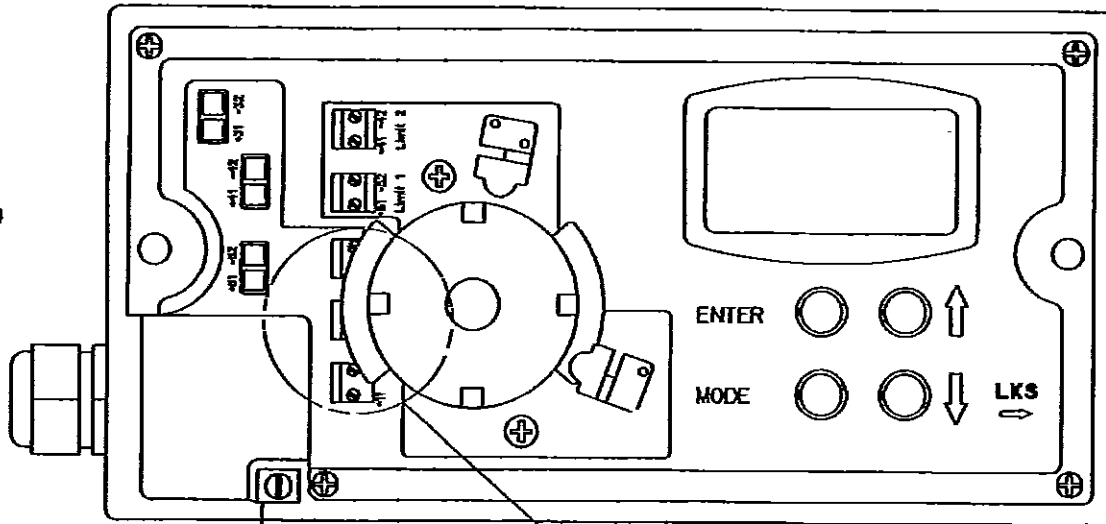
DRAWING No : 02-04913-EC1

Masonellan

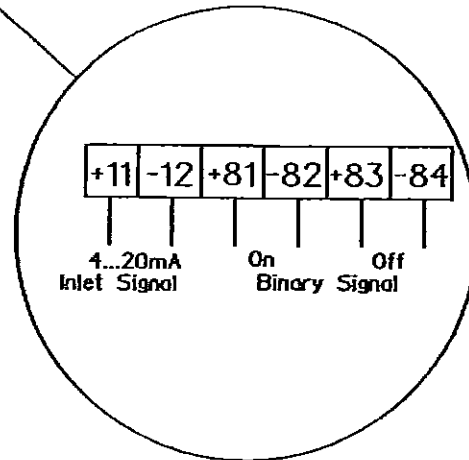


ELECTRICAL CONNECTIONS DETAIL

ELECTROPNEUMATIC POSITIONER TZID-C



Earth Terminal



Rev. 0	DATE: 16/OCT/2002	DRAWN BY: P. SEVESTRE	ITEM : /	MN SERIAL NUMBER : 02-04913-EC1
CUSTOMER: TECHNIP		ISSUED BY: C. DROUARD		
TAG :		CUSTOMER ORDER: 6465C 30 1541 01 0 10007		



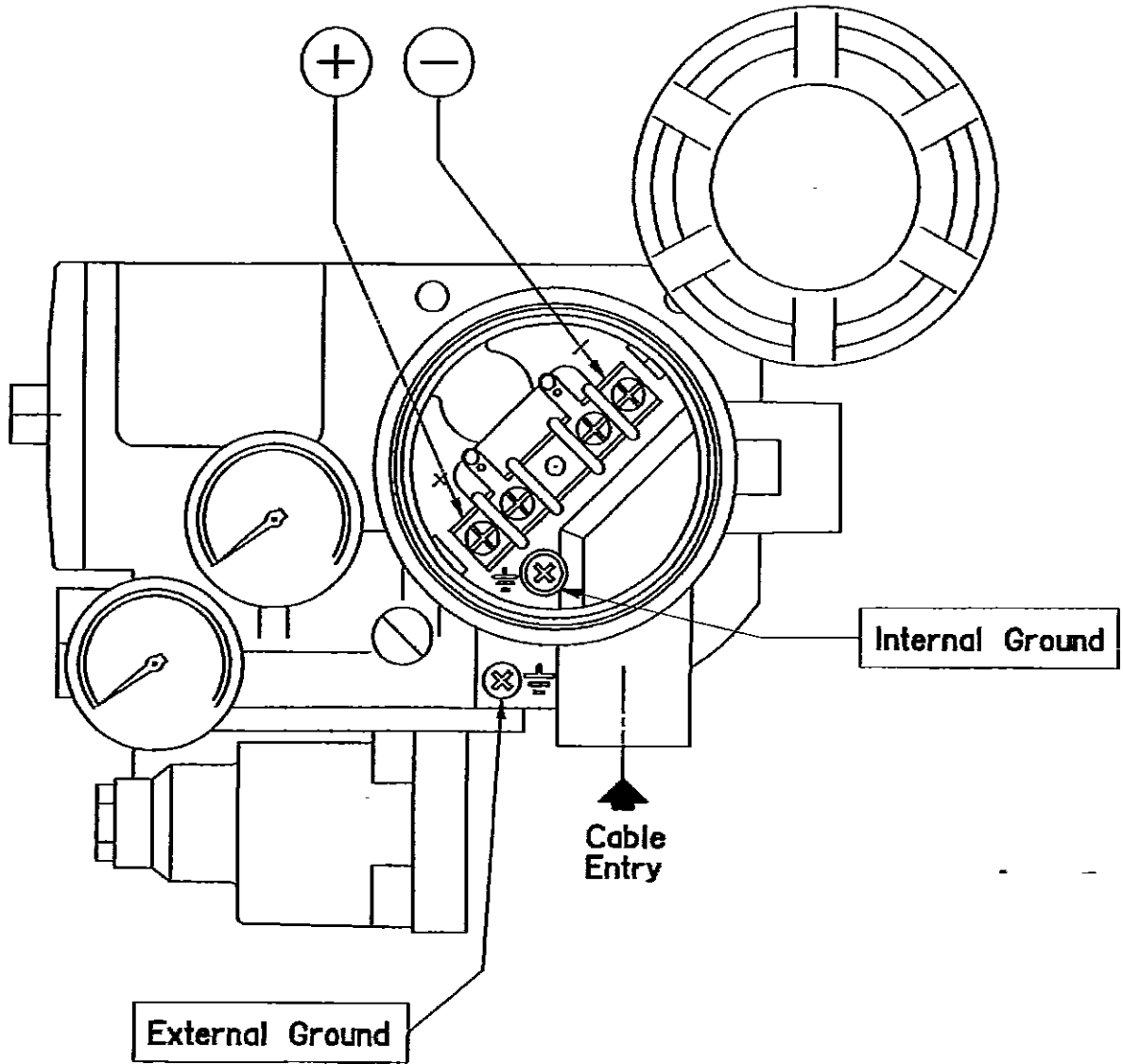
DRAWING No : 02-04913-EC2

Masonellan



ELECTRICAL CONNECTIONS DETAIL

ELECTROPNEUMATIC POSITIONER FVP



Rev. 0		DATE: 16/OCT/2002	DRAWN BY: P. SEVSTRE	ISSUED BY: C. DROUARD	ITEM : /	VN SERIAL NUMBER : 02-04913-EC2
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C 30 1541 01 0 10007			
TAG : /						



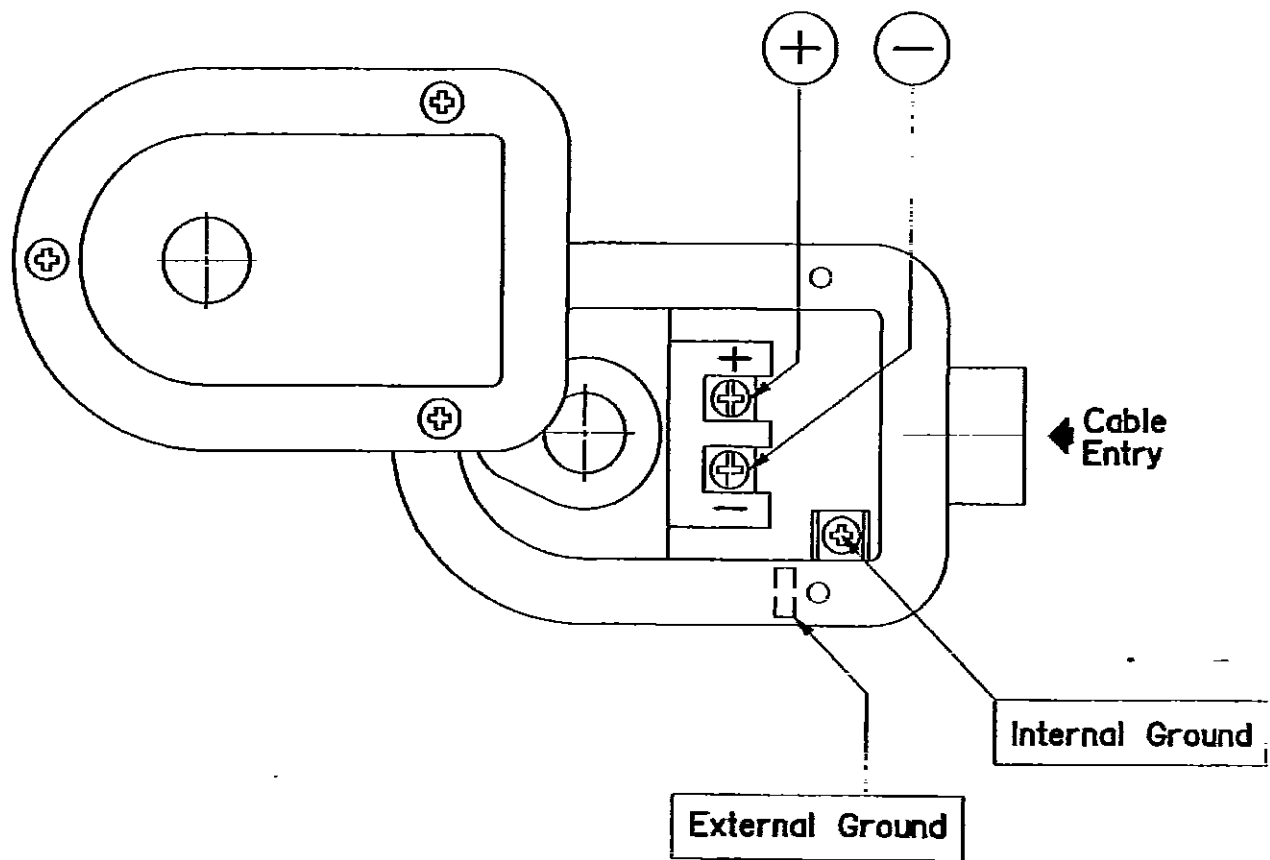
DRAWING No : 02-04913-EC3

Masonellan

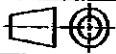


ELECTRICAL CONNECTIONS DETAIL

WSTIS B317A308 SOLENOID VALVE



Rev. 0		DATE: 16/OCT/2002	DRAWN BY: P. SEVESTRE	ISSUED BY: C. DRUARD	ITEM : /	MN SERIAL NUMBER : 02-04913-EC3
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C 30 1541 01 0 10007			
TAG : /						

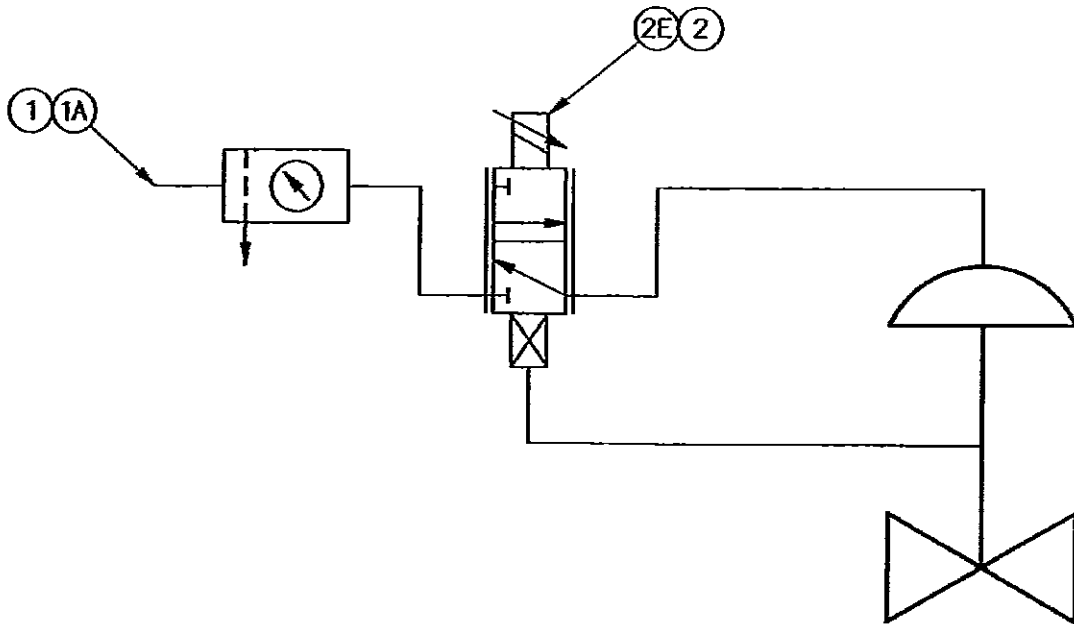


DRAWING No : 02-04913-PW1

Masonellam



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10₂

Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal

ITEM : _____ / SERIAL NUMBER : 02-04913-PW1

Rev. 0 | DATE: 16/OCT/2002 | DRAWN BY: P. SEVESTRE | ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP | CUSTOMER ORDER: 6465C 30 1541 01 0 10007

TAG : _____

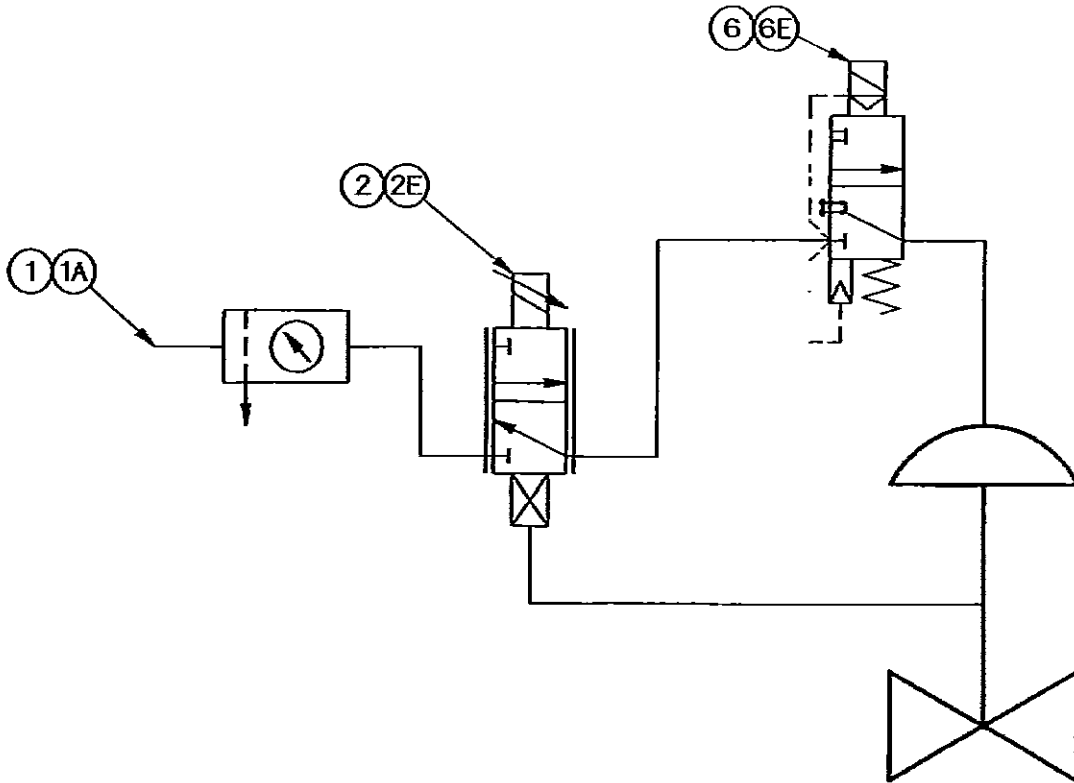


DRAWING No : 02-04913-PW2

Masonellan

BRASSER

PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10₂

Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal
6	Solenoid Valve	6E	

ITEM : / MN SERIAL NUMBER : 02-04913-PW2

Rev. 0 DATE: 16/OCT/2002

DRAWN BY: P. SEVESTRE

ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6485C 30 1541 01 0 1007

TAG : /

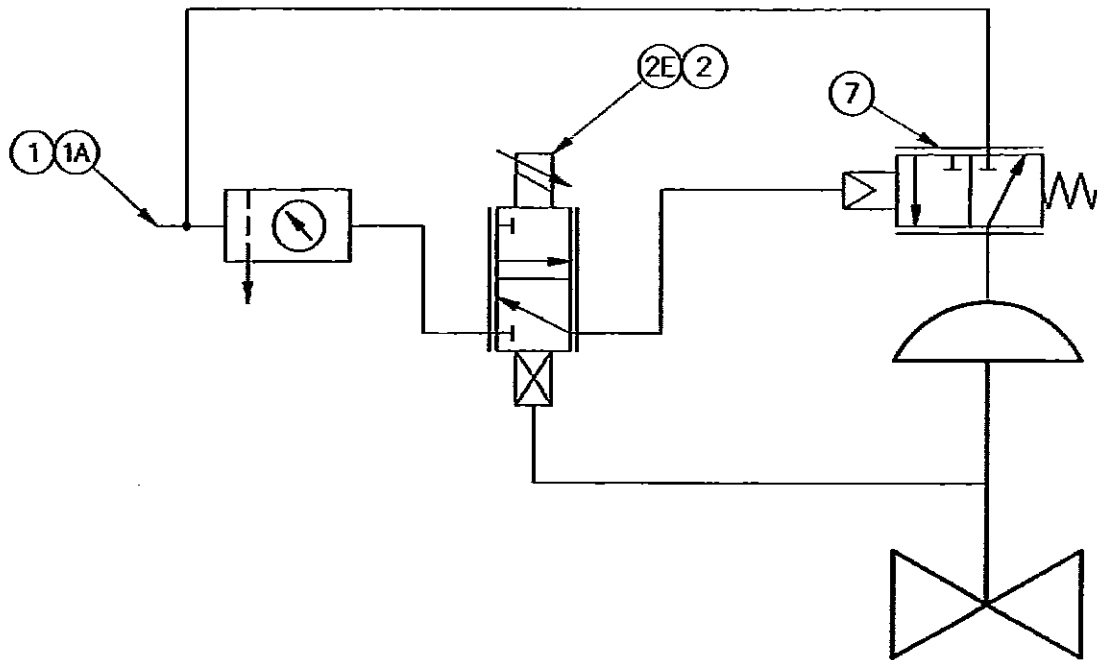


DRAWING No : 02-04913-PW3

Masonellan



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.1Q

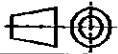
Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filler Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal
7	Volume Booster		

ITEM : / MN SERIAL NUMBER : 02-04913-PW3

Rev. 0 | DATE: 15/OCT/2002 | DRAWN BY: P. SEVESTRE | ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP | CUSTOMER ORDER: 6465C 30 1541 01 0 10007

TAG : /

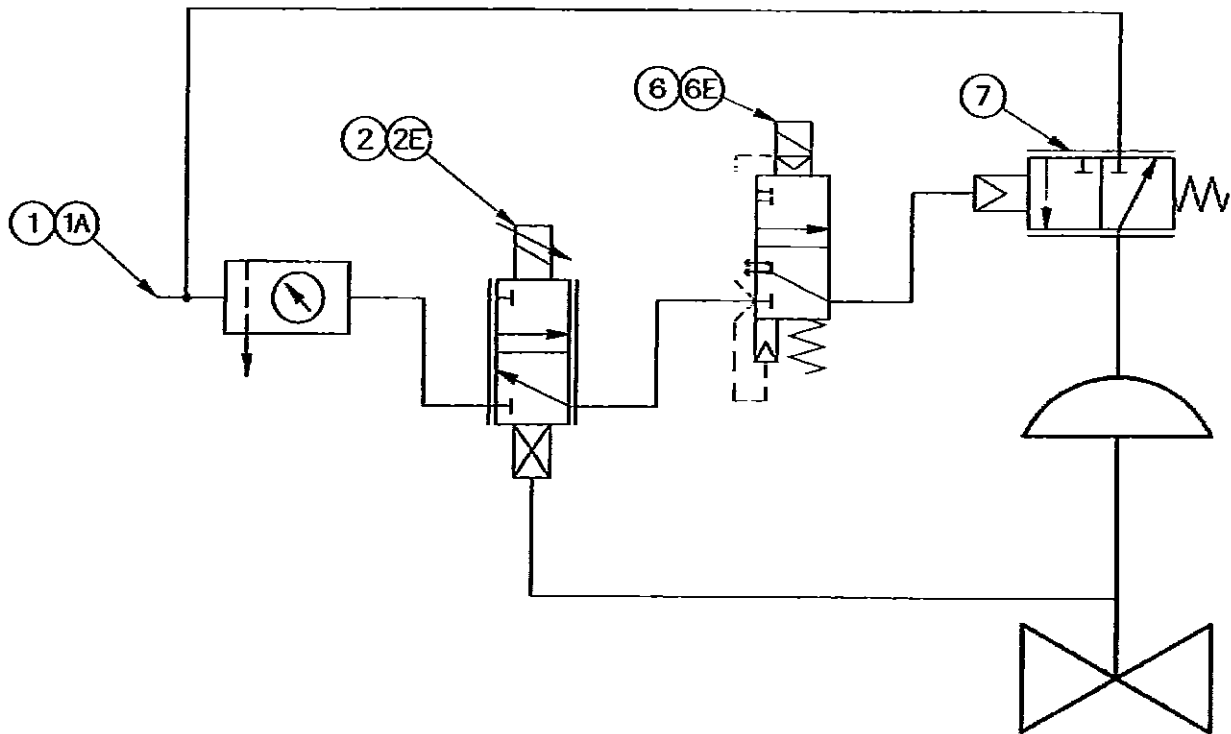


DRAWING No : 02-04913-PW5

Masonellan



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10

Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal
6	Solenoid Valve	6E	
7	Volume Booster		

ITEM : / MN SERIAL NUMBER : 02-04913-PW5

Rev. 0 | DATE: Jan-29-2003 | DRAWN BY: P. SEVESTRE | ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP

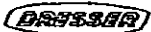
CUSTOMER ORDER: 6465C 30 1541 01 0 10007

TAG : /

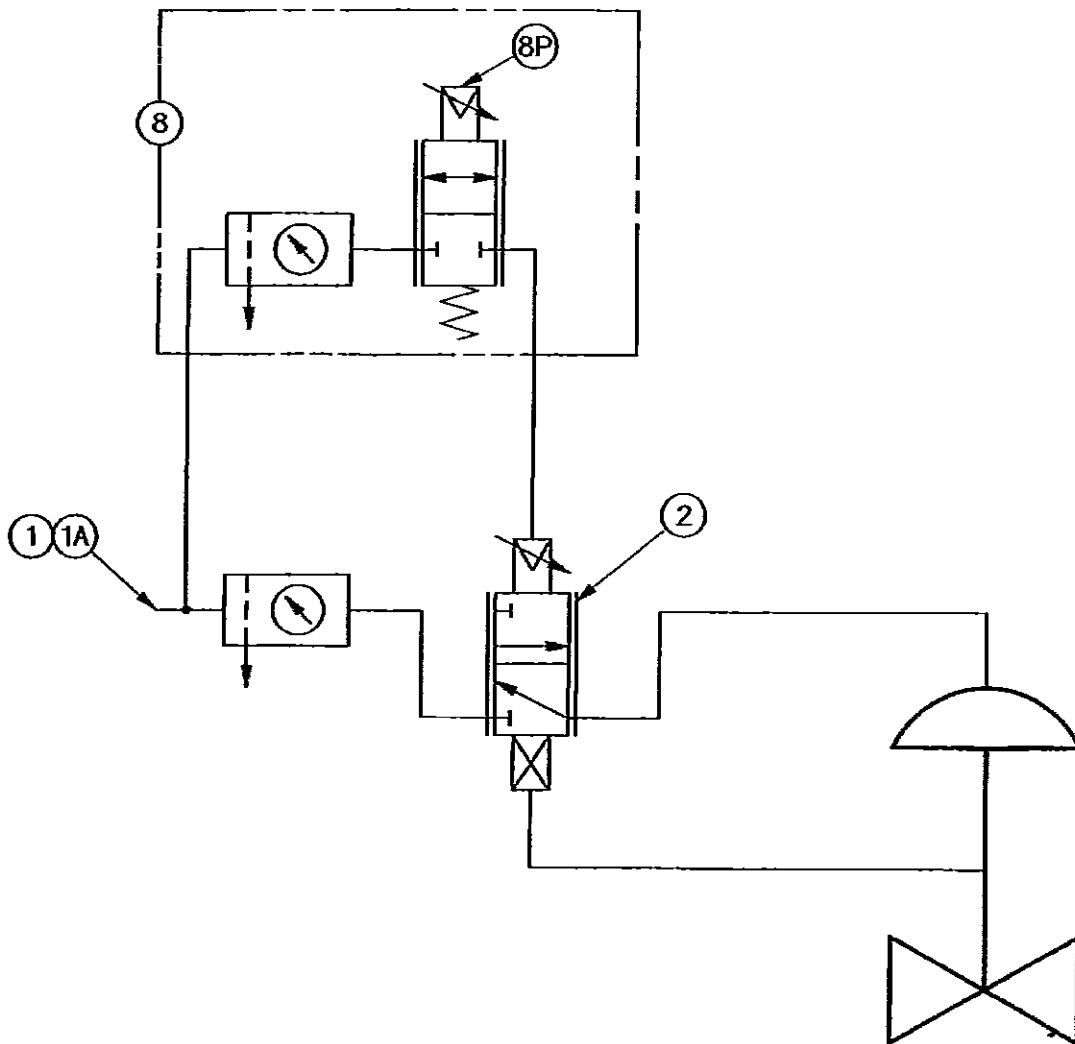


DRAWING No : 02-04913-PW10

Masonellan



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10

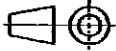
Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Pneumatic Positioner		
8	Pressure regulator Air Filter Regul.+Gauge	8P	Controlled pressure

ITEM : / MN SERIAL NUMBER : 02-04913-PW10

Rev. 0 || DATE: Oct-16-2002 || DRAWN BY: P. SEVESTRE || ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP || CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : /



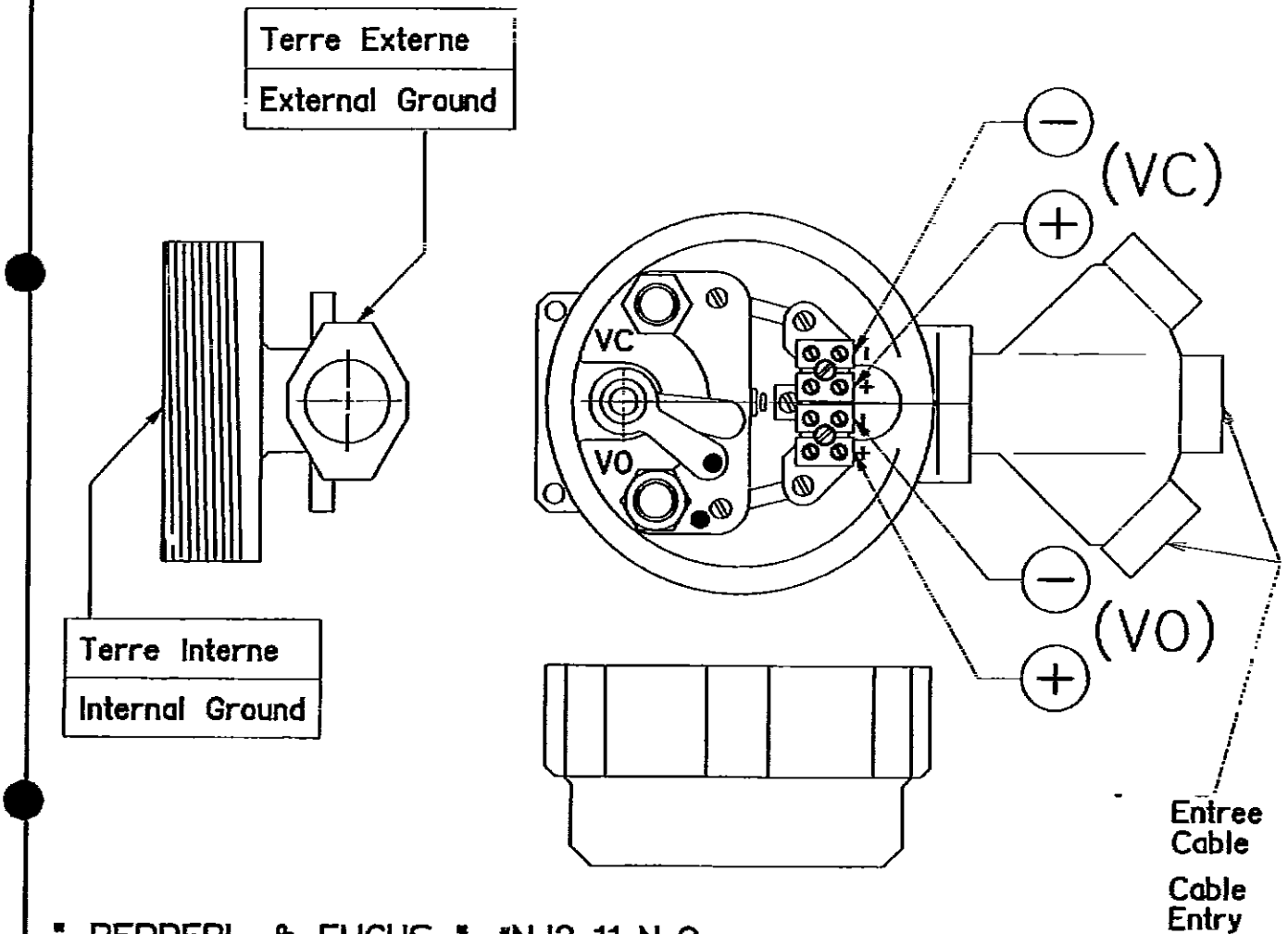
PLAN/DRWG : 02-04913-LD1

Masonellan



DETAIL RACCORDEMENTS ELECTRIQUES
ELECTRICAL CONNECTIONS DETAIL

DETECTEUR FIN DE COURSE 496-4 & 5
LIMIT DETECTOR 496-4 & 5



▪ PEPPERL & FUCHS ▪ #NJ2-11-N-G

VO : Detecteur Vanne OUVERTE
: OPEN Valve Detector

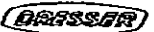
VC : Detecteur Vanne FERMEE
: CLOSED Valve Detector

Rev: 0		DATE: Dec-19-2002	DESS. PAR/DRAWN BY: P. SEVESTRE	ITEM: /	N° DE SERIE : 02-04913-LD1 SERIAL NUMBER:
CLIENT/CUSTOMER: TECHNIP			EMIS PAR/ISSUED BY: C. DROUARD		
REPERE/TAG No: /			Cde CLIENT/CUST. ORDER: 6465C30 1541 01 0 10007		



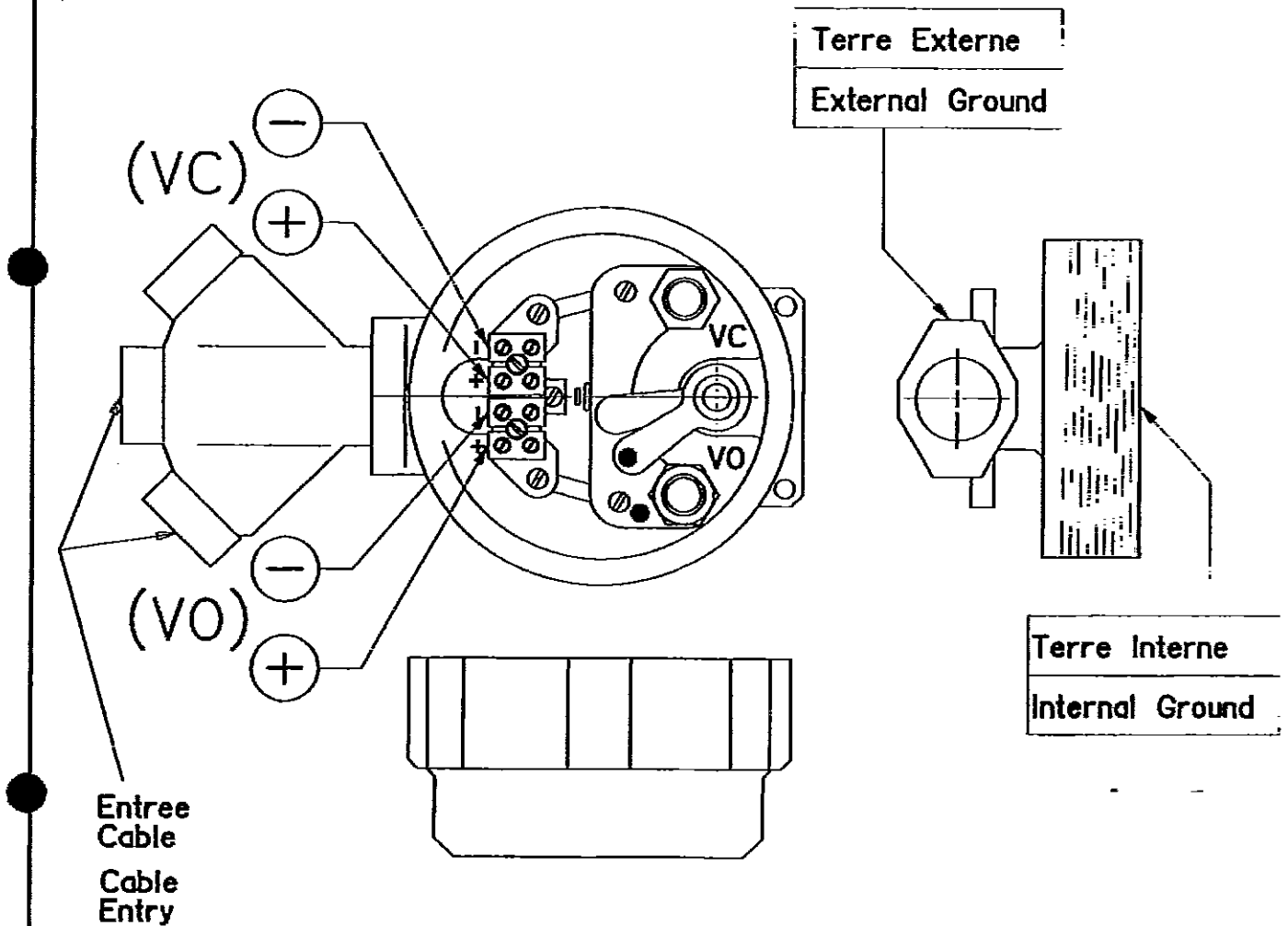
PLAN/DRWG : 02-04913-LD3

Masonellan



DETAIL RACCORDEMENTS ELECTRIQUES
ELECTRICAL CONNECTIONS DETAIL

DETECTEUR FIN DE COURSE 496-4 & 5
LIMIT DETECTOR 496-4 & 5



* PEPPERL & FUCHS * #NJ2-11-N-G

VO : Detecteur OUVERTURE
: OPENING Detector

VC : Detecteur FERMETURE
: CLOSING Detector

ITEM: _____

N° DE SERIE : 02-04913-LD3
SERIAL NUMBER:

Rev: 2 | DAT.: Dec-19-2002 | DESS.PAR/DRAWN BY: P. SEVESTRE

EMIS PAR/ISSUED BY: C. DROUARD

CLIENT/CUSTOMER: TECHNIP

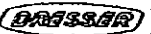
Cde CLIENT/CUST.ORDER: 6465C30 1541 01 0 10007

REPERE/TAG No: _____



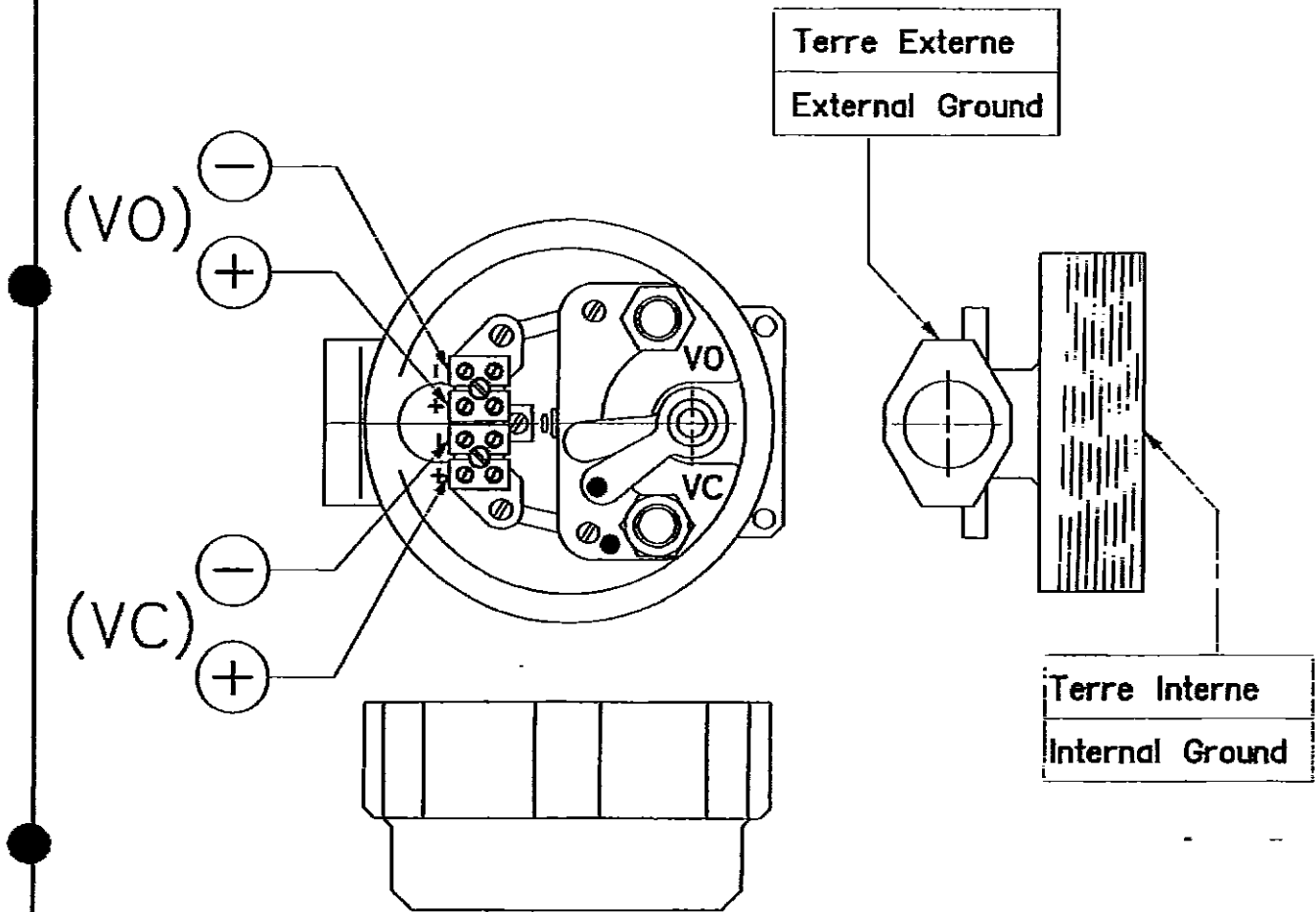
PLAN/DRWG : 02-04913-LD4

Masonellan



DETAIL RACCORDEMENTS ELECTRIQUES
ELECTRICAL CONNECTIONS DETAIL

DETECTEUR FIN DE COURSE 496-4 & 5
LIMIT DETECTOR 496-4 & 5



▪ PEPPERL & FUCHS ▪ #NJ2-11-N-G

VO : Detecteur OUVERTURE
: OPENING Detector

VC : Detecteur FERMETURE
: CLOSING Detector

			ITEM: /	N° DE SERIE : 02-04913-LD4 SERIAL NUMBER:
Rev: 1	DATE: Dec-11-2002	DESS. PAR/DRAWN BY: P. SEVESTRE	EMIS PAR/ISSUED BY: C. DROUARD	
CLIENT/CUSTOMER: TECHNIP			Cde CLIENT/CUST. ORDER: 6465C30 1541 01 0 10007	
REPERE/TAG No: /				




UNIT 70

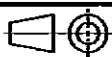
OUTLINE DRAWINGS

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
2003.03.26 13:19:39 +01'00'
<none>

STATUS CERTIFIED "FINAL"
ISSUED BY : C. DROUARD
DATE : 16/12/02

2	24/03/03	Up-dated drawings item 17007		
1	16/12/02	Up-dated drawings further to your comments		
0	18/10/02	FIRST ISSUE		
REV	DATE	DESCRIPTION		
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007		
		EQUIPMENT NAME:		
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	Control valves		
	DOCUMENT TITLE : Outline drawings	DOCUMENT CODE : A 3201		
	PURCHASE ORDER : 02-4914 (Unit 70)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Sheet 01 of 29</td> <td style="width: 50%; text-align: center;">Rev. 2</td> </tr> </table>	Sheet 01 of 29	Rev. 2
Sheet 01 of 29	Rev. 2			



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DASSER

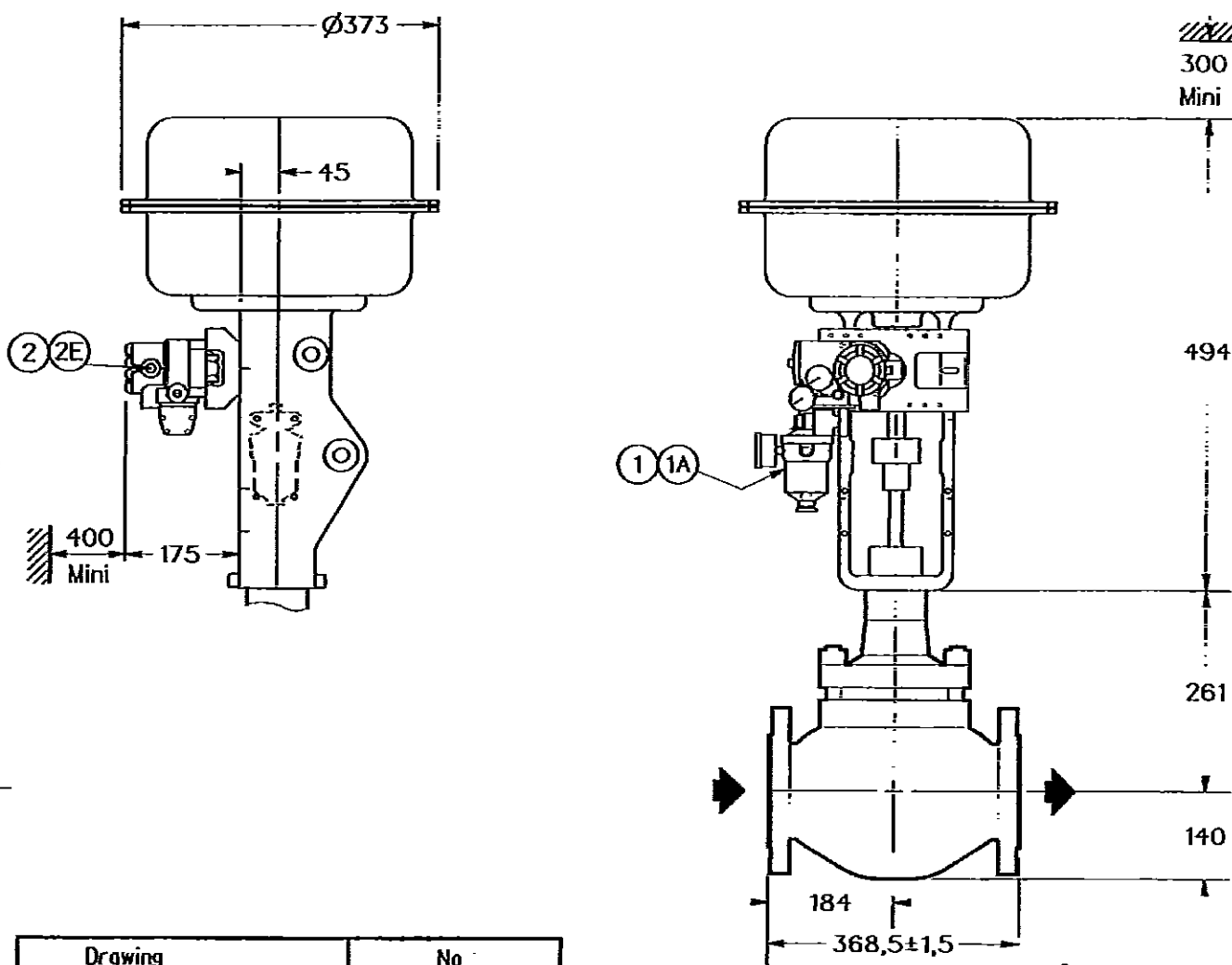
SERIES VALVE : 88-41355

DN : 4"x2"x4"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/0	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

134

ITEM : 17001

MN SERIAL NUMBER : 02-04914-01

Rev. 1

DATE: Oct-17-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 70002



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



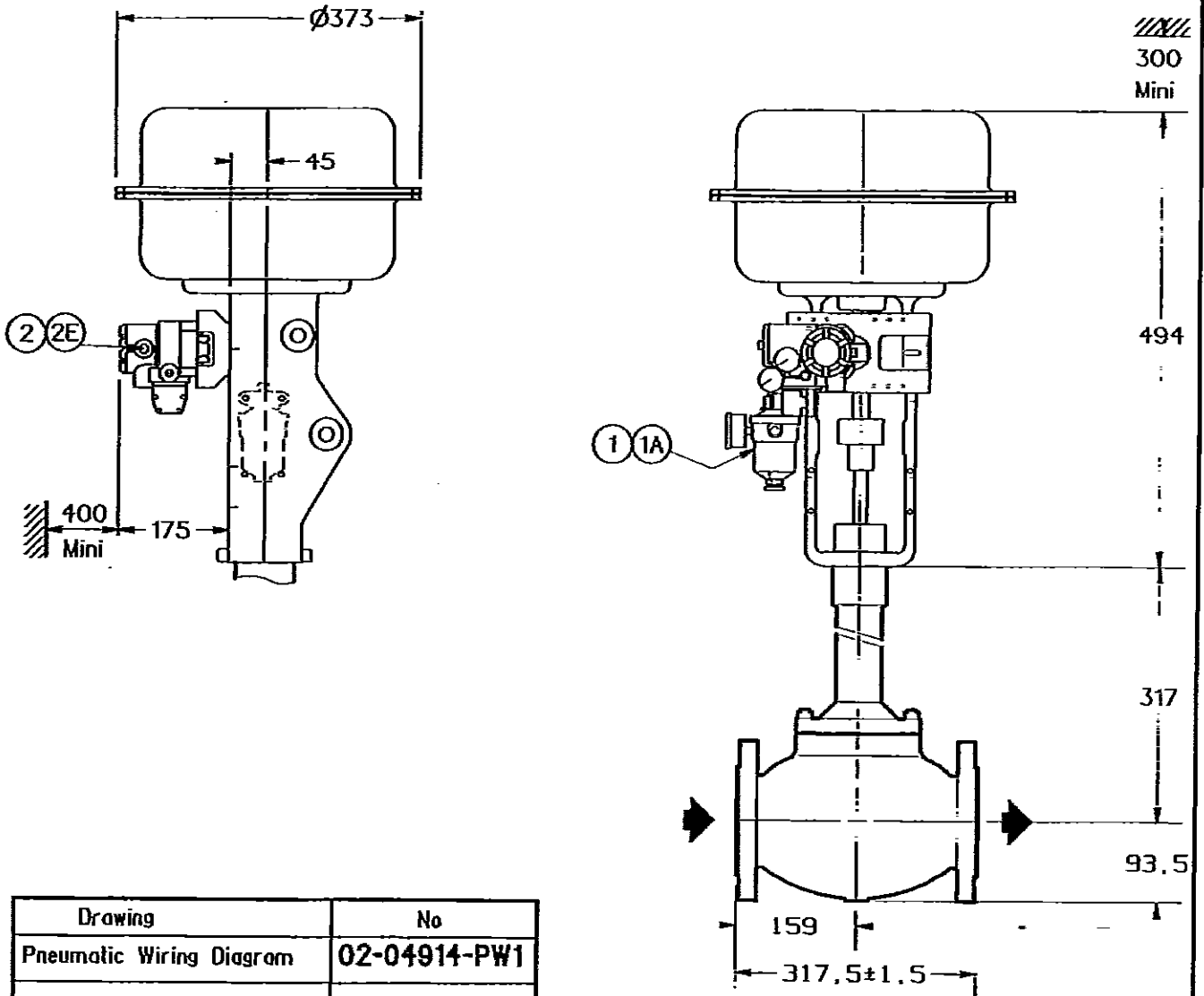
SERIES VALVE : 87-21125-EB

DN : 80 (3")

ON AIR FAILURE : OPEN

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC2

Ref.	TYPE	DESCRIPTION	Wgt	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

97

ITEM : 17002

MN SERIAL NUMBER : 02-04914-02

Rev. 1

DATE: Oct-17-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 FV 70021



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

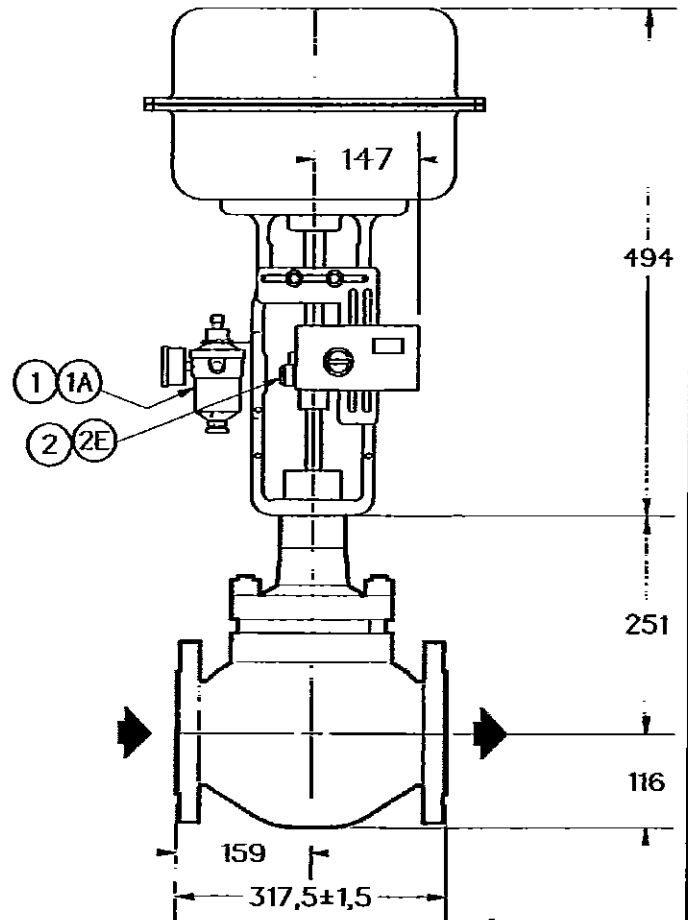
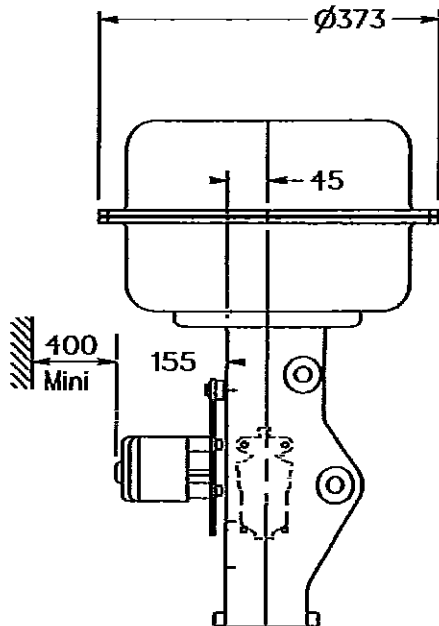
SERIES VALVE : 88-41335

DN : 3"x2"x3"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

107

ITEM : 1700E

SERIAL NUMBER : 02-04914-03

Rev. 1

DATE: Oct-17-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 70023 A



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

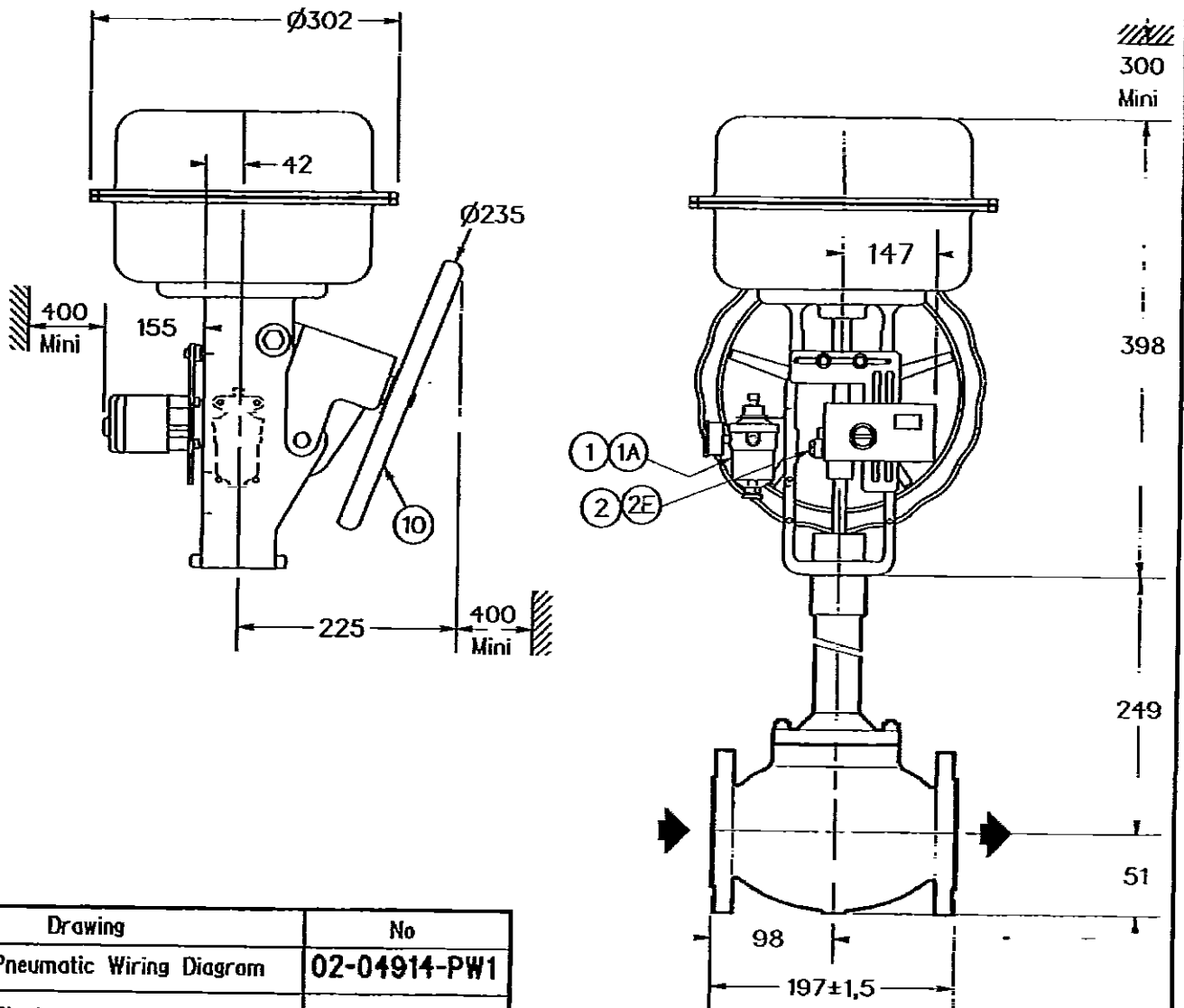
BRASSER

SERIES VALVE : 88-21014-2S-EB DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

44

ITEM : 17004 MN SERIAL NUMBER : 02-04914-04

Rev. 1

DATE: Oct-17-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 70023B



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

SERIES VALVE : 35-35602-/HW

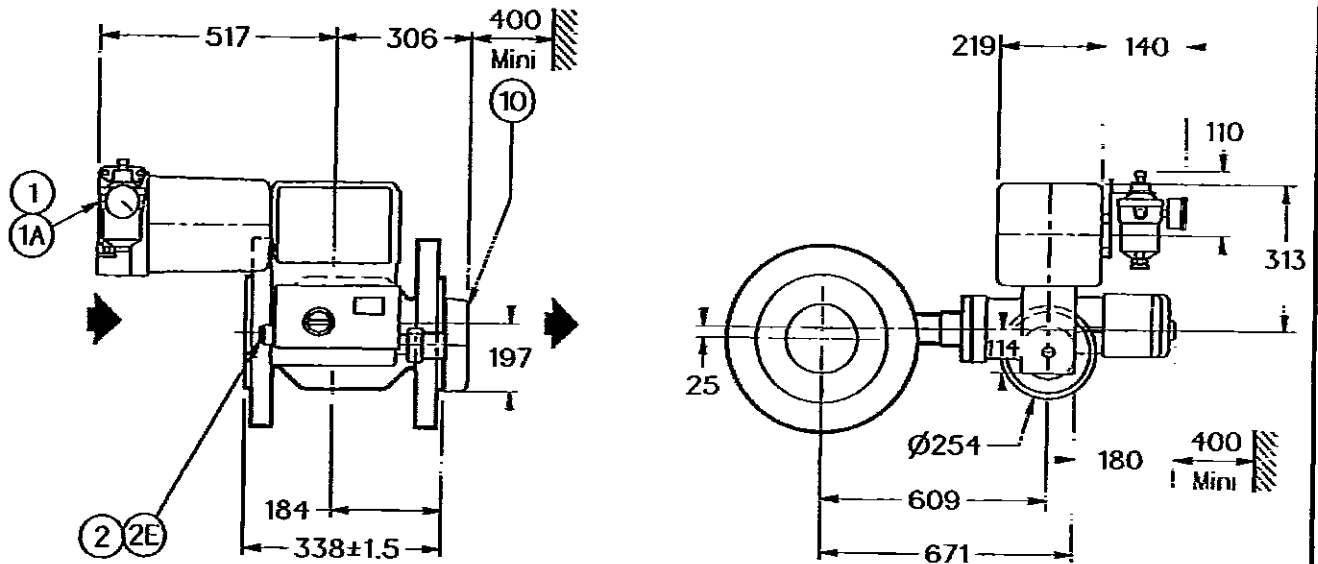
DN : 300 (12")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FRI0/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

275

ITEM : 17005

UN SERIAL NUMBER : 02-04914-05

Rev. 1

DATE: Oct-17-2002

DRAWN BY:

P-ROUELLE

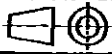
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 70023C



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellam

DRESSER

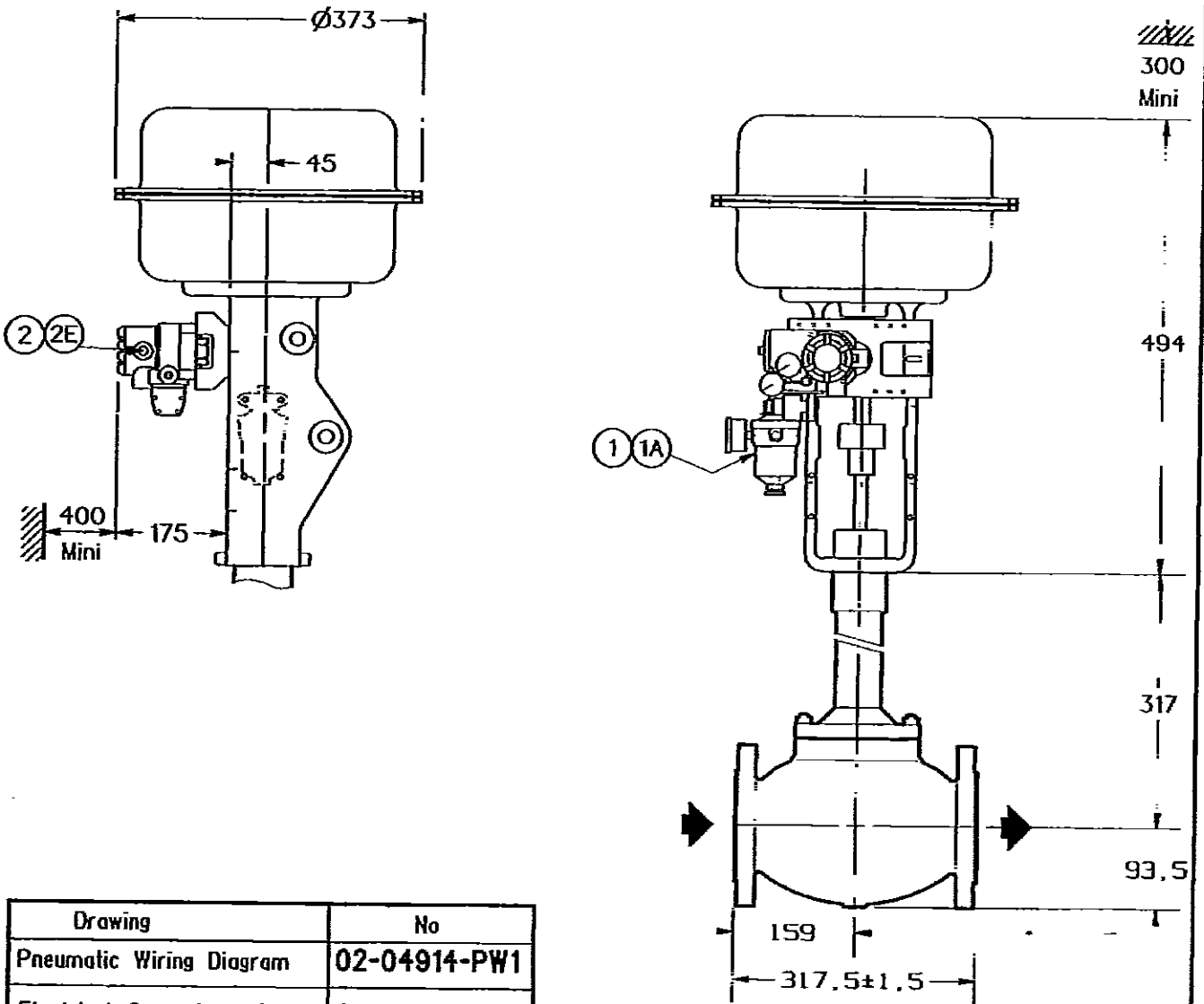
SERIES VALVE : 87-21125

DN : 80 (3")

ON AIR FAILURE : OPEN

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

97

ITEM : 17006

WN SERIAL NUMBER : 02-04914-08

Rev. 1

DATE: Oct-17-2002

DRAWN BY:

P-ROUELLE

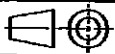
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 FV 70024



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

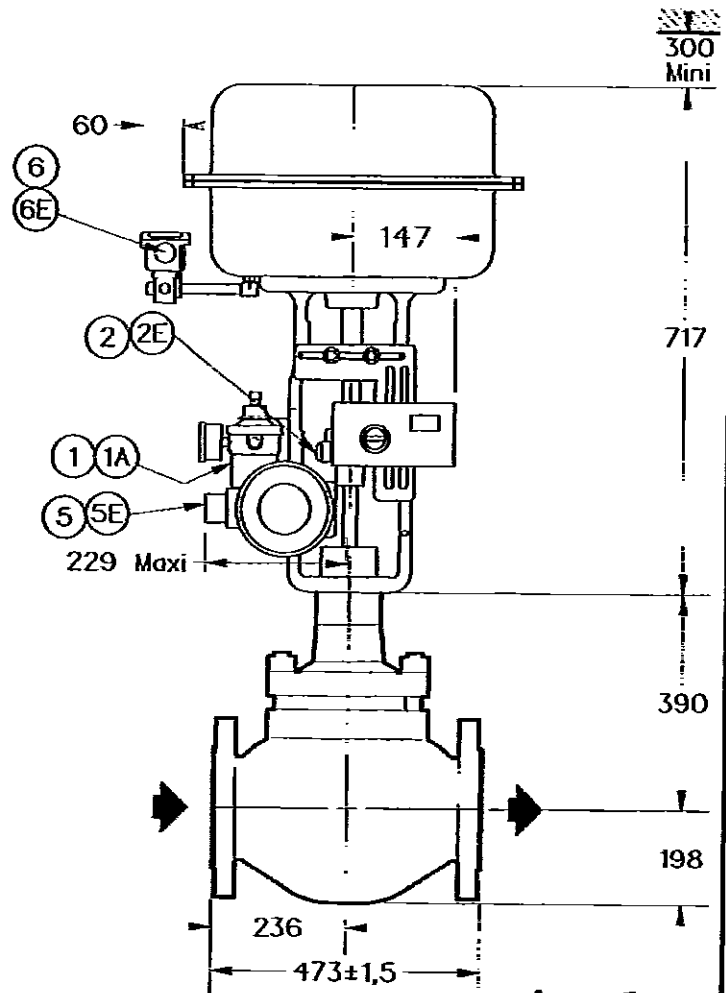
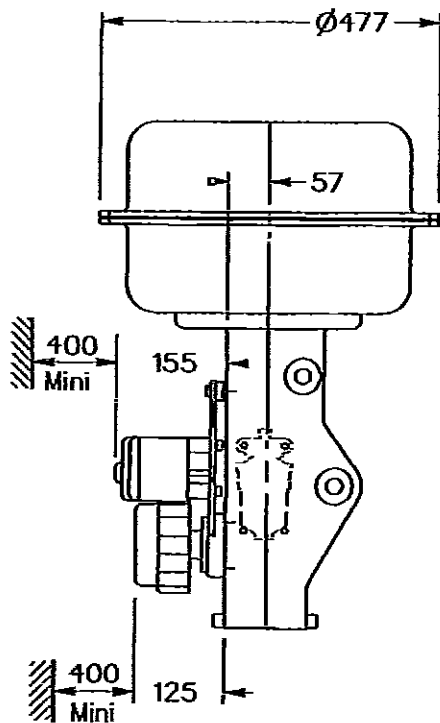
SERIES VALVE : 88-41325

DN : 6"

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW2
Electrical Connections Detail	02-04914-EC1
Electrical Connections Detail	02-04914-EC3
Electrical Connections Detail	02-04914-LD3

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZID-C	E/P Positioner	4.0	2E	M 20 - Signal
5	496/4	Closing Limit-Switch	2.5	5E	M20
6	WS..B317..	Solenoid Valve	1.0	6E	M20

TOTAL WEIGHT(accessories + valve) in kg

289

ITEM : 17007

MN SERIAL NUMBER : 02-04914-07

Rev. 3

DATE: Feb-04-2003

DRAWN BY:

P-ROUELLE

ISSUED BY:

C. DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 LV 70041



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



SERIES VALVE : 35-35202

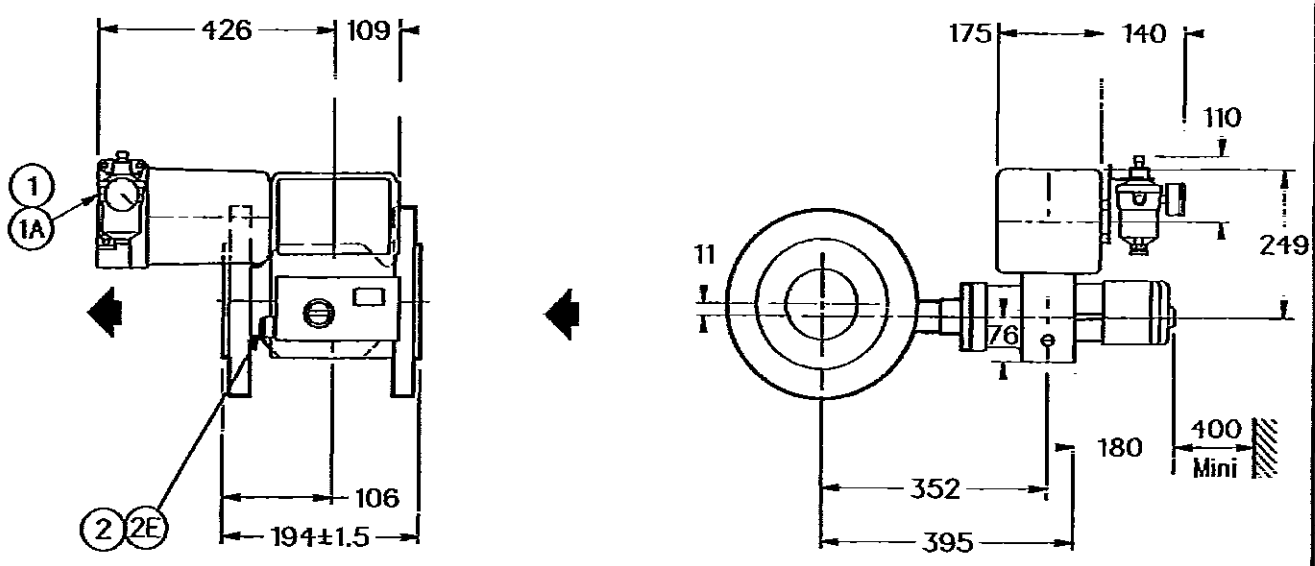
DN : 100 (4")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT(accessories + valve) in kg		62	ITEM : 17008	MN SERIAL NUMBER : 02-04914-08
Rev. 1	DATE: Oct-17-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 PV 70042				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

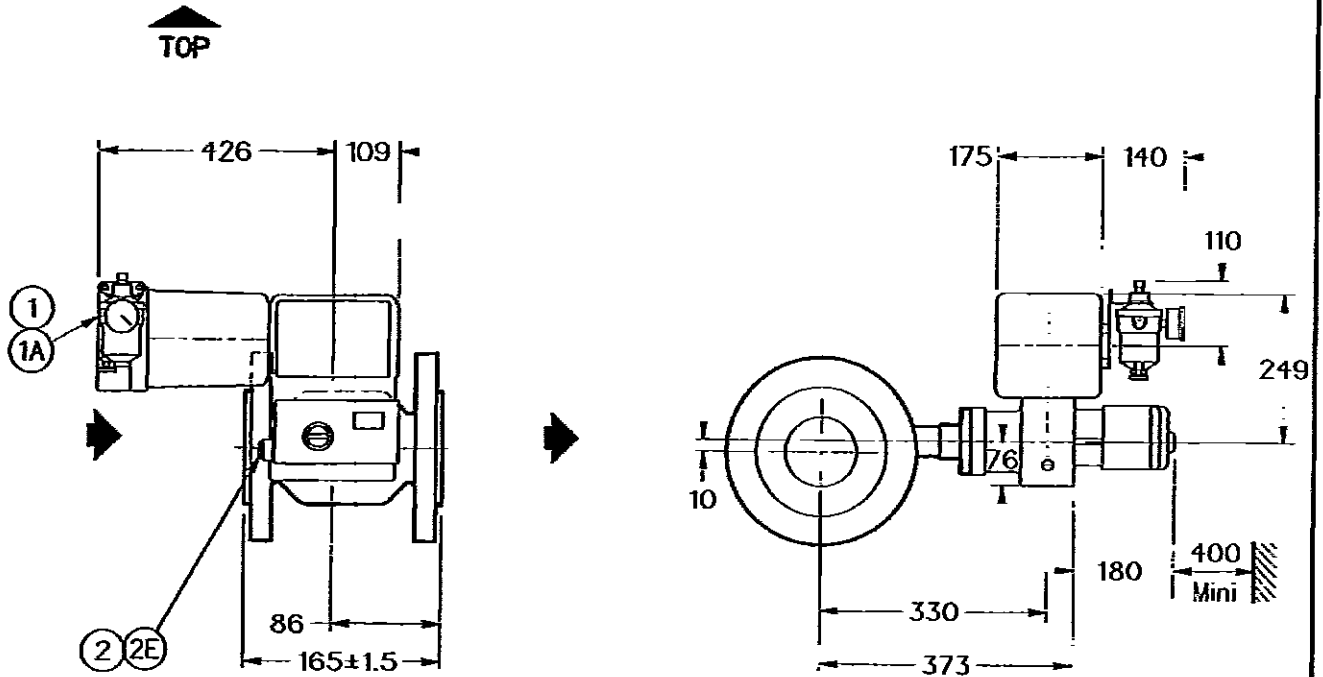
SERIES VALVE : 35-35602

DN : 80 (3")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	TZ10-C	E/P Positioner	4.0	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

48

ITEM : 17009

MN SERIAL NUMBER : 02-04914-09

Rev. 1

DATE: Oct-17-2002

DRAWN BY:

P-ROUELLE

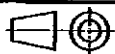
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

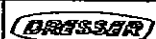
TAG : 30 TV 70048



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



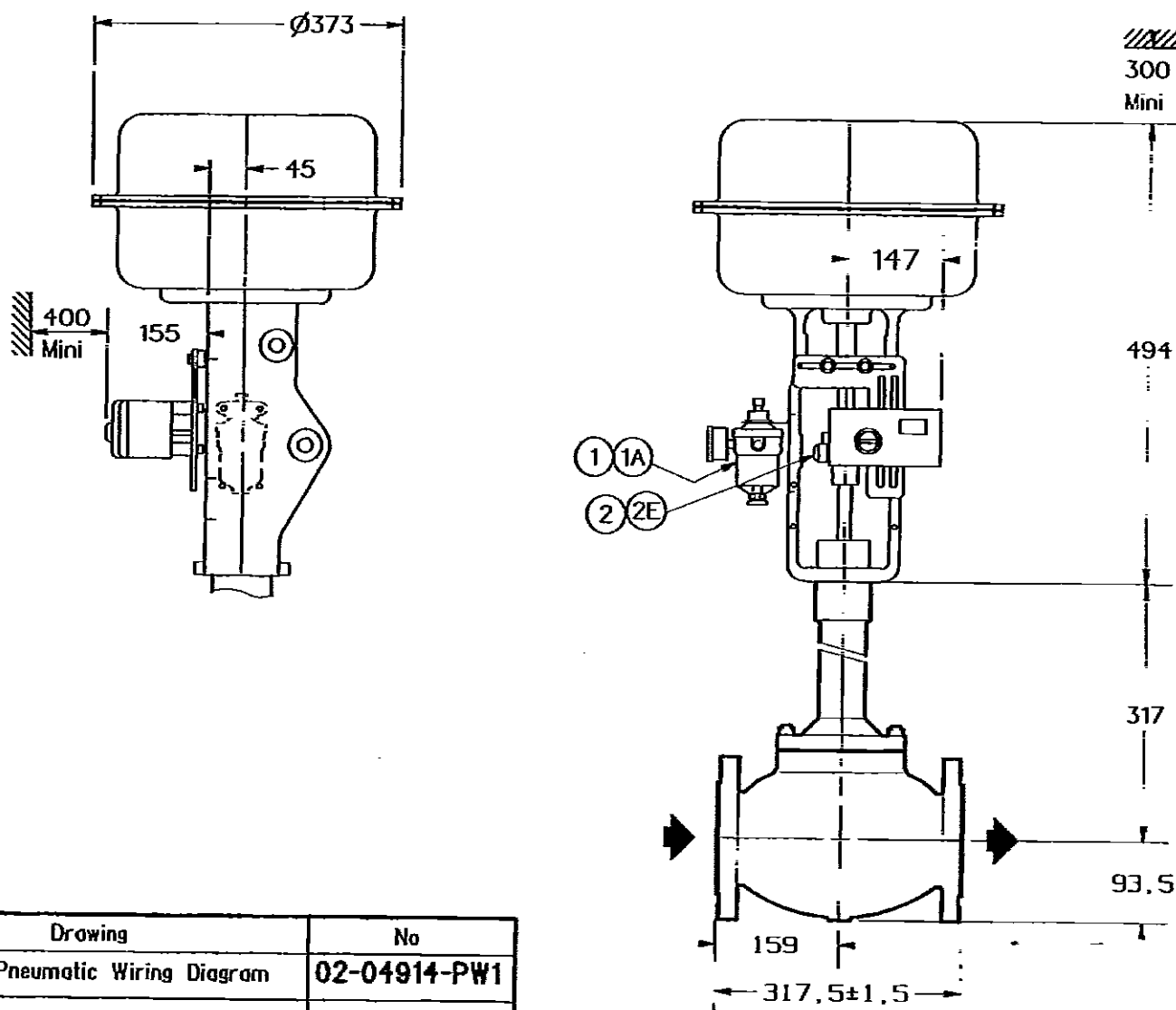
SERIES VALVE : 87-21125-EB

DN : 80 (3")

ON AIR FAILURE : OPEN

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FRI0/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

97

ITEM : 17010

MIN SERIAL NUMBER : 02-04914-10

Rev. 1

DATE: Oct-17-2002

DRAWN BY:

P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 FV 70061



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

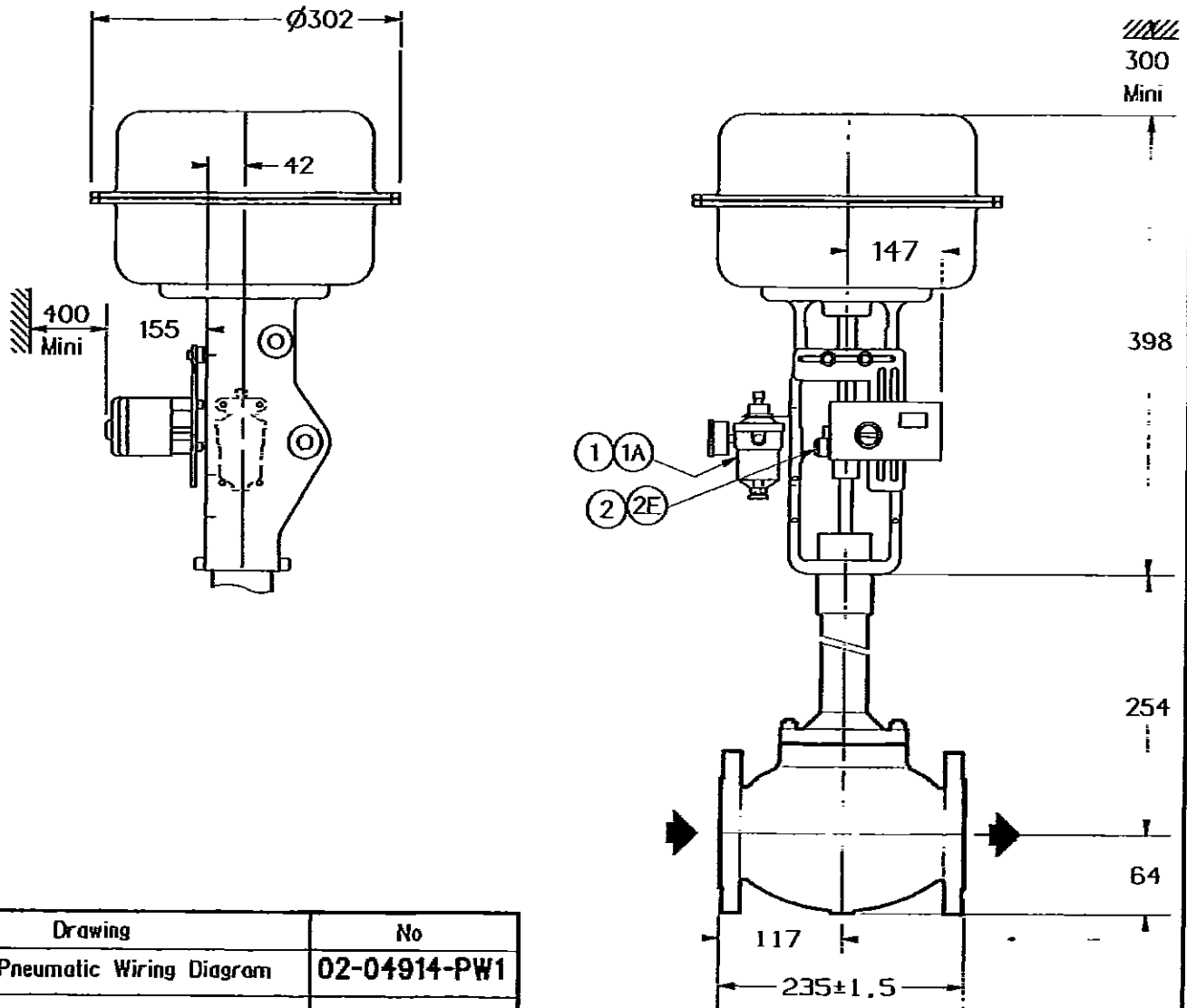
SERIES VALVE : 88-21715-EB

DN : 40 (1.5")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/O	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electro-pn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

47

ITEM : 17011

SERIAL NUMBER : 02-04914-11

Rev. 1

DATE: Oct-17-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 70063A



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

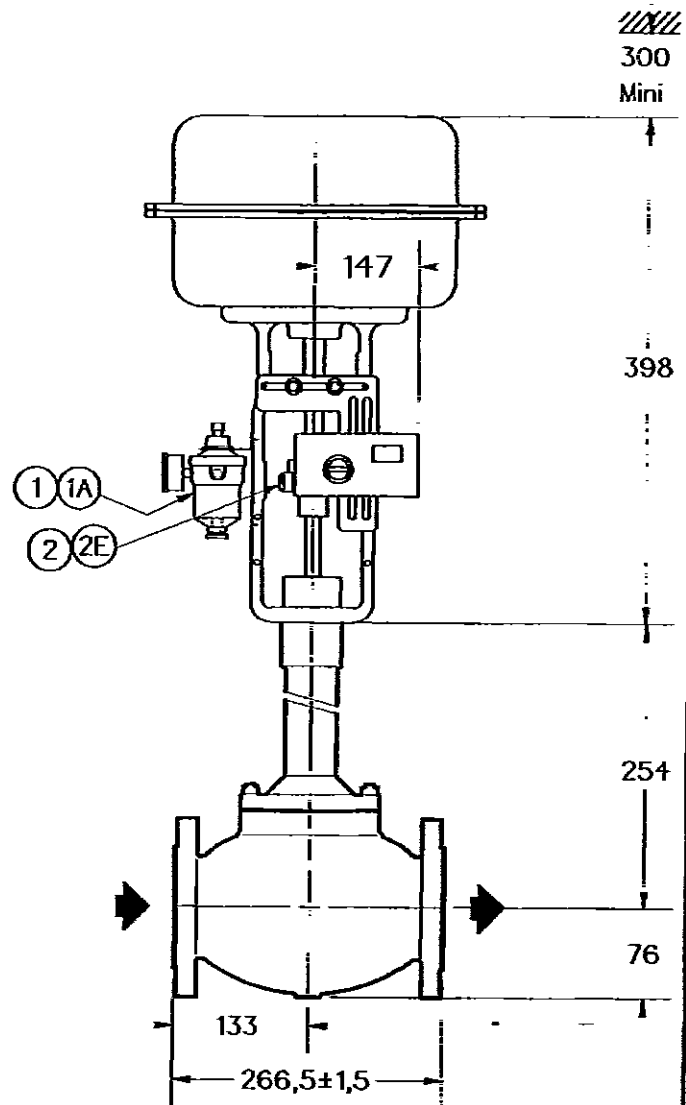
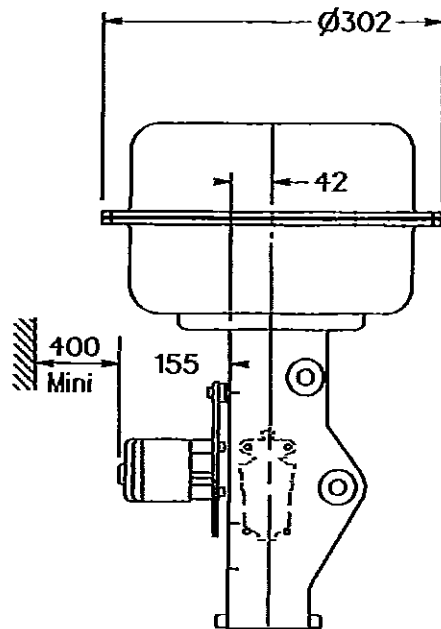
SERIES VALVE : 88-21125-EB

DN : 50 (2")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

51

ITEM : 17012

MAY SERIAL NUMBER : 02-04914-12

Rev. 1

DATE: Oct-17-2002

DRAWN BY:

P-ROUELLE

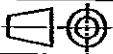
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 70063 B



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

SERIES VALVE : 35-35602-/HW

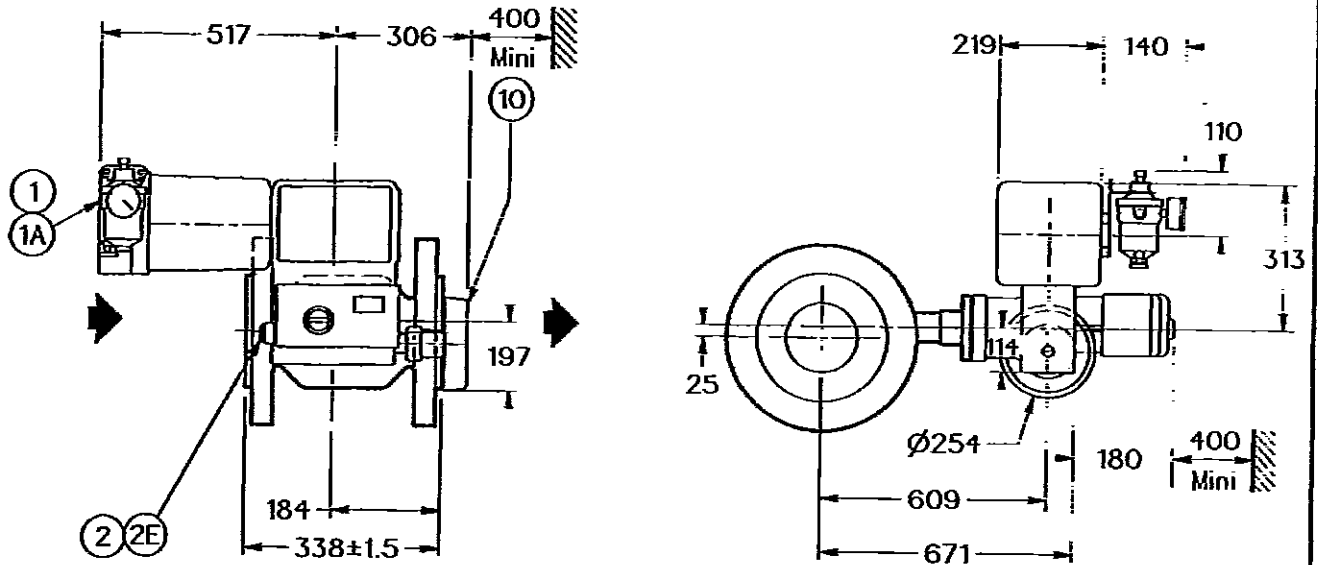
DN : 300 (12")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZ10-C	Electropn. Positioner	3.5	2E	M 20 - Signal
10		Handwheel			

TOTAL WEIGHT (accessories + valve) in kg

275

ITEM : 17013

M/N SERIAL NUMBER : 02-04914-13

Rev. 1

DATE: Oct-17-2002

DRAWN BY: P-ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 70063C



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



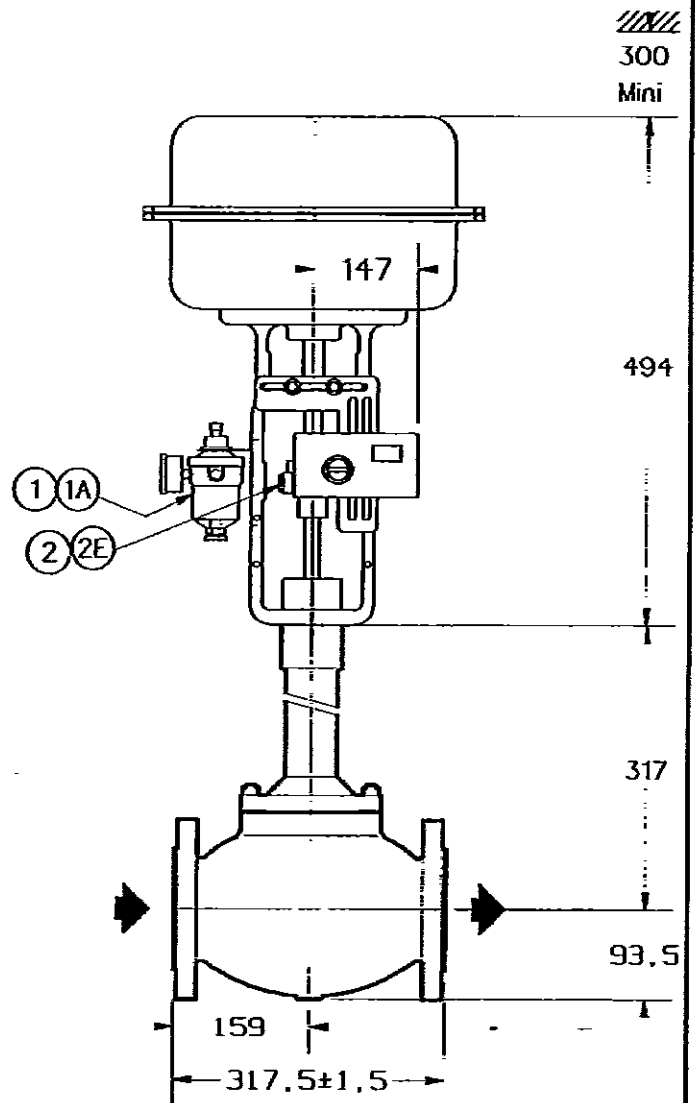
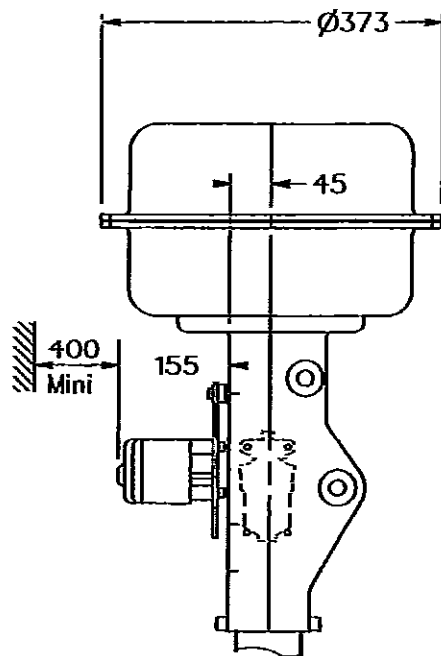
SERIES VALVE : 87-21125-EB

DN : 80 (3")

ON AIR FAILURE : OPEN

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

97

ITEM : 17014

VN SERIAL NUMBER : 02-04914-14

Rev. 1

DATE: Oct-17-2002

DRAWN BY:

P-ROUELLE

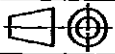
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 FV 70064



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

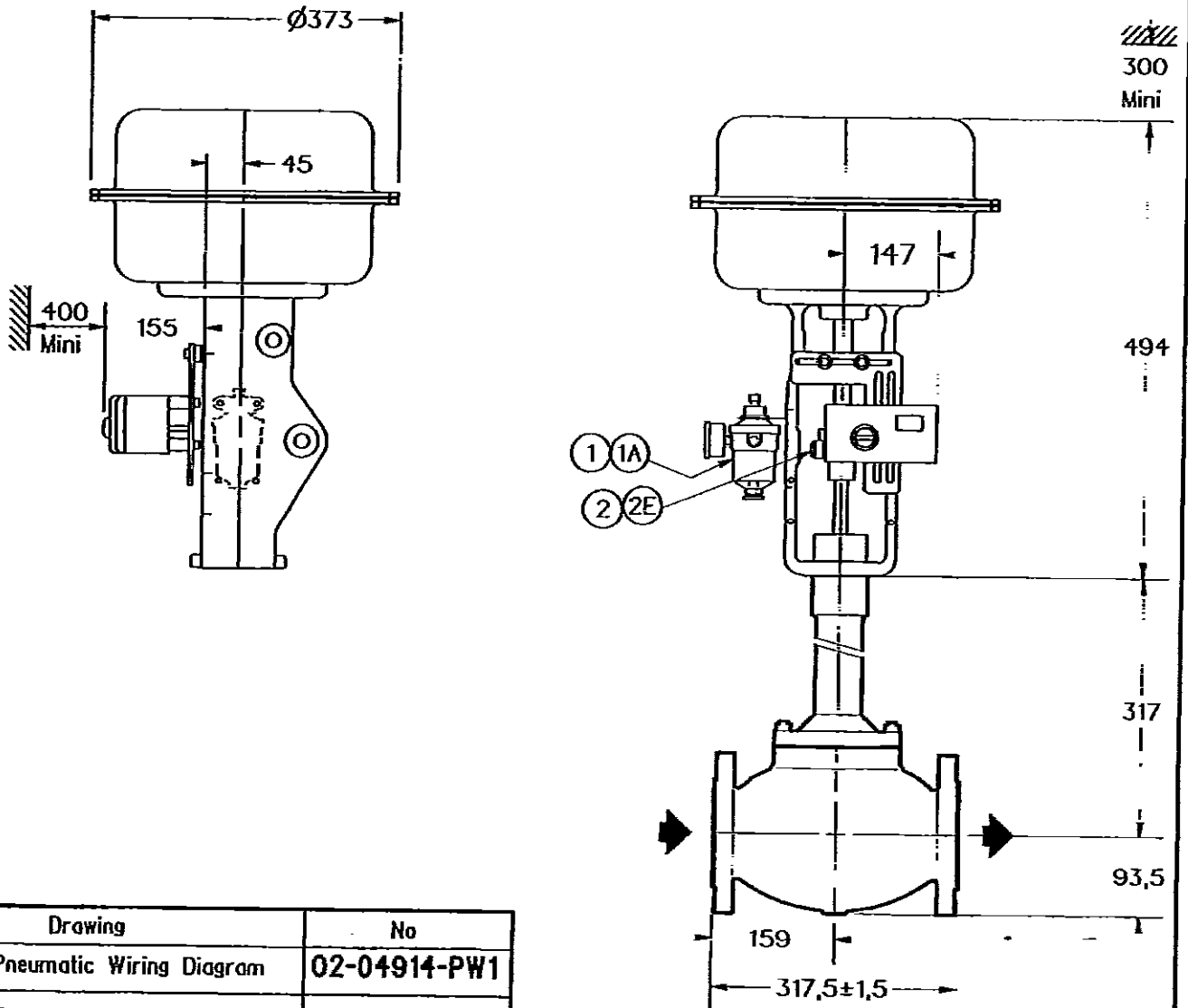
SERIES VALVE : 88-21125-EB

CN : 80 (3°)

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #81



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC1

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Reg. + Gauge	1.0	1A	1/4" NPT - Air Supply
2	TZID-C	Electropn. Positioner	3.5	2E	M 20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

97

ITEM : 17015

MH SERIAL NUMBER : 02-04914-15

Rev. 1

DATE: Oct-17-2002

DRAWN BY:

P-ROUELLE

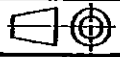
ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 FV 70065



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

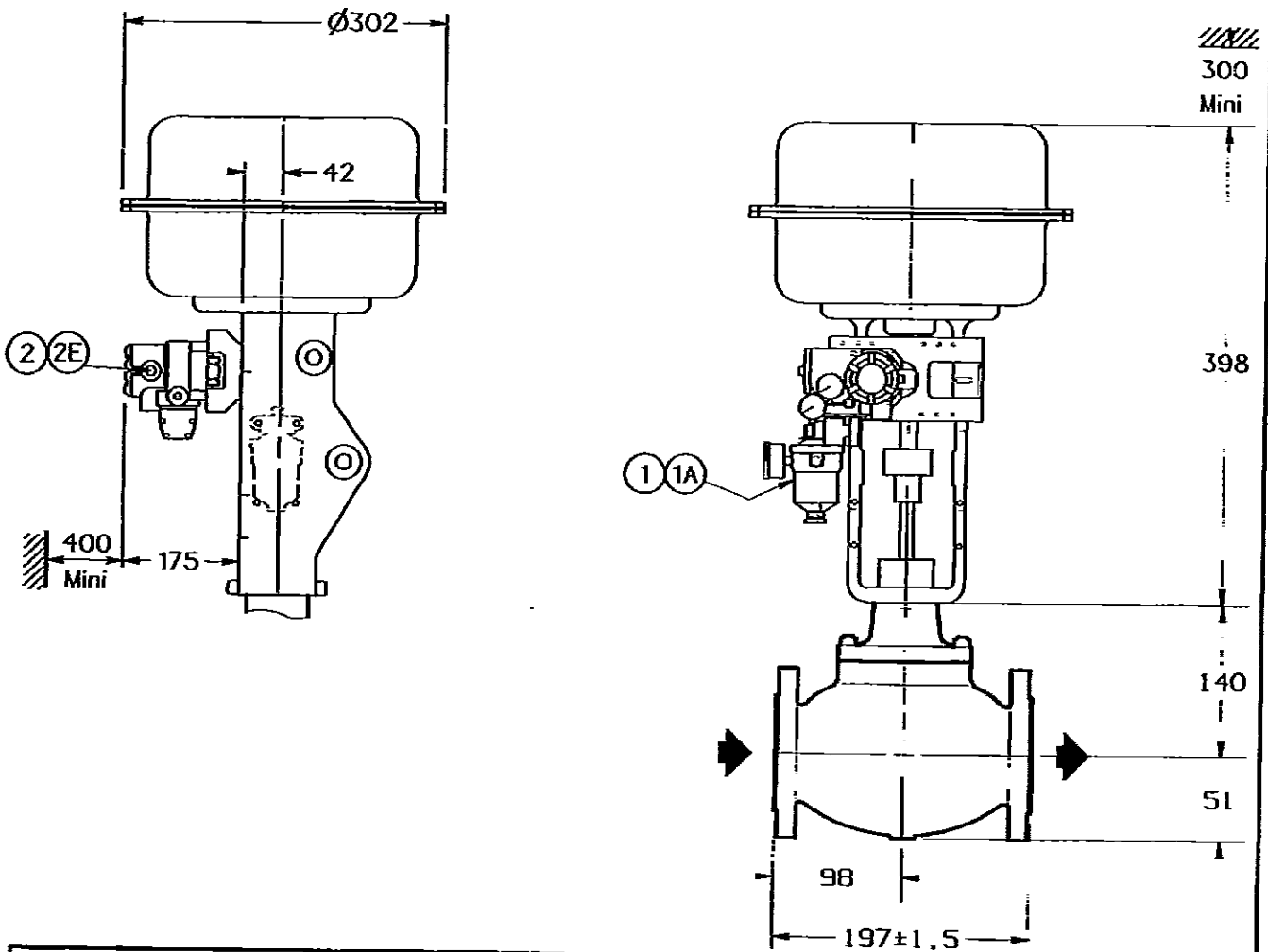
SERIES VALVE : 88-21125

DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filler Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg		38	ITEM : 17016	MIN SERIAL NUMBER : 02-04914-16	
Rev. 1	DATE: Oct-17-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007		
TAG : 30 PV 70081 A					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

SERIES VALVE : 35-35602

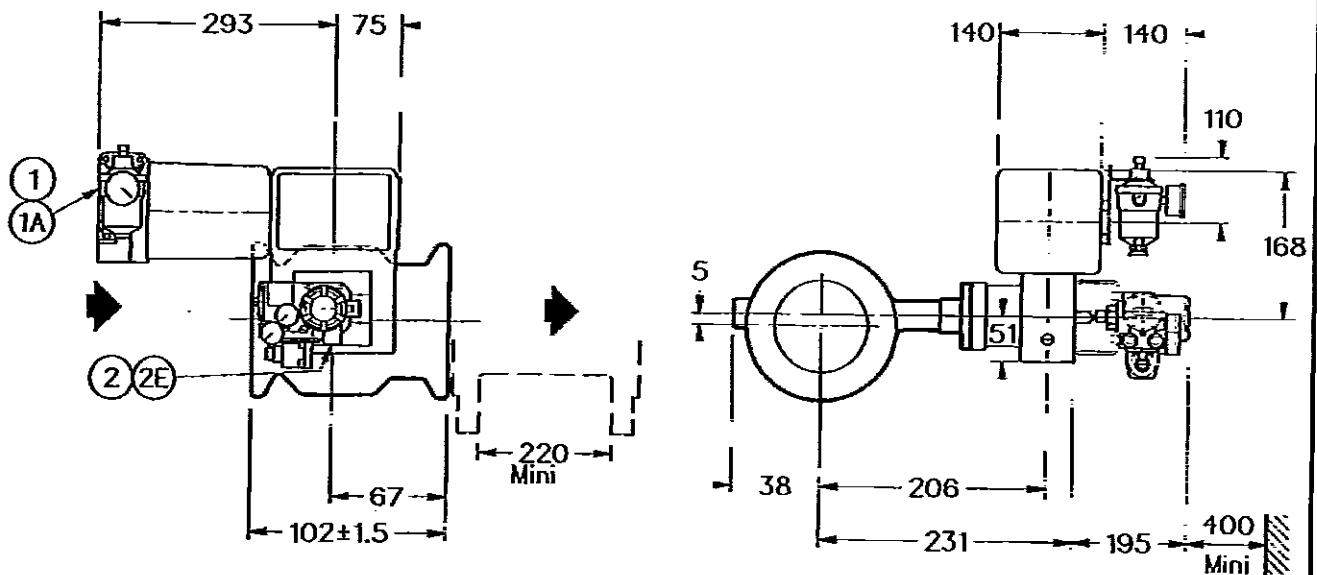
DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

14

ITEM : 17017

WH SERIAL NUMBER : 02-04914-17

Rev. 1

DATE: Oct-17-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PV 70081 B



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

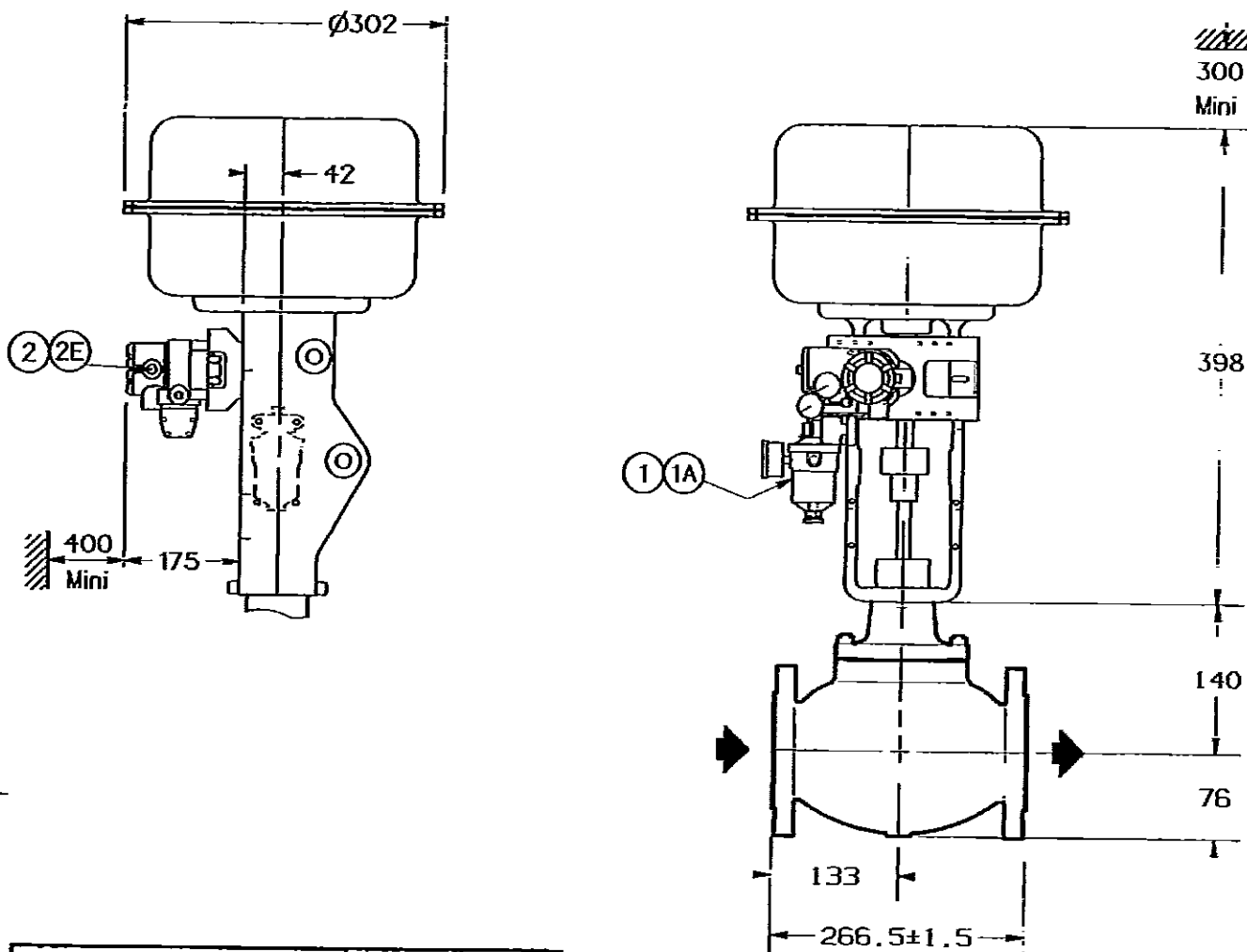
SERIES VALVE : 88-21125

DN : 50 (2")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electropn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

51

ITEM : 17018

MN SERIAL NUMBER : 02-04914-18

Rev. 1

DATE: Oct-17-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 FV 70082



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

SERIES VALVE : 35-35202

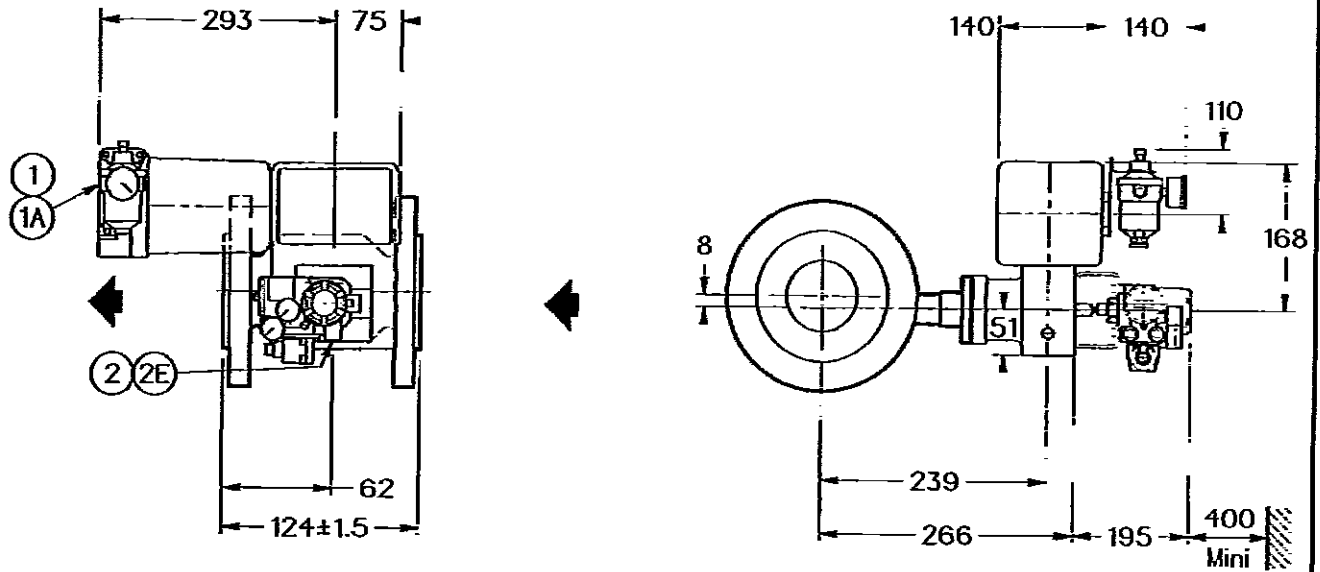
DN : 50 (2")

ON AIR FAILURE : CLOSED

FLOW TO : CLOSE

CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	N20 - Signal

TOTAL WEIGHT(accessories + valve) in kg

20

ITEM : 17019

MN SERIAL NUMBER : 02-04914-19

Rev. 1

DATE: Oct-17-2002

DRAWN BY:

P. ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 FV 70091



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masoneilan

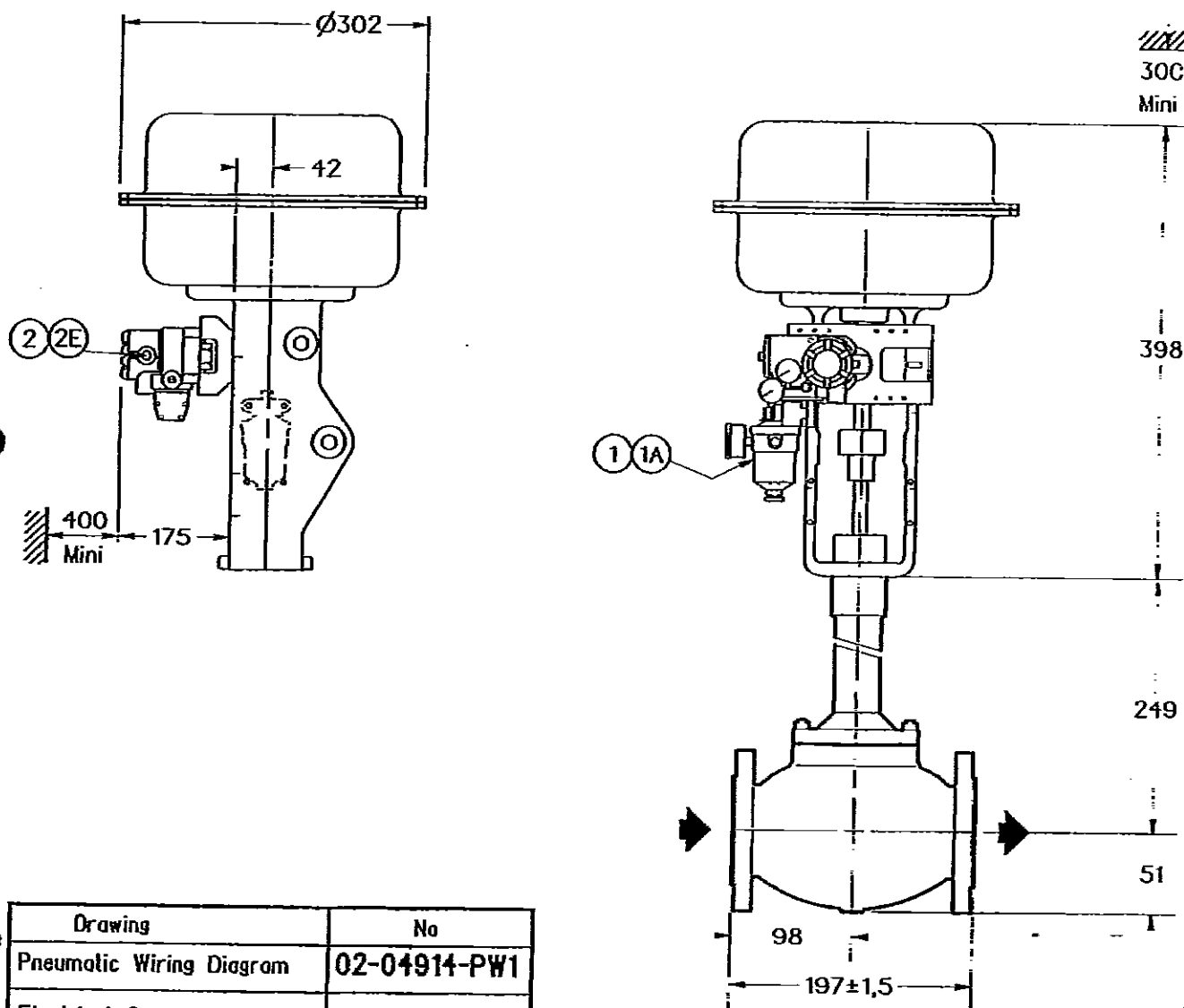


SERIES VALVE : 88-21014-25-EB DN : 25 (1")

ON AIR FAILURE : CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC2

Ref.	TYPE	DESCRIPTION	Wgtk	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electro-p. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT (accessories + valve) in kg

44

ITEM : 17020

UN SERIAL NUMBER : 02-04914-20

Rev. 2

DATE: Dec-06-2002

DRAWN BY:

P-ROUELLE

ISSUED BY:

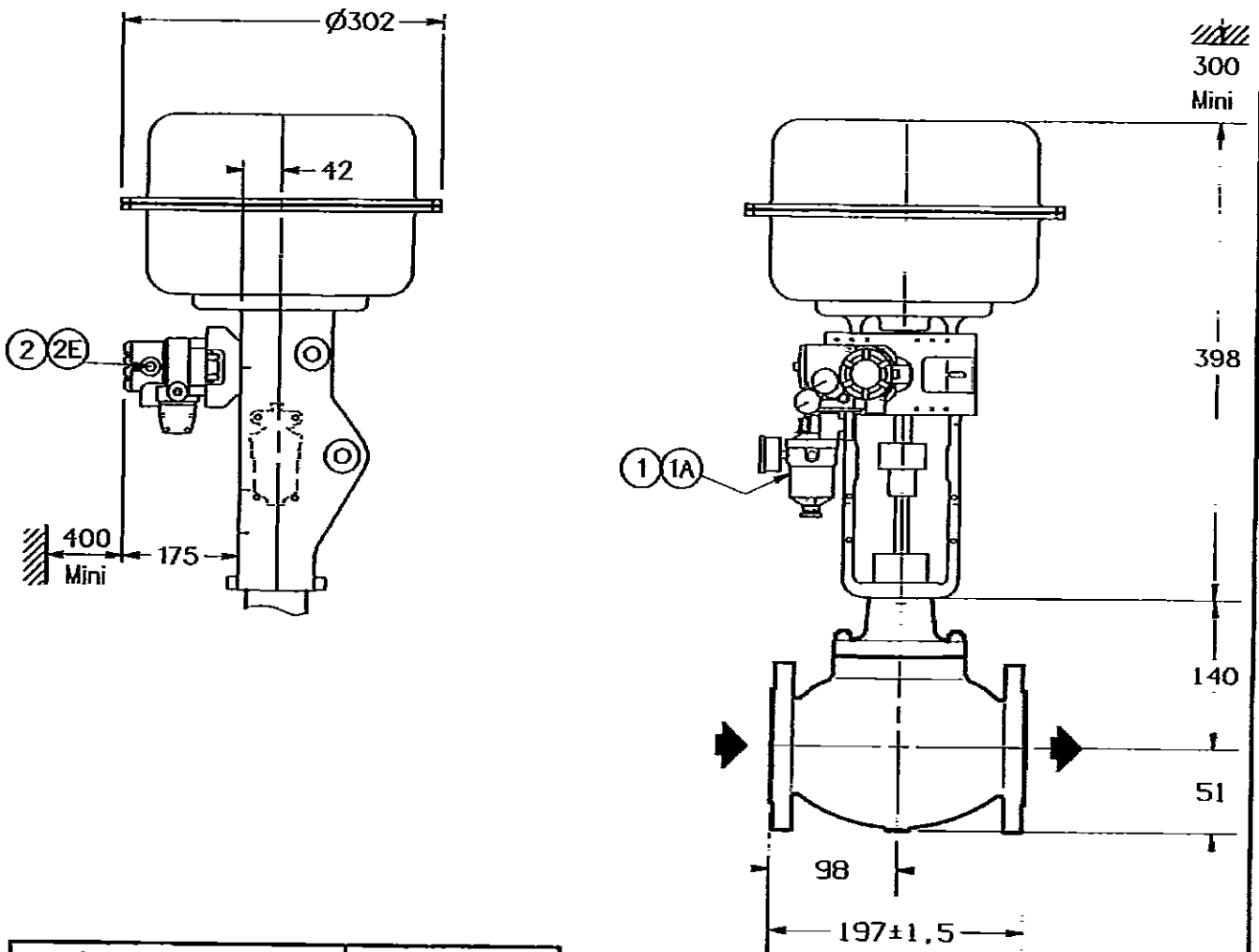
C-DROUARD

CUSTOMER: TECHNIP

CUSTOMER ORDER: 6465C30 1541 01 0 1CCC7

TAG : 30 PV 70091

	DIMENSIONS in mm ±5%	OUTLINE DRAWING	Masonellan	
SERIES VALVE : 88-21125		DN : 25 (1")	ON AIR FAILURE : CLOSED	
FLOW TO : OPEN		CONNECTION: 300 ANSI RF		



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	Electroprn. positioner	1.0	2E	M20 - Signal

TOTAL WEIGHT(accessories + valve) in kg		38	ITEM : 17021	WH SERIAL NUMBER : 02-04914-21
Rev. 1	DATE: Oct-17-2002	DRAWN BY: P-ROUELLE	ISSUED BY: C-DROUARD	
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10007	
TAG : 30 PV 70094 A				



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

SERIES VALVE : 35-35202

DN : 40 (1.5")

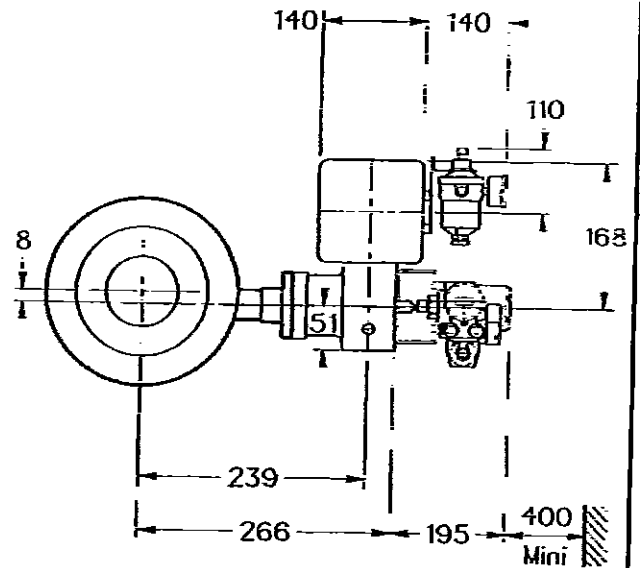
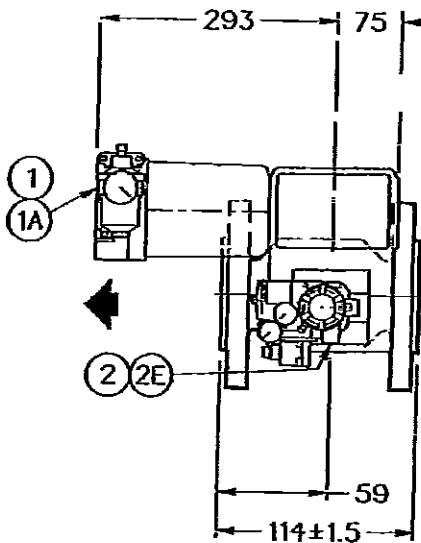
ON AIR FAILURE :

CLOSED

FLOW TO : CLOSE

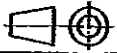
CONNECTION: 300 ANSI RF

TOP



Drawing	No
Pneumatic Wiring Diagram	02-04914-PW1
Electrical Connections Detail	02-04914-EC2

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/D	Air Filter Regul.+Gauge	1.0	1A	1/4 NPT - Air Supply
2	FVP	E/P Positioner	4.0	2E	M20 - Signal
TOTAL WEIGHT (accessories + valve) in kg			18	ITEM : 17022	MN SERIAL NUMBER : 02-04914-22
Rev. 2	DATE: Dec-11-2002	DRAWN BY: P. ROUELLE	ISSUED BY: C-DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C30 1541 01 0 10CC7		
TAG : 30 PV 70094 B					



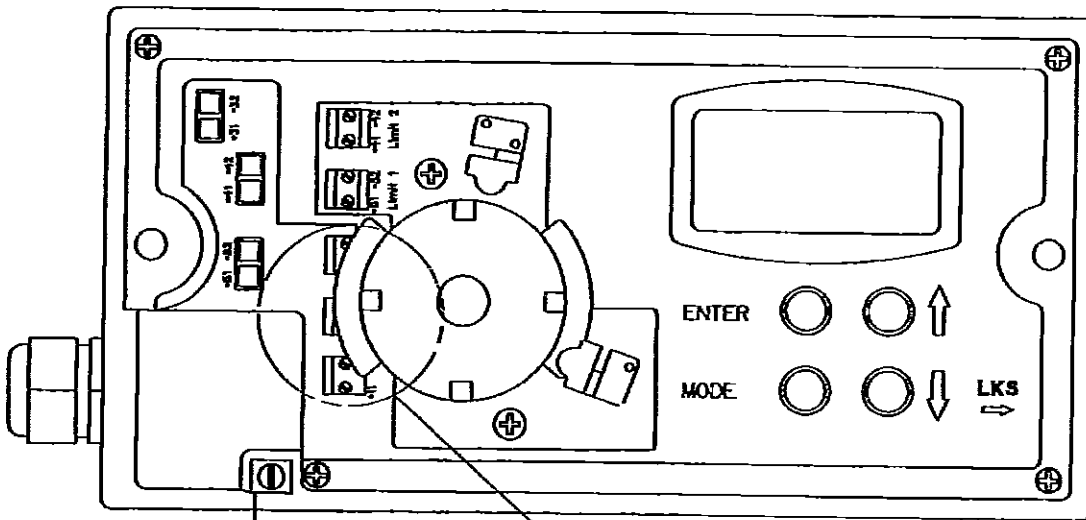
DRAWING No : 02-04914-EC1

Masonellan

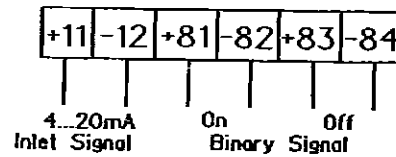


ELECTRICAL CONNECTIONS DETAIL

ELECTROPNEUMATIC POSITIONER TZID-C



Earth Terminal



Rev. 0	DATE: 17/OCT/2002	DRAWN BY: P. SEVESTRE	ITEM : /	SN SERIAL NUMBER : 02-04914-EC1
CUSTOMER: TECHNIP		ISSUED BY: C. DROUARD		
TAG :		CUSTOMER ORDER: 6465C 30 1541 01 0 10007		

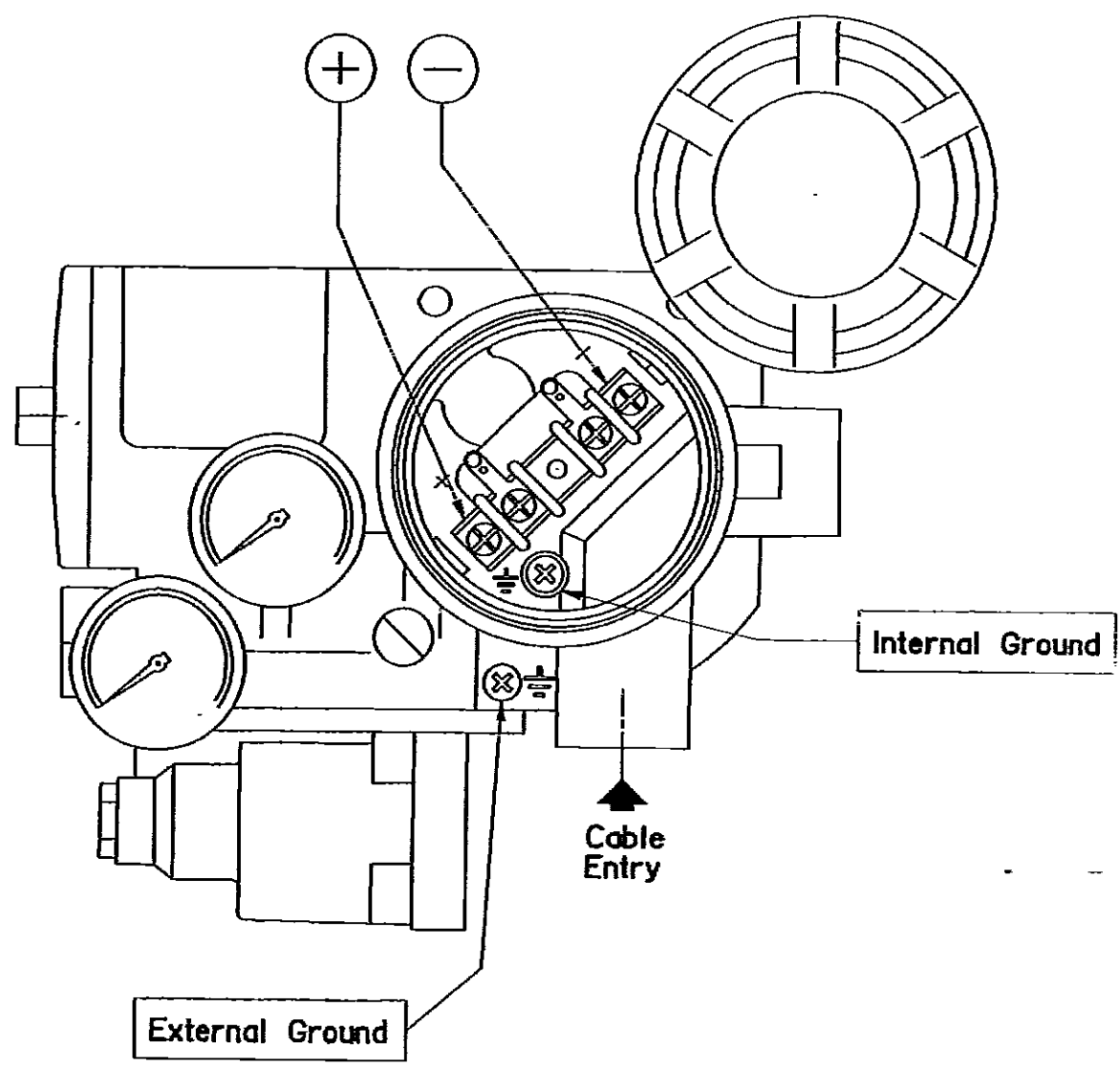


DRAWING No : 02-04914-EC2

Masonellan **BRASSER**

ELECTRICAL CONNECTIONS DETAIL

ELECTROPNEUMATIC POSITIONER FVP



Rev. 0	DATE: 17/OCT/2002	DRAWN BY: P. SEVESTRE	ISSUED BY: C. DROUARD	ITEM : /	MN SERIAL NUMBER : 02-04914-EC2
CUSTOMER: TECHNIP			CUSTOMER ORDER: 6465C 30 1541 01 0 10007		
TAG : _____					



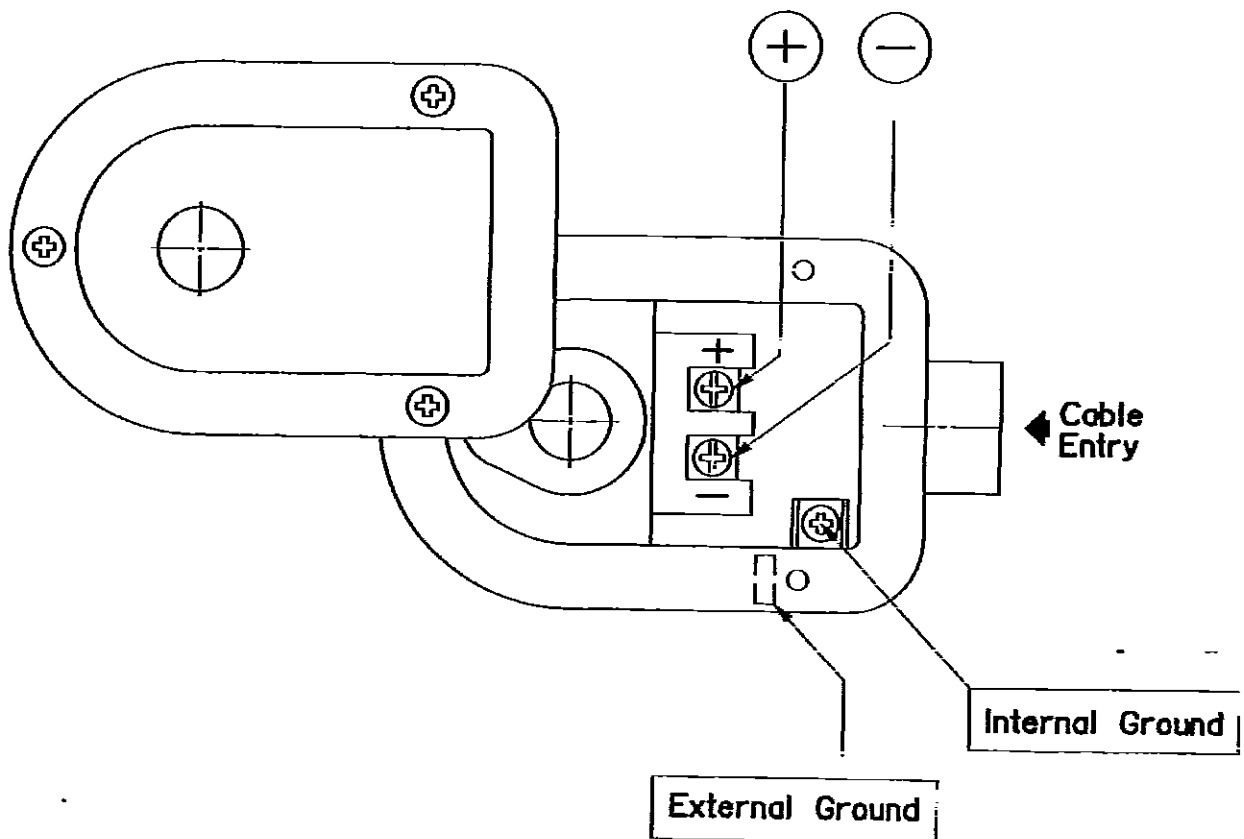
DRAWING No : 02-04914-EC3

Masonellan



ELECTRICAL CONNECTIONS DETAIL

WSTIS B317A308 SOLENOID VALVE



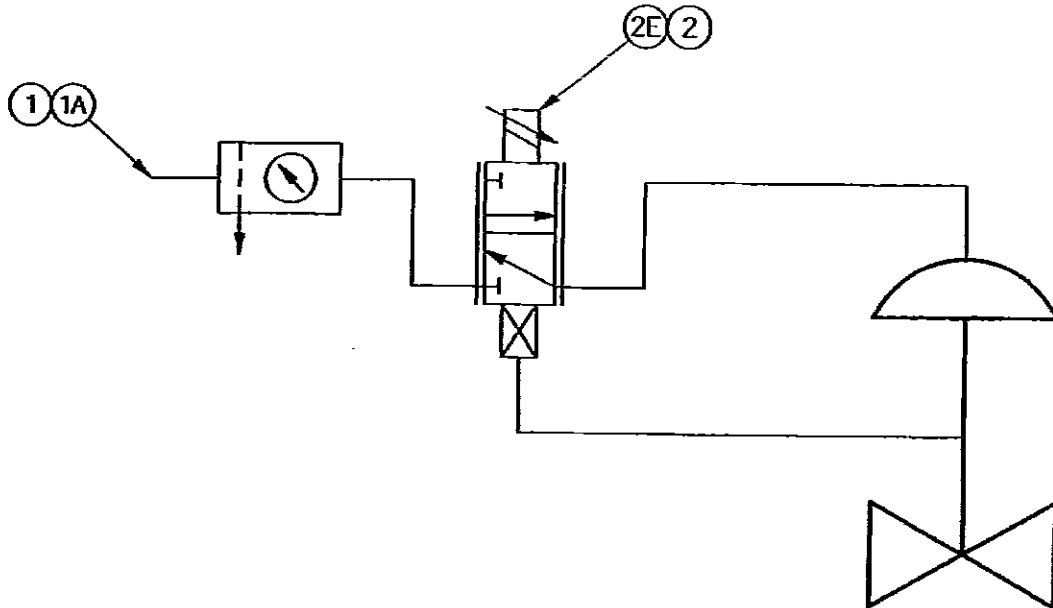
Rev. 0	DATE: 17/OCT/2002	DRAWN BY: P. SEVESTRE	ITEM : /	MN SERIAL NUMBER : 02-04914-EC3
CUSTOMER: TECHNIP	ISSUED BY: C. DROUARD		CUSTOMER ORDER: 6465C 30 1541 01 0 10007	
TAG :				



DRAWING No : 02-04914-PW1

Masonellan

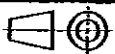
PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-3
- USAS Y32.10

Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filter Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal

Rev. 0	DATE: 17/OCT/2002	DRAWN BY: P. SEVESTRE	ISSUED BY: C. DROUARD
CUSTOMER: TECHNIP		CUSTOMER ORDER: 6465C 30 1541 01 0 10007	
TAG : _____			

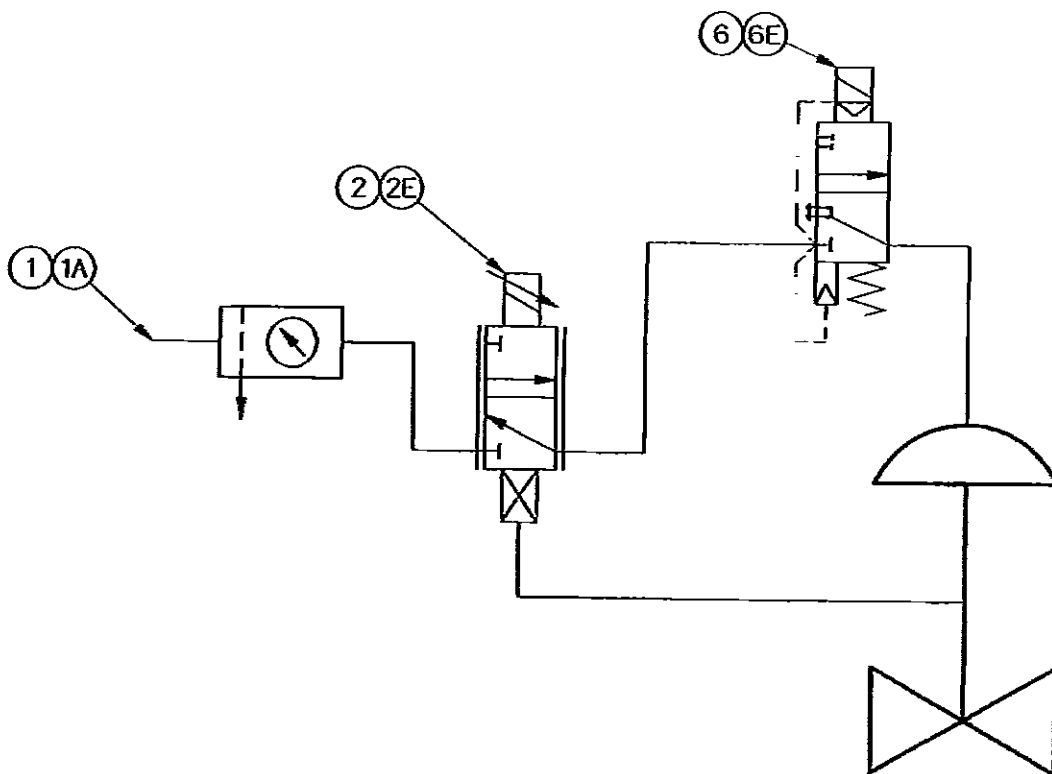
ITEM : _____ MN SERIAL NUMBER : 02-04914-PW1



DRAWING No : 02-04914-PW2

Masonellian **BRASSIR**

PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-3
- USAS Y32.10

Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filler Regul. +Gauge	1A	Air Supply
2	Electropneumatic Positioner	2E	Signal
6	Solenoid Valve	6E	

Rev. 0 DATE: 17/OCT/2002 DRAWN BY: P. SEVESTRE ITEM : / MW SERIAL NUMBER : 02-04914-PW2
 ISSUED BY: C. DROUARD
 CUSTOMER: TECHNIP CUSTOMER ORDER: 6465C 30 1541 01 0 10007
 TAG : _____



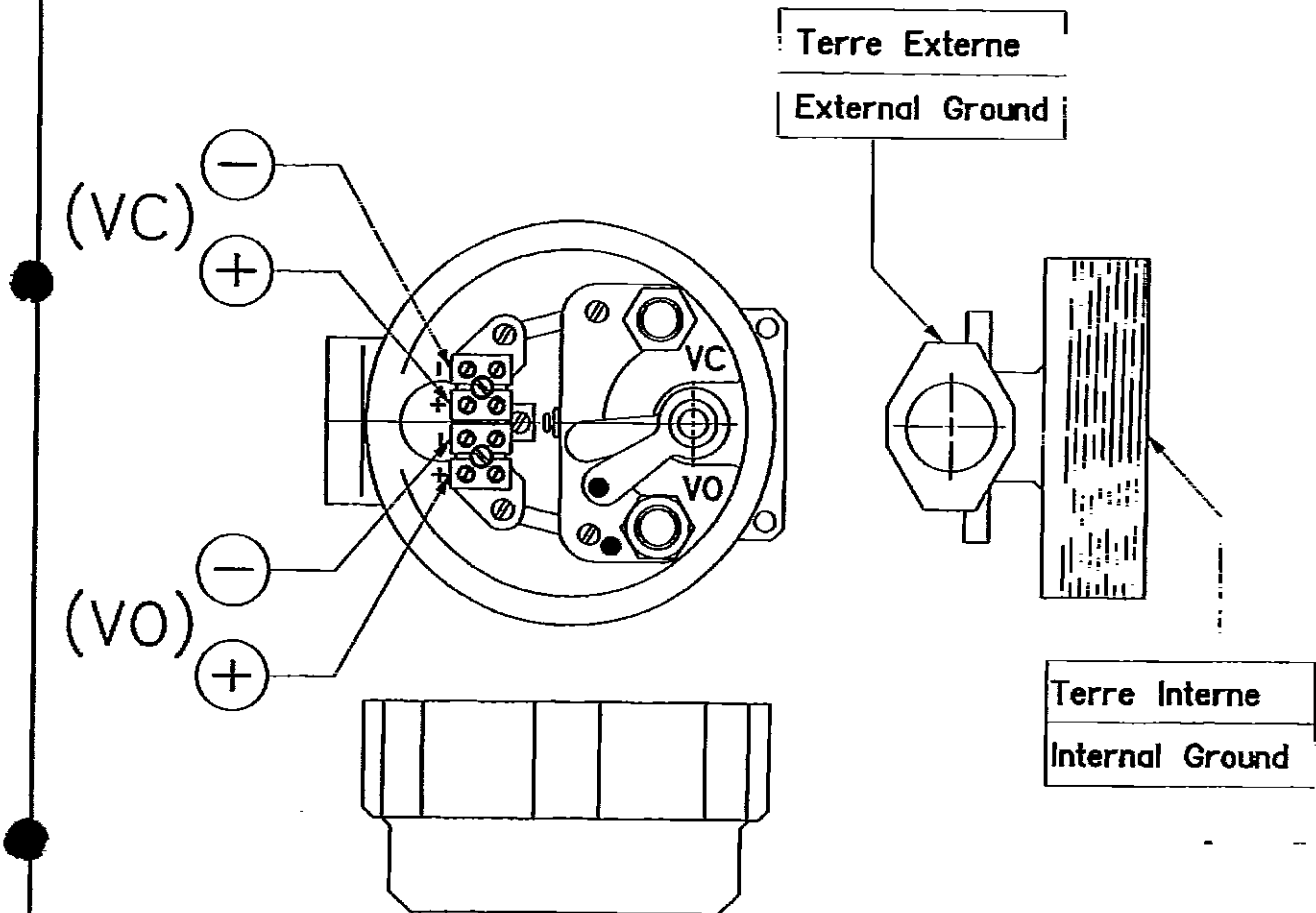
PLAN/DRWG : 02-04914-LD3

Masonellan



DETAIL RACCORDEMENTS ELECTRIQUES
ELECTRICAL CONNECTIONS DETAIL

DETECTEUR FIN DE COURSE 496-4 & 5
LIMIT DETECTOR 496-4 & 5



* PEPPERL & FUCHS * #NJ2-11-N-G

VO : Detecteur OUVERTURE
: OPENING Detector

VC : Detecteur FERMETURE
: CLOSING Detector

			ITEM: /	N° DE SERIE : 02-04914-LD3 SERIAL NUMBER:
Rev: 1	DATE: Dec-11-2002	DESS. PAR/DRAWN BY: P. SEVESTRE	EMIS PAR/ISSUED BY: C. DROUARD	
CLIENT/CUSTOMER: TECHNIP		Cde CLIENT/CUST. ORDER: 6465C30 1541 01 0 10007		
REPERE/TAG No: /				

UNIT 80

TECHNIP

VENDOR DOCUMENT REVIEW

- 1 REVISE AND RESUBMIT
- 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
- 3 NO COMMENT - FINAL ISSUE

OUTLINE DRAWINGS




THIERRY GRANDRY - TECHNIP

2002.12.23 14:06:09 +01'00'

<none>

STATUS CERTIFIED "FINAL"
 ISSUED BY: C. DROUARD
 DATE: 16/12/02

REV	DATE	DESCRIPTION
1	16/12/02	Up-dated drawings further to your comments
0	18/10/02	FIRST ISSUE

	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY 	TP REQUISITION NUMBER 6465C-3D-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-3D-MR-1541-01-0-1007
	Project: 3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	EQUIPMENT NAME: Control valves
	DOCUMENT TITLE : Outline drawings	DOCUMENT CODE : A 3201
	PURCHASE ORDER : 02-4915 (Unit 80)	Sheet 01 of 06 Rev. 1



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



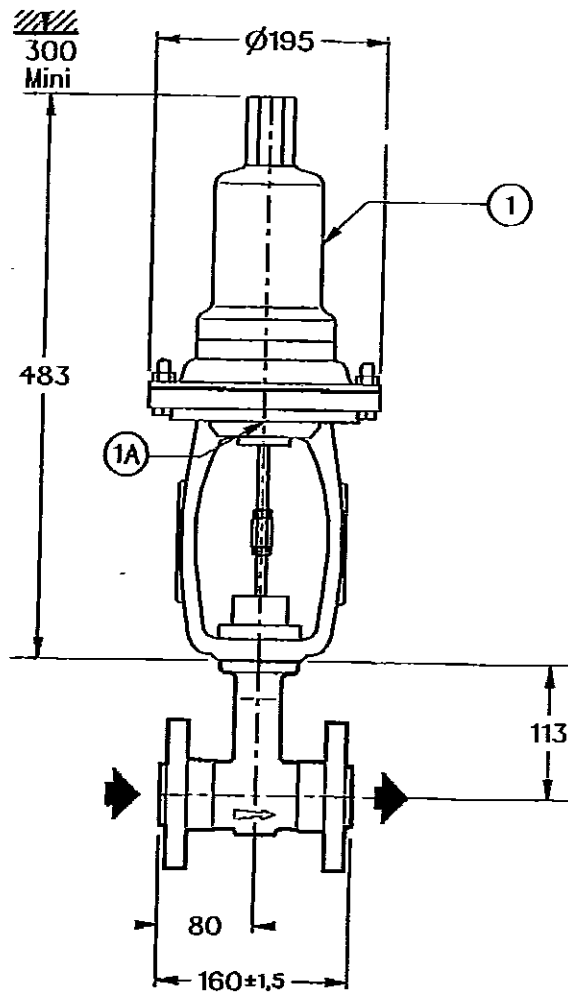
SERIES VALVE : 536 - V

DN : 25 (1")

ON PRESSURE FAILURE: CLOSED

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	N° 3.5	Actuator Range: 10 - 40 psi (0.7 - 2.8 bar)	15.0	1A	1/2 NPTF - Pressure Supply
TOTAL WEIGHT in kg : ≈ 22 kg			ITEM : 18001	MIN SERIAL NUMBER : 02-04915-01	
Rev. 1	DATE: Dec-06-2002	DRAWN BY: P.SEVESTRE	ISSUED BY: C.DRUCARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER:		
TAG : 30 PCV 80043					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

DRESSER

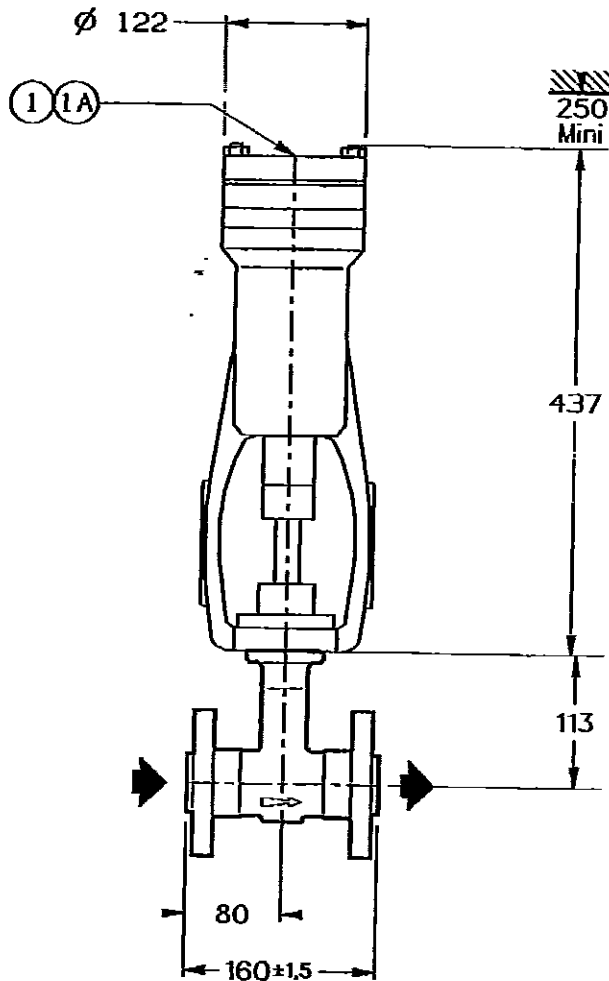
SERIES VALVE : 535 - V

DN : 25 (1")

ON PRESSURE FAILURE: OPEN

FLOW TO : OPEN

CONNECTION: 300 ANSI RF



Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	N° 3 1/2	Actuator Range: 150 - 450 psi (10.5 - 31.5 bar)	15.0	1A	1/2 NPTF - Pressure Supply
TOTAL WEIGHT in kg : \approx 21 kg			ITEM : 18002	MIN SERIAL NUMBER : 02-04915-02	
Rev. 0	DATE: Apr-22-2002	DRAWN BY: P.SEVESTRE	ISSUED BY: C.DROUARD		
CUSTOMER: TECHNIP			CUSTOMER ORDER:		
TAG : 30 PCV 80045					



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan



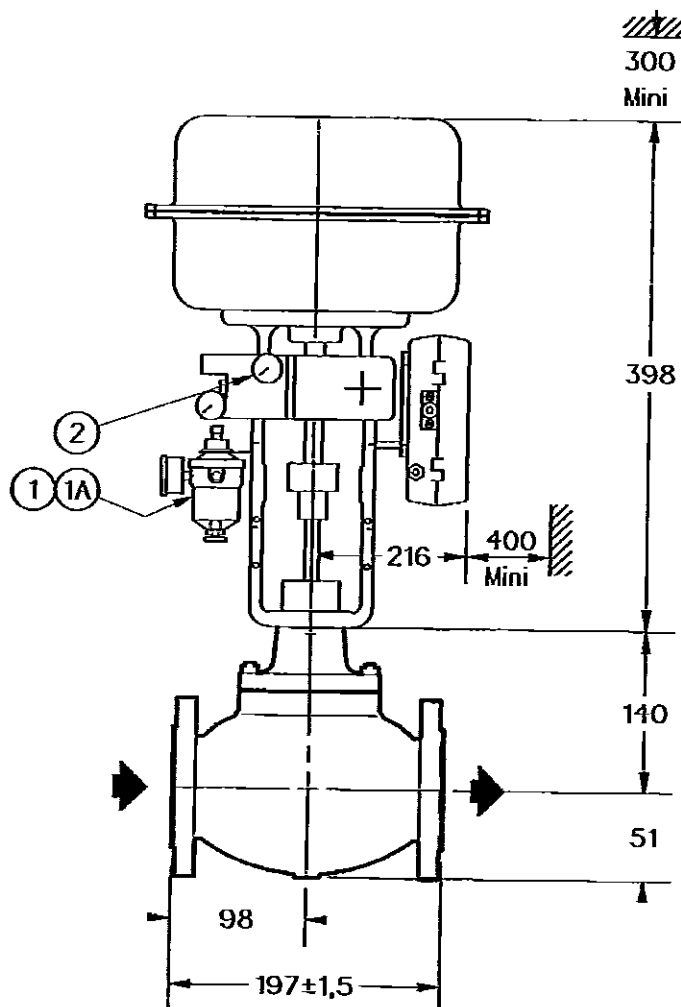
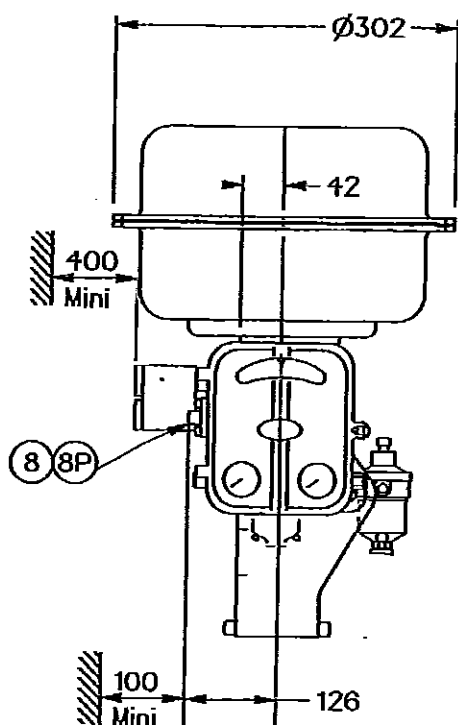
SERIES VALVE : 87-21014-2S

DN : 25 (1")

ON AIR FAILURE : OPEN.

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Drawing	No
Pneumatic Wiring Diagram	02-04915-PW10

Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filter Regul. +Gauge	1.0	1A	1/4" NPT - Air Supply
2	4700P	Pneumatic Positioner	3.0		
8	2700 + FR10/C	Pressure Regulator + Air Filter Regul. +Gauge	6.0	8P	1/4" NPTF-Controlled Pressure

TOTAL WEIGHT(accessories + valve) in kg

48

ITEM : 003

MN SERIAL NUMBER : 02-04915-03

Rev. 1

DATE: Oct-14-2002

DRAWN BY:

P. ROUELLE

ISSUED BY:

C-DROUARD

CUSTOMER: TECHNIP 9TH OLEFIN

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PCV 80029



DIMENSIONS in mm ±5%

OUTLINE DRAWING

Masonellan

BRASSER

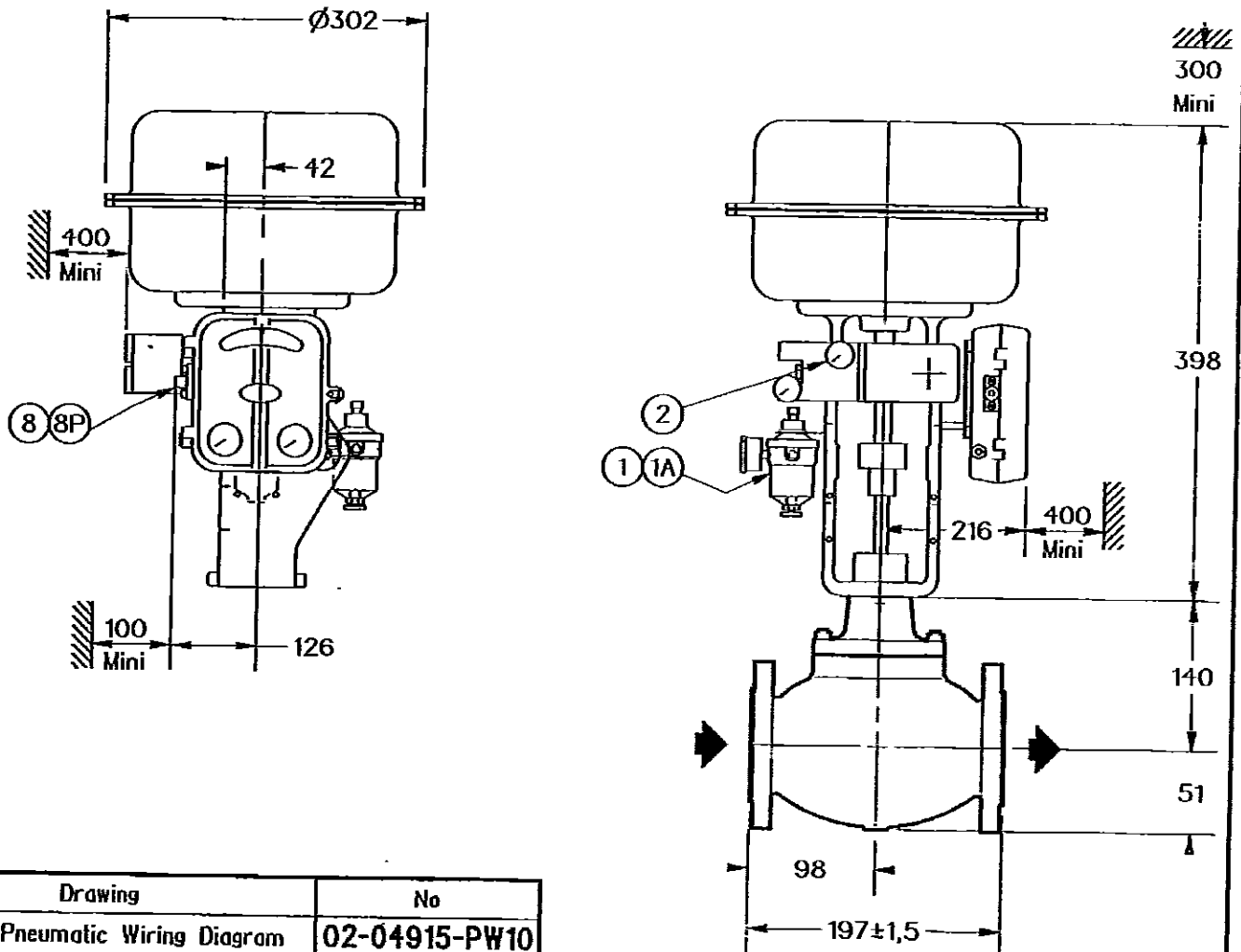
SERIES VALVE : 87-21014-2S

DN : 25 (1")

ON AIR FAILURE : OPEN.

FLOW TO : OPEN

CONNECTION: 300 ANSI RF-ISO PN 50 #B1



Ref.	TYPE	DESCRIPTION	Weight	Ref.	CONNECTION - FUNCTION
1	FR10/C	Air Filter Regul. +Gauge	1.0	1A	1/4" NPT - Air Supply
2	4700P	Pneumatic Positioner	3.0		
8	2700 + FR10/C	Pressure Regulator + Air Filter Regul. +Gauge	6.0	8P	1/4" NPTF-Controlled Pressure

TOTAL WEIGHT(accessories + valve) in kg

48

ITEM : 004

MN SERIAL NUMBER : 02-04915-04

Rev. 1

DATE: Oct-14-2002

DRAWN BY:

P. ROUELLE

ISSUED BY: C-DROUARD

CUSTOMER: TECHNIP 9TH OLEFIN

CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : 30 PCV 80049



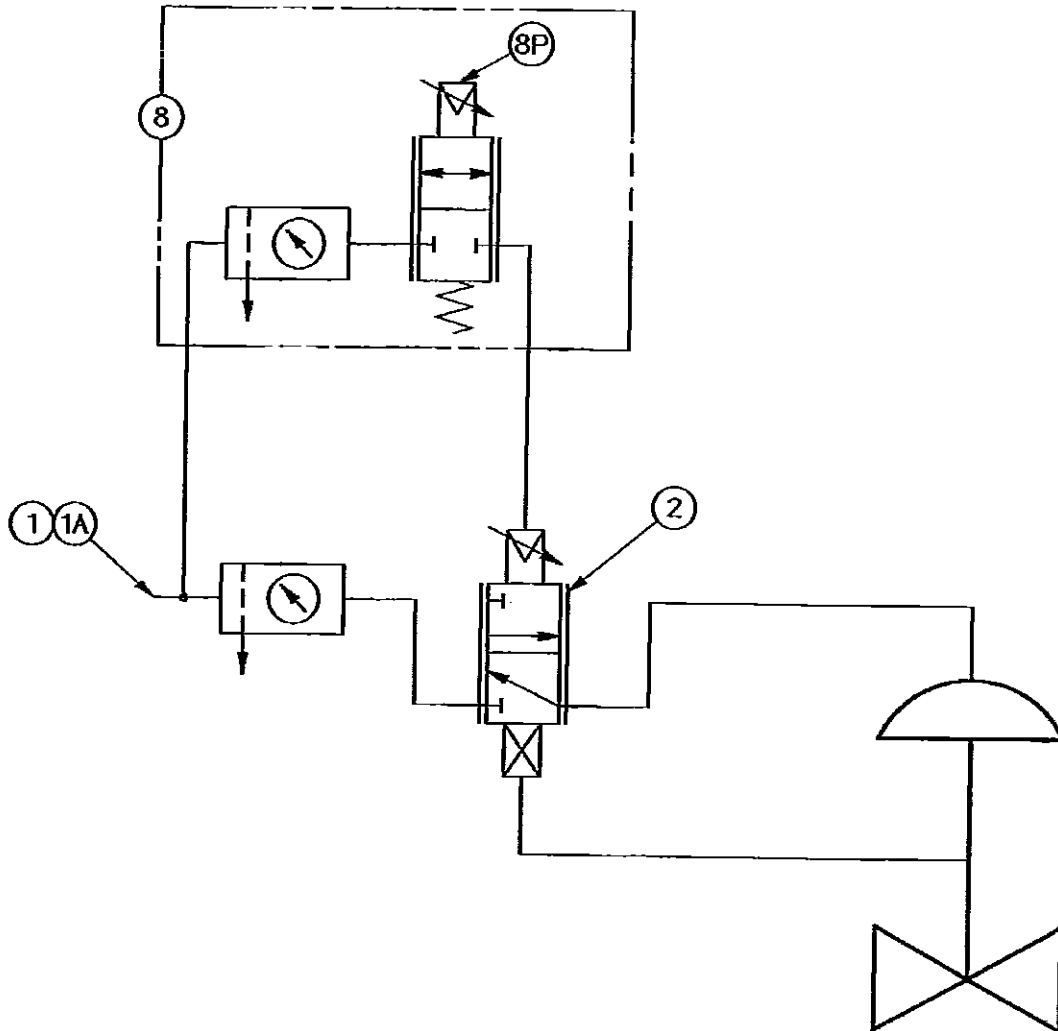
DRAWING No : 02-04915-PW10

Masonellan



PNEUMATIC WIRING DIAGRAM

Acc. to Standard : - NF ISO 1219-1
- USAS Y32.10



Ref.	DESCRIPTION	Ref.	CONNECTION - FUNCTION
1	Air Filler Regul. *Gauge	1A	Air Supply
2	Pneumatic Positioner		
8	Pressure regulator Air Filler Regul.*Gauge .	8P	Controlled pressure

ITEM : / MW SERIAL NUMBER : 02-04915-PW10

Rev. 0 || DATE: Oct-16-2002 || DRAWN BY: P. SEVESTRE || ISSUED BY: C. DROUARD

CUSTOMER: TECHNIP || CUSTOMER ORDER: 6465C30 1541 01 0 10007

TAG : /

2.3 CALCULATION NOTES

Unit 10
Unit 20
Unit 30
Unit 40
Unit 50
Unit 60
Unit 70
Unit 80

UNIT 10




10

CALCULATION SHEETS
(valves, actuators, safety devices, flow measuring devices)

TECHNIP	
VENDOR DOCUMENT REVIEW	
<input type="checkbox"/>	1 REVISE AND RESUBMIT
<input type="checkbox"/>	2 TO BE ISSUED AS FINAL IF PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/>	3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
 2003.04.07 16:14:30 +01'00'
 <none>

STATUS CERTIFIED "FINAL" ISSUED BY : S. LEGE DATE : 04/04/03
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2	04/04/03	Up-date
1	16/12/02	Up-date
0	27/09/02	FIRST ISSUE
REV	DATE	DESCRIPTION
	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY 	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007 EQUIPMENT NAME: Control valves
	Project: 3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	
	DOCUMENT TITLE : Calculation sheets	DOCUMENT CODE : A 3102
	PURCHASE ORDER : 02-4648 (Unit 10)	Sheet 01 of 26

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04648-01 REVISION : 1
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 11-12-02

PAGE : V0.001 CALC 1

ITEM : 001 QTY : 9 ENGINEER : SL
 TAG : 30FV 10101 TO 30FV 10901 REVISION : 3 04-09-02
 MN ITEM : 001 V0

CALCULATION SHEET

FLUID : Dimethyl disulfide (liquid)
 Critical Pressure: bar a 53.6

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	3.38	4.51	11.25		
Inlet Pressure : bar a	8.52	8.5	8.29		11.5
Outlet Pressure : bar a	7.02	6.9	6.99		
Pressure Drop : bar	1.5	1.6	1.3		
Temperature : °C	27	27	27		320
Vapour Pressure : bar a	0.036	0.036	0.036		
Gf :	1.057	1.057	1.057		
Viscosity : cPo	0.589	0.589	0.589		
Fl :	0.850	0.850	0.850		
Shut Off P.Drop : bar					12.5
Calculated Cv :	0.00311	0.00402	0.01113		
Inlet Velocity : m/s	0.0	0.0	0.0		
Outlet Pipe DN : mm	25	25	25		
Thickness : mm	4.55	4.55	4.55		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	22.6	29.2	80.7		
Signal% : equal %	60.2	67.5	94.2		

PRODUCT TYPE : VARIPAK
 Flow Direction : FTO Trim : -
 Nominal Cv : 0.025 Adjusted : .0138
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04648-02 REVISION : 0
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 17-04-02

PAGE : V0.002 CALC 1

ITEM : 002 QTY : 9 ENGINEER : SL
 TAG : 30FV 10102 TO 30FV 10902 REVISION : 2 05-08-02
 SERVICE : ETHANE FEED MN ITEM : 002 V0

CALCULATION SHEET

FLUID : ethane (gas)
 Critical Pressure: bar a 48.8
 Critical Temp. : °C 32.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM OTHER	DESIGN
Flowrate : kg/h	4606	15353	16888	
Inlet Pressure : bar a	7.09	6.96	6.93	8.6
Outlet Pressure : bar a	4.67	5.99	6.66	
Pressure Drop : bar	2.42	0.97	0.27	
Temperature : °C	55	55	55	70
MW :	29.93	29.93	29.93	
Cp/Cv :	1.201	1.201	1.201	
Z :	0.961	0.961	0.961	
F1 :	0.899	0.822	0.704	
Shut Off P.Drop : bar				11.5
Calculated Cv :	60.93	283	553.1	
Outlet Mach : (IEC)	0.043	0.111	0.110	
Sonic Diameter : in	1.22	1.97	1.96	
Outlet Pipe DN : mm	250	250	250	
Schedule :	20.0	20.0	20.0	
Valve SPL : dBA (IEC)	81.8	77.8	< 70	
Lift% : equal %	25.5	65.6	84.1	
Signal% : equal %	25.5	65.6	84.1	

PRODUCT TYPE : 36000 (Ball)
 Flow Direction : FTO Trim : -
 Nominal Cv : 1030
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N° : 2-04648-02 REVISION : 0
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 17-04-02

PAGE : V1.002 CALC 1

ITEM : 002 QTY : 9 ENGINEER : SL
 TAG : 30FV 10102 TO 30FV 10902 REVISION : 2 05-08-02
 SERVICE : DECOKE AIR MN ITEM : 002 V1

CALCULATION SHEET

FLUID : air (gas)
 Critical Pressure: bar a 37.7
 Critical Temp. : °C -140.7

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	1000	5500	6050		
Inlet Pressure : bar a	6.1	5.8	5.7		10.5
Outlet Pressure : bar a	3.6	3.9	4.3		
Pressure Drop : bar	2.5	1.9	1.4		
Temperature : °C	150	150	150		200
MW :	28.97	28.97	28.97		
Cp/Cv :	1.369	1.369	1.369		
Z :	1	1	1		
F1 :	0.921	0.881	0.874		
Shut Off P.Drop : bar					11.5
Calculated Cv :	16.63	103.1	126.6		
Outlet Mach : (IEC)	0.013	0.066	0.066		
Sonic Diameter : in	0.67	1.52	1.52		
Outlet Pipe DN : mm	250	250	250		
Schedule :	20.0	20.0	20.0		
Valve SPL : dBA (IEC)	74.2	82.9	80.5		
Lift% : equal %	10.9	36.8	42.3		
Signal% : equal %	10.9	36.8	42.3		

PRODUCT TYPE : 36000 (Ball)
 Flow Direction : FTO Trim : -
 Nominal Cv : 1030
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-01
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL Nr	: 2-04648-02	REVISION	: 1
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 11-12-02

PAGE : V2.002 CALC 1

ITEM	: 002	QTY	: 9	ENGINEER	: SL
TAG	: 30FV 10102 TO 30FV 10902	REVISION	: 3	05-08-02	
SERVICE	: STEAM PURGE	MN ITEM	: 002	V2	

CALCULATION SHEET

FLUID : steam
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		3000			
Inlet Pressure : bar a		6.7			8.3
Outlet Pressure : bar a		4.6			
Pressure Drop : bar		2.1			
Temperature : °C		190			310
Tsh : °C		26.76			
MW :		18.02			
Cp/Cv :		1.314			
Z :		0.96			
Fl :		0.899			
Shut Off P.Drop : bar					11.5
Calculated Cv :		64.34			
Outlet Mach : (IEC)		0.041			
Sonic Diameter : in		1.20			
Outlet Pipe DN : mm		250			
Schedule :		20.0			
Valve SPL : dBA (IEC)		83.8			
Lift% : equal %		26.4			
Signal% : equal %		26.4			

PRODUCT TYPE : 36000 (Ball)
 Flow Direction : FTO Trim : -
 Nominal Cv : 1030
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04648-03 REVISION : 0
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 17-04-02

PAGE : V0.003 CALC 1

ITEM : 003 QTY : 9 ENGINEER : SL
 TAG : 30FV 10104 TO 30FV 10904 REVISION : 2 05-08-02
 SERVICE : ETHANE FEED MN ITEM : 003 V0

CALCULATION SHEET

FLUID : ethane (gas)
 Critical Pressure: bar a 48.8
 Critical Temp. : °C 32.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	4606	15353	16888		
Inlet Pressure : bar a	7.09	6.96	6.93		8.6
Outlet Pressure : bar a	4.67	5.99	6.66		
Pressure Drop : bar	2.42	0.97	0.27		
Temperature : °C	55	55	55		70
MW :	29.93	29.93	29.93		
Cp/Cv :	1.201	1.201	1.201		
Z :	0.961	0.961	0.961		
F1 :	0.899	0.822	0.704		
Shut Off P.Drop : bar					11.5
Calculated Cv :	60.93	283	553.1		
Outlet Mach : (IEC)	0.043	0.111	0.110		
Sonic Diameter : in	1.22	1.97	1.96		
Outlet Pipe DN : mm	250	250	250		
Schedule :	20.0	20.0	20.0		
Valve SPL : dBA (IEC)	81.8	77.8	< 70		
Lift% : equal %	25.5	65.6	84.1		
Signal% : equal %	25.5	65.6	84.1		

PRODUCT TYPE : 36000 (Ball)
 Flow Direction : FTO Trim : -
 Nominal Cv : 1030
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04648-03 REVISION : 1
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 11-12-02

PAGE : VI.003 CALC 1

ITEM : 003 QTY : 9 ENGINEER : SL
 TAG : 30FV 10122 TO 30FV 10922 REVISION : 2 04-09-02
 SERVICE : DECOKE AIR MN ITEM : 003 V1

CALCULATION SHEET

FLUID : air (gas)
 Critical Pressure: bar a 37.7
 Critical Temp. : °C -140.7

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	1000	5500	6050		
Inlet Pressure : bar a	6.1	5.8	5.7		10.5
Outlet Pressure : bar a	3.6	3.9	4.3		
Pressure Drop : bar	2.5	1.9	1.4		
Temperature : °C	150	150	150		200
MW :	28.97	28.97	28.97		
Cp/Cv :	1.369	1.369	1.369		
Z :	1	1	1		
Fl :	0.921	0.881	0.874		
Shut Off P.Drop : bar					11.5
Calculated Cv :	16.63	103.1	126.6		
Outlet Mach : (IEC)	0.013	0.066	0.066		
Sonic Diameter : in	0.67	1.52	1.52		
Outlet Pipe DN : mm	250	250	250		
Schedule :	20.0	20.0	20.0		
Valve SPL : dBA (IEC)	74.2	82.9	80.5		
Lift% : equal %	10.9	36.8	42.3		
Signal% : equal %	10.9	36.8	42.3		

PRODUCT TYPE : 36000 (Ball)
 Flow Direction : FTO Trim : -
 Nominal Cv : 1030
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04648-03 REVISION : 1
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 11-12-02

PAGE : V2.003 CALC 1

ITEM : 003 QTY : 9 ENGINEER : SL
 TAG : 30FV 10104 TO 30FV 10904 REVISION : 4 04-09-02
 SERVICE : STEAM PURGE MN ITEM : 003 V2

CALCULATION SHEET

FLUID : steam
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		3000			
Inlet Pressure : bar a		6.7			8.3
Outlet Pressure : bar a		4.6			
Pressure Drop : bar		2.1			
Temperature : °C		190			310
Tsh : °C		26.76			
MW :		18.02			
Cp/Cv :		1.314			
Z :		0.96			
Fl :		0.899			
Shut Off P.Drop : bar					11.5
Calculated Cv :		64.34			
Outlet Mach : (IEC)		0.041			
Sonic Diameter : in		1.20			
Outlet Pipe DN : mm		250			
Schedule :		20.0			
Valve SPL : dBA (IEC)		83.8			
Lift% : equal %		26.4			
Signal% : equal %		26.4			

PRODUCT TYPE : 36000 (Ball)
 Flow Direction : FTO Trim : -
 Nominal Cv : 1030
 Rating : 300.
 Input Size : 6 in Output : 6 in
 MN 0109

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04648-04 REVISION : 1
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 11-12-02

PAGE : V0.004 CALC 1

ITEM : 004 QTY : 9 ENGINEER : SL
 TAG : 30FV 10106 TO 30FV 10906 REVISION : 4 04-09-02
 SERVICE : DILUTION STEAM MN ITEM : 004 V0

CALCULATION SHEET

FLUID : steam
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	3454	4606	5067		
Inlet Pressure : bar a	6.99	6.92	6.9		8.3
Outlet Pressure : bar a	4.79	5.82	6.5		
Pressure Drop : bar	2.2	1.1	0.4		
Temperature : °C	190	190	190		320
Tsh. : °C	25.06	25.46	25.58		
MW :	18.02	18.02	18.02		
Cp/Cv :	1.314	1.314	1.314		
Z :	0.958	0.958	0.958		
Fl :	0.940	0.940	0.940		
Shut Off P.Drop : bar					9.3
Calculated Cv :	54.8	95.37	165.4		
Outlet Mach : (IEC)	0.044	0.062	0.095		
Sonic Diameter : in	1.23	1.47	1.82		
Outlet Pipe DN : mm	200	200	200		
Schedule :	20.0	20.0	20.0		
Valve SPL : dBA (IEC)	72.0	< 70	< 70		
Lift% : linear	23.8	41.5	71.9		
Signal% : equal %	61.6	77.7	91.6		

PRODUCT TYPE : 41935
 Flow Direction : FTO Trim : red.
 Nominal Cv : 230
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109.



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04648-04 REVISION : 0
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 17-04-02

PAGE : V1.004 CALC 1

ITEM : 004 QTY : 9
 TAG : 30FV 10106 TO 30FV 10906
 SERVICE : DILUTION STEAM (DECOKING)

ENGINEER : SL
 REVISION : 0 05-08-02
 MN ITEM : 004 V1

CALCULATION SHEET

FLUID : steam
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	6250		11250		
Inlet Pressure : bar a	6.92		6.81		8.3
Outlet Pressure : bar a	4.02		4.21		
Pressure Drop : bar	2.9		2.6		
Temperature : °C	190		190		310
Tsh : °C	25.46		26.11		
MW :	18.02		18.02		
Cp/Cv :	1.314		1.314		
Z :	0.958		0.958		
.Fl :	0.940		0.940		
Shut Off P.Drop : bar					9.3
Calculated Cv :	92.32		173		
Outlet Mach : (IEC)	0.087		0.152		
Sonic Diameter : in	1.74		2.30		
Outlet Pipe DN : mm	200		200		
Schedule :	20.0		20.0		
Valve SPL : dBA (IEC)	77.8		79.7		
Lift% : linear	40.1		75.2		
Signal% : equal %	76.7		92.6		

PRODUCT TYPE : 41935
 Flow Direction : FTO Trim : full
 Nominal Cv : 230
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04648-05 REVISION : 1
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 11-12-02

PAGE : V0.005 CALC 1

ITEM : 005 QTY : 9 ENGINEER : SL
 TAG : 30FV 10108 TO 30FV 10908 REVISION : 3 04-09-02
 SERVICE : ETHANE FEED MN ITEM : 005 V0

CALCULATION SHEET

FLUID : steam
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	3454	4606	5067		
Inlet Pressure : bar a	6.99	6.92	6.9		8.3
Outlet Pressure : bar a	4.79	5.82	6.5		
Pressure Drop : bar	2.2	1.1	0.4		
Temperature : °C	190	190	190		320
Tsh : °C	25.06	25.46	25.58		
MW :	18.02	18.02	18.02		
Cp/Cv :	1.314	1.314	1.314		
Z :	0.958	0.958	0.958		
Fl :	0.940	0.940	0.940		
Shut Off P.Drop : bar					9.3
Calculated Cv :	54.8	95.37	165.4		
Outlet Mach : (IEC)	0.044	0.062	0.095		
Sonic Diameter : in	1.23	1.47	1.82		
Outlet Pipe DN : mm	200	200	200		
Schedule :	20.0	20.0	20.0		
Valve SPL : dBA (IEC)	72.0	67.1	59.3		
Lift% : linear	23.8	41.5	71.9		
Signal% : equal %	61.6	77.7	91.6		

PRODUCT TYPE : 41935
 Flow Direction : FTO Trim : red.
 Nominal Cv : 230
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-01
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL Nr	: 2-04648-06	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 17-04-02

PAGE : V0.006 CALC 1

ITEM	: 006	QTY	: 9	ENGINEER	: SL
TAG	: 30FV 10112 TO 30FV 10912	REVISION	: 2	05-08-02	
		MN ITEM	: 006	V0	

CALCULATION SHEET

FLUID	: water					
Critical Pressure:	bar a	220.5				(liquid)
SERVICE CONDITIONS						
Flowrate	: kg/h	2425	33790	53210	43790	
Inlet Pressure	: bar a	140.6	140.6	140.5	140.5	172
Outlet Pressure	: bar a	107.6	113.4	115.5	137	
Pressure Drop	: bar	33	27.2	25	3.5	
Temperature	: °C	130	130	130	130	153
Vapour Pressure	: bar a	2.707	2.707	2.707	2.707	
Gf	:	0.9418	0.9418	0.9418	0.9418	
Viscosity	: cPo	0.213	0.213	0.213	0.213	
Fl	:	0.940	0.933	0.926	0.903	
Shut Off P.Drop	: bar					173
Calculated Cv	:	0.5046	7.745	12.72	28	
Inlet Velocity	: m/s	0.1	1.5	2.4	1.9	
Outlet Pipe DN	: mm	150	150	150	150	
Schedule	:	160.0	160.0	160.0	160.0	
Sound Level	: dBA	< 70	70.5	71.9	< 70	
Flowing Condition:		subcrit	subcrit	subcrit	subcrit	
Lift%	: equal %	11.2	63.8	78.4	98.0	
Signal%	: equal %	11.2	63.8	78.4	98.0	
W Maxi	: kg/h				50080	
Full Opening						

PRODUCT TYPE	: 41425		
Flow Direction	: FTO	Trim	: red.
Nominal Cv	: 30		
Rating	: 1500		
Input Size	: 4 in	Output	: 4 in
MN 0109			

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-01
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N°	: 2-04648-07	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 17-04-02

PAGE : V0.007 CALC 1

ITEM	: 007	QTY	: 9	ENGINEER	: SL
TAG	: 30FV 10119A TO 30FV 10919A	REVISION	: 2	05-08-02	
SERVICE	: DESIGN FUEL GAS	MN ITEM	: 007	V0	

CALCULATION SHEET

FLUID	: Design fuel gas	(gas)		
SERVICE CONDITIONS				
Flowrate	: kg/h	MINIMUM	NORMAL	MAXIMUM OTHER DESIGN
Inlet Pressure	: bar a	424	3300	4235
Outlet Pressure	: bar a	4	3.92	3.87
Pressure Drop	: bar	1	2.62	3.47
Temperature	: °C	3	1.3	0.4
MW	:	27	27	27
Cp/Cv	:	4.6	4.6	4.6
Z	:	1.38	1.38	1.38
Fl	:	1	1	1
Shut Off P.Drop	: bar	0.940	0.940	0.940
				11.5
Calculated Cv	:	15.84	146.7	304.4
Outlet Mach	: (IEC)	0.019	0.067	0.104
Sonic Diameter	: in	1.10	2.04	2.54
Outlet Pipe DN	: mm	200	200	200
Schedule	:	20.0	20.0	20.0
Valve SPL	: dBA (IEC)	74.1	75.0	< 70
Lift%	: linear	4.2	38.6	80.1
Signal%	: linear	4.2	38.6	80.1

PRODUCT TYPE	: 41335 LO-DB		
Flow Direction	: FTO	Trim	: red.
Nominal Cv	: 380		
Rating	: 300		
Input Size	: 8 in	Output	: 8 in
MN 0109			

Flow Control

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04648-07 REVISION : 0
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 17-04-02

PAGE : V1.007, CALC 1

ITEM : 007 QTY : 9 ENGINEER : SL
 TAG : 30FV 10119A TO 30FV 10919A REVISION : 2 05-08-02
 SERVICE : START UP FUEL GAS MN ITEM : 007 V1

CALCULATION SHEET

FLUID : Design fuel gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	678		6778		
Inlet Pressure : bar a	4		3.94		10.5
Outlet Pressure : bar a	1		2.94		
Pressure Drop : bar	3		1		
Temperature : °C	27		27		75
MW :	16.7		16.7		
Cp/Cv :	1.38		1.38		
Z :	1		1		
F1 :	0.940		0.940		
Shut Off P.Drop : bar					11.5
Calculated Cv :	13.29		172.7		
Outlet Mach : (IEC)	0.016		0.071		
Sonic Diameter : in	1.00		2.09		
Outlet Pipe DN : mm	200		200		
Schedule :	20.0		20.0		
Valve SPL : dBA (IEC)	71.5		71.2		
Lift% : linear	3.5		45.4		
Signal% : linear	3.5		45.4		

PRODUCT TYPE : 41335 LO-DB
 Flow Direction : FTO Trim : red.
 Nominal Cv : 380
 Rating : 150
 Input Size : 8 in Output : 8 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04648-09 REVISION : 1
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 11-12-02

PAGE : V0.009 CALC 1

ITEM : 009 QTY : 9
 TAG : 30FV 10122 TO 30FV 10922

ENGINEER : SL
 REVISION : 4 04-09-02
 MN ITEM : 009 V0

CALCULATION SHEET

FLUID	: fuel gas	(gas)		
SERVICE CONDITIONS		MINIMUM	NORMAL	MAXIMUM OTHER DESIGN
Flowrate	: kg/h		180	466
Inlet Pressure	: bar a		2.55	2.55 10.5
Outlet Pressure	: bar a		2.37	2.53
Pressure Drop	: bar		0.18	0.02
Temperature	: °C		27	27 75
MW	:		4.6	4.6
Cp/Cv	:		1.38	1.38
Z	:		1	1
Fl	:		0.939	0.726
Shut Off P.Drop	: bar			11.5
Calculated Cv	:		23.4	176.9
Outlet Mach	: (IEC)		0.017	0.041
Sonic Diameter	: in		0.51	0.80
Outlet Pipe DN	: mm		100	100
Schedule	:		40.0	40.0
Valve SPL	: dBA (IEC)		< 70	< 70
Lift%	: linear		10.2	76.9
Signal%	: linear		10.2	76.9
W Maxi	: kg/h			
Full Opening				

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 230
 Rating : 150
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04648-10 REVISION : 1
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 11-12-02

PAGE : V0.010 CALC 1

ITEM : 010 QTY : 9
 TAG : 30FV 10123 TO 30FV 10923

ENGINEER : SL
 REVISION : 4 04-09-02
 MN ITEM : 010 V0

CALCULATION SHEET

FLUID	: fuel gas	(gas)		
SERVICE CONDITIONS		MINIMUM	NORMAL	MAXIMUM OTHER DESIGN
Flowrate	: kg/h		180	466
Inlet Pressure	: bar a		2.55	2.55 10.5
Outlet Pressure	: bar a		2.37	2.53
Pressure Drop	: bar		0.18	0.02
Temperature	: °C		27	27 75
MW	:		4.6	4.6
Cp/Cv	:		1.38	1.38
Z	:		1	1
Fl	:		0.939	0.726
Shut Off P.Drop	: bar			11.5
Calculated Cv	:		23.4	176.9
Outlet Mach	: (IEC)		0.017	0.041
Sonic Diameter	: in		0.51	0.80
Outlet Pipe DN	: mm		100	100
Schedule	:		40.0	40.0
Valve SPL	: dBA (IEC)		< 70	< 70
Lift%	: linear		10.2	76.9
Signal%	: linear		10.2	76.9
W Maxi	: kg/h			
Full Opening				

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 230
 Rating : 150
 Input Size : 4 in Output : 4 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N° : 2-04648-11 REVISION : 1
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 11-12-02

PAGE : V0.011 CALC 1

ITEM : 011 QTY : 9 ENGINEER : SL
 TAG : 30HV 10125 TO 30HV 10925 REVISION : 5 04-09-02
 MN ITEM : 011 V0

CALCULATION SHEET

FLUID : steam
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	400	15220	19000		
Inlet Pressure : bar a	6	105.4	105.4		120
Outlet Pressure : bar a	1	9.6	12		
Pressure Drop : bar	5	95.8	93.4		
Temperature : °C	159	510	510		530
Tsh : °C	0.1302	195	195		
MW :	18.02	18.02	18.02		
Cp/Cv :	1.274	1.274	1.274		
Z :	0.919	0.919	0.919		
Fl :	0.975	0.975	0.975		
Shut Off P.Drop : bar					120
Calculated Cv :	5.806	16.93	21.14		
Outlet Mach :	0.043	0.231	0.231		
Sonic Diameter : in	0.91	2.11	2.11		
Outlet Pipe DN : mm	150	150	150		
Schedule :	40.0	40.0	40.0		
Valve SPL : dBA	< 70	89.4	90.8		
Lift% : linear	24.2	70.5	88.1		
Signal% : linear	24.2	70.5	88.1		

PRODUCT TYPE : 41055 LO-DB
 Flow Direction : FTO Trim : red.
 Nominal Cv : 24
 Rating : 2500
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-01
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL Nr	: 2-04648-12	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 17-04-02

PAGE : V0.012 CALC 1

ITEM	: 012	QTY	: 9	ENGINEER	: SL
TAG	: 30HV 10126 TO 30HV 10926	REVISION	: 2	13-08-02	
		MN ITEM	: 012	V0	

CALCULATION SHEET

FLUID : water (liquid)
 Critical Pressure: bar a 220.5

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	4000	12000	16000		
Inlet Pressure : bar a	142	140.6	140.6		172
Outlet Pressure : bar a	1	113.6	107.6		
Pressure Drop : bar	141	27	33		
Temperature : °C	130	130	130		153
Vapour Pressure : bar a	2.707	2.707	2.707		
Gf :	0.9418	0.9418	0.9418		
Viscosity : cPo	0.213	0.213	0.213		
Fl :	0.995	0.995	0.995		
Shut Off P.Drop : bar					173
Calculated Cv :	0.4071	2.76	3.329		
Inlet Velocity : m/s	0.7	2.0	2.6		
Outlet Pipe DN : mm	50	50	50		
Schedule :	160.0	160.0	160.0		
Sound Level : dBA	no calc	< 70	< 70		
Flowing Condition:	flash.	subcrit	subcrit		
Lift% : linear	9.0	61.3	74.0		
Signal% : linear	9.0	61.3	74.0		

PRODUCT TYPE : 78103
 Flow Direction : FTO Trim : red.
 Nominal Cv : 4.5
 Rating : 1500
 Input Size : 2 in Output : 2 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04648-13 REVISION : 1
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 11-12-02

PAGE : V0.013 CALC 1

ITEM : 013 QTY : 9 ENGINEER : SL
 TAG : 30TV 10117 TO 30TV 10917 REVISION : 4 04-09-02
 MN ITEM : 013 V0

CALCULATION SHEET

FLUID : fuel gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		120	311		
Inlet Pressure : bar a		2.55	2.55		10.5
Outlet Pressure : bar a		2.37	2.53		
Pressure Drop : bar		0.18	0.02		
Temperature : °C		27	27		75
MW :		4.6	4.6		
Cp/Cv :		1.38	1.38		
Z :		1	1		
F1 :		0.940	0.796		
Calculated Cv :		15.6	117.9		
Outlet Mach :		0.011	0.026		
Sonic Diameter : in		0.42	0.65		
Outlet Pipe DN : mm		100	100		
Schedule :		40.0	40.0		
Valve SPL : dBA		< 70	< 70		
Lift% : linear		6.8	51.3		
Signal% : linear		6.8	51.3		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 230
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04648-14 REVISION : 1
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 11-12-02

PAGE : V0.014 CALC 1

ITEM : 014 QTY : 9

ENGINEER : SL
 REVISION : 4 04-09-02
 MN ITEM : 014 V0

TAG : 30TV 10122 TO 30TV 10922

CALCULATION SHEET

FLUID : fuel gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		120	311		
Inlet Pressure : bar a		2.55	2.55		10.5
Outlet Pressure : bar a		2.37	2.53		
Pressure Drop : bar		0.18	0.02		
Temperature : °C		27	27		75
MW :		4.6	4.6		
Cp/Cv :		1.38	1.38		
Z :		1	1		
Fl :		0.940	0.796		
Calculated Cv :		15.6	117.9		
Outlet Mach :		0.011	0.026		
Sonic Diameter : in		0.42	0.65		
Outlet Pipe DN : mm		100	100		
Schedule :		40.0	40.0		
Valve SPL : dBA		< 70	< 70		
Lift% : linear		6.8	51.3		
Signal% : linear		6.8	51.3		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC
 Nominal Cv : 230
 Rating : 300
 Input Size : 4 in
 MN 0109

Trim : full
 Output : 4 in



Flow Control

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N° : 2-04648-15 REVISION : 1
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 11-12-02

PAGE : V0.015 CALC 1

ITEM : 015 QTY : 9 ENGINEER : SL
 TAG : 30TV 10127 TO 30TV 10927 REVISION : 4 04-09-02
 MN ITEM : 015 V0

CALCULATION SHEET

FLUID : fuel gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		120	311		
Inlet Pressure : bar a		2.55	2.55		10.5
Outlet Pressure : bar a		2.37	2.53		
Pressure Drop : bar		0.18	0.02		
Temperature : °C		27	27		75
MW :		4.6	4.6		
Cp/Cv :		1.38	1.38		
Z :		1	1		
Fl :		0.940	0.796		
Calculated Cv :		15.6	117.9		
Outlet Mach :		0.011	0.026		
Sonic Diameter : in		0.42	0.65		
Outlet Pipe DN : mm		100	100		
Schedule :		40.0	40.0		
Valve SPL : dBA		< 70	< 70		
Lift% : linear		6.8	51.3		
Signal% : linear		6.8	51.3		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 230
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N° : 2-04648-16 REVISION : 1
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 11-12-02

PAGE : V0.016 CALC 1

ITEM : 016 QTY : 9
 TAG : 30TV 10132 TO 30TV 10932

ENGINEER : SL
 REVISION : 4 04-09-02
 MN ITEM : 016 V0

CALCULATION SHEET

FLUID : fuel gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		120	311		
Inlet Pressure : bar a		2.55	2.55		10.5
Outlet Pressure : bar a		2.37	2.53		
Pressure Drop : bar		0.18	0.02		
Temperature : °C		27	27		75
MW :		4.6	4.6		
Cp/Cv :		1.38	1.38		
Z :		1	1		
Fl :		0.940	0.796		
Calculated Cv :		15.6	117.9		
Outlet Mach :		0.011	0.026		
Sonic Diameter : in		0.42	0.65		
Outlet Pipe DN : mm		100	100		
Schedule :		40.0	40.0		
Valve SPL : dBA		< 70	< 70		
Lift% : linear		6.8	51.3		
Signal% : linear		6.8	51.3		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 230
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N° : 2-04648-17 REVISION : 1
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 11-12-02

PAGE : V0.017 CALC 1

ITEM : 017 QTY : 9
 TAG : 30TV 10137 TO 30TV 10937

ENGINEER : SL
 REVISION : 4 04-09-02
 MN ITEM : 017 V0

CALCULATION SHEET

FLUID : fuel gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		120	311		
Inlet Pressure : bar a		2.55	2.55		10.5
Outlet Pressure : bar a		2.37	2.53		
Pressure Drop : bar		0.18	0.02		
Temperature : °C		27	27		75
MW :		4.6	4.6		
Cp/Cv :		1.38	1.38		
Z :		1	1		
F1 :		0.940	0.796		
Calculated Cv :		15.6	117.9		
Outlet Mach :		0.011	0.026		
Sonic Diameter : in		0.42	0.65		
Outlet Pipe DN : mm		100	100		
Schedule :		40.0	40.0		
Valve SPL : dBA		< 70	< 70		
Lift% : linear		6.8	51.3		
Signal% : linear		6.8	51.3		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 230
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109

Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-01
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL Nr	: 2-04648-18	REVISION	: 1
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 11-12-02

PAGE : V0.018 CALC 1

ITEM	: 018	QTY	: 9	ENGINEER	: SL
TAG	: 30TV 10142 TO 30TV 10942	REVISION	: 4	04-09-02	
		MN ITEM	: 018	V0	

CALCULATION SHEET

FLUID	: fuel gas	(gas)		
SERVICE CONDITIONS		MINIMUM	NORMAL	MAXIMUM OTHER DESIGN
Flowrate	: kg/h		120	311
Inlet Pressure	: bar a		2.55	2.55 10.5
Outlet Pressure	: bar a		2.37	2.53
Pressure Drop	: bar		0.18	0.02
Temperature	: °C		27	27 75
MW	:		4.6	4.6
Cp/Cv	:		1.38	1.38
Z	:		1	1
F1	:		0.940	0.796
Calculated Cv	:		15.6	117.9
Outlet Mach	:		0.011	0.026
Sonic Diameter	: in		0.42	0.65
Outlet Pipe DN	: mm		100	100
Schedule	:		40.0	40.0
Valve SPL	: dBA		< 70	< 70
Lift%	: linear		6.8	51.3
Signal%	: linear		6.8	51.3

PRODUCT TYPE	: CamFlex		
Flow Direction	: FTC	Trim	: full
Nominal Cv	: 230		
Rating	: 300		
Input Size	: 4 in	Output	: 4 in
MN 0109			



Flow Control

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N° : 2-04648-19 REVISION : 0
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-01
 DATED : 10-04-02
 DATED : 17-04-02

PAGE : V0.019 CALC 1

ITEM : 019 QTY : 9

ENGINEER : SL
 REVISION : 3 05-08-02
 MN ITEM : 019 V0

TAG : 30UV 30127 TO 30UV 30927

CALCULATION SHEET

FLUID : water (liquid)
 Critical Pressure: bar a 220.5

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	2425	36373	53210		
Inlet Pressure : bar a	107.6	113.4	115.5		172
Outlet Pressure : bar a	107.6	113.4	115.4		
Pressure Drop : bar	0.00014	0.03287	0.07033		
Temperature : °C	130	130	130		153
Vapour Pressure : bar a	2.707	2.707	2.707		
Gf :	0.9401	0.9404	0.9405		
Viscosity : cPo	0.213	0.213	0.213		
Fl :	0.900	0.900	0.900		
Shut Off P.Drop : bar					173
Cv :	240	240	240		
Inlet Velocity : m/s	0.1	1.6	2.4		
Outlet Pipe DN : mm	100	100	100		
Schedule :	160.0	160.0	160.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : on/off	100.0	100.0	100.0		
Signal% : on/off	100.0	100.0	100.0		

PRODUCT TYPE : 41415
 Flow Direction : FTO Trim : full
 Nominal Cv : 240
 Rating : 1500
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP PROPOSAL : 20139C
 ENQUIRY : ITB N° 041 DATED : 07-09-01
 CUST. ORDER : 6465C30 1541 01 0 10007 DATED : 10-04-02
 SERIAL Nr : 2-04648-19 REVISION : 0 DATED : 17-04-02
 PROJECT : 9TH OLEFIN COMPLEX

ITEM : 019 QTY : 1 ENGINEER : SL
 TAG : 30UV 30127 TO 30UV 30927 REVISION : 3 05-08-02
 MN ITEM : 019 V1

CALCULATION SHEET

FLUID	: water				(liquid)
Critical Pressure:	bar a	220.5			
SERVICE CONDITIONS					
Flowrate	: kg/h	2425	36373	53210	
Inlet Pressure	: bar a	107.6	113.4	115.5	172
Outlet Pressure	: bar a	107.6	113.4	115.4	
Pressure Drop	: bar	0,00014	0.03287	0.07033	
Temperature	: °C	130	130	130	153
Vapour Pressure	: bar a	2.707	2.707	2.707	
Gf	:	0.9401	0.9404	0.9405	
Viscosity	: cPo	0.213	0.213	0.213	
Fl	:	0.900	0.900	0.900	
Shut Off P.Drop	: bar				173
Cv	:	240	240	240	
Inlet Velocity	: m/s	0.1	1.6	2.4	
Outlet Pipe DN	: mm	100	100	100	
Schedule	:	160.0	160.0	160.0	
Sound Level	: dBA	< 70	< 70	< 70	
Flowing Condition:		subcrit	subcrit	subcrit	
Lift%	: on/off	100.0	100.0	100.0	
Signal%	: on/off	100.0	100.0	100.0	

PRODUCT TYPE : 41415
 Flow Direction : FTO Trim : full
 Nominal Cv : 240
 Rating : 1500
 Input Size : 4 in Output : 4 in
 MN 0109

UNIT 20



CALCULATION SHEETS

(valves, actuators, safety devices, flow measuring devices)

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
2002.12.20 09:38:56 +01'00'
<none>

STATUS CERTIFIED "FINAL"
ISSUED BY : S. LEGE
DATE : 16/12/02

1	16/12/02	Up-date
0	27/09/02	FIRST ISSUE
REV	DATE	DESCRIPTION
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY	TP REQUISITION NUMBER -- 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007
		EQUIPMENT NAME: Control valves
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	
DRESSER Flow Control	DOCUMENT TITLE :	DOCUMENT CODE :
	Calculation sheets	A 3102
	PURCHASE ORDER :	Sheet
	02-4909 (Unit 20)	01 of 18
		Rev. 1

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04909-01 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - -
 DATED : 18-04-02

PAGE : V0.001 CALC 1

ITEM : 12001 QTY : 1 ENGINEER : SL
 TAG : 30 FV 20001 REVISION : 4 05-08-02
 MN ITEM : 001 V0

CALCULATION SHEET

FLUID : quench water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	643840	1609600	2167990		
Inlet Pressure : bar a	9.25	7.46	5.47		12.6
Outlet Pressure : bar a	4.88	4.94	4.97		
Pressure Drop : bar	4.37	2.52	0.5		
Temperature : °C	37.5	37.5	37.5		120
Vapour Pressure : bar a	0.06451	0.06451	0.06451		
Gf :	0.9937	0.9937	0.9937		
Viscosity : cPo	1	1	1		
Fl :	0.860	0.860	0.740		
Shut Off P.Drop : bar					7.4
Calculated Cv :	358.7	1190	3884		
Inlet Velocity : m/s	1.8	4.5	6.1		
Outlet Pipe DN : mm	500	500	500		
Schedule :	10.0	10.0	10.0		
Sound Level : dBA	76.0	73.0	69.0		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : equal %	26.8	58.1	90.8		
Signal% : equal %	26.8	58.1	90.8		

PRODUCT TYPE : butterfly
 Flow Direction : - Trim : -
 Nominal Cv : 5610
 Rating : 150
 Input Size : 14 in Output : 14 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04909-02 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - -
 DATED : 18-04-02

PAGE : V0.002 CALC 1

ITEM : 12002 QTY : 1 ENGINEER : SL
 TAG : 30 LV 20001 REVISION : 4 18-07-02
 MN ITEM : 002 V0

CALCULATION SHEET

FLUID : Sour water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	38529	96322	132971		
Inlet Pressure : bar a	7.4	5.99	4.42		9.5
Outlet Pressure : bar a	3.35	3.53	3.72		
Pressure Drop : bar	4.05	2.46	0.7		
Temperature : °C	78	78	78		120
Vapour Pressure : bar a	0.4372	0.4372	0.4372		
Gf :	0.9736	0.9736	0.9736		
Viscosity : cPo	1	1	1		
F1 :	0.937	0.872	0.711		
Shut Off P.Drop : bar					5
Calculated Cv :	22.52	72.62	195.1		
Inlet Velocity : m/s	1.4	3.4	4.7		
Outlet Pipe DN : mm	150	150	150		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	71.3	72.1	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	9.8	31.6	84.8		
Signal% : equal %	36.2	70.4	95.4		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 230
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nbr : 2-04909-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - -
 DATED : 18-04-02

PAGE : V0.003 CALC 1

ITEM : 12003 QTY : 1 ENGINEER : SL
 TAG : 30 PV 20001 REVISION : 5 18-07-02
 MN ITEM : 003 V0

CALCULATION SHEET

FLUID : fuel gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			696		
Inlet Pressure : bar a			3.49		
Outlet Pressure : bar a			0.94		
Pressure Drop : bar			2.55		
Temperature : °C			40		60
MW :			4		
Cp/Cv :			1.39		
Z :			1		
F1 :			0.880		
Shut Off P.Drop : bar					5.5
Calculated Cv :			34.75		
Outlet Mach :			0.309		
Sonic Diameter : in			1.67		
Outlet Pipe DN : mm			100		
Schedule :			40.0		
Valve SPL : dBA			82.9		
Lift% : linear			64.3		
Signal% : equal %			88.9		

PRODUCT TYPE : CamFlex
 Flow Direction : FTO Trim : red.
 Nominal Cv : 54
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nbr : 2-04909-04 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - - -
 DATED : 18-04-02

PAGE : V0.004 CALC 1

ITEM : 12004 QTY : 1 ENGINEER : SL
 TAG : 30 PV 20022 A REVISION : 3 18-07-02
 MN ITEM : 004 V0

CALCULATION SHEET

FLUID : Fresh Ethane (gas)
 Critical Pressure: bar a 48.8
 Critical Temp. : °C 32.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	64237	160593	176652		
Inlet Pressure : bar a	17.88	16.25	15.1		22
Outlet Pressure : bar a	7.03	7.69	7.86		
Pressure Drop : bar	10.85	8.56	7.24		
Temperature : °C	40	40	50		65
MW :	29.9	29.9	29.9		
Cp/Cv :	1.28	1.28	1.28		
Z :	0.875	0.875	0.875		
F1 :	0.940	0.940	0.940		
Shut Off P.Drop : bar					22
Calculated Cv :	212.1	592.5	723.8		
Outlet Mach : (IEC)	0.074	0.170	0.188		
Sonic Diameter : in	3.20	4.87	5.12		
Outlet Pipe DN : mm	450	450	450		
Schedule :	20.0	20.0	20.0		
Valve SPL : dBA (IEC)	82.1	84.6	84.1		
Lift% : linear	25.3	70.5	86.2		
Signal% : equal %	63.2	91.2	95.8		

PRODUCT TYPE : 41335 LO-DB
 Flow Direction : FTO Trim : -
 Nominal Cv : 840
 Rating : 300
 Input Size : 12 in Output : 12 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04909-05 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - -
 DATED : 18-04-02

PAGE : V0.005 CALC 1

ITEM : 12005 QTY : 1 ENGINEER : SL
 TAG : 30 PV 20022B REVISION : 5 18-07-02
 MN ITEM : 005 V0

CALCULATION SHEET

FLUID : ethane (liquid)
 Critical Pressure: bar a 49

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	58959		96381		
Inlet Pressure : bar a	12.92		10.51		14.8
Outlet Pressure : bar a	7.71		10.07		
Pressure Drop : bar	5.21		0.44		
Temperature : °C	-88.7		-88.7		-90.60
Vapour Pressure : bar a	1.05		1.05		
Gf :	0.547		0.547		
Viscosity : cPo	0.165		0.165		
Fl :	0.929		0.727		
Shut Off P.Drop : bar					14.8

Calculated Cv :	40.52	229.5
Inlet Velocity : m/s	1.6	2.7
Outlet Pipe DN : mm	200	200
Thickness : mm	3.76	3.76
Sound Level : dBA	83.7	< 70
Flowing Condition:	subcrit	subcrit
Lift% : linear	13.5	76.5
Signal% : equal %	44.8	93.0

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 300
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01.0 10007
 SERIAL Nr : 2-04909-06 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - -
 DATED : 18-04-02

PAGE : V0.006 CALC 1

ITEM : 12006 QTY : 1 ENGINEER : SL
 TAG : 30 PV 20024 REVISION : 3 18-07-02
 MN ITEM : 006 V0

CALCULATION SHEET

FLUID : ethane (gas)
 Critical Pressure: bar a 48.8
 Critical Temp. : °C 32.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			30707		
Inlet Pressure : bar a			8.7		8.4
Outlet Pressure : bar a			2.7		
Pressure Drop : bar			6		
Temperature : °C			55		80
MW :			29.9		
Cp/Cv :			1.21		
Z :			0.945		
F1 :			0.975		
Shut Off P.Drop : bar					8.4
Calculated Cv :			216.5		
Outlet Mach :			0.260		
Sonic Diameter : in			4.08		
Outlet Pipe DN : mm			200		
Schedule :			20.0		
Valve SPL : dBA			79.4		
Lift% : linear			86.6		
Signal% : equal %			96.0		

PRODUCT TYPE : 41355 LO-DB
 Flow Direction : - Trim : -
 Nominal Cv : 250
 Rating : 300
 Input Size : 8 in Output : 8 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04909-07 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - -
 DATED : 18-04-02

PAGE : V0.007 CALC 1

ITEM : 12007 QTY : 1 ENGINEER : SL
 TAG : 30 TV 20024 REVISION : 5 18-07-02
 MN ITEM : 007 V0

CALCULATION SHEET

FLUID : quench water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	40350	166330	182960		
Inlet Pressure : bar a	11.37	9.18	7.75		12.6
Outlet Pressure : bar a	9.36	8.12	6.9		
Pressure Drop : bar	2.01	1.06	0.85		
Temperature : °C	63	63	63		120
Vapour Pressure : bar a	0.2288	0.2288	0.2288		
Gf :	0.9822	0.9822	0.9822		
Viscosity : cPo	0.446	0.446	0.446		
Fl :	0.937	0.761	0.725		
Shut Off P.Drop : bar					7.4
Calculated Cv :	33.31	189.1	232.3		
Inlet Velocity : m/s	0.6	2.6	2.8		
Outlet Pipe DN : mm	150	150	150		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	11.1	63.0	77.4		
Signal% : equal %	39.7	88.4	93.2		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 300
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04909-08 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - -
 DATED : 18-04-02

PAGE : V0.008 CALC 1

ITEM : 12008 QTY : 1 ENGINEER : SL
 TAG : 30 PDV 20031 REVISION : 4 18-07-02
 MN ITEM : 008 V0

CALCULATION SHEET

FLUID : quench water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	518260	1011770	1582400		
Inlet Pressure : bar a	11.27	9.53	7.3		12.6
Outlet Pressure : bar a	9.35	8.08	6.68		
Pressure Drop : bar	1.92	1.45	0.62		
Temperature : °C	63	63	63		120
Vapour Pressure : bar a	0.2288	0.2288	0.2288		
Gf :	0.9822	0.9822	0.9822		
Viscosity : cPo	0.446	0.446	0.446		
Fl :	0.920	0.891	0.840		
Shut Off P.Drop : bar					7.4
Calculated Cv :	437.8	983.5	2352		
Inlet Velocity : m/s	1.2	2.4	3.8		
Outlet Pipe DN : mm	400	400	400		
Schedule :	10.0	10.0	10.0		
Sound Level : dBA	80.8	81.9	78.3		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	15.3	34.4	82.2		
Signal% : equal %	48.6	72.5	94.7		

PRODUCT TYPE : VARIMAX
 Flow Direction : FTO Trim : red.
 Nominal Cv : 2860
 Rating : 300
 Input Size : 16 in Output : 16 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04909-09 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - - -
 DATED : 18-04-02

PAGE : V0.009 CALC 1

ITEM : 12009 QTY : 1 ENGINEER : SL
 TAG : 30 LDV 20051 REVISION : 3 18-07-02
 MN ITEM : 009 V0

CALCULATION SHEET

FLUID : light oil (liquid)

Critical Pressure: bar a 58.8

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	195	487	666		
Inlet Pressure : bar a	7.4	6.3	4.58		9.5
Outlet Pressure : bar a	1.54	2.04	2.04		
Pressure Drop : bar	5.86	4.26	2.54		
Temperature : °C	78	78	78		120
Vapour Pressure : bar a	0.007	0.007	0.007		
Gf :	0.919	0.919	0.919		
Viscosity : cPo	0.694	0.694	0.694		
F1 :	0.979	0.956	0.938		
Shut Off P.Drop : bar					9.5
Calculated Cv :	0.09747	0.2855	0.5057		
Inlet Velocity : m/s	0.1	0.3	0.4		
Outlet Pipe DN : mm	50	50	50		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : equal %	25.0	51.2	68.2		
Signal% : equal %	25.0	51.2	68.2		

PRODUCT TYPE : 21125

Flow Direction : FTO

Trim : red.

Nominal Cv : 1.7

Rating : 300

Input Size : 1 in

Output : 1 in

MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04909-10 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - -
 DATED : 18-04-02

PAGE : V0.010 CALC 1

ITEM : 12010 QTY : 1 ENGINEER : SL
 TAG : 30 FV 20061 REVISION : 4 18-07-02
 MN ITEM : 010 V0

CALCULATION SHEET

FLUID : quench water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	38900	97300	107030		
Inlet Pressure : bar a	5.51	4.56	4.19		7.4
Outlet Pressure : bar a	3.29	3.62	3.69		
Pressure Drop : bar	2.22	0.94	0.5		
Temperature : °C	78	78	78		120
Vapour Pressure : bar a	0.4372	0.4372	0.4372		
Gf :	0.9736	0.9736	0.9736		
Viscosity : cPo	20	20	20		
F1 :	0.930	0.794	0.720		
Shut Off P.Drop : bar					2.2
Calculated Cv :	30.72	119.9	185		
Inlet Velocity : m/s	1.4	3.4	3.8		
Outlet Pipe DN : mm	150	150	150		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	13.4	52.1	80.4		
Signal% : equal %	44.5	83.4	94.1		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 230
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04909-11 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED :
 DATED : 18-04-02

PAGE : V0.011 CALC 1

ITEM : 12011 QTY : 1 ENGINEER : SL
 TAG : 30 LV 20071 REVISION : 4 18-07-02
 MN ITEM : 011 V0

CALCULATION SHEET

FLUID : process water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	41252	103130	142380		
Inlet Pressure : bar a	13.93	12.62	11.89		14.7
Outlet Pressure : bar a	8.13	9.04	11.4		
Pressure Drop : bar	5.8	3.58	0.49		
Temperature : °C	117.8	117.8	117.8		150
Vapour Pressure : bar a	1.856	1.856	1.856		
Gf :	0.9456	0.9456	0.9456		
Viscosity : cPo	0.24	0.24	0.24		
F1 :	0.940	0.905	0.718		
Shut Off P.Drop : bar					14.7
Calculated Cv :	20.43	65.02	242.6		
Inlet Velocity : m/s	0.7	1.7	2.3		
Outlet Pipe DN : mm	150	150	150		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	74.0	74.9	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	6.8	21.7	80.9		
Signal% : equal %	28.0	58.9	94.3		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 300
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04909-12 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE20
 DATED : - - -
 DATED : 18-04-02

PAGE : V0.012 CALC 1

ITEM : 12012 QTY : 1 ENGINEER : SL
 TAG : 30 FV 20071 REVISION : 4 18-07-02
 MN ITEM : 012 V0

CALCULATION SHEET

FLUID : dilution steam (steam)
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	3879	9698	13400		
Inlet Pressure : bar a	8.38	7.35	6.19		8.3
Outlet Pressure : bar a	1.8	1.85	1.87		
Pressure Drop : bar	6.58	5.5	4.32		
Temperature : °C	190	190	190		320
Tsh : °C	17.61	23.02	29.91		
MW :	18.03	18.03	18.03		
Cp/Cv :	1.37	1.37	1.37		
Z :	0.955	0.955	0.955		
Fl :	0.940	0.940	0.940		
Shut Off P.Drop : bar					8.3
Calculated Cv :	43.96	125.3	205.7		
Outlet Mach :	0.127	0.308	0.421		
Sonic Diameter : in	2.14	3.33	3.89		
Outlet Pipe DN : mm	250	250	250		
Schedule :	20.0	20.0	20.0		
Valve SPL : dBA	84.9	84.9	85.0		
Lift% : linear	14.7	41.8	68.6		
Signal% : equal %	47.2	77.9	90.6		

PRODUCT TYPE : 41935 LO-DB
 Flow Direction : FTO Trim : red.
 Nominal Cv : 300
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

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CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04909-13 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - -
 DATED : 18-04-02

PAGE : V0.013 CALC 1

ITEM : 12013 QTY : 1 ENGINEER : SL
 TAG : 30 LV 20081 REVISION : 5 18-07-02
 MN ITEM : 013 V0

CALCULATION SHEET

FLUID : boiler feed water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			8700		
Inlet Pressure : bar a			40.7		44
Outlet Pressure : bar a			9.7		
Pressure Drop : bar			31		
Temperature : °C			130		150
Vapour Pressure : bar a			2.71		
Gf :			0.937		
Viscosity : cPo			0.214		
F1 :			0.975		
Shut Off P.Drop : bar					44
Calculated Cv :			1.873		
Inlet Velocity : m/s			2.3		
Outlet Pipe DN : mm			80		
Schedule :			40.0		
Sound Level : dBA			75.2		
Flowing Condition:			subcrit		
Lift% : linear			66.9		
Signal% : equal %			90.1		

PRODUCT TYPE : 21014-2S
 Flow Direction : FTO Trim : red.
 Nominal Cv : 2.8
 Rating : 600
 Input Size : 1.5 in Output : 1.5 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04909-14 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - - -
 DATED : 18-04-02

PAGE : V0.014 CALC 1

ITEM : 120014 QTY : 1 ENGINEER : SL
 TAG : 30 FV 20081 REVISION : 3 18-07-02
 MN ITEM : 014 V0

CALCULATION SHEET

FLUID : D. Steam blow (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	6000	15000	129436		
Inlet Pressure : bar a	9.62	8.49	5.72		9.5
Outlet Pressure : bar a	3.01	3.03	4.25		
Pressure Drop : bar	6.61	5.46	1.47		
Temperature : °C	50	50	50		65
Vapour Pressure : bar a	0.1235	0.1235	0.1235		
Gf :	0.9886	0.9886	0.9886		
Viscosity : cPo	0.547	0.547	0.547		
Fl :	0.987	0.982	0.910		
Shut Off P.Drop : bar					9.5
Calculated Cv :	2.723	7.49	126.8		
Inlet Velocity : m/s	0.2	0.5	4.5		
Outlet Pipe DN : mm	150	150	150		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	< 70	< 70	70.0		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : equal %	10	19.4	89.3		
Signal% : equal %	10	19.4	89.3		

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : full
 Nominal Cv : 195
 Rating : 150
 Input Size : 4 in Output : 4 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04909-15 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - - -
 DATED : 18-04-02

PAGE : V0.015 CALC 1

ITEM : 12015 QTY : 1 ENGINEER : SL
 TAG : 30 PV 20083 A REVISION : 5 18-07-02
 MN ITEM : 015 V0

CALCULATION SHEET

FLUID : MP steam (steam)
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	40840	102100	143781		
Inlet Pressure : bar a	17.37	16.8	16.4		18.6
Outlet Pressure : bar a	10.51	16.11	16.19		
Pressure Drop : bar	6.86	0.69	0.21		
Temperature : °C	285	300	315		330
Tsh : °C	79.78	96.4	112.6		
MW :	18.03	18.03	18.03		
Cp/Cv :	1.37	1.37	1.37		
Z :	0.947	0.947	0.947		
Fl :	0.794	0.786	0.681		
Shut Off P.Drop : bar					18.6
Calculated Cv :	322.3	1881	4826		
Outlet Mach : (IEC)	0.037	0.062	0.087		
Sonic Diameter : in	3.04	3.91	4.65		
Outlet Pipe DN : mm	450	450	450		
Schedule :	20.0	20.0	20.0		
Valve SPL : dBA (IEC)	94.4	85.1	< 70		
Lift% : equal %	18.4	57.3	83.8		
Signal% : equal %	18.4	57.3	83.8		

PRODUCT TYPE : Butterfly
 Flow Direction : - Trim : -
 Nominal Cv : 9100
 Rating : 300
 Input Size : 16 in Output : 16 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04909-16 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - - -
 DATED : 18-04-02

PAGE : V0.016 CALC 1

ITEM : 12016 QTY : 1 ENGINEER : SL
 TAG : 30 PV 20083 B REVISION : 4 18-07-02
 MN ITEM : 016 V0

CALCULATION SHEET

FLUID : MP steam (steam)
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	10538	84304	180000		
Inlet Pressure : bar a	17.4	16.7	16.4		18.6
Outlet Pressure : bar a	6.9	7	7.9		
Pressure Drop : bar	10.5	9.7	8.5		
Temperature : °C	285	300	315		330
Tsh : °C	79.7	96.68	112.6		
MW :	18	18	18		
Cp/Cv :	1.35	1.35	1.35		
Z :	0.958	0.958	0.958		
F1 :	0.940	0.940	0.940		
Shut Off P.Drop : bar					18.6
Calculated Cv :	62.58	530.9	1189		
Outlet Mach : (IEC)	0.012	0.096	0.187		
Sonic Diameter : in	1.73	4.89	6.82		
Outlet Pipe DN : mm	600	600	600		
Thickness : mm	9.53	9.53	9.53		
Valve SPL : dBA (IEC)	75.5	84.4	84.8		
Lift% : linear	4.6	39.0	87.5		
Signal% : equal %	21.7	75.9	96.2		

PRODUCT TYPE : 41935 LO-DB
 Flow Direction : FTO Trim : -
 Nominal Cv : 1360
 Rating : 300
 Input Size : 16 in Output : 16 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04909-17 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - -
 DATED : 18-04-02

PAGE : V0.017 CALC 1

ITEM : 12017 QTY : 1 ENGINEER : SL
 TAG : 30 LV 20091 REVISION : 3 18-07-02
 MN ITEM : 017 V0

CALCULATION SHEET

FLUID : MP condensate (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	40840	102100	143781		
Inlet Pressure : bar a	16.64	16.46	10.85		19.4
Outlet Pressure : bar a	5.63	6.56	7		
Pressure Drop : bar	11.01	9.9	3.85		
Temperature : °C	201	201	201		330
Vapour Pressure : bar a	15.9	15.9	10.5		
Gf :	0.865	0.865	0.865		
Viscosity : cPo	0.134	0.134	0.134		
Fl :	0.936	0.865	0.743		
Shut Off P.Drop : bar					19.4

Calculated Cv :	33.97	95.55	205.3		
Inlet Velocity : m/s	0.7	1.8	2.5		
Outlet Pipe DN : mm	250	250	250		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	11.3	31.8	68.4		
Signal% : equal %	40.3	70.6	90.5		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 300
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109




UNIT 30

CALCULATION SHEETS
(valves, actuators, safety devices, flow measuring devices)

TECHNIP	
VENDOR DOCUMENT REVIEW	
<input type="checkbox"/>	1 REVISE AND RE-SENT
<input type="checkbox"/>	2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/>	3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
2003.04.08 11:55:03 +01'00'
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STATUS CERTIFIED "FINAL" ISSUED BY : S. LEGE DATE : 04/04/03

2	04/04/03	Up-date		
1	16/12/02	Up-date		
0	27/09/02	FIRST ISSUE		
REV	DATE	DESCRIPTION		
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007		
		EQUIPMENT NAME: Control valves		
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant			
	DOCUMENT TITLE : Calculation sheets	DOCUMENT CODE : A 3102		
	PURCHASE ORDER : 02-4910 (Unit 30)	<table border="1"> <tr> <td> Sheet 01 of 38 </td> <td> Rev 2 </td> </tr> </table>	Sheet 01 of 38	Rev 2
Sheet 01 of 38	Rev 2			

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-01 REVISION : 2
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 19-02-03

PAGE : V0.001 CALC 1

ITEM : 13001 QTY : 1 ENGINEER : SL
 TAG : 30 PV 30002 REVISION : 5 19-02-03
 MN ITEM : 001 V0

CALCULATION SHEET

FLUID : cracked gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	102880	257200	282920		
Inlet Pressure : bar a	3	3.5	3.5		22.7
Outlet Pressure : bar a	1.5	2.5	2.5		
Pressure Drop : bar	1.5	1	1		
Temperature : °C	40	40	40		65
MW :	18.6	18.6	18.6		
Cp/Cv :	1.26	1.26	1.26		
Z :	0.996	0.996	0.996		
Fl :	0.823	0.763	0.740		
Shut Off P.Drop : bar					3.3
Calculated Cv :	3106	7178	8141		
Outlet Mach :	0.225	0.326	0.358		
Sonic Diameter : in	11.20	13.70	14.36		
Outlet Pipe DN : mm	700	700	700		
Schedule :	10.0	10.0	10.0		
Valve SPL : dBA	108.6	119.0	119.8		
Lift% : equal %	54.4	79.2	82.1		
Signal% : equal %	54.4	79.2	82.1		

PRODUCT TYPE : Butterfly
 Flow Direction : - Trim : -
 Nominal Cv : 16500
 Rating : 150
 Input Size : 24 in Output : 24 in
 MN 0109



Flow Control

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CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04910-02 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.002 CALC 1

ITEM : 13002 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30004 REVISION : 3 18-07-02
 MN ITEM : 002 V0

CALCULATION SHEET

FLUID : Light oil (liquid)
 Critical Pressure: bar a 58.8

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	221	552	1840		
Inlet Pressure : bar a	5.59	3.99	3.68		6.1
Outlet Pressure : bar a	1.01	2.15	1.9		
Pressure Drop : bar	4.58	1.84	1.78		
Temperature : °C	23.2	40	40		60
Vapour Pressure : bar a	0.0001	0.0005	0.0005		
Gf :	0.941	0.920	0.920		
Viscosity : cPo	0.88	0.71	0.71		
F1 :	0.983	0.964	0.924		
Shut Off P.Drop : bar					6.1
Calculated Cv :	0.1235	0.4922	1.67		
Inlet Velocity : m/s	0.1	0.3	1.1		
Outlet Pipe DN : mm	50	50	50		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : equal %	17.4	43.7	79.5		
Signal% : equal %	17.4	43.7	79.5		

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : -
 Nominal Cv : 3.8
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04910-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.003 CALC 1

ITEM : 13003 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30022 REVISION : 3 18-07-02
 MN ITEM : 003 V0

CALCULATION SHEET.

FLUID : Hydrocarbons (liquid)
 Critical Pressure: bar a 60.6

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	198	556	612		
Inlet Pressure : bar a	3.24	3.2	3.17		6.1
Outlet Pressure : bar a	1.3	1.3	2.3		
Pressure Drop : bar	1.94	1.9	0.87		
Temperature : °C	24.8	38.9	38.9		60
Vapour Pressure : bar a	0.0002	0.0006	0.0006		
Gf :	0.9345	0.9125	0.9125		
Viscosity : cPo	0.836	0.66	0.66		
Fl :	0.970	0.939	0.922		
Shut Off P.Drop : bar					6.1
Calculated Cv :	0.1706	0.4899	0.7971		
Inlet Velocity : m/s	0.1	0.3	0.4		
Outlet Pipe DN : mm	80	80	80		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : equal %	36.9	67.1	81.0		
Signal% : equal %	36.9	67.1	81.0		

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : -
 Nominal Cv : 1.7
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-04 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.004 CALC 1

ITEM : 13004 QTY : 1 ENGINEER : SL
 TAG : 30 LDV 30024 REVISION : 3 18-07-02
 MN ITEM : 004 V0

CALCULATION SHEET

FLUID : water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	6096	20630	22693		
Inlet Pressure : bar a	2.83	2.83	2.83		6.4
Outlet Pressure : bar a	1.55	1.82	1.89		
Pressure Drop : bar	1.28	1.01	0.94		
Temperature : °C	27.3	40	40		60
Vapour Pressure : bar a	0.04	0.04	0.04		
Gf :	0.997	0.997	0.997		
Viscosity : cPo	0.845	0.652	0.652		
Fl :	0.932	0.805	0.784		
Shut Off P.Drop : bar					5.85
Calculated Cv :	6.265	24.15	27.64		
Inlet Velocity : m/s	0.8	2.8	3.1		
Outlet Pipe DN : mm	80	80	80		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	12.5	48.3	55.3		
Signal% : equal %	42.8	81.7	84.8		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 50
 Rating : 300
 Input Size : 2 in Output : 2 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-05 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.005 CALC 1

ITEM : 13005 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30032 REVISION : 3 18-07-02
 MN ITEM : 005 V0

CALCULATION SHEET

FLUID : water + HC (liquid)
 Critical Pressure: bar a 236.6

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	2465	16490	18139		
Inlet Pressure : bar a	5.17	5.15	5.12		6.4
Outlet Pressure : bar a	3.36	3.4	3.4		
Pressure Drop : bar	1.81	1.75	1.72		
Temperature : °C	24	38.8	38.8		60
Vapour Pressure : bar a	0.03	0.07	0.07		
Gf :	1	0.997	0.997		
Viscosity : cPo	0.91	0.667	0.667		
Fl :	0.940	0.803	0.786		
Shut Off P.Drop : bar					4.8
Calculated Cv :	2.126	14.73	16.42		
Inlet Velocity : m/s	0.6	4.0	4.4		
Outlet Pipe DN : mm	80	80	80		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	7.1	49.1	54.7		
Signal% : equal %	28.8	82.0	84.6		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 30
 Rating : 300
 Input Size : 1.5 in Output : 1.5 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04910-06 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.006 CALC 1

ITEM : 13006 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30042 REVISION : 3 18-07-02
 MN ITEM : 006 V0

CALCULATION SHEET

FLUID : Hydrocarbons (liquid)
 Critical Pressure: bar a 247.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	1788	10630	11693		
Inlet Pressure : bar a	10.07	10	10		12.7
Outlet Pressure : bar a	5.25	5.27	5.27		
Pressure Drop : bar	4.82	4.73	4.73		
Temperature : °C	22.2	35.6	35.6		60
Vapour Pressure : bar a	0.03	0.06	0.06		
Gf :	0.998	0.991	0.991		
Viscosity : cPo	0.95	0.71	0.71		
Fl :	0.936	0.742	0.726		
Shut Off P.Drop : bar					8.8
Calculated Cv :	0.9463	5.844	6.467		
Inlet Velocity : m/s	1	5.9	6.5		
Outlet Pipe DN : mm	80	80	80		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	< 70	73.9	75.9		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	11.3	69.6	77.0		
Signal% : equal %	40.1	90.9	93.1		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 8.4
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-07 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.007 CALC 1

ITEM : 13007 QTY : 1
 TAG : 30 UV 30051

ENGINEER : SL
 REVISION : 4 18-07-02
 MN ITEM : 007 V0

CALCULATION SHEET.

FLUID : cracked gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			10400		
Inlet Pressure : bar a			6.49		21
Outlet Pressure : bar a			1.71		
Pressure Drop : bar			4.78		
Temperature : °C			56		130
MW :			18.63		
Cp/Cv :			1.24		
Z :			0.986		
Fl :			0.880		
Shut Off P.Drop : bar					21
Calculated Cv :			133.8		
Outlet Mach :			0.317		
Sonic Diameter : in			3.38		
Outlet Pipe DN : mm			150		
Schedule :			40.0		
Valve SPL : dBA			104.2		
Lift% : linear			66.9		
Signal% : equal %			90.1		

PRODUCT TYPE : CamFlex
 Flow Direction : FTO Trim : red.
 Nominal Cv : 200
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-08 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.008 CALC 1

ITEM : 13008 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30052 REVISION : 4 18-07-02
 MN ITEM : 008 V0

CALCULATION SHEET

FLUID : Hydrocarbons (liquid)
 Critical Pressure: bar a 277.8

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	1394	6571	7228		
Inlet Pressure : bar a	19.27	19.25	19.22		23
Outlet Pressure : bar a	10.1	10.15	10.16		
Pressure Drop : bar	9.17	9.1	9.06		
Temperature : °C	20.3	30	30		60
Vapour Pressure : bar a	0.025	0.04	0.04		
Gf :	0.981	0.9852	0.9852		
Viscosity : cPo	0.994	0.916	0.916		
Fl :	0.940	0.813	0.799		
Shut Off P.Drop : bar					14.3
Calculated Cv :	0.5392	2.554	2.818		
Inlet Velocity : m/s	0.8	3.7	4.0		
Outlet Pipe DN : mm	50	50	50		
Schedule :	80.0	80.0	80.0		
Sound Level : dBA	< 70	70.4	70.7		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	9.6	45.6	50.3		
Signal% : equal %	35.8	80.5	82.6		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 5.6
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-09 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.009 CALC 1

ITEM : 13009 QTY : 1
 TAG : 30 FV 30071

ENGINEER : SL
 REVISION : 3 18-07-02
 MN ITEM : 009 V0

CALCULATION SHEET.

FLUID : BFW (liquid)
 Critical Pressure: bar a 221.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	1044	2610	2871		
Inlet Pressure : bar a	38.22	37.19	36.93		44
Outlet Pressure : bar a	20.06	20.06	20.06		
Pressure Drop : bar	18.16	17.13	16.87		
Temperature : °C	45	45	45		150
Vapour Pressure : bar a	0.096	0.096	0.096		
Gf :	0.992	0.992	0.992		
Viscosity : cPo	0.6	0.6	0.6		
Fl :	0.956	0.925	0.921		
Shut Off P.Drop : bar					25.3
Calculated Cv :	0.2853	0.7347	0.8144		
Inlet Velocity : m/s	0.6	1.4	1.6		
Outlet Pipe DN : mm	50	50	50		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	70.6	74.2	74.5		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : equal %	51.2	79.0	81.5		
Signal% : equal %	51.2	79.0	81.5		

PRODUCT TYPE : 21125
 Flow Direction : FTO
 Nominal Cv : 1.7
 Rating : 300
 Input Size : 1 in
 MN 0109

Trim : red.

Output : 1 in



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04910-10 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.010 CALC 1

ITEM : 13010 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30071 REVISION : 3 18-07-02
 MN ITEM : 010 V0

CALCULATION SHEET

FLUID : BFW (liquid)
 Critical Pressure: bar a 221.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	1044	2610	2871		
Inlet Pressure : bar a	20.08	20.08	20.08		22.7
Outlet Pressure : bar a	18.63	18.78	18.83		
Pressure Drop : bar	1.45	1.3	1.25		
Temperature : °C	50	50	50		65
Vapour Pressure : bar a	0.123	0.123	0.123		
Gf :	0.992	0.992	0.992		
Viscosity : cPO	0.6	0.6	0.6		
Fl :	0.916	0.807	0.789		
Shut Off P.Drop : bar					3.3
Calculated Cv :	1.01	2.676	3.005		
Inlet Velocity : m/s	0.6	1.4	1.6		
Outlet Pipe DN : mm	50	50	50		
Schedule :	80.0	80.0	80.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	18.0	47.8	53.7		
Signal% : equal %	53.2	81.4	84.1		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 5.6
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-11 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
 DATED : 10-04-02
 DATED : 18-04-02
 PAGE : V0.011 CALC 1

ITEM : 13011 QTY : 1 ENGINEER : SL
 TAG : 30 TV 30071 REVISION : 4 18-07-02
 MN ITEM : 011 V0

CALCULATION SHEET

FLUID : LP steam (steam)
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	582	1456	1602		
Inlet Pressure : bar a	6.22	5.69	5.12		
Outlet Pressure : bar a	4.72	4.69	4.72		
Pressure Drop : bar	1.5	1	0.4		
Temperature : °C	220	220	220		295
Tsh : °C	59.72	63.2	67.24		
MW :	18.03	18.03	18.03		
Cp/Cv :	1.34	1.34	1.34		
Z :	0.97	0.97	0.97		
Fl :	0.921	0.804	0.718		
Shut Off P.Drop : bar					7
Calculated Cv :	11.85	37.71	65.42		
Outlet Mach : (IEC)	0.028	0.071	0.077		
Sonic Diameter : in	0.53	0.84	0.88		
Outlet Pipe DN : mm	100	100	100		
Schedule :	80.0	80.0	80.0		
Valve SPL : dBA (IEC)	< 70	75.9	< 70		
Lift% : linear	14.6	46.6	80.8		
Signal% : equal %	47.2	80.9	94.2		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 81
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-12 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.012 CALC 1

ITEM : 13012 QTY : 1
 TAG : 30 LV 30073

ENGINEER : SL
 REVISION : 4 18-07-02
 MN ITEM : 012 V0

CALCULATION SHEET

FLUID : Caustic sol (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	1332	3330	3663		
Inlet Pressure : bar a	22.6	22.24	22.12		24.35
Outlet Pressure : bar a	19.42	19.46	19.48		
Pressure Drop : bar	3.18	2.78	2.64		
Temperature : °C	50	50	50		65
Vapour Pressure : bar a	0.1	0.1	0.1		
Gf :	1.1	1.1	1.1		
Viscosity : cPo	1	1	1		
F1 :	0.926	0.832	0.816		
Shut Off P.Drop : bar					3.28
Calculated Cv :	0.8264	2.214	2.501		
Inlet Velocity : m/s	0.7	1.7	1.8		
Outlet Pipe DN : mm	50	50	50		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	14.8	39.5	44.7		
Signal% : equal %	47.4	76.3	80.0		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 5.6
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nbr : 2-04910-13 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.013 CALC 1

ITEM : 13013 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30075 REVISION : 5 18-07-02
 MN ITEM : 013 V0

CALCULATION SHEET

FLUID : Caustic solution (liquid)
 Critical Pressure: bar a 221.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	1580	3950	4345		
Inlet Pressure : bar a	19.5	19.5	19.5		21.6
Outlet Pressure : bar a	2.8	2.8	2.9		
Pressure Drop : bar	16.7	16.7	16.6		
Temperature : °C	50	50	50		85
Vapour Pressure : bar a	0.123	0.123	0.123		
Gf :	1.01	1.01	1.01		
Viscosity : cPo	0.6	0.6	0.6		
Fl :	0.950	0.950	0.950		
Shut Off P.Drop : bar					19.5
Calculated Cv :	0.4463	1.116	1.232		
Inlet Velocity : m/s	0.9	2.1	2.4		
Outlet Pipe DN : mm	50	50	50		
Schedule :	80.0	80.0	80.0		
Sound Level : dBA	74.4	78.4	78.6		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	11.2	27.9	30.8		
Signal% : equal %	39.9	66.1	69.3		

PRODUCT TYPE : 21715 ANTICAV
 Flow Direction : FTC Trim : red.
 Nominal Cv : 4
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109



Masoneilan

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-14 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.014 CALC 1

ITEM : 13014 QTY : 1
 TAG : 30 LV 30093

ENGINEER : SL
 REVISION : 3 18-07-02
 MN ITEM : 014 V0

CALCULATION SHEET.

FLUID : water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			1000		
Inlet Pressure : bar a			18.57		26
Outlet Pressure : bar a			10.19		
Pressure Drop : bar			8.38		
Temperature : °C			50		65
Vapour Pressure : bar a			0.12		
Gf :			0.9886		
Viscosity : cPo			0.545		
F1 :			0.946		17.2
Shut Off P.Drop : bar			0.4031		
Calculated Cv :			0.6		
Inlet Velocity : m/s			50		
Outlet Pipe DN : mm			80.0		
Schedule :			< 70		
Sound Level : dBA			subcrit		
Flowing Condition:			61.5		
Lift% : equal %			61.5		
Signal% : equal %					

PRODUCT TYPE : 21125
 Flow Direction : FTO
 Nominal Cv : 1.7
 Rating : 300
 Input Size : 1 in
 MN 0109

Trim : -
 Output : 1 in



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04910-15 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 13015 QTY : 1
 TAG : 30 UV 30101

ENGINEER : SL
 REVISION : 4 18-07-02
 MN ITEM : 015 V0

CALCULATION SHEET.

FLUID	: Cracked gas	(gas)		
SERVICE CONDITIONS			MINIMUM NORMAL	MAXIMUM OTHER DESIGN
Flowrate	: kg/h			5039
Inlet Pressure	: bar a		21.82	36.6
Outlet Pressure	: bar a		1.63	
Pressure Drop	: bar		20.19	
Temperature	: °C		52	130
MW	:		18.7	
Cp/Cv	:		1.4	
Z	:		1	
F1	:		0.912	
Shut Off P.Drop	: bar			36.6
Calculated Cv	:		18.22	
Outlet Mach	:		0.605	
Sonic Diameter	: in		2.33	
Outlet Pipe DN	: mm		100	
Schedule	:		40.0	
Valve SPL	: dBA		103.1	
Lift%	: on/off		0.0	
Signal%	: on/off		0.0	

PRODUCT TYPE : 21105
 Flow Direction : FTO Trim : red.
 Nominal Cv : 31
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109



Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-16 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 13016 QTY : 1
 TAG : 30 LV 30102

ENGINEER : SL
 REVISION : 3 18-07-02
 MN ITEM : 016 V0

CALCULATION SHEET

FLUID	: propylene				(liquid)
Critical Pressure:	bar a	46.2			
SERVICE CONDITIONS					
Flowrate	: kg/h	32438	81097	89207	
Inlet Pressure	: bar a	18.58	18.51	17.18	20.2
Outlet Pressure	: bar a	6.64	6.89	7.19	
Pressure Drop	: bar	11.94	11.62	9.99	
Temperature	: °C	45	45	45	-48.90
Vapour Pressure	: bar a	18.4	18.4	17.18	
Gf	:	0.4697	0.4697	0.4697	
Viscosity	: cPo	0.051	0.051	0.051	
F1	:	0.904	0.748	0.714	14.1
Shut Off P.Drop	: bar				
Calculated Cv	:	29.81	91.66	112.9	
Inlet Velocity	: m/s	2.4	5.9	6.5	
Outlet Pipe DN	: mm	250	250	250	
Schedule	:	20.0	20.0	20.0	
Sound Level	: dBA	no calc	no calc	no calc	
Flowing Condition:	:	flash.	flash.	flash.	
Lift%	: linear	21.6	66.4	81.8	
Signal%	: equal %	58.7	89.9	94.5	

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 138
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04910-17 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.017 CALC 1

ITEM : 13017 QTY : 1
 TAG : 30 LV 30103

ENGINEER : SL
 REVISION : 4 18-07-02
 MN ITEM : 017 V0

CALCULATION SHEET.

FLUID : hydrocarbon (liquid)
 Critical Pressure: bar a 343.3

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM OTHER	DESIGN
Flowrate : kg/h	1214	3901	4291	
Inlet Pressure : bar a	33.5	32.4	32.18	38
Outlet Pressure : bar a	20.31	21.22	21.47	
Pressure Drop : bar	13.19	11.18	10.71	60
Temperature : °C	19	19	19	
Vapour Pressure : bar a	0.02	0.02	0.02	
Gf	0.9765	0.9767	0.9767	
Viscosity : cPo	1.03	1.4	1.4	
Fl	0.969	0.931	0.927	20
Shut Off P.Drop : bar				
Calculated Cv	0.3924	1.37	1.54	
Inlet Velocity : m/s	0.7	2.2	2.4	
Outlet Pipe DN : mm	40	40	40	
Schedule	80.0	80.0	80.0	
Sound Level : dBA	< 70	70.4	70.6	
Flowing Condition:	subcrit	subcrit	subcrit	
Lift% : equal %	37.6	73.7	77.0	
Signal% : equal %	37.6	73.7	77.0	

PRODUCT TYPE : 21125 Trim : red.
 Flow Direction : FTO
 Nominal Cv : 3.8
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109



Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04910-18 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.018 CALC 1

ITEM : 13018 QTY : 1
 TAG : 30 TV 30104

ENGINEER : SL
 REVISION : 4 18-07-02
 MN ITEM : 018 V0

CALCULATION SHEET.

FLUID	: propylene				(gas)
Critical Pressure:	bar a	45.0			
Critical Temp.	: °C	91.9			
SERVICE CONDITIONS		MINIMUM	NORMAL	MAXIMUM	OTHER DESIGN
Flowrate	: kg/h	32438	81097	89207	15
Inlet Pressure	: bar a	6.87	6.7	6.66	
Outlet Pressure	: bar a	6.43	6.5	6.52	
Pressure Drop	: bar	0.44	0.2	0.14	-0.8
Temperature	: °C	6	6	6	
MW	:	42.1	42.1	42.1	
Cp/Cv	:	1.23	1.23	1.23	
Z	:	0.87	0.87	0.87	
F1	:	0.794	0.724	0.681	9.58
Shut Off P.Drop	: bar				
Calculated Cv	:	686.6	2506	3281	
Outlet Mach	: (IEC)	0.042	0.104	0.114	
Sonic Diameter	: in	2.42	3.81	3.99	
Outlet Pipe DN	: mm	400	400	400	
Schedule	:	10.0	10.0	10.0	
Valve SPL	: dBA (IEC)	73.0	< 70	< 70	
Lift%	: equal %	35.2	72.4	80.1	
Signal%	: equal %	35.2	72.4	80.1	
PRODUCT TYPE	: Butterfly		Trim	:	-
Flow Direction	:				
Nominal Cv	: 7300				
Rating	: 300				
Input Size	: 12 in		Output	: 12 in	
MN 0109					

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04910-19 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.019 CALC 1

ITEM : 13019 QTY : 1
 TAG : 30 TV 30107

ENGINEER : SL
 REVISION : 3 18-07-02
 MN ITEM : 019 V0

CALCULATION SHEET

FLUID : quench water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	395	987	1086		12.6
Inlet Pressure : bar a	11.38	9.9	8.63		
Outlet Pressure : bar a	9.38	8.19	6.98		
Pressure Drop : bar	2	1.71	1.65		120
Temperature : °C	63	63	63		
Vapour Pressure : bar a	0.2288	0.2288	0.2288		
Gf :	0.9822	0.9822	0.9822		
Viscosity : cPo	0.446	0.446	0.446		
F1 :	0.973	0.946	0.943		12.6
Shut Off P.Drop : bar					
Calculated Cv :	0.3269	0.8837	0.9899		
Inlet Velocity : m/s	0.2	0.6	0.6		
Outlet Pipe DN : mm	40	40	40		
Schedule :	80.0	80.0	80.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : equal %	33.0	60.9	64.1		
Signal% : equal %	33.0	60.9	64.1		

PRODUCT TYPE : 21125
 Flow Direction : FTO
 Nominal Cv : 3.8
 Rating : 300
 Input Size : 1 in
 MN 0109

Trim : red.

Output : 1 in



CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-20 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 13020 QTY : 1
 TAG : 30 KV 30141

ENGINEER : SL
 REVISION : 3 18-07-02
 MN ITEM : 020 V0

CALCULATION SHEET

FLUID	: cracked gas	(gas)		
SERVICE CONDITIONS		MINIMUM NORMAL	MAXIMUM OTHER	DESIGN
Flowrate	: kg/h		27600	
Inlet Pressure	: bar a		33.4	36.6
Outlet Pressure	: bar a		5	
Pressure Drop	: bar		28.4	
Temperature	: °C		15	60
MW	:		18.6	
Cp/Cv	:		1.4	
Z	:		0.9	
F1	:		0.909	
Shut Off P.Drop	: bar			36.6
Calculated Cv	:		58.58	
Outlet Mach	:		0.544	
Sonic Diameter	: in		2.95	
Outlet Pipe DN	: mm		100	
Schedule	:		40.0	
Valve SPL	: dBA		113.1	
Lift%	: linear		78.1	
Signal%	: linear		78.1	
PRODUCT TYPE	: 41315	Trim	: red.	
Flow Direction	: FTO			
Nominal Cv	: 75			
Rating	: 300	Output	: 4 in	
Input Size	: 4 in			
MN 0109				



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-21 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 13021 QTY : 1 ENGINEER : SL
 TAG : 30 KV 30142 REVISION : 4 18-07-02
 MN ITEM : 021 V0

CALCULATION SHEET

FLUID : cracked gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			22700		
Inlet Pressure : bar a			33.4		36.6
Outlet Pressure : bar a			31.98		
Pressure Drop : bar			1.42		
Temperature : °C			15		60
MW :			18.6		
Cp/Cv :			1.4		
Z :			0.9		
Fl :			0.700		
Shut Off P.Drop : bar					36.6
Calculated Cv :			137.2		
Outlet Mach : (IEC)			0.076		
Sonic Diameter : in			1.09		
Outlet Pipe DN : mm			150		
Schedule :			40.0		
Valve SPL : dBA (IEC)			< 70		
Lift% : linear			99.4		
Signal% : linear			99.4		
P2 Maxi : bar a					32
Full Opening					

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 138
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-22 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 13022 QTY : 1 ENGINEER : SL
 TAG : 30 KV 30143 REVISION : 3 18-07-02
 MN ITEM : 022 V0

CALCULATION SHEET.

FLUID : cracked gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			27600		
Inlet Pressure : bar a			33.4		36.6
Outlet Pressure : bar a			5		
Pressure Drop : bar			28.4		
Temperature : °C			15		60
MW :			18.6		
Cp/Cv :			1.4		
Z :			0.9		
F1 :			0.909		
Shut Off P.Drop : bar					36.6
Calculated Cv :			58.58		
Outlet Mach :			0.544		
Sonic Diameter : in			2.95		
Outlet Pipe DN : mm			100		
Schedule :			40.0		
Valve SPL : dBA			113.1		
Lift% : linear			78.1		
Signal% : linear			78.1		

PRODUCT TYPE : 41315
 Flow Direction : FTO Trim : red.
 Nominal Cv : 75
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-23 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 13023 QTY : 1
 TAG : 30 KV 30144

ENGINEER : SL
 REVISION : 4 18-07-02
 MN ITEM : 023 V0

CALCULATION SHEET

FLUID	:	cracked gas	(gas)		
SERVICE CONDITIONS				MINIMUM	NORMAL
Flowrate	:	kg/h			MAXIMUM
Inlet Pressure	:	bar a			OTHER
Outlet Pressure	:	bar a			DESIGN
Pressure Drop	:	bar			
Temperature	:	°C			
MW	:				
Cp/Cv	:				
Z	:				
F1	:				
Shut Off P.Drop	:	bar			
Calculated Cv	:				
Outlet Mach	:	(IEC)			
Sonic Diameter	:	in			
Outlet Pipe DN	:	mm			
Schedule	:				
Valve SPL	:	dBA (IEC)			
Lift%	:	linear			
Signal%	:	linear			
P2 Maxi	:	bar a			
Full Opening					
PRODUCT TYPE	:	CamFlex			
Flow Direction	:	FTC	Trim	:	red.
Nominal Cv	:	138			
Rating	:	300			
Input Size	:	4 in	Output	:	4 in
MN 0109					

DRESSER

Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-24 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 13024 QTY : 1
 TAG : 30 FV 30151

ENGINEER : SL
 REVISION : 4 18-07-02
 MN ITEM : 024 V0

CALCULATION SHEET

FLUID	: Fuel gas	(gas)	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
SERVICE CONDITIONS					8100		
Flowrate	: kg/h				10.15		11.7
Inlet Pressure	: bar a				5.62		
Outlet Pressure	: bar a				4.53		
Pressure Drop	: bar				41		60
Temperature	: °C				4		
MW	:				1.4		
Cp/Cv	:				1		
Z	:				0.940		
F1	:						11.7
Shut Off P.Drop	: bar						
Calculated Cv	:				140.7		
Outlet Mach	:				0.150		
Sonic Diameter	: in				2.32		
Outlet Pipe DN	: mm				200		
Schedule	:				20.0		
Valve SPL	: dBA				71.7		
Lift%	: linear				72.2		
Signal%	: equal %				91.7		

PRODUCT TYPE : 41335 LO-DB Trim : red.
 Flow Direction : FTO
 Nominal Cv : 195
 Rating : 300 Output : 6 in
 Input Size : 6 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-25 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 13025 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30151 REVISION : 3 18-07-02
 MN ITEM : 025 V0

CALCULATION SHEET.

FLUID : water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	237	592	1200		
Inlet Pressure : bar a	4.5	4.49	4.47		5.8
Outlet Pressure : bar a	3.24	3.26	3.25		
Pressure Drop : bar	1.26	1.23	1.22		
Temperature : °C	45	45	45		60
Vapour Pressure : bar a	0.1	0.1	0.1		
Gf	0.990	0.990	0.990		
Viscosity : cPo	0.6	0.6	0.6		
F1	0.977	0.957	0.934		4.95
Shut Off P.Drop : bar					
Calculated Cv :	0.2462	0.6224	1.267		
Inlet Velocity : m/s	0.1	0.3	0.7		
Outlet Pipe DN : mm	40	40	40		
Schedule :	80.0	80.0	80.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : equal %	27.1	50.6	71.7		
Signal% : equal %	27.1	50.6	71.7		

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : -
 Nominal Cv : 3.8
 Rating : 150
 Input Size : 1 in Output : 1 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-26 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.026 CALC 1

ITEM : 13026 QTY : 1 ENGINEER : SL
 TAG : 30 FV 30152 REVISION : 4 18-07-02
 MN ITEM : 026 V0

CALCULATION SHEET.

FLUID : Fuel gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			2500		
Inlet Pressure : bar a			10.15		11.3
Outlet Pressure : bar a			5.62		
Pressure Drop : bar			4.53		
Temperature : °C			41		60
MW :			4		
Cp/Cv :			1.4		
Z :			1		
F1 :			0.950		
Shut Off P.Drop : bar					11.3
Calculated Cv :			43.39		
Outlet Mach :			0.185		
Sonic Diameter : in			1.29		
Outlet Pipe DN : mm			150		
Schedule :			40.0		
Valve SPL : dBA			70.7		
Lift% : linear			57.9		
Signal% : equal %			86.0		

PRODUCT TYPE : 21715 LO-DB
 Flow Direction : FTO Trim : full
 Nominal Cv : 75
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04910-27 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.027 CALC 1

ITEM : 13027 QTY : 1
 TAG : 30 LV 30153

ENGINEER : SL
 REVISION : 4 18-07-02
 MN ITEM : 027 V0

CALCULATION SHEET.

FLUID : HP condensate (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		7415	8157		
Inlet Pressure : bar a		38.32	33.79		47.22
Outlet Pressure : bar a		12.35	13.69		
Pressure Drop : bar		25.97	20.1		
Temperature : °C		245.1	245.1		425
Vapour Pressure : bar a		33.79	33.79		
Gf :		0.802	0.802		
Viscosity : cPo		0.1	0.1		
Fl :		0.946	0.933		
Shut Off P.Drop : bar					42.5
Calculated Cv :		3.28	5.044		
Inlet Velocity : m/s		1.3	1.4		
Outlet Pipe DN : mm		80	80		
Schedule :		40.0	40.0		
Sound Level : dBA		no calc	no calc		
Flowing Condition:		flash.	flash.		
Lift% : equal %		59.2	71.9		
Signal% : equal %		59.2	71.9		

PRODUCT TYPE : 21125
 Flow Direction : FTO
 Nominal Cv : 15
 Rating : 600
 Input Size : 2 in
 MN 0109

Trim : -
 Output : 2 in



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04910-28 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.028 CALC 1

ITEM : 13028 QTY : 1 ENGINEER : SL
 TAG : 30 PV 30153 REVISION : 4 18-07-02
 MN ITEM : 028 V0

CALCULATION SHEET

FLUID : unreferenced gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	10760	14760	23500		
Inlet Pressure : bar a	11.9	10.8	9.6		11.3
Outlet Pressure : bar a	4	4.1	4		
Pressure Drop : bar	7.9	6.7	5.6		
Temperature : °C	41	41	41		60
MW :	3.96	3.96	3.96		
Cp/Cv :	1.4	1.4	1.4		
Z :	1	1	1		
Fl :	0.975	0.975	0.975		
Shut Off P.Drop : bar					11.3
Calculated Cv :	144.1	219.7	397.4		
Outlet Mach : (IEC)	0.199	0.203	0.220		
Sonic Diameter : in	5.26	5.33	5.54		
Outlet Pipe DN : mm	450	450	450		
Schedule :	10.0	10.0	10.0		
Valve SPL : dBA (IEC)	< 70	< 70	71.3		
Lift% : linear	24.0	36.6	66.2		
Signal% : equal %	61.8	74.1	89.8		

PRODUCT TYPE : 41355 LO-DB
 Flow Direction : FTO Trim : full
 Nominal Cv : 600
 Rating : 300
 Input Size : 12 in Output : 12 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-29 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.029 CALC 1

ITEM : 13029 QTY : 1 ENGINEER : SL
 TAG : 30 TV 30154 REVISION : 4 18-07-02
 MN ITEM : 029 V0

CALCULATION SHEET

FLUID : Fuel gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			2500		
Inlet Pressure : bar a			9.63		11.3
Outlet Pressure : bar a			5.69		
Pressure Drop : bar			3.94		
Temperature : °C			230		245
MW :			4		
Cp/Cv :			1.4		
Z :			1		
Fl :			0.950		
Shut Off P.Drop : bar					11.3

Calculated Cv :	60.09
Outlet Mach :	0.231
Sonic Diameter : in	1.44
Outlet Pipe DN : mm	150
Schedule :	40.0
Valve SPL : dBA	73.0
Lift% : linear	80.1
Signal% : equal %	94.0

PRODUCT TYPE : 21715 LO-DB
 Flow Direction : FTO Trim : full
 Nominal Cv : 75
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-30 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.030 CALC 1

ITEM : 13030 QTY : 1 ENGINEER : SL
 TAG : 30 TV 30155 REVISION : 3 18-07-02
 MN ITEM : 030 V0

CALCULATION SHEET

FLUID	: Fuel gas	(gas)		
SERVICE CONDITIONS		MINIMUM	NORMAL	MAXIMUM OTHER DESIGN
Flowrate	: kg/h		6000	8100
Inlet Pressure	: bar a		9.6	9.63 11.3
Outlet Pressure	: bar a		5.7	5.69
Pressure Drop	: bar		3.9	3.94
Temperature	: °C		230	230 245
MW	:		4	4
Cp/Cv	:		1.4	1.4
Z	:		1	1
F1	:		0.940	0.940
Shut Off P.Drop	: bar			11.3
Calculated Cv	:		146	196.1
Outlet Mach	:		0.139	0.187
Sonic Diameter	: in		2.23	2.60
Outlet Pipe DN	: mm		250	250
Schedule	:		20.0	20.0
Valve SPL	: dBA		73.2	74.6
Lift%	: linear		48.7	65.4
Signal%	: equal %		81.8	89.4

PRODUCT TYPE : 41935 LO-DB
 Flow Direction : FTO Trim : full
 Nominal Cv : 300
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-31 REVISION : 1
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 12-12-02

PAGE : V0.031 CALC 1

ITEM : 13031 QTY : 1

ENGINEER : SL

TAG : 30 FV 30161

REVISION : 7 04-09-02

MN ITEM : 031 V0

CALCULATION SHEET

FLUID : Fuel gas (gas)

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	120	200	300		
Inlet Pressure : bar a	3.93	3.55	3.46		5.5
Outlet Pressure : bar a	1.17	1.3	1.43		
Pressure Drop : bar	2.76	2.25	2.03		
Temperature : °C	45	45	45		85
MW :	4	4	4		
Cp/Cv :	1.2	1.2	1.2		
Z :	0.9	0.9	0.9		
Fl :	0.914	0.843	0.762		
Shut Off P.Drop : bar					5.2
Calculated Cv :	5.465	10.88	18.43		
Outlet Mach :	0.176	0.264	0.360		
Sonic Diameter : in	0.63	0.77	0.90		
Outlet Pipe DN : mm	50	50	50		
Schedule :	40.0	40.0	40.0		
Valve SPL : dBA	72.6	73.9	75.2		
Lift% : linear	18.2	36.3	61.4		
Signal% : equal %	53.5	73.9	87.6		

PRODUCT TYPE : CamFlex

Flow Direction : FTC

Trim : full

Nominal Cv : 30

Rating : 300

Input Size : 1.5 in

Output : 1.5 in

MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04910-32 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.032 CALC 1

ITEM : 13032 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30161 REVISION : 4 18-07-02
 MN ITEM : 032 V0

CALCULATION SHEET

FLUID : Caustic solution (liquid)
 Critical Pressure: bar a 221.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	1580	3950	4345		
Inlet Pressure : bar a	3.01	2.73	2.47		3.5
Outlet Pressure : bar a	1.02	1.56	1.59		
Pressure Drop : bar	1.99	1.17	0.88		
Temperature : °C	50	50	50		65
Vapour Pressure : bar a	0.1	0.1	0.1		
Gf :	1.01	1.01	1.01		
Viscosity : cPo	0.6	0.6	0.6		
Fl :	0.924	0.798	0.756		
Shut Off P.Drop : bar					3.48
Calculated Cv :	1.294	4.255	5.428		
Inlet Velocity : m/s	0.9	2.1	2.4		
Outlet Pipe DN : mm	50	50	50		
Schedule :	80.0	80.0	80.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	15.4	50.6	64.6		
Signal% : equal %	48.8	82.7	89.1		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 8.4
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-33 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.033 CALC 1

ITEM : 13033 QTY : 1 ENGINEER : SL
 TAG : 30 PV 30162 REVISION : 3 18-07-02
 MN ITEM : 033 V0

CALCULATION SHEET

FLUID : Cracked gas/nitrogen (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	120	300	350		
Inlet Pressure : bar a	2.72	2.3	2.01		3.5
Outlet Pressure : bar a	1.29	1.78	1.9		
Pressure Drop : bar	1.43	0.52	0.11		
Temperature : °C	50	50	50		65
MW :	24	24	24		
Cp/Cv :	1.32	1.32	1.32		
Z :	0.998	0.998	0.998		
Fl :	0.940	0.898	0.768		
Shut Off P.Drop : bar					3.5
Calculated Cv :	3.139	12.03	29.96		
Outlet Mach : (IEC)	0.038	0.069	0.076		
Sonic Diameter : in	0.39	0.52	0.54		
Outlet Pipe DN : mm	50	50	50		
Schedule :	80.0	80.0	80.0		
Valve SPL : dBA (IEC)	< 70	< 70	< 70		
Lift% : linear	6.3	24.1	59.9		
Signal% : equal %	26.5	61.8	86.9		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 50
 Rating : 300
 Input Size : 2 in Output : 2 in
 MN 0109



Flow Control

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CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nbr : 2-04910-34 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.034 CALC 1

ITEM : 13034 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30164 REVISION : 4 18-07-02
 MN ITEM : 034 V0

CALCULATION SHEET.

FLUID : water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	2412	6030	6700		
Inlet Pressure : bar a	5.26	4.56	4.39		4.6
Outlet Pressure : bar a	3.1	3.63	3.76		
Pressure Drop : bar	2.16	0.93	0.63		
Temperature : °C	66.2	66.2	66.2		85
Vapour Pressure : bar a	0.2642	0.2642	0.2642		
Gf :	0.9804	0.9804	0.9804		
Viscosity : cPo	0.4	0.4	0.4		
F1 :	0.929	0.789	0.731		
Shut Off P.Drop : bar					2.6
Calculated Cv :	1.926	7.547	10.49		
Inlet Velocity : m/s	1.3	3.4	3.7		
Outlet Pipe DN : mm	50	50	50		
Schedule :	80.0	80.0	80.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	13.8	53.9	74.9		
Signal% : equal %	45.3	84.2	92.5		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 14
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-35 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.035 CALC 1

ITEM : 13035 QTY : 1 ENGINEER : SL
 TAG : 30 FV 30171 REVISION : 4 18-07-02
 MN ITEM : 035 V0

CALCULATION SHEET

FLUID : Spent caustic (liquid)
 Critical Pressure: bar a 221.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	2400	6000	6700		
Inlet Pressure : bar a	5.3	3.79	3.19		4.6
Outlet Pressure : bar a	1.98	2.7	2.89		
Pressure Drop : bar	3.32	1.09	0.3		
Temperature : °C	50	50	50		65
Vapour Pressure : bar a	0.125	0.125	0.125		
Gf :	1.010	1.010	1.010		
Viscosity : cPo	0.6	0.6	0.6		
Fl :	0.940	0.846	0.723		
Shut Off P.Drop : bar					2.5
Calculated Cv :	1.52	6.639	14.17		
Inlet Velocity : m/s	0.6	1.4	1.6		
Outlet Pipe DN : mm	50	50	50		
Schedule :	80.0	80.0	80.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	8.4	36.9	78.7		
Signal% : equal %	32.6	74.3	93.6		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 18
 Rating : 150
 Input Size : 1.5 in Output : 1.5 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-37 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 04-09-02

PAGE : V0.037 CALC 1

ITEM : 13037 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30701B REVISION : 5 04-09-02
 MN ITEM : 037 V0

CALCULATION SHEET

FLUID : TC (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	41680	104200	116380		
Inlet Pressure : bar a	7	7	7		8
Outlet Pressure : bar a	3.5	3.5	3.5		
Pressure Drop : bar	3.5	3.5	3.5		
Temperature : °C	54	54	54		70
Vapour Pressure : bar a	0.15	0.15	0.15		
Gf :	0.986	0.986	0.986		
Viscosity : cPo	0.512	0.512	0.512		
Fl :	0.932	0.880	0.874		
Shut Off P.Drop : bar					8
Calculated Cv :	26.15	67.21	75.74		
Inlet Velocity : m/s	2.6	6.4	7.2		
Outlet Pipe DN : mm	250	250	250		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	72.3	76.4	76.9		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	19.4	49.8	56.1		
Signal% : equal %	55.3	82.3	85.2		

PRODUCT TYPE : CamFlex
 Flow Direction : FTO Trim : full
 Nominal Cv : 135
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04910-38 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 04-09-02

PAGE : V0.038 CALC 1

ITEM : 13036 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30701A REVISION : 6 04-09-02
 MN ITEM : 038 V0

CALCULATION SHEET

FLUID : TC (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	77900	104200	149000		
Inlet Pressure : bar a	7.9	7.7	7.5		10
Outlet Pressure : bar a	7	7	7		
Pressure Drop : bar	0.9	0.7	0.5		
Temperature : °C	54	54	54		70
Vapour Pressure : bar a	0.15	0.15	0.15		
Gf :	0.986	0.986	0.986		
Viscosity : cPo	0.51	0.51	0.51		
F1 :	0.870	0.805	0.716		
Shut Off P.Drop : bar					10
Calculated Cv :	95.93	145.5	246.2		
Inlet Velocity : m/s	1.2	1.6	2.3		
Outlet Pipe DN : mm	150	150	150		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	< 70	< 70	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	32.0	48.5	82.1		
Signal% : equal %	70.7	81.8	94.6		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 300
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

UNIT 40

11



CALCULATION SHEETS

(valves, actuators, safety devices, flow measuring devices)

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
2002.12.20 09:46:29 +01'00'
<none>

STATUS CERTIFIED "FINAL"
ISSUED BY : S. LEGE
DATE : 16/12/02

1	16/12/02	Up-date		
0	27/09/02	FIRST ISSUE		
REV	DATE	DESCRIPTION		
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY	TP REQUISITION NUMBER -- 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007		
		EQUIPMENT NAME:		
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	Control valves		
DRESSER Flow Control	DOCUMENT TITLE : Calculation sheets	DOCUMENT CODE : A 3102		
	PURCHASE ORDER : 02-4911 (Unit 40)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Sheet 01 of 49</td> <td style="width: 50%; text-align: center;">Rev. 1</td> </tr> </table>	Sheet 01 of 49	Rev. 1
Sheet 01 of 49	Rev. 1			

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-01 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40 -
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.001 CALC 1

ITEM : 14001 QTY : 1 ENGINEER : SL
 TAG : 30 HV 40033 REVISION : 2 18-07-02
 MN ITEM : 001 V0

CALCULATION SHEET

FLUID : unreferenced gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM OTHER	DESIGN
Flowrate : kg/h		21360		
Inlet Pressure : bar a		11.95		36.6
Outlet Pressure : bar a		11		
Pressure Drop : bar		0.9516		
Temperature : °C		40		60
MW :		4		
Cp/Cv :		1.4		
Z :		1		
F1 :		0.900		
Shut Off P.Drop : bar				36.6
Cv :		640		
Outlet Mach : (IEC)		0.113		
Sonic Diameter : in		2.69		
Outlet Pipe DN : mm		350		
Schedule :		10.0		
Valve SPL : dBA (IEC)		89.8		
Lift% : linear		100.0		
Signal% : equal %		100.0		

PRODUCT TYPE : 41315
 Flow Direction : - Trim : -
 Nominal Cv : 640
 Rating : 300
 Input Size : 8 in Output : 8 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-02 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40 -
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.002 CALC 1

ITEM : 14002 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40051 REVISION : 4 18-07-02
 MN ITEM : 002 V0

CALCULATION SHEET

FLUID : HC (liquid)
 Critical Pressure: bar a 48.7

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM OTHER	DESIGN
Flowrate : kg/h	33390	83470	91820	
Inlet Pressure : bar a	33.8	32.1	30.5	36.8
Outlet Pressure : bar a	11.4	11.6	11.7	
Pressure Drop : bar	22.4	20.5	18.8	
Temperature : °C	-36	-36	-36	-135.60
Vapour Pressure : bar a	33.6	32	30.4	
Gf :	0.4734	0.4734	0.4734	
Viscosity : cPo	0.083	0.083	0.083	
Fl :	0.932	0.912	0.908	
Shut Off P.Drop : bar				36.8
Calculated Cv :	19.75	52.74	60.52	
Inlet Velocity : m/s	2.4	6.0	6.6	
Outlet Pipe DN : mm	200	200	200	
Thickness : mm	3.76	3.76	3.76	
Sound Level : dBA	no calc	no calc	no calc	
Flowing Condition:	flash.	flash.	flash.	
Lift% : linear	26.3	70.3	80.7	
Signal% : equal %	64.4	91.1	94.2	

PRODUCT TYPE : 41515
 Flow Direction : FTO Trim : full
 Nominal Cv : 75
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04911-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.003 CALC 1

ITEM : 14003 QTY : 1 ENGINEER : SL
 TAG : 30 TV 40053 REVISION : 3 18-07-02
 MN ITEM : 003 V0

CALCULATION SHEET

FLUID : cracked gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	8440	21100	23210		
Inlet Pressure : bar a	31.85	31.85	31.85		36.6
Outlet Pressure : bar a	31.8	31.65	31.61		
Pressure Drop : bar	0.05	0.2	0.24		
Temperature : °C	-36.1	-36.1	-36.1		-48.60
MW :	16	16	16		
Cp/Cv :	1.25	1.25	1.25		
Z :	0.87	0.87	0.87		
F1 :	0.825	0.817	0.816		
Calculated Cv :	253.6	318	319.5		
Outlet Mach : (IEC)	0.013	0.033	0.036		
Sonic Diameter : in	0.68	1.07	1.12		
Outlet Pipe DN : mm	150	150	150		
Schedule :	40.0	40.0	40.0		
Valve SPL : dBA (IEC)	7.0	32.2	35.6		
Lift% : linear	62.6	78.5	78.9		
Signal% : equal %	88.2	93.6	93.7		

PRODUCT TYPE : VARIMAX
 Flow Direction : FTC Trim : -
 Nominal Cv : 405
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01.0 10007
 SERIAL N^o : 2-04911-04 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.004 CALC 1

ITEM : 14004 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40053 REVISION : 4 18-07-02
 MN ITEM : 004 V0

CALCULATION SHEET

FLUID : HC (liquid)
 Critical Pressure: bar a 48.8

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	50480	126200	138820		
Inlet Pressure : bar a	33.6	31.9	30.2		36.9
Outlet Pressure : bar a	11.9	12.1	12.2		
Pressure Drop : bar	21.7	19.8	18		
Temperature : °C	-69	-69	-69		-135.60
Vapour Pressure : bar a	33.3	31.7	30.1		
Gf :	0.498	0.498	0.498		
Viscosity : cPo	0.1	0.1	0.1		
F1 :	0.935	0.920	0.916		
Shut Off P.Drop : bar					36.9
Calculated Cv :	29.05	76.96	88.72		
Inlet Velocity : m/s	1.5	3.9	4.2		
Outlet Pipe DN : mm	200	200	200		
Thickness : mm	3.76	3.76	3.76		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : equal %	57.4	84.7	88.5		
Signal% : equal %	57.4	84.7	88.5		

PRODUCT TYPE : 41525
 Flow Direction : - Trim : -
 Nominal Cv : 140
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-05 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.005 CALC 1

ITEM : 14005 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40061 REVISION : 4 18-07-02
 MN ITEM : 005 V0

CALCULATION SHEET

FLUID : HC (liquid)
 Critical Pressure: bar a 48.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	11240	28100	30910		
Inlet Pressure : bar a	33.3	31.6	30		36.8
Outlet Pressure : bar a	12	12.3	12.4		
Pressure Drop : bar	21.3	19.3	17.6		
Temperature : °C	-95	-95	-95		
Vapour Pressure : bar a	33.1	31.5	29.9		-135.60
GF :	0.5254	0.5254	0.5254		
Viscosity : cPo	0.13	0.13	0.13		
Fl :	0.948	0.916	0.911		
Shut Off P.Drop : bar					36.8
Calculated Cv :	6.271	16.92	19.42		
Inlet Velocity : m/s	1.3	3.3	3.6		
Outlet Pipe DN : mm	100	100	100		
Thickness : mm	3.05	3.05	3.05		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	20.2	54.6	62.6		
Signal% : equal %	56.6	84.5	88.2		

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : red.
 Nominal Cv : 31
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-06 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.006 CALC 1

ITEM : 14006 QTY : 1

ENGINEER : SL

TAG : 30 PV 40061 C

REVISION : 4 18-07-02

MN ITEM : 006 V0

CALCULATION SHEET.

FLUID : HC

(gas)

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	8550	21360	23496		
Inlet Pressure : bar a	32.5	31	29.5		36.6
Outlet Pressure : bar a	11.5	12	12.1		
Pressure Drop : bar	21	19	17.4		
Temperature : °C	-104.3	-104.3	-104.3		-135.60
MW :	4	4	4		
Cp/Cv :	1.4	1.4	1.4		
Z :	1	1	1		
F1 :	0.940	0.940	0.940		
Shut Off P.Drop : bar					36.6
Calculated Cv :	31.78	83.7	97.23		
Outlet Mach :	0.057	0.136	0.148		
Sonic Diameter : in	1.43	2.21	2.31		
Outlet Pipe DN : mm	350	350	350		
Thickness : mm	9.53	9.53	9.53		
Valve SPL : dBA	76.0	78.6	78.0		
Lift% : linear	25.4	67.0	77.8		
Signal% : equal %	63.4	90.1	93.3		

PRODUCT TYPE : 41435 LO-DB

Flow Direction : FTO

Trim : red.

Nominal Cv : 125

Rating : 300

Input Size : 6 in

Output : 6 in

MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-07 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.007 CALC 1

ITEM : 14007 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40063 REVISION : 5 18-07-02
 MN ITEM : 007 V0

CALCULATION SHEET

FLUID : HC (liquid)
 Critical Pressure: bar a 48.7

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	3310	8270	9100		
Inlet Pressure : bar a	33	31.4	29.8		36.8
Outlet Pressure : bar a	12	12.5	12.6		
Pressure Drop : bar	21	18.9	17.2		
Temperature : °C	-115	-115	-115		-135.60
Vapour Pressure : bar a	32.9	31.3	29.7		
Gf :	0.5362	0.5362	0.5362		
Viscosity : cPo	0.15	0.15	0.15		
Fl :	0.964	0.934	0.929		
Shut Off P.Drop : bar					36.8
Calculated Cv :	1.814	4.849	5.568		
Inlet Velocity : m/s	0.8	2.1	2.3		
Outlet Pipe DN : mm	80	80	80		
Thickness : mm	3.05	3.05	3.05		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : equal %	41.9	71.0	74.5		
Signal% : equal %	41.9	71.0	74.5		

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : -
 Nominal Cv : 15
 Rating : 300
 Input Size : 2 in Output : 2 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-08 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.008 CALC 1

ITEM : 14008 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40065 REVISION : 4 18-07-02
 MN ITEM : 008 V0

CALCULATION SHEET

FLUID : HC (liquid)
 Critical Pressure: bar a 47.8

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	1550	3870	4260		
Inlet Pressure : bar a	32.8	31.2	29.6		36.8
Outlet Pressure : bar a	12	12.6	12.8		
Pressure Drop : bar	20.8	18.6	16.8		
Temperature : °C	-135	-135	-135		
Vapour Pressure : bar a	32.7	31.1	29.5		-152.60
GF :	0.5113	0.5113	0.5113		
Viscosity : cPo	0.15	0.15	0.15		
Fl :	0.945	0.911	0.907		
Shut Off P.Drop : bar					36.8
Calculated Cv :	0.8883	2.383	2.734		
Inlet Velocity : m/s	0.4	1.0	1.1		
Outlet Pipe DN : mm	50	50	50		
Thickness : mm	2.77	2.77	2.77		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	23.4	62.7	71.9		
Signal% : equal %	61.1	88.2	91.6		

PRODUCT TYPE : 21115
 Flow Direction : FTO Trim : -
 Nominal Cv : 3.8
 Rating : 300
 Input Size : 2 in Output : 2 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-09 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.009 CALC 1

ITEM : 14009 QTY : 1 ENGINEER : SL
 TAG : 30 PV 40071 REVISION : 4 18-07-02
 MN ITEM : 009 V0

CALCULATION SHEET

FLUID	: HC				(gas)
SERVICE CONDITIONS					
Flowrate	: kg/h	MINIMUM	NORMAL	MAXIMUM	OTHER DESIGN
Inlet Pressure	: bar a	11160	27900	30690	
Outlet Pressure	: bar a	13	11	11	13.5
Pressure Drop	: bar	9.9	10.7	10.8	
Temperature	: °C	3.1	0.3	0.2	
MW	:	-71	-71	-71	-135.60
Cp/Cv	:	19.4	19.4	19.4	
Z	:	1.26	1.26	1.26	
F1	:	0.89	0.89	0.89	
Shut Off P.Drop	: bar	0.891	0.819	0.809	
					13.5
Calculated Cv	:	67.09	513.9	688.2	
Outlet Mach	: (IEC)	0.026	0.060	0.066	
Sonic Diameter	: in	1.27	1.94	2.02	
Outlet Pipe DN	: mm	250	250	250	
Thickness	: mm	4.19	4.19	4.19	
Valve SPL	: dBA (IEC)	82.2	< 70	< 70	
Lift%	: linear	7.5	57.7	77.3	
Signal%	: equal %	30.1	86.0	93.2	

PRODUCT TYPE : VARIMAX
 Flow Direction : FTC Trim : -
 Nominal Cv : 890
 Rating : 300
 Input Size : 8 in Output : 8 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-10 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.010 CALC 1

ITEM : 14010 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40071 A REVISION : 3 18-07-02
 MN ITEM : 010 V0

CALCULATION SHEET

FLUID : HC (liquid)
 Critical Pressure: bar a 49.7

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	89220	223020	245330		
Inlet Pressure : bar a	30.4	28.4	27.7		30.7
Outlet Pressure : bar a	23.4	25.3	27		
Pressure Drop : bar	7	3.1	0.7		
Temperature : °C	-41	-41	-41		-52.60
Vapour Pressure : bar a	11.4	11.4	11.4		
Gf	0.4826	0.4826	0.4826		
Viscosity : cPo	0.09	0.09	0.09		
F1	0.899	0.850	0.821		
Shut Off P.Drop : bar					30.7
Calculated Cv :	56.31	211.8	493.1		
Inlet Velocity : m/s	1.6	4.0	4.4		
Outlet Pipe DN : mm	250	250	250		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	81.6	80.3	71.0		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	9.1	34.2	79.5		
Signal% : equal %	34.3	72.3	93.9		

PRODUCT TYPE : VARIMAX
 Flow Direction : FTC Trim : -
 Nominal Cv : 620
 Rating : 300
 Input Size : 8 in Output : 8 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-11 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.011 CALC 1

ITEM : 14011 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40071 B REVISION : 3 18-07-02
 MN ITEM : 011 V0

CALCULATION SHEET.

FLUID : HC (liquid)
 Critical Pressure: bar a 49.7

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM OTHER	DESIGN
Flowrate : kg/h		81770		
Inlet Pressure : bar a		30.2		30.7
Outlet Pressure : bar a		14		
Pressure Drop : bar		16.2		
Temperature : °C		-41		-102.60
Vapour Pressure : bar a		11.4		
Gf :		0.4826		
Viscosity : cPo		0.09		
Fl :		0.975		
Shut Off P.Drop : bar				18.9
Calculated Cv :		33.97		
Inlet Velocity : m/s		5.8		
Outlet Pipe DN : mm		150		
Thickness : mm		3.40		
Sound Level : dBA		85.7		
Flowing Condition:		subcrit		
Lift% : linear		64.1		
Signal% : linear		64.1		

PRODUCT TYPE : 41355 ANTICAV
 Flow Direction : FTO Trim : red.
 Nominal Cv : 53
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-12 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.012 CALC 1

ITEM : 14012 QTY : 1 ENGINEER : SL
 TAG : 30 PV 40073 REVISION : 5 18-07-02
 MN ITEM : 012 V0

CALCULATION SHEET

FLUID : DC1 OVHD (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			2800		
Inlet Pressure : bar a			13.8		13.5
Outlet Pressure : bar a			2.5		
Pressure Drop : bar			11.3		
Temperature : °C			-66		-135.60
MW :			19.4		
Cp/Cv :			1.25		
Z :			0.87		
F1 :			0.975		
Shut Off P.Drop : bar					13.5
Calculated Cv :			11.59		
Outlet Mach :			0.382		
Sonic Diameter : in			1.24		
Outlet Pipe DN : mm			80		
Thickness : mm			3.05		
Valve SPL : dBA			78.2		
Lift% : linear			55.2		
Signal% : equal %			84.8		

PRODUCT TYPE : 21914
 Flow Direction : FTO Trim : full
 Nominal Cv : 21
 Rating : 300
 Input Size : 2 in Output : 2 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-13 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.013 CALC 1

ITEM : 14013 QTY : 1

ENGINEER : SL

TAG : 30 TV 40075A

REVISION : 5 18-07-02

MN ITEM : 013 V0

CALCULATION SHEET

FLUID : cracked gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			81600		
Inlet Pressure : bar a			32.5		36.6
Outlet Pressure : bar a			32.45		
Pressure Drop : bar			0.05		
Temperature : °C			14.5		-48.60
MW :			18.6		
Cp/Cv :			1.23		
Z :			0.9		
F1 :			0.681		
Calculated Cv :			2715		
Outlet Mach : (IEC)			0.032		
Sonic Diameter : in			2.11		
Outlet Pipe DN : mm			350		
Thickness : mm			9.53		
Valve SPL : dBA (IEC)			< 70		
Lift% : equal %			84.0		
Signal% : equal %			84.0		

PRODUCT TYPE : Butterfly

Flow Direction : -

Trim

Nominal Cv : 5090

Rating : 300

Input Size : 12 in

Output

: 12 in

MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-14 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.014 CALC 1

ITEM : 14014 QTY : 1 ENGINEER : SL
 TAG : 30 TV 40075B REVISION : 3 18-07-02
 MN ITEM : 014 V0

CALCULATION SHEET

FLUID : cracked gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			27200		
Inlet Pressure : bar a			32.3		36.6
Outlet Pressure : bar a			32.06		
Pressure Drop : bar			0.24		
Temperature : °C			-28.3		-48.60
MW :			17.6		
Cp/Cv :			1.24		
Z :			0.86		
Fl :			0.812		
Calculated Cv :			368.2		
Outlet Mach : (IEC)			0.041		
Sonic Diameter : in			1.19		
Outlet Pipe DN : mm			200		
Schedule :			20.0		
Valve SPL : dBA (IEC)			< 70		
Lift% : linear			80.1		
Signal% : equal %			94.0		

PRODUCT TYPE : VARIMAX
 Flow Direction : FTC Trim : -
 Nominal Cv : 460
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-15 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.015 CALC 1

ITEM : 14015 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40093 REVISION : 4 18-07-02
 MN ITEM : 015 V0

CALCULATION SHEET

FLUID : propylene (liquid)
 Critical Pressure: bar a 46.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	4980	12450	13690		
Inlet Pressure : bar a	6.7	6.1	5.5		16.1
Outlet Pressure : bar a	3.4	4.2	4.4		
Pressure Drop : bar	3.3	1.9	1.1		
Temperature : °C	1.8	1.8	1.8		-48.60
Vapour Pressure : bar a	6.7	6.1	5.5		
Gf :	0.5425	0.5425	0.5425		
Viscosity : cPo	0.09	0.09	0.09		
F1 :	0.922	0.800	0.766		
Shut Off P.Drop : bar					13
Calculated Cv :	8.59	26.43	32.6		
Inlet Velocity : m/s	0.6	1.4	1.5		
Outlet Pipe DN : mm	150	150	150		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	15.9	48.9	60.4		
Signal% : equal %	49.8	82.0	87.1		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 54
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04911-16 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.016 CALC 1

ITEM : 14016 QTY : 1

ENGINEER : SL

TAG : 30 PV 40102

REVISION : 5 18-07-02

MN ITEM : 016 V0

CALCULATION SHEET

FLUID : C2 CUT

(gas)

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	85000	212500	233750		
Inlet Pressure : bar a	22	22	22		25.3
Outlet Pressure : bar a	21.2	21.3	21.8		
Pressure Drop : bar	0.8	0.7	0.2		
Temperature : °C	-16	-16	-16		-54.60
MW :	28.9	28.9	28.9		
Cp/Cv :	1.12	1.12	1.12		
Z :	0.7	0.7	0.7		
F1 :	0.794	0.779	0.698		
Shut Off P.Drop : bar					25.3
Calculated Cv :	654.7	1743	3515		
Outlet Mach : (IEC)	0.030	0.074	0.080		
Sonic Diameter : in	2.38	3.75	3.89		
Outlet Pipe DN : mm	450	450	450		
Schedule :	30.0	30.0	30.0		
Valve SPL : dBA (IEC)	< 70	73.6	< 70		
Lift% : equal %	33.4	61.0	81.1		
Signal% : equal %	33.4	61.0	81.1		

PRODUCT TYPE : Butterfly

Flow Direction : -

Trim

Nominal Cv : 7470

Rating : 300

Input Size : 14 in

Output

: 14 in

MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-19 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.019 CALC 1

ITEM : 14019 QTY : 1
 TAG : 30 FV 40108

ENGINEER : SL
 REVISION : 3 18-07-02
 MN ITEM : 019 V0

CALCULATION SHEET

FLUID : HC (liquid)
 Critical Pressure: bar a 45.3

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	4280	10690	11760		
Inlet Pressure : bar a	26.1	23.9	22.3		26.4
Outlet Pressure : bar a	15.5	16.5	16.8		
Pressure Drop : bar	10.6	7.4	5.5		
Temperature : °C	44.7	44.7	44.7		60
Vapour Pressure : bar a	14	14	14		
Gf :	0.595	0.595	0.595		
Viscosity : cPo	0.124	0.124	0.124		
Fl :	0.960	0.923	0.913		
Shut Off P.Drop : bar					26.4
Calculated Cv :	1.978	5.926	7.575		
Inlet Velocity : m/s	1.8	4.4	4.8		
Outlet Pipe DN : mm	80	80	80		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	72.5	74.2	72.7		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	15.2	45.6	58.3		
Signal% : equal %	48.4	80.4	86.2		

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : -
 Nominal Cv : 13
 Rating : 300
 Input Size : 1.5 in Output : 1.5 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-18 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.018 CALC 1

ITEM : 14018 QTY : 1 ENGINEER : SL
 TAG : 30 TV 40104 REVISION : 3 18-07-02
 MN ITEM : 018 V0

CALCULATION SHEET

FLUID : LP steam (steam)
 Critical Pressure: bar a 221.2
 Critical Temp. : °C -374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	8880	22190	24410		
Inlet Pressure : bar a	6.5	5.6	5		17.3
Outlet Pressure : bar a	3.5	3.6	3.7		
Pressure Drop : bar	3	2	1.3		
Temperature : °C	163	220	279		295
Tsh : °C	0.9711	63.81	127.1		
MW :	18.03	18.03	18.03		
Cp/Cv :	1.3	1.3	1.3		
Z :	0.9721	0.983	0.989		
Fl :	0.810	0.806	0.800		
Shut Off P.Drop : bar					7
Calculated Cv :	146.9	471.5	667.3		
Outlet Mach : (IEC)	0.046	0.123	0.150		
Sonic Diameter : in	2.11	3.45	3.81		
Outlet Pipe DN : mm	300	300	300		
Schedule :	20.0	20.0	20.0		
Valve SPL : dBA (IEC)	79.0	81.7	79.7		
Lift% : linear	19.7	63.3	89.6		
Signal% : equal %	55.8	88.5	96.9		

PRODUCT TYPE : VARIMAX LO-DB
 Flow Direction : - Trim : -
 Nominal Cv : 745
 Rating : 300
 Input Size : 10 in Output : 10 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-17 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40

DATED : 10-04-02

DATED : 18-04-02

PAGE : V0.017 CALC 1

ITEM : 14017 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40103 REVISION : 3 18-07-02
 MN ITEM : 017 V0

CALCULATION SHEET

FLUID : LP condensate (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	8880	22190	24410		
Inlet Pressure : bar a	4	3.5	3.1		17.3
Outlet Pressure : bar a	3.8	1.5	1.5		
Pressure Drop : bar	0.2	2	1.6		
Temperature : °C	138	138	138		295
Vapour Pressure : bar a	3.8	3.4	3.1		
Gf :	0.927	0.927	0.927		
Viscosity : cPo	0.2	0.2	0.2		
Fl :	0.918	0.829	0.771		
Shut Off P.Drop : bar					7
Calculated Cv :	23.95	54.47	80.82		
Inlet Velocity : m/s	0.3	0.8	0.9		
Outlet Pipe DN : mm	200	200	200		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	17.4	39.5	58.6		
Signal% : equal %	52.1	76.2	86.3		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 138
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-20 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.020 CALC 1

ITEM : 14020 QTY : 1

ENGINEER : SL

TAG : 30 PV 40121

REVISION : 5 18-07-02

MN ITEM : 020 V0

CALCULATION SHEET.

FLUID : C2 CUT (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	7310		127480		
Inlet Pressure : bar a	22		20.9		25.3
Outlet Pressure : bar a	2.5		2.5		
Pressure Drop : bar	19.5		18.4		
Temperature : °C	-16		-16		-104.60
MW :	28.9		28.9		
Cp/Cv :	1.12		1.12		
Z :	0.7		0.7		
F1 :	0.975		0.975		
Shut Off P.Drop : bar					25.3
Calculated Cv :	16.27		298.7		
Outlet Mach :	0.024		0.417		
Sonic Diameter : in	1.86		7.75		
Outlet Pipe DN : mm	350		350		
Thickness : mm	4.78		4.78		
Valve SPL : dBA	81.7		94.6		
Lift% : linear	4.8		87.9		
Signal% : equal %	22.2		96.4		

PRODUCT TYPE : 41355 LO-DB

Flow Direction : FTO

Trim : -

Nominal Cv : 340

Rating : 300

Input Size : 12 in

Output : 12 in

MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-21 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.021 CALC 1

ITEM : 14021 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40121 REVISION : 3 18-07-02
 MN ITEM : 021 V0

CALCULATION SHEET

FLUID : propylene (liquid)
 Critical Pressure: bar a 46.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	24270	60660	72800		
Inlet Pressure : bar a	4.7	3.8	3.2		15.6
Outlet Pressure : bar a	1.8	1.8	1.8		
Pressure Drop : bar	2.9	2	1.4		
Temperature : °C	-18	-18	-18		-48.60
Vapour Pressure : bar a	3.5	3.2	2.9		
Gf :	0.5724	0.5724	0.5724		
Viscosity : cPo	0.12	0.12	0.12		
Fl :	0.938	0.835	0.758		
Shut Off P.Drop : bar					14.9
Calculated Cv :	31.27	113.9	188.7		
Inlet Velocity : m/s	0.6	1.6	1.9		
Outlet Pipe DN : mm	250	250	250		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	10.4	38.0	62.9		
Signal% : equal %	37.9	75.1	88.3		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 300
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-22 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.022 CALC 1

ITEM : 14022 QTY : 1

ENGINEER : SL

TAG : 30 FV 40121

REVISION : 3 18-07-02

MN ITEM : 022 V0

CALCULATION SHEET

FLUID : C2 CUT (liquid)
 Critical Pressure: bar a 49.6

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	12530	31320	37590		
Inlet Pressure : bar a	27.1	26.4	26.1		30
Outlet Pressure : bar a	25.3	25.5	25.6		
Pressure Drop : bar	1.8	0.9	0.5		
Temperature : °C	-16.3	-16.3	-16.3		-102.60
Vapour Pressure : bar a	22.1	22.1	22.1		
Gf	0.4256	0.4256	0.4256		
Viscosity : cPo	0.06	0.06	0.06		
F1	0.953	0.886	0.869		
Shut Off P.Drop : bar					5
Calculated Cv	16.61	58.93	95.51		
Inlet Velocity : m/s	1.8	4.5	5.4		
Outlet Pipe DN : mm	100	100	100		
Schedule	40.0	40.0	40.0		
Sound Level : dBA	65.3	64.8	61.8		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	12.3	43.7	70.7		
Signal% : equal %	42.3	79.3	91.2		

PRODUCT TYPE : CamFlex
 Flow Direction : FTO Trim : full
 Nominal Cv : 135
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04911-23 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.023 CALC 1

ITEM : 14023 QTY : 1

ENGINEER : SL

TAG : 30 FV 40132

REVISION : 4 18-07-02

MN ITEM : 023 V0

CALCULATION SHEET

FLUID : hydrogen (gas)
 Critical Pressure: bar a 13.0
 Critical Temp. : °C -239.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	30	114	160		
Inlet Pressure : bar a	31.3	28.5	28.5		36.6
Outlet Pressure : bar a	23.3	23.5	24.8		
Pressure Drop : bar	8	5	3.7		
Temperature : °C	40	40	40		60
MW :	2	2	2		
Cp/Cv :	1.4	1.4	1.4		
Z :	1	1	1		
F1 :	0.975	0.931	0.914		
Shut Off P.Drop : bar					36.6
Calculated Cv :	0.2817	1.378	2.203		
Outlet Mach : (IEC)	0.007	0.026	0.035		
Sonic Diameter : in	0.08	0.16	0.18		
Outlet Pipe DN : mm	40	40	40		
Schedule :	80.0	80.0	80.0		
Valve SPL : dBA (IEC)	< 70	< 70	< 70		
Lift% : equal %	29.8	73.9	86.1		
Signal% : equal %	29.8	73.9	86.1		

PRODUCT TYPE : 21125

Flow Direction : FTO

Trim

Nominal Cv : 3.8

Rating : 300

Input Size : 1 in

Output

: 1 in

MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-24 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.024 CALC 1

ITEM : 14024 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40135 REVISION : 2 18-07-02
 MN ITEM : 024 V0

CALCULATION SHEET

FLUID : nitrogen (gas)
 Critical Pressure: bar a 33.9
 Critical Temp. : °C -147.0

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	14800	14800	14800		
Inlet Pressure : bar a	8.2	7.4	6.6		11.7
Outlet Pressure : bar a	1.5	1.6	1.6		
Pressure Drop : bar	6.7	5.8	5		
Temperature : °C	151	151	151		170
MW :	28	28	28		
Cp/Cv :	1.38	1.38	1.38		
Z :	1	1	1		
F1 :	0.975	0.975	0.975		
Shut Off P.Drop : bar					11.7
Calculated Cv :	126.6	140.3	157.3		
Outlet Mach :	0.454	0.426	0.426		
Sonic Diameter : in	4.04	3.91	3.91		
Outlet Pipe DN : mm	200	200	200		
Schedule :	20.0	20.0	20.0		
Valve SPL : dBA	79.5	78.8	78.4		
Lift% : linear	66.6	73.8	82.8		
Signal% : equal %	90.0	92.2	94.8		

PRODUCT TYPE : 41004 LO-DB
 Flow Direction : - Trim : -
 Nominal Cv : 190
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01.0 10007
 SERIAL N^o : 2-04911-25 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 14025 QTY : 1 ENGINEER : SL
 TAG : 30 UV 40136 REVISION : 5 18-07-02
 MN ITEM : 025 V0

CALCULATION SHEET

FLUID : HC (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			8660		
Inlet Pressure : bar a			23.3		25.3
Outlet Pressure : bar a			1.5		
Pressure Drop : bar			21.8		
Temperature : °C			180		
MW :			28.88		
C _p /C _v :			1.14		
Z :			0.958		
F ₁ :			0.911		
Shut Off P.Drop : bar					25.3
Calculated Cv :			30.27		
Outlet Mach :			0.655		
Sonic Diameter : in			3.24		
Outlet Pipe DN : mm			150		
Schedule :			40.0		
Valve SPL : dBA			106.2		
Lift% : on/off			0.0		
Signal% : on/off			0.0		

PRODUCT TYPE : 21105
 Flow Direction : FTO Trim : red.
 Nominal Cv : 49
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04911-26 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 14026 QTY : 1 ENGINEER : SL
 TAG : 30 PV 40136 REVISION : 2 18-07-02
 MN ITEM : 026 V0

CALCULATION SHRET

FLUID : hydrogen (gas)
 Critical Pressure: bar a 13.0
 Critical Temp. : °C -239.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	60	140	160		
Inlet Pressure : bar a	32.4	29.9	29.8		36.6
Outlet Pressure : bar a	29.5	29.6	29.6		
Pressure Drop : bar	2.9	0.3	0.2		
Temperature : °C	40	40	40		60
MW :	2	2	2		
Cp/Cv :	1.4	1.4	1.4		
Z :	1	1	1		
F1 :	0.940	0.799	0.739		
Shut Off P.Drop : bar					36.6
Calculated Cv :	0.9642	7.039	9.856		
Outlet Mach : (IEC)	0.011	0.026	0.030		
Sonic Diameter : in	0.10	0.16	0.17		
Outlet Pipe DN : mm	80	80	80		
Schedule :	40.0	40.0	40.0		
Valve SPL : dBA (IEC)	< 70	< 70	< 70		
Lift% : linear	6.9	50.3	70.4		
Signal% : equal %	28.3	82.6	91.1		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 14
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-27 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 14027 QTY : 1

ENGINEER : SL

TAG : 30 FV 40137

REVISION : 4 18-07-02

MN ITEM : 027 V0

CALCULATION SHEET

FLUID : Fuel gas (gas)

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		121900			
Inlet Pressure : bar a		22.3			25.3
Outlet Pressure : bar a		4.2			
Pressure Drop : bar		18.1			
Temperature : °C		48			70
MW :		28.9			
Cp/Cv :		1.12			
Z :		0.7			
F1 :		0.975			
Shut Off P.Drop : bar					25.3
Calculated Cv :		303.3			
Outlet Mach :		0.382			
Sonic Diameter : in		6.18			
Outlet Pipe DN : mm		350			
Schedule :		10.0			
Valve SPL : dBA		85.0			
Lift% : linear		72.2			
Signal% : equal %		91.7			

PRODUCT TYPE : 41355 LO-DB

Flow Direction : FTO

Trim : full

Nominal Cv : 420

Rating : 300

Input Size : 10 in

Output : 10 in

MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-28 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 14028 QTY : 1 ENGINEER : SL
 TAG : 30 TV 40137 REVISION : 5 18-07-02
 MN ITEM : 028 V0

CALCULATION SHEET

FLUID : LC (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		5732	8025		
Inlet Pressure : bar a		5	5		17.1
Outlet Pressure : bar a		1.7	2.2		
Pressure Drop : bar		3.3	2.8		
Temperature : °C		151	151		220
Vapour Pressure : bar a		4.906	4.906		
Gf :		0.915	0.915		
Viscosity : cPo		0.18	0.18		
Fl :		0.827	0.763		
Shut Off P.Drop : bar					17.1
Calculated Cv :		12	18.26		
Inlet Velocity : m/s		0.9	1.2		
Outlet Pipe DN : mm		100	100		
Schedule :		40.0	40.0		
Sound Level : dBA		no calc	no calc		
Flowing Condition:		flash.	flash.		
Lift% : linear		40.0	60.9		
Signal% : equal %		76.6	87.4		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 30
 Rating : 300
 Input Size : 2 in Output : 2 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-29 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.029 CALC 1

ITEM : 14029 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40138 REVISION : 4 18-07-02
 MN ITEM : 029 V0

CALCULATION SHEET

FLUID	: HC	(gas)		
SERVICE CONDITIONS		MINIMUM	NORMAL	MAXIMUM OTHER DESIGN
Flowrate	: kg/h	10	20	
Inlet Pressure	: bar a	30.6	30.6	36.6
Outlet Pressure	: bar a	30.1	30.1	
Pressure Drop	: bar	0.5	0.5	
Temperature	: °C	40	40	60
MW	:	4	4	
Cp/Cv	:	1.4	1.4	
Z	:	1	1	
Fl	:	0.962	0.940	
Shut Off P.Drop	: bar			36.6
Calculated Cv	:	0.2403	0.4808	
Outlet Mach	: (IEC)	0.001	0.003	
Sonic Diameter	: in	0.04	0.05	
Outlet Pipe DN	: mm	25	25	
Schedule	:	80.0	80.0	
Valve SPL	: dBA (IEC)	< 70	< 70	
Lift%	: equal %	46.1	66.5	
Signal%	: equal %	46.1	66.5	

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : -
 Nominal Cv : 1.7
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-30 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 14030 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40139 REVISION : 4 18-07-02
 MN ITEM : 030 V0

CALCULATION SHEET

FLUID : quench water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	59050	431500	474650		
Inlet Pressure : bar a	11.35	9.38	7.74		12.8
Outlet Pressure : bar a	9.36	8.62	7.24		
Pressure Drop : bar	1.99	0.76	0.5		
Temperature : °C	40	65	65		120
Vapour Pressure : bar a	0.0738	0.2504	0.2504		
Gf :	0.9928	0.9811	0.9811		
Viscosity : cPo	0.653	0.653	0.653		
F1 :	0.903	0.814	0.805		
Shut Off P.Drop : bar					7.4
Calculated Cv :	48.74	585.5	801		
Inlet Velocity : m/s	0.5	3.8	4.1		
Outlet Pipe DN : mm	250	250	250		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	70.1	72.5	70.2		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	5.1	61.6	84.3		
Signal% : equal %	23.2	87.7	95.3		

PRODUCT TYPE : VARIMAX
 Flow Direction : FTC Trim : -
 Nominal Cv : 950
 Rating : 300
 Input Size : 8 in Output : 8 in
 MN 0109



CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-31 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 14031 QTY : 1 ENGINEER : SL
 TAG : 30 TV 40139 REVISION : 3 18-07-02
 MN ITEM : 031 V0

CALCULATION SHEET

FLUID : MP condensate (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM OTHER	DESIGN
Flowrate : kg/h	360	893	982	
Inlet Pressure : bar a	17.2	13.6	12.7	18.6
Outlet Pressure : bar a	6.1	6.5	6.6	
Pressure Drop : bar	11.1	7.1	6.1	
Temperature : °C	194	194	194	330
Vapour Pressure : bar a	17.2	13.6	12.7	
Gf	0.8835	0.8835	0.8835	
Viscosity : cPo	0.14	0.14	0.14	
Fl	0.950	0.913	0.909	
Shut Off P.Drop : bar				18.6
Calculated Cv	0.3283	0.9901	1.144	
Inlet Velocity : m/s	0.2	0.6	0.6	
Outlet Pipe DN : mm	50	50	50	
Schedule	40.0	40.0	40.0	
Sound Level : dBA	no calc	no calc	no calc	
Flowing Condition:	flash.	flash.	flash.	
Lift% : linear	19.3	58.2	67.3	
Signal% : equal %	55.2	86.2	90.2	

PRODUCT TYPE : 21000
 Flow Direction : FTO Trim : -
 Nominal Cv : 1.7
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-32 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.032 CALC 1

ITEM : 14032 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40151 REVISION : 4 18-07-02
 MN ITEM : 032 V0

CALCULATION SHEET

FLUID : LP steam (steam)
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	2300		5385		
Inlet Pressure : bar a	6.3		5.3		7
Outlet Pressure : bar a	1.6		2.4		
Pressure Drop : bar	4.7		2.9		
Temperature : °C	161		279		295
Tsh : °C	0.2105		124.9		
MW :	18.03		18.03		
Cp/Cv :	1.27		1.27		
Z :	0.9727		0.9883		
F1 :	0.940		0.940		
Shut Off P.Drop : bar					7
Calculated Cv :	35.66		114.5		
Outlet Mach : (IEC)	0.179		0.314		
Sonic Diameter : in	1.67		2.21		
Outlet Pipe DN : mm	250		250		
Schedule :	20.0		20.0		
Valve SPL : dBA (IEC)	79.2		78.9		
Lift% : linear	23.8		76.3		
Signal% : equal %	61.5		92.9		

PRODUCT TYPE : 41935 LO-DB
 Flow Direction : FTO Trim : full
 Nominal Cv : 150
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-33 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.033 CALC 1

ITEM : 14033 QTY : 1 ENGINEER : SL
 TAG : 30 TV 40158 REVISION : 3 18-07-02
 MN ITEM : 033 V0

CALCULATION SHEET

FLUID : VH steam (steam)
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			5385		
Inlet Pressure : bar a			98.4		120
Outlet Pressure : bar a			8.195		
Pressure Drop : bar			90.205		
Temperature : °C			510		530
Tsh : °C			200		
MW :			18.03		
Cp/Cv :			1.22		
Z :			0.9		
F1 :			0.975		
Shut Off P.Drop : bar					120
Calculated Cv :			6.492		
Outlet Mach :			0.224		
Sonic Diameter : in			1.36		
Outlet Pipe DN : mm			250		
Thickniess : mm			31.75		
Valve SPL : dBA			< 70		
Lift% : linear			54.1		
Signal% : equal %			84.3		

PRODUCT TYPE : 41555 LO-DB
 Flow Direction : FTO Trim : red.
 Nominal Cv : 12
 Rating : 2500
 Input Size : 4 in Output : 4 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-33 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V1.033 CALC 1

ITEM : 14033 QTY : 1 ENGINEER : SL
 TAG : 30 TV 40158 REVISION : 3 18-07-02
 MN ITEM : 033 V1

CALCULATION SHEET

FLUID : VH steam (steam)
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			5385		
Inlet Pressure : bar a			8.195		120
Outlet Pressure : bar a			2.4		
Pressure Drop : bar			5.795		
Temperature : °C			510		530
Tsh : °C			355.2		
MW :			18.03		
Cp/Cv :			1.22		
Z :			0.9		
F1 :			0.800		
Shut Off P.Drop : bar					120
Cv :			95		
Outlet Mach :			0.766		
Sonic Diameter : in			2.52		
Outlet Pipe DN : mm			250		
Thickness : mm			31.75		
Valve SPL : dBA			81.9		
Lift% : linear			100.0		
Signal% : equal %			100.0		

PRODUCT TYPE : MULTIHOLE PLATE
 Flow Direction : - Trim : -
 Nominal Cv : 95
 Rating : 2500
 Input Size : 4 in Output : 4 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-34 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.034 CALC 1

ITEM : 14034 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40171 REVISION : 5 18-07-02
 MN ITEM : 034 V0

CALCULATION SHEET

FLUID : ethylene
 Critical Pressure: bar a

(liquid)

50.3

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	10940	27340	30080		
Inlet Pressure : bar a	13.4	11.7	10.4		13
Outlet Pressure : bar a	4.8	4.9	4.9		
Pressure Drop : bar	8.6	6.8	5.5		
Temperature : °C	-48	-48	-48		-104.60
Vapour Pressure : bar a	12.4	11.3	10.2		
Gf :	0.478	0.478	0.478		
Viscosity : cPo	0.08	0.08	0.08		
Fl :	0.929	0.809	0.769		
Shut Off P.Drop : bar					9.2
Calculated Cv :	11.02	37.15	48.07		
Inlet Velocity : m/s	1.4	3.5	3.8		
Outlet Pipe DN : mm	150	150	150		
Thickness : mm	3.40	3.40	3.40		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	13.6	45.9	59.3		
Signal% : equal %	45.0	80.6	86.7		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC
 Nominal Cv : 81
 Rating : 300
 Input Size : 3 in
 MN 0109

Trim : red.

Output : 3 in

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04911-35 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.035 CALC 1

ITEM : 14035 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40181 REVISION : 3 18-07-02
 MN ITEM : 035 V0

CALCULATION SHEET

FLUID : propylene (liquid)
 Critical Pressure: bar a 46.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	157840	394600	434060		
Inlet Pressure : bar a	6.8	6	5.5		16.1
Outlet Pressure : bar a	3.6	4.3	4.5		
Pressure Drop : bar	3.2	1.7	1		
Temperature : °C	1.9	1.9	1.9		60
Vapour Pressure : bar a	6.7	6	5.5		
Gf :	0.543	0.543	0.543		
Viscosity : cPo	0.09	0.09	0.09		
F1 :	0.871	0.833	0.828		
Shut Off P.Drop : bar					10
Calculated Cv :	274.6	820.1	967.4		
Inlet Velocity : m/s	1.1	2.8	3.0		
Outlet Pipe DN : mm	450	450	450		
Schedule :	10.0	10.0	10.0		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	21.8	65.1	76.8		
Signal% : equal %	59.1	89.3	93.0		

PRODUCT TYPE : VARIMAX
 Flow Direction : FTC Trim : -
 Nominal Cv : 1260
 Rating : 300
 Input Size : 12 in Output : 12 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-36 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.036 CALC 1

ITEM : 14036 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40181 REVISION : 3 18-07-02
 MN ITEM : 036 V0

CALCULATION SHEET

FLUID : HC (liquid)
 Critical Pressure: bar a 48.8

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	34030	85070	93580		
Inlet Pressure : bar a	22.9	21.4	19.9		22.5
Outlet Pressure : bar a	8.4	9	9.2		
Pressure Drop : bar	14.5	12.4	10.7		
Temperature : °C	-5	-5	-5		-54.60
Vapour Pressure : bar a	22.7	21.2	19.7		
Gf	0.4144	0.4144	0.4144		
Viscosity : cPo	0.07	0.07	0.07		
F1	0.927	0.821	0.796		
Shut Off P.Drop : bar					22.5

Calculated Cv :	28.37	83.96	100.1		
Inlet Velocity : m/s	1.3	3.1	3.4		
Outlet Pipe DN : mm	200	200	200		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	14.2	42.0	50.0		
Signal% : equal %	46.2	78.1	82.5		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 200
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-37 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.037 CALC 1

ITEM : 14037 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40182A REVISION : 4 18-07-02
 MN ITEM : 037 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.32

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	50505	126263	138889		
Inlet Pressure : bar a	22.89	21.01	19.41		22.9
Outlet Pressure : bar a	11.31	11.37	11.38		
Pressure Drop : bar	11.58	9.64	8.03		
Temperature : °C	-28.3	-28.3	-28.3		-104.60
Vapour Pressure : bar a	20.33	20.33	19.41		
Gf :	0.4357	0.4357	0.4357		
Viscosity : cPo	0.063	0.063	0.063		
Fl :	0.937	0.923	0.918		
Shut Off P.Drop : bar					11.6
Calculated Cv :	35.83	106.8	131.3		
Inlet Velocity : m/s	1.8	4.4	4.9		
Outlet Pipe DN : mm	250	250	250		
Thickness : mm	4.19	4.19	4.19		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : equal %	49.8	81.3	86.2		
Signal% : equal %	49.8	81.3	86.2		

PRODUCT TYPE : 41325
 Flow Direction : FTO Trim : full
 Nominal Cv : 225
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-38 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.038 CALC 1

ITEM : 14038 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40182 B REVISION : 2 18-07-02
 MN ITEM : 038 V0

CALCULATION SHEET

FLUID : Off spec C2 (liquid)
 Critical Pressure: bar a 50.3

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		50589	126472		
Inlet Pressure : bar a		22	22		24.1
Outlet Pressure : bar a		18.65	18.65		
Pressure Drop : bar		3.35	3.35		
Temperature : °C		-28.3	-28.3		-54.60
Vapour Pressure : bar a		20.3	20.3		
Gf :	0.4358		0.4358		
Viscosity : cPo		0.06	0.06		
F1 :	0.919		0.828		
Shut Off P.Drop : bar					24.1
Calculated Cv :		48.6	121.9		
Inlet Velocity : m/s		1.8	4.4		
Outlet Pipe DN : mm		250	250		
Schedule :		20.0	20.0		
Sound Level : dBA		no calc	no calc		
Flowing Condition:		flash.	flash.		
Lift% : linear		16.2	40.6		
Signal% : equal %		50.3	77.1		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 300
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04911-39 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.039 CALC 1

ITEM : 14039 QTY : 1 ENGINEER : SL
 TAG : 30 PV 40184 REVISION : 3 18-07-02
 MN ITEM : 039 V0

CALCULATION SHEET

FLUID	: HC	(gas)		
SERVICE CONDITIONS		MINIMUM	NORMAL	MAXIMUM OTHER DESIGN
Flowrate	: kg/h	20727	75840	
Inlet Pressure	: bar a	20.3	19.3	21.3
Outlet Pressure	: bar a	2.5	2.5	
Pressure Drop	: bar	17.8	16.8	
Temperature	: °C	-29	-27	-104.60
MW	:	28	28	
C _p /C _v	:	1.14	1.14	
Z	:	0.72	0.72	
F1	:	0.975	0.975	
Shut Off P.Drop	: bar			21.3
Calculated Cv	:	50.2	194	
Outlet Mach	: (IEC)	0.237	0.433	
Sonic Diameter	: in	3.83	5.18	
Outlet Pipe DN	: mm	300	300	
Thickness	: mm	4.57	4.57	
Valve SPL	: dBA (IEC)	73.6	91.1	
Lift%	: linear	16.7	64.7	
Signal%	: equal %	51.1	89.1	

PRODUCT TYPE : 41355 LO-DB
 Flow Direction : FTO Trim : red.
 Nominal Cv : 300
 Rating : 300
 Input Size : 8 in Output : 8 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-40 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.040 CALC 1

ITEM : 14040 QTY : 1 ENGINEER : SL
 TAG : 30 PV 40201 REVISION : 4 18-07-02
 MN ITEM : 040 V0

CALCULATION SHEET

FLUID : propylene (liquid)
 Critical Pressure: bar a 46.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	213270	532920	639500		
Inlet Pressure : bar a	4.7	3.7	3.2		15.6
Outlet Pressure : bar a	1.7	1.7	1.8		
Pressure Drop : bar	3	2	1.4		
Temperature : °C	-18	-18	-18		-48.60
Vapour Pressure : bar a	3.5	3.2	2.9		
Gf	0.572	0.572	0.572		
Viscosity : cPo	0.11	0.11	0.11		
F1	0.869	0.824	0.811		
Shut Off P.Drop : bar					14.9
Calculated Cv	297.4	1092	1608		
Inlet Velocity : m/s	1.4	3.5	4.3		
Outlet Pipe DN : mm	600	600	600		
Schedule	10.0	10.0	10.0		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	13.9	51.0	75.1		
Signal% : equal %	45.6	82.9	92.5		

PRODUCT TYPE : VARIMAX
 Flow Direction : FTC Trim : -
 Nominal Cv : 2140
 Rating : 150
 Input Size : 12 in Output : 12 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-41 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.041 CALC 1

ITEM : 14041 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40207 REVISION : 3 18-07-02
 MN ITEM : 041 V0

CALCULATION SHEET

FLUID : HC (liquid)
 Critical Pressure: bar a 50.27

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	65940	164830	181320		
Inlet Pressure : bar a	20.2	20.2	20.2		21.8
Outlet Pressure : bar a	19.9	19.95	20		
Pressure Drop : bar	0.3	0.25	0.2		
Temperature : °C	-30.8	-30.8	-30.8		-104.60
Vapour Pressure : bar a	20	20	20		
GF :	0.440	0.440	0.440		
Viscosity : cPo	0.07	0.07	0.07		
Fl :	0.921	0.817	0.786		
Shut Off P.Drop : bar					1
Calculated Cv :	210.5	576.5	709		
Inlet Velocity : m/s	0.8	2.1	2.3		
Outlet Pipe DN : mm	250	250	250		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	16.2	44.3	54.5		
Signal% : equal %	50.3	79.8	84.5		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 1300
 Rating : 300
 Input Size : 10 in Output : 10 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-42 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.042 CALC 1

ITEM : 14042 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40211 A REVISION : 5 18-07-02
 MN ITEM : 042 V0

CALCULATION SHEET

FLUID : HC (liquid)
 Critical Pressure: bar a 50.3

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	275960	689900	827880		
Inlet Pressure : bar a	25.1	24.4	24.1		26.7
Outlet Pressure : bar a	23.1	23.2	23.3		
Pressure Drop : bar	2	1.2	0.8		
Temperature : °C	-31	-31	-31		-104.60
Vapour Pressure : bar a	19.9	19.9	19.9		
Gf :	0.440	0.440	0.440		
Viscosity : cPo	0.06	0.06	0.06		
F1 :	0.909	0.849	0.818		
Shut Off P.Drop : bar					5
Calculated Cv :	341.6	1113	1657		
Inlet Velocity : m/s	2.4	6.0	7.2		
Outlet Pipe DN : mm	400	400	400		
Thickness : mm	9.53	9.53	9.53		
Sound Level : dBA	72.5	73.2	71.4		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	15.3	49.8	74.1		
Signal% : equal %	48.5	82.3	92.2		

PRODUCT TYPE : VARIMAX
 Flow Direction : FTO Trim : -
 Nominal Cv : 2235
 Rating : 300
 Input Size : 12 in Output : 12 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-43 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

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ITEM : 14043 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40211 B REVISION : 3 18-07-02
 MN ITEM : 043 V0

CALCULATION SHEET

FLUID : HC (liquid)
 Critical Pressure: bar a 50.3

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM OTHER
Flowrate : kg/h		389400	
Inlet Pressure : bar a		25.4	
Outlet Pressure : bar a		20.4	
Pressure Drop : bar		5	
Temperature : °C		-31	
Vapour Pressure : bar a		19.9	
Gf :		0.44	
Viscosity : cPo		0.06	
Fl :		0.880	
Calculated Cv :		305.4	
Inlet Velocity : m/s		7.6	
Outlet Pipe DN : mm		250	
Schedule :		20.0	
Sound Level : dBA		86.0	
Flowing Condition:		subcrit	
Lift% : linear		89.8	
Signal% : linear		89.8	

PRODUCT TYPE : CamFlex
 Flow Direction : FTO Trim : red.
 Nominal Cv : 340
 Rating : 300
 Input Size : 8 in Output : 8 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-44 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.044 CALC 1

ITEM : 14044 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40212 REVISION : 4 18-07-02
 MN ITEM : 044 V0

CALCULATION SHEET

FLUID	: HC	(gas)			
SERVICE CONDITIONS		MINIMUM	NORMAL	MAXIMUM	OTHER DESIGN
Flowrate	: kg/h	400	1000	1100	
Inlet Pressure	: bar a	21.3	19.4	19.3	21.3
Outlet Pressure	: bar a	11.9	14.2	16.7	
Pressure Drop	: bar	9.4	5.2	2.6	
Temperature	: °C	-31	-31	-31	-104.60
MW	:	27.3	27.3	27.3	
Cp/Cv	:	1.15	1.15	1.15	
Z	:	0.74	0.74	0.74	
F1	:	0.955	0.917	0.905	
Shut Off P.Drop	: bar				21.3
Calculated Cv	:	1.012	3.223	4.616	
Outlet Mach	: (IEC)	0.048	0.101	0.094	
Sonic Diameter	: in	0.22	0.31	0.30	
Outlet Pipe DN	: mm	40	40	40	
Schedule	:	40.0	40.0	40.0	
Valve SPL	: dBA (IEC)	< 70	73.3	< 70	
Lift%	: linear	16.9	53.7	76.9	
Signal%	: equal %	51.4	84.1	93.1	

PRODUCT TYPE : 21124
 Flow Direction : FTO Trim : red.
 Nominal Cv : 6
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-45 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.045 CALC 1

ITEM : 14045 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40222 REVISION : 4 18-07-02
 MN ITEM : 045 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.3

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	16030	40070	44070		
Inlet Pressure : bar a	31.4	28.3	26.4		36.513
Outlet Pressure : bar a	11.4	11.5	11.6		
Pressure Drop : bar	20	16.8	14.8		
Temperature : °C					-104.60
Vapour Pressure : bar a	18.3	18.3	18.3		
Gf :	0.4503	0.4503	0.4503		
Viscosity : cPo	0.07	0.07	0.07		
F1 :	0.945	0.909	0.904		
Shut Off P.Drop : bar					25.2
Calculated Cv :	7.13	20.53	24.46		
Inlet Velocity : m/s	2.2	5.4	6.0		
Outlet Pipe DN : mm.	150	150	150		
Thickness : mm	3.40	3.40	3.40		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	23.0	66.2	78.9		
Signal% : equal %	60.7	89.8	93.7		

PRODUCT TYPE : 21115
 Flow Direction : FTO Trim : red.
 Nominal Cv : 31
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-46 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.046 CALC 1

ITEM : 14046 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40224 REVISION : 4 18-07-02
 MN ITEM : 046 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.3

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	46940	117350	129090		
Inlet Pressure : bar a	13.2	11.5	10.2		13
Outlet Pressure : bar a	4.9	5	5		
Pressure Drop : bar	8.3	6.5	5.2		
Temperature : °C	-48	-48	-48		-104.60
Vapour Pressure : bar a	12.4	11.3	10.2		
Gf :	0.478	0.478	0.478		
Viscosity : cPo	0.08	0.08	0.08		
F1 :	0.926	0.798	0.751		
Shut Off P.Drop : bar					9.2
Calculated Cv :	48.94	168.5	222.1		
Inlet Velocity : m/s	0.8	2.1	2.3		
Outlet Pipe DN : mm	250	250	250		
Thickness : mm	4.19	4.19	4.19		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	14.4	49.6	65.3		
Signal% : equal %	46.7	82.2	89.4		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 340
 Rating : 150
 Input Size : 8 in Output : 8 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-47 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.047 CALC 1

ITEM : 14047 QTY : 1

ENGINEER : SL

TAG : 30 LV 40226

REVISION : 3 18-07-02

MN ITEM : 047 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.3

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	12720	31800	34960		
Inlet Pressure : bar a	5.9	5.3	4.7		13
Outlet Pressure : bar a	1.4	1.5	1.7		
Pressure Drop : bar	4.5	3.8	3		
Temperature : °C	-72	-72	-72		-104.60
Vapour Pressure : bar a	5.3	4.8	4.3		
Gf :	0.5192	0.5192	0.5192		
Viscosity : cPo	0.11	0.11	0.11		
Fl :	0.927	0.817	0.783		
Shut Off P.Drop : bar					13
Calculated Cv :	19.43	59.91	75.42		
Inlet Velocity : m/s	0.8	2.1	2.3		
Outlet Pipe DN : mm	200	200	200		
Thickness : mm	3.76	3.76	3.76		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	14.1	43.4	54.7		
Signal% : equal %	46.0	79.1	84.6		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC
 Nominal Cv : 138
 Rating : 300
 Input Size : 4 in
 MN 0109

Trim : red.

Output : 4 in

UNIT 50

CALCULATION SHEETS




(valves, actuators, safety devices, flow measuring devices)

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY | TECHNIP
 2002.12.20 09:50:03 +01'00'
 <none>

STATUS CERTIFIED "FINAL"
 ISSUED BY : S. LEGE
 DATE : 16/12/02

REV	DATE	DESCRIPTION
1	16/12/02	Up-date
0	27/09/02	FIRST ISSUE

TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007
		EQUIPMENT NAME: Control valves
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	
	DOCUMENT TITLE : Calculation sheets	DOCUMENT CODE : A 3102
	PURCHASE ORDER : 02-4912 (Unit 50)	Sheet 01 of 34
		Rev. 1



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-01 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.001 CALC 1

ITEM : 15001 QTY : 1 ENGINEER : SL
 TAG : 30 UV 50002 REVISION : 4 18-07-02
 MN ITEM : 001 V0

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			5207		
Inlet Pressure : bar a			10.28		35
Outlet Pressure : bar a			1.5		
Pressure Drop : bar			8.78		
Temperature : °C			-6.6		-54.80
MW :			28.05		
Cp/Cv :			1.34		
Z :			0.902		
F1 :			0.900		
Shut Off P.Drop : bar					35
Calculated Cv :			29.08		
Outlet Mach :			0.488		
Sonic Diameter : in			2.09		
Outlet Pipe DN : mm			100		
Schedule :			40.0		
Valve SPL : dBA			97.8		
Lift% : on/off			0.0		
Signal% : on/off			0.0		

PRODUCT TYPE : 21105
 Flow Direction : FTO Trim : -
 Nominal Cv : 31
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-02 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

ITEM : 15002 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50021 REVISION : 4 18-07-02
 MN ITEM : 002 V0

CALCULATION SHEET

FLUID : propylene (liquid)
 Critical Pressure: bar a 46.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	12098	63043	69438		
Inlet Pressure : bar a	18.59	18.54	17.2		20.7
Outlet Pressure : bar a	6.56	6.61	6.62		
Pressure Drop : bar	12.03	11.93	10.58		
Temperature : °C	45	45	45		-48.90
Vapour Pressure : bar a	18.44	18.44	17.1		
Gf :	0.4697	0.4697	0.4765		
Viscosity : cPo	0.051	0.051	0.054		
Fl :	0.934	0.716	0.700		
Shut Off P.Drop : bar					15.2

Calculated Cv :	10.76	74.15	87.44		
Inlet Velocity : m/s	0.9	4.6	5.0		
Outlet Pipe DN : mm	250	250	250		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	11.7	80.6	95.0		
Signal% : equal %	41.0	94.2	98.5		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 92
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nbr : 2-04912-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.003 CALC 1

ITEM : 15003 QTY : 1 ENGINEER : SL
 TAG : 30 FV 50021 REVISION : 3 18-07-02
 MN ITEM : 003 V0

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			50000		
Inlet Pressure : bar a			30.43		35
Outlet Pressure : bar a			3.75		
Pressure Drop : bar			26.68		
Temperature : °C			48		0.80
MW :			28.1		
Cp/Cv :			1.42		
Z :			0.832		
F1 :			0.975		
Shut Off P.Drop : bar					35
Calculated Cv :			89.09		
Outlet Mach : (IEC)			0.375		
Sonic Diameter : in			3.62		
Outlet Pipe DN : mm			250		
Schedule :			20.0		
Valve SPL : dBA (IEC)			87.9		
Lift% : linear			59.4		
Signal% : equal %			86.7		

PRODUCT TYPE : 41355 LO-DB
 Flow Direction : FTO Trim : red.
 Nominal Cv : 150
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-04 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.004 CALC 1

ITEM : 15004 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50022 A REVISION : 3 18-07-02
 MN ITEM : 004 V0

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	50605	126263	126263		
Inlet Pressure : bar a	31.28	30.91	30.71		35
Outlet Pressure : bar a	29.08	30.21	30.21		
Pressure Drop : bar	2.2	0.7	0.5		
Temperature : °C	48	48	48		0.80
MW :	28.1	28.1	28.1		
Cp/Cv :	1.42	1.42	1.42		
Z :	0.832	0.832	0.832		
F1 :	0.868	0.816	0.810		
Shut Off P.Drop : bar					6.94
Calculated Cv :	215.4	934.9	1106		
Outlet Mach : (IEC)	0.025	0.061	0.061		
Sonic Diameter : in	1.57	2.43	2.43		
Outlet Pipe DN : mm	350	350	350		
Schedule :	20.0	20.0	20.0		
Valve SPL : dBA (IEC)	77.6	< 70	< 70		
Lift% : linear	14.9	64.5	76.3		
Signal% : equal %	47.6	89.0	92.9		

PRODUCT TYPE : VARIMAX
 Flow Direction : FTC Trim : -
 Nominal Cv : 1450
 Rating : 300
 Input Size : 10 in Output : 10 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-05 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.005 CALC 1

ITEM : 15005 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50022B REVISION : 3 18-07-02
 MN ITEM : 005 V0

CALCULATION SHEET

FLUID : methanol (liquid)
 Critical Pressure: bar a 33.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	6137		61369		
Inlet Pressure : bar a	4.26		4.13		5.5
Outlet Pressure : bar a	4		4		
Pressure Drop : bar	0.26		0.13		
Temperature : °C	105.3		105.3		-104.12
Vapour Pressure : bar a	3.9		3.9		
Gf :	0.694		0.694		
Viscosity : cPo	0.21		0.21		
F1 :	0.982		0.912		
Shut Off P.Drop : bar					0.5
Calculated Cv :	16.76		238.8		
Inlet Velocity : m/s	0.1		1.3		
Outlet Pipe DN : mm	200		200		
Thickness : mm	3.76		3.76		
Sound Level : dBA	< 70		< 70		
Flowing Condition:	subcrit		subcrit		
Lift% : equal %	20.5		86.8		
Signal% : equal %	20.5		86.8		

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : -
 Nominal Cv : 400
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-06 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.006 CALC 1

ITEM : 15006 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50023 A REVISION : 3 18-07-02
 MN ITEM : 006 V0

CALCULATION SHEET

FLUID : propylene (liquid)
 Critical Pressure: bar a 46.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	30715	168328	185161		
Inlet Pressure : bar a	7.59	6.86	6.58		16.9
Outlet Pressure : bar a	3.26	3.34	3.35		
Pressure Drop : bar	4.33	3.52	3.23		
Temperature : °C	-13.9	-13.9	-13.9		-48.60
Vapour Pressure : bar a	3.72	3.72	3.72		
Gf :	0.5663	0.5663	0.5663		
Viscosity : cPo	0.109	0.109	0.109		
Fl :	0.939	0.727	0.700		
Shut Off P.Drop : bar					14.7
Calculated Cv :	25.64	190	226.6		
Inlet Velocity : m/s	0.8	4.5	5.0		
Outlet Pipe DN : mm	250	250	250		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	10.3	76.0	90.6		
Signal% : equal %	37.5	92.8	97.2		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 250
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-07 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.007 CALC 1

ITEM : 15007 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50023 B REVISION : 4 18-07-02
 MN ITEM : 007 V0

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	8228		40295		
Inlet Pressure : bar a	29.59		30.34		35
Outlet Pressure : bar a	29.16		29.87		
Pressure Drop : bar	0.43		0.47		
Temperature : °C	8.5		8.5		-54.60
MW :	28.1		28.1		
Cp/Cv :	1.64		1.64		
Z :	0.73		0.73		
F1 :	0.929		0.759		
Shut Off P.Drop : bar					6.85

Calculated Cv :	68.38		317.4		
Outlet Mach : (IEC)	0.01		0.048		
Sonic Diameter : in	0.59		1.29		
Outlet Pipe DN : mm	200		200		
Schedule :	20.0		20.0		
Valve SPL : dBA (IEC)	< 70		< 70		
Lift% : linear	13.7		63.5		
Signal% : equal %	45.2		88.6		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 500
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-08 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.008 CALC 1

ITEM : 15008 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50031 REVISION : 4 18-07-02
 MN ITEM : 008 V0

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			20148		
Inlet Pressure : bar a			32.94		35
Outlet Pressure : bar a			1.5		
Pressure Drop : bar			31.44		
Temperature : °C			-9.4		-104
MW :			28.1		
Cp/Cv :			2.02		
Z :			0.59		
F1 :			0.975		
Shut Off P.Drop : bar					35
Calculated Cv :			21.42		
Outlet Mach :			0.695		
Sonic Diameter : in			3.33		
Outlet Pipe DN : mm			100		
Thickness : mm			3.05		
Valve SPL : dBA			85.5		
Lift% : linear			71.4		
Signal% : equal %			91.4		

PRODUCT TYPE : 41355 LO-DB
 Flow Direction : FTO Trim : red.
 Nominal Cv : 30
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-09 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.009 CALC 1

ITEM : 15009 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50031 REVISION : 4 18-07-02
 MN ITEM : 009 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.3

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		37879	88380		
Inlet Pressure : bar a		22.95	20.14		24.2
Outlet Pressure : bar a		1.31	1.6		
Pressure Drop : bar		21.64	18.54		
Temperature : °C		-96	-96		-104.60
Vapour Pressure : bar a		1.616	1.616		
Gf :		0.558	0.558		
Viscosity : cPo		0.15	0.15		
Fl :		0.939	0.907		
Shut Off P.Drop : bar					24.2

Calculated Cv :		13.56	35.24		
Inlet Velocity : m/s		2.3	5.4		
Outlet Pipe DN : mm		200	200		
Thickness : mm		3.76	3.76		
Sound Level : dBA		no calc	no calc		
Flowing Condition:		flash.	flash.		
Lift% : linear		27.7	71.9		
Signal% : equal %		65.9	91.6		

PRODUCT TYPE : 21115
 Flow Direction : FTO Trim : -
 Nominal Cv : 49
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-10 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.010 CALC 1

ITEM : 15010 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50033 REVISION : 3 18-07-02
 MN ITEM : 010 V0

CALCULATION SHEET

FLUID : propylene (liquid)
 Critical Pressure: bar a 46.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	5683	25806	35558		
Inlet Pressure : bar a	4.32	3.62	3.37		16.8
Outlet Pressure : bar a	1.6	1.65	1.67		
Pressure Drop : bar	2.72	1.97	1.7		
Temperature : °C	-18.9	-18.9	-18.9		-48.60
Vapour Pressure : bar a	3.24	3.24	3.24		
Gf :	0.5712	0.5712	0.5712		
Viscosity : cPo	0.114	0.114	0.114		
Fl :	0.940	0.826	0.719		
Shut Off P.Drop : bar					16.2

Calculated Cv :	7.708	55.59	108.7		
Inlet Velocity : m/s	0.3	1.5	2.1		
Outlet Pipe DN : mm	150	150	150		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	5.6	40.3	78.8		
Signal% : equal %	24.5	76.8	93.6		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 138
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04912-11 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.011 CALC 1

ITEM : 15011 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50041 REVISION : 4 18-07-02
 MN ITEM : 011 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.32

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	6134	15334	16867		
Inlet Pressure : bar a	12.17	11.63	11.45		13.7
Outlet Pressure : bar a	4.87	5.07	5.13		
Pressure Drop : bar	7.3	6.56	6.32		
Temperature : °C	-48.3	-48.3	-48.3		-104.60
Vapour Pressure : bar a	11.23	11.23	11.23		
Gf :	0.4778	0.4778	0.4778		
Viscosity : cPo	0.081	0.081	0.081		
Fl :	0.933	0.839	0.815		
Shut Off P.Drop : bar					9.9

Calculated Cv :	6.505	20.1	23.68		
Inlet Velocity : m/s	0.8	2.0	2.2		
Outlet Pipe DN : mm	100	100	100		
Thickness : mm	3.05	3.05	3.05		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	12.0	37.2	43.9		
Signal% : equal %	41.8	74.6	79.4		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 54
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01.0 10007
 SERIAL Nr : 2-04912-12 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.012 CALC 1

ITEM : 15012 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50043 REVISION : 4 18-07-02
 MN ITEM : 012 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.32

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM OTHER	DESIGN
Flowrate : kg/h	5688	14219	15641	
Inlet Pressure : bar a	5.7	5.62	5.59	13.7
Outlet Pressure : bar a	1.43	1.55	1.58	
Pressure Drop : bar	4.27	4.07	4.01	
Temperature : °C	-72	-72	-72	-104.60
Vapour Pressure : bar a	4.78	4.78	4.78	
Gf	0.5192	0.5192	0.5192	
Viscosity : cPo	0.109	0.109	0.109	
F1	0.925	0.817	0.799	
Shut Off P.Drop : bar				13.3
Calculated Cv	8.024	23.36	26.57	
Inlet Velocity : m/s	0.7	1.7	1.8	
Outlet Pipe DN : mm	150	150	150	
Thickness : mm	3.40	3.40	3.40	
Sound Level : dBA	no calc	no calc	no calc	
Flowing Condition:	flash.	flash.	flash.	
Lift% : linear	14.9	43.3	49.2	
Signal% : equal %	47.6	79.0	82.1	

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 54
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-13 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.013 CALC 1

ITEM : 15013 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50045 REVISION : 4 18-07-02
 MN ITEM : 013 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.32

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	5071	12677	13944		
Inlet Pressure : bar a	30.55	30.25	30.15		35.4
Outlet Pressure : bar a	11.38	11.5	11.53		
Pressure Drop : bar	19.17	18.75	18.62		
Temperature : °C	-32	-32	-32		-54.60
Vapour Pressure : bar a	18.34	18.34	18.34		
Gf :	0.4503	0.4503	0.4503		
Viscosity : cPo	0.067	0.067	0.067		
Fl :	0.934	0.864	0.844		
Shut Off P.Drop : bar					25
Calculated Cv :	2.342	6.4	7.233		
Inlet Velocity : m/s	1.5	3.9	4.2		
Outlet Pipe DN : mm	100	100	100		
Thickness : mm	3.05	3.05	3.05		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	11.7	32.0	36.2		
Signal% : equal %	41.1	70.7	73.8		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 20
 Rating : 300
 Input Size : 2 in Output : 2 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-14 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.014 CALC 1

ITEM : 15014 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50051 REVISION : 4 18-07-02
 MN ITEM : 014 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.32

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	17103	160755	176831		
Inlet Pressure : bar a	29.97	29.59	29.47		35.5
Outlet Pressure : bar a	11.4	11.43	11.43		
Pressure Drop : bar	18.57	18.16	18.04		
Temperature : °C	-32	-32	-32		-104.60
Vapour Pressure : bar a	18.34	18.34	18.34		
Gf :	0.4503	0.4503	0.4503		
Viscosity : cPo	0.067	0.067	0.067		
F1 :	0.982	0.929	0.925		
Shut Off P.Drop : bar					24.6

Calculated Cv :	7.657	77.2	85.63		
Inlet Velocity : m/s	0.6	5.4	6.0		
Outlet Pipe DN : mm	250	250	250		
Thickness : mm	4.19	4.19	4.19		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : equal %	18.9	74.5	77.5		
Signal% : equal %	18.9	74.5	77.5		

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : -
 Nominal Cv : 208
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-15 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.015 CALC 1

ITEM : 15015 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50061 REVISION : 5 18-07-02
 MN ITEM : 015 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.32

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	18265	45663	50229		
Inlet Pressure : bar a	12.17	11.65	11.47		13.6
Outlet Pressure : bar a	4.93	5.09	5.13		
Pressure Drop : bar	7.24	6.56	6.34		
Temperature : °C	-48.3	-48.3	-48.3		-104.60
Vapour Pressure : bar a	11.23	11.23	11.23		
Gf :	0.4772	0.4772	0.4772		
Viscosity : cPo	0.081	0.081	0.081		
F1 :	0.927	0.812	0.788		
Shut Off P.Drop : bar					9.7

Calculated Cv :	19.53	61.82	73.09		
Inlet Velocity : m/s	1.3	3.3	3.6		
Outlet Pipe DN : mm	150	150	150		
Thickness : mm	3.40	3.40	3.40		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	14.2	44.8	53.0		
Signal% : equal %	46.1	80.1	83.8		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 138
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-16 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.016 CALC 1

ITEM : 15016 QTY : 1 ENGINEER : SL
 TAG : 30 TV 50062 REVISION : 4 18-07-02
 MN ITEM : 016 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.32

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			20771		
Inlet Pressure : bar a			11.4		12.25
Outlet Pressure : bar a			4.95		
Pressure Drop : bar			6.45		
Temperature : °C			-48		-104.60
Vapour Pressure : bar a			11.32		
Gf :			0.4773		
Viscosity : cPo			0.081		
F1 :			0.914		
Shut Off P.Drop : bar					8.3
Calculated Cv :			26.81		
Inlet Velocity : m/s			2.7		
Outlet Pipe DN : mm			100		
Thickness : mm			3.05		
Sound Level : dBA			no calc		
Flowing Condition:			flash.		
Lift% : linear			57.0		
Signal% : equal %			85.6		

PRODUCT TYPE : 21115
 Flow Direction : FTO Trim : -
 Nominal Cv : 47
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-17 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.017 CALC 1

ITEM : 15017 QTY : 1

ENGINEER : SL

TAG : 30 PV 50071

REVISION : 4 18-07-02

MN ITEM : 017 V0

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			10000		
Inlet Pressure : bar a			11.46		12
Outlet Pressure : bar a			1.5		
Pressure Drop : bar			9.96		
Temperature : °C			-46.2		-104.60
MW :			28.1		
Cp/Cv :			1.45		
Z :			0.811		
F1 :			0.975		
Shut Off P.Drop : bar					12
Calculated Cv :			38.59		
Outlet Mach :			0.443		
Sonic Diameter : in			2.66		
Outlet Pipe DN : mm			100		
Thickness : mm			3.05		
Valve SPL : dBA			83.6		
Lift% : linear			72.8		
Signal% : equal %			91.8		

PRODUCT TYPE : 21900 LO-DB
 Flow Direction : FTO
 Nominal Cv : 53
 Rating : 300
 Input Size : 4 in
 MN 0109

Trim : red.

Output : 4 in



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04912-18 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.018 CALC 1

ITEM : 15018 QTY : 1 ENGINEER : SL
 TAG : 30 TV 50072 REVISION : 4 18-07-02
 MN ITEM : 018 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.32

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			7840		
Inlet Pressure : bar a			11.39		12.25
Outlet Pressure : bar a			1.51		
Pressure Drop : bar			9.88		
Temperature : °C			-48		-104.60
Vapour Pressure : bar a			11.32		
Gf :			0.4773		
Viscosity : cPo			0.081		
Fl :			0.927		
Shut Off P.Drop : bar					11.75

Calculated Cv : 10
 Inlet Velocity : m/s 2.3
 Outlet Pipe DN : mm 100
 Thickness : mm 3.05
 Sound Level : dBA no calc
 Flowing Condition: flash.
 Lift% : linear 38.5
 Signal% : equal % 75.5

PRODUCT TYPE : 21115
 Flow Direction : FTO Trim : -
 Nominal Cv : 26
 Rating : 300
 Input Size : 2 in Output : 2 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-19 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.019 CALC 1

ITEM : 15019 QTY : 1 ENGINEER : SL
 TAG : 30 UV 50102 REVISION : 4 18-07-02
 MN ITEM : 019 V0

CALCULATION SHEET

FLUID : propylene (gas)
 Critical Pressure: bar a 45.0
 Critical Temp. : °C 91.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			4041		
Inlet Pressure : bar a			2.9		20.5
Outlet Pressure : bar a			1.5		
Pressure Drop : bar			1.4		
Temperature : °C			15		105
MW :			42.08		
Cp/Cv :			1.18		
Z :			0.951		
Fl :			0.850		
Shut Off P.Drop : bar					20.5
Calculated Cv :			79.9		
Outlet Mach :			0.352		
Sonic Diameter : in			1.78		
Outlet Pipe DN : mm			150		
Schedule :			40.0		
Valve SPL : dBA			86.9		
Lift% : linear			98.6		
Signal% : equal %			99.6		

PRODUCT TYPE : CamFlex
 Flow Direction : FTO Trim : red.
 Nominal Cv : 81
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01.0 10007
 SERIAL N^o : 2-04912-20 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.020 CALC 1

ITEM : 15020 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50105 REVISION : 4 18-07-02
 MN ITEM : 020 V0

CALCULATION SHEET

FLUID : propylene (gas)
 Critical Pressure: bar a 45.0
 Critical Temp. : °C 91.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			86026		
Inlet Pressure : bar a			17.45		20.5
Outlet Pressure : bar a			17.1		
Pressure Drop : bar			0.35		
Temperature : °C			82		105
MW :			42.08		
Cp/Cv :			1.24		
Z :			0.832		
F1 :			0.725		
Shut Off P.Drop : bar					4.4
Calculated Cv :			1004		
Outlet Mach : (IEC)			0.068		
Sonic Diameter : in			2.56		
Outlet Pipe DN : mm			300		
Schedule :			20.0		
Valve SPL : dBA (IEC)			< 70		
Lift% : linear			77.3		
Signal% : equal %			93.2		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 1300
 Rating : 300
 Input Size : 10 in Output : 10 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-21 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.021 CALC 1

ITEM : 15021 QTY : 1

ENGINEER : SL

TAG : 30 PV 50121

REVISION : 4 18-07-02

MN ITEM : 021 V0

CALCULATION SHEET

FLUID : propylene (gas)
 Critical Pressure: bar a 45.0
 Critical Temp. : °C 91.9

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			63663		
Inlet Pressure : bar a			19.5		20.5
Outlet Pressure : bar a			4.34		
Pressure Drop : bar			15.16		
Temperature : °C			45		-48.90
MW :			42.08		
Cp/Cv :			1.37		
Z :			0.725		
Fl :			0.975		
Shut Off P.Drop : bar					20.5

Calculated Cv : 136.4
 Outlet Mach : 0.229
 Sonic Diameter : in 3.83
 Outlet Pipe DN : mm 250
 Schedule : 20.0
 Valve SPL : dBA 83.1
 Lift% : linear 54.6
 Signal% : equal % 84.5

Total SPL : dBA 89.1

Valve Mounted with 1 LO-DB Cartridge Downstream

CARTRIDGE #1

Outlet Pressure : bar a 1.5 (P2)

PRODUCT TYPE : 41355 LO-DB

Flow Direction : FTO Trim : red.

Nominal Cv : 250

Rating : 300

Input Size : 8 in Output : 8 in

MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-21 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.021 CALC 2

ITEM : 15021 QTY : 1

ENGINEER : SL
 REVISION : 4 18-07-02
 MN ITEM : 021 V0

TAG : 30 PV 50121

CARTRIDGES -Close Coupled Mounting-

CARTRIDGE #1	MINIMUM	NORMAL	MAXIMUM	OTHER
Nominal Cv :		650		
Nominal Diameter :		200		
Inlet Pressure : bar a			4.34	
Outlet Pressure : bar a			1.5	
Sonic Diameter : in			6.51	
SPL : dBA			89.0	

MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-21 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V1.021 CALC 1

ITEM : 15021 QTY : 1

ENGINEER : SL
 REVISION : 3 18-07-02
 MN ITEM : 021 V1

TAG : 30 PV 50121

CALCULATION SHEET

FLUID : propylene (gas)
 Critical Pressure: bar a 45.0
 Critical Temp. : °C 91.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			63663		
Inlet Pressure : bar a			2.868		20.5
Outlet Pressure : bar a			1.5		
Pressure Drop : bar			1.368		
Temperature : °C			45		-48.90
MW :			42.08		
Cp/Cv :			1.37		
Z :			0.725		
F1 :			0.800		
Shut Off P.Drop : bar					20.5
Cv :			950		
Outlet Mach : (IEC)			0.424		
Sonic Diameter : in			6.51		
Outlet Pipe DN : mm			250		
Schedule :			20.0		
Valve SPL : dBA (IEC)			83.6		
Lift% : linear			100.0		
Signal% : equal %			100.0		

PRODUCT TYPE : LODB PLATE
 Flow Direction : -
 Nominal Cv : 950
 Rating : 300
 Input Size : 10 in
 MN 0109

Trim : -
 Output : 10 in



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-22 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.022 CALC 1

ITEM : 15022 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50122 REVISION : 4 18-07-02
 MN ITEM : 022 V0

CALCULATION SHEET

FLUID : propylene (liquid)
 Critical Pressure: bar a 46.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	61095	505198	555718		
Inlet Pressure : bar a	18.63	18.01	16.52		20.7
Outlet Pressure : bar a	6.57	6.64	6.65		
Pressure Drop : bar	12.06	11.37	9.87		
Temperature : °C	40.6	40.6	37.1		-48.90
Vapour Pressure : bar a	16.7	16.7	15.4		
Gf :	0.4787	0.4787	0.4862		
Viscosity : cPo	0.055	0.055	0.058		
F1 :	0.940	0.923	0.919		
Shut Off P.Drop : bar					15.2
Calculated Cv :	46.86	423.1	494.9		
Inlet Velocity : m/s	0.7	5.8	6.3		
Outlet Pipe DN : mm	450	450	450		
Schedule :	10.0	10.0	10.0		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : equal %	23.4	81.1	84.7		
Signal% : equal %	23.4	81.1	84.7		

PRODUCT TYPE : 41325
 Flow Direction : FTO Trim : full
 Nominal Cv : 900
 Rating : 300
 Input Size : 10 in Output : 10 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-23 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.023 CALC 1

ITEM : 15023 QTY : 1

ENGINEER : SL

TAG : 30 PV 50132 A

REVISION : 4 18-07-02

MN ITEM : 023 V0

CALCULATION SHEET

FLUID : propylene (gas)
 Critical Pressure: bar a 45.0
 Critical Temp. : °C 91.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	52862	190740	209814		
Inlet Pressure : bar a	6.98	6.93	6.46		15
Outlet Pressure : bar a	6.41	6.48	6.41		
Pressure Drop : bar	0.57	0.45	0.05		
Temperature : °C	34	34	29.9		-48.60
MW :	42.08	42.08	42.08		
Cp/Cv :	1.2	1.2	1.2		
Z :	0.904	0.904	0.904		
Fl :	0.794	0.794	0.681		
Shut Off P.Drop : bar					9.6
Calculated Cv :	916.1	3665	11725		
Outlet Mach : (IEC)	0.018	0.065	0.072		
Sonic Diameter : in	3.19	6.02	6.33		
Outlet Pipe DN : mm	700	700	700		
Schedule :	10.0	10.0	10.0		
Valve SPL : dBA (IEC)	76.7	85.0	< 70		
Lift% : equal %	16.4	41.3	75.0		
Signal% : equal %	16.4	41.3	75.0		

PRODUCT TYPE : Butterfly
 Flow Direction : -
 Nominal Cv : 31000
 Rating : 150
 Input Size : 24 in
 MN 0109

Trim : -
 Output : 24 in



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-24 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.024 CALC 1

ITEM : 15024 QTY : 1

ENGINEER : SL
 REVISION : 3 18-07-02
 MN ITEM : 024 V0

TAG : 30 PV 50132 B

CALCULATION SHEET

FLUID : propylene (gas)
 Critical Pressure: bar a 45.0
 Critical Temp. : °C 91.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			301851		
Inlet Pressure : bar a			6.3		15
Outlet Pressure : bar a			5.417		
Pressure Drop : bar			0.883		
Temperature : °C			8.8		-48.60
MW :			42.08		
Cp/Cv :			1.22		
Z :			0.881		
F1 :			0.690		
Shut Off P.Drop : bar					14.35
Calculated Cv :			5066		
Outlet Mach : (IEC)			0.263		
Sonic Diameter : in			8.08		
Outlet Pipe DN : mm			700		
Schedule :			10.0		
Valve SPL : dBA (IEC)			100.2		
Lift% : equal %			74.4		
Signal% : equal %			74.4		

PRODUCT TYPE : Butterfly
 Flow Direction : - Trim : -
 Nominal Cv : 13700
 Rating : 150
 Input Size : 16 in Output : 16 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-24 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V1.024 CALC 1

ITEM : 024 QTY : 1

ENGINEER : SL

TAG : 30 PV 50132 B

REVISION : 3 18-07-02

MN ITEM : 024 V1

CALCULATION SHEET

FLUID : propylene (gas)
 Critical Pressure: bar a 45.0
 Critical Temp. : °C 91.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			301851		
Inlet Pressure : bar a			5.417		15
Outlet Pressure : bar a			1.66		
Pressure Drop : bar			3.757		
Temperature : °C			8.8		-48.60
MW :			42.08		
Cp/Cv :			1.22		
Z :			0.881		
F1 :			0.800		
Shut Off P.Drop : bar					14.35
Cv :			3130		
Outlet Mach : (IEC)			0.500		
Sonic Diameter : in			14.14		
Outlet Pipe DN : mm			700		
Schedule :			10.0		
Valve SPL : dBA (IEC)			106.7		
Lift% : equal %			100.0		
Signal% : equal %			100.0		

PRODUCT TYPE : MULTIHOLE PLATE

Flow Direction : - Trim : -

Nominal Cv : 3130

Rating : 150

Input Size : 20 in Output : 20 in

MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-25 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.025 CALC 1

ITEM : 15025 QTY : 1

ENGINEER : SL

TAG : 30 TV 50141

REVISION : 4 18-07-02

MN ITEM : 025 V0

CALCULATION SHEET

FLUID : propylene (liquid)
 Critical Pressure: bar a 46.2

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			52336		
Inlet Pressure : bar a			6.5		15.4
Outlet Pressure : bar a			3.4		
Pressure Drop : bar			3.1		
Temperature : °C			3.5		-48.60
Vapour Pressure : bar a			6.42		
Gf :			0.541		
Viscosity : cPo			0.089		
Fl :			0.903		
Shut Off P.Drop : bar					13

Calculated Cv :	92.29
Inlet Velocity : m/s	3.3
Outlet Pipe DN : mm	150
Schedule :	40.0
Sound Level : dBA	no calc
Flowing Condition:	flash.
Lift% : linear	81.7
Signal% : equal %	94.5

PRODUCT TYPE : 21115

Flow Direction : FTO

Trim

Nominal Cv : 113

Rating : 150

Input Size : 4 in

Output : 4 in

MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-26 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.026 CALC 1

ITEM : 15026 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50143 REVISION : 3 18-07-02
 MN ITEM : 026 V0

CALCULATION SHEET

FLUID : propylene (liquid)
 Critical Pressure: bar a 46.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	22368	244311	268742		
Inlet Pressure : bar a	7.61	6.8	6.52		16.9
Outlet Pressure : bar a	3.7	3.72	3.73		
Pressure Drop : bar	3.91	3.08	2.79		
Temperature : °C	-13.9	-13.9	-13.9		-48.60
Vapour Pressure : bar a	3.72	3.72	3.72		
Gf :	0.5662	0.5662	0.5662		
Viscosity : cPo	0.114	0.109	0.109		
Fl :	0.918	0.844	0.839		
Shut Off P.Drop : bar					14.2
Calculated Cv :	19.05	239	276.2		
Inlet Velocity : m/s	0.3	3.7	4.1		
Outlet Pipe DN : mm	300	300	300		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	no calc	no calc	74.6		
Flowing Condition:	flash.	flash.	cavit.		
Lift% : linear	4.5	56.9	65.8		
Signal% : equal %	21.5	85.6	89.6		

PRODUCT TYPE : VARIMAX
 Flow Direction : FTC Trim : -
 Nominal Cv : 420
 Rating : 300
 Input Size : 8 in Output : 8 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-27 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.027 CALC 1

ITEM : 15027 QTY : 1

ENGINEER : SL

TAG : 30 TV 50152

REVISION : 4 18-07-02

MN ITEM : 027 V0

CALCULATION SHEET

FLUID : propylene (liquid)
 Critical Pressure: bar a 46.2

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			192208		
Inlet Pressure : bar a			6.52		15.4
Outlet Pressure : bar a			1.63		
Pressure Drop : bar			4.89		
Temperature : °C			3.5		-48.60
Vapour Pressure : bar a			6.42		
Gf :			0.541		
Viscosity : cPo			0.089		
Fl :			0.919		
Shut Off P.Drop : bar					14.8
Calculated Cv :			330		
Inlet Velocity : m/s			3.0		
Outlet Pipe DN : mm			400		
Schedule :			10.0		
Sound Level : dBA			no calc		
Flowing Condition:			flash.		
Lift% : equal %			85.8		
Signal% : equal %			85.8		

PRODUCT TYPE : 41325

Flow Direction : FTO

Trim : -

Nominal Cv : 575

Rating : 300

Input Size : 8 in

Output : 8 in

MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-28 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.028 CALC 1

ITEM : 15028 QTY : 1

ENGINEER : SL
 REVISION : 4 18-07-02
 MN ITEM : 028 V0

TAG : 30 LV 50701A

CALCULATION SHEET

FLUID : TC (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	70000	165000	208000		
Inlet Pressure : bar a	8.2	7.9	7.6		8
Outlet Pressure : bar a	7	7	7		
Pressure Drop : bar	1.2	0.9	0.6		
Temperature : °C	54	54	54		70
Vapour Pressure : bar a	0.15	0.15	0.15		
Gf :	0.986	0.986	0.986		
Viscosity : cPo	0.51	0.51	0.51		
Fl :	0.925	0.827	0.759		
Shut Off P.Drop : bar					8
Calculated Cv :	74.71	204.3	318		
Inlet Velocity : m/s	1.1	2.5	3.2		
Outlet Pipe DN : mm	200	200	200		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	< 70	70.7	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	14.9	40.9	63.6		
Signal% : equal %	47.8	77.2	88.6		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 500
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-29 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.029 CALC 1

ITEM : 15029 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50701B REVISION : 3 18-07-02
 MN ITEM : 029 V0

CALCULATION SHEET

FLUID : TC (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	67000	165000	208000		
Inlet Pressure : bar a	8.2	7.5	7.2		7
Outlet Pressure : bar a	1.287	2.738	4.213		
Pressure Drop : bar	6.913	4.762	2.987		
Temperature : °C	54	54	54		70
Vapour Pressure : bar a	0.15	0.15	0.15		
Gf :	0.986	0.986	0.986		
Viscosity : cPo	0.512	0.512	0.512		
F1 :	0.948	0.892	0.870		
Shut Off P.Drop : bar					7
Calculated Cv :	29.85	90.18	149		
Inlet Velocity : m/s	2.3	5.7	7.2		
Outlet Pipe DN : mm	250	250	250		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	83.7	81.5	78.4		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	13.0	39.2	64.8		
Signal% : equal %	43.7	76.0	89.1		

PRODUCT TYPE : CamFlex
 Flow Direction : FTO Trim : full
 Nominal Cv : 230
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-29 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : VI.029 CALC 1

ITEM : 15029 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50701B REVISION : 2 18-07-02
 MN ITEM : 029 V1

CALCULATION SHEET

FLUID : TC (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM OTHER	DESIGN
Flowrate : kg/h	67000	165000	208000	
Inlet Pressure : bar a	1.287	2.738	4.213	7
Outlet Pressure : bar a	1	1	1	
Pressure Drop : bar	0.2866	1.738	3.213	
Temperature : °C	54	54	54	70
Vapour Pressure : bar a	0.15	0.15	0.15	
Gf :	0.986	0.986	0.986	
Viscosity : cPo	0.512	0.512	0.512	
Fl :	0.800	0.800	0.800	
Shut Off P.Drop : bar				7
Cv :	156	156	156	
Inlet Velocity : m/s	2.3	5.7	7.2	
Outlet Pipe DN : mm	250	250	250	
Schedule :	20.0	20.0	20.0	
Sound Level : dBA	< 70	75.9	84.2	
Flowing Condition:	subcrit	subcrit	cavit.	
Lift% : linear	100.0	100.0	100.0	
Signal% : equal %	100.0	100.0	100.0	

PRODUCT TYPE : MULTIHOLE PLATE
 Flow Direction : - Trim : -
 Nominal Cv : 156
 Rating : 150
 Input Size : 4 in Output : 4 in
 MN 0109

UNIT 60




CALCULATION SHEETS

(valves, actuators, safety devices, flow measuring devices)

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
 2002.12.20 09:54:51 +01'00'
 <none>

STATUS CERTIFIED "FINAL"
 ISSUED BY : S. LEGE
 DATE : 16/12/02

1	16/12/02	Up-date
0	27/09/02	FIRST ISSUE
REV	DATE	DESCRIPTION
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007
		EQUIPMENT NAME: Control valves
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	
	DOCUMENT TITLE : Calculation sheets	DOCUMENT CODE : A 3102
	PURCHASE ORDER : 02-4913 (Unit 60)	Sheet 01 of 31
		Rev. 1



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-01 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.001 CALC 1

ITEM : 16001 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60001 A REVISION : 4 18-07-02
 MN ITEM : 001 V0

CALCULATION SHEET

FLUID : DW (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	44000	100000	252000		
Inlet Pressure : bar a	6.6	5.8	4.3		7
Outlet Pressure : bar a	2	2	2		
Pressure Drop : bar	4.6	3.8	2.3		
Temperature : °C	27	27	27		65
Vapour Pressure : bar a	0.04	0.04	0.04		
Gf	0.996	0.996	0.996		
Viscosity : cPo	0.85	0.85	0.85		
Fl	0.978	0.960	0.921		
Shut Off P.Drop : bar					7
Calculated Cv :	23.85	59.65	194.1		
Inlet Velocity : m/s	0.7	1.5	3.9		
Outlet Pipe DN : mm	200	200	200		
Thickness : mm	3.76	3.76	3.76		
Sound Level : dBA	80.3	82.6	83.4		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	6.0	14.9	48.5		
Signal% : equal %	25.6	47.7	81.8		

PRODUCT TYPE : 21000
 Flow Direction : FTO Trim : -
 Nominal Cv : 400
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04913-02 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

ITEM : 16002 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60001B REVISION : 5 18-07-02
 MN ITEM : 002 V0

CALCULATION SHEET

FLUID : TC (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	101200	253000	276000		
Inlet Pressure : bar a	6.9	6.75	6.7		8
Outlet Pressure : bar a	2	2	2		
Pressure Drop : bar	4.9	4.75	4.7		
Temperature : °C	54	54	54		70
Vapour Pressure : bar a	0.15	0.15	0.15		
Gf	0.986	0.986	0.986		
Viscosity : cPo	0.51	0.51	0.51		
Fl	0.941	0.907	0.903		
Shut Off P.Drop : bar					8
Calculated Cv :	53.8	143.2	159.1		
Inlet Velocity : m/s	3.5	8.8	9.6		
Outlet Pipe DN : mm	250	250	250		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	84.4	84.4	84.9		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	27.6	73.4	81.6		
Signal% : equal %	65.8	92.0	94.5		

PRODUCT TYPE : 21115
 Flow Direction : FTO Trim : -
 Nominal Cv : 195
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.003 CALC 1

ITEM : 16003 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60007 REVISION : 5 18-07-02
 MN ITEM : 003 V0

CALCULATION SHEET.

FLUID : DW (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			274000		
Inlet Pressure : bar a			4.5		5
Outlet Pressure : bar a			2.2		
Pressure Drop : bar			2.3		
Temperature : °C			54		70
Vapour Pressure : bar a			0.15		
Gf :			0.986		
Viscosity : cPo			0.51		
F1 :			0.880		
Shut Off P.Drop : bar					5
Calculated Cv :			212.3		
Inlet Velocity : m/s			4.2		
Outlet Pipe DN : mm			200		
Thickness : mm			3.76		
Sound Level : dBA			83.7		
Flowing Condition:			subcrit		
Lift% : linear			70.8		
Signal% : equal %			91.2		

PRODUCT TYPE : CamFlex
 Flow Direction : FTO Trim : red.
 Nominal Cv : 300
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-04 REVISION : 1
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 12-12-02

PAGE : V0.004 CALC 1

ITEM : 16004 QTY : 1

TAG : 30 PV 60008A

ENGINEER : SL
 REVISION : 5 07-10-02
 MN ITEM : 004 V0

CALCULATION SHEET

FLUID : TC (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	1800				
Inlet Pressure : bar a	6.9				
Outlet Pressure : bar a	3.5				8
Pressure Drop : bar	3.4				
Temperature : °C	54				
Vapour Pressure : bar a	0.15				70
Gf :	0.986				
Viscosity : cPo	0.51				
Fl :	0.938				
Shut Off P.Drop : bar					8
Calculated Cv :	1.141				
Inlet Velocity : m/s	1.0				
Outlet Pipe DN : mm	50				
Schedule :	40.0				
Sound Level : dBA	< 70				
Flowing Condition:	subcrit				
Lift% : equal %	68.5				
Signal% : equal %	68.5				
P2 Maxi : bar a					
Full Opening					

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : red.
 Nominal Cv : 3.8
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-05 REVISION : 1
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 12-12-02

PAGE : V0.005 CALC 1

ITEM : 16005 QTY : 1

ENGINEER : SL
 REVISION : 5 07-10-02
 MN ITEM : 005 V0

TAG : 30 PV 60008B

CALCULATION SHEET

FLUID : TC (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		22600	90000	276000	
Inlet Pressure : bar a		6.75	6.7	6.7	8
Outlet Pressure : bar a		5.15	6.3	5.985	
Pressure Drop : bar		1.6	0.4	0.715	
Temperature : °C		54	54	54	70
Vapour Pressure : bar a		0.15	0.15	0.15	
Gf :		0.986	0.986	0.986	
Viscosity : cPo		0.51	0.51	0.51	
F1 :		0.980	0.926	0.900	
Shut Off P.Drop : bar					8
Calculated Cv :		20.87	167.6	398.3	
Inlet Velocity : m/s		0.3	1.4	4.3	
Outlet Pipe DN : mm		250	250	250	
Schedule :		20.0	20.0	20.0	
Sound Level : dBA		< 70	< 70	70.3	
Flowing Condition:		subcrit	subcrit	subcrit	
Lift% : equal %		23.5	78.0	99.9	
Signal% : equal %		23.5	78.0	99.9	
P2 Maxi : bar a					
Full Opening				5.985	

PRODUCT TYPE : 21000
 Flow Direction : FTO
 Nominal Cv : 400
 Rating : 300
 Input Size : 6 in
 MN 0109

Trim : -
 Output : 6 in



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01.0 10007
 SERIAL Nr : 2-04913-06 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.006 CALC 1

ITEM : 16006 QTY : 1 ENGINEER : SL
 TAG : 30 FV 60011 REVISION : 4 18-07-02
 MN ITEM : 006 V0

CALCULATION SHEET

FLUID : DW (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			103500		
Inlet Pressure : bar a			8.6		8.5
Outlet Pressure : bar a			2		
Pressure Drop : bar			6.6		
Temperature : °C			54		70
Vapour Pressure : bar a			0.1502		
Gf :			0.986		
Viscosity : cPo			0.51		
Fl :			0.975		
Shut Off P.Drop : bar					8.5
Calculated Cv :			47.64		
Inlet Velocity : m/s			6.4		
Outlet Pipe DN : mm			150		
Thickness : mm			3.40		
Sound Level : dBA			79.1		
Flowing Condition:			subcrit		
Lift% : linear			74.4		
Signal% : equal %			92.3		

PRODUCT TYPE : 41355
 Flow Direction : FTO Trim : red.
 Nominal Cv : 64
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-07 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.007 CALC 1

ITEM : 16007 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60021 REVISION : 3 18-07-02
 MN ITEM : 007 V0

CALCULATION SHEET

FLUID : Condensate S (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	12000	21900	47900		
Inlet Pressure : bar a	9.5	9	8.7		9.6
Outlet Pressure : bar a	5	5.5	8.4		
Pressure Drop : bar	4.5	3.5	0.3		
Temperature : °C	100	100	100		115
Vapour Pressure : bar a	1	1	1		
Gf	0.959	0.959	0.959		
Viscosity : cPo	0.29	0.29	0.29		
Fl	0.983	0.976	0.918		
Shut Off P.Drop : bar					9.6
Calculated Cv :	6.701	13.87	103.6		
Inlet Velocity : m/s	0.4	0.8	1.7		
Outlet Pipe DN : mm	100	100	100		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	< 70	70.3	< 70		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : equal %	18.0	28.9	83.9		
Signal% : equal %	18.0	28.9	83.9		

PRODUCT TYPE : 21000
 Flow Direction : FTO Trim : full
 Nominal Cv : 195
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04913-08 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.008 CALC 1

ITEM : 16008 QTY : 1

ENGINEER : SL
 REVISION : 3 18-07-02
 MN ITEM : 008 V0

TAG : 30 LV 60023

CALCULATION SHEET

FLUID : Condensate S (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	46500	92800	124650		
Inlet Pressure : bar a	6.84	6.25	6.16		7.4
Outlet Pressure : bar a	3.06	3.52	5.05		
Pressure Drop : bar	3.78	2.73	1.11		
Temperature : °C	155	155	155		175
Vapour Pressure : bar a	6.5	6.02	5.43		
Gf	0.905	0.908	0.912		
Viscosity : cPo	0.17	0.17	0.17		
Fl	0.903	0.776	0.762		
Shut Off P.Drop : bar					7.4
Calculated Cv :	65.86	169.1	183.7		
Inlet Velocity : m/s	0.8	1.6	2.1		
Outlet Pipe DN : mm	200	200	200		
Schedule :	20.0	20.0	20.0		
Sound Level : dBA	no calc	no calc	no calc		
Flowing Condition:	flash.	flash.	flash.		
Lift% : linear	22.0	56.4	61.2		
Signal% : equal %	59.3	85.3	87.5		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 300
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04913-09 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.009 CALC 1

ITEM : 16009 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60031 REVISION : 4 18-07-02
 MN ITEM : 009 V0

CALCULATION SHEET

FLUID : polished water (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	79000	252416	295800		
Inlet Pressure : bar a	8.6	7.7	7.3		8.5
Outlet Pressure : bar a	4.8	5.2	7		
Pressure Drop : bar	3.8	2.5	0.3		
Temperature : °C	54	54	54		70
Vapour Pressure : bar a	0.15	0.15	0.15		
Gf :	0.986	0.986	0.986		
Viscosity : cPo	0.51	0.51	0.51		
F1 :	0.870	0.830	0.700		
Shut Off P.Drop : bar					8.5
Calculated Cv :	47.36	187.4	667.5		
Inlet Velocity : m/s	1.2	3.9	4.6		
Outlet Pipe DN : mm	200	200	200		
Thickness : mm	3.76	3.76	3.76		
Sound Level : dBA	81.6	83.9	71.0		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : equal %	17.1	42.7	79.9		
Signal% : equal %	17.1	42.7	79.9		

PRODUCT TYPE : Butterfly
 Flow Direction : - Trim : -
 Nominal Cv : 1500
 Rating : 150
 Input Size : 6 in Output : 6 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nbr : 2-04913-10 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.010 CALC 1

ITEM : 16010 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60032 REVISION : 4 18-07-02
 MN ITEM : 010 V0

CALCULATION SHEET

FLUID : LP steam (steam)
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	10400	33000	40600		
Inlet Pressure : bar a	6.5	6	5.5		7
Outlet Pressure : bar a	2.8	3.25	2.78		
Pressure Drop : bar	3.7	2.75	2.72		
Temperature : °C	170	170	170		295
Tsh : °C	7.971	11.13	14.51		
MW :	18	18	18		
Cp/Cv :	1.32	1.32	1.32		
Z :	0.97	0.97	0.97		
Fl :	0.810	0.810	0.819		
Shut Off P.Drop : bar					7
Calculated Cv :	173	597.2	790.2		
Outlet Mach : (IEC)	0.047	0.129	0.184		
Sonic Diameter : in	2.56	4.24	5.07		
Outlet Pipe DN : mm	400	400	400		
Schedule :	10.0	10.0	10.0		
Valve SPL : dBA (IEC)	81.3	84.7	84.3		
Lift% : linear	17.3	59.7	79.0		
Signal% : equal %	52.0	86.9	93.7		

PRODUCT TYPE : VARIMAX LO-DB
 Flow Direction : FTC Trim : -
 Nominal Cv : 1000
 Rating : 300
 Input Size : 12 in Output : 12 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04913-11 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.011 CALC 1

ITEM : 16011 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60034A REVISION : 4 18-07-02
 MN ITEM : 011 V0

CALCULATION SHEET

FLUID : Condensate S (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			25000		
Inlet Pressure : bar a			4.5		5.5
Outlet Pressure : bar a			1		
Pressure Drop : bar			3.5		
Temperature : °C			130		150
Vapour Pressure : bar a			2.47		
Gf :			0.937		
Viscosity : cPo			0.218		
F1 :			0.860		
Shut Off P.Drop : bar					5.5
Calculated Cv :			23.85		
Inlet Velocity : m/s			3.7		
Outlet Pipe DN : mm			150		
Schedule :			40.0		
Sound Level : dBA			no calc		
Flowing Condition:			flash.		
Lift% : on/off			0.0		
Signal% : on/off			0.0		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 30
 Rating : 300
 Input Size : 2 in Output : 2 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-12 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.012 CALC 1

ITEM : 16012 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60034B REVISION : 2 18-07-02
 MN ITEM : 012 V0

CALCULATION SHEET

FLUID : cooling water (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			21700		
Inlet Pressure : bar a			5		7
Outlet Pressure : bar a			1		
Pressure Drop : bar			4		
Temperature : °C			27		65
Vapour Pressure : bar a			0.04		
Gf :			0.996		
Viscosity : cPo			0.798		
F1 :			0.900		
Shut Off P.Drop : bar					7
Calculated Cv :			12.78		
Inlet Velocity : m/s			5.3		
Outlet Pipe DN : mm			80		
Schedule :			40.0		
Sound Level : dBA			77.9		
Flowing Condition:			subcrit		
Lift% : on/off			0.0		
Signal% : on/off			0.0		

PRODUCT TYPE : 21000
 Flow Direction : FTO Trim : -
 Nominal Cv : 13
 Rating : 150
 Input Size : 1.5 in Output : 1.5 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01.0 10007
 SERIAL Nr : 2-04913-14 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.014 CALC 1

ITEM : 16014 QTY : 1

ENGINEER : SL

TAG : 30 PV 60102 A

REVISION : 3 18-07-02

MN ITEM : 014 V0

CALCULATION SHEET

FLUID : ethane (gas)
 Critical Pressure: bar a 48.8
 Critical Temp. : °C 32.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	1250		19052		
Inlet Pressure : bar a	7.2		7.1		8.4
Outlet Pressure : bar a	1.3		1.4		
Pressure Drop : bar	5.9		5.7		
Temperature : °C	55		55		80
MW :	30		30		
Cp/Cv :	1.2		1.2		
Z :	0.95		0.95		
F1 :	0.975		0.975		
Shut Off P.Drop : bar					8.4
Calculated Cv :	10.62		164.2		
Outlet Mach :	0.022		0.313		
Sonic Diameter : in	1.19		4.47		
Outlet Pipe DN : mm	250		250		
Schedule :	20.0		20.0		
Valve SPL : dBA	< 70		77.3		
Lift% : linear	5.6		86.4		
Signal% : equal %	24.5		95.9		

PRODUCT TYPE : 41355 LO-DB

Flow Direction : FTO Trim : full

Nominal Cv : 190

Rating : 300

Input Size : 8 in Output : 8 in

MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04913-15 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.015 CALC 1

ITEM : 16015 QTY : 1

ENGINEER : SL

TAG : 30 PV 60102 B

REVISION : 3 18-07-02

MN ITEM : 015 V0

CALCULATION SHEET

FLUID : ethane (gas)
 Critical Pressure: bar a 48.8
 Critical Temp. : °C 32.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	1250		19052		
Inlet Pressure : bar a	7.2		6.7		8.4
Outlet Pressure : bar a	1.3		1.4		
Pressure Drop : bar	5.9		5.3		
Temperature : °C	55		55		80
MW :	30		30		
Cp/Cv :	1.2		1.2		
Z :	0.95		0.95		
F1 :	0.975		0.975		
Shut Off P.Drop : bar					8.4
Calculated Cv :	10.7		175.3		
Outlet Mach :	0.022		0.313		
Sonic Diameter : in	1.19		4.47		
Outlet Pipe DN : mm	200		200		
Schedule :	20.0		20.0		
Valve SPL : dBA	< 70		76.4		
Lift% : linear	5.6		92.3		
Signal% : equal %	24.7		97.7		

PRODUCT TYPE : 41355 LO-DB

Flow Direction : FTO Trim : full

Nominal Cv : 190

Rating : 300

Input Size : 8 in Output : 8 in

MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-16 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLEG0
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.016 CALC 1

ITEM : 16016 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60121 REVISION : 4 18-07-02
 MN ITEM : 016 V0

CALCULATION SHEET

FLUID : oily water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			10300		
Inlet Pressure : bar a			3.8		5.7
Outlet Pressure : bar a			3.4		
Pressure Drop : bar			0.4		
Temperature : °C			48		85
Vapour Pressure : bar a			0.1117		
Gf :			0.996		
Viscosity : cPo			0.85		
F1 :			0.689		
Shut Off P.Drop : bar					5.7
Calculated Cv :			19.08		
Inlet Velocity : m/s			1.4		
Outlet Pipe DN : mm			80		
Schedule :			40.0		
Sound Level : dBA			< 70		
Flowing Condition:			subcrit		
Lift% : on/off			0.0		
Signal% : on/off			0.0		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 20
 Rating : 300
 Input Size : 2 in Output : 2 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-17 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.017 CALC 1

ITEM : 16017 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60122 A REVISION : 3 18-07-02
 MN ITEM : 017 V0

CALCULATION SHEET

FLUID	: Fuel gas	(gas)		
SERVICE CONDITIONS				
Flowrate	: kg/h	2041	5103	20827
Inlet Pressure	: bar a	12.95	10.68	8.36
Outlet Pressure	: bar a	4	4	4
Pressure Drop	: bar	8.95	6.68	4.36
Temperature	: °C	5	48	48
MW	:	16.7	16.7	16.7
Cp/Cv	:	1.3	1.3	1.3
Z	:	0.98	0.98	0.98
F1	:	0.940	0.940	0.940
Shut Off P.Drop	: bar			14
Calculated Cv	:	12.53	40.93	217.7
Outlet Mach	: (IEC)	0.023	0.061	0.248
Sonic Diameter	: in	0.89	1.46	2.94
Outlet Pipe DN	: mm	250	250	250
Schedule	:	20.0	20.0	20.0
Valve SPL	: dBA (IEC)	74.2	79.1	83.2
Lift%	: linear	4.2	13.6	72.6
Signal%	: equal %	20.5	45.1	91.8

PRODUCT TYPE : 41335 LO-DB
 Flow Direction : FTO Trim : full
 Nominal Cv : 300
 Rating : 300
 Input Size : 6 in Output : 6 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-18 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.018 CALC 1

ITEM : 16018 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60122 B REVISION : 4 18-07-02
 MN ITEM : 018 V0

CALCULATION SHEET

FLUID : fuel gas (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			22000		
Inlet Pressure : bar a			5.85		5.5
Outlet Pressure : bar a			3.8		
Pressure Drop : bar			2.05		
Temperature : °C			48		85
MW :			4		
Cp/Cv :			1.39		
Z :			1		
F1 :			0.814		
Shut Off P.Drop : bar					5.5
Calculated Cv :			757.5		
Outlet Mach :			0.153		
Sonic Diameter : in			4.69		
Outlet Pipe DN : mm			350		
Schedule :			10.0		
Valve SPL : dBA			83.0		
Lift% : linear			75.8		
Signal% : equal %			92.7		

PRODUCT TYPE : VARIMAX LO-DB
 Flow Direction : - Trim : -
 Nominal Cv : 1000
 Rating : 300
 Input Size : 12 in Output : 12 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04913-19 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.019 CALC 1

ITEM : 16019 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60211 REVISION : 4 18-07-02
 MN ITEM : 019 V0

CALCULATION SHEET

FLUID : WD (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			20850		
Inlet Pressure : bar a			5.5		7.5
Outlet Pressure : bar a			2.75		
Pressure Drop : bar			2.75		
Temperature : °C			38		100
Vapour Pressure : bar a			0.06		
Gf :			0.993		
Viscosity : cPo			0.68		
Fl :			0.850		
Shut Off P.Drop : bar					7.5
Calculated Cv :			14.9		
Inlet Velocity : m/s			5.1		
Outlet Pipe DN : mm			80		
Schedule :			40.0		
Sound Level : dBA			< 70		
Flowing Condition:			subcrit		
Lift% : linear			99.3		
Signal% : equal %			99.8		

PRODUCT TYPE : CamFlex
 Flow Direction : FTO Trim : full
 Nominal Cv : 15
 Rating : 300
 Input Size : 1.5 in Output : 1.5 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-20 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.020 CALC 1

ITEM : 16020 QTY : 1

ENGINEER : SL
 REVISION : 4 18-07-02
 MN ITEM : 020 V0

TAG : 30 PV 60211 A

CALCULATION SHEET

FLUID : N2 (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			55		
Inlet Pressure : bar a			7		10.5
Outlet Pressure : bar a			2.5		
Pressure Drop : bar			4.5		
Temperature : °C			48		75
MW :			28		
Cp/Cv :			1.4		
Z :			0.99		
Fl :			0.938		
Shut Off P.Drop : bar					10.5
Calculated Cv :			0.4912		
Outlet Mach :			0.031		
Sonic Diameter : in			0.18		
Outlet Pipe DN : mm			40		
Schedule :			80.0		
Valve SPL : dBA			< 70		
Lift% : equal %			67.2		
Signal% : equal %			67.2		

PRODUCT TYPE : 21125
 Flow Direction : FTO
 Nominal Cv : 1.7
 Rating : 300
 Input Size : 1 in
 MN 0109

Trim : -
 Output : 1 in

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-21 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.021 CALC 1

ITEM : 16021 QTY : 1

ENGINEER : SL

TAG : 30 PV 60211B

REVISION : 5 18-07-02

MN ITEM : 021 V0

CALCULATION SHEET

FLUID : nitrogen (gas)
 Critical Pressure: bar a 33.9
 Critical Temp. : °C -147.0

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			55		
Inlet Pressure : bar a			2.5		3.5
Outlet Pressure : bar a			1.1		
Pressure Drop : bar			1.4		
Temperature : °C			55		100
MW :			28		
Cp/Cv :			1.4		
Z :			0.99		
Fl :			0.929		
Shut Off P.Drop : bar					3.5
Calculated Cv :			1.432		
Outlet Mach : (IEC)			0.075		
Sonic Diameter : in			0.27		
Outlet Pipe DN : mm			40		
Schedule :			80.0		
Valve SPL : dBA (IEC)			< 70		
Lift% : equal %			74.9		
Signal% : equal %			74.9		

PRODUCT TYPE : 21125

Flow Direction : FTO

Trim : -

Nominal Cv : 3.8

Rating : 150

Input Size : 1 in

Output : 1 in

MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nbr : 2-04913-22 REVISION : 1
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 12-12-02

PAGE : V0.022 CALC 1

ITEM : 16022 QTY : 1

TAG : 30-PV 60404

ENGINEER : SL
 REVISION : 5 07-10-02
 MN ITEM : 022 V0

CALCULATION SHEET

FLUID : steam
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			156000		
Inlet Pressure : bar a			43		47
Outlet Pressure : bar a			41		
Pressure Drop : bar			2		
Temperature : °C			400		425
Tsh : °C			145.4		
MW :			18.03		
Cp/Cv :			1.3		
Z :			0.9454		
F1 :			0.910		
Shut Off P.Drop : bar					47
Calculated Cv :			1099		
Outlet Mach : (IEC)			0.073		
Sonic Diameter : in			3.19		
Outlet Pipe DN : mm			400		
Schedule :			60.0		
Valve SPL : dBA (IEC)			74.0		
Lift% : linear			78.5		
Signal% : equal %			93.5		

PRODUCT TYPE : 41915
 Flow Direction : FTO
 Nominal Cv : 1400 Trim : full
 Rating : 600
 Input Size : 12 in Output : 12 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-23 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.023 CALC 1

ITEM : 16023 QTY : 1 ENGINEER : SL
 TAG : 30 TV 60402 REVISION : 1 18-07-02
 SERVICE : DESUPERHEATING VALVE MN ITEM : 023 V0

CALCULATION SHEET

FLUID : water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		1100	10100		
Inlet Pressure : bar a		141.9	138.3		172
Outlet Pressure : bar a		46.99	52.11		
Pressure Drop : bar		94.91	86.19		
Temperature : °C		130	130		150
Vapour Pressure : bar a		2.71	2.71		
Gf :	0.9355		0.9355		
Viscosity : cPo		1	1		
F1 :	0.992		0.992		
Calculated Cv :	0.1354		1.305		
Inlet Velocity : m/s		0.2	1.7		
Outlet Pipe DN : mm		50	50		
Schedule :	160.0		160.0		
Sound Level : dBA		< 70	71.7		
Flowing Condition:		subcrit	subcrit		
Lift% : linear		7.5	72.5		
Signal% : equal %		30.1	91.7		

PRODUCT TYPE : 78121
 Flow Direction : FTO Trim : red.
 Nominal Cv : 1.8
 Rating : 1500
 Input Size : 2 in Output : 2 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 ENQUIRY : DESUPERHEATING VALVE
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04913-24 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : - - -
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.024 CALC 1

ITEM : 16024 QTY : 1 ENGINEER : SL
 TAG : 30 TV 60406 A REVISION : 2 18-07-02
 SERVICE : DESUPERHEATING VALVE MN ITEM : 024 V0

CALCULATION SHEET

FLUID : water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	5388	21904	29633		
Inlet Pressure : bar a	147.3	141.2	137.5		172
Outlet Pressure : bar a	41.8	45.5	48.88		
Pressure Drop : bar	105.5	95.7	88.62		
Temperature : °C	130	130	130		150
Vapour Pressure : bar a	2.71	2.71	2.71		
Gf	0.9355	0.9355	0.9355		
Viscosity : cPo	1	1	1		
Fl	0.992	0.992	0.992		
Calculated Cv	0.6291	2.686	3.776		
Inlet Velocity : m/s	0.9	3.6	4.9		
Outlet Pipe DN : mm	80	80	80		
Schedule	160.0	160.0	160.0		
Sound Level : dBA	< 70	72.4	73.2		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	12.6	53.7	75.5		
Signal% : equal %	42.9	84.1	92.7		

PRODUCT TYPE : 78128
 Flow Direction : FTO Trim : full
 Nominal Cv : 5
 Rating : 1500
 Input Size : 2 in Output : 2 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-25 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.025 CALC 1

ITEM : 16025 QTY : 1

ENGINEER : SL

TAG : 30 TV 60406 B

REVISION : 2 18-07-02

MN ITEM : 025 V0

CALCULATION SHEET

FLUID : water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	5388	21904	29633		
Inlet Pressure : bar a	147.3	141.2	137.5		172
Outlet Pressure : bar a	41.8	45.5	48.88		
Pressure Drop : bar	105.5	95.7	88.62		
Temperature : °C	130	130	130		150
Vapour Pressure : bar a	2.71	2.71	2.71		
Gf :	0.9355	0.9355	0.9355		
Viscosity : cPo	1	1	1		
Fl :	0.992	0.992	0.992		
Calculated Cv :	0.6291	2.686	3.776		
Inlet Velocity : m/s	0.9	3.6	4.9		
Outlet Pipe DN : mm	80	80	80		
Schedule :	160.0	160.0	160.0		
Sound Level : dBA	< 70	72.4	73.2		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	12.6	53.7	75.5		
Signal% : equal %	42.9	84.1	92.7		

PRODUCT TYPE : 78128

Flow Direction : FTO

Trim : full

Nominal Cv : 5

Rating : 1500

Input Size : 2 in

Output : 2 in

MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04913-26 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.026 CALC 1

ITEM : 16026 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60411 REVISION : 4 18-07-02
 MN ITEM : 026 V0

CALCULATION SHEET

FLUID : Boiler feed Water (liquid)
 Critical Pressure: bar a 221.29

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	3100	11300	28300		
Inlet Pressure : bar a	147.3	141.9	138.7		172
Outlet Pressure : bar a	36.2	40.7	41		
Pressure Drop : bar	111.1	101.2	97.7		
Temperature : °C	130	130	130		150
Vapour Pressure : bar a	2.7	2.7	2.7		
Gf :	0.934	0.934	0.934		
Viscosity : cPo	0.21	0.21	0.21		
Fl :	0.975	0.975	0.975		
Shut Off P.Drop : bar					172
Calculated Cv :	0.353	1.348	3.438		
Inlet Velocity : m/s	0.5	1.9	4.7		
Outlet Pipe DN : mm	80	80	80		
Schedule :	160.0	160.0	160.0		
Sound Level : dBA	< 70	< 70	73.6		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	7.1	27.0	68.8		
Signal% : equal %	28.8	65.1	90.6		

PRODUCT TYPE : 78128
 Flow Direction : FTO Trim : -
 Nominal Cv : 5
 Rating : 1500
 Input Size : 2 in Output : 2 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-27 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.027 CALC 1

ITEM : 16027 QTY : 1 ENGINEER : SL
 TAG : 30 TV 60416 REVISION : 2 18-07-02
 SERVICE : DESUPERHEATING VALVE MN ITEM : 027 V0

CALCULATION SHEET

FLUID : water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	378	2000	11164		
Inlet Pressure : bar a	40.6	40.7	40.7		44
Outlet Pressure : bar a	19.42	19.93	22.39		
Pressure Drop : bar	21.18	20.77	18.31		
Temperature : °C	130	130	130		150
Vapour Pressure : bar a	2.71	2.71	2.71		
Gf	0.9355	0.9355	0.9355		
Viscosity : cPo	1	1	1		
Fl	0.987	0.972	0.918		
Calculated Cv	0.09851	0.5264	3.145		
Inlet Velocity : m/s	0.2	1.2	6.5		
Outlet Pipe DN : mm	50	50	50		
Schedule	40.0	40.0	40.0		
Sound Level : dBA	< 70	74.4	81.1		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : equal %	11.0	33.4	83.5		
Signal% : equal %	11.0	33.4	83.5		

PRODUCT TYPE : 21124
 Flow Direction : FTO Trim : red.
 Nominal Cv : 6
 Rating : 600
 Input Size : 1 in Output : 1 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-28 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.028 CALC 1

ITEM : 16028 QTY : 1 ENGINEER : SL
 TAG : 30 TV 60426 REVISION : 2 18-07-02
 SERVICE : DESUPERHEATING VALVE MN ITEM : 028 V0

CALCULATION SHEET

FLUID : water (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	620	3500	10600		
Inlet Pressure : bar a	40.6	40.6	40.7		44
Outlet Pressure : bar a	5.56	6.44	9.05		
Pressure Drop : bar	35.04	34.16	31.65		
Temperature : °C	130	130	130		150
Vapour Pressure : bar a	2.71	2.71	2.71		
Gf	0.9355	0.9355	0.9355		
Viscosity : cPo	1	1	1		
Fl	0.975	0.975	0.975		
Calculated Cv	0.1256	0.7184	2.266		
Inlet Velocity : m/s	0.4	2.1	6.2		
Outlet Pipe DN : mm	50	50	50		
Schedule	40.0	40.0	40.0		
Sound Level : dBA	< 70	76.8	78.7		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : linear	4.5	25.7	80.9		
Signal% : equal %	21.4	63.6	94.3		

PRODUCT TYPE : 21014-2S
 Flow Direction : FTO Trim : red.
 Nominal Cv : 2.8
 Rating : 600
 Input Size : 1 in Output : 1 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-29 REVISION : 1
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 12-12-02

PAGE : V0.029 CALC 1

ITEM : 16029 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60427 REVISION : 5 07-10-02
 MN ITEM : 029 V0

CALCULATION SHEET

FLUID : LP steam (steam)
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	35000	58000	65000		
Inlet Pressure : bar a	7.2	7.2	7.2		7
Outlet Pressure : bar a	1.945	3.062	3.504		
Pressure Drop : bar	5.255	4.138	3.696		
Temperature : °C	170	170	190		220
Tsh : °C	3.861	3.861	23.86		
MW :	18	18	18		
Cp/Cv :	1.35	1.35	1.35		
Z :	0.96	0.96	0.96		
F1 :	0.923	0.909	0.903		
Shut Off P.Drop : bar					7
Calculated Cv :	466.4	788.5	919.4		
Outlet Mach :	0.376	0.396	0.397		
Sonic Diameter : in	6.13	6.29	6.30		
Outlet Pipe DN : mm	400	400	400		
Schedule :	10.0	10.0	10.0		
Valve SPL : dBA	115.1	115.5	115.1		
Lift% : linear	46.6	78.8	91.9		
Signal% : equal %	80.9	93.7	97.6		

PRODUCT TYPE : 41000
 Flow Direction : FTO Trim : full
 Nominal Cv : 1000
 Rating : 300
 Input Size : 10 in Output : 10 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-30 REVISION : 1
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 12-12-02

PAGE : V0.030 CALC 1

ITEM : 16029 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60427 REVISION : 4 07-10-02
 MN ITEM : 030 V0

CALCULATION SHEET

FLUID : LP steam (steam)
 Critical Pressure: bar a 221.2
 Critical Temp. : °C 374.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	35000	58000	65000		
Inlet Pressure : bar a	1.945	3.062	3.504		7
Outlet Pressure : bar a	1.3	1.6	1.7		
Pressure Drop : bar	0.6452	1.462	1.804		
Temperature : °C	170	170	190		220
Tsh : °C	3.861	3.861	190		
MW :	18	18	18		
Cp/Cv :	1.35	1.35	1.35		
Z :	0.96	0.96	0.96		
F1 :	0.800	0.800	0.800		
Shut Off P.Drop : bar					7
Cv :	2000	2000	2000		
Outlet Mach :	0.242	0.326	0.352		
Sonic Diameter : in	7.50	8.71	9.04		
Outlet Pipe DN : mm	400	400	400		
Schedule :	10.0	10.0	10.0		
Valve SPL : dBA	82.6	90.2	91.6		
Lift% : linear	100.0	100.0	100.0		
Signal% : equal %	100.0	100.0	100.0		

PRODUCT TYPE : MULTIHOLE PLATE
 Flow Direction : - Trim : -
 Nominal Cv : 2000
 Rating : 300
 Input Size : 16 in Output : 16 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-33 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60-
 DATED : 10-04-02
 DATED : 26-09-02

PAGE : V0.033 CALC 1

ITEM : 033 QTY : 1 ENGINEER : SL
 TAG : 30 PCV 60063 REVISION : 1 26-09-02
 MN ITEM : 033 V0

CALCULATION SHEET

FLUID : C2H6S2 (liquid)
 Critical Pressure: bar a 47

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : l/min				1	
Inlet Pressure : bar a				10	11.5
Outlet Pressure : bar a				1.25	
Pressure Drop : bar				8.75	
Temperature : °C				48	65
Vapour Pressure : bar a				0.11	
Gf :				1.063	
Viscosity : cPo				0.27	
F1 :				0.980	
Shut Off P.Drop : bar					11.5
Calculated Cv :			0.02426		
Inlet Velocity : m/s			0.1		
Outlet Pipe DN : mm			15		
Schedule :			80.0		
Sound Level : dBA			< 70		
Flowing Condition:			subcrit		
Lift% : linear			74.6		
Signal% : linear			74.6		

PRODUCT TYPE : VARILOG
 Flow Direction : FTO Trim : -
 Nominal Cv : 0.05 Adjusted : .0325
 Rating : 300
 Input Size : 0.5 in Output : 0.5 in
 MN 0109




UNIT 70

CALCULATION SHEETS
(valves, actuators, safety devices, flow measuring devices)

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
2002.12.20 09:57:20 +01'00'
<none>

STATUS CERTIFIED "FINAL" ISSUED BY : S. LEGE DATE : 16/12/02

1	16/12/02	Up-date				
0	27/09/02	FIRST ISSUE				
REV	DATE	DESCRIPTION				
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007				
		EQUIPMENT NAME: Control valves				
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant					
	DOCUMENT TITLE : Calculation sheets	DOCUMENT CODE : A 3102				
	PURCHASE ORDER : 02-4914 (Unit 70)	<table border="1"> <tr> <td>Sheet</td> <td>Rev.</td> </tr> <tr> <td align="center">01 of 23</td> <td align="center">1</td> </tr> </table>	Sheet	Rev.	01 of 23	1
Sheet	Rev.					
01 of 23	1					



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-01 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.001 CALC 1

ITEM : 17001 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70002 REVISION : 3 18-07-02
 MN ITEM : 001 V0

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			7220		
Inlet Pressure : bar a			19		24.2
Outlet Pressure : bar a			1.5		
Pressure Drop : bar			17.5		
Temperature : °C			45		60
MW :			28.05		
Cp/Cv :			1.33		
Z :			0.89		
F1 :			0.975		
Shut Off P.Drop : bar					24.2
Calculated Cv :			21.94		
Outlet Mach :			0.414		
Sonic Diameter : in			2.57		
Outlet Pipe DN : mm			150		
Schedule :			40.0		
Valve SPL : dBA			70.4		
Lift% : linear			73.1		
Signal% : equal %			91.9		

PRODUCT TYPE : 41355 LO-DB
 Flow Direction : FTO Trim : red.
 Nominal Cv : 30
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-02 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.002 CALC 1

ITEM : 17002 QTY : 1

ENGINEER : SL
 REVISION : 5 18-07-02
 MN ITEM : 002 V0

TAG : 30 FV 70021

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.3

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			31860		
Inlet Pressure : bar a			37.7		39.9
Outlet Pressure : bar a			1		
Pressure Drop : bar			36.7		
Temperature : °C			-102		-104
Vapour Pressure : bar a			1.02		
Gf			0.5686		
Viscosity : cPo			0.16		
Fl			0.939		
Shut Off P.Drop : bar					39.9
Calculated Cv			8.619		
Inlet Velocity : m/s			3.4		
Outlet Pipe DN : mm			100		
Thickness : mm			3.05		
Sound Level : dBA			no calc		
Flowing Condition:			flash.		
Lift% : equal %			66.0		
Signal% : equal %			66.0		

PRODUCT TYPE : 21124

Flow Direction : FTO Trim : red.

Nominal Cv : 31

Rating : 300

Input Size : 3 in Output : 3 in

MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.003 CALC 1

ITEM : 17003 QTY : 1

ENGINEER : SL
 REVISION : 4 18-07-02
 MN ITEM : 003 V0

TAG : 30 PV 70023 A

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			1805		
Inlet Pressure : bar a			22.5		24.2
Outlet Pressure : bar a			1		
Pressure Drop : bar			21.5		
Temperature : °C			45		-104.60
MW :			28.05		
Cp/Cv :			1.35		
Z :			0.845		
F1 :			0.975		
Shut Off P.Drop : bar					24.2
Calculated Cv :			4.48		
Outlet Mach :			0.267		
Sonic Diameter : in			1.55		
Outlet Pipe DN : mm			100		
Thickness : mm			3.05		
Valve SPL : dBA			70.3		
Lift% : linear			56.0		
Signal% : equal %			85.2		

PRODUCT TYPE : 41335 LO-DB
 Flow Direction : FTO Trim : -
 Nominal Cv : 8
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nbr : 2-04914-04 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.004 CALC 1

ITEM : 17004 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70023B REVISION : 4 18-07-02
 MN ITEM : 004 V0

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		400	440		
Inlet Pressure : bar a		31	29.7		35
Outlet Pressure : bar a		1	1		
Pressure Drop : bar		30	28.7		
Temperature : °C		-11.6	-11.6		-104.60
MW :		28.05	28.05		
Cp/Cv :		1.25	1.25		
Z :		0.61	0.61		
F1 :		0.975	0.975		
Shut Off P.Drop : bar					35
Calculated Cv :		0.5769	0.6624		
Outlet Mach :		0.427	0.469		
Sonic Diameter : in		0.65	0.68		
Outlet Pipe DN : mm		50	50		
Thickness : mm		2.77	2.77		
Valve SPL : dBA		< 70	< 70		
Lift% : linear		64.1	73.6		
Signal% : equal %		88.8	92.1		

PRODUCT TYPE : 21014 2S
 Flow Direction : FTO Trim : -
 Nominal Cv : 0.9
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109

Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-05 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.005 CALC 1

ITEM : 17005 QTY : 1

ENGINEER : SL

TAG : 30 PV 70023C

REVISION : 5 18-07-02

MN ITEM : 005 V0

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER
Flowrate : kg/h			7220	
Inlet Pressure : bar a			1.08	
Outlet Pressure : bar a			1.05	
Pressure Drop : bar			0.03	
Temperature : °C			-103	
MW :			28.05	
Cp/Cv :			1.31	
Z :			0.97	
Fl :			0.768	
Calculated Cv :			1057	
Outlet Mach : (IEC)			0.053	
Sonic Diameter : in			2.72	
Outlet Pipe DN : mm			350	
Thickness : mm			4.78	
Valve SPL : dBA (IEC)			< 70	
Lift% : linear			60.4	
Signal% : equal %			87.2	

PRODUCT TYPE : CamFlex
 Flow Direction : FTC
 Nominal Cv : 1750
 Rating : 300
 Input Size : 12 in
 MN 0109

Trim : full

Output : 12 in



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-06 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.006 CALC 1

ITEM : 17006 QTY : 1 ENGINEER : SL
 TAG : 30 FV 70024 REVISION : 4 18-07-02
 MN ITEM : 006 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.3

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			31860		
Inlet Pressure : bar a			37.7		39.9
Outlet Pressure : bar a			1		
Pressure Drop : bar			36.7		
Temperature : °C			-102		-104
Vapour Pressure : bar a			1.02		
Gf :			0.5686		
Viscosity : cPo			0.016		
F1 :			0.939		
Shut Off P.Drop : bar					39.9
Calculated Cv :			8.619		
Inlet Velocity : m/s			3.4		
Outlet Pipe DN : mm			100		
Thickness : mm			3.05		
Sound Level : dBA			no calc		
Flowing Condition:			flash.		
Lift% : equal %			66.0		
Signal% : equal %			66.0		

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : -
 Nominal Cv : 31
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04914-07 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.007 CALC 1

ITEM : 17007 QTY : 1

ENGINEER : SL

TAG : 30 LV 70041

REVISION : 4 18-07-02

MN ITEM : 007 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.3

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM OTHER	DESIGN
Flowrate : kg/h	12621	126214		
Inlet Pressure : bar a	39.63	31.96		40.313
Outlet Pressure : bar a	29.01	31.26		
Pressure Drop : bar	10.62	0.7		
Temperature : °C	-102.2	-102.2		-104.60
Vapour Pressure : bar a	1.02	1.02		
Gf :	0.567	0.567		
Viscosity : cPo	0.17	0.17		
F1 :	0.940	0.915		
Shut Off P.Drop : bar				39.3
Calculated Cv :	5.966	234.1		
Inlet Velocity : m/s	0.3	3.4		
Outlet Pipe DN : mm	200	200		
Thickness : mm	3.76	3.76		
Sound Level : dBA	81.5	73.8		
Flowing Condition:	subcrit	subcrit		
Lift% : equal %	11.1	89.3		
Signal% : equal %	11.1	89.3		

PRODUCT TYPE : 41325

Flow Direction : FTO

Trim : full

Nominal Cv : 360

Rating : 300

Input Size : 6 in

Output : 6 in

MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-08 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.008 CALC 1

ITEM : 17008 QTY : 1

ENGINEER : SL
 REVISION : 3 18-07-02
 MN ITEM : 008 V0

TAG : 30 PV 70042

CALCULATION SHEET

FLUID : Condensate LP (liquid)
 Critical Pressure: bar a 221

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			34675		
Inlet Pressure : bar a			4.3		7
Outlet Pressure : bar a			1.4		
Pressure Drop : bar			2.9		
Temperature : °C			146.2		220
Vapour Pressure : bar a			4.3		
Gf :			0.920		
Viscosity : cPo			0.186		
F1 :			0.735		
Shut Off P.Drop : bar					7
Calculated Cv :			99.03		
Inlet Velocity : m/s			1.3		
Outlet Pipe DN : mm			250		
Schedule :			20.0		
Sound Level : dBA			no calc		
Flowing Condition:			flash.		
Lift% : linear			71.8		
Signal% : equal %			91.5		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 138
 Rating : 300
 Input Size : 4 in Output : 4 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-09 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.009 CALC 1

ITEM : 17009 QTY : 1

ENGINEER : SL
 REVISION : 3 18-07-02
 MN ITEM : 009 V0

TAG : 30 TV 70048

CALCULATION SHEET

FLUID : methanol (liquid)
 Critical Pressure: bar a 33.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	1189		11891		
Inlet Pressure : bar a	4.46		4.11		5.5
Outlet Pressure : bar a	4		4		
Pressure Drop : bar	0.46		0.11		
Temperature : °C	105.3		105.3		-12.125
Vapour Pressure : bar a	3.9		3.9		
Gf :	0.694		0.694		
Viscosity : cPo	0.21		0.21		
F1 :	0.940		0.765		
Shut Off P.Drop : bar					0.5
Calculated Cv :	2.441		50.06		
Inlet Velocity : m/s	0.1		1.0		
Outlet Pipe DN : mm	100		100		
Schedule :	40.0		40.0		
Sound Level : dBA	< 70		< 70		
Flowing Condition:	subcrit		subcrit		
Lift% : linear	3.0		61.8		
Signal% : equal %	16.6		87.8		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : red.
 Nominal Cv : 81
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-10 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.010 CALC 1

ITEM : 17010 QTY : 1 ENGINEER : SL
 TAG : 30 FV 70061 REVISION : 5 18-07-02
 MN ITEM : 010 V0

CALCULATION SHEET

FLUID : ethane (liquid)
 Critical Pressure: bar a 48.8

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			23980		
Inlet Pressure : bar a			11.3		13.5
Outlet Pressure : bar a			1		
Pressure Drop : bar			10.3		
Temperature : °C			-87		-95
Vapour Pressure : bar a			1.02		
Gf :			0.5447		
Viscosity : cPo			0.163		
Fl :			0.925		
Shut Off P.Drop : bar					13.5
Calculated Cv :			12.71		
Inlet Velocity : m/s			2.7		
Outlet Pipe DN : mm			100		
Thickness : mm			3.05		
Sound Level : dBA			no calc		
Flowing Condition:			flash.		
Lift% : equal %			77.3		
Signal% : equal %			77.3		

PRODUCT TYPE : 20125
 Flow Direction : FTO Trim : -
 Nominal Cv : 31
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-11 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.011 CALC 1

ITEM : 17011 QTY : 1

ENGINEER : SL

TAG : 30 PV 70063A

REVISION : 4 18-07-02

MN ITEM : 011 V0

CALCULATION SHEET

FLUID : ethane (gas)
 Critical Pressure: bar a 48.8
 Critical Temp. : °C 32.2

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	236		384		
Inlet Pressure : bar a	7.42		6.51		9
Outlet Pressure : bar a	1.02		1.13		
Pressure Drop : bar	6.4		5.38		
Temperature : °C	-39.4		-41.5		-88.60
MW :	30.2		30.2		
Cp/Cv :	1.3		1.3		
Z :	0.88		0.88		
Fl :	0.950		0.950		
Shut Off P.Drop : bar					9
Calculated Cv :	1.565		2.89		
Outlet Mach : (IEC)	0.088		0.129		
Sonic Diameter : in	0.47		0.56		
Outlet Pipe DN : mm	80		80		
Thickness : mm	3.05		3.05		
Valve SPL : dBA (IEC)	72.5		79.7		
Lift% : linear	19.6		36.1		
Signal% : equal %	55.6		73.8		

PRODUCT TYPE : 21700 LO-DB
 Flow Direction : -
 Nominal Cv : 8
 Rating : 150
 Input Size : 1.5 in
 MN 0109

Trim : -
 Output : 1.5 in



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-12 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.012 CALC 1

ITEM : 17012 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70063B REVISION : 5 18-07-02
 MN ITEM : 012 V0

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.3

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		410	8979		
Inlet Pressure : bar a		5.71	4.89		13.3
Outlet Pressure : bar a		1.1	1.41		
Pressure Drop : bar		4.61	3.48		
Temperature : °C		-72	-75		-104.60
Vapour Pressure : bar a		4.78	4.23		
Gf :		0.519	0.516		
Viscosity : cPo		0.11	0.11		
F1 :		0.985	0.914		
Shut Off P.Drop : bar					13.3
Calculated Cv :		0.5409	14.75		
Inlet Velocity : m/s		0.1	2.4		
Outlet Pipe DN : mm		100	100		
Thickness : mm		3.05	3.05		
Sound Level : dBA		no calc	no calc		
Flowing Condition:		flash.	flash.		
Lift% : equal %		12.9	85.5		
Signal% : equal %		12.9	85.5		

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : red.
 Nominal Cv : 26
 Rating : 300
 Input Size : 2 in Output : 2 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-13 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

ITEM : 17013 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70063C REVISION : 4 18-07-02
 MN ITEM : 013 V0

CALCULATION SHEET

FLUID : Ethane BOG (gas)

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			7453		
Inlet Pressure : bar a			1.08		0.1
Outlet Pressure : bar a			1.062		
Pressure Drop : bar			0.018		
Temperature : °C			-87.5		-95
MW :			30.06		
Cp/Cv :			1.26		
Z :			0.97		
Fl :			0.718		
Shut Off P.Drop : bar					0.1
Calculated Cv :			1413		
Outlet Mach : (IEC)			0.056		
Sonic Diameter : in			2.79		
Outlet Pipe DN : mm			350		
Thickness : mm			4.78		
Valve SPL : dBA (IEC)			< 70		
Lift% : linear			80.8		
Signal% : equal %			94.2		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 1750
 Rating : 150
 Input Size : 12 in Output : 12 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-14 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.014 CALC 1

ITEM : 17014 QTY : 1

ENGINEER : SL

TAG : 30 FV 70064

REVISION : 4 18-07-02

MN ITEM : 014 V0

CALCULATION SHEET

FLUID : ethane (liquid)
 Critical Pressure: bar a 48.8

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			23980		
Inlet Pressure : bar a			11.3		13.5
Outlet Pressure : bar a			1		
Pressure Drop : bar			10.3		
Temperature : °C			-87		-95
Vapour Pressure : bar a			1.02		
Gf :			0.5447		
Viscosity : cPo			0.163		
F1 :			0.925		
Shut Off P.Drop : bar					13.5

Calculated Cv :	12.71
Inlet Velocity : m/s	2.7
Outlet Pipe DN : mm	100
Thickness : mm	3.05
Sound Level : dBA	no calc
Flowing Condition:	flash.
Lift% : equal %	77.3
Signal% : equal %	77.3

PRODUCT TYPE : 21125

Flow Direction : FTO

Trim : red.

Nominal Cv : 31

Rating : 300

Input Size : 3 in

Output : 3 in

MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-15 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.015 CALC 1

ITEM : 17015 QTY : 1 ENGINEER : SL
 TAG : 30 FV 70065 REVISION : 4 18-07-02
 MN ITEM : 015 V0

CALCULATION SHEET

FLUID : ethane (liquid)
 Critical Pressure: bar a 49

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			55300		
Inlet Pressure : bar a			18.25		22.5
Outlet Pressure : bar a			1.27		
Pressure Drop : bar			16.98		
Temperature : °C			-69		-90.60
Vapour Pressure : bar a			2.46		
Gf :			0.524		
Viscosity : cPo			0.13		
F1 :			0.918		
Shut Off P.Drop : bar					22.5
Calculated Cv :			24.37		
Inlet Velocity : m/s			6.4		
Outlet Pipe DN : mm			250		
Thickness : mm			4.19		
Sound Level : dBA			no calc		
Flowing Condition:			flash.		
Lift% : equal %			83.3		
Signal% : equal %			83.3		

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : red.
 Nominal Cv : 47
 Rating : 300
 Input Size : 3 in Output : 3 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-16 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.016 CALC 1

ITEM : 17016 QTY : 1

ENGINEER : SL

TAG : 30 PV 70081 A

REVISION : 3 18-07-02

MN ITEM : 016 V0

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		350	420		
Inlet Pressure : bar a		30.9	28.5		
Outlet Pressure : bar a		14	14		35
Pressure Drop : bar		16.9	14.5		
Temperature : °C		27	27		
MW :		28.05	28.05		60
Cp/Cv :		1.25	1.25		
Z :		0.785	0.785		
Fl :		0.928	0.919		
Shut Off P.Drop : bar					35

Calculated Cv :	0.6534	0.8639
Outlet Mach : (IEC)	0.038	0.045
Sonic Diameter : in	0.19	0.21
Outlet Pipe DN : mm	40	40
Schedule :	80.0	80.0
Valve SPL : dBA (IEC)	< 70	70.9
Lift% : equal %	75.5	82.8
Signal% : equal %	75.5	82.8

PRODUCT TYPE : 21125
 Flow Direction : FTO
 Nominal Cv : 1.7
 Rating : 300
 Input Size : 1 in
 MN 0109

Trim : -

Output : 1 in

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-17 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70-
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.017 CALC 1

ITEM : 17017 QTY : 1

ENGINEER : SL

TAG : 30 PV 70081 B

REVISION : 2 18-07-02

MN ITEM : 017 V0

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		290.4	351.9		
Inlet Pressure : bar a		15.3	14.9		15
Outlet Pressure : bar a		14.2	14.2		
Pressure Drop : bar		1.1	0.7		
Temperature : °C		45	45		60
MW :		28.05	28.05		
Cp/Cv :		1.25	1.25		
Z :		0.92	0.92		
Fl :		0.810	0.740		
Shut Off P.Drop : bar					15
Calculated Cv :		2.567	3.907		
Outlet Mach : (IEC)		0.032	0.039		
Sonic Diameter : in		0.18	0.19		
Outlet Pipe DN : mm		50	50		
Schedule :		40.0	40.0		
Valve SPL : dBA (IEC)		< 70	< 70		
Lift% : linear		45.8	69.8		
Signal% : equal %		80.6	90.9		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC
 Nominal Cv : 5.6
 Rating : 300
 Input Size : 1 in
 MN 0109

Trim : red.

Output : 1 in



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-18 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.018 CALC 1

ITEM : 17018 QTY : 1 ENGINEER : SL
 TAG : 30 FV 70082 REVISION : 3 18-07-02
 MN ITEM : 018 V0

CALCULATION SHEET

FLUID : C3 (liquid)
 Critical Pressure: bar a 59.8

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h	4277	10691	12830		
Inlet Pressure : bar a	22.7	19.9	18.5		26.5
Outlet Pressure : bar a	17.9	17.9	18		
Pressure Drop : bar	4.8	2	0.5		
Temperature : °C	45	45	45		60
Vapour Pressure : bar a	13.1	13.1	13.1		
Gf	0.592	0.592	0.592		
Viscosity : cPo	0.123	0.123	0.123		
Fl	0.977	0.944	0.912		
Shut Off P.Drop : bar					26.5

Calculated Cv :	2.944	11.45	28.07		
Inlet Velocity : m/s	1	2.5	3.0		
Outlet Pipe DN : mm	100	100	100		
Schedule :	40.0	40.0	40.0		
Sound Level : dBA	66.3	64.6	56.5		
Flowing Condition:	subcrit	subcrit	subcrit		
Lift% : equal %	26.9	62.8	87.4		
Signal% : equal %	26.9	62.8	87.4		

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : full
 Nominal Cv : 46
 Rating : 300
 Input Size : 2 in Output : 2 in
 MN 0109



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-19 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.019 CALC 1

ITEM : 17019 QTY : 1

ENGINEER : SL
 REVISION : 2 18-07-02
 MN ITEM : 019 V0

TAG : 30 FV 70091

CALCULATION SHEET

FLUID : ethylene (liquid)
 Critical Pressure: bar a 50.3

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		12626	13889		
Inlet Pressure : bar a		18	16.5		23.6
Outlet Pressure : bar a		14	14		
Pressure Drop : bar		4	2.5		
Temperature : °C		-32.6	-35.7		-54
Vapour Pressure : bar a		18	16.5		
Gf :	0.4457		0.4524		
Viscosity : cPo		0.07	0.07		
F1 :	0.720		0.685		
Shut Off P.Drop : bar					23.6
Calculated Cv :		15.84	19.34		
Inlet Velocity : m/s		3.9	4.2		
Outlet Pipe DN : mm		100	100		
Schedule :		40.0	40.0		
Sound Level : dBA		no calc	no calc		
Flowing Condition:		flash.	flash.		
Lift% : linear		79.2	96.7		
Signal% : equal %		93.8	99.0		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC Trim : full
 Nominal Cv : 20
 Rating : 300
 Input Size : 2 in Output : 2 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-20 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.020 CALC 1

ITEM : 17020 QTY : 1

ENGINEER : SL

TAG : 30 PV 70091

REVISION : 2 18-07-02

MN ITEM : 020 V0

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		370			
Inlet Pressure : bar a		21			23.6
Outlet Pressure : bar a		1.5			
Pressure Drop : bar		19.5			
Temperature : °C		-27			-104
MW :		28.05			
Cp/Cv :		1.25			
Z :		0.72			
F1 :		0.975			
Shut Off P.Drop : bar					23.6
Calculated Cv :		0.831			
Outlet Mach :		0.277			
Sonic Diameter : in		0.53			
Outlet Pipe DN : mm		80			
Thickness : mm		3.05			
Valve SPL : dBA		71.1			
Lift% : linear		55.4			
Signal% : equal %		84.9			

PRODUCT TYPE : 21014-2S
 Flow Direction : FTO
 Nominal Cv : 1.5
 Rating : 300
 Input Size : 1 in
 MN 0109

Trim : red.

Output : 1 in



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04914-21 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.021 CALC 1

ITEM : 17021 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70094 A REVISION : 4 18-07-02
 MN ITEM : 021 V0

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		797	797		
Inlet Pressure : bar a		30.6	28.3		35
Outlet Pressure : bar a		18	18		
Pressure Drop : bar		12.6	10.3		
Temperature : °C		27	27		
MW :		28.05	28.05		0.60
Cp/Cv :		1.25	1.25		
Z :		0.78	0.78		
F1 :		0.925	0.922		
Calculated Cv :		1.585	1.77		
Outlet Mach : (IEC)		0.067	0.067		
Sonic Diameter : in		0.25	0.25		
Outlet Pipe DN : mm		50	50		
Schedule :		40.0	40.0		
Valve SPL : dBA (IEC)		73.9	73.3		
Lift% : equal %		77.9	80.9		
Signal% : equal %		77.9	80.9		

PRODUCT TYPE : 21125
 Flow Direction : FTO Trim : -
 Nominal Cv : 3.8
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-22 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.022 CALC 1

ITEM : 17022 QTY : 1

ENGINEER : SL

TAG : 30 PV 70094 B

REVISION : 2 18-07-02

MN ITEM : 022 V0

CALCULATION SHEET

FLUID : ethylene (gas)
 Critical Pressure: bar a 51.2
 Critical Temp. : °C 9.9

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h		370	4230		
Inlet Pressure : bar a		18	18		23
Outlet Pressure : bar a		12.4	14.5		
Pressure Drop : bar		5.6	3.5		
Temperature : °C		-32.6	-32.6		-54
MW :		28.05	28.05		
Cp/Cv :		1.25	1.25		
Z :		0.745	0.745		
F1 :		0.940	0.772		
Shut Off P.Drop : bar					23
Calculated Cv :		1.251	17.72		
Outlet Mach : (IEC)		0.016	0.154		
Sonic Diameter : in		0.20	0.62		
Outlet Pipe DN : mm		100	100		
Schedule :		40.0	40.0		
Valve SPL : dBA (IEC)		< 70	78.0		
Lift% : linear		4.2	59.1		
Signal% : equal %		20.5	86.6		

PRODUCT TYPE : CamFlex
 Flow Direction : FTC
 Nominal Cv : 30
 Rating : 300
 Input Size : 1.5 in
 MN 0109

Trim : full

Output : 1.5 in




UNIT 80

CALCULATION SHEETS
(valves, actuators, safety devices, flow measuring devices)

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY: TECHNIP
2002.12.20 10:00:41 +01'00'
<none>

STATUS CERTIFIED "FINAL" ISSUED BY : S. LEGE DATE : 16/12/02

1	16/12/02	Up-date
0	27/09/02	FIRST ISSUE
REV	DATE	DESCRIPTION
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007
		EQUIPMENT NAME: Control valves
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	
	DOCUMENT TITLE : Calculation sheets	DOCUMENT CODE : A 3102
	PURCHASE ORDER : 02-4915 (Unit 80)	Sheet 01 of 05
		Rev. 1



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04915-01 REVISION : 1
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE80
 DATED : 10-04-02
 DATED : 12-12-02

PAGE : V0.001 CALC 1

ITEM : 18001 QTY : 1 ENGINEER : SL
 TAG : 30 PCV 80043 REVISION : 3 14-11-02
 MN ITEM : 001 V0

CALCULATION SHEET

FLUID : nitrogen (gas)
 Critical Pressure: bar a 33.9
 Critical Temp. : °C -147.0

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER
Flowrate : kg/h			10.5	
Inlet Pressure : bar a			2	
Outlet Pressure : bar a			1.1	
Pressure Drop : bar			0.9	
Temperature : °C			48	
MW :			28	
Cp/Cv :			1.4	
Z :			0.99	
Fl :			0.900	
Calculated Cv :			0.357	
Outlet Mach :			0.014	
Sonic Diameter : in			0.12	
Outlet Pipe DN : mm			40	
Schedule :			40.0	
Valve SPL : dBA			< 70	
Lift% : linear			59.5	
Signal% : linear			59.5	

PRODUCT TYPE : 536 V
 Flow Direction : FTO Trim : -
 Nominal Cv : 0.6 Adjusted : .6000
 Rating : 150
 Input Size : 1 in Output : 1 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04915-02 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE80
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.002 CALC 1

ITEM : 18002 QTY : 1

ENGINEER : SL

TAG : 30 PCV 80045

REVISION : 2 05-08-02

MN ITEM : 002 V0

CALCULATION SHEET

FLUID : CH3OH (liquid)
 Critical Pressure: bar a 73.8

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER
Flowrate : kg/h			2270	
Inlet Pressure : bar a			35	
Outlet Pressure : bar a			19	
Pressure Drop : bar			16	
Temperature : °C			48	
Vapour Pressure : bar a			0.04	
Gf :			0.756	
Viscosity : cPo			0.44	
Fl :			0.920	

Calculated Cv :	0.7573
Inlet Velocity : m/s	1.6
Outlet Pipe DN : mm	40
Schedule :	80.0
Sound Level : dBA	71.0
Flowing Condition:	subcrit
Lift% : linear	63.1
Signal% : linear	63.1

PRODUCT TYPE : 535 V

Flow Direction : FTO

Nominal Cv : 1.2

Rating : 300

Input Size : 1 in

MN 0109

Trim : full

Adjusted : 1.200

Output : 1 in

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04915-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE80-
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.003 CALC 1

ITEM : 18003 QTY : 1

ENGINEER : SL
 REVISION : 1 04-09-02
 MN ITEM : 003 V0

TAG : 30 PCV 80029

CALCULATION SHEET

FLUID : wash oil (liquid)

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : l/mn			83.34		
Inlet Pressure : bar a			37.1		39.1
Outlet Pressure : bar a			1		
Pressure Drop : bar			36.1		
Temperature : °C			48		65
Gf :			0.900		
Viscosity : cPo			2.5		
F1 :			0.975		
Shut Off P.Drop : bar					39.1
Calculated Cv :			0.9272		
Inlet Velocity : m/s			2.7		
Outlet Pipe DN : mm			50		
Schedule :			40.0		
Sound Level : dBA			72.5		
Flowing Condition:			cavit.		
Lift% : linear			71.3		
Signal% : linear			71.3		

PRODUCT TYPE : 21014-2S
 Flow Direction : FTO
 Nominal Cv : 1.3
 Rating : 300
 Input Size : 1 in
 MN 0109

Trim : red.

Output : 1 in

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04915-04 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE80
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.004 CALC 1

ITEM : 18004 QTY : 1

ENGINEER : SL
 REVISION : 1 04-09-02
 MN ITEM : 004 V0

TAG : 30 PCV 80049

CALCULATION SHEET

FLUID : Methanol (liquid)
 Critical Pressure: bar a 73.8

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			2420		
Inlet Pressure : bar a			35		39
Outlet Pressure : bar a			0.8		
Pressure Drop : bar			34.2		
Temperature : °C			48		48
Vapour Pressure : bar a			0.04		
Gf :			0.764		
Viscosity : cPo			0.44		
F1 :			0.975		
Shut Off P.Drop : bar					39
Calculated Cv :			0.5572		
Inlet Velocity : m/s			1.7		
Outlet Pipe DN : mm			50		
Schedule :			40.0		
Sound Level : dBA			< 70		
Flowing Condition:			cavit.		
Lift% : linear			42.9		
Signal% : linear			42.9		

PRODUCT TYPE : 21014-2S
 Flow Direction : FTO
 Nominal Cv : 1.3
 Rating : 300
 Input Size : 1 in
 MN 0109

Trim : red.




Output : 1 in

CALCULATION SHEETS
(valves, actuators, safety devices, flow measuring devices)

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY: TECHNIP
2002.12.20 10:00:41 +01'00'
<none>

STATUS CERTIFIED "FINAL" ISSUED BY : S. LEGE DATE : 16/12/02

1	16/12/02	Up-date	
0	27/09/02	FIRST ISSUE	
REV	DATE	DESCRIPTION	
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007	
		EQUIPMENT NAME: Control valves	
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant		
	DOCUMENT TITLE : Calculation sheets	DOCUMENT CODE : A 3102	
	PURCHASE ORDER : 02-4915 (Unit 80)	Sheet 01 of 05	Rev. 1



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04915-01 REVISION : 1
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE80
 DATED : 10-04-02
 DATED : 12-12-02

PAGE : V0.001 CALC 1

ITEM : 18001 QTY : 1 ENGINEER : SL
 TAG : 30 PCV 80043 REVISION : 3 14-11-02
 MN ITEM : 001 V0

CALCULATION SHEET

FLUID : nitrogen (gas)
 Critical Pressure: bar a 33.9
 Critical Temp. : °C -147.0

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER
Flowrate : kg/h			10.5	
Inlet Pressure : bar a			2	
Outlet Pressure : bar a			1.1	
Pressure Drop : bar			0.9	
Temperature : °C			48	
MW :			28	
Cp/Cv :			1.4	
Z :			0.99	
Fl :			0.900	
Calculated Cv :			0.357	
Outlet Mach :			0.014	
Sonic Diameter : in			0.12	
Outlet Pipe DN : mm			40	
Schedule :			40.0	
Valve SPL : dBA			< 70	
Lift% : linear			59.5	
Signal% : linear			59.5	

PRODUCT TYPE : 536 V
 Flow Direction : FTO Trim : -
 Nominal Cv : 0.6 Adjusted : .6000
 Rating : 150
 Input Size : 1 in Output : 1 in
 MN 0109



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04915-02 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE80
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.002 CALC 1

ITEM : 18002 QTY : 1 ENGINEER : SL
 TAG : 30 PCV 80045 REVISION : 2 05-08-02
 MN ITEM : 002 V0

CALCULATION SHEET

FLUID : CH3OH (liquid)
 Critical Pressure: bar a 73.8

SERVICE CONDITIONS	MINIMUM	NORMAL	MAXIMUM	OTHER
Flowrate : kg/h			2270	
Inlet Pressure : bar a			35	
Outlet Pressure : bar a			19	
Pressure Drop : bar			16	
Temperature : °C			48	
Vapour Pressure : bar a			0.04	
Gf :			0.756	
Viscosity : cPo			0.44	
Fl :			0.920	
Calculated Cv :			0.7573	
Inlet Velocity : m/s			1.6	
Outlet Pipe DN : mm			40	
Schedule :			80.0	
Sound Level : dBA			71.0	
Flowing Condition:			subcrit	
Lift% : linear			63.1	
Signal% : linear			63.1	

PRODUCT TYPE : 535 V
 Flow Direction : FTO Trim : full
 Nominal Cv : 1.2 Adjusted : 1.200
 Rating : 300
 Input Size : 1 in Output : 1 in
 MN 0109

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL-Nr : 2-04915-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE80
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.003 CALC 1

ITEM : 18003 QTY : 1 ENGINEER : SL
 TAG : 30 PCV 80029 REVISION : 1 04-09-02
 MN ITEM : 003 V0

CALCULATION SHEET

FLUID : wash oil

(liquid)

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : l/mn			83.34		
Inlet Pressure : bar a			37.1		39.1
Outlet Pressure : bar a			1		
Pressure Drop : bar			36.1		
Temperature : °C			48		65
Gf :			0.900		
Viscosity : cPo			2.5		
F1 :			0.975		
Shut Off P.Drop : bar					39.1
Calculated Cv :			0.9272		
Inlet Velocity : m/s			2.7		
Outlet Pipe DN : mm			50		
Schedule :			40.0		
Sound Level : dBA			72.5		
Flowing Condition:			cavit.		
Lift% : linear			71.3		
Signal% : linear			71.3		

PRODUCT TYPE : 21014-2S
 Flow Direction : FTO
 Nominal Cv : 1.3
 Rating : 300
 Input Size : 1 in
 MN 0109

Trim : red.

Output : 1 in

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04915-04 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE80
 DATED : 10-04-02
 DATED : 18-04-02

PAGE : V0.004 CALC 1

ITEM : 18004 QTY : 1

ENGINEER : SL
 REVISION : 1 04-09-02
 MN ITEM : 004 V0

TAG : 30 PCV 80049

CALCULATION SHEET

FLUID : Methanol (liquid)
 Critical Pressure: bar a 73.8

SERVICE CONDITIONS

	MINIMUM	NORMAL	MAXIMUM	OTHER	DESIGN
Flowrate : kg/h			2420		
Inlet Pressure : bar a			35		39
Outlet Pressure : bar a			0.8		
Pressure Drop : bar			34.2		
Temperature : °C			48		48
Vapour Pressure : bar a			0.04		
Gf :			0.764		
Viscosity : cPo			0.44		
F1 :			0.975		
Shut Off P.Drop : bar					39
Calculated Cv :			0.5572		
Inlet Velocity : m/s			1.7		
Outlet Pipe DN : mm			50		
Schedule :			40.0		
Sound Level : dBA			< 70		
Flowing Condition:			cavit.		
Lift% : linear			42.9		
Signal% : linear			42.9		

PRODUCT TYPE : 21014-2S
 Flow Direction : FTO
 Nominal Cv : 1.3
 Rating : 300
 Input Size : 1 in
 MN 0109

Trim : red.

Output : 1 in

2.4 TECHNICAL DATA

Technip data sheets

Unit 10
Unit 20
Unit 30
Unit 40
Unit 50
Unit 60
Unit 70
Unit 80

Masoneilan Dresser data sheets

Unit 10
Unit 20
Unit 30
Unit 40
Unit 50
Unit 60
Unit 70
Unit 80

TECHNIP DATA SHEETS

UNIT 10

TECHNIP



9TH OLEFIN COMPLEX

ETHANE CRACKING PLANT



PARS PETROCHEMICAL COMPANY

CONTRACTOR DOCUMENT N°							OWNER DOCUMENT N°						
Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page	Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page
31961	30	SP	1541	101	2	1/24	3930	30	SP	1541	101	2	1/25

0204648

DATA SHEETS FOR CONTROL VALVES

(Section 10 Furnaces)

Pages modified under this revision: Updated for positioners TZID-C as per vendor information [rev. 2]. Sheet 25 shedule changed of outlet pipe.

Rev	Date DDMMYY	STATUS	WRITTEN BY (name & visa)	CHECKED BY (name & visa)	APPROVED BY (name & visa)
2	11/11/02	Final	<i>[Signature]</i>	MB <i>[Signature]</i>	PTV <i>[Signature]</i>
1	30/05/02	Revised	SG	MB	MVR
0	25/02/02	Issue for Purchase	SG	MB	MVR
A	20/07/01	Issued for Inquiry	A. Broere	M. van der Bij	M. Vrijheid

DOCUMENT REVISIONS

Sections changed in last revision are identified by a vertical line in the right margin

TECHNIP9TH OLEFIN COMPLEX

ETHANE CRACKING PLANT



PARS PETROCHEMICAL COMPANY

CONTRACTOR DOCUMENT N°							OWNER DOCUMENT N°						
Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page	Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page
31961	30	SP	1541	101	2	2/24	3930	30	SP	1541	101	2	2/25

Data sheets are only made for furnace 30-F-101 control valves. For the remaining 8 furnaces the data is identical and tag numbers as listed in table below.

30-F-101	30-F-102	30-F-103	30-F-104	30-F-105
30FV10101	30FV10201	30FV10301	30FV10401	30FV10501
30FV10102	30FV10202	30FV10302	30FV10402	30FV10502
30FV10104	30FV10204	30FV10304	30FV10404	30FV10504
30FV10106	30FV10206	30FV10306	30FV10406	30FV10506
30FV10108	30FV10208	30FV10308	30FV10408	30FV10508
30FV10112	30FV10212	30FV10312	30FV10412	30FV10512
30FV10119A	30FV10219A	30FV10319A	30FV10419A	30FV10519A
30FV10119B	30FV10219B	30FV10319B	30FV10419B	30FV10519B
30FV10122	30FV10222	30FV10322	30FV10422	30FV10522
30FV10123	30FV10223	30FV10323	30FV10423	30FV10523
30HV10125	30HV10225	30HV10325	30HV10425	30HV10525
30HV10126	30HV10226	30HV10326	30HV10426	30HV10526
30TV10117	30TV10217	30TV10317	30TV10417	30TV10517
30TV10122	30TV10222	30TV10322	30TV10422	30TV10522
30TV10127	30TV10227	30TV10327	30TV10427	30TV10527
30TV10132	30TV10232	30TV10332	30TV10432	30TV10532
30TV10137	30TV10237	30TV10337	30TV10437	30TV10537
30TV10142	30TV10242	30TV10342	30TV10442	30TV10542
30UV10127	30UV10227	30UV10327	30UV10427	30UV10527



30-F-106	30-F-107	30-F-108	30-F-109
30FV10601	30FV10701	30FV10801	30FV10901
30FV10602	30FV10702	30FV10802	30FV10902
30FV10604	30FV10704	30FV10804	30FV10904
30FV10606	30FV10706	30FV10806	30FV10906
30FV10608	30FV10708	30FV10808	30FV10908
30FV10612	30FV10712	30FV10812	30FV10912
30FV10619A	30FV10719A	30FV10819A	30FV10919A
30FV10619B	30FV10719B	30FV10819B	30FV10919B
30FV10622	30FV10722	30FV10822	30FV10922
30FV10623	30FV10723	30FV10823	30FV10923
30HV10625	30HV10725	30HV10825	30HV10925
30HV10626	30HV10726	30HV10826	30HV10926
30TV10617	30TV10717	30TV10817	30TV10917
30TV10622	30TV10722	30TV10822	30TV10922
30TV10627	30TV10727	30TV10827	30TV10927
30TV10632	30TV10732	30TV10832	30TV10932
30TV10637	30TV10737	30TV10837	30TV10937
30TV10642	30TV10742	30TV10842	30TV10942
30UV10627	30UV10727	30UV10827	30UV10927

Making the total scope for Section 10 (furnaces) 171 control valves [1]

Note: Suffixes like C1, C2 and C3 refer to different operating cases for the same valve not provided with a suffix. Example; data sheet 30FV10102, 30FV10102-C2 and 30FV10102-C3 contain data for one and the same valve.


General Data	1	Tag No.			30FV 10101			
	2	Client Reference	Requisition No.	Item	1541-01			11101
	3	Supplier	Model	DRESSER FLOW CONTROL		28000 Series Varipak		
	4	Serial Number						
	5	Service						
	6	P&ID No.						
Inlet line	7	Diameter	Number	1 in		1" -CH10101A-DA10-N		
	8	Line schedule	Piping class	XS		DA10		
Outlet line	9	Diameter	Number	1 in				
	10	Line schedule	Piping class	XS		DA10		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both			
	12	Sour service	Special conditions					
	13	Molecular Weight	Viscosity at @ normal					
	14	Cp/Cv	Compressibility					
	15	Density min	Density nor	Density max	1057	1057	1057	kg/m3
	16	Vapour Pressure at T nom.			0.036 bar-a			
	17	Critical Pressure		Critical Temperature		53.6 bar-a		
	18	Fluid	Phase	State		Dimethyl disulfide		Liquid
	19	Flow	Min.	Norm.	Max.	Unit	3.38	4.51
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	27	27
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	8.52	8.5
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	1.5	1.6
	23	CV	Min.	Norm.	Max.		0.0031	0.004
	24	Noise	Min.	Norm.	Max.		<70	<70
	25	Required CV						
26	Selected CV Internal / Mfr			/ 0.0138 note1				
27	Fd	Internal / Mfr	FI (Cf)		/		0.85	
28	Fluid tending to		Air-Fail Position		TO OPEN		Close	
Valve Body	29	Body type		Body material		Single Seat Globe		
	30	Design Pressure		Min.	Max.	bar-g		
	31	Design Temperature		Min.	Max.	320		
	32	Max. DP closed valve		12.5 bar				
	33	Valve end con. & rating		Seat leakage class		1 in - 300 lb ANSI RFS		
	34	Plug type		Plug material		TOP GUIDED		
	35	Plug dim.		Plug form/law		reduced port		
	36	Seat type		Qty	Material	Clamped by retainer		
	37	Packing mat.		Lubricator		note-3		
	38	Bonnet type				Integral		
Actuator	40	Direction of action						
	41	Spring range						
Positioner	42	Type	Input signal		Smart positioner (note-4)		4w20 mA 24Vdc+Hart	
	43	Air supply	Action dir.		note-10)		Direct (note-5)	
Accessories	44	Protection						
	45	Booster relay						
	46	Locking device						
	47	Pressure reducing valve			YES			
	48	Pressure gauge			YES(2nos.)			
	49	Handwheel						
50	Solenoid valve		Spec. No.					
51	Pos. detector		Spec. No.					
52	Weight		Consumption					

Notes: 1) Valve Cv is adjustable from 0.010 to 0.025 and hence set at 55% where Cv=0.0138
2) Positioner characteristics shall be set for =% for better opening.
3) Low emission packing design with Graphite, PTFE rings and Kalrez O-rings.
4) Model TZID-C
5) Stroking time to be less than or equal to 3seconds.
10) Actuator shall be sized for intr. air press. is 4 bar-g.


					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
2	AHBR	MB	PTV	11/11/2002	Revised			
1	SG	MB	MVR	30/05/2002	Revised			
0	SG	MB	MVR	25/02/2002	Issue for Purchase			
A	AHBR	MB	AR	20/07/2001	For Enquiry			
No.	By	Chk	Appr	Date	Revision		Code: 507	
					Dwg No.:		31961-30-SP-1541-101	
					Rev.:		2	

General Data	1	Tag No.			SEE LIST [30FV 10102]						
	2	Client Reference	Requisition No.	Item	1541-01		11102				
	3	Supplier	Model		DRESSER FLOW CONTROL		36000 Series Paramax				
	4	Serial Number									
	5	Service									
	6	P&ID No. 0021-10-10									
Inlet line	7	Diameter	Number		10 in		SEE LIST				
	8	Line schedule	Piping class		20		DA10				
Outlet line	9	Diameter	Number		10 in						
	10	Line schedule	Piping class		20		DA10				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal		29.93		0.011 cP				
	14	Cp/Cv	Compressibility		1.201		0.961				
	15	Density min	Density nor	Density max	8.096	7.947	7.913	kg/m3			
	16	Vapour Pressure at T nom.									
	17	Critical Pressure			Critical Temperature						
	18	Fluid	Phase	State		Ethane Feed		Gas	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	4606	15353	16888	kg/h	
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	55	55	55	°C	
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	7.09	6.96	6.93	bar-a	
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	2.42	0.97	0.27	bar	
	23	CV	Min.	Norm.	Max.		60.93	283	553.1		
	24	Noise	Min.	Norm.	Max.		-81.8	77.8	<70	dBA	
25	Required CV										
26	Selected CV	Internal / Mfr			/ 1030 note-3						
27	Fd	Internal / Mfr		FI (CI)	/		0.89/0.82/0.7				
28	Fluid tending to	Air-Fail Position			into seal ring side		Close				
29	Body type	Body material									
30	Design Pressure	Min.	Max.	bar-g		8.6		bar-g			
31	Design Temperature	Min.	Max.	70							
32	Max.DP closed valve	11.5 bar									
33	Valve end con.& rating	Seat leakage class			6 in - 300 lb ANSI RFS		ANSI IV (standard)				
34	Plug type	Plug material									
35	Plug dim.	Plug form/law			full port		=1/2 note-4)				
36	Seat type	Q.ty	Material		clamped by retainer		1 316 S.S.[1]				
37	Packing mat.	Lubricator									
38	Bonnet type	integral									
39											
Actuator	40	Direction of action									
	41	Spring range									
Positioner	42	Type	Input signal		Smart positioner note-5)		4w20 mA 24Vdc+Hart				
	43	Air supply	Action dir.		10)		Direct note-6)				
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve									
	48	Pressure gauge									
	49	Handwheel									
	50	Solenoid valve	Spec. No.								
	51	Pos.detector	Spec. No.								
52	Weight										
Consumption											

- Notes: 1) For other operating cases see sheet 6 & 8.
2) Design condition for steam purge Td=3200C @ Pd=8.3 bar-g.
Design condition for decock air Td=2500C @ Pd=10.5 bar-g.
3) Indicated valve Cv is at 90 degree opening.
4) Positioner characteristics shall be set to linear for better opening in various cases.[1]
5) Model TZID-C
6) Stroking time to be less than or equal 18seconds.
10) Actuator shall be sized for intr. air press. is 4 bar-g.


					INSTRUMENT SPECIFICATION			TECHNIP		
					Control Valve			 PARS PETROCHEMICAL COMPANY		
2	AHBR	MB	PTV	11/11/2002	Revised					
1	SG	MB	MVR	30/05/2002	Revised					
0	SG	MB	MVR	25/02/2002	Issue for Purchase					
A	AHBR	MB	AR	20/07/2001	For Enquiry					
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No.: 31961-30-SP-1541-101	Sheet 4 of 25	
							Rev: 2			

Tag Number	Service	Inlet Line No.
30FV 10102	Feed/DA To FPH Pass 1	10" -P 10102A-DA10-H
30FV 10104	Feed/DA To FPH Pass 2	10" -P 10104A-DA10-H


2	AHBR	11/11/2002	Revised	INSTRUMENT SPECIFICATION Multiple Items List Control Valve See list	TECHNIP  PARS PETROCHEMICAL COMPANY	Sheet 5 of 25
1	SG	30/05/2002	Revised			
0	SG	25/02/2002	Issue for Purchase			
A	AHBR	20/07/2001	For Enquiry			
No.	By	Date	Description	Code: 507	Dwg. No.: 31961-30-SP-1541-101	Rev: 2

General Data	1	Tag No.			SEE LIST [30FV 10102 C2]					
	2	Client Reference	Requisition No.	Item						
	3	Supplier	Model							
	4	Serial Number								
	5	Service			SEE LIST					
	6	P&ID No.			0021-10-10					
Inlet line	7	Diameter	Number	10 in		SEE LIST				
	8	Line schedule	Piping class	20		DA10				
Outlet line	9	Diameter	Number	10 in						
	10	Line schedule	Piping class	20		DA10				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal			28.97 0.0242 cP				
	14	Cp/Cv	Compressibility			1.369 1.				
	15	Density min	Density nor	Density max	5.013	4.767	4.684	kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure			Critical Temperature					
	18	Fluid	Phase	State		Decoke Air	Gas	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	1000	5500	6050	kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	150	150	150	°C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	6.1	5.8	5.7	bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	2.5	1.9	1.4	bar
	23	CV	Min.	Norm.	Max.		16.63	103.1	126.6	
	24	Noise	Min.	Norm.	Max.		74.2	82.9	80.5	dBA
	25	Required CV								
26	Selected CV Internal / Mfr			/ note-1)						
27	Fd	Internal / Mfr	FI (Cf)	/		0.92/0.88/87				
28	Fluid tending to		Air-Fail Position		Close					
Valve Body	29	Body type		Body material		Ball		note-1)		
	30	Design Pressure		Min.	Max.	bar-g		8.6 bar-g		
	31	Design Temperature		Min.	Max.	70				
	32	Max.DP closed valve				11.5 bar				
	33	Valve end con.& rating		Seat leakage class		6		ANSI IV (standard)		
	34	Plug type		Plug material						
	35	Plug dim.		Plug form/taw						
	36	Seat type		Q.ty	Material					
	37	Packing mat.		Lubricator						
	38	Bonnet type								
Actuator	40	Direction of action								
	41	Spring range			note-1)					
Positioner	42	Type		Input signal		note-1)				
	43	Air supply		Action dir.						
Accessories	44	Protection								
	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve								
	48	Pressure gauge								
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
	52	Weight		Consumption						

Notes: 1) For mechanical data, main process data/operating case and selected valve details see sheet 4.
2) Operating temp. 150 is preliminary.
Design condition for steam purge Td=3200C @ Pd=8.3 bar-g.
Design condition for decoke air Td=2500C @ Pd=10.5 bar-g.



					INSTRUMENT SPECIFICATION Control Valve		TECHNIP  PARIS PETROCHEMICAL COMPANY	
1	SG	MB	MVR	30/05/2002	Revised		Sheet 6 of 25	
0	SG	MB		25/02/2002	Issue for Purchase			
A	AHBR	MB	AR	20/07/2001	For Enquiry			
No.	By	Chk	Appr	Date	Revision	Code 507	Dwg. No. 31961-30-SP-1541-101	Rev: 1

Tag Number	Service	Inlet Line No
30FV 10102 C2	Feed/DA To FPH Pass 1	10" -P 10102A-DA10-H
30FV 10104 C2	Feed/DA To FPH Pass 2	10" -P 10104A-DA10-H


				INSTRUMENT SPECIFICATION Multiple Items List Control Valve See list	TECHNIP  PARS PETROCHEMICAL COMPANY		
1	SG	30/05/2002	Revised				
0	SG	25/02/2002	Issue for Purchase				
A	AHBR	20/07/2001	For Enquiry				
No.	By	Date	Description	Code: 507	Dwg. No.: 31961-30-SP-1541-101	Sheet 7 of 25	Rev.: 1

General Data	1	Tag No.			SEE LIST (30FV 10102 C3)			
	2	Client Reference	Requisition No.	Item				
	3	Supplier	Model					
	4	Serial Number						
	5	Service			SEE LIST			
	6	P&ID No.			0021-10-10			
Inlet line	7	Diameter	Number	10 in	SEE LIST			
	8	Line schedule	Piping class	20	DA10			
Outlet line	9	Diameter	Number	10				
	10	Line schedule	Piping class	20	DA10			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both			
	12	Sour service	Special conditions					
	13	Molecular Weight	Viscosity at @ normal		18.02	0.0157 cP		
	14	Cp/Cv	Compressibility		1.314	0.96		
	15	Density min	Density nor	Density max	3.266	kg/m3		
	16	Vapour Pressure at T norm.						
	17	Critical Pressure		Critical Temperature				
	18	Fluid	Phase	State	Steam	Steam	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	3000 kg/h	
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	190 °C	
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	6.7 bar-a	
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	2.1 bar	
	23	CV	Min.	Norm.	Max.		64.36	
	24	Noise	Min.	Norm.	Max.		80.3 dBA	
	25	Required CV						
26	Selected CV Internal / Mfr			/ note-1)				
27	Fd	Internal / Mfr	FI (C)	/		0.899		
28	Fluid tending to		Air-Fail Position		Close			
Valve Body	29	Body type		Body material		Ball note-1)		
	30	Design Pressure	Min.	Max.	bar-g 8.6 bar-g			
	31	Design Temperature	Min.	Max.	70			
	32	Max.DP closed valve		11.5 bar				
	33	Valve end con.& rating		Seat leakage class		8 ANSI IV (standard)		
	34	Plug type		Plug material				
	35	Plug dim.		Plug form/law				
	36	Seat type		Q.ty	Material			
	37	Packing mat.		Lubricator				
	38	Bonnet type						
Actuator	40	Direction of action						
	41	Spring range			note-1)			
Positioner	42	Type	Input signal		note-1)			
	43	Air supply	Action dir.					
Accessories	44	Protection						
	45	Booster relay						
	46	Locking device						
	47	Pressure reducing valve						
	48	Pressure gauge						
	49	Handwheel						
	50	Solenoid valve	Spec. No.					
51	Pos.detector	Spec. No.						
	52	Weight		Consumption				

Notes: 1) For mechanical data, main proces data/operating case and selected valve details see sheet 4
2) Design condition for steam purge Td=3200C @ Pd=8.3 bar-g.
Design condition for decoke air Td=2500C @ Pd=10.5 bar-g.


						INSTRUMENT SPECIFICATION Control Valve		 	
1	SG	MB	MVR	30/05/2002	Revised				
0	SG	MB	MVR	25/02/2002	Issue for Purchase				
A	AHBR	MB	AR	20/07/2001	For Enquiry				
No.	By	Chk	Appr	Date	Revision	Code 507	Dwg. No	31961-30-SP-1541-101	Rev.. 1

Tag Number	Service	Inlet Line No.
30FV 10102 C3	Feed/DA To FPH Pass 1	10" -P 10102A-DA10-H
30FV 10104 C3	Feed/DA To FPH Pass 2	10" -P 10104A-DA10-H

				INSTRUMENT SPECIFICATION Multiple Items List Control Valve See list	TECHNIP  PARIS PETROCHEMICAL COMPANY	Sheet 9 of 25
1	SG	30/05/2002	Revised			
0	SG	25/02/2002	Issue for Purchase			
A	AHBR	20/07/2001	For Enquiry			
No.	By	Date	Description	Code: 507	Dwg. No.: 31961-30-SP-1541-101	Rev.: 1


General Data	1	Tag No.			SEE LIST [30FV 10106]					
	2	Client Reference	Requisition No.	Item	1541-01		11104			
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe			
	4	Serial Number								
	5	Service			SEE LIST					
	6	P&ID No.			0021-10-10					
Inlet line	7	Diameter	Number		8 in	SEE LIST				
	8	Line schedule	Piping class		20	DA10				
Outlet line	9	Diameter	Number		8 in					
	10	Line schedule	Piping class		20	DA10				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service			Special conditions					
	13	Molecular Weight	Viscosity at @ normal		18.02	0.0157 cP				
	14	Cp/Cv	Compressibility		1.314	0.958				
	15	Density min	Density nor	Density max	3.414	3.378	3.368	kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State	Steam	Steam	Single Phase			
	19	Flow	Min.	Norm.	Max.	Unit	3454	4606	5067	kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	190	190	190	°C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	6.99	6.92	6.9	bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	2.2	1.1	0.4	bar
	23	CV	Min.	Norm.	Max.		54.8	95.37	169 (1)	
	24	Noise	Min.	Norm.	Max.		72	<70	<70	dBA
	25	Required CV								
	26	Selected CV Internal / Mfr			/ 230					
27	Fd	Internal / Mfr	FI (CI)	/		0.94				
28	Fluid tending to		Air-Fail Position		TO OPEN		Open			
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A 216 GR WCC		
	30	Design Pressure	Min.	Max.	bar-g		8.3 bar-g			
	31	Design Temperature	Min.	Max.			320			
	32	Max. DP closed valve				9.3 bar				
	33	Valve end con. & rating	Seat leakage class		6 in - 300 lb ANSI RFS		ANSI IV (standard)			
	34	Plug type		Plug material		BALANCED		17-4 PH		
	35	Plug dim.		Plug form/law		Full port		Linear, 1stage (odb note-2)		
	36	Seat type	Q.ty	Material	Clamped In		1 AISI 410			
	37	Packing mat.		Lubricator		KELVAR PTFE				
	38	Bonnet type				STANDARD				
39										
Actuator	40	Direction of action								
	41	Spring range			3 - 15 psig (Model 87, size 16)					
Positioner	42	Type	Input signal		Smart positioner note-3)		4w20 mA 24Vdc+Hart			
	43	Air supply	Action dir.		10)		Direct note-4)			
	44	Protection			IP-65 EEXI-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES(2nos.)					
	49	Handwheel			YES SIDE MOUNTED					
	50	Solenoid valve	Spec. No.							
51	Pos. detector	Spec. No.								
52	Weight		Consumption							

- Notes: 1) For other operating cases see sheet 12.
2) Positioner characteristics shall be set to =% for better opening.
3) Model TZID-C
4) stroking time shall be less than or equal to 18seconds.
10) Actuator shall be sized for intrs. air press. is 4 bar-g.

						INSTRUMENT SPECIFICATION		TECHNIP	
						Control Valve		 PARS PETROCHEMICAL COMPANY	
2	AHBR	MB	PTV	11/11/2002	Revised			Sheet 10 of 25	
1	SG	MB	MVR	30/05/2002	Revised				
0	SG	MB	MVR	25/02/2002	Issue for Purchase				
A	AHBR	MB	AR	20/07/2001	For Enquiry				
No.	By	Chk	Appr	Date	Revision	Code: 507	Dwg. No.: 31961-30-SP-1541-101	Rev.: 2	


Tag Number	Service	Inlet Line No.
30FV 10106	DS to Feed/ DS Mixing P1	8" -DS10101A-DA10-H
30FV 10108	DS to Feed/ DS Mixing P2	8" -DS10103A-DA10-H

Ref:


2	AHBR	11/11/2002	Revised	INSTRUMENT SPECIFICATION Multiple Items List Control Valve See list	TECHNIP  <small>PARS PETROCHEMICAL COMPANY</small>		
1	SG	30/05/2002	Revised				
0	SG	25/02/2002	Issue for Purchase				
A	AHBR	20/07/2001	For Enquiry				
No.	By	Date	Description	Code: 507	Dwg. No.: 31961-30-SP-1541-101	Sheet 11 of 25	Rev.: 2

General Data	1	Tag No.				SEE LIST (30FV 10106 C1)			
	2	Client Reference	Requisition No.		Item				
	3	Supplier		Model					
	4	Serial Number							
	5	Service				SEE LIST			
	6	P&ID No.				0021-10-10			
Inlet line	7	Diameter		Number		8 in		SEE LIST	
	8	Line schedule		Piping class		20		DA10	
Outlet line	9	Diameter		Number					
	10	Line schedule		Piping class					
Operating Conditions	11	Calculation Results From:				<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both			
	12	Sour service		Special conditions					
	13	Molecular Weight		Viscosity at @ normal		18.02			
	14	Cp/Cv		Compressibility					
	15	Density min	Density nor	Density max	3.378		3.322	kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		Steam		Steam	
	19	Flow	Min.	Norm.	Max.	Unit	6250		11250 kg/h
	20	Temp.	Q/Min.	Q Norm.	Q Max.	Unit	190		190 °C
	21	Press.	Q/Min.	Q Norm.	Q Max.	Unit	6.92		6.81 bar-a
	22	DP	Q/Min.	Q Norm.	Q Max.	Unit	2.9		2.6 bar
	23	CV	Min.	Norm.	Max.		92.32		173
	24	Noise	Min.	Norm.	Max.		77.8		79.7 dBA
	25	Required CV							
26	Selected CV Internal / Mfr				/ note-1)				
27	Fd	Internal / Mfr		FI (CI)				0.94	
28	Fluid tending to		Air-Fail Position		Open				
Valve Body	29	Body type		Body material		Single Seat Globe		note-1)	
	30	Design Pressure		Min.	Max.	bar-g			
	31	Design Temperature		Min.	Max.				
	32	Max. DP closed valve							
	33	Valve end con. & rating		Seat leakage class		0 -			
	34	Plug type		Plug material					
	35	Plug dim.		Plug form/law					
	36	Seat type		Q.ty	Material				
	37	Packing mat.		Lubricator					
	38	Bonnet type							
Actuator	40	Direction of action				note-1)			
	41	Spring range							
Positioner	42	Type		Input signal		note-1)			
	43	Air supply		Action dir.					
Accessories	44	Protection							
	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve							
	48	Pressure gauge							
	49	Handwheel							
	50	Solenoid valve		Spec. No.					
51	Pos. detector		Spec. No.						
	52	Weight		Consumption					

Notes: 1) For mechanical data, main process data/operating case and selected valve details see sheet 10.
2) Min. flow: Decoking.
Max. flow: Standby.



						INSTRUMENT SPECIFICATION Control Valve		TECHNIP  PARIS PETROCHEMICAL COMPANY	
1	SG	MB	MVR	30/05/2002	Revised				
0	SG	MB	MVR	25/02/2002	Issue for Purchase				
A	AHBR	MB	AR	20/07/2001	For Enquiry				
No.	By	Chk	Appr	Date	Revision	Code 507	Dwg. No. 31961-30-SP-1541-101	Sheet 12	of 25

Tag Number	Service	Inlet Line No.
30FV 10106 C1	DS to Feed/ DS Mixing P1	8" -DS10101A-DA10-H
30FV 10108 C1	DS to Feed/ DS Mixing P2	8" -DS10103A-DA10-H

				INSTRUMENT SPECIFICATION Multiple Items List Control Valve See list	TECHNIP  PARS PETROCHEMICAL COMPANY
1	SG	30/05/2002	Revised		
0	SG	25/02/2002	Issue for Purchase		
A	AHBR	20/07/2001	For Enquiry		
No.	By	Date	Description	Code: 507	Dwg. No.: 31961-30-SP-1541-101 Rev.: 1

General Data	1	Tag No.			30FV 10112				
	2	Client Reference	Requisition No.	Item	1541-01		11106		
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe			
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number	6 in		6" -BW10102A-JA02-H			
	8	Line schedule	Piping class	160		JA02			
Outlet line	9	Diameter	Number	4					
	10	Line schedule	Piping class	160		JA02			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal						
	14	Cp/Cv	Compressibility						
	15	Density min	Density nom	Density max	941.8	941.8	941.8	kg/m ³	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure		Critical Temperature		220.5 bar-a			
	18	Fluid	Phase	State		Water	Water	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	2425	33790	
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	130	130	
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	140.6	140.5	
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	33	27.2	
	23	CV	Min.	Norm.	Max.		0.5046	7.745	
	24	Noise	Min.	Norm.	Max.		<70	<70.5	
	25	Required CV							
26	Selected CV Internal / Mfr								
27	Fd	Internal / Mfr	FI (CI)	/			0.94/0.93/92		
Valve Body	28	Fluid tending to		Air-Fail Position		TO CLOSE			
	29	Body type		Body material		Single Seat Globe			
	30	Design Pressure		Min.	Max.	bar-g			
	31	Design Temperature		Min.	Max.	153			
	32	Max. DP closed valve		173 bar					
	33	Valve end con. & rating		Seat leakage class		4 in - 1500 lb ANSI RTJ			
	34	Plug type		Plug material		BALANCED			
	35	Plug dim.		Plug form/law		reduced			
	36	Seat type		Q.ty	Material	Clamped In			
	37	Packing mat.		Lubricator					
	38	Bonnet type		STANDARD					
	Actuator	40	Direction of action						
41		Spring range							
Positioner	42	Type	Input signal		Smart positioner note-4)		4w20 mA 24Vdc +Hart		
	43	Air supply	Action dir.		10)		Direct note-5)		
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve							
	48	Pressure gauge							
	49	Handwheel							
	50	Solenoid valve		Spec. No.					
51	Pos. detector		Spec. No.						
52	Weight		Consumption						

- Notes: 1) Second pair of design conditions 152 bar-G, 345 0C
2) Relief case: 43790 kg/h with a upstream pressure of 140.5 bara and a pressure drop of 3.5 bar. Cv=28, FI=0.9, Noise <70dBA
3) Valve Cv is 35 but selected Cv is limited to 30 via limit stop adjustment.
4) Model TZID-C. Positioner characteristic shall be set to linear.
5) Stroking time shall less than or equal to 12seconds
6) Maximum allowable dynamic pressure drop (valve opened) is 87 bar
10) Actuator shall be sized for intrs. air press. is 4 bar-g.

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 PARS PETROCHEMICAL COMPANY	
2	AHBR	MB	PTV	11/11/2002	Revised		 Sheet 14 of 25	
1	SG	MB	MVR	30/05/2002	Revised			
0	SG	MB	MVR	25/02/2002	Issue for Purchase			
A	AHBR	MB	AR	20/07/2001	For Enquiry			
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No.: 31961-30-SP-1541-101
							Rev.: 2	


General Data	1	Tag No.			30FV 10119A					
	2	Client Reference	Requisition No.	Item	1541-01		11107			
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe				
	4	Serial Number								
	5	Service								
	6	P&ID No. 0021-10-17								
Inlet line	7	Diameter	Number	8 in		8" -FG10102A-DA03-N				
	8	Line schedule	Piping class	20		DA03				
Outlet line	9	Diameter	Number	8 in						
	10	Line schedule	Piping class	20		DA03				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		4.6		0.0101 cP			
	14	Cp/Cv	Compressibility		1.38		1.			
	15	Density min	Density nor	Density max	0.7366		0.7218		0.7126 kg/m3	
	16	Vapour Pressure at T nom.								
	17	Critical Pressure			Critical Temperature					
	18	Fluid	Phase	State		Design fuel gas/note-2		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	424		3300	4235 kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	27		27	27 °C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	4		3.92	3.87 bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	3		1.3	0.4 bar
	23	CV	Min.	Norm.	Max.	15.84		146.7		304.4
	24	Noise	Min.	Norm.	Max.	74		75		<70 dBA
	25	Required CV								note-1)
26	Selected CV			Internal / Mfr		/ 340note-3)				
27	Fd			Internal / Mfr		FI (CI)		/ 0.940		
28	Fluid tending to		Air-Fail Position			TO OPEN		Close		
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		10.5 bar-g		
	31	Design Temperature		Min.	Max.			75		
	32	Max.DP closed valve			11.5		bar			
	33	Valve end con.& rating		Seat leakage class		8 in .300 lb ANSI RF		CLASS IV (standard)		
	34	Plug type		Plug material		BALANCED		17-4 PH		
	35	Plug dm.		Plug form/law		reduced		LINEAR, 1stage lodf		
	36	Seat type		Q.ty	Material	Clamped In		1 AISI 410		
	37	Packing mat.		Lubricator		KEVLAR PTFE				
	38	Bonnet type				STANDARD				
39										
Actuator	40	Direction of action								
	41	Spring range 6-30 psig (type no. 88, size 16)								
Positioner	42	Type	Input signal		Smart Positioner note-4)		4w20 mA 24Vdc+ Hart			
	43	Air supply	Action dir.		10)		Direct note-5)			
	44	Protection IP-65 EEXI-a (Cenelec)								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES(2nos)					
	49	Handwheel								NO
	50	Solenoid valve		Spec. No.						
	51	Pos.detector		Spec. No.						
52	Weight		Consumption							

Notes: 1) Cv selected shall be as close as possible to the 108% of Cv required @ max flow(based on DCS split range configuration).
2) For other operating cases see sheet 16.
3) Cv=340 to be achieved by limitstop where valve Cv is 380
4) Model TZID-C. Positioner characteristic shall be set to linear.
5) Stroking time shall be less than or equal to 24seconds
10) Actuator shall be sized for intrs. air press. is 4 bar-g.

INSTRUMENT SPECIFICATION						TECHNIP			
Control Valve									
2	AHBR	MB	PTV	11/11/2002	Revised				
1	SG	MB	MVR	30/05/2002	Revised				
0	SG	MB	MVR	25/02/2002	Issue for Purchase				
A	AHBR	MB	AR	20/07/2001	For Enquiry				
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General Data	1	Tag No.			30FV 10119A C2							
	2	Client Reference	Requisition No.	Item								
	3	Supplier		Model								
	4	Serial Number										
	5	Service										
	6	P&ID No.			0021-10-17							
Inlet line	7	Diameter		Number		8 in		8" -FG10102A-DA03-N				
	8	Line schedule		Piping class		20		DA03				
Outlet line	9	Diameter		Number								
	10	Line schedule		Piping class								
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both							
	12	Sour service		Special conditions								
	13	Molecular Weight		Viscosity at @ normal								
	14	Cp/Cv		Compressibility								
	15	Density min	Density nor	Density max	2.701		2.661		kg/m3			
	16	Vapour Pressure at T norm.										
	17	Critical Pressure			Critical Temperature							
	18	Fluid	Phase	State		start up fuel gas		Gas	Single Phase			
	19	Flow	Min.	Norm.	Max.	Unit	678		6778	kg/h		
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	27		27	°C		
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	4		3.94	bar-a		
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	3		1	bar		
	23	CV	Min.	Norm.	Max.	13.29		172.7				
	24	Noise	Min.	Norm.	Max.	71.5		71.2		dBA		
	25	Required CV										
26	Selected CV Internal / Mfr				/ note-1)							
27	Fd	Internal / Mfr	FI (Cf)		/		0.94					
28	Fluid tending to		Air-Fail Position						Close			
Valve Body	29	Body type		Body material		Single Seat Globe		note-1)				
	30	Design Pressure		Min.	Max.	bar-g						
	31	Design Temperature		Min.	Max.							
	32	Max. DP closed valve										
	33	Valve end con. & rating		Seat leakage class						0		
	34	Plug type		Plug material								
	35	Plug dim.		Plug form/law								
	36	Seat type		Q.ty	Material							
	37	Packing mat.		Lubricator								
	38	Bonnet type										
Actuator	40	Direction of action										
	41	Spring range			note-1)							
Positioner	42	Type		Input signal		note-1)						
	43	Air supply		Action dir.								
Accessories	44	Protection										
	45	Booster relay										
	46	Locking device										
	47	Pressure reducing valve										
	48	Pressure gauge										
	49	Handwheel										
	50	Solenoid valve		Spec. No.								
51	Pos. detector		Spec. No.									
52	Weight		Consumption									

Notes: 1) For mechanical data, main proces data/operating case and selected valve details see sheet 15.

					INSTRUMENT SPECIFICATION Control Valve			TECHNIP  PARIS PETROCHEMICAL COMPANY	
1	SG	MB	MVR	30/05/2002	Revised				
0	SG	MB	MVR	25/02/2002	Issue for purchase				
A	AHBF	MB	AR	20/07/2001	For Enquiry				
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General Data	1	Tag No.			30FV 10119B						
	2	Client Reference	Requisition No.	Item	1541-01		11108				
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		3 in		3" -FG10102A-DA03-N				
	8	Line schedule	Piping class		STD		DA03				
Outlet line	9	Diameter	Number		3 in						
	10	Line schedule	Piping class		STD		DA03				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal		4.6						
	14	Cp/Cv	Compressibility								
	15	Density min	Density nor	Density max	0.7366	0.7218	0.7126	kg/m ³			
	16	Vapour Pressure at T nom.									
	17	Critical Pressure			Critical Temperature						
	18	Fluid	Phase	State		Design fuel gas note-3		Gas	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit					
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit					
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit					
	22	DP	Q Min.	Q Norm.	Q Max.	Unit					
	23	CV	Min.	Norm.	Max.						
	24	Noise	Min.	Norm.	Max.	-			dBA		
	25	Required CV									
26	Selected CV Internal / Mfr										
27	Fd	Internal / Mfr	FI (Ci)		/ 75 note-2)						
Valve Body	28	Fluid tending to		Air-Fail Position		TO OPEN		Close			
	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC			
	30	Design Pressure		Min.	Max.	bar-g		10.5 bar-g			
	31	Design Temperature		Min.	Max.	75					
	32	Max. DP closed valve				11.5 bar					
	33	Valve end con. & rating		Seat leakage class		3 in -300 lb ANSI RF		CLASS IV (standard)			
	34	Plug type		Plug material		TOP GUIDED		AISI 416			
	35	Plug dim.		Plug form/law		full port		LINEAR, one stage lodb			
	36	Seat type		Q.ty	Material	screwed		1		AISI 416	
	37	Packing mat.		Lubricator		KEVLAR PTFE					
38	Bonnet type				STANDARD						
39											
Actuator	40	Direction of action									
	41	Spring range									
Positioner	42	Type	Input signal		Smart positioner note-4)		4w/20 mA 24Vdc + Hart				
	43	Air supply	Action dir.		10)		Direct note-5)				
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve									
	48	Pressure gauge									
	49	Handwheel									
	50	Solenoid valve	Spec. No.								
	51	Pos. detector	Spec. No.								
52	Weight		Consumption								

Notes: 1) Cv selected shall be around 25% of Cv 30FV 10119A. Therefore datas/ calculations for min./nor./max. conditions does not exist.
2) Based on DCS split range configuration.
3) For other operating cases see sheet 18.
4) Model is TZID-C. Positioner characteristic shall be set to linear.
5) Stoking time shall less than or equal to 9 seconds.
10) Actuator shall be sized for instr. air press. is 4 bar-g.

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 PARIS PETROCHEMICAL COMPANY	
2	AHBR	MB	PTV	11/11/2002	Revised			
1	SG	MB	MVR	30/05/2002	Revised			
0	SG	MB	MVR	25/02/2002	Issue for Purchase			
A	AHBR	MB	AR	20/07/2001	For Enquiry			
No.	Bv	Chk	Appr	Date	Revision		Sheet 17 of 25	
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General Data	1	Tag No.			30FV 101198 C2		
	2	Client Reference	Requisition No.	Item	1		
	3	Supplier		Model			
	4	Serial Number					
	5	Service					
	6	P&ID No.			0021-10-17		
Inlet line	7	Diameter		Number		3 in 3" -FG10102A-DA03-N	
	8	Line schedule		Piping class		STD DA03	
Outlet line	9	Diameter		Number			
	10	Line schedule		Piping class			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both		
	12	Sour service		Special conditions			
	13	Molecular Weight		Viscosity at @ normal		16.7	
	14	Cp/Cv		Compressibility			
	15	Density min	Density nor	Density max	2.701		2.661 kg/m3
	16	Vapour Pressure at T nom.					
	17	Critical Pressure			Critical Temperature		
	18	Fluid	Phase	State		start up fuel gas Gas Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	
	23	CV	Min.	Norm.	Max.		
	24	Noise	Min.	Norm.	Max.	- dBA	
	25	Required CV					
26	Selected CV Internal / Mfr			/ note-1)			
27	Fd	Internal / Mfr	FI (Cf)		/		
28	Fluid tending to		Air-Fail Position		Close		
Valve Body	29	Body type		Body material			
	30	Design Pressure		Min.	Max.	bar-g	
	31	Design Temperature		Min.	Max.		
	32	Max.DP closed valve					
	33	Valve end con.& rating		Seat leakage class		0	
	34	Plug type		Plug material			
	35	Plug dim.		Plug form/low			
	36	Seat type		Q.ty	Material		
	37	Packing mat.		Lubricator			
	38	Bonnet type					
Actuator	40	Direction of action					
	41	Spring range				note-1)	
Positioner	42	Type		Input signal		note-1)	
	43	Air supply		Action dir.			
	44	Protection					
Accessories	45	Booster relay					
	46	Locking device					
	47	Pressure reducing valve					
	48	Pressure gauge					
	49	Handwheel				NO	
	50	Solenoid valve		Spec. No.			
51	Pos.detector		Spec. No.				
52	Weight		Consumption				

Notes: 1) For mechanical data ,main proces data/operating case and selected valve details, see sheet 17.


						INSTRUMENT SPECIFICATION Control Valve		TECHNIP  PARIS PETROCHEMICAL COMPANY	
1	SG	MB	MVR	30/05/2002	Revised				
0	SG	MB	MVR	25/02/2002	Issue for purchase				
A	AHBR	MB	AR	20/07/2001	For Enquiry				
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General Data	1	Tag No.				SEE LIST [30FV 10122]				
	2	Client Reference	Requisition No.	Item	1541-01			11109		
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		4 in		SEE LIST			
	8	Line schedule	Piping class		STD		DA03			
Outlet line	9	Diameter	Number		4 in					
	10	Line schedule	Piping class		STD		DA03			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal		4.6		0.0101 cP		
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max	0.4696		0.4696		0.4696 kg/m3	
	16	Vapour Pressure at T nom.								
	17	Critical Pressure			Critical Temperature					
	18	Fluid	Phase	State		Fuel Gas		Gas		Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	0	180	466	kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	27	27	27	°C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	2.55	2.55	2.55	bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	0.35	0.18	0.02	bar
	23	CV	Min.	Norm.	Max.			23.4	176.9	
	24	Noise	Min.	Norm.	Max.			<70	<70	dBA
25	Required CV									
26	Selected CV Internal / Mfr				/ 230					
27	Fd Internal / Mfr		FI (CI)		/		0.939/0.726			
28	Fluid tending to		Air-Fail Position		TO CLOSE		Close			
Valve Body	29	Body type		Body material		Eccentric Plug		ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		10.5	bar-g	
	31	Design Temperature		Min.	Max.	75				
	32	Max. DP closed valve								
	33	Valve end con. & rating		Seat leakage class		4 in - 300 lb ANSI RFS		ANSI IV (standard)		
	34	Plug type		Plug material		rotary eccentric plug		316L S.S. + STELLITE		
	35	Plug dim.		Plug form/law		full port		linear modified (1)		
	36	Seat type		Qty	Material	clamped by retainer		1 AISI 316		
	37	Packing mat.		Lubricator		KEVLAR PTFE				
	38	Bonnet type				Integral				
39										
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type		Input signal		Smart positioner (note-1)		4w20 mA 24Vdc +Hart		
	43	Air supply		Action dir.		10)		Direct (note-2)		
Accessories	44	Protection								
	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve				YES				
	48	Pressure gauge				YES(2nos)				
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
51	Pos. detector		Spec. No.							
52	Weight		Consumption							

Notes: 1) Model is TZID-C, Positioner characteristic shall be set to linear
2) Stroking time shall be less than or equal 12 seconds.
10) Actuator shall be sized for instr. air press. is 4 bar-g.

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 PARE PETROCHEMICAL COMPANY	
2	AHBR	MB	PTV	11/11/2002	Revised			
1	SG	MB	MVR	30/05/2002	Revised			
0	SG	MB	MVR	25/02/2002	Issue for inquiry			
A	AHBR	MB	AR	20/07/2001	For Enquiry			
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Tag Number	Service	Inlet Line No.
30FV 10122	FG Of. Zone Side Burners	4" -FG10103A-DA03-N
30FV 10123	FG Of. Zone Bot. Burners	4" -FG10107A-DA03-N

				INSTRUMENT SPECIFICATION Multiple Items List Control Valve See list	TECHNIP  PARS PETROCHEMICAL COMPANY	
2	AHBR	11/11/2002	Revised			
1	SG	30/05/2002	Revised			
0	SG	25/02/2002	Issue for inquiry			
A	AHBR	20/07/2001	For Enquiry		Sheet 20 of 25	
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General Data	1	Tag No.			30HV 10125					
	2	Client Reference	Requisition No.	Item	1541-01		11111			
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe			
	4	Serial Number			-					
	5	Service			VHP Steam Vent					
	6	P&ID No.			0021-10-15					
Inlet line	7	Diameter	Number	6 in		6" -VH10106A-KE02-H				
	8	Line schedule	Piping class	XXS		KE02				
Outlet line	9	Diameter	Number	6 in		6" -VH10103A-EO21-P				
	10	Line schedule	Piping class	40		ED21				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions		NO		High Temp & Pressure			
	13	Molecular Weight	Viscosity at @ normal		18.02		0.0294 cP			
	14	Cp/Cv	Compressibility		1.274		0.919			
	15	Density min	Density nor	Density max	3.168	31.75	31.75	kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State	Steam		Steam		Non Homogeneous	
	19	Flow	Min.	Norm.	Max.	Unit	400	15220	19000	kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	159	510	510	°C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	6	105.4	105.4	bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	5	95.8	93.4	bar
	23	CV	Min.	Norm.	Max.		5.806	16.93	21.14	
	24	Noise	Min.	Norm.	Max.		≤70	89.4	90.8 (4)	dBA
	25	Required CV			note-1)					
26	Selected CV Internal / Mfr			/ 24						
27	Fd Internal / Mfr			FI (Cf)				0.975		
28	Fluid tending to		Air-Fail Position		TO CLOSE		Closed			
Valve Body	29	Body type		Body material		Single Seat Globe		A217 GR WC9		
	30	Design Pressure		Min.	Max.	0.0001 bar-a		120 bar-g		
	31	Design Temperature		Min.	Max.	530				
	32	Max.DP closed valve			120 bar					
	33	Valve end con.& rating		Seat leakage class		6 in -2500# RTJ		ANSI V		
	34	Plug type		Plug material		BALANCED		ASTM A 487 GR CA6NM		
	35	Plug dim.		Plug form/law		reduced		LINEAR, 2stages lodb		
	36	Seat type		Q.ty	Material	clamped In		1 316 S.S. + STELLITE		
	37	Packing mat.		Lubricator		Graphite [1]				
	38	Bonnet type		STANDARD						
Actuator	40	Direction of action								
	41	Spring range			37 - 45 psig (type no. 88, size16)					
Positioner	42	Type		Input signal		Smart positioner note-2)		4w20 mA 24Vdc + Hart		
	43	Air supply		Action dir.		10)		Direct note-3)		
	44	Protection			IP-65 EEXI-a (Genelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES(2nos.)					
	49	Handwheel			YES SIDE MOUNTED					
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption							

Notes: 1) Selected Cv shall be less than or equal to 120% of calculated Cv(=21.14) at maximum condition based on the downstream silencer capacity supplied by others.
2) Model is TZID-C. Positioner characteristic shall be set to linear.
3) Stroking time shall be less than or equal to 18seconds.
4) 70 mm thermal isolation material from the valve up to the silencer, will reduce the noise to meet the required 85 dBA.
10) Actuator shall be sized for instr. air press. is 4 bar-g.



					INSTRUMENT SPECIFICATION		TECHNIP				
					Control Valve				PARE PETROCHEMICAL COMPANY		
2	AHBR	MB	PTV	11/11/2002	Revised						
1	SG	MB	MVR	30/05/2002	Revised						
0	SG	MB	MVR	25/02/2002	Issue for Purchase						
A	AHBR	MB	AR	09/08/2001	FI						
No.	By	Chk	Appr	Date	Revision		Code: 507		Dwg. No : 31961-30-SP-1541-101		
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								Rev.: 2			

General Data	1	Tag No.	30HV 10126			
	2	Client Reference	Requisition No.	Item	1541-01 11112	
	3	Supplier	Model	DRESSER FLOW CONTROL 78000 Series Globe		
	4	Serial Number				
	5	Service	BFW Startup to TLE30E121			
	6	P&ID No.	0021-10-16			
Inlet line	7	Diameter	Number	2 in	2" -BW10103A-JA02-H	
	8	Line schedule	Piping class	160	JA02	
Outlet line	9	Diameter	Number	2		
	10	Line schedule	Piping class	160	JA02	
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both	
	12	Sour service	Special conditions			
	13	Molecular Weight	Viscosity at @ normal		0.213 cP	
	14	Cp/Cv	Compressibility			
	15	Density min	Density nor	Density max	941.8 941.8 941.8 kg/m3	
	16	Vapour Pressure at nom.				2.707 bar-a
	17	Critical Pressure		Critical Temperature		220.5 bar-a
	18	Fluid	Phase	State		Water Water Single Phase
	19	Flow	Min.	Norm.	Max.	Unit 4000 12000 16000 kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit 130 130 130 °C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit 142 140.6 140.6 bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit 141 27 33 bar
	23	CV	Min.	Norm.	Max.	0.407 2.76 3.329
	24	Noise	Min.	Norm.	Max.	note-1 <70 <70 dBA
	25	Required CV				
26	Selected CV Internal / Mfr		/ 4.5			
27	Fd Internal / Mfr		FI (Cf)		0.995	
28	Fluid tending to		Air-Fail Position TO OPEN Open			
Valve Body	29	Body type	Body material Single Seal Globe ASTM A216 GR WCC			
	30	Design Pressure	Min.	Max.	172 bar-g	
	31	Design Temperature	Min.	Max.	153	
	32	Max.DP closed valve	173 bar			
	33	Valve end con.& rating	Seat leakage class		2 in - 1500 lb ANSI RTJ ANSI IV (standard)	
	34	Plug type	Plug material TOP GUIDED AISI 410 Hardened			
	35	Plug dim.	Plug form/law reduced LINEAR note-2)			
	36	Seat type	Q.ty	Material	Clamped In 1 AISI 410 Hardened	
	37	Packing mat.	Lubricator graphite			
	38	Bonnet type	STANDARD note-3)			
	39					
Actuator	40	Direction of action				
	41	Spring range 8-15 psig (type no.87, size 10)				
Positioner	42	Type	Input signal Smart Positioner note-4) 4w20 mA 24Vdc + Hart			
	43	Air supply	Action dir. 10) Direct note-5)			
	44	Protection IP-65 EEXI-a (Cenelec)				
Accessories	45	Booster relay				
	46	Locking device				
	47	Pressure reducing valve YES				
	48	Pressure gauge YES(2nos)				
	49	Handwheel YES SIDE MOUNTED				
	50	Solenoid valve	Spec. No.			
	51	Pos.detector	Spec. No.			
52	Weight Consumption					


- Notes: 1) Flashing condition
2) Anticavitation (5 stages) trim design
3) Second pair of design conditions 152 barg @3450C
4) Model is TZID-C. Positioner characteristic shall be set to linear.
5) Stroking time shall be less than or equal to 6 seconds.
10) Actuator shall be sized for instr. air press. is 4 bar-g.

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 PARIS PETROCHEMICAL EQUIPMENT	
2	AHBR	MB	PTV	11/11/2002	Revised		Sheet 22 of 25	
1	SG	MB	MVR	30/05/2002	Revised			
0	SG	MB	MVR	25/02/2002	Issue for Purchase			
A	AHBR	MB	AR	09/08/2001	FI			
No.	By	Chk	Appr	Date	Revision	Code: 507	Dwg. No.: 31961-30-SP-1541-101	Rev.: 2

General Data	1	Tag No.			SEE LIST (30TV 10117)						
	2	Client Reference	Requisition No.	Item	1541-02		11101				
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex				
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		4 in		SEE LIST				
	8	Line schedule	Piping class		STD		DA03				
Outlet line	9	Diameter	Number		4 in						
	10	Line schedule	Piping class		STD		DA03				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both		
	12	Sour service			Special conditions						
	13	Molecular Weight			Viscosity at @ normal		4.6		0.0101 cP		
	14	Cp/Cv			Compressibility		1.38		1.		
	15	Density min	Density nor	Density max	0.4696	0.4696	0.4696	kg/m3			
	16	Vapour Pressure at T nom.									
	17	Critical Pressure			Critical Temperature						
	18	Fluid	Phase	State		Fuel Gas		Gas		Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	0	120	311	kg/h	
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	27	27	27	°C	
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	2.55	2.55	2.55	bar-a	
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	0.35	0.18	0.02	bar	
	23	CV	Min.	Norm.	Max.			15.6	117.9		
	24	Noise	Min.	Norm.	Max.			46.1	45.9	dBA	
	25	Required CV									
26	Selected CV			Internal / Mfr		/ 230					
27	Fd			Internal / Mfr		FI (CI)		0.94/0.796			
28	Fluid tending to		Air-Fail Position			TO CLOSE		Close			
Valve Body	29	Body type		Body material			Eccentric Plug		ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		10.5 bar-g			
	31	Design Temperature		Min.	Max.	75					
	32	Max. DP closed valve		11.5 bar							
	33	Valve end con. & rating		Seat leakage class			4 - 300 lb ANSI RFS		ANSI IV (standard)		
	34	Plug type		Plug material			rotary eccentric plug		316L S.S. + STELLITE		
	35	Plug dim.		Plug form/law			full port		linear modified [1]		
	36	Seat type		Qty	Material		316 S.S.				
	37	Packing mat.		Lubricator			KEVLAR PTFE				
	38	Bonnet type		Integral							
Actuator	40	Direction of action									
	41	Spring range									
Positioner	42	Type		Input signal			Smart positioner (note-1)		4w20 mA 24Vdc + Hart		
	43	Air supply		Action dir.			10)		Direct (note-2)		
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve									
	48	Pressure gauge									
	49	Handwheel									
	50	Solenoid valve		Spec. No.							
	51	Pos. detector		Spec. No.							
52	Weight										
<p>Notes: 1) Model is TZID-C. Positioner characteristic shall be set to linear 2) Stroking time shall be less than or equal to 12 seconds. 3) Second Design Conditions 5.5 bar-g @ 85 deg. C 10) Actuator shall be sized for instr. air press. is 4 bar-g.</p>											



						INSTRUMENT SPECIFICATION		TECHNIP		 PARS PETROCHEMICAL COMPANY	
						Control Valve		 PARS PETROCHEMICAL COMPANY			
2	AHBR	MB	PTV	11/11/2002	Revised						
1	SG	MB	MVR	30/05/2002	Revised						
0	SG	MB	MVR	25/02/2002	Issue for Purchase						
A	AHBR	MB	AR	20/07/2001	For Enquiry						
No.	By	Chk	Appr	Date	Revision	Code	507	Dwg. No.	31961-30-SP-1541-101	Sheet 23	of 25
										Rev. 2	

Tag Number	Service	Inlet Line No.
30TV 10117	Fuel Gas To Zone A	4" -FG10114A-DA03-N
30TV 10122	Fuel Gas To Zone B	4" -FG10118A-DA03-N
30TV 10127	Fuel Gas To Zone C	4" -FG10122A-DA03-N
30TV 10132	Fuel Gas To Zone D	4" -FG10126A-DA03-N
30TV 10137	Fuel Gas To Zone E	4" -FG10130A-DA03-N
30TV 10142	Fuel Gas To Zone F	4" -FG10134A-DA03-N

				INSTRUMENT SPECIFICATION Multiple Items List Control Valve See list	TECHNIP  PARS PETROCHEMICAL COMPANY		
2	AHBR	11/11/2002	Revised				
1	SG	30/05/2002	Revised				
0	SG	25/02/2002	Issue for Purchase				
A	AHBR	20/07/2001	For Enquiry				
No.	By	Date	Description	Code: 507	Dwg. No.: 31961-30-SP-1541-101	Sheet 24 of 25	Rev.: 2

General Data	1	Tag No.			30UV 10127				
	2	Client Reference	Requisition No.	Item	1541-01		11113		
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe		
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number		6 in		6" -BW10102A-JA02-H		
	8	Line schedule	Piping class		160		JA02		
Outlet line	9	Diameter	Number						
	10	Line schedule	Piping class						
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal						
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	940.1	940.4	940.5	kg/m3	
	16	Vapour Pressure at T nom.			2.707 bar-a				
	17	Critical Pressure		Critical Temperature		220.5 bar-a		max. 10	
	18	Fluid	Phase	State		Water		Water Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	2425	36373	53210
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	130	130	130
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	107.6	113.4	115.5
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	0.00014	0.03287	0.07033
	23	CV	Min.	Norm.	Max.		240	240	240
	24	Noise	Min.	Norm.	Max.		<70	<70	<70
25	Required CV							240	
26	Selected CV			Internal / Mfr		/ 240			
27	Fd		Internal / Mfr		FI (Cf)		/ 0.9		
28	Fluid tending to		Air-Fail Position		TO CLOSE		Close		
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC 1)	
	30	Design Pressure		Min.	Max.	bar-g		172 bar-g	
	31	Design Temperature		Min.	Max.			153	
	32	Max. DP closed valve				173 bar			
	33	Valve end con. & rating		Seat leakage class		4 in - 1500 lb ANSI RTJ		CLASS V	
	34	Plug type		Plug material		Balanced		17-4 PH	
	35	Plug dim.		Plug form/taw		Full		on/off	
	36	Seat type		Q.ty	Material	Clamped in		1 AISI 410	
	37	Packing mat.		Lubricator		KELVAR PTFE			
	38	Bonnet type				Standard			
39									
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal						
	43	Air supply	Action dir.						
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve							
	48	Pressure gauge							
	49	Handwheel							
	50	Solenoid valve	Spec. No.		Yes 3)				
	51	Pos. detector	Spec. No.		Yes 5)				
	52	Weight							

Notes: 1) Secondary design condition: P=152 barg at T=345 0C
2) Operating time open to close has to be max. 6seconds. Operating time Close to open has to be 10seconds.
3) 24VDC EEx ia Iic T6 +IP65, 3 way Universal type & SSbody Tag no. UY10*27
4) Model BR 400
5) Close position, P & F make Namur type NJ2-11-N-G, tag no. UZSL 10*27
6) Actuator shall be sized for inst. air pressure 4barg

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 PARS PETROCHEMICAL COMPANY	
2	AHBR	MB	PTV	11/11/2002	Revised		 09233-20232309	
0	SG	MB	MVR	30/05/2002	For Purchase		Sheet 25 of 25	
A	MB	AR	MV	27/07/2001	For inquiry			
No.	By	Chk	Appr	Date	Revision		Code: 507 Dwg. No.: 31961-30-SP-1541-101 Rev.: 2	

UNIT 20

TECHNIP



9TH OLEFIN COMPLEX

ETHANE CRACKING PLANT



PARS PETROCHEMICAL COMPANY

CONTRACTOR DOCUMENT N°							OWNER DOCUMENT N°						
Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page	Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page
6465C	30	SP	1541	20	2	1/20	3930	30	SP	1541	20	2	1/20

02-04909

CONTROL VALVES DATA SHEETS

(SECTION 20)

Pages modified under this revision: ALL (19 & 20: Valves deleted)



2	02/10/02	Issue for purchase					T.GRANDRY	F.REGARD					P.E.CROUZIER
1	10/07/02	Issue for purchase					T.GRANDRY	F.REGARD					P.E.CROUZIER
0	19/04/02	Issue for purchase					S.SRIRAM	T.GRANDRY					P.E.CROUZIER
Rev	Date DD/MM/YY	STATUS					WRITTEN BY (name & visa)	CHECKED BY (name & visa)	APPROVED BY (name & visa)				

DOCUMENT REVISIONS

Sections changed in last revision are identified by a vertical line in the right margin



General Data	1	Tag No.			30FV 2001					
	2	Client Reference	Requisition No.	Item	1541-01		12001			
	3	Supplier	Model		DRESSER FLOW CONTROL		Butterfly Flangeless			
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		20 in	20"-QW20006A-DA10-N				
	8	Line schedule	Piping class		10					
Outlet line	9	Diameter	Number		20 in					
	10	Line schedule	Piping class		10					
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal		0.685 cP				
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max	994	993	993	kg/m3		
	16	Vapour Pressure at T nom.			0.06 bar-a					
	17	Critical Pressure		Critical Temperature		221 bar-a				
	18	Fluid	Phase	State		Quench Water	Liquid	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	643840	1609600	2167990	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	37.5	37.5	37.5	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	9.25	7.46	5.47	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.37	2.52	0.5	bar
	23	CV	Min.	Norm.	Max.		358.7	1190	3884	
	24	Noise	Min.	Norm.	Max.		76	73	69	dba
	25	Required CV								
	26	Selected CV Internal / Mfr			/ 5610					
27	Fd Internal / Mfr		FI (Cf)		/			0.780@max.		
28	Fluid tending to		Air-Fail Position					Open		
Valve Body	29	Body type		Body material		Butterfly		ASTM A216 GR WCB		
	30	Design Pressure		Min.	Max.	bar-g		12.6 bar-g		
	31	Design Temperature		Min.	Max.					
	32	Max.DP closed valve				7.4 bar				
	33	Valve end con.& rating		Seat leakage class		14 in - 150 lb ANSI RF		CLASS IV		
	34	Plug type		Plug material		Stainless Steel CF8M				
	35	Plug dim.		Plug form/law		=%				
	36	Seat type		Q.ty	Material	Incolloy 825				
	37	Packing mat.		Lubricator		PTFE				
	38	Bonnet type								
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Smart		4-20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve								
	48	Pressure gauge								
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		275 KG					

Notes: 1) May contain some tar and coke particles (coke particles diameter : 0.5 mm maxi)
2) Valve closes upon increasing the variable
3) Actuator model no.: B1JARRU20. Valve model is S-LW5C.

					INSTRUMENT SPECIFICATION		TECHNIP					
					Control Valve							
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE							
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE							
No.		By	Chk	Appr	Date	Revision	Code: 507	Dwg. No.: 6465C 30 SP 1541 20	Sheet 2	of 20		
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General Data	1	Tag No.			30LV 20001					
	2	Client Reference	Requisition No.	Item	1541-01			12002		
	3	Supplier		Model	DRESSER FLOW CONTROL		Camflex Flangeless			
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter		Number	6"-QW20022A-DA10-H					
	8	Line schedule		Piping class						
Outlet line	9	Diameter		Number	6 in					
	10	Line schedule		Piping class						
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal						
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max	973	973	973	kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		SOUR WATER		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	38529	96322	132971	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	78	78	78	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	7.4	5.99	4.42	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.05	2.46	0.7	bar
	23	CV	Min.	Norm.	Max.		22.52	72.62	195.1	
	24	Noise	Min.	Norm.	Max.		71.3	72.1	< 70	dba
	25	Required CV							-	
	26	Selected CV			Internal / Mfr		/ 230			
	27	Fd		Internal / Mfr		FI (CF)		/ 0.711@max.		
	28	Fluid tending to		Air-Fail Position					Close	
Valve Body	29	Body type		Body material					ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g		9.5 bar-g		
	31	Design Temperature		Min.	Max.	120				
	32	Max.DP closed valve							5 bar	
	33	Valve end con.& rating		Seat leakage class		4 in - 300 lb ANSI RF		CLASS IV		
	34	Plug type		Plug material					Eccentric rotary	316L S.S. + STELLITE
	35	Plug dim.		Plug form/law					Full trim	LINEAR
	36	Seat type		Q.ty	Material	316 S.S.				
	37	Packing mat.		Lubricator					KELVAR PTFE WITH VITON O RINGS	
	38	Bonnet type							Integral extended	
Actuator	40	Direction of action								
	41	Spring range							7 TO 15	
Positioner	42	Type		Input signal			Smart	4w20 mA 24Vdc HART		
	43	Air supply		Action dir.					4 BAR-G	
Accessories	44	Protection							IP-65 EEXI-a (Cenelec)	
	45	Booster relay							-	
	46	Locking device							-	
	47	Pressure reducing valve							YES	
	48	Pressure gauge							YES	
	49	Handwheel							NO	
	50	Solenoid valve		Spec. No.						
	51	Pos.detector		Spec. No.						
	52	Weight		Consumption			49 KG			

Notes: 1) Process water may contain tar particles.
2) Valve opens upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE			
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No.: 6465C 30 SP 1541 20
							Sheet 3	of 20
							Rev.: 2	



General Data	1	Tag No.			30PV 20001					
	2	Client Reference	Requisition No.	Item	1541-01			12003		
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		3"-FG20001A-DA03-N					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		4 in					
	10	Line schedule	Piping class							
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		4					
	14	Cp/Cv	Compressibility		1.39		1			
	15	Density min	Density nor	Density max		0.55 kg/m3				
	16	Vapour Pressure atT nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		FUEL GAS		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	696		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	40		:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	3.49		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	2.55		bar	
	23	CV	Min.	Norm.	Max.	34.75				
	24	Noise	Min.	Norm.	Max.	82.9				dba
	25	Required CV								
26	Selected CV	Internal / Mir		/ 54						
27	Fd	Internal / Mir		FI (Cf)	/				0.880	
28	Fluid tending to	Air-Fail Position						Open		
Valve Body	29	Body type	Body material						ASTM A216 GR WCC	
	30	Design Pressure	Min.	Max.	bar-g					
	31	Design Temperature	Min.	Max.	60					
	32	Max.DP closed valve	5.5 bar							
	33	Valve end con.& rating	Seat leakage class		3 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type	Plug material						Eccentric rotary 316L S.S. + STELLITE	
	35	Plug dim.	Plug form/flaw						Red. trim in LINEAR	
	36	Seat type	Q.ty	Material	316 S.S.					
	37	Packing mat.	Lubricator						KELVAR PTFE WITH VITON O RINGS	
	38	Bonnet type	Integral extended							
Actuator	40	Direction of action								
	41	Spring range							7 TO 15	
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.						4 BAR-G	
Accessories	44	Protection							IP-65 EEXI-a (Cenelec)	
	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve						YES		
	48	Pressure gauge						YES		
	49	Handwheel							NO	
50	Solenoid valve	Spec. No.		YES						
51	Pos.detector	Spec. No.		YES (1 No. Low limit switch)						
52	Weight	Consumption		48 KG						

Notes: (1) Design pressure : -0.2 / 5.5
(2) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE			
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No.: 6465C 30 SP 1541 20
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							Rev.: 2	



General Data	1	Tag No.			30PV 20022A					
	2	Client Reference	Requisition No.	Item	1541-01		12004			
	3	Supplier		Model	DRESSER FLOW CONTROL		41000 Series Globe			
	4	Serial Number								
	5	Service			Fresh Ethane Gas To E201					
	6	P&ID No.			0021-20-02					
Inlet line	7	Diameter	Number				16"-P20007A-EA01-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		14 in					
	10	Line schedule	Piping class		20					
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal		29.9		0.01 cP		
	14	Cp/Cv		Compressibility		1.28		0.875		
	15	Density min	Density nor	Density max	23.8	21.6	19.9	kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		Fresh Ethane		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	64237	160593	176652	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	40	40	50	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	17.88	16.25	15.1	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	10.85	8.56	7.24	bar
	23	CV	Min.	Norm.	Max.		212.1	592.5	723.8	
	24	Noise	Min.	Norm.	Max.		82.1	84.6	84	dBA
	25	Required CV								
26	Selected CV Internal / Mfr			/ 840						
27	Fd Internal / Mfr		FI (CI)		/		0.940			
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type		Body material				ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		22 bar-g		
	31	Design Temperature		Min.	Max.			65		
	32	Max.DP closed valve			22		bar			
	33	Valve end con.& rating		Seat leakage class		12 in - 300 lb ANSI RF		CLASS IV		
	34	Plug type		Plug material		BALANCED		17-4 PH		
	35	Plug diam.		Plug form/law		Full trim		LO-DB LINEAR		
	36	Seat type		Q.ty	Material	Clamped in		AISI 410		
	37	Packing mat.		Lubricator		KELVAR PTFE				
	38	Bonnet type		STANDARD						
39										
Actuator	40	Direction of action								
	41	Spring range			6 TO 30					
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXI-a (Cenelec)					
Accessories	45	Booster relay			YES					
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			YES					
	50	Solenoid valve		Spec. No.						
	51	Pos.detector		Spec. No.						
52	Weight		Consumption		1140 KG					

Notes: (1) Design pressure to be determined by PPC
(2) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE		Sheet 5		of 20	
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 20022B			
	2	Client Reference	Requisition No.	Item	1541-01		12005	
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex		
	4	Serial Number						
	5	Service						
	6	P&ID No.						
Inlet line	7	Diameter	Number		8"-P40087A-DJ01-C			
	8	Line schedule	Piping class					
Outlet line	9	Diameter	Number		8 in			
	10	Line schedule	Piping class					
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both			
	12	Sour service	Special conditions					
	13	Molecular Weight	Viscosity at @ normal					
	14	Cp/Cv	Compressibility					
	15	Density min	Density nor	Density max	547	547		kg/m3
	16	Vapour Pressure atT nom.						
	17	Critical Pressure	Critical Temperature		49 bar-a			
	18	Fluid	Phase	State		Ethane	Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	58959	96381 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-88.7	-88.7 :C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	12.92	10.51 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	5.21	0.44 bar
	23	CV	Min.	Norm.	Max.	40.52		229.5
	24	Noise	Min.	Norm.	Max.	82.2		<70 dBA
	25	Required CV						
26	Selected CV			Internal / Mfr		/ 300		
27	Fd		Internal / Mfr		FI (Cf)		0.727@max.	
28	Fluid tending to		Air-Fail Position			Close		
Valve Body	29	Body type		Body material		A 351 Gr. CF3M		
	30	Design Pressure	Min.	Max.	bar-g		14.8 bar-g	
	31	Design Temperature	Min.	Max.				
	32	Max.DP closed valve				14.8 bar		
	33	Valve end con.& rating	Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV	
	34	Plug type	Plug material		Eccentric rotary		316L S.S. + STELLITE	
	35	Plug dim.	Plug form/law		red. port		LINEAR	
	36	Seat type	Q.ty	Material		316 S.S.		
	37	Packing mat.	Lubricator		KELVAR PTFE WITH VITON O RINGS			
	38	Bonnet type			Integral extended			
39								
Actuator	40	Direction of action						
	41	Spring range						
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART	
	43	Air supply	Action dir.		4 BAR-G			
	44	Protection						
Accessories	45	Booster relay						
	46	Locking device						
	47	Pressure reducing valve		YES				
	48	Pressure gauge		YES				
	49	Handwheel						
	50	Solenoid valve	Spec. No.		YES			
51	Pos.detector	Spec. No.		YES (One No. Low Limit Switch)				
52	Weight	Consumption		120 KG				

Notes: (1) Design temperature : -90 OC/+600C
(2) Valve closes upon increasing the variable
(3) No flow in normal operation

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE					
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						Code: 507	Dwg. No.: 6465C 30 SP 1541 20	Rev.: 2		



General Data	1	Tag No.			30PV 20024				
	2	Client Reference	Requisition No.	Item	1541-01		12006		
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe			
	4	Serial Number							
	5	Service							Ethane From E 201
	6	P&ID No.							0021-20-02
Inlet line	7	Diameter	Number			8"-WF20002A-DA03-N			
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number			8 in			
	10	Line schedule	Piping class						20
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal			29.9	0.01 cP		
	14	Cp/Cv	Compressibility			1.21	0.945		
	15	Density min	Density nor	Density max		10		kg/m3	
	16	Vapour Pressure atT nom.							
	17	Critical Pressure			Critical Temperature				
	18	Fluid	Phase	State		Ethane	Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	30707		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	55		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	8.7		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	6		bar
	23	CV	Min.	Norm.	Max.	216.5			
	24	Noise	Min.	Norm.	Max.	79.4		dBA	
	25	Required CV							
	26	Selected CV			Internal / Mr		/ 250		
27	Fd	Internal / Mr		FI (CI)		/		0.975	
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material		ASTM A216 GR WCC			
	30	Design Pressure	Min.	Max.	bar-g		8.4 bar-g		
	31	Design Temperature	Min.	Max.	80				
	32	Max.DP closed valve		8.4		bar			
	33	Valve end con.& rating	Seat leakage class		8 in - 300 lb ANSI RF		CLASS V (IEC534-4)		
	34	Plug type	Plug material		BALANCED		17-4 PH		
	35	Plug dim.	Plug form/law		LO-DB 2 STAGE LINEAR				
	36	Seat type	Q.ty	Material	Clamped in		AISI 410		
	37	Packing mat.	Lubricator		KELVAR PTFE				
	38	Bonnet type		STANDARD					
39									
Actuator	40	Direction of action							
	41	Spring range			21 TO 45				
Positioner	42	Type	Input signal			Smart		4±20 mA 24Vdc Hart	
	43	Air supply	Action dir.			4 BAR-G			
	44	Protection							IP-65 EEXI-a (Cenelec)
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel							YES
	50	Solenoid valve	Spec. No.						
51	Pos.detector	Spec. No.							
52	Weight	Consumption		529 KG					

Notes: 1) Valve opens upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP					
					Control Valve							
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE							
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE							
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General Data	1	Tag No.			30TV 20024				
	2	Client Reference	Requisition No.	Item	1541-01		12007		
	3	Supplier	Model	DRESSER FLOW CONTROL		Camflex Flangeless			
	4	Serial Number							
	5	Service			Ethane To E 201				
	6	P&ID No.			0021-20-02				
Inlet line	7	Diameter	Number				6"-QW20011A-DA10-N		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		6 in				
	10	Line schedule	Piping class		STD				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal			0.446 cP			
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	982	982	982	kg/m3	
	16	Vapour Pressure at T nom.			0.23 bar-a				
	17	Critical Pressure		Critical Temperature		221 bar-a			
	18	Fluid	Phase	State		Quench Water		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	40350	166330	182960 kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	63	63	63 :C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	11.37	9.18	7.75 bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	2.01	1.06	0.85 bar
	23	CV	Min.	Norm.	Max.		33.31	189.1	232.3
	24	Noise	Min.	Norm.	Max.		<70	<70	<70 dBA
	25	Required CV							
26	Selected CV Internal / Mfr			/ 300					
27	Fd Internal / Mfr			FI (CI)				0.725@max.	
28	Fluid tending to		Air-Fail Position		Close				
Valve Body	29	Body type		Body material		ASTM A216 GR WCC			
	30	Design Pressure	Min.	Max.	bar-g		12.6 bar-g		
	31	Design Temperature	Min.	Max.	120				
	32	Max.DP closed valve			7.4 bar				
	33	Valve end con.& rating	Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV		
	34	Plug type	Plug material		Eccentric rotary		316 S.S. + STELLITE		
	35	Plug dim.	Plug form/law		Red. trim		LINEAR		
	36	Seat type	Q.ty	Material			316 S.S.		
	37	Packing mat.	Lubricator		KELVAR PTFE WITH VITON O RINGS				
	38	Bonnet type			Integral extended				
39									
Actuator	40	Direction of action							
	41	Spring range			7 TO 24				
Positioner	42	Type	Input signal		Field Bus		Field Bus		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXI-a (Cenelec)				
Accessories	45	Booster relay			NO				
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve	Spec. No.						
	51	Pos.detector	Spec. No.						
52	Weight	Consumption		100 KG					

Notes: (1) May contain some tar and coke particles (coke particles diameter : 0.5 mm maxi)
(2) Valve closes upon increasing the signal

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE		Sheet 8		of 20	
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PDV 20031					
	2	Client Reference	Requisition No.	Item	1541-01			12008		
	3	Supplier	Model		DRESSER FLOW CONTROL		30000 Series Varimax			
	4	Serial Number								
	5	Service							Quench Water From AE 201	
	6	P&ID No.							0021-20-03	
Inlet line	7	Diameter	Number					16"-QW20007A-DA10-N		
Outlet line	8	Line schedule	Piping class							
	9	Diameter	Number		16 in					
Operating Conditions	10	Line schedule	Piping class		10					
	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal						0.446 cP	
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max		982	982	982	kg/m3	
	16	Vapour Pressure at T nom.			0.23 bar-a					
	17	Critical Pressure		Critical Temperature		221 bar-a				
	18	Fluid	Phase	State		Quench Water		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	518260	1011770	1582400	kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	63	63	63	:C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	11.27	9.53	7.3	bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	1.92	1.45	0.62	bar
	23	CV	Min.	Norm.	Max.		437.8	983.5	2352	
	24	Noise	Min.	Norm.	Max.		80.8	81.9	78.3	dba
	25	Required CV								
	26	Selected CV			Internal / Mir		/ 2860			
	27	Fd	Internal / Mir		FI (Cf)		/		0.840@max.	
	28	Fluid tending to		Air-Fail Position						Open
	Valve Body	29	Body type		Body material		ASTM A216 GR WCC			
		30	Design Pressure	Min.	Max.	bar-g		12.6 bar-g		
		31	Design Temperature	Min.	Max.	120				
		32	Max.DP closed valve			7.4 bar				
		33	Valve end con.& rating	Seat leakage class		16 in -300 lb ANSI RF		CLASS IV (IEC 534-4)		
34		Plug type		Plug material		Rotary		316 S.S.		
35		Plug dim.		Plug form/law		LINEAR				
36		Seat type		Q.ty	Material	clamped		316 S.S.		
37		Packing mat.		Lubricator		KELVAR PTFE				
38		Bonnet type		Integral extended						
39										
Actuator	40	Direction of action								
	41	Spring range							7 TO 25	
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection							IP-65 EEXi-a (Cenelec)	
Accessories	45	Booster relay							YES	
	46	Locking device								
	47	Pressure reducing valve							YES	
	48	Pressure gauge							YES	
	49	Handwheel							YES	
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		480 KG					

Notes: (1) Process may contain some tar and coke particles (coke particles diameter : 0.5 mm max)
(2) Valve opens upon increasing the variable
(3) Adjustment at position D (Cv = 2860).

					INSTRUMENT SPECIFICATION		TECHNIP					
					Control Valve							
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE							
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE							
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General Data	1	Tag No.			30LDV 20051				
	2	Client Reference	Requisition No.	Item	1541-01		12009		
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number					2"-P20002A-DA10-P	
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		2 in				
	10	Line schedule	Piping class						
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal						
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	919	919	919	kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure	Critical Temperature						
	18	Fluid	Phase	State		LIGHT OIL		Liquid	
	19	Flow	Min.	Norm.	Max.	Unit	195	487	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	78	78	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	7.4	6.3	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	5.86	4.26	
	23	CV	Min.	Norm.	Max.		0.0975	0.285	
	24	Noise	Min.	Norm.	Max.		<70	<70	
	25	Required CV							
	26	Selected CV			Internal / Mir		/ 1.7		
27	Fd			Internal / Mir		FI (Cf)		0.938@max.	
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g		9.5 bar-g	
	31	Design Temperature		Min.	Max.	120			
	32	Max.DP closed valve							
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material					
	35	Plug dim.		Plug form/law					
	36	Seal type		Q.ty	Material	Threaded		AISI 416	
	37	Packing mat.		Lubricator					
	38	Bonnet type							
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type		Input signal		Field Bus		Field Bus	
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve							
	48	Pressure gauge							
	49	Handwheel							
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
	52	Weight		Consumption		38 KG			

Notes: (1) Valve closes upon increasing the signal

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	TG	TG	02/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30FV 20061							
	2	Client Reference	Requisition No.	Item	1541-01		12010					
	3	Supplier	Model	DRESSER FLOW CONTROL		Camflex Flangeless						
	4	Serial Number										
	5	Service										
	6	P&ID No.										
Inlet line	7	Diameter	Number				6"-QW20003A-DA10-P					
	8	Line schedule	Piping class									
Outlet line	9	Diameter	Number		6 in							
	10	Line schedule	Piping class									
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both			
	12	Sour service	Special conditions									
	13	Molecular Weight	Viscosity at @ normal						20 cP			
	14	Cp/Cv	Compressibility									
	15	Density min	Density nor	Density max	973	973	973	kg/m3				
	16	Vapour Pressure at T nom.										
	17	Critical Pressure			Critical Temperature							
	18	Fluid	Phase	State		Quench Water		Liquid	Single Phase			
	19	Flow	Min.	Norm.	Max.	Unit	38900	97300	107030	kg/h		
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	78	78	78	:C		
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	5.51	4.56	4.19	bar-a		
	22	DP	QMin.	Q Norm.	Q Max.	Unit	2.22	0.94	0.5	bar		
	23	CV	Min.	Norm.	Max.		30.72	119.9	185			
	24	Noise	Min.	Norm.	Max.		<70	<70	<70	dba		
	25	Required CV										
	26	Selected CV Internal / Mfr			/ 230							
	27	Fd Internal / Mfr		FI (CI)		/		0.720@max.				
	28	Fluid tending to		Air-Fail Position						Close		
	Valve Body	29	Body type		Body material						ASTM A216 GR WCC	
		30	Design Pressure		Min.	Max.	bar-g		7.4 bar-g			
		31	Design Temperature		Min.	Max.						
		32	Max.DP closed valve									
		33	Valve end con.& rating		Seat leakage class			4 in - 300 lb ANSI RF		CLASS IV		
		34	Plug type		Plug material						Eccentric rotary	
		35	Plug dim.		Plug form/law						Full trim	
36		Seat type		Q.ty	Material							
37		Packing mat.		Lubricator						KELVAR PTFE WITH VITON O RINGS		
38		Bonnet type		Integral extended								
Actuator		40	Direction of action									
	41	Spring range										
Positioner	42	Type		Input signal			Field Bus		Field Bus			
	43	Air supply		Action dir.			4 BAR-G					
	44	Protection										
Accessories	45	Booster relay										
	46	Locking device										
	47	Pressure reducing valve										
	48	Pressure gauge										
	49	Handwheel										
	50	Solenoid valve		Spec. No.								
	51	Pos.detector		Spec. No.								
	52	Weight		Consumption			49 KG					

Notes: (1) Presence of tar and coke particles may occur (maximum size : 3 mm)
(2) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 20071				
	2	Client Reference	Requisition No.	Item	1541-01			12011	
	3	Supplier	Model		DRESSER FLOW CONTROL		Camiflex Flangeless		
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number					6"-QW20026A-DA10-H	
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		6 in				
	10	Line schedule	Piping class						
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal						
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	945	945	945	kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure	Critical Temperature						
	18	Fluid	Phase	State		Process Water		Liquid	
	19	Flow	Min.	Norm.	Max.	Unit	41252	103130	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	117.8	117.8	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	13.93	12.62	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	5.8	3.58	
	23	CV	Min.	Norm.	Max.		20.43	65.02	
	24	Noise	Min.	Norm.	Max.		74	74.9	
	25	Required CV							
	26	Selected CV Internal / Mfr							
	27	Fd		Internal / Mfr		FI (Cl)		0.718@max.	
	28	Fluid tending to		Air-Fail Position				Close	
	Valve Body	29	Body type		Body material				ASTM A216 GR WCC
		30	Design Pressure		Min.	Max.	bar-g		14.7 bar-g
		31	Design Temperature		Min.	Max.	150		
		32	Max.DP closed valve						
		33	Valve end con.& rating		Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV
		34	Plug type		Plug material		Eccentric rotary		316L S.S. + STELLITE
35		Plug dim.		Plug form/law		Red. trim		LINEAR	
36		Seat type		Q.ty	Material	316 S.S.			
37		Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS			
38		Bonnet type							
39									
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve							
	48	Pressure gauge							
	49	Handwheel							
	50	Solenoid valve		Spec. No.		YES			
51	Pos.detector		Spec. No.		YES (1no. Low limit switch)				
	52	Weight		Consumption		100 KG			

Notes: (1) Process water may contain tar and polymer deposit
(2) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP		 PARS PETROCHEMICAL COMPANY
					Control Valve		 Sheet 12 of 20		
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE				
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE				
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General Data	1	Tag No.				30FV 20071				
	2	Client Reference	Requisition No.	Item	1541-01			12012		
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number	10 in		10"-DS20003A-DA10-H				
	8	Line schedule	Piping class	20						
Outlet line	9	Diameter	Number	10 in						
	10	Line schedule	Piping class	20						
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		18	0.016 cP				
	14	Cp/Cv	Compressibility		1.37	0.955				
	15	Density m/n	Density nor	Density max	3.6	3.6	3.6	kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure			Critical Temperature					
	18	Fluid	Phase	State		Dilution Steam		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	3879	9698	13400	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	190	190	190	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	8.38	7.35	6.19	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	6.58	5.5	4.32	
	23	CV	Min.	Norm.	Max.		43.96	125.3	205.7	
	24	Noise	Min.	Norm.	Max.		84.9	84.9	85	
	25	Required CV								
26	Selected CV		Internal / Mlr		/ 300					
27	Fd		Internal / Mlr		FI (Ci)		0.940			
28	Fluid tending to		Air-Fail Position							
Valve Body	29	Body type		Body material						
	30	Design Pressure		Min.	Max.	bar-g				
	31	Design Temperature		Min.	Max.	320				
	32	Max. DP closed valve		8.3 bar						
	33	Valve end con. & rating		Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV		
	34	Plug type		Plug material						
	35	Plug dim.		Plug form/law						
	36	Seat type		Q.ty	Material	Clamped in		AISI 410		
	37	Packing mat.		Lubricator						
	38	Bonnet type		STANDARD						
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve				YES				
	48	Pressure gauge				YES				
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
51	Pos. detector		Spec. No.							
	52	Weight		Consumption		279 KG				

Notes: (1) Valve closes upon increasing the variable
(2) Design pressure 8.3 barg / FV

					INSTRUMENT SPECIFICATION		TECHNIP					
					Control Valve							
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE							
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE							
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General Data	1	Tag No.			30LV 20081					
	2	Client Reference	Requisition No.	Item	1541-01			12013		
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		3"-BW20001A-GA02-H					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		3 in					
	10	Line schedule	Piping class							
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal							
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max		937			kg/m3	
	16	Vapour Pressure at T nom.								
	17	Critical Pressure	Critical Temperature		221 bar-a					
	18	Fluid	Phase	State		Boiler F. Water		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	8700		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	130		:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	40.7		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	31		bar	
	23	CV	Min.	Norm.	Max.	1.873				
	24	Noise	Min.	Norm.	Max.	75.2				dBA
	25	Required CV							-	
	26	Selected CV Internal / Mfr			/ 2.8					
27	Fd	Internal / Mfr		FI (CI)		/ 0.975				
28	Fluid tending to	Air-Fail Position		Close						
Valve Body	29	Body type	Body material						ASTM A216 GR WCC	
	30	Design Pressure	Min.	Max.	bar-g		44 bar-g			
	31	Design Temperature	Min.	Max.	150					
	32	Max.DP closed valve	44 bar							
	33	Valve end con.& rating	Seat leakage class		1 in - 600 lb ANSI RF		CLASS IV			
	34	Plug type	Plug material						SS 410	
	35	Plug dim.	Plug form/law						Red. trim	
	36	Seat type	Q.ty	Material		Combined in cage		AISI 410		
	37	Packing mat.	Lubricator						KELVAR PTFE	
	38	Bonnet type	STANDARD							
Actuator	40	Direction of action								
	41	Spring range							11 TO 23	
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
Accessories	44	Protection							IP-65 EEXi-a (Cenelec)	
	45	Booster relay							-	
	46	Locking device							-	
	47	Pressure reducing valve							YES	
	48	Pressure gauge							YES	
	49	Handwheel							YES	
50	Solenoid valve	Spec. No.								
51	Pos.detector	Spec. No.								
	52	Weight	Consumption		44 KG					

Notes: (1) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30FV 20081					
	2	Client Reference	Requisition No.	Item	1541-01			12014		
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		6"-CB20002A-DA10-N					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		6 in					
	10	Line schedule	Piping class							
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal					0.547 cP		
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	988	988	988	kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure	Critical Temperature							
	18	Fluid	Phase	State						
	19	Flow	Min.	Norm.	Max.	Unit	6000	15000	129436	kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	50	50	50	:C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	9.62	8.49	5.72	bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	6.61	5.46	1.47	bar
	23	CV	Min.	Norm.	Max.		2.723	7.49	126.8	
	24	Noise	Min.	Norm.	Max.		<70	<70	<70	dba
	25	Required CV								
26	Selected CV			Internal / Mr	/ 195					
27	Fd	Internal / Mr		FI (Cf)	/			0.910 @max.		
28	Fluid tending to		Air-Fail Position			Close				
Valve Body	29	Body type	Body material		Single Seat Globe		ASTM A216 GR WCC			
	30	Design Pressure	Min.	Max.	bar-g		9.5 bar-g			
	31	Design Temperature	Min.	Max.						
	32	Max.DP closed valve	9.5 bar							
	33	Valve end con.& rating	Seat leakage class		4 in - 300 lb ANSI RF		CLASS IV			
	34	Plug type	Plug material							
	35	Plug dim.	Plug form/law							
	36	Seat type	Q.ty	Material		Threaded		AISI 416		
	37	Packing mat.	Lubricator							
	38	Bonnet type	STANDARD							
39										
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve								
	48	Pressure gauge								
	49	Handwheel								
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
52	Weight	Consumption		128 KG						

Notes: (1) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30PV 20083A					
	2	Client Reference	Requisition No.	Item	1541-01		12015			
	3	Supplier	Model		DRESSER FLOW CONTROL		Butterfly Flangeless			
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		18 in		18"-MP20001A-EA02-H			
	8	Line schedule	Piping class		20					
Outlet line	9	Diameter	Number		18 in					
	10	Line schedule	Piping class		20					
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		18		0.019 cP			
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	7.7		7.08			
	16	Vapour Pressure at T nom.								
	17	Critical Pressure			Critical Temperature					
	18	Fluid	Phase	State		MP STEAM		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	40840	102100	143781	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	285	300	315	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	17.37	16.8	16.4	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	6.86	0.69	0.21	
	23	CV	Min.	Norm.	Max.		322.3	1881	4826	
	24	Noise	Min.	Norm.	Max.		94.4	85.1	<70	
	25	Required CV								
	26	Selected CV Internal / Mfr			/ 9100					
	27	Fd Internal / Mfr		FI (Cf)		/		0.681 @ max.		
	28	Fluid tending to		Air-Fail Position			Open			
	Valve Body	29	Body type		Body material		Butterfly		ASTM A216 GR WCB	
		30	Design Pressure		Min.	Max.	bar-g			
		31	Design Temperature		Min.	Max.	330			
		32	Max.DP closed valve		18.6 bar					
		33	Valve end con.& rating		Seat leakage class		16 in - 300 lb ANSI RF		CLASS IV	
		34	Plug type		Plug material					
		35	Plug dim.		Plug form/law					
36		Seat type		Q.ty	Material	= % Incolloy 825				
37		Packing mat.		Lubricator		GRAPHITE				
38		Bonnet type								
39										
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection								
Accessories	45	Booster relay		YES						
	46	Locking device								
	47	Pressure reducing valve		YES						
	48	Pressure gauge		YES						
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
	51	Pos.detector		Spec. No.						
52	Weight		Consumption		965 KG					

Notes: (1) Valve closes upon increasing the variable
(2) Design pressure : 18.6 barg / FV
(3) Actuator model no.: B1JARRU32. Valve model is L1D.

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30PV 20083B					
	2	Client Reference	Requisition No.	Item	1541-01		12016			
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number	18 in		18" MP20001A-EA02-H				
	8	Line schedule	Piping class	20						
Outlet line	9	Diameter	Number	24 in						
	10	Line schedule	Piping class	STD						
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		18	0.019 cP				
	14	Cp/Cv	Compressibility		1.35	0.958				
	15	Density min	Density nor	Density max	7.1	6.6	6.2	kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		MP STEAM	Gas	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	10538	84304	180000	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	285	300	315	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	17.4	16.7	16.4	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	10.5	9.7	8.5	bar
	23	CV	Min.	Norm.	Max.	62.58		530.9	1189	
	24	Noise	Min.	Norm.	Max.	75.5	84.4	84.8	dba	
	25	Required CV							-	
26	Selected CV Internal / Mfr			/ 1360						
27	Fd Internal / Mfr		FI (CI)		/		0.940			
28	Fluid tending to		Air-Fail Position			Close				
Valve Body	29	Body type		Body material			ASTM A216 GR WCC			
	30	Design Pressure		Min.	Max.	bar-g				
	31	Design Temperature		Min.	Max.	330				
	32	Max. DP closed valve			18.6 bar					
	33	Valve end con. & rating		Seat leakage class		16 in - 300 lb ANSI RF	CLASS IV			
	34	Plug type		Plug material		BALANCED	17-4 PH			
	35	Plug diam.		Plug form/law		LO-DB LINEAR				
	36	Seat type		Q.ty	Material	Clamped in		AISI 410		
	37	Packing mat.		Lubricator		KELVAR PTFE				
	38	Bonnet type		STANDARD						
	39									
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Smart	4w20 mA 24Vdc HART				
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve								
	48	Pressure gauge								
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
51	Pos. detector		Spec. No.							
52	Weight		Consumption		1614 KG					

Notes: (1) Valve closes upon increasing the variable
(2) Design pressure : 18.6 barg /FV

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 20091				
	2	Client Reference	Requisition No.	Item	1541-01		12017		
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number		10"-MC20003A-EA02-H				
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		10 in				
	10	Line schedule	Piping class						
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal			0.134 cP			
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	865	865	885	kg/m3	
	16	Vapour Pressure at T nom.			15.9 bar-a				
	17	Critical Pressure		Critical Temperature		221 bar-a			
	18	Fluid	Phase	State		MP condensate	Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	40840	102100	143781
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	201	201	182
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	16.64	16.46	10.85
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	11.01	9.9	3.85
	23	CV	Min.	Norm.	Max.		33.97	95.55	205.3
	24	Noise	Min.	Norm.	Max.				dBA
	25	Required CV							
26	Selected CV			Internal / Mir		/ 300			
27	Fd		Internal / Mir		FI (Cf)		0.743@max.		
28	Fluid tending to		Air-Fail Position						
Valve Body	29	Body type		Body material		ASTM A216 GR WCC			
	30	Design Pressure		Min.	Max.	bar-g			
	31	Design Temperature		Min.	Max.	330			
	32	Max.DP closed valve		19.4 bar					
	33	Valve end con.& rating		Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV	
	34	Plug type		Plug material		Eccentric rotary		316L S.S. + STELLITE	
	35	Plug dim.		Plug form/law		Red. trim		LINEAR	
	36	Seat type		Q.ty	Material	316SS stellited hard faced			
	37	Packing mat.		Lubricator					
	38	Bonnet type		Integral extended					
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type		Input signal		Smart	4w20 mA 24Vdc HART		
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel							
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
	52	Weight		Consumption		120 KG			

Notes: (1) Mixed phase at outlet valve : 9.4 % wt of vaporization vapor density : 3.7 kg/m3
(2) Valve opens upon increasing the variable
(3) Design pressure : 19.4 barg / FV

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	02/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	10/04/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30UV 2001				
	2	Client Reference	Requisition No.	Item	DELETED			DELETED	
	3	Supplier		Model					
	4	Serial Number							
	5	Service							
	6	P&ID No. 0021-20-01							
Inlet line	7	Diameter		Number					
	8	Line schedule		Piping class					
Outlet line	9	Diameter		Number		6"			
	10	Line schedule		Piping class		XS			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service		Special conditions					
	13	Molecular Weight		Viscosity at @ normal		18.02			
	14	Cp/Cv		Compressibility					
	15	Density min	Density nor	Density max					
	16	Vapour Pressure at T nom.							
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		Steam		Steam	
	19	Flow	Min.	Norm.	Max.	Unit			
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	370		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	40.5		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit			
	23	CV	Min.	Norm.	Max.		1)	1)	1)
	24	Noise	Min.	Norm.	Max.		1)	1)	1) dBA
25	Required CV								
26	Selected CV Internal / Mfr			/ 400					
27	Fd Internal / Mfr		FI (Cf)		/				
28	Fluid tending to		Air-Fail Position		TO OPEN		Close		
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g		47 bar-g	
	31	Design Temperature		Min.	Max.	425			
	32	Max.DP closed valve				47 bar			
	33	Valve end con.& rating		Seat leakage class		6 in - 600 lb ANSI RFS		CLASS IV (standard)	
	34	Plug type		Plug material		BALANCED		A 487 Gr CA6NM Nitrided	
	35	Plug dim.		Plug form/law		Full trim			
	36	Seat type		Q.ty	Material	Clamped in		AISI 410	
	37	Packing mat.		Lubricator		GRAPHITE			
	38	Bonnet type				STANDARD			
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type		Input signal		Without			
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve					YES		
	48	Pressure gauge					YES		
	49	Handwheel							
	50	Solenoid valve		Spec. No.		YES			
51	Pos.detector		Spec. No.		YES Two limit switch				
	52	Weight		Consumption					

Notes: 1) ON-OFF VALVE NO CALCULATION

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
2	T.G.	FR	FR	02/10/2002	DELETED			
1	T.G.	FR	FR	09/07/2002	ISSUE FOR PURCHASE			
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No.: DELETED
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							Rev.: 2	

General Data	1	Tag No.			30UV 20011					
	2	Client Reference	Requisition No.	Item	DELETED		DELETED			
	3	Supplier	Model							
	4	Serial Number			41005					
	5	Service								
	6	P&ID No.			0021-20-01					
Inlet line	7	Diameter	Number							
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number			6"				
	10	Line schedule	Piping class			XS				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal							
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max						
	16	Vapour Pressure atT nom.								
	17	Critical Pressure	Critical Temperature							
	18	Fluid	Phase	State		Steam				
	19	Flow	Min.	Norm.	Max.	Unit				
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit				
	21	Press.	QMin.	Q Norm.	Q Max.	Unit				
	22	DP	QMin.	Q Norm.	Q Max.	Unit				
	23	CV	Min.	Norm.	Max.		1)	1)	1)	
	24	Noise	Min.	Norm.	Max.		1)	1)	1)	dBA
	25	Required CV								
26	Selected CV Internal / Mfr			/ 400						
27	Fd Internal / Mfr F1 (Cf)			/						
28	Fluid tending to		Air-Fail Position		TO OPEN		Close			
Valve Body	29	Body type		Body material				ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g				
	31	Design Temperature		Min.	Max.					
	32	Max.OP closed valve				47 bar				
	33	Valve end con.& rating		Seat leakage class		6 in - 600 lb ANSI RFS		CLASS IV (standard)		
	34	Plug type		Plug material		BALANCED		A 487 Gr CA6NM Nitrided		
	35	Plug dim.		Plug form/law		Full trim				
	36	Seat type		Q.ty	Material	Clamped in		AISI 410		
	37	Packing mat.		Lubricator		GRAPHITE				
	38	Bonnet type				STANDARD				
39										
Actuator	40	Direction of action								
	41	Spring range			Piston actuator L300 SR (f) 51					
Positioner	42	Type		Input signal		Without				
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel								
	50	Solenoid valve		Spec. No.		YES				
51	Pos.detector		Spec. No.		YES Two limit switch					
52	Weight		Consumption							

Notes: 1) ON-OFF VALVE NO CALCULATION

					INSTRUMENT SPECIFICATION		TECHNIP		 	
					Control Valve					
2	T.G.	FR	FR	02/10/2002	DELETED					
1	T.G.	FR	FR	09/07/2002	ISSUE FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507		Dwg. No.: DELETED	
							Sheet 20		of 20	
							Rev.: 2			

UNIT 30

TECHNIP



**9TH OLEFIN COMPLEX
ETHANE CRACKING PLANT**



PARS PETROCHEMICAL COMPANY

CONTRACTOR DOCUMENT N°							OWNER DOCUMENT N°						
Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page	Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page
6465C	30	SP	1541	30	2	1/38	3930	30	SP	1541	30	2	1/38

CONTROL VALVES DATA SHEETS

(SECTION 30)

Pages modified under this revision: 2, 29.



2	02/04/03	Revised					T.GRANDRY	F.REGARD	J.M.AUBRY				
1	03/10/02	Issue for purchase					T.GRANDRY	F.REGARD	P.E.CROUZIER				
0	19/04/02	Issue for purchase					S.SRIRAM	T.GRANDRY	P.E.CROUZIER				
Rev	Date DD/MM/YY	STATUS					WRITTEN BY (name & visa)	CHECKED BY (name & visa)		APPROVED BY (name & visa)			

DOCUMENT REVISIONS

Sections changed in last revision are identified by a vertical line in the right margin

General Data	1	Tag No.			30PV 30002					
	2	Client Reference	Requisition No.	Item	1541-01		13001			
	3	Supplier	Model		DRESSER FLOW CONTROL		Butterfly Flangeless			
	4	Serial Number								
	5	Service			Cracked Gas To Wet Flare					
	6	P&ID No.			0021-30-01					
Inlet line	7	Diameter	Number				24"-P30001A-DA10-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		28 in					
	10	Line schedule	Piping class		10		DA07			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		18.6		0.012 cP			
	14	Cp/Cv	Compressibility		1.26		0.996			
	15	Density min	Density nor	Density max	1.05		1.05		1.05 kg/m3	
	16	Vapour Pressure atT nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		Cracked gas		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	102880	257200	282920	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	40	40	40	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	3	3.5	3.5	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.5	1	1	bar
	23	CV	Min.	Norm.	Max.		3106	7178	8141	
	24	Noise	Min.	Norm.	Max.		107.9	119	119.8	dBA
	25	Required CV								
26	Selected CV Internal / Mfr									
27	Fd	Internal / Mfr	FI (Ci)			16500		0.740@max.		
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type	Body material		Butterfly		ASTM A216 GR WCB			
	30	Design Pressure	Min.	Max.	bar-g		3.5 bar-g			
	31	Design Temperature	Min.	Max.			120			
	32	Max.DP closed valve			3.5 bar					
	33	Valve end con.& rating	Seat leakage class		24 in - 150 lb ANSI RF		CLASS V			
	34	Plug type	Plug material				CF8M Stainless Steel			
	35	Plug dim.	Plug form/law				=%			
	36	Seat type	Q.ty	Material			Incolloy 825			
	37	Packing mat.	Lubricator		PTFE					
	38	Bonnet type								
39										
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay			YES					
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
52	Weight	Consumption		1020 KG						

Notes: (1) Valve opens upon increasing the variable.
(2) Actuator model number is B1JU32. Valve model is S-L1C.

					INSTRUMENT SPECIFICATION		TECHNIP		 PARS PETROCHEMICAL COMPANY	
					Control Valve		 PARS PETROCHEMICAL COMPANY		Sheet 2 of 38	
2	T.G.	FR	FR	02/04/2003	REVISED					
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision	Code: 507	Dwg. No.: 6465C 30 SP 1541 30	Rev.: 2		

General Data	1	Tag No.			30LV 30004					
	2	Client Reference	Requisition No.	Item	1541-01		13002			
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number								
	5	Service			Light Oil To TK705					
	6	P&ID No.			0021-30-01					
Inlet line	7	Diameter	Number				2"-P30052A-DA10-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		2 in					
	10	Line schedule	Piping class		STD		DA10			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal				0.71 cP			
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	941	920	920	kg/m3		
	16	Vapour Pressure aTT nom.			0.0005 bar-a					
	17	Critical Pressure	Critical Temperature		58.8 bar-a					
	18	Fluid	Phase	State		Light oil		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	221	552	1840	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	23.2	40	40	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	5.59	3.99	3.68	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.58	1.84	1.78	bar
	23	CV	Min.	Norm.	Max.		0.1235	0.492	1.67	
	24	Noise	Min.	Norm.	Max.		<70	<70	<70	dBA
	25	Required CV								
26	Selected CV Internal / Mir			/ 3.8						
27	Fd Internal / Mir		FI (Ci)		/		0.924@max.			
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type	Body material		Single Seat Globe		ASTM A216 GR WCC			
	30	Design Pressure	Min.	Max.	bar-g		6.1 bar-g			
	31	Design Temperature	Min.	Max.						
	32	Max.DP closed valve			6.1 bar					
	33	Valve end con.& rating	Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type	Plug material		Contoured		SS 416			
	35	Plug dim.	Plug form/law		=%					
	36	Seat type	Q.ty	Material	Threaded		AISI 416			
	37	Packing mat.	Lubricator		CARBON-PTFE + (Note 1)					
	38	Bonnet type			STANDARD					
39										
Actuator	40	Direction of action								
	41	Spring range			3 TO 15					
Positioner	42	Type	Input signal		Field Bus		Field bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXI-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
52	Weight	Consumption		38 KG						

Notes: (1) Low emission packing L 13.
(2) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.		By	Chk	Appr	Date	Revision	Code: 507	Dwg. No.:	6465C 30 SP 1541 30	
								Sheet 3	of 38	
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General Data	1	Tag No.				30LV 30022				
	2	Client Reference	Requisition No.	Item	1541-01			13003		
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number								
	5	Service				Back Flash To D301				
	6	P&ID No.				0021-30-03				
Inlet line	7	Diameter	Number			3"-P30007A-DA10-N				
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number			3 in				
	10	Line schedule	Piping class			STD		DA10		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal			0.66 cP				
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	934.5	912.5	912.5	kg/m3		
	16	Vapour Pressure at T nom.			0.0006 bar-a					
	17	Critical Pressure		Critical Temperature		60.6 bar-a				
	18	Fluid	Phase	State		Hydrocarbons		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	198	556	612	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	24.8	38.9	38.9	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	3.24	3.2	3.17	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.94	1.9	0.87	bar
	23	CV	Min.	Norm.	Max.		0.1706	0.489	0.7971	
	24	Noise	Min.	Norm.	Max.		<70	<70	<70	dBA
	25	Required CV								
26	Selected CV Internal / Mfr				/ 1.7					
27	Fd		Internal / Mfr	Fl (Cf)	/		0.922@max.			
28	Fluid tending to		Air-Fail Position		Close					
Valve Body	29	Body type	Body material		Single Seat Globe		ASTM A216 GR WCC			
	30	Design Pressure	Min.	Max.	bar-g		6.1 bar-g			
	31	Design Temperature	Min.	Max.						
	32	Max.DP closed valve				6.1 bar				
	33	Valve end con.& rating	Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type	Plug material		Contoured		SS 416			
	35	Plug dim.	Plug form/flaw		=%					
	36	Seat type	Q.ty	Material	Threaded		AISI 416			
	37	Packing mat.	Lubricator		CARBON - PTFE + (Note 1)					
	38	Bonnet type			STANDARD					
39										
Actuator	40	Direction of action								
	41	Spring range				3 TO 15				
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection				IP-65 EEXi-a (Cenelec)				
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve				YES				
	48	Pressure gauge				YES				
	49	Handwheel				NO				
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
52	Weight	Consumption		38 KG						

Notes: (1) Low emission packing L 13.
(2) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507		Dwg. No.: 6465C 30 SP 1541 30	
							Sheet 4		of 38	
							Rev.: 1			



General Data	1	Tag No.			30LDV 30024						
	2	Client Reference	Requisition No.	Item	1541-01		13004				
	3	Supplier	Model		DRESSER FLOW CONTROL		Camflex Flangeless				
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		3" P-30008A-DA10-N						
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		3 in						
	10	Line schedule	Piping class		STD		DA10				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both						
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal		0.652 cP						
	14	Cp/Cv	Compressibility								
	15	Density min	Density nor	Density max	997	996	996	kg/m3			
	16	Vapour Pressure atT nom.			0.07 bar-a						
	17	Critical Pressure		Critical Temperature		2309 bar-a					
	18	Fluid	Phase	State		Water		Liquid	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	6096	20630	22693	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	27.3	40	40	:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	2.83	2.83	2.83	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.28	1.01	0.94	bar	
	23	CV	Min.	Norm.	Max.	6.265				24.15	27.64
	24	Noise	Min.	Norm.	Max.	<70				<70	<70
25	Required CV										
26	Selected CV			Internal / Mfr		/ 50					
27	Fd	Internal / Mfr		FI (CI)		/			0.784@max.		
28	Fluid tending to		Air-Fail Position			Close					
Valve Body	29	Body type		Body material					ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g			6.4	bar-g	
	31	Design Temperature		Min.	Max.	60					
	32	Max.DP closed valve		5.85 bar							
	33	Valve end con.& rating		Seat leakage class		2 in -300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type		Plug material					Eccentric rotary		SOLID STELLITE
	35	Plug dim.		Plug form/law					Full trim		LINEAR
	36	Seat type		Q.ty	Material		316 S.S.				
	37	Packing mat.		Lubricator						KELVAR PTFE WITH VITON O RINGS	
	38	Bonnet type		Integral bonnet							
39											
Actuator	40	Direction of action									
	41	Spring range							7 TO 15		
Positioner	42	Type	Input signal		Field Bus		Field Bus				
	43	Air supply	Action dir.		4 BAR-G						
	44	Protection							IP-65 EEXi-a (Cenelec)		
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve							YES		
	48	Pressure gauge							YES		
	49	Handwheel							NO		
	50	Solenoid valve		Spec. No.							
51	Pos.detector		Spec. No.								
52	Weight		Consumption			17 KG					

Notes: (1) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP		 PARS PETROCHEMICAL COMPANY	
					Control Valve		 NARBAN		Sheet 5 of 38	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No.: 6465C 30 SP 1541 30		Rev.: 1



General Data	1	Tag No.			30LV 30032				
	2	Client Reference	Requisition No.	Item	1541-01		13005		
	3	Supplier	Model		DRESSER FLOW CONTROL		Camflex Flangeless		
	4	Serial Number							
	5	Service			Back Flash From D303				
	6	P&ID No.			0021-30-04				
Inlet line	7	Diameter	Number				3"-P30013A-DA10-N		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		3 in				
	10	Line schedule	Piping class		STD		DA10		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal				0.667 cP		
	14	Cp/Cv	Compressibility		1.16				
	15	Density min	Density nor	Density max	1000	997	997	kg/m3	
	16	Vapour Pressure aT nom.			0.07 bar-a				
	17	Critical Pressure	Critical Temperature		236.6 bar-a				
	18	Fluid	Phase	State		Water and HC		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	2465	16490	18139 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	24	38.8	38.8 :C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	5.17	5.15	5.12 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.81	1.75	1.72 bar
	23	CV	Min.	Norm.	Max.		2.126	14.73	16.42
	24	Noise	Min.	Norm.	Max.		<70	<70	<70 dBA
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 30			
27	Fd			Internal / Mfr		FI (CI)		0.786@max.	
28	Fluid tending to		Air-Fail Position				Close		
Valve Body	29	Body type		Body material				ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g		6.4 bar-g	
	31	Design Temperature		Min.	Max.			60	
	32	Max.DP closed valve				4.8 bar			
	33	Valve end con.& rating		Seat leakage class		1.5 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material		Eccentric rotary		SOLID STELLITE	
	35	Plug dim.		Plug form/flaw		Full trim		LINEAR	
	36	Seat type		Q.ty	Material			316 S.S.	
	37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS			
	38	Bonnet type				Integral extended			
39									
Actuator	40	Direction of action							
	41	Spring range			7 TO 15				
Positioner	42	Type		Input signal		Field Bus		Field Bus	
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection			IP-65 EEXi-a (Cenelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
52	Weight		Consumption		15 KG				

Notes: (1) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No.: 6465C 30 SP 1541 30
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							Rev.: 1	


General Data	1	Tag No.			30LV 30042					
	2	Client Reference	Requisition No.	Item	1541-01		13006			
	3	Supplier	Model		DRESSER FLOW CONTROL		Camflex Flangeless			
	4	Serial Number								
	5	Service			Back Flash From D304					
	6	P&ID No.			0021-30-05					
Inlet line	7	Diameter	Number				2"-P30018A-DA10-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		3 in					
	10	Line schedule	Piping class		STD		DA10			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		0.71 cP					
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	998	991	991	kg/m3		
	16	Vapour Pressure atT nom.			0.06 bar-a					
	17	Critical Pressure		Critical Temperature		247.9 bar-a				
	18	Fluid	Phase	State		Hydrocarbons		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	1788	10630	11693	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	22.2	35.6	35.6	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	10.07	10	10	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.82	4.73	4.73	bar
	23	CV	Min.	Norm.	Max.		0.9463	5.844	6.467	
	24	Noise	Min.	Norm.	Max.		<70	73.9	75.9	dBA
	25	Required CV								
26	Selected CV			Internal / Mir		/ 8.4				
27	Fd			Internal / Mir		FI (CI)		0.726@max.		
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type		Body material				ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		12.7 bar-g		
	31	Design Temperature		Min.	Max.			60		
	32	Max.DP closed valve				8.8 bar				
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		Eccentric rotary		SOLID STELLITE		
	35	Plug dim.		Plug form/law				LINEAR		
	36	Seat type		Q.ty	Material	Red. trim		316 S.S.		
	37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS				
	38	Bonnet type				Integral extended				
39										
Actuator	40	Direction of action								
	41	Spring range			7 TO 15					
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		14 KG					

Notes: (1) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP					
					Control Valve							
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE							
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE							
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General Data	1	Tag No.			30UV 30051				
	2	Client Reference	Requisition No.	Item	1541-01		13007		
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex		
	4	Serial Number							
	5	Service			Cracked Gas To Wet Flare				
	6	P&ID No.			0021-30-06				
Inlet line	7	Diameter	Number		16 in		16"-P30068A-EA04-N		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		6 in				
	10	Line schedule	Piping class		STD		EA04		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		18.63				
	14	Cp/Cv	Compressibility		1.24		0.986		
	15	Density min	Density nor	Density max				4.9 kg/m3	
	16	Vapour Pressure atf nom.							
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		Cracked gas		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	10400		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	56		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.49		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.78		bar
	23	CV	Min.	Norm.	Max.				
	24	Noise	Min.	Norm.	Max.			104.2 dBA	
	25	Required CV							
26	Selected CV Internal / Mfr			/ 200					
27	Fd	Internal / Mfr		FI (Ci)		/		0.880	
28	Fluid tending to		Air-Fail Position				Open		
Valve Body	29	Body type		Body material		ASTM A216 GR WCC			
	30	Design Pressure		Min.	Max.	bar-g		21 bar-g	
	31	Design Temperature		Min.	Max.	130			
	32	Max.DP closed valve				21 bar			
	33	Valve end con.& rating		Seat leakage class		6 in - 300 lb ANSI RF		CLASS VI (IEC 534-4)	
	34	Plug type		Plug material		Eccentric rotary		316L S.S. + STELLITE	
	35	Plug dim.		Plug form/law		Red. trim		ON-OFF	
	36	Seat type		Q.ty	Material	316 PTFE SOFT SEAT			
	37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS			
	38	Bonnet type				Integral extended			
39									
Actuator	40	Direction of action							
	41	Spring range			7 TO 24				
Positioner	42	Type		Input signal					
	43	Air supply		Action dir.					
44	Protection								
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve		Spec. No.		YES			
51	Pos.detector		Spec. No.		YES (2 nos. limit switch)				
52	Weight		Consumption		140 KG				

Notes: (1) Line 30: To be confirmed after air drying operation definition
(2) Air volume tank is required for this valve. The capacity shall be sufficient to allow three strokes (36 litres).
(3) This is an on-off valve with limit stop CV=140.

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve			
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30LV 30052					
	2	Client Reference	Requisition No.	Item	1541-01		13008			
	3	Supplier	Model	DRESSER FLOW CONTROL		Camflex Flangeless				
	4	Serial Number								
	5	Service			Back Flash From D305					
	6	P&ID No.			0021-30-06					
Inlet line	7	Diameter	Number				2"-P30023A-EA04-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		2 in					
	10	Line schedule	Piping class							
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal				0.916 cP			
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	981	985.2	985.2	kg/m3		
	16	Vapour Pressure at T nom.			0.04 bar-a					
	17	Critical Pressure		Critical Temperature		277.8 bar-a				
	18	Fluid	Phase	State		Hydrocarbons		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	1394	6571	7228	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	20.3	30	30	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	19.27	19.25	19.22	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	9.17	9.1	9.06	bar
	23	CV	Min.	Norm.	Max.		0.5392	2.551	2.814	
	24	Noise	Min.	Norm.	Max.		<70	70.4	70.7	dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 5.6				
27	Fd		Internal / Mfr	FI (Cf)			0.799@max.			
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type	Body material				ASTM A216 GR WCC			
	30	Design Pressure	Min.	Max.	bar-g		23 bar-g			
	31	Design Temperature	Min.	Max.			60			
	32	Max.DP closed valve			14.3 bar					
	33	Valve end con.& rating	Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type	Plug material		Eccentric rotary		SOLID STELLITE			
	35	Plug dim.	Plug form/law		Red. trim		LINEAR			
	36	Seat type	Q.ty	Material			316 S.S.			
	37	Packing mat.	Lubricator		KELVAR PTFE WITH VITON O RINGS					
	38	Bonnet type			Integral extended					
39										
Actuator	40	Direction of action								
	41	Spring range			7 TO 15					
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
52	Weight	Consumption		14 KG						

Notes: (1) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE		Sheet 9		of 38	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30FV 30071				
	2	Client Reference	Requisition No.	Item	10	1541-01	13009		
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number							
	5	Service			Boiler Feed Wtr To T301				
	6	P&ID No.			0021-30-08				
Inlet line	7	Diameter	Number				2"-BW30005A-EA22-N		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		2 in				
	10	Line schedule	Piping class		STD		EA22		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal			0.6		cP	
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	992	992	992	kg/m3	
	16	Vapour Pressure aTf nom.			0.096 bar-a				
	17	Critical Pressure	Critical Temperature			221.2 bar-a			
	18	Fluid	Phase	State		BFW		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	1044	2610	2871
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	45	45	45
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	38.22	37.19	36.93
	22	DP	QMin.	Q Norm.	Q Max.	Unit	18.16	17.13	16.87
	23	CV	Min.	Norm.	Max.		0.2853	0.734	0.8144
	24	Noise	Min.	Norm.	Max.		70.6	74.2	74.5
25	Required CV								
26	Selected CV			Internal / Mfr		/ 1.7			
27	Fd		Internal / Mfr	FI (CI)	/		0.921@max.		
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type	Body material		Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure	Min.	Max.	bar-g		44 bar-g		
	31	Design Temperature	Min.	Max.					
	32	Max.DP closed valve				25.3 bar			
	33	Valve end con.& rating	Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type	Plug material			Contoured		SS 416	
	35	Plug dim.	Plug form/aw			Red. trim		=%	
	36	Seat type	Q.ty	Material		Threaded		AISI 416	
	37	Packing mat.	Lubricator			KELVAR PTFE			
	38	Bonnet type				STANDARD			
39									
Actuator	40	Direction of action							
	41	Spring range			3 TO 15				
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply	Action dir.		4 BAR-G				
44	Protection			IP-65 EEXI-a (Cenelec)					
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve	Spec. No.						
51	Pos.detector	Spec. No.							
52	Weight	Consumption		38 KG					

Notes: (1) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 FARS PETROCHEMICAL COMPANY	
1	T.G.	TG		03/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30LV 30971					
	2	Client Reference	Requisition No.	Item	1541-01		13010			
	3	Supplier	Model		DRESSER FLOW CONTROL		Camflex Flangeless			
	4	Serial Number								
	5	Service			SCA From T301					
	6	P&ID No.			0021-30-08					
Inlet line	7	Diameter	Number				2"-SC30002A-EA03-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		2 in					
	10	Line schedule	Piping class		XS		EA03			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal				0.6 cP			
	14	Cp/Cv	Compressibility							
	15	Vapour min	Density nor	Density max	992	992	992	kg/m3		
	16	Density at T nom.			0.123 bar-a					
	17	Critical Pressure		Critical Temperature		221.2 bar-a				
	18	Fluid	Phase	State		BFW		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	1044	2610	2871	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	50	50	50	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	20.08	20.08	20.08	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.45	1.3	1.25	bar
	23	CV	Min.	Norm.	Max.		1.01	2.676	3.005	
	24	Noise	Min.	Norm.	Max.		<70	<70	<70	dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 5.6				
27	Fd			Internal / Mfr		FI (Ci)		0.789@max.		
28	Fluid tending to			Air-Fail Position				Close		
Valve Body	29	Body type		Body material				ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		22.7 bar-g		
	31	Design Temperature		Min.	Max.					
	32	Max.DP closed valve				3.3 bar				
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		Eccentric rotary		SOLID STELLITE		
	35	Plug dim.		Plug form/law		Red. trim		LINEAR		
	36	Seat type		Q.ty	Material			316 S.S.		
	37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS				
	38	Bonnet type				Integral extended				
Actuator	39	Direction of action								
	41	Spring range			7 TO 15					
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXI-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		14 KG					

Notes: (1) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP					
					Control Valve							
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE							
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE							
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General Data	1	Tag No.			30TV 30071						
	2	Client Reference	Requisition No.	Item	1541-01		13011				
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex					
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		4"-LP30004A-DA04-H						
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		4 in						
	10	Line schedule	Piping class		STD		DA04				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal		18		0.01 cP				
	14	Cp/Cv	Compressibility								
	15	Density min	Density nor	Density max	2.7		2.7		2.7 kg/m3		
	16	Vapour Pressure at T nom.									
	17	Critical Pressure			Critical Temperature						
	18	Fluid	Phase	State		LP steam		Gas		Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	582	1456	1602	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	220	220	220	:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.22	5.69	5.12	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.5	1	0.4	bar	
	23	CV	Min.	Norm.	Max.	11.85		37.71		65.42	
	24	Noise	Min.	Norm.	Max.	77.1		79.3		73.5 dBA	
	25	Required CV									
26	Selected CV			Internal / Mfr		/ 81					
27	Fd		Internal / Mfr		FI (CI)				0.718@max.		
28	Fluid tending to			Air-Fail Position							
29	Body type		Body material								
30	Design Pressure		Min.	Max.	bar-g						
31	Design Temperature		Min.	Max.	295						
32	Max.DP closed valve		7 bar								
33	Valve end con.& rating		Seat leakage class		3 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)				
34	Plug type		Plug material		Eccentric rotary		316L S.S. + STELLITE				
35	Plug dim.		Plug form/law		Red. trim		LINEAR				
36	Seat type		Q.ty	Material			316 S.S.				
37	Packing mat.		Lubricator								
38	Bonnet type		Integral extended								
39											
Actuator	40	Direction of action									
	41	Spring range									
Positioner	42	Type	Input signal			Field Bus		Field Bus			
	43	Air supply	Action dir.			4 BAR-G					
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve			YES						
	48	Pressure gauge			YES						
	49	Handwheel									
	50	Solenoid valve		Spec. No.							
	51	Pos.detector		Spec. No.							
	52	Weight		Consumption			48 KG				

Notes: (1) Valve design pressure 7 barg / FV
(2) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 30073				
	2	Client Reference	Requisition No.	Item	1541-01		13012		
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex		
	4	Serial Number							
	5	Service			CA Soda To P302				
	6	P&ID No.			0021-30-07				
Inlet line	7	Diameter	Number				2"-CA30011A-EA03-N		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		2 in				
	10	Line schedule	Piping class		XS		EA03		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal					1 cP	
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	1100	1100	1100	kg/m3	
	16	Vapour Pressure at T nom.			0.1 bar-a				
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		Caustic sol.		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	1332	3330	3663 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	50	50	50 °C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	22.6	22.24	22.12 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3.18	2.78	2.64 bar
	23	CV	Min.	Norm.	Max.		0.8264	2.214	2.501
	24	Noise	Min.	Norm.	Max.		<70	<70	<70 dBA
	25	Required CV							
26	Selected CV		Internal / Mfr	/ 5.6					
27	Fd		Internal / Mfr	Fl (Ci)	/		0.816@max.		
28	Fluid tending to		Air-Fail Position				Close		
Valve Body	29	Body type		Body material				ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g		24.4 bar-g	
	31	Design Temperature		Min.	Max.			65	
	32	Max.DP closed valve				3.28 bar			
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material		Eccentric rotary		SOLID STELLITE	
	35	Plug dim.		Plug form/law		Red. trim		LINEAR	
	36	Seat type		Q.ty	Material			316 S.S.	
	37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS			
	38	Bonnet type				Integral extended			
39									
Actuator	40	Direction of action							
	41	Spring range			7 TO 15				
Positioner	42	Type		Input signal		Field Bus		Field Bus	
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection			IP-65 EEXi-a (Cenelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
52	Weight		Consumption		16 KG				

Notes: (1) Line 18: 10% wt of NaOH
(2) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE		Sheet 13		of 38	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 30075					
	2	Client Reference	Requisition No.	Item	1541-01		13013			
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		2" SC30001A-EA03-N					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		2 in					
	10	Line schedule	Piping class		XS		DA05			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal					0.6 cP		
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	1010	1010	1010	kg/m3		
	16	Vapour Pressure at T nom.			0.123 bar-a					
	17	Critical Pressure		Critical Temperature		221.2 bar-a				
	18	Fluid	Phase	State		Caustic solut.		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	1580	3950	4345	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	50	50	50	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	19.5	19.5	19.4	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	16.7	16.7	16.6	bar
	23	CV	Min.	Norm.	Max.		0.4463	1.116	1.232	
	24	Noise	Min.	Norm.	Max.		74.4	78.4	78.6	dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 4				
27	Fd		Internal / Mfr		FI (Cf)	/		0.950		
28	Fluid tending to		Air-Fail Position							
Valve Body	29	Body type		Body material		ASTM A216 GR WCC				
	30	Design Pressure		Min.	Max.	bar-g		21.6 bar-g		
	31	Design Temperature		Min.	Max.	65				
	32	Max.DP closed valve		19.5 bar						
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		Contoured		SS 416		
	35	Plug dim.		Plug form/law		ANTICAVI. 1 STAGE LINEAR				
	36	Seat type		Q.ty	Material	Threaded		AISI 416		
	37	Packing mat.		Lubricator		KELVAR PTFE				
	38	Bonnet type		STANDARD						
	Actuator	40	Direction of action							
41		Spring range			6 TO 30					
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
	51	Pos.detector		Spec. No.						
	52	Weight		Consumption		38 KG				

Notes: (1) Valve opens upon increasing the variable
(2) Line 18: 2 - 4 % wt of NaOH

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 30093				
	2	Client Reference	Requisition No.	Item	1541-01		13014		
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number							
	5	Service			Back Flash From D306				
	6	P&ID No.			0021-30-09				
Inlet line	7	Diameter	Number				2" P30033A-EA04-N		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		2 in				
	10	Line schedule	Piping class		XS		EA04		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal						
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max			989		kg/m3
	16	Vapour Pressure atT nom.							
	17	Critical Pressure	Critical Temperature		2165 bar-a				
	18	Fluid	Phase	State		Water		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	1000		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	50		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	18.57		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	8.38		bar
	23	CV	Min.	Norm.	Max.			0.4031	
	24	Noise	Min.	Norm.	Max.			<70 dBA	
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 1.7			
27	Fd			Internal / Mfr		/		0.946	
28	Fluid tending to		Air-Fail Position				Close		
Valve Body	29	Body type	Body material		Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure	Min.	Max.	bar-g		26 bar-g		
	31	Design Temperature	Min.	Max.					
	32	Max.DP closed valve			17.2 bar				
	33	Valve end con.& rating	Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type	Plug material		Contoured		SS 416		
	35	Plug dim.	Plug form/law		=%				
	36	Seat type	Q.ty	Material	Threaded		AISI 416		
	37	Packing mat.	Lubricator		KELVAR PTFE				
	38	Bonnet type			STANDARD				
39									
Actuator	40	Direction of action							
	41	Spring range			3 TO 15				
Positioner	42	Type	Input signal		Field Bus		Field Bus		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXI-a (Cenelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve	Spec. No.						
	51	Pos.detector	Spec. No.						
52	Weight	Consumption		38 KG					

Notes: (1) Valve opens upon increasing the variable(5) No flow in normal operation

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE		Sheet 15		of 38	
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General Data	1	Tag No.			30UV 30101						
	2	Client Reference	Requisition No.	Item	1541-01		13015				
	3	Supplier	Model		DRESSER MASONEILAN		21000 Series Globe				
	4	Serial Number									
	5	Service			CG From C301 To Flare						
	6	P&ID No.			0021-30-09						
Inlet line	7	Diameter	Number				3"-PH-30023A-EB21-P				
	8	Line schedule	Piping class				EB 21				
Outlet line	9	Diameter	Number		4 "						
	10	Line schedule	Piping class		STD						
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal								
	14	Cp/Cv	Compressibility				18.7				
	15	Density min	Density nor	Density max			16		kg/m3		
	16	Vapour Pressure at T nom.									
	17	Critical Pressure		Critical Temperature							
	18	Fluid	Phase	State		Gas		Single Phase			
	19	Flow	Min.	Norm.	Max.	Unit	5039		kg/h		
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	52		:C		
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	21.82		bar-a		
	22	DP	QMin.	Q Norm.	Q Max.	Unit	20.19		bar		
	23	CV	Min.	Norm.	Max.		18.22				
	24	Noise	Min.	Norm.	Max.		103.1		dBA		
	25	Required CV									
26	Selected CV Internal / Mfr					/ 31					
27	Fd Internal / Mfr		FI (Ci)				/		0.912		
28	Fluid tending to		Air-Fail Position				Open				
Valve Body	29	Body type		Body material		Single Seat Globe		A351 GR CF8M			
	30	Design Pressure		Min.	Max.	bar-g		36.6 bar-g			
	31	Design Temperature		Min.	Max.			130			
	32	Max.DP closed valve				36.6 bar					
	33	Valve end con.& rating		Seat leakage class		3 in - 300 lb ANSI RF		CLASS V			
	34	Plug type		Plug material		CONTOURED		316 S.S. + STELLITE			
	35	Plug dim.		Plug form/law		Red.Trim		ON-OFF			
	36	Seat type		Q.ty	Material	Treaded		316 S.S. + STELLITE			
	37	Packing mat.		Lubricator		KEVLAR PTFE					
	38	Bonnet type				STANDARD					
Actuator	40	Direction of action									
	41	Spring range			3 to 15						
Positioner	42	Type		Input signal							
	43	Air supply		Action dir.							
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device			YES						
	47	Pressure reducing valve			YES						
	48	Pressure gauge			YES						
	49	Handwheel			NO						
	50	Solenoid valve		Spec. No.		YES					
51	Pos.detector		Spec. No.		YES (2nos. of limit switches)						
52	Weight		Consumption		125 KG						

Notes: 1) Air volume tank is required. The capacity shall be sufficient to allow three strokes.
2) This is an On-Off valve with limit stop (CV= 18)

					INSTRUMENT SPECIFICATION		TECHNIP		 PARS PETROCHEMICAL COMPANY	
					Control Valve		 PARS PETROCHEMICAL COMPANY		Sheet 16 of 38	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 30102					
	2	Client Reference	Requisition No.	Item	1541-01		13016			
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex				
	4	Serial Number								
	5	Service			PR From E307					
	6	P&ID No.			0021-30-10					
Inlet line	7	Diameter	Number		8"-PR30001A-EB01-N					
Outlet line	8	Line schedule	Piping class							
	9	Diameter	Number		10 in					
Operating Conditions	10	Line schedule	Piping class		20		DB01			
	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal				0.051 cP			
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	469.7	469.7	469.7	kg/m3		
	16	Vapour Pressure at T nom.			18.4 bar-a					
	17	Critical Pressure	Critical Temperature		46.2 bar-a					
	18	Fluid	Phase	State		Propylene		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	32438	81097	89207	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	45	45	41.6	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	18.58	18.51	17.18	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	11.94	11.62	9.99	bar
	23	CV	Min.	Norm.	Max.		29.81	91.66	112.9	
	24	Noise	Min.	Norm.	Max.					dBA
25	Required CV									
26	Selected CV			Internal / Mir		/ 138				
27	Fd			Internal / Mir		/		0.714@max.		
28	Fluid tending to		Air-Fail Position		Close					
Valve Body	29	Body type	Body material		A 351 Gr. CF3M					
	30	Design Pressure	Min.	Max.	bar-g		20.2 bar-g			
	31	Design Temperature	Min.	Max.						
	32	Max.DP closed valve			14.1 bar					
	33	Valve end con.& rating	Seat leakage class		4 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type	Plug material		Eccentric rotary		316L S.S. + STELLITE			
	35	Plug dim.	Plug form/law		Red. trim		LINEAR			
	36	Seat type	Q.ty	Material			316 S.S.			
	37	Packing mat.	Lubricator		KELVAR PTFE WITH VITON O RINGS					
	38	Bonnet type			Integral extended					
Actuator	40	Direction of action								
	41	Spring range			7 TO 15					
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
	52	Weight	Consumption		62 KG					

Notes: (1) Valve design temperature: -48 / 90 OC
(2) Valve closes upon increasing the variable
(3) Mixed phase at valve outlet: % wt of vapor 27.6 vapor density 14.4 kg/m3

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.				30LV 30103				
	2	Client Reference	Requisition No.	Item	1541-01			13017		
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number								
	5	Service							D307 CG 5th Stg Disc Drm	
	6	P&ID No.							0021-30-10	
Inlet line	7	Diameter	Number			1"1/2-P30050A-EA11-N				
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number			1.5 in				
	10	Line schedule	Piping class			XS		EA11		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal			1.4 cP				
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	976.5	976.7	976.7	kg/m3		
	16	Vapour Pressure atT nom.			0.02 bar-a					
	17	Critical Pressure	Critical Temperature			343.3 bar-a				
	18	Fluid	Phase	State		Hydrocarbons		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	1214	3901	4291	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	19	19	19	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	33.5	32.4	32.18	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	13.19	11.18	10.71	bar
	23	CV	Min.	Norm.	Max.		0.3924	1.37	1.54	
	24	Noise	Min.	Norm.	Max.		<70	70.4	70.6	dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 3.8				
27	Fd	Internal / Mfr		FI (Cf)	/			0.927@max.		
28	Fluid tending to		Air-Fail Position			Close				
Valve Body	29	Body type	Body material			Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure	Min.	Max.	bar-g		38 bar-g			
	31	Design Temperature	Min.	Max.						
	32	Max.DP closed valve				20 bar				
	33	Valve end con.& rating	Seat leakage class			1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type	Plug material			Contoured		SS 416		
	35	Plug dim.	Plug form/aw			Red. trim		=%		
	36	Seat type	Q.ty	Material	Threaded		AISI 416			
	37	Packing mat.	Lubricator			KELVAR PTFE				
	38	Bonnet type				STANDARD				
39										
Actuator	40	Direction of action								
	41	Spring range			3 TO 15					
Positioner	42	Type	Input signal			Field Bus		Field Bus		
	43	Air supply	Action dir.			4 BAR-G				
	44	Protection							IP-65 EEXi-a (Cenelec)	
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel							NO	
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
52	Weight	Consumption			38 KG					

Notes: (1) Valve opens upon increasing the variable
(2) A small vaporization at valve inlet will occur

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30TV 30104					
	2	Client Reference	Requisition No.	Item	1541-01		13018			
	3	Supplier	Model		DRESSER FLOW CONTROL		Butterfly Flangeless			
	4	Serial Number								
	5	Service			Cracked Gas From D307					
	6	P&ID No.			0021-30-10					
Inlet line	7	Diameter	Number				16"-PR30003A-DB01-C			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		16 in					
	10	Line schedule	Piping class		10		DB01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		42.1		0.008 cP			
	14	Cp/Cv	Compressibility		1.23		0.87			
	15	Density min	Density nor	Density max	14.4	14.4	14.4	kg/m3		
	16	Vapour Pressure atT nom.								
	17	Critical Pressure	Critical Temperature							
	18	Fluid	Phase	State		Propylene		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	32438	81097	89207	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	6	6	6	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.87	6.7	6.66	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	0.44	0.2	0.14	bar
	23	CV	Min.	Norm.	Max.		686.6	2506	3281	
	24	Noise	Min.	Norm.	Max.		73	<70	<70	dBA
	25	Required CV								
26	Selected CV Internal / Mfr			/ 7300						
27	Fd	Internal / Mfr		FI (Ci)		/		0.681@max.		
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type	Body material		Butterfly		A 351 Gr. CF8M			
	30	Design Pressure	Min.	Max.	bar-g		15 bar-g			
	31	Design Temperature	Min.	Max.			-48			
	32	Max.DP closed valve			9.58 bar					
	33	Valve end con.& rating	Seat leakage class		12 in - 150 lb ANSI RF		CLASS IV			
	34	Plug type	Plug material				A 351 Gr. CF8M			
	35	Plug dim.	Plug form/law				=%			
	36	Seat type	Q.ty	Material			Incolloy 825			
	37	Packing mat.	Lubricator		PTFE					
	38	Bonnet type								
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEX-a (Cenelec)					
Accessories	45	Booster relay			YES					
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			YES					
	50	Solenoid valve	Spec. No.		-					
	51	Pos.detector	Spec. No.							
	52	Weight	Consumption		235 KG					

Notes: (1) Valve opens upon increasing the variable
(2) DESIGN TEMP. = -48 / 60 OC
(3) Actuator model no. is B1JRRU20. Valve model is LW5C.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
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General Data	1	Tag No.			30TV 30107					
	2	Client Reference	Requisition No.	Item	1541-01		13019			
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number								
	5	Service			Quench Water From E310					
	6	P&ID No.			0021-30-10					
Inlet line	7	Diameter	Number			1 1/2-QW30001A-DA10-N				
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number	1.5 in						
	10	Line schedule	Piping class	XS		DA10				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal			0.446 cP				
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	982	982	982	kg/m3		
	16	Vapour Pressure atT nom.			0.23 bar-a					
	17	Critical Pressure	Critical Temperature			221 bar-a				
	18	Fluid	Phase	State		Quench Water		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	395	987	1086 kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	63	63	63 :C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	11.38	9.9	8.63 bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	2	1.71	1.65 bar	
	23	CV	Min.	Norm.	Max.		0.3269	0.883	0.9899	
	24	Noise	Min.	Norm.	Max.		<70	<70	<70 dBA	
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 3.8				
27	Fd	Internal / Mfr		FI (CI)	/		0.943@max.			
28	Fluid tending to		Air-Fail Position			Close				
Valve Body	29	Body type	Body material		Single Seat Globe		ASTM A216 GR WCC			
	30	Design Pressure	Min.	Max.	bar-g		12.6 bar-g			
	31	Design Temperature	Min.	Max.	120					
	32	Max.DP closed valve				12.6 bar				
	33	Valve end con.& rating	Seat leakage class			1 in -300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type	Plug material			Contoured		SS 416		
	35	Plug dim.	Plug form/flaw			Red. trim		=%		
	36	Seat type	Q.ty	Material	Threaded		AISI 416			
	37	Packing mat.	Lubricator			KELVAR PTFE				
	38	Bonnet type				STANDARD				
39										
Actuator	40	Direction of action								
	41	Spring range			3 TO 15					
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
	52	Weight	Consumption		38 KG					

Notes: (1) May contain some tar and coke particles (coke particles diameter : 0.5 mm maxi)
(2) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP				
					Control Valve				PARS PETROCHEMICAL COMPANY		
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE						
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE						
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								Sheet 20		of 38	
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General Data	1	Tag No.			30KV 30141				
	2	Client Reference	Requisition No.	Item	1541-01		13020		
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe		
	4	Serial Number							
	5	Service			Cracked Gas To D308 A				
	6	P&ID No.			0021-30-11				
Inlet line	7	Diameter	Number				4"-PH30013A-EB21-N		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		4 in				
	10	Line schedule	Piping class		STD		EB21		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		18.6				
	14	Cp/Cv	Compressibility		1.4		0.9		
	15	Density min	Density nor	Density max			28.9	kg/m3	
	16	Vapour Pressure aT nom.							
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		Cracked gas		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	27600		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	15		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	33.4		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	28.4		bar
	23	CV	Min.	Norm.	Max.			58.58	
	24	Noise	Min.	Norm.	Max.			113.1	dBA
	25	Required CV							
26	Selected CV		Internal / Mfr		/ 75				
27	Fd		Internal / Mfr		/		0.909		
28	Fluid tending to		Air-Fail Position				Close		
Valve Body	29	Body type		Body material				A 351 Gr. CF8M	
	30	Design Pressure		Min.	Max.	bar-g		36.6 bar-g	
	31	Design Temperature		Min.	Max.			60	
	32	Max.DP closed valve				36.6 bar			
	33	Valve end con.& rating		Seat leakage class		0 - 300 lb ANSI RF		CLASS V (IEC 534-4)	
	34	Plug type		Plug material		BALANCED		316 S.S. + STELLITE	
	35	Plug dim.		Plug form/law		Red. trim		LINEAR	
	36	Seat type		Q.ty	Material	Clamped in		316 S.S. + STELLITE	
	37	Packing mat.		Lubricator		KELVAR PTFE			
	38	Bonnet type				STANDARD			
39									
Actuator	40	Direction of action							
	41	Spring range			21 TO 45				
Positioner	42	Type		Input signal					
	43	Air supply		Action dir.					
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve		Spec. No.		YES			
51	Pos.detector		Spec. No.		YES (2 nos. limit switch)				
52	Weight		Consumption		134 KG				

Notes: 1) Valve body size is 4" * 2" * 4".
2) This is an on-off valve with limit stop at CV=59.

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE		Sheet 21 of 38	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30KV 30142						
	2	Client Reference	Requisition No.	Item	21	1541-01	13021				
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex					
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number			4"-PH30016A-EB21-N					
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number			6 in					
	10	Line schedule	Piping class			STD		DB01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal			18.6					
	14	Cp/Cv	Compressibility			1.4					
	15	Density min	Density nom	Density max		28.9		kg/m3			
	16	Vapour Pressure at T nom.									
	17	Critical Pressure			Critical Temperature						
	18	Fluid	Phase	State		Cracked gas		Gas	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	22700		kg/h		
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	15		:C		
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	33.4		bar-a		
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.4		bar		
	23	CV	Min.	Norm.	Max.	137.2					
	24	Noise	Min.	Norm.	Max.	<70				dBA	
	25	Required CV									
26	Selected CV			Internal / Mfr		/ 138					
27	Fd		Internal / Mfr		FI (CI)		0.700				
28	Fluid tending to			Air-Fail Position							
Valve Body	29	Body type		Body material				A 351 Gr. CF3M			
	30	Design Pressure		Min.	Max.	bar-g		36.6 bar-g			
	31	Design Temperature		Min.	Max.	60					
	32	Max.DP closed valve		36.6 bar							
	33	Valve end con.& rating		Seat leakage class		4 in - 300 lb ANSI RF		CLASS VI (IEC 534-4)			
	34	Plug type		Plug material				Eccentric rotary 316L S.S. + STELLITE			
	35	Plug dim.		Plug form/law				Red. trim LINEAR			
	36	Seat type		Q.ty	Material		316 S.S.+Soft seat				
	37	Packing mat.		Lubricator						KELVAR PTFE WITH VITON O RINGS	
	38	Bonnet type		Integral extended							
	Actuator	40	Direction of action								
41		Spring range			7 TO 15						
Positioner	42	Type		Input signal							
	43	Air supply		Action dir.							
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve			YES						
	48	Pressure gauge			YES						
	49	Handwheel									
	50	Solenoid valve		Spec. No.		YES					
	51	Pos.detector		Spec. No.		YES (2 nos. limit switch)					
52	Weight		Consumption		62 KG		(LATER)				

Notes: 1) This is an on-off valve.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30KV 30143				
	2	Client Reference	Requisition No.	Item	1541-01		13022		
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe		
	4	Serial Number							
	5	Service			Cracked Gas To D308 B				
	6	P&ID No.			0021-30-11				
Inlet line	7	Diameter	Number				4"-PH30014A-EB21-N		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		4 in				
	10	Line schedule	Piping class		STD		EB21		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		18.6				
	14	Cp/Cv	Compressibility		1.4		0.9		
	15	Density min	Density nor	Density max			28.9 kg/m3		
	16	Vapour Pressure aT nom.							
	17	Critical Pressure	Critical Temperature						
	18	Fluid	Phase	State		Cracked gas		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	27600		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	15		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	33.4		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	28.4		bar
	23	CV	Min.	Norm.	Max.			58.58	
	24	Noise	Min.	Norm.	Max.			113.1 dBA	
	25	Required CV							
26	Selected CV Internal / Mfr			/ 75					
27	Fd	Internal / Mfr		FI (Ci)	/		0.909		
28	Fluid tending to		Air-Fail Position				Close		
Valve Body	29	Body type	Body material				A 351 Gr. CF8M		
	30	Design Pressure	Min.	Max.	bar-g		36.6 bar-g		
	31	Design Temperature	Min.	Max.			60		
	32	Max.DP closed valve			36.6 bar				
	33	Valve end con.& rating	Seat leakage class		0 - 300 lb ANSI RF		CLASS V (IEC 534-4)		
	34	Plug type	Plug material		BALANCED		316 S.S. + STELLITE		
	35	Plug dim.	Plug form/law		Red. trim		LINEAR		
	36	Seat type	Q.ty	Material	Clamped in		316 S.S. + STELLITE		
	37	Packing mat.	Lubricator		KELVAR PTFE				
	38	Bonnet type			STANDARD				
39									
Actuator	40	Direction of action							
	41	Spring range			21 TO 45				
Positioner	42	Type	Input signal						
	43	Air supply	Action dir.						
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve	Spec. No.		YES				
	51	Pos.detector	Spec. No.		YES (2 nos. limit switch)				
52	Weight	Consumption		134 KG					

Notes: 1) Valve body size is 4" * 2" * 4".
2) This is an on-off valve with limit stop CV=59.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE		Sheet 23		of 38	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30KV 30144					
	2	Client Reference	Requisition No.	Item	1541-01		13023			
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		6"-PH30017A-EB21-N					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		6 in					
	10	Line schedule	Piping class		STD		DB01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		18.6					
	14	Cp/Cv	Compressibility		1.4					
	15	Density min	Density nor	Density max		28.9		kg/m3		
	16	Vapour Pressure atT nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		Cracked gas		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	22700		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	15		:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	33.4		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.4		bar	
	23	CV	Min.	Norm.	Max.	137.2				
	24	Noise	Min.	Norm.	Max.	<70				dBA
	25	Required CV								
26	Selected CV		Internal / Mfr		/ 138					
27	Fd		Internal / Mfr		FI (Cf)		0.700			
28	Fluid tending to		Air-Fail Position							
29	Body type		Body material							
30	Design Pressure		Min.	Max.	bar-g		36.6 bar-g			
31	Design Temperature		Min.	Max.	60					
32	Max.DP closed valve		36.6 bar							
33	Valve end con.& rating		Seat leakage class		4 in - 300 lb ANSI RF		CLASS VI (IEC 534-4)			
34	Plug type		Plug material		Eccentric rotary		316L S.S. + STELLITE			
35	Plug dim.		Plug form/law		Red. trim		LINEAR			
36	Seat type		Q.ty	Material	316 S.S.+Soft seat					
37	Packing mat.		Lubricator							
38	Bonnet type		Integral extended							
39										
Actuator	40	Direction of action								
	41	Spring range		7 TO 15						
Positioner	42	Type	Input signal							
	43	Air supply	Action dir.							
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve		YES						
	48	Pressure gauge		YES						
	49	Handwheel								
	50	Solenoid valve		Spec. No.		YES				
51	Pos.detector		Spec. No.		YES (2 nos. limit switch)					
52	Weight		Consumption		62 KG					

Notes: 1) This is an on-off valve.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARIS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507		Dwg. No.: 6465C 30 SP 1541 30	
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							Code: 507		Dwg. No.: 6465C 30 SP 1541 30	
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General Data	1	Tag No.			30FV 30151					
	2	Client Reference	Requisition No.	Item	1541-01			13024		
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe			
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		8"-PH40005A-DB01-N					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		8 in					
	10	Line schedule	Piping class		20		DB01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal							
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	1.55		kg/m3			
	16	Vapour Pressure atT nom.								
	17	Critical Pressure	Critical Temperature							
	18	Fluid	Phase	State		Fuel Gas		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	8100		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	41		°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	10.15		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.53		bar	
	23	CV	Min.	Norm.	Max.	140.7				
	24	Noise	Min.	Norm.	Max.	71.7				dBA
	25	Required CV								
26	Selected CV			Internal / Mir		/ 195				
27	Fd	Internal / Mir		FI (Cf)	/				0.940	
28	Fluid tending to		Air-Fail Position						Close	
Valve Body	29	Body type	Body material						A 351 Gr. CF8M	
	30	Design Pressure	Min.	Max.	bar-g		11.7 bar-g			
	31	Design Temperature	Min.	Max.	60					
	32	Max.DP closed valve	11.7 bar							
	33	Valve end con.& rating	Seat leakage class		0 - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type	Plug material						BALANCED	316 S.S. + STELLITE
	35	Plug dim.	Plug form/law						Red. trim	LO-DB LINEAR
	36	Seat type	Q.ty	Material		Clamped in		316 S.S. + STELLITE		
	37	Packing mat.	Lubricator						KELVAR PTFE	
	38	Bonnet type	STANDARD							
Actuator	40	Direction of action								
	41	Spring range							6 TO 30	
Positioner	42	Type	Input signal						Smart	4w20 mA 24Vdc HART
	43	Air supply	Action dir.						4 BAR-G	
	44	Protection							IP-65 EEXi-a (Cenelec)	
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve							YES	
	48	Pressure gauge							YES	
	49	Handwheel							NO	
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
52	Weight	Consumption						259 KG		

Notes: (1) Valve operates between 0 and 100 %
(2) Valve closes upon increasing the variable
(3) Valve body size is 6" * 4" * 6".

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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							Sheet 25		of 38	



General Data	1	Tag No.			30LV 30151					
	2	Client Reference	Requisition No.	Item	1541-01		13025			
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number								
	5	Service			D309 Bottom Outlet					
	6	P&ID No.			0021-30-12					
Inlet line	7	Diameter	Number					1"1/2-P30047A-DA10-N		
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		1.5 in					
	10	Line schedule	Piping class		XS		DA10			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal					0.6 cP		
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	990	990	990	kg/m3		
	16	Vapour Pressure aT nom.			0.1 bar-a					
	17	Critical Pressure	Critical Temperature			2435 bar-a				
	18	Fluid	Phase	State		Water		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	237	592	1200	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	45	45	45	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	4.5	4.49	4.47	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.26	1.23	1.22	
	23	CV	Min.	Norm.	Max.		0.2462	0.622	1.267	
	24	Noise	Min.	Norm.	Max.		<70	<70	<70	
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 3.8				
27	Fd			Internal / Mfr		FI (Ci)		0.934@max.		
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type	Body material		Single Seat Globe		ASTM A216 GR WCC			
	30	Design Pressure	Min.	Max.	bar-g		5.8 bar-g			
	31	Design Temperature	Min.	Max.			60			
	32	Max.DP closed valve				4.95 bar				
	33	Valve end con.& rating	Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type	Plug material		CONTOURED		SS 416			
	35	Plug dim.	Plug form/law				=%			
	36	Seat type	Q.ty	Material	Threaded		AISI 416			
	37	Packing mat.	Lubricator		KELVAR PTFE					
	38	Bonnet type			STANDARD					
39										
Actuator	40	Direction of action								
	41	Spring range			3 TO 15					
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
52	Weight	Consumption		38 KG						

Notes: (1) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE		Sheet 26		of 38	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30FV 30152				
	2	Client Reference	Requisition No.	Item	1541-01		13026		
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number							
	5	Service			Regen Gas To D408				
	6	P&ID No.			0021-30-12				
Inlet line	7	Diameter	Number				4"-PH40005A-DB01-N		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		6 in				
	10	Line schedule	Piping class		STD		DB01		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		4				
	14	Cp/Cv	Compressibility		1.4		1		
	15	Density min	Density nor	Density max				1.55	kg/m3
	16	Vapour Pressure at T nom.							
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		Fuel Gas		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	2500		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	41		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	10.15		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.53		bar
	23	CV	Min.	Norm.	Max.			43.39	
	24	Noise	Min.	Norm.	Max.			70.7	dBA
25	Required CV								
26	Selected CV Internal / Mfr					/ 75			
27	Fd	Internal / Mfr	FI (Cf)					0.950	
28	Fluid tending to		Air-Fail Position				Close		
Valve Body	29	Body type	Body material		Single Seat Globe		A 351 Gr. CF8M		
	30	Design Pressure	Min.	Max.	bar-g		11.3 bar-g		
	31	Design Temperature	Min.	Max.			60		
	32	Max.DP closed valve			11.3 bar				
	33	Valve end con.& rating	Seat leakage class		3 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type	Plug material		CONTOURED		316 S.S. + STELLITE		
	35	Plug dim.	Plug form/law		Full trim		LO-DB LINEAR		
	36	Seat type	Q.ty	Material	Threaded		316 S.S. + STELLITE		
	37	Packing mat.	Lubricator		KELVAR PTFE				
	38	Bonnet type			STANDARD				
Actuator	40	Direction of action							
	41	Spring range			11 TO 23				
Positioner	42	Type	Input signal		Field Bus		Field Bus		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve	Spec. No.						
51	Pos.detector	Spec. No.							
	52	Weight	Consumption		147 KG		(LATER)		

Notes: (1) Valve operates between 0 and 100 %
(2) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE		Sheet 27		of 38	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No.: 6465C 30 SP 1541 30		Rev.: 1

General Data	1	Tag No.			30LV 30153				
	2	Client Reference	Requisition No.	Item	1541-01		13027		
	3	Supplier		Model	DRESSER FLOW CONTROL		21000 Series Globe		
	4	Serial Number							
	5	Service			E308 HC To HC Network				
	6	P&ID No.			0021-30-12				
Inlet line	7	Diameter		Number			2"-HC30001A-GA02-H		
	8	Line schedule		Piping class					
Outlet line	9	Diameter		Number	3 in				
	10	Line schedule		Piping class	STD		DA04		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service		Special conditions					
	13	Molecular Weight		Viscosity at @ normal		0.1 cP			
	14	Cp/Cv		Compressibility					
	15	Vapour min	Density nor	Density max	802.2	802.2	kg/m3		
	16	Vapour Pressure atT nom.			38.32 bar-a				
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State	HP condensate		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	7415	8157	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	245.1	245.1	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	38.32	33.79	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	25.97	20.1	bar
	23	CV	Min.	Norm.	Max.		3.28	5.044	
	24	Noise	Min.	Norm.	Max.				dBA
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 15			
27	Fd		Internal / Mfr	FI (CI)			0.933@max.		
28	Fluid tending to		Air-Fail Position				Close		
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g			
	31	Design Temperature		Min.	Max.			425	
	32	Max.DP closed valve				42.5 bar			
	33	Valve end con.& rating		Seat leakage class		2 in - 600 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material		CONTOURED		316 S.S. + FUL. STELLITE	
	35	Plug dim.		Plug form/law				=%	
	36	Seat type		Q.ty	Material	Clamped in		316 S.S. FULL STELLITE	
	37	Packing mat.		Lubricator		KELVAR PTFE			
	38	Bonnet type				Extended type EB			
Actuator	39	Direction of action							
	41	Spring range			11 TO 23				
Positioner	42	Type		Input signal		Field Bus		Field Bus	
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection			IP-65 EEXi-a (Cenelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
	52	Weight		Consumption		51 KG			

Notes: (1) Valve design pressure 47.22 barg / FV
(2) Valve opens upon increasing the variable
(3) % flash downstream valve: 19.4 wt

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE		Sheet 28		of 38	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507		Dwg. No.: 6465C 30 SP 1541 30	
									Rev.: 1	

General Data	1	Tag No.			30PV 30153					
	2	Client Reference	Requisition No.	Item	1541-01		13028			
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe			
	4	Serial Number								
	5	Service			E308 By Pass					
	6	P&ID No.			0021-30-12					
Inlet line	7	Diameter	Number				12"-PH40005A-DB01-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		18 in					
	10	Line schedule	Piping class		10		DA01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		3.96		0.01 cP			
	14	Cp/Cv	Compressibility		1.4		1			
	15	Density min	Density nor	Density max	1.6	1.6	1.6	kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		Fuel Gas		Gas	1 Phase	
	19	Flow	Min.	Norm.	Max.	Unit	10760	14760	23500	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	41	41	41	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	11.9	10.8	9.6	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	7.9	6.7	5.6	bar
	23	CV	Min.	Norm.	Max.		144.1	219.7	397.4	
	24	Noise	Min.	Norm.	Max.		<70	<70	71.3	dBA
	25	Required CV								
26	Selected CV Internal / Mfr			/ 600						
27	Fd Internal / Mfr / FI (CI)			/						
28	Fluid tending to		Air-Fail Position				OPEN			
Valve Body	29	Body type	Body material				A 351 Gr. CF8M			
	30	Design Pressure	Min.	Max.	bar-g		11.3			
	31	Design Temperature	Min.	Max.			60			
	32	Max.DP closed valve			11.3 bar					
	33	Valve end con.& rating	Seat leakage class		12 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type	Plug material		BALANCED		316 S.S. + STELLITE			
	35	Plug dim.	Plug form/law		Full trim		LQ-DB 2 STAGE LINEAR			
	36	Seat type	Q.ty	Material	Clamped in		316 S.S. + STELLITE			
	37	Packing mat.	Lubricator		KELVAR PTFE					
	38	Bonnet type			STANDARD					
39										
Actuator	40	Direction of action								
	41	Spring range			3 TO 15					
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay			YES					
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			YES					
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
52	Weight	Consumption		1087 KG						

Notes: 1) Valve opens upon increasing the variable.
2) Critical pressure > 10E6 bar(a).

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	02/04/2003	REVISED					
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507		Dwg. No.: 6465C 30 SP 1541 30	
							Sheet 29		of 38	
							Rev.: 2			

General Data	1	Tag No.			30TV 30154						
	2	Client Reference	Requisition No.	Item	1541-01		13029				
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number									
	5	Service			Regen Gas To D408						
	6	P&ID No.			0021-30-12						
Inlet line	7	Diameter	Number				6"-PH30011A-DB01-H				
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		6 in						
	10	Line schedule	Piping class		STD		DB01				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal			4					
	14	Cp/Cv	Compressibility			1.4		1			
	15	Density min	Density nor	Density max				0.9		kg/m3	
	16	Vapour Pressure at T nom.									
	17	Critical Pressure		Critical Temperature							
	18	Fluid	Phase	State		Fuel Gas		Gas	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit			2500	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit			230	:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit			9.63	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit			3.94	bar	
	23	CV	Min.	Norm.	Max.					60.09	
	24	Noise	Min.	Norm.	Max.					73	dBA
	25	Required CV									
26	Selected CV			Internal / Mfr		/ 75					
27	Fd		Internal / Mfr	FI (CI)	/		0.950				
28	Fluid tending to		Air-Fail Position					Close			
Valve Body	29	Body type	Body material		Single Seat Globe		A 351 Gr. CF8M				
	30	Design Pressure	Min.	Max.	bar-g		11.3 bar-g				
	31	Design Temperature	Min.	Max.					245		
	32	Max.DP closed valve				11.3 bar					
	33	Valve end con.& rating	Seat leakage class		3 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)				
	34	Plug type	Plug material			CONTOURED		316 S.S. + STELLITE			
	35	Plug dim.	Plug form/law			Full trim		LO-DB LINEAR			
	36	Seat type	Q.ty	Material		Threaded		316 S.S. + STELLITE			
	37	Packing mat.	Lubricator			Graphite					
	38	Bonnet type				STANDARD (T= 245 Deg. C)					
39											
Actuator	40	Direction of action									
	41	Spring range			11 TO 23						
Positioner	42	Type	Input signal		Field Bus		Field Bus				
	43	Air supply	Action dir.		4 BAR-G						
	44	Protection			IP-65 EEXI-a (Cenelec)						
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve			YES						
	48	Pressure gauge			YES						
	49	Handwheel			NO						
	50	Solenoid valve	Spec. No.								
51	Pos.detector	Spec. No.									
52	Weight	Consumption		147 KG							

Notes: (1) Valve operates between 0 and 100 %
(2) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				FARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No.: 6465C 30 SP 1541 30	Sheet 30	of 38

General Data	1	Tag No.			30TV 30155					
	2	Client Reference	Requisition No.	Item	1541-01		13030			
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe			
	4	Serial Number								
	5	Service			Regen Gas To D308 A/B					
	6	P&ID No.			0021-30-12					
Inlet line	7	Diameter	Number				10"-PH30007A-DB01-H			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		10 in					
	10	Line schedule	Piping class		20		DB01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal			4				
	14	Cp/Cv	Compressibility			1.4		1		
	15	Density min	Density nor	Density max				0.9		kg/m3
	16	Vapour Pressure aTT nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		Fuel Gas		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	6600	8100	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	230	230	:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	9.6	9.63	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3.9	3.94	bar	
	23	CV	Min.	Norm.	Max.			146	196.1	
	24	Noise	Min.	Norm.	Max.			73.2	74.6	dBA
	25	Required CV								
26	Selected CV		Internal / Mfr		/ 300					
27	Fd		Internal / Mfr		/		0.940			
28	Fluid tending to		Air-Fail Position					Close		
Valve Body	29	Body type		Body material			A 351 Gr. CF8M			
	30	Design Pressure		Min.	Max.	bar-g		11.3	bar-g	
	31	Design Temperature		Min.	Max.	245				
	32	Max.DP closed valve					11.3		bar	
	33	Valve end con.& rating		Seat leakage class			6 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material			BALANCED		316 S.S. + STELLITE	
	35	Plug dim.		Plug form/law			Full trim		LO-DB LINEAR	
	36	Seat type		Q.ty	Material		Clamped in		316 S.S. + STELLITE	
	37	Packing mat.		Lubricator			KELVAR PTFE			
	38	Bonnet type					STANDARD (T= 245 Deg.C)			
39										
Actuator	40	Direction of action								
	41	Spring range			6 TO 30					
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		279 KG					

Notes: (1) Valve operates between 0 and 100 %
(2) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE		Sheet 31		of 38	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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									Rev.: 1	



General Data	1	Tag No.				30FV 30161			
	2	Client Reference	Requisition No.	Item	1541-01			13031	
	3	Supplier	Model	DRESSER FLOW CONTROL			35000 Series Camflex		
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number			2"-FG30006A-DA03-N			
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number			2 in			
	10	Line schedule	Piping class			STD DA03			
Operating Conditions	11	Calculation Results From:				<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both			
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal			4		0.01 cP	
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max		1.64		1.64 kg/m3	
	16	Vapour Pressure aT nom.							
	17	Critical Pressure				Critical Temperature			
	18	Fluid	Phase	State		Fuel gas		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	120	200	300 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	45	45	45 °C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	3.93	3.55	3.46 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	2.76	2.25	2.03 bar
	23	CV	Min.	Norm.	Max.	5.465		10.88	18.43
	24	Noise	Min.	Norm.	Max.	72.6		73.9	75.2 dBA
	25	Required CV							
26	Selected CV Internal / Mfr				/ 30				
27	Fd		Internal / Mfr	FI (Cf)	/			0.762@max.	
28	Fluid tending to		Air-Fail Position						
29	Body type		Body material						
Valve Body	30	Design Pressure		Min.	Max.	bar-g		5.5 bar-g	
	31	Design Temperature		Min.	Max.	85			
	32	Max.DP closed valve		5.2			bar		
	33	Valve end con.& rating		Seat leakage class		1.5 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material					
	35	Plug dim.		Plug form/law				Full trim	
	36	Seat type		Q.ty	Material		316 S.S.		
	37	Packing mat.		Lubricator					
	38	Bonnet type		Integral extended					
	39								
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal			Smart		4w20 mA 24Vdc HART	
	43	Air supply	Action dir.						
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve				YES			
	48	Pressure gauge				YES			
	49	Handwheel							
	50	Solenoid valve		Spec. No.					
	51	Pos.detector		Spec. No.					
52	Weight		Consumption				19 KG		

Notes: (1) Valve closes upon increase in the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No.:	6465C 30 SP 1541 30	Rev.: 1

General Data	1	Tag No.				30LV 30161					
	2	Client Reference	Requisition No.	Item	1541-01		13032				
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex				
	4	Serial Number									
	5	Service				SCA From D312					
	6	P&ID No.				0021-30-13					
Inlet line	7	Diameter	Number			2" SC30004A-DA05-N					
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number			2 in					
	10	Line schedule	Piping class			XS		DA05			
Operating Conditions	11	Calculation Results From:				<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal			0.6		cP			
	14	Cp/Cv	Compressibility								
	15	Density min	Density nor	Density max		1010	1010		1010	kg/m3	
	16	Vapour Pressure aT nom.				0.1		bar-a			
	17	Critical Pressure		Critical Temperature			221.2		bar-a		
	18	Fluid	Phase	State		Caustic sol.		Liquid		Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	1580	3950	4345	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	50	50	50	:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	3.01	2.73	2.47	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.99	1.17	0.88	bar	
	23	CV	Min.	Norm.	Max.		1.294	4.255	5.428		
	24	Noise	Min.	Norm.	Max.		<70	<70	<70	dBA	
	25	Required CV									
26	Selected CV Internal / Mfr				/ 8.4						
27	Fd Internal / Mfr		FI (Ci)		/		0.756@max.				
28	Fluid tending to		Air-Fail Position					Close			
Valve Body	29	Body type		Body material				ASTM A216 GR WCC			
	30	Design Pressure		Min.	Max.	bar-g		3.5 bar-g			
	31	Design Temperature		Min.	Max.			65			
	32	Max.DP closed valve				3.48		bar			
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type		Plug material		Eccentric rotary		SOLID STELLITE			
	35	Plug dim.		Plug form/law		Red. trim		LINEAR			
	36	Seat type		Q.ty	Material			316 S.S.			
	37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS					
	38	Bonnet type				Integral extended					
39											
Actuator	40	Direction of action									
	41	Spring range				7 TO 15					
Positioner	42	Type		Input signal		Field Bus		Field Bus			
	43	Air supply		Action dir.		4 BAR-G					
	44	Protection				IP-65 EEX-a (Cenelec)					
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve				YES					
	48	Pressure gauge				YES					
	49	Handwheel				NO					
	50	Solenoid valve		Spec. No.							
51	Pos.detector		Spec. No.								
52	Weight		Consumption		16 KG						

Notes: (1) Valve opens upon increasing the variable
(2) Line 18: 2 - 4% wt of NaOH

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE		Sheet 33		of 38	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision	Code: 507	Dwg. No.: 6465C 30 SP 1541 30	Rev.: 1		

General Data	1	Tag No.			30PV 30162					
	2	Client Reference	Requisition No.	Item	1541-01		13033			
	3	Supplier	Model		DRESSER FLOW CONTROL		Camflex Flangeless			
	4	Serial Number								
	5	Service			Acid Flare From D312					
	6	P&ID No.			0021-30-13					
Inlet line	7	Diameter	Number				2"-AF30001A-DA05-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		2 in					
	10	Line schedule	Piping class		XS		DA05			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		24		0.02 cP			
	14	Cp/Cv	Compressibility			1.32		0.998		
	15	Density min	Density nor	Density max	2.24	2.24	2.24	kg/m3		
	16	Vapour Pressure atT nom.								
	17	Critical Pressure	Critical Temperature							
	18	Fluid	Phase	State		See notes		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	120	300	350	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	50	50	50	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	2.72	2.3	2.01	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.43	0.52	0.11	bar
	23	CV	Min.	Norm.	Max.		3.139	12.03	29.96	
	24	Noise	Min.	Norm.	Max.		<70	<70	<70	dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 50				
27	Fd			Internal / Mfr		FI (CI)		0.768@max.		
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type	Body material					ASTM A216 GR WCC		
	30	Design Pressure	Min.	Max.	bar-g		3.5 bar-g			
	31	Design Temperature	Min.	Max.			65			
	32	Max.DP closed valve				3.5 bar				
	33	Valve end con.& rating	Seat leakage class			2 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type	Plug material			Eccentric rotary		SOLID STELLITE		
	35	Plug dim.	Plug form/law			Full trim		LINEAR		
	36	Seat type	Q.ty	Material				316 S.S.		
	37	Packing mat.	Lubricator			KELVAR PTFE WITH VITON O RINGS				
	38	Bonnet type				Integral extended				
	39									
Actuator	40	Direction of action								
	41	Spring range			7 TO 15					
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve	Spec. No.							
	51	Pos.detector	Spec. No.							
	52	Weight	Consumption		17 KG					

Notes: (1) Line 18: Cracked gas and nitrogen
(2) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE		Sheet 34		of 38	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507		Dwg. No.: 6465C 30 SP 1541 30	
									Rev.: 1	

General Data	1	Tag No.			30LV 30164				
	2	Client Reference	Requisition No.	Item	1541-01		13034		
	3	Supplier	Model	DRESSER FLOW CONTROL		Camflex Flangeless			
	4	Serial Number							
	5	Service			Conlam Eff From D313				
	6	P&ID No.			0021-30-13				
Inlet line	7	Diameter	Number		2"-CE30002A-DA10-N				
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		2 in				
	10	Line schedule	Piping class		STD		DA10		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		0.4 cP				
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	980	980	980	kg/m3	
	16	Vapour Pressure at T nom.			0.264 bar-a				
	17	Critical Pressure	Critical Temperature		221.2 bar-a				
	18	Fluid	Phase	State		Water		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	2412	6030	6700 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	66.2	66.2	66.2 :C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	5.26	4.56	4.39 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	2.16	0.93	0.63 bar
	23	CV	Min.	Norm.	Max.		1.926	7.547	10.49
	24	Noise	Min.	Norm.	Max.		<70	<70	<70 dBA
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 14			
27	Fd			Internal / Mfr		FI (CI)		0.731@max	
28	Fluid tending to		Air-Fail Position						
Valve Body	29	Body type	Body material		ASTM A216 GR WCC				
	30	Design Pressure	Min.	Max.	bar-g		4.6 bar-g		
	31	Design Temperature	Min.	Max.	85				
	32	Max.DP closed valve			2.6 bar				
	33	Valve end con.& rating	Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type	Plug material		Eccentric rotary		SOLID STELLITE		
	35	Plug dim.	Plug form/law		Full trim		LINEAR		
	36	Seat type	Q.ty	Material			316 S.S.		
	37	Packing mat.	Lubricator		KELVAR PTFE WITH VITON O RINGS				
	38	Bonnet type			Integral extended				
Actuator	40	Direction of action							
	41	Spring range			7 TO 15				
Positioner	42	Type	Input signal		Field Bus		Field Bus		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve	Spec. No.						
	51	Pos.detector	Spec. No.						
	52	Weight	Consumption		14 KG				

Notes: (1) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No.:	6465C 30 SP 1541 30	Rev.: 1

General Data	1	Tag No.			30FV 30171					
	2	Client Reference	Requisition No.	Item	1541-01		13035			
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number								
	5	Service			SCA From S311 A/B					
	6	P&ID No.			0021-30-14					
Inlet line	7	Diameter	Number				2"-SC30007A-DA05-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		2 in					
	10	Line schedule	Piping class		XS		DA05			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal				0.6		cP	
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	1010	1010	1010	kg/m3		
	16	Vapour Pressure atT nom.			0.125 bar-a					
	17	Critical Pressure		Critical Temperature		221.2 bar-a				
	18	Fluid	Phase	State		Spent caustic		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	2400	6000	6700	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	50	50	50	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	5.3	3.79	3.19	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3.32	1.09	0.3	bar
	23	CV	Min.	Norm.	Max.		1.52	6.639	14.17	
	24	Noise	Min.	Norm.	Max.		<70	<70	<70	dBA
	25	Required CV								
26	Selected CV			Internal / Mfr				/ 18		
27	Fd		Internal / Mfr	FI (CI)			/		0.723@max.	
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type		Body material				ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		4.6		bar-g
	31	Design Temperature		Min.	Max.			65		
	32	Max.DP closed valve				2.5 bar				
	33	Valve end con.& rating		Seat leakage class		1.5 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		Eccentric rotary		SOLID STELLITE		
	35	Plug dim.		Plug form/law		Red. trim		LINEAR		
	36	Seat type		Q.ty	Material			316 S.S.		
	37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS				
	38	Bonnet type				Integral extended				
Actuator	40	Direction of action								
	41	Spring range			7 TO 15					
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
52	Weight		Consumption		19 KG					

Notes: (1) Line 18: 2 - 4 % NaOH wt
(2) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE		Sheet 36		of 38	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No.: 6465C 30 SP 1541 30		Rev.: 1



General Data	1	Tag No.			30LV 30701A				
	2	Client Reference	Requisition No.	Item	1541-01		13036		
	3	Supplier	Model		DRESSER FLOW CONTROL		Camflex Flangeless		
	4	Serial Number							
	5	Service			Turbine Cond From STC301				
	6	P&ID No.			0041-30-01				
Inlet line	7	Diameter	Number				6"-TC65005A-DA04-N		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		6 in				
	10	Line schedule	Piping class		STD		DA04		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		0.51 cP				
	14	Cp/Cv	Compressibility						
	15	Vapour min	Density nor	Density max	986	986	986	kg/m3	
	16	Vapour Pressure atT nom.			0.15 bar-a				
	17	Critical Pressure		Critical Temperature		221.3 bar-a		374.15 :C	
	18	Fluid	Phase	State		TC		Liquid	1 Phase
	19	Flow	Min.	Norm.	Max.	Unit	77900	104200	149000 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	54	54	54 :C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	7.9	7.7	7.5 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	0.9	0.7	0.5 bar
	23	CV	Min.	Norm.	Max.		68.18	185.6	212.3
	24	Noise	Min.	Norm.	Max.		<70	<70	<70 dBA
	25	Required CV							
26	Selected CV Internal / Mfr			/ 300					
27	Fd Internal / Mfr		FI (Ci)	/		0.738@max.			
28	Fluid tending to		Air-Fail Position				Close		
Valve Body	29	Body type	Body material				ASTM A216 GR WCC		
	30	Design Pressure	Min.	Max.	bar-g		10 bar-g		
	31	Design Temperature	Min.	Max.			70		
	32	Max.DP closed valve			10 bar				
	33	Valve end con.& rating	Seat leakage class		6 in -300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type	Plug material		Eccentric rotary		316L S.S. + STELLITE		
	35	Plug dim.	Plug form/flaw		Red. trim		LINEAR		
	36	Seat type	Q.ty	Material			316 S.S.		
	37	Packing mat.	Lubricator		KEVLAR PTFE WITH VITON O RINGS				
	38	Bonnet type			Integral extended				
Actuator	40	Direction of action							
	41	Spring range			7 TO 24				
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXI-a (Cenelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel							
	50	Solenoid valve	Spec. No.						
51	Pos.detector	Spec. No.							
	52	Weight	Consumption						

Notes: 1) Molecular weight = 18.
2) Valve opens upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE		Sheet 37		of 38	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No.: 6465C 30 SP 1541 30		Rev.: 1

General Data	1	Tag No.				30LV 30701B				
	2	Client Reference	Requisition No.	Item	1541-01			13037		
	3	Supplier	Model	DRESSER FLOW CONTROL			Camflex Flangeless			
	4	Serial Number								
	5	Service				Turbine Cond From STC301				
	6	P&ID No.				0041-30-01				
Inlet line	7	Diameter	Number			10"-TC65005A-DA04-N				
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number			10 in				
	10	Line schedule	Piping class			20 DA04				
Operating Conditions	11	Calculation Results From:				<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal			0.512 cP				
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	986	986	986	kg/m3		
	16	Vapour pressure atT nom.				0.15 bar-a				
	17	Critical Pressure	Critical Temperature							
	18	Fluid	Phase	State		TC	Liquid	1 Phase		
	19	Flow	Min.	Norm.	Max.	Unit	80000	104200	149000	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	54	54	54	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	8.2	7.5	7.2	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	7.2	6.5	6.2	bar
	23	CV	Min.	Norm.	Max.		26.15	67.21	75.74	
	24	Noise	Min.	Norm.	Max.		72.3	76.4	76.9	dBA
	25	Required CV								
26	Selected CV Internal / Mir				/ 135					
27	Fd	Internal / Mir	FI (Ci)		/			0.875@max.		
28	Fluid tending to		Air-Fail Position			CLOSE				
Valve Body	29	Body type	Body material			ASTM A216 GR WCC				
	30	Design Pressure	Min.	Max.	bar-g			8		
	31	Design Temperature	Min.	Max.				70		
	32	Max.DP closed valve				8 bar				
	33	Valve end con.& rating	Seat leakage class			3 in - 300 lb ANSI RF			CLASS IV (IEC 534-4)	
	34	Plug type	Plug material			Eccentric rotary			316L S.S. + STELLITE	
	35	Plug dim.	Plug form/law			Full trim			LINEAR	
	36	Seat type	Q.ty	Material					316 S.S.	
	37	Packing mat.	Lubricator			KEVLAR PTFE WITH VITON O RINGS				
	38	Bonnet type				Integral extended				
39										
Actuator	40	Direction of action								
	41	Spring range				7 TO 15				
Positioner	42	Type	Input signal			Smart		4w20 mA 24Vdc HART		
	43	Air supply	Action dir.			4 BAR-G				
	44	Protection				IP-65 EEXi-a (Cenelec)				
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve				YES				
	48	Pressure gauge				YES				
	49	Handwheel								
	50	Solenoid valve	Spec. No.							
	51	Pos.detector	Spec. No.							
52	Weight	Consumption			40 KG					

Notes: 1) Molecular weight = 18.
2) Valve opens upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	03/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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UNIT 40

TECHNIP



**9TH OLEFIN COMPLEX
ETHANE CRACKING PLANT**



CONTRACTOR DOCUMENT N°							OWNER DOCUMENT N°						
Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page	Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page
6465C	30	SP	1541	40	1	1/48	3930	30	SP	1541	40	1	1/48

02-04811

CONTROL VALVES DATA SHEETS

(SECTION 40)

Pages modified under this revision: ALL



Rev	Date DD/MM/YY	STATUS	WRITTEN BY (name & visa)	CHECKED BY (name & visa)	APPROVED BY (name & visa)
1	04/10/02	Issue for purchase	T.GRANDRY	F.REGARD	P.E.CROUZIER
0	19/04/02	Issue for purchase	S.SRIRAM	T.GRANDRY	P.E.CROUZIER

DOCUMENT REVISIONS

Sections changed in last revision are identified by a vertical line in the right margin

General Data	1	Tag No.				30HV 40033			
	2	Client Reference	Requisition No.	Item	1541-01			14001	
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe			
	4	Serial Number							
	5	Service							By Pass C401 Exp Compr
	6	P&ID No.							0021-40-03
Inlet line	7	Diameter	Number			14"-PH40013A-EB21-K			
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number			14 in			
	10	Line schedule	Piping class			10		DB01	
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal			4		0.009 cP	
	14	Cp/Cv	Compressibility			1.4		1	
	15	Density min	Density nom	Density max		1.74		kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure			Critical Temperature				
	18	Fluid	Phase	State		HC		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	21360		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	40		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	11.95		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	0.95		bar
	23	CV	Min.	Norm.	Max.	640			
	24	Noise	Min.	Norm.	Max.	89.8		dBA	
25	Required CV								
26	Selected CV			Internal / Mfr		/ 640			
27	Fd	Internal / Mfr		FI (Cf)		/		0.900	
28	Fluid tending to			Air-Fail Position					
29	Body type			Body material					A 351 Gr. CF8M
30	Design Pressure		Min.	Max.	36.6 bar-g				
31	Design Temperature		Min.	Max.	60 :C				
32	Max.DP closed valve			36.6 bar					
33	Valve end con.& rating		Seat leakage class		8 in - 300 lb ANSI RF		CLASS IV		
34	Plug type		Plug material		BALANCED		316 S.S. + STELLITE		
35	Plug dim.		Plug form/law		LINEAR				
36	Seat type		Q.ty	Material	Clamped in		316 S.S. + STELLITE		
37	Packing mat.		Lubricator		KELVAR PTFE				
38	Bonnet type				STANDARD				
39									
Actuator	40	Direction of action							
	41	Spring range			3 TO 15				
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXI-a (Cenelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel							
	50	Solenoid valve		Spec. No.	YES				
51	Pos.detector		Spec. No.	YES (1 No. high limit switch)					
52	Weight		Consumption		507 KG				

Notes: (1) Hydrogen content = 87% mol

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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					Code: 507	Dwg. No.: 6465C 30 SP 1541 40		Rev.: 1



General Data	1	Tag No.			30LV 40051						
	2	Client Reference	Requisition No.	Item	1541-01		14002				
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe				
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		6"-P40034A-EJ01-C						
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		8 in						
	10	Line schedule	Piping class		10S		DJ01				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal						0.083 cP		
	14	Cp/Cv	Compressibility								
	15	Density min	Density nor	Density max	473.4		kg/m3				
	16	Vapour Pressure at T nom.			32 bar-a						
	17	Critical Pressure		Critical Temperature		48.7 bar-a					
	18	Fluid	Phase	State		HC		Liquid		Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	33390	83470	91820	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-36		°C		
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	33.8	32.1	30.5	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	22.4	20.5	18.8	bar	
	23	CV	Min.	Norm.	Max.	19.75		52.74	60.52		
	24	Noise	Min.	Norm.	Max.	dBA					
	25	Required CV									
26	Selected CV Internal / Mfr			175							
27	Fd Internal / Mfr		FI (Cf)		/			0.908			
28	Fluid tending to		Air-Fail Position			Close					
Valve Body	29	Body type		Body material			A 351 Gr. CF8M				
	30	Design Pressure		Min.	Max.	bar-g		36.8 bar-g			
	31	Design Temperature		Min.	Max.						
	32	Max. DP closed valve									
	33	Valve end con. & rating		Seat leakage class			4 in - 300 lb ANSI RF		CLASS II (IEC 534-4)		
	34	Plug type		Plug material			BALANCED		316 S.S. + STELLITE		
	35	Plug dim.		Plug form/law			2" trim		LINEAR		
	36	Seat type		Q.ty	Material	Clamped in		316 S.S. + STELLITE			
	37	Packing mat.		Lubricator			KELVAR PTFE				
	38	Bonnet type					Cryogenic-Extended bonnet				
39											
Actuator	40	Direction of action									
	41	Spring range									
Positioner	42	Type		Input signal			Field Bus		Field Bus		
	43	Air supply		Action dir.			4 BAR-G				
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve			YES						
	48	Pressure gauge			YES						
	49	Handwheel									
	50	Solenoid valve		Spec. No.							
51	Pos. detector		Spec. No.								
52	Weight		Consumption			150 KG					

Notes: (1) Valve closes upon increasing the variable
(2) Design temperature: -1350C / 600C
(3) Mixed phase at valve outlet: % wt of vaporization : 13 max. vapor density : 14.3 kg/m3
(4) Valve Body size is 4" * 2" * 4".

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30TV 40053					
	2	Client Reference	Requisition No.	Item	1541-01		14003			
	3	Supplier	Model	DRESSER FLOW CONTROL		30000 Series Varimax				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		6"-PH40006A-EB21-C					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		6 in					
	10	Line schedule	Piping class		STD	EB21				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		16	0.01 cP				
	14	Cp/Cv	Compressibility		1.25	0.87				
	15	Density min	Density nor	Density max		29.7	kg/m3			
	16	Vapour Pressure atT nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		cracked gas	Gas	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	8440	21100	23210	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit		-36.1		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	31.85	31.85	31.85	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	0.05	0.2	0.24	bar
	23	CV	Min.	Norm.	Max.		253.6	318	319.5	
	24	Noise	Min.	Norm.	Max.		7	32.2	35.6	dBA
	25	Required CV								
	26	Selected CV		Internal / Mfr		/ 405				
	27	Fd	Internal / Mfr		FI (C)	/		0.816@max.		
	28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material					A 351 Gr. CF8M	
	30	Design Pressure		Min.	Max.	bar-g		36.6	bar-g	
	31	Design Temperature		Min.	Max.					
	32	Max.DP closed valve				0	bar			
	33	Valve end con. & rating		Seat leakage class		6 in	- 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material					Rotary	316 S.S.
	35	Plug dim.		Plug form/law					LINEAR	
	36	Seat type		Q.ty	Material		316 S.S.			
	37	Packing mat.		Lubricator						KELVAR PTFE
	38	Bonnet type		Integral extended						
39										
Actuator	40	Direction of action								
	41	Spring range							7 TO 25	
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection							IP-65 EEXi-a (Cenelec)	
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve							YES	
	48	Pressure gauge							YES	
	49	Handwheel							NO	
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
	52	Weight		Consumption		71 KG				

Notes: (1) Valves closes when increasing the variable.
(2) Design temperature -480C / 600C
(3) Adjustment at CV = 405.

					INSTRUMENT SPECIFICATION		TECHNIP					
					Control Valve							
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE							
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE							
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General Data	1	Tag No.			30LV 40053						
	2	Client Reference	Requisition No.	Item	1541-01		14004				
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe				
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		8"-P40036A-EJ01-C						
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		8 in						
	10	Line schedule	Piping class		10S		EJ01				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both						
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal					0.1 cP			
	14	Cp/Cv	Compressibility								
	15	Density min	Density nor	Density max		498		kg/m3			
	16	Vapour Pressure at T nom.							31.7 bar-a		
	17	Critical Pressure		Critical Temperature					48.8 bar-a		
	18	Fluid	Phase	State		HC		Liquid	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	50480	126200	138820		
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	-69			:C	
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	33.6	31.9	30.2	bar-a	
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	21.7	19.8	18	bar	
	23	CV	Min.	Norm.	Max.	29.05		76.96	88.72		
	24	Noise	Min.	Norm.	Max.					dBa	
	25	Required CV									
	26	Selected CV Internal / Mfr				/ 140					
	27	Fd		Internal / Mfr	FI (Ci)	/		0.916@max.			
	28	Fluid tending to		Air-Fail Position					Close		
	Valve Body	29	Body type		Body material				A 351 Gr. CF8M		
		30	Design Pressure		Min.	Max.	bar-g		36.9 bar-g		
		31	Design Temperature		Min.	Max.					
		32	Max. DP closed valve							36.9 bar	
		33	Valve end con. & rating		Seat leakage class			6 in - 300 lb ANSI RF		CLASS II (IEC 534-4)	
		34	Plug type		Plug material						BALANCED
35		Plug diam.		Plug form/law			3" trim		=%		
36		Seat type		Q.ty	Material	Clamped in			316 S.S. + STELLITE		
37		Packing mat.		Lubricator						KELVAR PTFE	
38		Bonnet type		Cryogenic-Extended bonnet							
Actuator	40	Direction of action									
	41	Spring range							6 TO 30		
Positioner	42	Type	Input signal				Field Bus		Field Bus		
	43	Air supply	Action dir.						4 BAR-G		
	44	Protection							IP-65 EEXI-a (Cenelec)		
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve							YES		
	48	Pressure gauge							YES		
	49	Handwheel							NO		
	50	Solenoid valve		Spec. No.							
51	Pos. detector		Spec. No.								
	52	Weight		Consumption				270 KG			

Notes: (1) Valve closes upon increasing the variable
(2) Design temperature: -1350C / 600C
(3) Mixed phase at valve outlet: % wt of vaporization : 3.6 max. vapor density : 11 kg/m3
(4) Valve body size is 6" * 3" * 6".

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30LV 40061				
	2	Client Reference	Requisition No.	Item	1541-01		14005		
	3	Supplier		Model	DRESSER FLOW CONTROL		21000 Series Globe		
	4	Serial Number							
	5	Service			D403 Feed Third Sep				
	6	P&ID No.			0021-40-05				
Inlet line	7	Diameter	Number				4"-P40041A-EJ01-C		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		4 in				
	10	Line schedule	Piping class		10S		EJ01		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service		Special conditions					
	13	Molecular Weight		Viscosity at @ normal		0.13 cP			
	14	Cp/Cv		Compressibility					
	15	Density min	Density nor	Density max		525.4		kg/m3	
	16	Vapour Pressure atT nom.			31.5 bar-a				
	17	Critical Pressure		Critical Temperature		48.9 bar-a			
	18	Fluid	Phase	State		HC		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	11240	28100	30910
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-95		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	33.3	31.6	30
	22	DP	QMin.	Q Norm.	Q Max.	Unit	21.3	19.3	17.6
	23	CV	Min.	Norm.	Max.		6.271	16.92	19.42
	24	Noise	Min.	Norm.	Max.		-		dBA
	25	Required CV							
26	Selected CV Internal / Mfr			/ 31					
27	Fd Internal / Mfr		Fi (Ci)		/		0.911@max.		
28	Fluid tending to		Air-Fail Position		Close				
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M	
	30	Design Pressure		Min.	Max.	bar-g		36.8 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve				36.8 bar			
	33	Valve end con.& rating		Seat leakage class		3 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material		Contoured		316 S.S. FULL STELLITE	
	35	Plug dim.		Plug form/law		Red. trim		LINEAR	
	36	Seat type		Q.ty	Material	Threaded		316 S.S. FULL STELLITE	
	37	Packing mat.		Lubricator		KELVAR PTFE			
	38	Bonnet type				Cryogenic-Extended bonnet			
Actuator	40	Direction of action							
	41	Spring range			11 TO 23				
Positioner	42	Type		Input signal		Field Bus		Field Bus	
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection			IP-65 EEXI-a (Cenelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
52	Weight		Consumption		97 KG				

Notes: (1) Valve closes upon increasing the variable
(2) Design temperature: -1350C / 600C
(3) Mixed phase at valve outlet: % wt of vaporization : 3.max. vapor density : 8 kg/m3

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30PV 40061C					
	2	Client Reference	Requisition No.	Item	1541-01		14006			
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe			
	4	Serial Number								
	5	Service			By Pass C401 Expander					
	6	P&ID No.			0021-40-03					
Inlet line	7	Diameter	Number		10"-PH40002A-EJ01-C					
	8	Line schedule	Piping class		EJ01					
Outlet line	9	Diameter	Number		14 in					
	10	Line schedule	Piping class		STD		EJ01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		4		0.006 cP			
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max		8.8		kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		HC		Gas		Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	8550	21360	23496	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-104.3		°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	32.5	31	29.5	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	21	19	14	bar
	23	CV	Min.	Norm.	Max.		31.78	83.7	97.23	
	24	Noise	Min.	Norm.	Max.		76	78.7	78.1	dBA
	25	Required CV								
26	Selected CV Internal / Mfr			/ 125						
27	Fd		Internal / Mfr	FI (C)	/		0.940			
28	Fluid tending to		Air-Fail Position		CLOSE					
Valve Body	29	Body type		Body material		A 351 Gr. CF8M				
	30	Design Pressure	Min.	Max.	bar-g		36.6 bar-g			
	31	Design Temperature	Min.	Max.						
	32	Max.DP closed valve								
	33	Valve end con.& rating	Seat leakage class		6 in - 300 lb ANSI RF		CLASS V (IEC 534-4)			
	34	Plug type	Plug material		BALANCED		316 S.S. + STELLITE			
	35	Plug dim.	Plug form/law		3" trim		LO-DB LINEAR			
	36	Seat type	Q.ty	Material	Clamped in		316 S.S. + STELLITE			
	37	Packing mat.	Lubricator		KELVAR PTFE					
	38	Bonnet type			Cryogenic-Extended bonnet					
39										
Actuator	40	Direction of action								
	41	Spring range			21 TO 45 / 13 - 45					
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection		IP-65 EEXi-a (Cenelec)						
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		270 KG					

Notes: 1) Valve body size is 6" * 3" * 6".

					INSTRUMENT SPECIFICATION		TECHNIP		 PARS PETROCHEMICAL COMPANY	
					Control Valve		 PARS PETROCHEMICAL COMPANY			
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.	30LV 40063				
	2	Client Reference	Requisition No.	Item	1541-01 14007		
	3	Supplier	Model	DRESSER FLOW CONTROL 21000 Series Globe			
	4	Serial Number					
	5	Service	D404 Feed Fourth Sep				
	6	P&ID No.	0021-40-05				
Inlet line	7	Diameter	Number	3"-P40043A-EJ01-C			
	8	Line schedule	Piping class				
Outlet line	9	Diameter	Number	3 in			
	10	Line schedule	Piping class	10S EJ01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both		
	12	Sour service	Special conditions				
	13	Molecular Weight	Viscosity at @ normal		0.15 cP		
	14	Cp/Cv	Compressibility				
	15	Density min	Density nor	Density max	536.2 kg/m3		
	16	Vapour Pressure at T nom.			31.3 bar-a		
	17	Critical Pressure		Critical Temperature	48.7 bar-a		
	18	Fluid	Phase	State	HC Liquid Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	3310 8270 9100 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-115 :C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	33 31.4 29.8 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	21 18.9 17.2 bar
	23	CV	Min.	Norm.	Max.		1.814 4.849 5.568
	24	Noise	Min.	Norm.	Max.		
	25	Required CV					
26	Selected CV Internal / Mfr			/ 15			
27	Fd	Internal / Mfr	FI (Cf)	/ 0.929@max.			
28	Fluid tending to		Air-Fail Position	Close			
Valve Body	29	Body type	Body material		Single Seat Globe A 351 Gr. CF8M		
	30	Design Pressure	Min.	Max.	bar-g 36.8 bar-g		
	31	Design Temperature	Min.	Max.			
	32	Max. DP closed valve				36.8 bar	
	33	Valve end con.& rating	Seat leakage class			2 in - 300 lb ANSI RF CLASS IV (IEC 534-4)	
	34	Plug type	Plug material			Contoured 316 S.S. FULL STELLITE	
	35	Plug dim.	Plug form/flaw			Red. trim =%	
	36	Seat type	Q.ty	Material	Threaded 316 S.S. FULL STELLITE		
	37	Packing mat.	Lubricator			KELVAR PTFE	
	38	Bonnet type		Cryogenic-Extended bonnet			
39							
Actuator	40	Direction of action					
	41	Spring range				11 TO 23	
Positioner	42	Type	Input signal		Field Bus Field Bus		
	43	Air supply	Action dir.		4 BAR-G		
	44	Protection				IP-65 EEXi-a (Cenelec)	
Accessories	45	Booster relay					
	46	Locking device					
	47	Pressure reducing valve			YES		
	48	Pressure gauge			YES		
	49	Handwheel				NO	
	50	Solenoid valve	Spec. No.				
51	Pos.detector	Spec. No.					
52	Weight	Consumption		51 KG			

Notes: (1) Valve closes upon increasing the variable
(2) Design temperature: -1350C / 600C
(3) Mixed phase at valve outlet: % wt of vaporization : 0.8 max. vapor density : 6.8 kg/m3

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30LV 40065				
	2	Client Reference	Requisition No.	Item	1541-01		14008		
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number		2"-P40044A-EJ01-C				
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		2 in				
	10	Line schedule	Piping class		10S		EJ01		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		0.15 cP				
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	511.3		kg/m3		
	16	Vapour Pressure at T nom.			31.1 bar-a				
	17	Critical Pressure	Critical Temperature		47.8 bar-a				
	18	Fluid	Phase	State		HC		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	1550	3870	4260
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit		-135	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	32.8	31.2	29.6
	22	DP	QMin.	Q Norm.	Q Max.	Unit	20.8	18.6	16.8
	23	CV	Min.	Norm.	Max.		0.8883	2.383	2.734
	24	Noise	Min.	Norm.	Max.				dBA
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 3.8			
27	Fd	Internal / Mfr		FI (Ci)	/		0.907@max.		
28	Fluid tending to		Air-Fail Position						
29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M		
30	Design Pressure		Min.	Max.	bar-g		36.8 bar-g		
31	Design Temperature		Min.	Max.					
32	Max. DP closed valve				36.8 bar				
33	Valve end con.& rating		Seat leakage class		2 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
34	Plug type		Plug material		Contoured		316 S.S. FULL STELLITE		
35	Plug dim.		Plug form/law		Red. trim		LINEAR		
36	Seat type		Q.ty	Material	Threaded		316 S.S. FULL STELLITE		
37	Packing mat.		Lubricator		KELVAR PTFE				
38	Bonnet type		Cryogenic-Extended bonnet						
39									
Actuator	40	Direction of action							
	41	Spring range			3 TO 15				
Positioner	42	Type	Input signal		Field Bus		Field Bus		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel							
	50	Solenoid valve	Spec. No.						
51	Pos.detector	Spec. No.							
	52	Weight		Consumption		51 KG			

Notes: (1) Valve closes upon increasing the variable
(2) Design temperature: -1520C / 600C
(3) Mixed phase at valve outlet: % wt of vaporization : 0.6 max. vapor density : 6.7 kg/m3

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30PV 40071					
	2	Client Reference	Requisition No.	Item	1541-01		14009			
	3	Supplier	Model		DRESSER FLOW CONTROL		30000 Series Varimax			
	4	Serial Number								
	5	Service			T401 Ovhd Outlet					
	6	P&ID No.			0021-40-06					
Inlet line	7	Diameter	Number				10"-P40030A-DJ01-C			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		10 in					
	10	Line schedule	Piping class		10S		DJ01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal		19.4		0.008 cP		
	14	Cp/Cv		Compressibility		1.26		0.89		
	15	Density min	Density nor	Density max		14.3		kg/m3		
	16	Vapour Pressure atT nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		HC	Gas	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	11160	27900	30690	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-71		:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	13	11	11	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3.1	0.3	0.2	bar
	23	CV	Min.	Norm.	Max.		67.09	513.9	688.2	
	24	Noise	Min.	Norm.	Max.		82.2	<70	<70	dba
	25	Required CV								
26	Selected CV		Internal / Mfr		/ 890					
27	Fd	Internal / Mfr		FI (Cf)	/		0.809@max.			
28	Fluid tending to		Air-Fail Position		Close					
Valve Body	29	Body type		Body material				A 351 Gr. CF8M		
	30	Design Pressure		Min.	Max.	bar-g		13.5 bar-g		
	31	Design Temperature		Min.	Max.					
	32	Max.DP closed valve				13.5 bar				
	33	Valve end con.& rating		Seat leakage class		8 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		Rotary		316 S.S.		
	35	Plug dim.		Plug form/law				LINEAR		
	36	Seat type		Q.ty	Material			316 S.S.		
	37	Packing mat.		Lubricator		KELVAR PTFE				
	38	Bonnet type				Integral extended				
39										
Actuator	40	Direction of action								
	41	Spring range			7 TO 25					
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-55 EEXd (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve		Spec. No.		YES				
51	Pos.detector		Spec. No.		YES (1No. Low limit switch)					
52	Weight		Consumption		113 KG					

Notes: (1) Valve closes upon increasing the variable
(2) Design temperature: -1350C / 600C
(3) Adjustment at position B (CV=890).

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30FV 40071A				
	2	Client Reference	Requisition No.	Item	1541-01			14010	
	3	Supplier		Model	DRESSER FLOW CONTROL		30000 Series Varimax		
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number		10"-P40016A-EB11-C				
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		10 in				
	10	Line schedule	Piping class		20		EB11		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal			0.09 cP			
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max		482.6		kg/m3	
	16	Vapour Pressure atT nom.			11.4 bar-a				
	17	Critical Pressure		Critical Temperature		49.7 bar-a			
	18	Fluid	Phase	State		HC		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	89220	223020	245330
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-41		
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	30.4	28.4	27.7
	22	DP	QMin.	Q Norm.	Q Max.	Unit	7	3.1	0.7
	23	CV	Min.	Norm.	Max.		56.31	211.8	493.1
	24	Noise	Min.	Norm.	Max.		81.6	80.3	71
25	Required CV								
26	Selected CV			Internal / Mfr		/ 620			
27	Fd	Internal / Mfr		FI (Cf)	/			0.821@max.	
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material					
	30	Design Pressure		Min.	Max.	bar-g			
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve			30.7 bar				
	33	Valve end con.& rating		Seat leakage class			8 in - 300 lb ANSI RF		
	34	Plug type		Plug material					
	35	Plug dim.		Plug form/law					
	36	Seat type		Q.ty	Material	316 S.S. + STELLITE			
	37	Packing mat.		Lubricator					
	38	Bonnet type		KELVAR PTFE					
39	Integral extended								
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply	Action dir.						
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel							
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
	52	Weight		Consumption		113 KG			

Notes: (1) Design temperature -520C / 600C
(2) Valve closes upon increasing the variable
(3) To be suitable for the following conditions : 0 barg - 1020C
(4) Adjustment at position E (CV= 620).

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30FV 40071B		
	2	Client Reference	Requisition No.	Item	1541-01		14011
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe	
	4	Serial Number					
	5	Service					
	6	P&ID No.					
Inlet line	7	Diameter	Number			6"-P40049A-EJ01-C	
	8	Line schedule	Piping class				
Outlet line	9	Diameter	Number			6 in	
	10	Line schedule	Piping class			10S DJ01	
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both		
	12	Sour service	Special conditions				
	13	Molecular Weight	Viscosity at @ normal			0.09 cP	
	14	Cp/Cv	Compressibility				
	15	Density min	Density nor	Density max		482.6 kg/m3	
	16	Vapour Pressure at T nom.			11.4 bar-a		
	17	Critical Pressure		Critical Temperature			
	18	Fluid	Phase	State		HC	Liquid Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	81770 kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	-41 °C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	30.2 bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	16.2 bar
	23	CV	Min.	Norm.	Max.	33.97	
	24	Noise	Min.	Norm.	Max.	85.7 dBA	
	25	Required CV					
26	Selected CV Internal / Mfr			/ 43			
27	Fd	Internal / Mfr		FI (CI)	0.975		
28	Fluid tending to		Air-Fail Position			Open	
Valve Body	29	Body type		Body material			A 351 Gr. CF8M
	30	Design Pressure		Min.	Max.	bar-g 30.7 bar-g	
	31	Design Temperature		Min.	Max.		
	32	Max. DP closed valve		18.9 bar			
	33	Valve end con. & rating		Seat leakage class			4 in - 300 lb ANSI RF CLASS IV (IEC534-4)
	34	Plug type		Plug material			BALANCED 316 S.S. + STELLITE
	35	Plug dim.		Plug form/flaw			2" trim Anti-cavit. 2 stage LINEAR
	36	Seat type		Q. ty	Material	SPECIAL 316 S.S. + STELLITE	
	37	Packing mat.		Lubricator			KELVAR PTFE
	38	Bonnet type		STANDARD (T= - 102Deg.C)			
Actuator	40	Direction of action					
	41	Spring range					3 TO 15
Positioner	42	Type		Input signal			
	43	Air supply		Action dir.			
	44	Protection					
Accessories	45	Booster relay					
	46	Locking device					
	47	Pressure reducing valve			YES		
	48	Pressure gauge			YES		
	49	Handwheel					NO
	50	Solenoid valve		Spec. No.		YES	
	51	Pos. detector		Spec. No.			
52	Weight		Consumption		134 KG		

Notes: (1) Design temperature -1020C / 600C
(2) On/off valve with limit stop at CV=34. Normally closed and opens in case of low flowrate at pump discharge
(3) Valve body size is 4" * 2" * 4".

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30PV 40073				
	2	Client Reference	Requisition No.	Item	1541-01		14012		
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe		
	4	Serial Number							
	5	Service			T401 Ovhd To Flare				
	6	P&ID No.			0021-40-06				
Inlet line	7	Diameter	Number				2"-CF40006A-DJ01-N		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		3 in				
	10	Line schedule	Piping class		10S		DJ04		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		19.4		0.009 cP		
	14	Cp/Cv	Compressibility		1.25		0.87		
	15	Density min	Density nor	Density max			17.8 kg/m3		
	16	Vapour Pressure at T nom.							
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		DC1 OVHD		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	2800		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-66		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	13.8		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	11.3		bar
	23	CV	Min.	Norm.	Max.			11.59	
	24	Noise	Min.	Norm.	Max.			78.2 dBA	
25	Required CV								
26	Selected CV Internal / Mfr					/ 21			
27	Fd	Internal / Mfr	FI (Cf)			/		0.975	
28	Fluid tending to		Air-Fail Position				Close		
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M	
	30	Design Pressure		Min.	Max.	bar-g		13.5 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve				13.5 bar			
	33	Valve end con. & rating		Seat leakage class		2 in - 300 lb ANSI RF		CLASS V (IEC 534-4)	
	34	Plug type		Plug material		Contoured		316 S.S. + STELLITE	
	35	Plug dim.		Plug form/law		Red. trim		LO-DB 2 STAGE LINEAR	
	36	Seat type		Q.ty	Material	Clamped in		316 S.S. + STELLITE	
	37	Packing mat.		Lubricator		KELVAR PTFE			
	38	Bonnet type				Cryogenic-Extended bonnet			
Actuator	40	Direction of action							
	41	Spring range			21 TO 45				
Positioner	42	Type		Input signal		Field Bus		Field Bus	
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection			IP-65 EEXI-a (Canelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
52	Weight		Consumption		51 KG				

Notes: (1) Valve opens upon increasing the variable
(2) Design temperature : -1350C / +600C
(3) Valve is normally closed

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.	30TV 40075A			
	2	Client Reference	Requisition No.	Item	1541-01 14013	
	3	Supplier	Model	DRESSER FLOW CONTROL Butterfly Flangeless		
	4	Serial Number				
	5	Service	CG From S401			
	6	P&ID No.	0021-40-06			
Inlet line	7	Diameter	Number	14"-PH40004A-EB21-C		
	8	Line schedule	Piping class			
Outlet line	9	Diameter	Number	14 in		
	10	Line schedule	Piping class	STD EB21		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both	
	12	Sour service	Special conditions			
	13	Molecular Weight	Viscosity at @ normal	18.6	0.012 cP	
	14	Cp/Cv	Compressibility	1.23	0.9	
	15	Density min	Density nor	Density max	28.1 kg/m3	
	16	Vapour Pressure at T nom.				
	17	Critical Pressure		Critical Temperature		
	18	Fluid	Phase	State	Cracked Gas Gas Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit
	21	Press.	QMin.	Q Norm.	Q Max.	Unit
	22	DP	QMin.	Q Norm.	Q Max.	Unit
	23	CV	Min.	Norm.	Max.	2715
	24	Noise	Min.	Norm.	Max.	<70 dBA
	25	Required CV				-
26	Selected CV Internal / Mfr			/ 5090		
27	Fd Internal / Mfr		FI (Cf)		0.681	
28	Fluid tending to		Air-Fail Position		Close	
Valve Body	29	Body type	Body material		Butterfly A 351 Gr. CF8M	
	30	Design Pressure	Min.	Max.	bar-g 36.6 bar-g	
	31	Design Temperature	Min.	Max.		
	32	Max. DP closed valve				0 bar
	33	Valve end con. & rating	Seat leakage class		12 in - 300 lb ANSI RF CLASS IV	
	34	Plug type	Plug material			A 351 Gr. CF8M
	35	Plug dim.	Plug form/law			=%
	36	Seat type	Q.ty	Material		Incolloy 825
	37	Packing mat.	Lubricator			PTFE
	38	Bonnet type				
Actuator	40	Direction of action				
	41	Spring range				
Positioner	42	Type	Input signal		Smart 4w20 mA 24Vdc HART	
	43	Air supply	Action dir.		4 BAR-G	
	44	Protection				IP-65 EEXi-a (Cenelec)
Accessories	45	Booster relay				YES
	46	Locking device				
	47	Pressure reducing valve				YES
	48	Pressure gauge				YES
	49	Handwheel				YES
	50	Solenoid valve	Spec. No.			
	51	Pos. detector	Spec. No.			
	52	Weight	Consumption		278 KG	

Notes: (1) Hydrogen service
(2) Valve is normally closed. Valve closes upon increasing the variable
(3) Design temperature : -480C / +600C
(4) Actuator model no. is B1JRRU20. Valve model is LID.

						INSTRUMENT SPECIFICATION		TECHNIP			
						Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE						
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE						
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General Data	1	Tag No.			30TV 40075B				
	2	Client Reference	Requisition No.	Item	1541-01			14014	
	3	Supplier	Model		DRESSER FLOW CONTROL		30000 Series Varimax		
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number			8"-PH40014A-EB21-C			
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number			8 in			
	10	Line schedule	Piping class			20 EB21			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal			17.6			
	14	Cp/Cv	Compressibility			1.24 0.86			
	15	Density min	Density nor	Density max		32.6		kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure			Critical Temperature				
	18	Fluid	Phase	State		CRACKED GAS Gas		Homogeneous	
	19	Flow	Min.	Norm.	Max.	Unit	27200 kg/h		
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-28.3 :C		
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	32.3 bar-a		
	22	DP	QMin.	Q Norm.	Q Max.	Unit	0.24 bar		
	23	CV	Min.	Norm.	Max.	368.2			
	24	Noise	Min.	Norm.	Max.	<70 dBA			
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 460			
27	Fd	Internal / Mfr		FI (Cf)	/		0.812		
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material				A 351 Gr. CF8M	
	30	Design Pressure		Min.	Max.	bar-g		36.6 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve			0 bar				
	33	Valve end con.& rating		Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV (IEC534-4)	
	34	Plug type		Plug material				Rotary 316 S.S.	
	35	Plug dim.		Plug form/law				LINEAR	
	36	Seat type		Q.ty	Material			316 S.S.	
	37	Packing mat.		Lubricator				KELVAR PTFE	
	38	Bonnet type						Integral extended	
39									
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal			Smart 4w20 mA 24Vdc HART			
	43	Air supply	Action dir.			4 BAR-G			
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel							
	50	Solenoid valve	Spec. No.						
51	Pos.detector	Spec. No.							
	52	Weight	Consumption			71 KG			

Notes: (1) 1% vol liquid at valve inlet - Given physical properties are vapor ones - Hydrogen service
(2) TV40075B is normally closed. Valve opens upon increasing the variable
(3) Design temperature : -480C / +600C

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30FV 40093					
	2	Client Reference	Requisition No.	Item	1541-01			14015		
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number								
	5	Service							E420 Outlet Tube Side	
	6	P&ID No.							0021-40-07	
Inlet line	7	Diameter	Number			4"-PR40007A-DB01-C				
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number			6 in				
	10	Line schedule	Piping class			STD	DB01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal					0.09	cP	
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max		542.5		kg/m3		
	16	Vapour Pressure atT nom.							6.1 bar-a	
	17	Critical Pressure	Critical Temperature						46.2 bar-a	
	18	Fluid	Phase	State		PROPYLENE	Liquid	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	4980	12450	13690	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	1.8		:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.7	6.1	5.5	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3.3	1.9	1.1	bar
	23	CV	Min.	Norm.	Max.	8.589		26.4	32.55	
	24	Noise	Min.	Norm.	Max.					dBa
25	Required CV									
26	Selected CV Internal / Mfr			/ 54						
27	Fd	Internal / Mfr		FI (Cf)	/			0.766@max.		
28	Fluid tending to		Air-Fail Position			Close				
Valve Body	29	Body type		Body material					A 351 Gr. CF3M	
	30	Design Pressure		Min.	Max.	bar-g			16.1 bar-g	
	31	Design Temperature		Min.	Max.					
	32	Max.DP closed valve		13 bar						
	33	Valve end con.& rating		Seat leakage class			3 in - 300 lb ANSI RF	CLASS IV (IEC 534-4)		
	34	Plug type		Plug material					Eccentric rotary	
	35	Plug dim.		Plug form/law					Red. trim	
	36	Seat type		Q.ty	Material	316SS Stellite hard faced				
	37	Packing mat.		Lubricator					KELVAR PTFE WITH VITON O RINGS	
	38	Bonnet type		Integral extended						
	39									
Actuator	40	Direction of action								
	41	Spring range							7 TO 15	
Positioner	42	Type		Input signal			Smart	4w20 mA 24Vdc HART		
	43	Air supply		Action dir.			4 BAR-G			
	44	Protection							IP-65 EEXi-a (Cenelec)	
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve					YES			
	48	Pressure gauge					YES			
	49	Handwheel							NO	
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption			48 KG				

Notes: (1) Valve opens upon increasing the variable
(2) Mixed phase at valve outlet: % wt of vap. :11.0 max. vapor dens.:7.4 kg/m3
(3) Design temperature : - 480C / 600C

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 40102				
	2	Client Reference	Requisition No.	Item	1541-01		14016		
	3	Supplier		Model	DRESSER FLOW CONTROL		Butterfly Flangeless		
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter		Number		18"-P40068A-EB21-C			
	8	Line schedule		Piping class					
Outlet line	9	Diameter		Number		18 in			
	10	Line schedule		Piping class		30 EB21			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service		Special conditions					
	13	Molecular Weight		Viscosity at @ normal		28.9		0.01 cP	
	14	Cp/Cv		Compressibility		1.12		0.7	
	15	Density min	Density nor	Density max		42.5		kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure			Critical Temperature				
	18	Fluid	Phase	State		C2 CUT		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	85000	212500	233750 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-16		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	22		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	0.8	0.7	0.2 bar
	23	CV	Min.	Norm.	Max.	654.7		1743	3515
	24	Noise	Min.	Norm.	Max.	<70		73.6	<70 dBA
	25	Required CV							
26	Selected CV Internal / Mfr				/ 17470				
27	Fd		Internal / Mfr		FI (C)		/ 0.698@max.		
28	Fluid lending to		Air-Fail Position						
Valve Body	29	Body type		Body material		Butterfly		A 351 Gr. CF8M	
	30	Design Pressure		Min.	Max.	bar-g		25.3 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve				25.3 bar			
	33	Valve end con.& rating		Seat leakage class		14 in - 300 lb ANSI RF		CLASS IV	
	34	Plug type		Plug material		A 351 Gr. CF8M			
	35	Plug dim.		Plug form/law		=%			
	36	Seat type		Q.ty	Material	Incolloy 825			
	37	Packing mat.		Lubricator		PTFE			
	38	Bonnet type							
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART	
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve							
	48	Pressure gauge							
	49	Handwheel							
	50	Solenoid valve		Spec. No.		YES (EEExd Herion type 2411)			
51	Pos.detector		Spec. No.		YES (1 No. low limit switch)				
52	Weight		Consumption		505 KG				

Notes: (1) Design temperature : -540C/600C
(2) Valve to be suitable for the following cond: 0 barg - 1040C
(3) Valve closes upon increasing the variable
(4) Actuator model no. is B1JRRU25. Valve model is LID.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 40103						
	2	Client Reference	Requisition No.	Item	1541-01			14017			
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex				
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		4" LC40002A-EA02-P						
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		8 in						
	10	Line schedule	Piping class		20		DA04				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal					0.2	cP		
	14	Cp/Cv		Compressibility							
	15	Density min	Density nor	Density max		927		kg/m3			
	16	Vapour Pressure at T nom.			3.4 bar-a						
	17	Critical Pressure		Critical Temperature		221 bar-a					
	18	Fluid	Phase	State		LP CONDEN.		Liquid	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	8880	22190	24410		
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	138			:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	4	3.5	3.1	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	0.2	2	1.6	bar	
	23	CV	Min.	Norm.	Max.	23.95				54.47	80.82
	24	Noise	Min.	Norm.	Max.						dBA
	25	Required CV									
26	Selected CV		Internal / Mfr		/ 138						
27	Fd	Internal / Mfr		FI (C)		/		0.771@max.			
28	Fluid tending to		Air-Fail Position			Close					
Valve Body	29	Body type		Body material		ASTM A216 GR WCC					
	30	Design Pressure		Min.	Max.	bar-g					
	31	Design Temperature		Min.	Max.	295					
	32	Max. DP closed valve		7 bar							
	33	Valve end con. & rating		Seat leakage class		4 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type		Plug material		Eccentric rotary		316L S.S. + STELLITE			
	35	Plug dim.		Plug form/law		Red. trim		LINEAR			
	36	Seat type		Q.ty	Material	316SS Stellite hard faced					
	37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS					
	38	Bonnet type		Integral extended							
Actuator	40	Direction of action									
	41	Spring range									
Positioner	42	Type	Input signal		Field Bus		Field Bus				
	43	Air supply	Action dir.		4 BAR-G						
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve		YES							
	48	Pressure gauge		YES							
	49	Handwheel									
	50	Solenoid valve		Spec. No.							
51	Pos. detector		Spec. No.								
52	Weight		Consumption		62 KG						

Notes: (1) Design pressure : 17.3 barg / FV
(2) Valve opens upon increasing the variable
(3) Mixed phase at valve outlet: %wt of vap.: 7 max vapor density : 0.7 kg/m3

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30TV 40104				
	2	Client Reference	Requisition No.	Item	1541-01		14018		
	3	Supplier	Model		DRESSER FLOW CONTROL		30000 Series Varimax		
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number		10"-LP40001A-DA04-H				
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		12 in				
	10	Line schedule	Piping class		20		EA02		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		18		0.017 cP		
	14	Cp/Cv	Compressibility		1.27		0.97		
	15	Density min	Density nor	Density max		2.7		kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		LP STEAM		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	8880	22190	24410
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	158	220	279
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.5	5.6	5
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3	2	1.3
	23	CV	Min.	Norm.	Max.	146.9		471.5	667.3
	24	Noise	Min.	Norm.	Max.	79		81.7	79.7
	25	Required CV							-
26	Selected CV		Internal / Mfr		/ 745				
27	Fd		Internal / Mfr		/		0.800 @max.		
28	Fluid tending to		Air-Fail Position		Close				
Valve Body	29	Body type		Body material					ASTM A216 GR WCC
	30	Design Pressure		Min.	Max.	bar-g			
	31	Design Temperature		Min.	Max.	295			
	32	Max.DP closed valve							7 bar
	33	Valve end con.& rating		Seat leakage class		10 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material		Rotary ball (segment)		316 S.S.	
	35	Plug dim.		Plug form/law		LINEAR LO-DB HIGH CAPACI			
	36	Seat type		Q.ty	Material	316 S.S.			
	37	Packing mat.		Lubricator		KELVAR PTFE			
	38	Bonnet type		Integral extended					
Actuator	39								
	40	Direction of action							
Positioner	41	Spring range							
	42	Type		Input signal		Smart		4w20 mA 24Vdc HART	
	43	Air supply		Action dir.		4 BAR-G			
Accessories	44	Protection							
	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve		YES					
	48	Pressure gauge		YES					
	49	Handwheel							
	50	Solenoid valve		Spec. No.		YES			
51	Pos.detector		Spec. No.		YES (1no. low limit switch)				
52	Weight		Consumption		166 KG				

Notes: (1) Design pressure : 17.3 barg / FV
(2) Valve closes upon increasing the variable
(3) Adjustment at position A (CV=745).

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30FV 40108				
	2	Client Reference	Requisition No.	Item	1541-01			14019	
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe		
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number					3"-P40062A-EA01-N	
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		3 in				
	10	Line schedule	Piping class		STD		EA01		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service		Special conditions					
	13	Molecular Weight		Viscosity at @ normal				0.124 cP	
	14	Cp/Cv		Compressibility					
	15	Density min	Density nor	Density max		595		kg/m3	
	16	Vapour Pressure atT nom.			14 bar-a				
	17	Critical Pressure		Critical Temperature		45.3 bar-a			
	18	Fluid	Phase	State		HC		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	4280	10690	11760 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	44.7		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	26.1	23.9	22.3 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	10.6	7.4	5.5 bar
	23	CV	Min.	Norm.	Max.	1.978		5.926	7.575
	24	Noise	Min.	Norm.	Max.	72.5		74.2	72.7 dBA
25	Required CV								
26	Selected CV			Internal / Mfr		/ 13			
27	Fd	Internal / Mfr		FI (CI)		/		0.913@max.	
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g		26.4 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve				26.4 bar			
	33	Valve end con.& rating		Seat leakage class		1.5 in -300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material		Contoured		SS 416	
	35	Plug dim.		Plug form/law		LINEAR			
	36	Seat type		Q.ty	Material	Threaded		AISI 416	
	37	Packing mat.		Lubricator		CARBON / PTFE + Note 1			
	38	Bonnet type				STANDARD			
39									
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal		Field Bus		Field Bus		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve		YES					
	48	Pressure gauge		YES					
	49	Handwheel							
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
52	Weight		Consumption		47 KG				

Notes: (1) Low emission packing L 13.
(2) Valve closes upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 40121			1541-01		14020		
	2	Client Reference		Requisition No.		Item						
	3	Supplier		Model		DRESSER FLOW CONTROL			41000 Series Globe			
	4	Serial Number										
	5	Service				D406 Ovhd Outlet						
	6	P&ID No.				0021-40-09						
Inlet line	7	Diameter		Number		12"-CF40013A-EJ01-N						
	8	Line schedule		Piping class								
Outlet line	9	Diameter		Number		16 in						
	10	Line schedule		Piping class		10S		DJ04				
Operating Conditions	11	Calculation Results From:				<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both		
	12	Sour service		Special conditions								
	13	Molecular Weight		Viscosity at @ normal		28.9		0.01 cP				
	14	Cp/Cv		Compressibility		1.12		0.7				
	15	Density min	Density nor	Density max				42.5		kg/m3		
	16	Vapour Pressure at T nom.										
	17	Critical Pressure		Critical Temperature								
	18	Fluid		Phase		State		C2 CUT		Gas		Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	7310		127480		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-16		-16		:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	22		20.9		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	19.5		18.4		bar	
	23	CV	Min.	Norm.	Max.			16.27		298.7		
	24	Noise	Min.	Norm.	Max.			81.7		94.6		
	25	Required CV										
	26	Selected CV Internal / Mfr				/ 340						
27	Fd		Internal / Mfr		FI (Cf)				0.975		Close	
28	Fluid tending to		Air-Fail Position									
Valve Body	29	Body type		Body material				A 351 Gr. CF8M				
	30	Design Pressure		Min.	Max.	bar-g		25.3 bar-g				
	31	Design Temperature		Min.	Max.							
	32	Max. DP closed valve				25.3 bar						
	33	Valve end con.& rating		Seat leakage class		12 in - 300 lb ANSI RF		CLASS V (IEC 534-4)				
	34	Plug type		Plug material		BALANCED		316 S.S. + STELLITE				
	35	Plug dim.		Plug form/law		8" trim		LO-DB 2 STAGE LINEAR				
	36	Seat type		Q.ty	Material	Clamped in		316 S.S. + STELLITE				
	37	Packing mat.		Lubricator		KELVAR PTFE						
	38	Bonnet type				STANDARD(T= - 104Deg.C)						
Actuator	40	Direction of action										
	41	Spring range				20 TO 50						
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART				
	43	Air supply		Action dir.		4 BAR-G						
Accessories	44	Protection				IP-65 EEXI-a (Cenelec)						
	45	Booster relay				YES						
	46	Locking device				YES						
	47	Pressure reducing valve				YES						
	48	Pressure gauge				YES						
	49	Handwheel				NO						
50	Solenoid valve		Spec. No.									
51	Pos. detector		Spec. No.									
52	Weight		Consumption		1135 KG							

Notes: (1) Design temperature : -1040C/600C
(2) Valve opens upon increasing the variable - Valve is normally closed
(3) Valve body size is 12" * 8" * 12".

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1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE						
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE						
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General Data	1	Tag No.			30LV 40121					
	2	Client Reference	Requisition No.	Item	1541-01		14021			
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		6"-PR40014A-DB01-C					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		8 in					
	10	Line schedule	Piping class		20		DB01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal					0.12 cP		
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max		572.4		kg/m3		
	16	Vapour Pressure at T nom.			3.2 bar-a					
	17	Critical Pressure	Critical Temperature		46.2 bar-a					
	18	Fluid	Phase	State		PROPYLENE		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	24270	60660	72800	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-18		:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	4.7	3.8	3.2	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	2.9	2	1.4	
	23	CV	Min.	Norm.	Max.	31.27		113.9	188.7	
	24	Noise	Min.	Norm.	Max.					dBa
	25	Required CV								
	26	Selected CV		Internal / Mfr		/ 300				
	27	Fd		Internal / Mfr		FI (C)		0.758@max.		
28	Fluid tending to		Air-Fail Position			Close				
Valve Body	29	Body type		Body material					A 351 Gr. CF3M	
	30	Design Pressure		Min.	Max.	bar-g		15.6 bar-g		
	31	Design Temperature		Min.	Max.					
	32	Max.DP closed valve		14.9 bar						
	33	Valve end con.& rating		Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material					Eccentric rotary	
	35	Plug dim.		Plug form/law					Red.trim	
	36	Seat type		Q.ty	Material	316 SS Stellite hard faced				
	37	Packing mat.		Lubricator					KELVAR PTFE WITH VITON O RINGS	
	38	Bonnet type		Integral extended						
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve		YES						
	48	Pressure gauge		YES						
	49	Handwheel								
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
	52	Weight	Consumption		120 KG					

Notes: (1) Valve closes upon increasing the variable
(2) Design temperature: -480C / 600C
(3) Mixed phase at valve outlet: % wt of vaporization : 8.3 max. vapor density : 4 kg/m3

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30FV 40121				
	2	Client Reference	Requisition No.	Item	1541-01			14022	
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number			4"-P40063A-EB11-C			
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number			4 in			
	10	Line schedule	Piping class		STD	EB11			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal					0.06	cP
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max		425.6		kg/m3	
	16	Vapour Pressure atT nom.							
	17	Critical Pressure	Critical Temperature			22.1 bar-a			
	18	Fluid	Phase	State		C2 CUT		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	12530	31320	37590
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-16.3	-16.3	-16.3
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	27.1	26.4	26.1
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.8	0.9	0.5
	23	CV	Min.	Norm.	Max.		16.61	58.93	95.51
	24	Noise	Min.	Norm.	Max.		65.3	64.8	61.8
	25	Required CV							-
26	Selected CV			Internal / Mfr		/ 135			
27	Fd	Internal / Mfr		FI (C)		/		0.869@max.	
28	Fluid tending to		Air-Fail Position			Open			
Valve Body	29	Body type		Body material					A 351 Gr. CF3M
	30	Design Pressure		Min.	Max.	bar-g			30 bar-g
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve		5 bar					
	33	Valve end con.& rating		Seat leakage class		3 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material			Eccentric rotary		
	35	Plug dim.		Plug form/law			Full trim		
	36	Seat type		Q.ty	Material		316SS Stellite hard faced		
	37	Packing mat.		Lubricator					KELVAR PTFE WITH VITON O RINGS
	38	Bonnet type		Integral extended					
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal			Smart		4w20 mA 24Vdc HART	
	43	Air supply	Action dir.			4 BAR-G			
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve							
	48	Pressure gauge							
	49	Handwheel							
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
52	Weight		Consumption			48 KG			

Notes: (1) Design temperature : -520C/600C
(2) Valve to be suitable for the following cond: 0 barg - 1020C
(3) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30FV 40132					
	2	Client Reference	Requisition No.	Item	1541-01		14023			
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		1 1/2"-HG40001A-EB21-N					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		1.5 in					
	10	Line schedule	Piping class		XS		EB21			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		2		0.01 cP			
	14	Cp/Cv	Compressibility		1.4		1			
	15	Density min	Density nor	Density max		2.3		kg/m3		
	16	Vapour Pressure atT nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		HYDROGEN		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	30	114	160	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	40		:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	31.3	28.5	28.5	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	8	5	3.7	bar
	23	CV	Min.	Norm.	Max.	0.2817		1.378	2.203	
	24	Noise	Min.	Norm.	Max.	<70		<70	<70	dBA
25	Required CV									
26	Selected CV		Internal / Mfr		/ 3.8					
27	Fd	Internal / Mfr		FI (Cf)		/		0.914@max.		
28	Fluid tending to		Air-Fail Position						Close	
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M		
	30	Design Pressure		Min.	Max.	bar-g		36.6 bar-g		
	31	Design Temperature		Min.	Max.	60				
	32	Max.DP closed valve				36.6 bar				
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		Contoured		316 S.S.		
	35	Plug dim.		Plug form/law		=%				
	36	Seat type		Q.ty	Material	Threaded		316 S.S.		
	37	Packing mat.		Lubricator		KELVAR PTFE				
	38	Bonnet type				STANDARD				
39										
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.							
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve		YES						
	48	Pressure gauge		YES						
	49	Handwheel								
	50	Solenoid valve		Spec. No.		YES (EEXd, Herion type 2411)				
51	Pos.detector		Spec. No.		Yes (1no. low limit switch)					
52	Weight		Consumption		38 KG					

Notes: (1) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30FV 40135				
	2	Client Reference	Requisition No.	Item	1541-01		14024		
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe		
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number		8"-N400C6A-DA03-H				
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		8 in				
	10	Line schedule	Piping class		20		DA03		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		28		0.02 cP		
	14	Cp/Cv	Compressibility		1.38		1		
	15	Density min	Density nor	Density max	5.9		kg/m3		
	16	Vapour Pressure aT nom.							
	17	Critical Pressure			Critical Temperature				
	18	Fluid	Phase	State		NITROGEN		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	14800		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	151		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	8.2	7.4	6.6 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	6.7	5.8	5 bar
	23	CV	Min.	Norm.	Max.	126.6		140.3	157.3
	24	Noise	Min.	Norm.	Max.	79.5		78.8	78.4 dBA
25	Required CV								
26	Selected CV			Internal / Mfr		/ 190			
27	Fd		Internal / Mfr		F1 (C)		0.975		
28	Fluid tending to		Air-Fail Position					Close	
Valve Body	29	Body type		Body material					ASTM A216 GR WCC
	30	Design Pressure		Min.	Max.	bar-g		11.7 bar-g	
	31	Design Temperature		Min.	Max.	170			
	32	Max.DP closed valve							11.7 bar
	33	Valve end con.& rating		Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material					BALANCED 17-4 PH
	35	Plug dim.		Plug form/law					LO-DB 2 STAGE LINEAR
	36	Seat type		Q.ty	Material	Clamped in		AISI 410	
	37	Packing mat.		Lubricator					KELVAR PTFE
	38	Bonnet type		STANDARD					
Actuator	40	Direction of action							
	41	Spring range							6 TO 30
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART	
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection							IP-65 EEXi-a (Cenelec)
Accessories	45	Booster relay							-
	46	Locking device							-
	47	Pressure reducing valve							YES
	48	Pressure gauge							YES
	49	Handwheel							NO
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
52	Weight		Consumption					279 KG	

Notes: (1) Valve closes upon increasing the variable - Intermittent service
(2) Flowrate to be confirmed after C2 cut hydrogenation catalyst Vendor selection

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30UV 40136				
	2	Client Reference	Requisition No.	Item	1541-01		14025		
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe		
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number		4"-CF-40014A-DB02-N				
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		6 in				
	10	Line schedule	Piping class		STD		DB02		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		28.88				
	14	Cp/Cv	Compressibility		1.14		0.958		
	15	Density min	Density nor	Density max		18.64		kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		HC	Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	8660		Am3/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	180		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	23.3		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	21.8		bar
	23	CV	Min.	Norm.	Max.	30.27			
	24	Noise	Min.	Norm.	Max.	106.2		dBA	
	25	Required CV							
26	Selected CV		Internal / Mfr		/ 49				
27	Fd	Internal / Mfr		FI (CI)	/		0.911		
28	Fluid tending to		Air-Fail Position						
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g		25.3 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve		25.3		bar			
	33	Valve end con.& rating		Seat leakage class		4 in - 300 lb ANSI RF		CLASS V (IEC 534-4)	
	34	Plug type		Plug material					
	35	Plug dim.		Plug form/law					
	36	Seat type		Q.ty	Material	Threaded		AISI 416	
	37	Packing mat.		Lubricator					
	38	Bonnet type		STANDARD					
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal						
	43	Air supply	Action dir.						
Accessories	44	Protection							
	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve							
	48	Pressure gauge							
	49	Handwheel							
50	Solenoid valve		Spec. No.		YES (Herion make)				
51	Pos.detector		Spec. No.		YES (2nos. limit switch)				
52	Weight		Consumption		160 KG				

Notes: (1) On / Off blowdown valve with limit stop at CV=30.
(2) Air volume tank is required. The capacity shall be sufficient to allow three strokes.

					INSTRUMENT SPECIFICATION		TECHNIP					
					Control Valve							
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE							
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE							
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General Data	1	Tag No.			30PV 40136					
	2	Client Reference	Requisition No.	Item	1541-01			14026		
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number								
	5	Service							HG From W401	
	6	P&ID No.							0021-40-10	
Inlet line	7	Diameter	Number			3"-HG40001A-EB21-N				
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number			3 in				
	10	Line schedule	Piping class		STD		EB21			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal			2		0.01 cP		
	14	Cp/Cv	Compressibility			1.4		1		
	15	Density min	Density nor	Density max		2.3		kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		HYDROGEN		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	60	140	160	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	40			:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	32.4	29.9	29.8	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	2.9	0.3	0.2	bar
	23	CV	Min.	Norm.	Max.	0.9642		7.039	9.856	
	24	Noise	Min.	Norm.	Max.	<70		<70	<70	dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 14				
27	Fd	Internal / Mfr		Fl (Cf)		/		0.739		
28	Fluid tending to		Air-Fail Position			Close				
Valve Body	29	Body type		Body material					A 351 Gr. CF3M	
	30	Design Pressure		Min.	Max.	bar-g			36.6 bar-g	
	31	Design Temperature		Min.	Max.				60	
	32	Max.DP closed valve							36.6 bar	
	33	Valve end con.& rating		Seat leakage class			1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material					Eccentric rotary	SOLID STELLITE
	35	Plug dim.		Plug form/law					Full trim	LINEAR
	36	Seat type		Q.ty	Material				316 S.S.	
	37	Packing mat.		Lubricator					KELVAR PTFE WITH VITON O RINGS	
	38	Bonnet type							Integral extended	
39										
Actuator	40	Direction of action								
	41	Spring range							7 TO 15	
Positioner	42	Type		Input signal			Smart		4w20 mA 24Vdc HART	
	43	Air supply		Action dir.			4 BAR-G			
	44	Protection							IP-65 EEXi-a (Cenelec)	
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve							YES	
	48	Pressure gauge							YES	
	49	Handwheel							NO	
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption			16 KG				

Notes: (1) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP				
					Control Valve				PARS PETROCHEMICAL COMPANY		
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE						
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE						
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General Data	1	Tag No.			30FV 40137			
	2	Client Reference	Requisition No.	Item	1541-01		14027	
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe	
	4	Serial Number						
	5	Service						Off Spec C2 Cut To C301
	6	P&ID No.						0021-40-10
Inlet line	7	Diameter	Number			12"-P40113A-EA01-N		
	8	Line schedule	Piping class					
Outlet line	9	Diameter	Number			14 in		
	10	Line schedule	Piping class			DA10		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both			
	12	Sour service	Special conditions					
	13	Molecular Weight	Viscosity at @ normal			28.9	0.01 cP	
	14	Cp/Cv	Compressibility			1.12	0.7	
	15	Density min	Density nor	Density max		28.4	kg/m3	
	16	Vapour Pressure at T nom.						
	17	Critical Pressure			Critical Temperature			
	18	Fluid	Phase	State		C2 CUT	Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	121900	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	48	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	22.3	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	18.1	bar
	23	CV	Min.	Norm.	Max.	303.3		
	24	Noise	Min.	Norm.	Max.	85		
	25	Required CV						
	26	Selected CV			Internal / Mfr		/ 420	
27	Fd	Internal / Mfr		FI (CF)		0.975		
28	Fluid tending to		Air-Fail Position			Close		
Valve Body	29	Body type		Body material				ASTMA216 GR WCC
	30	Design Pressure		Min.	Max.	bar-g		25.3 bar-g
	31	Design Temperature		Min.	Max.	70		
	32	Max.DP closed valve		25.3 bar				
	33	Valve end con.& rating		Seat leakage class		10 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)
	34	Plug type		Plug material				BALANCED 17-4 PH
	35	Plug dim.		Plug form/law		Full trim		LO-DB 2 STAGE LINEAR
	36	Seat type		Q.ty	Material		Clamped in AISI 410	
	37	Packing mat.		Lubricator				KELVAR PTFE
	38	Bonnet type		STANDARD				
39								
Actuator	40	Direction of action						
	41	Spring range				6 TO 30		
Positioner	42	Type		Input signal		Smart	4w20 mA 24Vdc HART	
	43	Air supply		Action dir.		4 BAR-G		
	44	Protection						IP-65 EEXi-a (Cenelec)
Accessories	45	Booster relay					YES	
	46	Locking device						
	47	Pressure reducing valve					YES	
	48	Pressure gauge					YES	
	49	Handwheel						YES
	50	Solenoid valve		Spec. No.				
51	Pos.detector		Spec. No.					
52	Weight		Consumption		760 KG		(LATER)	

Notes: (1) Valve closes upon increasing the variable - Valve is normally closed

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30TV 40137				
	2	Client Reference	Requisition No.	Item	1541-01			14028	
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number			4"-LC40016A-DA04-P			
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number			4 in			
	10	Line schedule	Piping class			STD	DA04		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal						
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max		915		kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure			Critical Temperature				
	18	Fluid	Phase	State		LC	Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	5732	8025 kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	151	151 :C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	5	5 bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3.3	2.8 bar	
	23	CV	Min.	Norm.	Max.	12 18.26			
	24	Noise	Min.	Norm.	Max.	dBA			
	25	Required CV							
26	Selected CV Internal / Mfr			/ 30					
27	Fd	Internal / Mfr		FI (Cf)	/		0.763@max.		
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material				ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g		17.1 bar-g	
	31	Design Temperature		Min.	Max.			220	
	32	Max. DP closed valve				17.1 bar			
	33	Valve end con. & rating		Seat leakage class		2 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material				Eccentric rotary	
	35	Plug dim.		Plug form/law				Red. trim	
	36	Seat type		Q.ty	Material			316 SS Stellite hard faced	
	37	Packing mat.		Lubricator					KELVAR PTFE WITH VITON O RINGS
	38	Bonnet type							Integral extended
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal			Smart	4w20 mA 24Vdc HART		
	43	Air supply	Action dir.			4 BAR-G			
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve					YES		
	48	Pressure gauge					YES		
	49	Handwheel							
	50	Solenoid valve		Spec. No.					
51	Pos. detector		Spec. No.						
	52	Weight		Consumption			20 KG		

Notes: (1) Mixed flow downstream valve: vapour fraction = 7% wt vapour density = 1 kg/m3
(2) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETRO-CHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30FV 40138				
	2	Client Reference	Requisition No.	Item	1541-01		14029		
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number			4"-PH40001A-EB21-N			
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number			1 in			
	10	Line schedule	Piping class		XS	EB21			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal			4	0.01 cP		
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max		4.6	kg/m3		
	16	Vapour Pressure at T nom.							
	17	Critical Pressure			Critical Temperature				
	18	Fluid	Phase	State		HYD. 87% mol	Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	4	10	20
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	40		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	30.6		30.6
	22	DP	QMin.	Q Norm.	Q Max.	Unit	0.5		0.5
	23	CV	Min.	Norm.	Max.	0.240		0.4808	
	24	Noise	Min.	Norm.	Max.	<70		<70	
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 1.7			
27	Fd	Internal / Mfr		FI (Cf)		/		0.940@max.	
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M	
	30	Design Pressure		Min.	Max.	bar-g		36.6 bar-g	
	31	Design Temperature		Min.	Max.	60			
	32	Max.DP closed valve		36.6		bar			
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material		Contoured		316 S.S.	
	35	Plug dim.		Plug form/law		=%			
	36	Seat type		Q.ty	Material	Threaded		316 S.S.	
	37	Packing mat.		Lubricator		KELVAR PTFE			
	38	Bonnet type		STANDARD					
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal			Field Bus		Field Bus	
	43	Air supply	Action dir.					4 BAR-G	
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve		YES					
	48	Pressure gauge		YES					
	49	Handwheel							
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
52	Weight		Consumption		38 KG				

Notes: (1) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30FV 40139					
	2	Client Reference	Requisition No.	Item	1541-01		14030			
	3	Supplier	Model		DRESSER FLOW CONTROL		Varimax Flangeless			
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		4"-PH40001A-EB21-N					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		10 in					
	10	Line schedule	Piping class		20		DA10			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal					0.434 cP		
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	993	981	981	kg/m3		
	16	Vapour Pressure atT nom.								
	17	Critical Pressure	Critical Temperature		221 bar-a					
	18	Fluid	Phase	State		Quench water		Liquid	1 Phase	
	19	Flow	Min.	Norm.	Max.	Unit	59050	431500	474650	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	40	65	65	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	11.35	9.38	7.74	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.99	0.76	0.5	bar
	23	CV	Min.	Norm.	Max.		48.74	585.5	801	
	24	Noise	Min.	Norm.	Max.		70.1	72.5	70.2	dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 950				
27	Fd	Internal / Mfr		Ft (Cf)		/		0.805@max.		
28	Fluid tending to		Air-Fail Position			CLOSE				
Valve Body	29	Body type		Body material				ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	12.8 bar-g				
	31	Design Temperature		Min.	Max.					
	32	Max.DP closed valve			7.4 bar					
	33	Valve end con.& rating		Seat leakage class		8 in - 300 lb ANSI RF		CLASS IV		
	34	Plug type		Plug material				316 S.S.		
	35	Plug dim.		Plug form/law				LINEAR		
	36	Seat type		Q.ty	Material		316 S.S.			
	37	Packing mat.		Lubricator				KEVLAR PTFE		
	38	Bonnet type		Integral extended						
39										
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve				YES				
	48	Pressure gauge				YES				
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
	52	Weight		Consumption		45 KG				

Notes: 1) Adjustment at position A (CV=950).
2) Molecular weight = 18

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30TV 40139						
	2	Client Reference	Requisition No.	Item	1541-01		14031				
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number									
	5	Service			Condensate MP Steam						
	6	P&ID No.			0021-40-10						
Inlet line	7	Diameter	Number				2"-MC40006A-EA02-H				
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		2 in						
	10	Line schedule	Piping class		STD		EA02				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both						
	12	Sour service		Special conditions							
	13	Molecular Weight		Viscosity at @ normal		0.14 cP					
	14	Cp/Cv		Compressibility							
	15	Density min	Density nor	Density max		883.5		kg/m3			
	16	Vapour Pressure at T nom.			13.6 bar-a						
	17	Critical Pressure		Critical Temperature		221 bar-a					
	18	Fluid	Phase	State		MP COND.		Liquid	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	360	893	982	kg/h	
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	194		:C		
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	17.2	13.6	12.7	bar-a	
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	11.1	7.1	6.1	bar	
	23	CV	Min.	Norm.	Max.	0.3283				0.990	1.144
	24	Noise	Min.	Norm.	Max.					dBA	
	25	Required CV									
26	Selected CV			Internal / Mfr		/ 1.7					
27	Fd	Internal / Mfr		FI (Cf)		/		0.909@max.			
28	Fluid tending to		Air-Fail Position		Close						
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC			
	30	Design Pressure		Min.	Max.	bar-g					
	31	Design Temperature		Min.	Max.	330					
	32	Max.DP closed valve				18.6 bar					
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type		Plug material		Contoured		SS 440C			
	35	Plug dim.		Plug form/law		LINEAR					
	36	Seat type		Q.ty	Material	Clamped in		AISI 440C			
	37	Packing mat.		Lubricator		GRAPHITE					
	38	Bonnet type				STANDARD					
39											
Actuator	40	Direction of action									
	41	Spring range			3 TO 15						
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART				
	43	Air supply	Action dir.		4 BAR-G						
	44	Protection			IP-65 EEXI-a (Cenelec)						
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve			YES						
	48	Pressure gauge			YES						
	49	Handwheel			NO						
	50	Solenoid valve	Spec. No.								
51	Pos.detector	Spec. No.									
52	Weight		Consumption		38 KG						

Notes: (1) Design pressure : 18.6 barg / FV
(2) Valve closes upon increasing the variable
(3) Mixed phase at valve outlet: % wt of vaporization : 5.1 max. vapor density : 3.2 kg/m3 - Intermittent service

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.				30FV 40151			
	2	Client Reference	Requisition No.	Item	1541-01			14032	
	3	Supplier	Model	DRESSER FLOW CONTROL			41000 Series Globe		
	4	Serial Number							
	5	Service				LP Steam To R401 A/B			
	6	P&ID No.				0021-40-11			
Inlet line	7	Diameter	Number			6"-LP40002A-DA04-H			
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number			10 in			
	10	Line schedule	Piping class			20 DA04			
Operating Conditions	11	Calculation Results From:				<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both			
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal			18	0.017 cP		
	14	Cp/Cv	Compressibility			1.27	0.97		
	15	Density min	Density nor	Density max		3.3	2.5		kg/m3
	16	Vapour Pressure at T nom.							
	17	Critical Pressure	Critical Temperature						
	18	Fluid	Phase	State		LP STEAM	Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	80	5385	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	161	190	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.3	5.2	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.7	2.8	bar
	23	CV	Min.	Norm.	Max.		35.66	114.5	
	24	Noise	Min.	Norm.	Max.		79.2	78.9	dBA
	25	Required CV							
	26	Selected CV Internal / Mfr				/ 150			
27	Fd	Internal / Mfr	FI (C)		/			0.940	
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material		ASTM A216 GR WCC			
	30	Design Pressure	Min.	Max.	bar-g				
	31	Design Temperature	Min.	Max.			220		
	32	Max.DP closed valve				7 bar			
	33	Valve end con.& rating	Seat leakage class		4 in - 300 lb ANSI RF		CLASS III (IEC 534-4		
	34	Plug type	Plug material		BALANCED		17-4 PH		
	35	Plug dim.	Plug form/law		Full trim		LO-DB LINEAR		
	36	Seat type	Q.ty	Material		Clamped in		AISI 410	
	37	Packing mat.	Lubricator		KELVAR PTFE				
	38	Bonnet type				STANDARD			
39									
Actuator	40	Direction of action							
	41	Spring range				6 TO 30			
Positioner	42	Type	Input signal		Field Bus		Field Bus		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection				IP-65 EEXI-a (Canelec)			
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve				YES			
	48	Pressure gauge				YES			
	49	Handwheel				NO			
	50	Solenoid valve	Spec. No.						
51	Pos.detector	Spec. No.							
52	Weight	Consumption		201 KG					

Notes: (1) Design pressure : 7 barg / FV
(2) Valve closes upon increasing the variable - Intermittent service

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30TV 40158				
	2	Client Reference	Requisition No.	Item	1541-01			14033	
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe		
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number			4"-VH40001A-KE01-H			
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number			10 in			
	10	Line schedule	Piping class			31.75 mm KE01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal			18	0.03 cP		
	14	Cp/Cv	Compressibility			1.22	0.9		
	15	Density min	Density nor	Density max		30.2		kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure			Critical Temperature				
	18	Fluid	Phase	State		VHP STEAM		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	5385		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	510		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	98.4		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	96		bar
	23	CV	Min.	Norm.	Max.	6.492			
	24	Noise	Min.	Norm.	Max.	<70		dBa	
25	Required CV								
26	Selected CV			Internal / Mfr		/ 12			
27	Fd	Internal / Mfr		FI (Cf)	/		0.975		
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material					A 217 Gr. WC9
	30	Design Pressure		Min.	Max.	barg			
	31	Design Temperature		Min.	Max.	530			
	32	Max.DP closed valve		120 bar					
	33	Valve end con.& rating		Seat leakage class		4 in - 2500 lb RTJ		CLASS II (IEC 534-4)	
	34	Plug type		Plug material					BALANCED CA-6NM (Nitr.)
	35	Plug dim.		Plug form/law					Red. trim LO-DB 2 STAGE LINEAR
	36	Seat type		Q.ty	Material	Clamped in		316 S.S. + STELLITE	
	37	Packing mat.		Lubricator					Graphite
	38	Bonnet type		STANDARD					
39									
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal			Field Bus		Field Bus	
	43	Air supply	Action dir.			4 BAR-G			
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve					YES		
	48	Pressure gauge					YES		
	49	Handwheel							
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
52	Weight		Consumption			350 KG			

Notes: (1) Design pressure : 120 barg / FV
(2) Valve closes upon increasing the variable - Intermittent service - Valve to operate in the range of 0 to 100% of specified flowrate
(3) Valve supply includes 4" LO-DB Plate (2500# F22 material).

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 40171					
	2	Client Reference	Requisition No.	Item	1541-01			14034		
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number			4"-ER40009A-DJ01-C				
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number			6 in				
	10	Line schedule	Piping class			10S		DJ01		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal					0.08	cP	
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max		478		kg/m3		
	16	Vapour Pressure atT nom.								
	17	Critical Pressure	Critical Temperature			50.3 bar-a				
	18	Fluid	Phase	State		ETHYLENE		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	10940	27340	30080	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-48			:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	13.4	11.7	10.4	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	8.6	6.8	5.5	bar
	23	CV	Min.	Norm.	Max.	11.02		37.15	48.07	dBA
	24	Noise								
25	Required CV									
26	Selected CV	Internal / Mfr		/ 81						
27	Fd	Internal / Mfr		FI (C)		/			0.769@max.	
28	Fluid tending to	Air-Fail Position			Close					
Valve Body	29	Body type	Body material						A 351 Gr. CF3M	
	30	Design Pressure	Min.	Max.	bar-g		13 bar-g			
	31	Design Temperature	Min.	Max.						
	32	Max.DP closed valve				9.2 bar				
	33	Valve end con.& rating	Seat leakage class			3 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type	Plug material			Eccentric rotary		316L S.S. + STELLITE		
	35	Plug dim.	Plug form/law			Red. trim		LINEAR		
	36	Seat type	Q.ty	Material		SS 316 Stellite hard faced				
	37	Packing mat.	Lubricator			KELVAR PTFE WITH VITON O RINGS				
	38	Bonnet type	Integral extended							
39										
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal			Smart		4w20 mA 24Vdc HART		
	43	Air supply	Action dir.			4 BAR-G				
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve								
	48	Pressure gauge								
	49	Handwheel								
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
52	Weight	Consumption		48 KG						

Notes: (1) Design temperature : -1040C / 600C
(2) Valve closes upon increasing the variable
(3) Mixed phase at valve outlet: % wt of vap. :14.7 max. vapor dens.: 8.9 kg/m3

					INSTRUMENT SPECIFICATION		TECHNIP				
					Control Valve				PARS PETROCHEMICAL COMPANY		
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE						
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE						
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General Data	1	Tag No.			30FV 40181					
	2	Client Reference	Requisition No.	Item	1541-01		14035			
	3	Supplier	Model	DRESSER FLOW CONTROL		30000 Series Varimax				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number					16"-PR40010A-DB01-C		
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number	18 in						
	10	Line schedule	Piping class	10		DB01				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal						0.09 cP	
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	543		kg/m3			
	16	Vapour Pressure atT nom.			6 bar-a					
	17	Critical Pressure	Critical Temperature		46.2 bar-a					
	18	Fluid	Phase	State	PROPYLENE		Liquid	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	157840	394600	434060	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	1.9		:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.8	6	5.5	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3.2	1.7	1	bar
	23	CV	Min.	Norm.	Max.	274.6		820.1	967.4	
	24	Noise	Min.	Norm.	Max.					dBA
	25	Required CV								-
26	Selected CV			Internal / Mfr		/ 1260				
27	Fd	Internal / Mfr		FI (Cf)	/		0.828@max.			
28	Fluid tending to		Air-Fail Position			Close				
Valve Body	29	Body type		Body material					A 351 Gr. CF8M	
	30	Design Pressure	Min.	Max.	bar-g		16.1 bar-g			
	31	Design Temperature	Min.	Max.	60					
	32	Max.DP closed valve			10 bar					
	33	Valve end con.& rating	Seal leakage class			12 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type	Plug material					Rotary		316 S.S. + STELLITE
	35	Plug dim.	Plug fom/law					LINEAR		
	36	Seat type	Q.ty	Material		316 S.S. + STELLITE				
	37	Packing mat.	Lubricator			KELVAR PTFE				
	38	Bonnet type	Integral extended							
Actuator	40	Direction of action								
	41	Spring range							7 TO 25	
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection							IP-65 EEXi-a (Cenelec)	
Accessories	45	Booster relay							YES	
	46	Locking device								
	47	Pressure reducing valve							YES	
	48	Pressure gauge							YES	
	49	Handwheel							YES	
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
	52	Weight	Consumption		267 KG					

Notes: (1) Valve closes upon increasing the variable
(2) Mixed phase at valve outlet: % wt of vap. :10.3 max. vapor dens.: 7.7 kg/m3
(3) Valve to be suitable for the following cond: 0 barg - 480C
(4) Adjustment at position E (CV=1260).

					INSTRUMENT SPECIFICATION		TECHNIP				
					Control Valve				PARS PETROCHEMICAL COMPANY		
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE						
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE						
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General Data	1	Tag No.			30LV 40181				
	2	Client Reference	Requisition No.	Item	1541-01			14036	
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex		
	4	Serial Number							
	5	Service							Ethane To E432
	6	P&ID No.							0021-40-12
Inlet line	7	Diameter	Number			8" P40091A-EB01-C			
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number			8 in			
	10	Line schedule	Piping class			20 EB01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal						0.07 cP
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max		414.4		kg/m3	
	16	Vapour Pressure at T nom.			21.2 bar-a				
	17	Critical Pressure		Critical Temperature		48.8 bar-a			
	18	Fluid	Phase	State		HC		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	34030	85070	93580
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-5		
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	22.9	21.4	19.9
	22	DP	QMin.	Q Norm.	Q Max.	Unit	14.5	12.4	10.7
	23	CV	Min.	Norm.	Max.	28.37		83.96	100.1
	24	Noise	Min.	Norm.	Max.				dBA
	25	Required CV							-
26	Selected CV Internal / Mfr			/ 200					
27	Fd	Internal / Mfr		FI (Cf)		/		0.796@max.	
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material					A 351 Gr. CF3M
	30	Design Pressure		Min.	Max.	bar-g		22.5 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max. DP closed valve			22.5 bar				
	33	Valve end con. & rating		Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material					Eccentric rotary
	35	Plug dim.		Plug form/flaw					Red. trim
	36	Seat type		Q.ty	Material		SS 316 Stellite hard faced		
	37	Packing mat.		Lubricator					KELVAR PTFE WITH VITON O RINGS
	38	Bonnet type							Integral extended
Actuator	40	Direction of action							
	41	Spring range							7 to 24
Positioner	42	Type		Input signal			Smart		
	43	Air supply		Action dir.			4 BAR-G		
	44	Protection							IP-65 EEXi-a (Cenelec)
Accessories	45	Booster relay							-
	46	Locking device							-
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel							NO
50	Solenoid valve		Spec. No.		YES				
51	Pos. detector		Spec. No.		YES (1no. low limit switch)				
52	Weight		Consumption		120 KG				

Notes: (1) Valve closes upon increasing the variable
(2) Mixed phase at valve outlet: % wt of vap. :25 max. vapor dens.: 14.5 kg/m3
(3) Design temperature : -540C/600C valve to be suitable for the following cond: 0 barg - 1040C

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30FV 40182A				
	2	Client Reference	Requisition No.	Item	1541-01		14037		
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe		
	4	Serial Number							
	5	Service							Ethylene To D507
	6	P&ID No.							0021-50-05
Inlet line	7	Diameter	Number				10"-P40002A-EJ01-C		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		10 in				
	10	Line schedule	Piping class		10S		DJ01		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service			Special conditions				
	13	Molecular Weight			Viscosity at @ normal			0.063 cP	
	14	Cp/Cv			Compressibility				
	15	Density min	Density nor	Density max	435.7	435.7	435.7	kg/m3	
	16	Vapour Pressure atT nom.			20.33 bar-a				
	17	Critical Pressure			Critical Temperature		50.32 bar-a		
	18	Fluid	Phase	State		Ethylene		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	50505	126263	138889 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-28.3	-28.3	-28.3 :C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	22.89	21.01	19.41 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	11.58	9.64	8.03 bar
	23	CV	Min.	Norm.	Max.		35.83	106.8	131.3
	24	Noise	Min.	Norm.	Max.				dBA
25	Required CV								
26	Selected CV			Internal / Mfr		/ 225			
27	Fd	Internal / Mfr		FI (Cf)	/		0.918@max.		
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material		A 351 Gr. CF8M			
	30	Design Pressure		Min.	Max.	bar-g		22.9 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve				11.6 bar			
	33	Valve end con.& rating		Seat leakage class		6 in - 300 lb ANSI RF		CLASS V (IEC 534-4)	
	34	Plug type		Plug material		BALANCED		316 S.S. + STELLITE	
	35	Plug dim.		Plug form/law		4" trim		=%	
	36	Seat type		Q.ty	Material	Clamped in		316 S.S. + STELLITE	
	37	Packing mat.		Lubricator		KELVAR PTFE			
	38	Bonnet type		STANDARD(T= - 104Deg.C)					
39									
Actuator	40	Direction of action							
	41	Spring range							21 TO 45
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection							IP-65 EEXi-a (Cenelec)
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve							YES
	48	Pressure gauge							YES
	49	Handwheel							NO
	50	Solenoid valve	Spec. No.		YES				
51	Pos.detector	Spec. No.		YES(1no. low limit swiatch)					
52	Weight		Consumption		259 KG				

Notes: (1) Valve closes upon increasing the variable
(2) Mixed phase at valve outlet: % wt of vaporization: 14.1 vapor density (kg/m3): 20.8
(3) Design temperature : -1040C / 600C
(4) Valve body size is 6" * 4" * 6".

					INSTRUMENT SPECIFICATION		TECHNIP					
					Control Valve							
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE							
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE							
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General Data	1	Tag No.			30FV 40182B				
	2	Client Reference	Requisition No.	Item	1541-01		14038		
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex		
	4	Serial Number							
	5	Service						Ethylene To TK704	
	6	P&ID No.						0021-70-16	
Inlet line	7	Diameter	Number			10" P70043A-EB11-C			
Outlet line	8	Line schedule	Piping class						
	9	Diameter	Number			10	in		
Operating Conditions	10	Line schedule	Piping class				20	EB11	
	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer	<input type="radio"/> Both	
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal				0.06	cP	
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max		435.8	435.8	kg/m3	
	16	Vapour Pressure at T nom.			20.3 bar-a				
	17	Critical Pressure		Critical Temperature		50.3 bar-a			
	18	Fluid	Phase	State		Off-Spec C2=	Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	50589	126472	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-28.3	-28.3	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	22	22	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3.35	3.35	bar
	23	CV	Min.	Norm.	Max.		48.6	121.9	
	24	Noise	Min.	Norm.	Max.				dBa
	25	Required CV							
	26	Selected CV Internal / Mfr			/ 300				
27	Fd	Internal / Mfr		FI (Cf)	/ 0.828@max.				
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material			A 351 Gr. CF3M		
	30	Design Pressure		Min.	Max.	bar-g			
	31	Design Temperature		Min.	Max.				
	32	Max. DP closed valve		24.1			bar		
	33	Valve end con. & rating		Seat leakage class		6 in - 300 lb ANSI RF	CLASS IV (IEC 534-4)		
	34	Plug type		Plug material			Eccentric rotary		
	35	Plug dim.		Plug form/law			Red. trim		
	36	Seat type		Q.ty	Material		SS 316 Stellite hard faced		
	37	Packing mat.		Lubricator			KELVAR PTFE WITH VITON O RINGS		
	38	Bonnet type		Integral extended					
Actuator	39								
	40	Direction of action							
Positioner	41	Spring range				7 TO 24			
	42	Type	Input signal			Smart	4w20 mA 24Vdc HART		
	43	Air supply	Action dir.			4 BAR-G			
Accessories	44	Protection					IP-65 EEXi-a (Cenelec)		
	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve				YES			
	48	Pressure gauge				YES			
	49	Handwheel							
	50	Solenoid valve		Spec. No.					
51	Pos. detector		Spec. No.						
	52	Weight		Consumption		120 KG			

Notes: (1) Design temperature : -540C / 600C
(2) Downstream vapor fraction is 2.77% wt vapor density=35.2kg/m3
(3) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30PV 40184				
	2	Client Reference	Requisition No.	Item	1541-01		14039		
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe		
	4	Serial Number							
	5	Service			T403 Ovhd To Flare				
	6	P&ID No.			0021-40-13				
Inlet line	7	Diameter	Number				10"-P40120A-EJ01-C		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		12 in				
	10	Line schedule	Piping class		10S		DJ04		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		28		0.009 cP		
	14	Cp/Cv	Compressibility		1.14		0.72		
	15	Density min	Density nor	Density max		38.7		40.9	kg/m3
	16	Vapour Pressure at T nom.							
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		HC		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	20727	75840	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-29	-27	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	20.3	19.3	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	17.8	16.8	bar
	23	CV	Min.	Norm.	Max.				
	24	Noise	Min.	Norm.	Max.	73.6		91.1	dBA
25	Required CV								
26	Selected CV Internal / Mfr			/ 300					
27	Fd	Internal / Mfr	FI (C)		/		0.975		
28	Fluid tending to		Air-Fail Position				Close		
Valve Body	29	Body type		Body material				A 351Gr. CF8M	
	30	Design Pressure		Min.	Max.	bar-g		21.3 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve				21.3 bar			
	33	Valve end con. & rating		Seat leakage class		8 in - 300 lb ANSI RF		CLASS V (IEC 534-4)	
	34	Plug type		Plug material		BALANCED		316 S.S. + STELLITE	
	35	Plug dim.		Plug form/law		Red. trim		LO-DB 2 STAGE LINEAR	
	36	Seat type		Q.ty	Material	Clamped in		316 S.S. + STELLITE	
	37	Packing mat.		Lubricator		KELVAR PTFE			
	38	Bonnet type				STANDARD(T= - 104Deg.C)			
39									
Actuator	40	Direction of action							
	41	Spring range			20 TO 50				
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART	
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection			IP-65 EEXI-a (Cenelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
52	Weight		Consumption		548 KG				

Notes: (1) Design temperature : -710C/600C
(2) Valve to be suitable for the following cond: 0 barg - 104°C
(3) Valve opens upon increasing the variable - Valve is normally closed

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 40201				
	2	Client Reference	Requisition No.	Item	1541-01		14040		
	3	Supplier		Model	DRESSER FLOW CONTROL		30000 Series Varimax		
	4	Serial Number							
	5	Service			PR To E428				
	6	P&ID No.			0021-40-14				
Inlet line	7	Diameter	Number		18"-PR40012A-DB01-C				
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		24 in				
	10	Line schedule	Piping class		10		DB01		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal				0.11 cP		
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	572		kg/m3		
	16	Vapour Pressure at T nom.			3.2 bar-a				
	17	Critical Pressure		Critical Temperature		46.2 bar-a			
	18	Fluid	Phase	State		PROPYLENE		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	213270	532920	639500
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit		-18	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	4.7	3.7	3.2
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3	2	1.4
	23	CV	Min.	Norm.	Max.		297.4	1092	1608
	24	Noise	Min.	Norm.	Max.				dBA
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 2140			
27	Fd	Internal / Mfr		FI (Cf)		/		0.811@max.	
28	Fluid tending to		Air-Fail Position		Close				
Valve Body	29	Body type		Body material		A 351 Gr. CF8M			
	30	Design Pressure		Min.	Max.	bar-g		15.6 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve			14.9 bar				
	33	Valve end con.& rating		Seat leakage class		12 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material		Rotary			
	35	Plug dim.		Plug form/law		LINEAR			
	36	Seat type		Q.ty	Material	316 S.S. + STELLITE			
	37	Packing mat.		Lubricator		KELVAR PTFE			
	38	Bonnet type				Integral extended			
39									
Actuator	40	Direction of action							
	41	Spring range			7 TO 25				
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART	
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection			IP-65 EEXI-a (Cenelec)				
Accessories	45	Booster relay			YES				
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			YES				
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
	52	Weight		Consumption		267 KG			

Notes: (1) Valve opens upon increasing the variable
(2) Design temperature: -480C / 600C
(3) Mixed phase at valve outlet: % wt of vaporization : 8.8 max. vapor density : 4 kg/m3
(4) Adjustment at position B (CV=2140).

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30LV 40207					
	2	Client Reference	Requisition No.	Item	1541-01		14041			
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		10 in		10"-P40137A-EB01-C			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		10 in					
	10	Line schedule	Piping class		20		EB01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal				0.07		cP
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max		440		kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature		50.27		bar-a		
	18	Fluid	Phase	State		HC		Liquid		Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	65940	164830	181320	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit		-30.8		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	20.2	20.2	20.2	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	0.3	0.25	0.2	bar
	23	CV	Min.	Norm.	Max.		210.5	576.5	709	
	24	Noise	Min.	Norm.	Max.					dBa
	25	Required CV								
26	Selected CV Internal / Mfr				/ 1300					
27	Fd Internal / Mfr		FI (Cf)		/		0.786@max.			
28	Fluid tending to		Air-Fail Position			Close				
Valve Body	29	Body type		Body material		A 351 Gr. CF3M				
	30	Design Pressure		Min.	Max.	bar-g		21.8 bar-g		
	31	Design Temperature		Min.	Max.					
	32	Max. DP closed valve								
	33	Valve end con. & rating		Seat leakage class		1 bar		- 300 lb ANSI RF		
	34	Plug type		Plug material		Eccentric rotary		CLASS IV (IEC 534-4)		
	35	Plug dim.		Plug form/law		Full trim		316L S.S. + STELLITE		
	36	Seat type		Q.ty	Material	LINEAR				
	37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS				
	38	Bonnet type		Integral extended						
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve		YES						
	48	Pressure gauge		YES						
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
51	Pos. detector		Spec. No.							
52	Weight		Consumption		210 KG					

Notes: (1) Design temperature : -540C/600C
(2) Valve to be suitable for the following cond: 0 barg - 104°C
(3) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30FV 40211A				
	2	Client Reference	Requisition No.	Item	1541-01		14042		
	3	Supplier	Model		DRESSER FLOW CONTROL		30000 Series Varimax		
	4	Serial Number							
	5	Service			C2Split Refl To T403				
	6	P&ID No.			0021-40-15				
Inlet line	7	Diameter	Number		16 in	16"-P40104A-EB11-C			
	8	Line schedule	Piping class		20				
Outlet line	9	Diameter	Number		16 in				
	10	Line schedule	Piping class		STD	EB11			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal				0.06 cP		
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	440		kg/m3		
	16	Vapour Pressure at T nom.			19.9 bar-a				
	17	Critical Pressure		Critical Temperature		50.3 bar-a			
	18	Fluid	Phase	State		HC	Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	275960	689900	827880
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-31		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	25.1	24.4	24.1
	22	DP	QMin.	Q Norm.	Q Max.	Unit	2	1.2	0.8
	23	CV	Min.	Norm.	Max.	341.6		1113	1657
	24	Noise	Min.	Norm.	Max.	72.5	73.2	71.4	
	25	Required CV							
26	Selected CV Internal / Mfr			/ 2235					
27	Fd	Internal / Mfr		FI (Cf)	/		0.818@max.		
28	Fluid tending to		Air-Fail Position				Open		
Valve Body	29	Body type		Body material				A 351 Gr. CF8M	
	30	Design Pressure		Min.	Max.	bar-g		26.7 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve			5 bar				
	33	Valve end con.& rating		Seat leakage class		12 in	- 300 lb ANSI RF		CLASS IV (IEC 534-4)
	34	Plug type		Plug material		Rotary		316 S.S.	
	35	Plug dim.		Plug form/law				LINEAR	
	36	Seat type		Q.ty	Material			316 S.S.	
	37	Packing mat.		Lubricator		KELVAR PTFE			
	38	Bonnet type				Integral extended			
Actuator	40	Direction of action							
	41	Spring range			7 TO 25				
Positioner	42	Type		Input signal		Smart	4w20 mA 24Vdc HART		
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection			IP-65 EEXi-a (Cenelec)				
Accessories	45	Booster relay			YES				
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			YES				
	50	Solenoid valve		Spec. No.					
	51	Pos.detector		Spec. No.					
	52	Weight		Consumption		267 KG			

Notes: (1) Design temperature : -540C/600C
(2) Valve to be suitable for the following cond: 0 barg - 1040C
(3) Valve closes upon increasing the variable
(4) Adjustment at position B (CV=2235).

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30FV 40211B			
	2	Client Reference	Requisition No.	Item	1541-01		14043	
	3	Supplier	Model		DRESSER FLOW CONTROL	35000 Series Camflex		
	4	Serial Number						
	5	Service						
	6	P&ID No. C2Split Refl To T403 0021-40-15						
Inlet line	7	Diameter	Number			10"-P40104A-EB11-C		
	8	Line schedule	Piping class					
Outlet line	9	Diameter	Number			10 in		
	10	Line schedule	Piping class			20 EB11		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both			
	12	Sour service	Special conditions					
	13	Molecular Weight	Viscosity at @ normal				0.06 cP	
	14	Cp/Cv	Compressibility					
	15	Density min	Density nor	Density max		440 kg/m3		
	16	Vapour Pressure at T norm.			19.9 bar-a			
	17	Critical Pressure		Critical Temperature		50.3 bar-a		
	18	Fluid	Phase	State		HC	Liquid Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	389400 kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-31 :C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	25.4 bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	5 bar	
	23	CV	Min.	Norm.	Max.	305.4		
	24	Noise	Min.	Norm.	Max.	86 dBA		
	25	Required CV						-
26	Selected CV Internal / Mfr			/ 340				
27	Fd Internal / Mfr		FI (C)		/ 0.860			
28	Fluid tending to		Air-Fail Position			Open		
Valve Body	29	Body type		Body material			A 351 Gr. CF3M	
	30	Design Pressure	Min.	Max.	bar-g		26.7 bar-g	
	31	Design Temperature	Min.	Max.				
	32	Max. DP closed valve			5.4 bar			
	33	Valve end con. & rating		Seat leakage class		8 in - 300 lb ANSI RF CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		Eccentric rotary 316L S.S. + STELLITE		
	35	Plug dim.		Plug form/law		Red. trim LINEAR		
	36	Seat type		Q.ty	Material	316 S.S.		
	37	Packing mat.		Lubricator				KELVAR PTFE WITH VITON O RINGS
	38	Bonnet type		Integral extended				
Actuator	40	Direction of action						
	41	Spring range 7 TO 24						
Positioner	42	Type		Input signal				
	43	Air supply		Action dir.				
	44	Protection						
Accessories	45	Booster relay						
	46	Locking device						
	47	Pressure reducing valve			YES			
	48	Pressure gauge			YES			
	49	Handwheel						
	50	Solenoid valve		Spec. No.		YES		
	51	Pos. detector		Spec. No.				
	52	Weight		Consumption		170 KG		

Notes: (1) Design temp. : -540C/600C valve to be suitable for the following cond: 0 barg - 1040C
(2) On/off valve with limit stop at CV=305: normally closed and opens in case of low flowrate at pump discharge

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
No.	By	Chk	Appr	Date	Revision	Code: 507	Dwg. No.: 6465C 3D SP 1541 40	Sheet 44 of 48
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General Data	1	Tag No.			30FV 40212						
	2	Client Reference	Requisition No.	Item	1541-01		14044				
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe					
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		2"-P40107A-EJ01-C						
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		1.5 in						
	10	Line schedule	Piping class		40S		EJ01				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal		27.3		0.01 cP				
	14	Cp/Cv	Compressibility		1.15		0.74				
	15	Density min	Density nor	Density max	36.4		kg/m3				
	16	Vapour Pressure at T nom.									
	17	Critical Pressure		Critical Temperature							
	18	Fluid	Phase	State		HC	Gas		Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	400	1000	1100	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-31			:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	21.3	19.4	19.3	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	9.4	5.2	2.6	bar	
	23	CV	Min.	Norm.	Max.	1.012		3.223		4.616	
	24	Noise	Min.	Norm.	Max.	<70		73.3		<70	dBA
	25	Required CV									
26	Selected CV		Internal / Mfr		/6						
27	Fd	Internal / Mfr		FI (Cf)	/		0.905@max.				
28	Fluid tending to		Air-Fail Position			Close					
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M			
	30	Design Pressure		Min.	Max.	bar-g		21.3 bar-g			
	31	Design Temperature		Min.	Max.						
	32	Max.DP closed valve				21.3 bar					
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type		Plug material			BALANCED		316 S.S.		
	35	Plug dim.		Plug form/law			Red. trim		LINEAR		
	36	Seat type		Q.ty	Material	Clamped in		316 S.S.			
	37	Packing mat.		Lubricator							
	38	Bonnet type		With Extension EB (T= - 104)							
Actuator	40	Direction of action									
	41	Spring range			3 TO 15						
Positioner	42	Type	Input signal		Smart			4w20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G						
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve				YES					
	48	Pressure gauge				YES					
	49	Handwheel									
	50	Solenoid valve		Spec. No.							
	51	Pos.detector		Spec. No.							
	52	Weight		Consumption		212 KG					

Notes: (1) Design temperature : -1040C/600C
(2) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP					
					Control Valve							
1	T.G.	KG	KG	04/10/2002	ISSUED FOR PURCHASE							
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE							
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General Data	1	Tag No.	30LV 40222				
	2	Client Reference	Requisition No.	Item	1541-01 14045		
	3	Supplier	Model	DRESSER FLOW CONTROL 21000 Series Globe			
	4	Serial Number					
	5	Service	Cracked Gas First Chill				
	6	P&ID No.	0021-40-16				
Inlet line	7	Diameter	Number	6"-ER40001A-EJ01-C			
	8	Line schedule	Piping class				
Outlet line	9	Diameter	Number	6 in			
	10	Line schedule	Piping class	10S DJ01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both		
	12	Sour service	Special conditions				
	13	Molecular Weight	Viscosity at @ normal		0.07 cP		
	14	Cp/Cv	Compressibility				
	15	Density min	Density nor	Density max	450.3 kg/m3		
	16	Vapour Pressure at T nom.			18.3 bar-a		
	17	Critical Pressure		Critical Temperature	50.3 bar-a		
	18	Fluid	Phase	State	ETHYLENE Liquid Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	16030 40070 44070 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-32 :C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	31.4 28.3 26.4 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	20 16.8 14.8 bar
	23	CV	Min.	Norm.	Max.		7.13 20.53 24.46
	24	Noise	Min.	Norm.	Max.		dBa
	25	Required CV					
26	Selected CV Internal / Mfr			/ 31			
27	Fd Internal / Mfr		FI (Cf)	/ 0.904@max.			
28	Fluid tending to		Air-Fail Position Close				
Valve Body	29	Body type	Body material		Single Seat Globe A 351 Gr. CF8M		
	30	Design Pressure	Min.	Max.	bar-g 35.5 bar-g		
	31	Design Temperature	Min.	Max.			
	32	Max.DP closed valve	25.2 bar				
	33	Valve end con.& rating	Seat leakage class		3 in - 300 lb ANSI RF CLASS IV (IEC 534-4)		
	34	Plug type	Plug material			Contoured 316 S.S. FULL STELLITE	
	35	Plug dim.	Plug form/law			Red. trim LINEAR	
	36	Seat type	Q.ty	Material	Threaded 316 S.S. FULL STELLITE		
	37	Packing mat.	Lubricator			KELVAR PTFE	
	38	Bonnet type	With Extension EB (T= - 104				
Actuator	40	Direction of action					
	41	Spring range				11 TO 23	
Positioner	42	Type	Input signal		Field Bus Field Bus		
	43	Air supply	Action dir.			4 BAR-G	
	44	Protection				IP-65 EEXI-a (Cenelec)	
Accessories	45	Booster relay				-	
	46	Locking device				-	
	47	Pressure reducing valve			YES		
	48	Pressure gauge			YES		
	49	Handwheel				NO	
	50	Solenoid valve	Spec. No.				
51	Pos.detector	Spec. No.					
	52	Weight	Consumption		97 KG		

Notes: (1) Valve closes upon increasing the variable
(2) Mixed phase at valve outlet: % wt of vap. :12 max. vapocr dens.: 20.9 kg/m3
(3) Design temperature : -1040C/600C

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 40224					
	2	Client Reference	Requisition No.	Item	1541-01		14046			
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number			10"-ER40003A-DJ01-C				
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number			10 in				
	10	Line schedule	Piping class			10S		DJ01		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal						0.08 cP	
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max		478		kg/m3		
	16	Vapour Pressure atT nom.							11.3 bar-a	
	17	Critical Pressure		Critical Temperature					50.3 bar-a	
	18	Fluid	Phase	State		ETHYLENE		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	46940	117350	129090	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit		-48		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	13.2	11.5	10.2	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	8.3	6.5	5.2	bar
	23	CV	Min.	Norm.	Max.		48.94	168.5	222.1	
	24	Noise	Min.	Norm.	Max.					dBA
	25	Required CV								
26	Selected CV		Internal / Mfr		/ 340					
27	Fd		Internal / Mfr		FI (Cf)		/		0.751@max.	
28	Fluid tending to		Air-Fail Position			Close				
29	Body type		Body material						A 351Gr. CF3M	
30	Design Pressure		Min.	Max.	bar-g		13 bar-g			
31	Design Temperature		Min.	Max.						
32	Max.DP closed valve		9.2 bar							
33	Valve end con.& rating		Seat leakage class			8 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
34	Plug type		Plug material						316L S.S. + STELLITE	
35	Plug dim.		Plug form/law						LINEAR	
36	Seat type		Q.ty	Material					SS 316 Stellite hard faced	
37	Packing mat.		Lubricator						KELVAR PTFE WITH VITON O RINGS	
38	Bonnet type		Integral extended							
39										
Actuator	40	Direction of action								
	41	Spring range			7 TO 24					
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection							IP-65 EEXI-a (Cenelec)	
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel							NO	
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		170 KG					

Notes: (1) Valve closes upon increasing the variable
(2) Mixed phase at valve outlet: % wt of vap. :14.5 max. vapor dens.: 9 kg/m3
(3) Design temperature : -1040C/600C

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE			
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30LV 40226					
	2	Client Reference	Requisition No.	Item	1541-01		14047			
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		6"-ER40C05A-DJ01-C					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		8 in					
	10	Line schedule	Piping class		10S		DJ01			
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal					0.11 cP		
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max		519.2		kg/m3		
	16	Vapour Pressure atT nom.			4.8 bar-a					
	17	Critical Pressure		Critical Temperature		50.3 bar-a				
	18	Fluid	Phase	State		ETHYLENE		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	12720	31800	34980	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-72		:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	5.9	5.3	4.7	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.5	3.8	3	bar
	23	CV	Min.	Norm.	Max.	19.43		59.91	75.42	
	24	Noise	Min.	Norm.	Max.					dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 138				
27	Fd		Internal / Mfr		FI (Cf)		/		0.783@max.	
28	Fluid tending to		Air-Fail Position			Close				
Valve Body	29	Body type		Body material		A 351 Gr. CF3M				
	30	Design Pressure		Min.	Max.	bar-g		12. bar-g		
	31	Design Temperature		Min.	Max.					
	32	Max.DP closed valve								
	33	Valve end con.& rating		Seat leakage class		4 in -300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		Eccentric rotary		316L S.S. + STELLITE		
	35	Plug dim.		Plug form/law		Red. trim		LINEAR		
	36	Seat type		Q.ty	Material	SS 316 Stellite hard faced				
	37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS				
	38	Bonnet type		Integral extended						
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve		YES						
	48	Pressure gauge		YES						
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
	51	Pos.detector		Spec. No.						
52	Weight		Consumption		82 KG					

Notes: (1) Valve closes upon increasing the variable
(2) Mixed phase at valve outlet: % wt of vap. :14 max. vapor dens.: 3 kg/m3
(3) Design temperature : -1040C/600C

					INSTRUMENT SPECIFICATION		TECHNIP		 PARS PETROCHEMICAL COMPANY	
					Control Valve		 MAROAIN			
1	T.G.	FR	FR	04/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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UNIT 50

TECHNIP9TH OLEFIN COMPLEX

ETHANE CRACKING PLANT



PARS PETROCHEMICAL COMPANY

CONTRACTOR DOCUMENT N°							OWNER DOCUMENT N°						
Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page	Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page
6465C	30	SP	1541	50	2	1/30	3930	30	SP	1541	50	2	1/30

CONTROL VALVES DATA SHEETS**(SECTION 50)**



Pages modified under this revision: 25.

2	02/04/03	Revised					T.GRANDRY	F.REGARD	J.M ANBRY				
1	14/10/02	Issue for purchase					T.GRANDRY	F.REGARD	P.E.CROUZIER				
0	19/04/02	Issue for purchase					S.SRIRAM	T.GRANDRY	P.E.CROUZIER				
Rev	Date DD/MM/YY	STATUS					WRITTEN BY (name & visa)		CHECKED BY (name & visa)		APPROVED BY (name & visa)		
DOCUMENT REVISIONS													

Sections changed in last revision are identified by a vertical line in the right margin



General Data	1	Tag No.			30UV 50002			
	2	Client Reference	Requisition No.	Item	1541-01		15001	
	3	Supplier	Model		DRESSER FLOW CONTROL	21000 Series Globe		
	4	Serial Number						
	5	Service			C2 Refrig Fr C502 Outlet			
	6	P&ID No.			0021-50-01			
Inlet line	7	Diameter	Number				4"-ER50055A-EB21-N	
	8	Line schedule	Piping class					
Outlet line	9	Diameter	Number		4 in			
	10	Line schedule	Piping class		STD		EB21	
Operating Conditions	11	Calculation Results From:			Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both <input type="radio"/>			
	12	Sour service	Special conditions					
	13	Molecular Weight	Viscosity at @ normal		28.05			
	14	Cp/Cv	Compressibility		1.34		0.902	
	15	Density min	Density nor	Density max			14.74 kg/m3	
	16	Vapour Pressure atT nom.						
	17	Critical Pressure		Critical Temperature				
	18	Fluid	Phase	State		Ethylene	Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	5207	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-6.6	°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	10.28	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	8.78	bar
	23	CV	Min.	Norm.	Max.			29
	24	Noise	Min.	Norm.	Max.			97.8 dBA
	25	Required CV						
26	Selected CV Internal / Mfr			/ 31				
27	Fd	Internal / Mfr	FI (Cf)			0.900		
28	Fluid tending to		Air-Fail Position				Open	
Valve Body	29	Body type		Body material		Single Seat Globe A351 Gr. CF8M		
	30	Design Pressure		Min.	Max.	bar-g 35 bar-g		
	31	Design Temperature		Min.	Max.			
	32	Max.DP closed valve				35 bar		
	33	Valve end con.& rating		Seat leakage class		3 in - 300 lb ANSI RF CLASS V		
	34	Plug type		Plug material		Contoured 316 S.S. + STELLITE		
	35	Plug dim.		Plug form/flaw		ON-OFF		
	36	Seat type		Q.ty	Material	Threaded 316 S.S. + STELLITE		
	37	Packing mat.		Lubricator		KELVAR PTFE		
	38	Bonnet type				Extended (T= -54 Deg. C)		
Actuator	39	Direction of action						
	41	Spring range			3 TO 15			
Positioner	42	Type		Input signal				
	43	Air supply		Action dir.				
	44	Protection						
Accessories	45	Booster relay						
	46	Locking device			YES			
	47	Pressure reducing valve			YES			
	48	Pressure gauge			YES			
	49	Handwheel			NO			
	50	Solenoid valve		Spec. No.	YES			
51	Pos.detector		Spec. No.	YES (2 nos. limit switch)				
52	Weight		Consumption	97 KG				

Notes: (1) On / off blowdown valve
(2) Design temperature = -54 / 80 OC
(3) Supply shall include air volume tank. The capacity of the tank shall be sufficient to allow three strokes.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARIS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE		Sheet 2		of 30	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 50021					
	2	Client Reference	Requisition No.	Item	1541-01		15002			
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number								
	5	Service			E 504 Shellside					
	6	P&ID No.			0021-50-02					
Inlet line	7	Diameter	Number				10"-PR50011A-EB01-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		10 in					
	10	Line schedule	Piping class		20		DB01			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal				0.051 cP			
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	469.7	469.7	476.5	kg/m3		
	16	Vapour Pressure at T nom.			18.44 bar-a					
	17	Critical Pressure		Critical Temperature		46.2 bar-a				
	18	Fluid	Phase	State		Propylene		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	12098	63043	69438	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	45	45	41.6	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	18.59	18.54	17.2	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	12.03	11.93	10.56	bar
	23	CV	Min.	Norm.	Max.		10.76	74.15	87.44	
	24	Noise	Min.	Norm.	Max.					dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 92				
27	Fd	Internal / Mfr		FI (Cf)		/		0.700@max.		
28	Fluid tending to		Air-Fail Position				Close			
29	Body type		Body material				A 351 Gr. CF3M			
30	Design Pressure		Min.	Max.	bar-g		20.7		bar-g	
31	Design Temperature		Min.	Max.						
32	Max.DP closed valve			15.2		bar				
33	Valve end con.& rating		Seat leakage class		4 in - 300 lb ANSI RF		CLASS IV			
34	Plug type		Plug material		Eccentric rotary		316L S.S. + STELLITE			
35	Plug dim.		Plug form/law		Red. trim		LINEAR			
36	Seat type		Q.ty	Material			316 SS Stellite hard faced			
37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS					
38	Bonnet type		Integral extended							
39										
Actuator	40	Direction of action								
	41	Spring range			7 TO 15					
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve	Spec. No.							
	51	Pos.detector	Spec. No.							
52	Weight		Consumption		62 KG					

Notes: (1) Design temperature = 900C. Suitable for -480C and 0 barg.
(2) Valve closes upon increasing the variable.
(3) Mixed phase at valve outlet: % wt of vaporization: 28.5. vapor density (kg/m3): 13.7.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARIS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE		Sheet 3		of 30	
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General Data	1	Tag No.			30FV 50021			
	2	Client Reference	Requisition No.	Item	1541-01		15003	
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe		
	4	Serial Number						
	5	Service						
	6	P&ID No.						
Inlet line	7	Diameter	Number			6"-ER50006A-EA11-N		
	8	Line schedule	Piping class					
Outlet line	9	Diameter	Number			10 in		
	10	Line schedule	Piping class			20 EA11		
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal <input checked="" type="radio"/> Manufacturer <input type="checkbox"/> Both			
	12	Sour service	Special conditions					
	13	Molecular Weight	Viscosity at @ normal			28.1		
	14	Cp/Cv	Compressibility			1.42 0.832		
	15	Density min	Density nor	Density max		38.8 kg/m3		
	16	Vapour Pressure at T nom.						
	17	Critical Pressure			Critical Temperature			
	18	Fluid	Phase	State		Ethylene	Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	50000	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	48	°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	30.43	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	26.68	bar
	23	CV	Min.	Norm.	Max.	89.09		
	24	Noise	Min.	Norm.	Max.	87.9 dBA		
	25	Required CV						
26	Selected CV			Internal / Mfr		/ 150		
27	Fd	Internal / Mfr		FI (Cf)	/ 0.975			
Valve Body	28	Fluid tending to		Air-Fail Position				
	29	Body type		Body material				
	30	Design Pressure	Min.	Max.	bar-g		ASTM A216 GR WCC	
	31	Design Temperature	Min.	Max.			35 bar-g	
	32	Max.DP closed valve			35 bar			
	33	Valve end con.& rating	Seat leakage class			6 in - 300 lb ANSI RF		CLASS V
	34	Plug type	Plug material			BALANCED 17-4 PH		
	35	Plug dim.	Plug form/flaw			Red. trim LO-DB 2 STAGE LINEAR		
	36	Seat type	Q.ty	Material		Clamped in		AISI 410
	37	Packing mat.	Lubricator					KELVAR PTFE
38	Bonnet type		STANDARD					
39								
Actuator	40	Direction of action						
	41	Spring range				21 TO 45		
Positioner	42	Type	Input signal				Smart	4w20 mA 24Vdc HART
	43	Air supply	Action dir.					4 BAR-G
	44	Protection						IP-65 EEXi-a (Cenelec)
Accessories	45	Booster relay						
	46	Locking device						
	47	Pressure reducing valve				YES		
	48	Pressure gauge				YES		
	49	Handwheel						YES
	50	Solenoid valve	Spec. No.					
51	Pos.detector	Spec. No.						
	52	Weight	Consumption				301 KG	

Notes: (1) Valve closes upon increasing the variable
(2) Design temperature = 0 / 80 °C.
(3) No flow in normal operation.

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30PV 50022A					
	2	Client Reference	Requisition No.	Item	1541-01		15004			
	3	Supplier	Model		DRESSER FLOW CONTROL		30000 Series Varimax			
	4	Serial Number								
	5	Service			C2 Refrig To Pipeline					
	6	P&ID No.			0021-50-02					
Inlet line	7	Diameter	Number				14"-ER50005A-EA11-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		14 in					
	10	Line schedule	Piping class		20		EA11			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal		28.1		0.012 cP			
	14	Cp/Cv	Compressibility		1.42		0.832			
	15	Density min	Density nor	Density max	38.82	38.82	38.82	kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		Ethylene		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	50505	126263	126263	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	48	48	48	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	31.28	30.91	30.71	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	2.2	0.7	0.5	bar
	23	CV	Min.	Norm.	Max.		215.4	934.9	1106	
	24	Noise	Min.	Norm.	Max.		77.6	<70	<70	dBA
	25	Required CV								
26	Selected CV Internal / Mfr			/ 1450						
27	Fd	Internal / Mfr	FI (CI)					0.810@max.		
Valve Body	28	Fluid tending to		Air-Fail Position		Close				
	29	Body type		Body material		ASTM A216 GR WCC				
	30	Design Pressure	Min.	Max.	bar-g		35 bar-g			
	31	Design Temperature	Min.	Max.						
	32	Max.DP closed valve			6.94 bar					
	33	Valve end con.& rating	Seat leakage class		10 in - 300 lb ANSI RF		CLASS IV			
	34	Plug type	Plug material		Rotary		316 S.S.			
	35	Plug dim.	Plug form/law		LINEAR					
	36	Seat type	Q.ty	Material			316 S.S.			
	37	Packing mat.	Lubricator		KELVAR PTFE					
38	Bonnet type			Integral extended						
39										
Actuator	40	Direction of action								
	41	Spring range			7 TO 25					
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			YES					
	50	Solenoid valve	Spec. No.							
	51	Pos.detector	Spec. No.							
52	Weight	Consumption		166 KG						

Notes: (1) Design temperature = 0 / 80 OC
(2) Valve closes upon increasing the variable.
(3) Adjustment at position B (CV=1450).

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 50022B							
	2	Client Reference	Requisition No.	Item	1541-01		15005					
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe						
	4	Serial Number										
	5	Service										
	6	P&ID No.										
Inlet line	7	Diameter	Number				8"-ME70004A-DJ01-H					
	8	Line schedule	Piping class									
Outlet line	9	Diameter	Number		8 in							
	10	Line schedule	Piping class		10S		DJ01					
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both			
	12	Sour service		Special conditions								
	13	Molecular Weight		Viscosity at @ normal								
	14	Cp/Cv		Compressibility								
	15	Density min	Density nor	Density max	694		694		kg/m3			
	16	Vapour Pressure atT nom.										
	17	Critical Pressure		Critical Temperature		33.9 bar-a						
	18	Fluid	Phase	State		Methanol		Liquid		Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	6137			61369	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	105.3			105.3	°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	4.26			4.13	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	0.26			0.13	bar	
	23	CV	Min.	Norm.	Max.	16.76				238.8		
	24	Noise	Min.	Norm.	Max.	<70				<70	dBA	
	25	Required CV										
26	Selected CV		Internal / Mfr		/ 400							
27	Fd	Internal / Mfr		FI (Cf)					0.912@max.			
28	Fluid tending to		Air-Fail Position									
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M				
	30	Design Pressure		Min.	Max.	bar-g		5.5 bar-g				
	31	Design Temperature		Min.	Max.							
	32	Max.DP closed valve				0.5 bar						
	33	Valve end con.& rating		Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV				
	34	Plug type		Plug material		Contoured		316 S.S.				
	35	Plug dim.		Plug form/law		=%						
	36	Seat type		Q.ty	Material	Threaded		316 S.S.				
	37	Packing mat.		Lubricator								
	38	Bonnet type				Extended						
	39											
Actuator	40	Direction of action										
	41	Spring range										
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART				
	43	Air supply		Action dir.		4 BAR-G						
	44	Protection										
Accessories	45	Booster relay										
	46	Locking device										
	47	Pressure reducing valve				YES						
	48	Pressure gauge				YES						
	49	Handwheel										
	50	Solenoid valve		Spec. No.								
51	Pos.detector		Spec. No.									
52	Weight		Consumption		283 KG							

Notes: (1) Design temperature : -1040C/1250C
(2) Valve closes upon increasing the variable
(3) No flow in normal operation

					INSTRUMENT SPECIFICATION		TECHNIP		 PARS PETROCHEMICAL COMPANY	
					Control Valve		 PARS PETROCHEMICAL COMPANY		Sheet 6 of 30	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 50023A							
	2	Client Reference	Requisition No.	Item	1541-01		15006					
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex						
	4	Serial Number										
	5	Service										
	6	P&ID No.										
Inlet line	7	Diameter	Number		10"-PR50023A-DB01-C							
	8	Line schedule	Piping class									
Outlet line	9	Diameter	Number		10 in							
	10	Line schedule	Piping class		20		DB01					
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both			
	12	Sour service	Special conditions									
	13	Molecular Weight	Viscosity at @ normal						0.109 cP			
	14	Cp/Cv	Compressibility									
	15	Density min	Density nor	Density max	566.3	566.3	566.3	kg/m3				
	16	Vapour Pressure at T nom.										
	17	Critical Pressure	Critical Temperature							46.2 bar-a		
	18	Fluid	Phase	State		Propylene		Liquid	Single Phase			
	19	Flow	Min.	Norm.	Max.	Unit	30715	168328	185161	kg/h		
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-13.9	-13.9	-13.9	°C		
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	7.59	6.86	6.58	bar-a		
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.33	3.52	3.23	bar		
	23	CV	Min.	Norm.	Max.		25.64	190	226.6			
	24	Noise	Min.	Norm.	Max.					dBA		
	25	Required CV										
26	Selected CV	Internal / Mfr		/ 250								
27	Fd	Internal / Mfr		FI (Cf)	/				0.700@max.			
28	Fluid tending to		Air-Fail Position							Close		
Valve Body	29	Body type		Body material						A 351 Gr. CF3M		
	30	Design Pressure		Min.	Max.	bar-g				16.9 bar-g		
	31	Design Temperature		Min.	Max.							
	32	Max.DP closed valve									14.7 bar	
	33	Valve end con.& rating		Seal leakage class			6 in - 300 lb ANSI RF		CLASS IV			
	34	Plug type		Plug material						Eccentric rotary		316L S.S. + STELLITE
	35	Plug dim.		Plug form/law						Red. trim		LINEAR
	36	Seat type		Q.ty	Material							SS 316 Stellite hard faced
	37	Packing mat.		Lubricator							KELVAR PTFE WITH VITON O RINGS	
	38	Bonnet type		Integral extended								
Actuator	39											
	40	Direction of action										
Positioner	41	Spring range									7 TO 24	
	42	Type		Input signal			Smart		4w20 mA 24Vdc HART			
	43	Air supply		Action dir.			4 BAR-G					
Accessories	44	Protection									IP-65 EEXi-a (Cenelec)	
	45	Booster relay										
	46	Locking device										
	47	Pressure reducing valve									YES	
	48	Pressure gauge									YES	
	49	Handwheel									NO	
	50	Solenoid valve		Spec. No.								
	51	Pos.detector		Spec. No.								
	52	Weight		Consumption						120 KG		

Notes: (1) Design temperature = -48 / 60 OC
(2) Valve opens upon increasing the variable.
(3) Mixed phase at valve outlet: % wt of vaporization: 4.96 vapor density: 6.95 kg/m3.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 50023B						
	2	Client Reference	Requisition No.	Item	1541-01		15007				
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex					
	4	Serial Number									
	5	Service			C2 Refrig To D 506						
	6	P&ID No.			0021-50-02						
Inlet line	7	Diameter	Number				8"-ER50008A-EB21-C				
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		8 in						
	10	Line schedule	Piping class		20		EB21				
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both		
	12	Sour service		Special conditions							
	13	Molecular Weight		Viscosity at @ normal		28.1					
	14	Cp/Cv		Compressibility		1.64		0.73			
	15	Density min	Density nor	Density max		48		49.7		kg/m3	
	16	Vapour Pressure at T nom.									
	17	Critical Pressure		Critical Temperature							
	18	Fluid	Phase	State		Ethylene		Gas		Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	8228	40295		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	8.5	8.5		:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	29.59	30.34		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	0.43	0.47		bar	
	23	CV	Min.	Norm.	Max.	68.38		317.4			
	24	Noise	Min.	Norm.	Max.	<70		<70		dBA	
	25	Required CV									
	26	Selected CV			Internal / Mfr		/ 500				
	27	Fd	Internal / Mfr		FI (Ci)		/		0.759@max.		
28	Fluid tending to		Air-Fail Position				Close				
Valve Body	29	Body type		Body material				A 351 Gr. CF3M			
	30	Design Pressure		Min.	Max.	bar-g		35 bar-g			
	31	Design Temperature		Min.	Max.						
	32	Max.DP closed valve			6.85		bar				
	33	Valve end con.& rating		Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV			
	34	Plug type		Plug material		Eccentric rotary		316L S.S. + STELLITE			
	35	Plug dim.		Plug form/law		Full trim		LINEAR			
	36	Seat type		Q.ty	Material			316 S.S.			
	37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS					
	38	Bonnet type		Integral extended							
39											
Actuator	40	Direction of action									
	41	Spring range			7 TO 24						
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply		Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)						
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve			YES						
	48	Pressure gauge			YES						
	49	Handwheel			YES						
	50	Solenoid valve		Spec. No.							
51	Pos.detector		Spec. No.								
	52	Weight		Consumption		120 KG					

Notes: (1) Normally no flow. No normal case to be considered.
(2) Design temperature = -54 / 60 OC.
(3) Valve closes upon increasing the variable.

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					Control Valve		 Sheet 8 of 30			
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 50031			
	2	Client Reference	Requisition No.	Item	1541-01		15008	
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe		
	4	Serial Number						
	5	Service			C2 Refrig From D 506			
	6	P&ID No.			0021-50-03			
Inlet line	7	Diameter	Number		4" ER50017A-EJ01-C			
	8	Line schedule	Piping class					
Outlet line	9	Diameter	Number		4 in			
	10	Line schedule	Piping class		10S EJ01			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal <input checked="" type="radio"/> Manufacturer <input type="checkbox"/> Both			
	12	Sour service	Special conditions					
	13	Molecular Weight	Viscosity at @ normal		28.1			
	14	Cp/Cv	Compressibility		2.02			
	15	Density min	Density nor	Density max	71.6		kg/m3	
	16	Vapour Pressure at T nom.						
	17	Critical Pressure	Critical Temperature					
	18	Fluid	Phase	State		Ethylene	Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	20148	kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	-9.4	°C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	32.94	bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	31.44	bar
	23	CV	Min.	Norm.	Max.	21.42		
	24	Noise	Min.	Norm.	Max.	85.5		dBA
	25	Required CV						
26	Selected CV Internal / Mfr			/ 30				
27	Fd	Internal / Mfr		FI (Cf)	0.975			
28	Fluid tending to		Air-Fail Position		Close			
Valve Body	29	Body type	Body material		A 351 Gr. CF8M			
	30	Design Pressure	Min.	Max.	bar-g		35 bar-g	
	31	Design Temperature	Min.	Max.	-104			
	32	Max. DP closed valve		35		bar		
	33	Valve end con. & rating	Seat leakage class		4 in - 300 lb ANSI RF		CLASS V	
	34	Plug type	Plug material		BALANCED 316 S.S. + STELLITE			
	35	Plug dim.	Plug form/law		2" trim LO-DB 2 STAGE LINEAR			
	36	Seat type	Q.ty	Material	Clamped in		316 S.S. + STELLITE	
	37	Packing mat.	Lubricator		KELVAR PTFE			
	38	Bonnet type	STANDARD (T= -104 Deg. C)					
39								
Actuator	40	Direction of action						
	41	Spring range			21 TO 45			
Positioner	42	Type	Input signal		Field Bus		Field Bus	
	43	Air supply	Action dir.		4 BAR-G			
	44	Protection			IP-65 EEXI-a (Cenelec)			
Accessories	45	Booster relay						
	46	Locking device						
	47	Pressure reducing valve			YES			
	48	Pressure gauge			YES			
	49	Handwheel			YES			
	50	Solenoid valve	Spec. No.					
51	Pos. detector	Spec. No.						
52	Weight	Consumption		141 KG				

Notes: (1) Valve opens upon increasing the variable.
(2) No flow in normal operation.
(3) Valve body size is 4" x 2" x 4".

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
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General Data	1	Tag No.			30LV 50031				
	2	Client Reference	Requisition No.	Item	1541-01		15009		
	3	Supplier		Model	DRESSER FLOW CONTROL		21000 Series Globe		
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter		Number	8" P70006A-EJ01-C				
	8	Line schedule		Piping class					
Outlet line	9	Diameter		Number	8 in				
	10	Line schedule		Piping class		10S	EJ01		
Operating Conditions	11	Calculation Results From:			Internal <input type="radio"/> Manufacturer <input checked="" type="radio"/> Both <input type="radio"/>				
	12	Sour service		Special conditions					
	13	Molecular Weight		Viscosity at @ normal		0.15 cP			
	14	Cp/Cv		Compressibility					
	15	Density min	Density nor	Density max	558		558 kg/m3		
	16	Vapour Pressure at T nom.			1.58 bar-a				
	17	Critical Pressure		Critical Temperature		50.3 bar-a			
	18	Fluid	Phase	State		Ethylene		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	37879	88380	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-96	-96	°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	22.95	20.14	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	21.64	18.54	bar
	23	CV	Min.	Norm.	Max.				
	24	Noise	Min.	Norm.	Max.	13.56		35.24 dBA	
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 49			
27	Fd	Internal / Mfr		FI (Cf)	/		0.907@max.		
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M	
	30	Design Pressure		Min.	Max.	bar-g		24.2 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve			24.2 bar				
	33	Valve end con.& rating		Seat leakage class		4 in - 300 lb ANSI RF		CLASS IV	
	34	Plug type		Plug material		Contoured		316 S.S. FULL STELLITE	
	35	Plug dim.		Plug form/law		LINEAR			
	36	Seat type		Q.ty	Material	Threaded		316 S.S. FULL STELLITE	
	37	Packing mat.		Lubricator		KELVAR PTFE			
	38	Bonnet type		Extended					
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART	
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel							
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
52	Weight		Consumption		128 KG				

Notes: (1) Mixed phase at outlet valve : 2.4 % wt of vaporization vapor density : 2.6 kg/m3
(2) Valve opens upon increasing the variable
(3) Design temperature : -1040C/+600C

					INSTRUMENT SPECIFICATION		TECHNIP				
					Control Valve				PARIS PETROCHEMICAL COMPANY		
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE						
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE						
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General Data	1	Tag No.				30LV 50033					
	2	Client Reference		Requisition No.	Item	1541-01		15010			
	3	Supplier		Model		DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter		Number				4"-PR50029A-DB01-C			
	8	Line schedule		Piping class							
Outlet line	9	Diameter		Number		6 in					
	10	Line schedule		Piping class		STD		DB01			
Operating Conditions	11	Calculation Results From:				Internal		● Manufacturer		: : Both	
	12	Sour service		Special conditions							
	13	Molecular Weight		Viscosity at @ normal				0.114 cP			
	14	Cp/Cv		Compressibility							
	15	Density min	Density nor	Density max		571.2	571.2	571.2	kg/m3		
	16	Vapour Pressure at T nom.				3.24 bar-a					
	17	Critical Pressure		Critical Temperature		46.2 bar-a					
	18	Fluid	Phase	State		Propylene		Liquid	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	5683	25806	35558	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-18.9	-18.9	-18.9	°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	4.32	3.62	3.37	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	2.72	1.97	1.7	bar	
	23	CV	Min.	Norm.	Max.		7.708	55.59	108.7		
	24	Noise	Min.	Norm.	Max.					dBA	
	25	Required CV									
26	Selected CV				Internal / Mfr		/ 138				
27	Fd		Internal / Mfr		FI (CI)		/		0.719@max.		
28	Fluid tending to		Air-Fail Position				Close				
Valve Body	29	Body type		Body material				A 351 Gr. CF3M			
	30	Design Pressure		Min.	Max.	bar-g		16.8 bar-g			
	31	Design Temperature		Min.	Max.						
	32	Max.DP closed valve				16.2 bar					
	33	Valve end con.& rating		Seat leakage class		4 in - 300 lb ANSI RF		CLASS IV			
	34	Plug type		Plug material		Eccentric rotary		316L S.S. + STELLITE			
	35	Plug dim.		Plug form/law		Red. trim		LINEAR			
	36	Seat type		Q.ty	Material			SS 316 Stellite hard faced			
	37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS					
	38	Bonnet type				Integral extended					
39											
Actuator	40	Direction of action									
	41	Spring range				7 TO 15					
Positioner	42	Type		Input signal		Field Bus		Field Bus			
	43	Air supply		Action dir.		4 BAR-G					
	44	Protection				IP-65 EEXI-a (Cenelec)					
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve				YES					
	48	Pressure gauge				YES					
	49	Handwheel				NO					
	50	Solenoid valve		Spec. No.							
51	Pos.detector		Spec. No.								
	52	Weight		Consumption		62 KG					

Notes: (1) Design temperature = -48 / 600C
(2) Valve closes upon increasing the variable.
(3) Mixed phase at valve outlet: % wt of vaporization: 9.54 vapor density: 3.69 kg/m3.

					INSTRUMENT SPECIFICATION		TECHNIP		 FARS PETROCHEMICAL COMPANY	
					Control Valve		 FARS PETROCHEMICAL COMPANY		Sheet 11 of 30	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 50041					
	2	Client Reference	Requisition No.	Item	1541-01		15011			
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		4"-ER50030A-DJ01-C					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		4 in					
	10	Line schedule	Piping class		10S		DJ01			
Operating Conditions	11	Calculation Results From:								
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal							
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	477.8	477.8	477.8	kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure	Critical Temperature							
	18	Fluid	Phase	State						
	19	Flow	Min.	Norm.	Max.	Unit	6134	15334	16867	kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	-48.3	-48.3	-48.3	:C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	12.17	11.63	11.45	bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	7.3	6.56	6.32	bar
	23	CV	Min.	Norm.	Max.		6.505	20.1	23.68	
	24	Noise	Min.	Norm.	Max.					dBa
	25	Required CV								
26	Selected CV Internal / Mfr									
27	Fd	Internal / Mfr		FI (Cf)	/ 54		0.815@max.			
28	Fluid tending to		Air-Fail Position							
Valve Body	29	Body type		Body material						
	30	Design Pressure	Min.	Max.	bar-g		13.7 bar-g			
	31	Design Temperature	Min.	Max.						
	32	Max.DP closed valve							9.9 bar	
	33	Valve end con.& rating	Seat leakage class		3 in - 300 lb ANSI RF		CLASS IV			
	34	Plug type	Plug material							
	35	Plug dim.	Plug form/law							
	36	Seat type	Q.ty	Material						
	37	Packing mat.	Lubricator							
	38	Bonnet type	Integral extended							
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal					Smart		
	43	Air supply	Action dir.					4w20 mA 24Vdc HART		
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve								
	48	Pressure gauge								
	49	Handwheel								
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
52	Weight		Consumption						48 KG	

Notes: (1) Valve closes upon increasing the variable
(2) Mixed phase at valve outlet: % wt of vaporization: 14.6 vapor density (kg/m3) : 9.1
(3) Design temperature : -104 / 60 OC

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 50043			
	2	Client Reference	Requisition No.	Item	1541-01		15012	
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex	
	4	Serial Number						
	5	Service						
	6	P&ID No.						
Inlet line	7	Diameter		Number		3"-ER50036A-DJ01-C		
	8	Line schedule		Piping class				
Outlet line	9	Diameter		Number		6 in		
	10	Line schedule		Piping class		10S DJ01		
Operating Conditions	11	Calculation Results From:						
	12	Sour service		Special conditions				
	13	Molecular Weight		Viscosity at @ normal		0.109 cP		
	14	Cp/Cv		Compressibility				
	15	Density min	Density nor	Density max	519.2	519.2	519.2	kg/m3
	16	Vapour Pressure at T nom.			4.78 bar-a			
	17	Critical Pressure		Critical Temperature		50.32 bar-a		
	18	Fluid	Phase		State		Ethylene Liquid Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	5688	14219 15641 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-72	-72 -72 .C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	5.7	5.62 5.59 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.27	4.07 4.01 bar
	23	CV	Min.	Norm.	Max.		8.024	23.36 26.57
	24	Noise	Min.	Norm.	Max.			dBA
	25	Required CV						
26	Selected CV		Internal / Mfr		/ 54			
27	Fd		Internal / Mfr		FI (Cf)		0.799@max.	
28	Fluid tending to		Air-Fail Position		Close			
Valve Body	29	Body type		Body material		A 351 Gr. CF3M		
	30	Design Pressure		Min.	Max.	bar-g		13.7 bar-g
	31	Design Temperature		Min.	Max.			
	32	Max.DP closed valve				13.3 bar		
	33	Valve end con.& rating		Seat leakage class		3 in - 300 lb ANSI RF CLASS IV		
	34	Plug type		Plug material		Eccentric rotary 316L S.S. + STELLITE		
	35	Plug dim.		Plug form/law		Red. trim LINEAR		
	36	Seat type		Q.ty	Material	SS 316 Stellite hard faced		
	37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS		
	38	Bonnet type				Integral extended		
Actuator	40	Direction of action						
	41	Spring range						
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART
	43	Air supply		Action dir.		4 BAR-G		
	44	Protection						
Accessories	45	Booster relay						
	46	Locking device						
	47	Pressure reducing valve						
	48	Pressure gauge						
	49	Handwheel						
	50	Solenoid valve		Spec. No.				
51	Pos.detector		Spec. No.					
	52	Weight		Consumption		48 KG		

Notes: (1) Valve closes upon increasing the variable
(2) Mixed phase at valve outlet: %wt of vaporization: 13.33 vapor density (kg/m3): 3
(3) Design temperature = -104 / 60 OC.

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30LV 50045				
	2	Client Reference	Requisition No.	Item	1541-01		15013		
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number		3"-ER50018A-EJ01-C				
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		4 in				
	10	Line schedule	Piping class		10S		DJ01		
Operating Conditions	11	Calculation Results From:			Internal		● Manufacturer		Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal						
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	450.3	450.3	450.3	kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure		Critical Temperature		50.32 bar-a			
	18	Fluid	Phase	State			Ethylene	Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	5071	12677	13944
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-32	-32	-32
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	30.55	30.25	30.15
	22	DP	QMin.	Q Norm.	Q Max.	Unit	19.17	18.75	18.62
	23	CV	Min.	Norm.	Max.		2.342	6.4	7.233
	24	Noise	Min.	Norm.	Max.				dBA
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 20			
27	Fd		Internal / Mfr		FI (Cf)		0.844@max.		
28	Fluid tending to		Air-Fail Position			Close			
29	Body type		Body material						
30	Design Pressure		Min.	Max.	bar-g		35.4 bar-g		
31	Design Temperature		Min.	Max.					
32	Max.DP closed valve				25 bar				
33	Valve end con.& rating		Seat leakage class			2 in - 300 lb ANSI RF		CLASS IV	
34	Plug type		Plug material						
35	Plug dim.		Plug form/law						
36	Seat type		Q.ty	Material			SS 316 Stellite hard faced		
37	Packing mat.		Lubricator						
38	Bonnet type		KELVAR PTFE WITH VITON O RINGS						
39	Integral extended								
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve							
	48	Pressure gauge							
	49	Handwheel							
	50	Solenoid valve	Spec. No.						
	51	Pos.detector	Spec. No.						
52	Weight	Consumption		20 KG					

Notes: (1) Valve closes upon increasing the variable
(2) Mixed phase at valve outlet. % wt of vaporization: 11.8 vapor density (kg/m3): 20.9
(3) Design temperature = -54 / 60 0C

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30LV 50051					
	2	Client Reference	Requisition No.	Item	1541-01		15014			
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number								
	5	Service			C2 Refrig To D 507					
	6	P&ID No.			0021-50-05					
Inlet line	7	Diameter	Number				8"-ER50016A-EJ01-C			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		10 in					
	10	Line schedule	Piping class		10S		D.J01			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal				0.067 cP			
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	450.3	450.3	450.3	kg/m3		
	16	Vapour Pressure atT nom.			18.34 bar-a					
	17	Critical Pressure	Critical Temperature		50.32 bar-a					
	18	Fluid	Phase	State	Ethylene		Liquid	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	17103	160755	176831	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-32	-32	-32	°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	29.97	29.59	29.47	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	18.57	18.16	18.04	bar
	23	CV	Min.	Norm.	Max.		7.657	77.2	85.63	
	24	Noise	Min.	Norm.	Max.					dBA
	25	Required CV								
26	Selected CV Internal / Mfr			/ 208						
27	Fd	Internal / Mfr	FI (Cf)	/		0.925@max.				
28	Fluid tending to	Air-Fail Position				Close				
Valve Body	29	Body type	Body material		Single Seat Globe		A 351 Gr. CF8M			
	30	Design Pressure	Min.	Max.	bar-g		35.5 bar-g			
	31	Design Temperature	Min.	Max.						
	32	Max. DP closed valve			24.6 bar					
	33	Valve end con. & rating	Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV			
	34	Plug type	Plug material		Contoured		316 S.S. FULL STELLITE			
	35	Plug dim.	Plug form/law		=%					
	36	Seat type	Q.ty	Material	Threaded		316 S.S. FULL STELLITE			
	37	Packing mat.	Lubricator		KELVAR PTFE					
	38	Bonnet type			Extended					
	39									
Actuator	40	Direction of action								
	41	Spring range			21 TO 45					
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve	Spec. No.							
51	Pos. detector	Spec. No.								
52	Weight	Consumption		283 KG						

Notes: (1) Design temperature = -104 / 60 OC
(2) Valve closes upon increasing the variable.
(3) Mixed phase at valve outlet: % wt of vaporization: 11.97 vapor density (kg / m3) : 20.73

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE		Sheet 15		of 30	
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 50061					
	2	Client Reference		Requisition No.	Item	1541-01		15015		
	3	Supplier		Model		DRESSER FLOW CONTROL		35000 Series Camflex		
	4	Serial Number								
	5	Service							ER To D508	
	6	P&ID No.							0021-50-06	
Inlet line	7	Diameter		Number		6"-ER50029A-DJ01-C				
	8	Line schedule		Piping class						
Outlet line	9	Diameter		Number		6 in				
	10	Line schedule		Piping class		10S DJ01				
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal					0.081 cP	
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max	477.2	477.2	477.2	kg/m3		
	16	Vapour Pressure atT nom.							11.23 bar-a	
	17	Critical Pressure		Critical Temperature					50.32 bar-a	
	18	Fluid		Phase	State		Ethylene		Liquid Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	18265	45663	50229	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-48.3	-48.3	-48.3	C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	12.17	11.65	11.47	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	7.24	6.56	6.34	bar
	23	CV	Min.	Norm.	Max.		19.53	61.88	73.2	
	24	Noise	Min.	Norm.	Max.					dBA
	25	Required CV								
26	Selected CV		Internal / Mfr		/ 138					
27	Fd		Internal / Mfr		FI (C)		0.787@max.			
28	Fluid tending to		Air-Fail Position					Close		
29	Body type		Body material						A 351 Gr. CF3M	
30	Design Pressure		Min.	Max.	bar-g			13.6 bar-g		
31	Design Temperature		Min.	Max.						
32	Max.DP closed valve		9.7 bar							
33	Valve end con.& rating		Seat leakage class		4 in - 300 lb ANSI RF		CLASS IV			
34	Plug type		Plug material						Eccentric rotary 316L S.S. + STELLITE	
35	Plug dim.		Plug form/law						Red. trim LINEAR	
36	Seat type		Q.ty	Material	SS 316 Stellite hard faced					
37	Packing mat.		Lubricator						KELVAR PTFE WITH VITON O RINGS	
38	Bonnet type		Integral extended							
39										
Actuator	40	Direction of action								
	41	Spring range							7 TO 15	
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection							IP-65 EEXt-a (Cenelec)	
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve							YES	
	48	Pressure gauge							YES	
	49	Handwheel							NO	
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption			62 KG				

Notes: (1) Design temperature = -104 / 60 0C
(2) Valve closes upon increasing the variable.
(3) Mixed phase at valve outlet: % wt of vaporization: 14.9 % vapor density 8.9 kg / m3.

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 PARIS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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					Code: 507	Dwg. No.: 6465C 30 SP 1541 50		Rev : 1

General Data	1	Tag No.			30TV 50062					
	2	Client Reference	Requisition No.	Item	1541-01		15016			
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number			4"-ER50024A-DJ01-C				
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number			4 in				
	10	Line schedule	Piping class			10S DJ01				
Operating Conditions	11	Calculation Results From:			Internal		● Manufacturer		: Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal							
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	477.3		kg/m3			
	16	Vapour Pressure at T nom.								
	17	Critical Pressure	Critical Temperature			50.32 bar-a				
	18	Fluid	Phase	State			Ethylene	Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	20771		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-48		:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	11.4		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	6.45		bar	
	23	CV	Min.	Norm.	Max.	26.81				
	24	Noise	Min.	Norm.	Max.					
	25	Required CV								
	26	Selected CV	Internal / Mfr			/ 47				
	27	Fd	Internal / Mfr		FI (Cf)	/		0.914		
28	Fluid tending to	Air-Fail Position								
29	Body type	Body material			Single Seat Globe		A 351 Gr. CF8M			
30	Design Pressure	Min.	Max.	bar-g		12.3 bar-g				
31	Design Temperature	Min.	Max.							
32	Max.DP closed valve	8.3			bar					
33	Valve end con.& rating	Seat leakage class			3 in - 300 lb ANSI RF		CLASS V			
34	Plug type	Plug material			Contoured		316 S.S. + STELLITE			
35	Plug dim.	Plug form/law			LINEAR					
36	Seat type	Q.ty	Material	Threaded		316 S.S. + STELLITE				
37	Packing mat.	Lubricator			KELVAR PTFE					
38	Bonnet type	Extended								
39										
Actuator	40	Direction of action								
	41	Spring range			11 TO 23					
Positioner	42	Type	Input signal			Filed Bus		Field Bus		
	43	Air supply	Action dir.			4 BAR-G				
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel								
	50	Solenoid valve	Spec. No.							
	51	Pos.detector	Spec. No.							
52	Weight	Consumption			104 KG					

Notes: (1) Design temperature: -104 / 600C
(2) Valve opens upon increasing the variable.
(3) Mixed phase at valve outlet: % wt of vaporization: 14.9% vapor density : 8.9 kg/m3.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 50071					
	2	Client Reference	Requisition No.	Item	1541-01		15017			
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number								
	5	Service			C2 Refrig From D 509					
	6	P&ID No.			0021-50-07					
Inlet line	7	Diameter	Number				4"-ER50039A-DJ01-C			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		4 in					
	10	Line schedule	Piping class		10S		DJ04			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal			28.1				
	14	Cp/Cv	Compressibility			1.45		0.811		
	15	Density min	Density nor	Density max				22 kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		Ethylene		Gas		Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	10000		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-46.2		°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	11.46		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	9.96		bar	
	23	CV	Min.	Norm.	Max.					
	24	Noise	Min.	Norm.	Max.			83.6 dBA		
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 53				
27	Fd	Internal / Mfr		FI (Cf)		/		0.975		
28	Fluid tending to		Air-Fail Position					Close		
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M		
	30	Design Pressure		Min.	Max.	bar-g		12 bar-g		
	31	Design Temperature		Min.	Max.					
	32	Max.DP closed valve			12 bar					
	33	Valve end con.& rating		Seat leakage class		4 in - 300 lb ANSI RF		CLASS V		
	34	Plug type		Plug material			Contoured		316 S.S. + STELLITE	
	35	Plug dim.		Plug form/law			Red. trim		LO-DB 2 STAGE LINEAR	
	36	Seat type		Q.ty	Material		Clamped in		316 S.S. + STELLITE	
	37	Packing mat.		Lubricator			KELVAR PTFE			
	38	Bonnet type		Extended						
Actuator	40	Direction of action								
	41	Spring range			21 TO 45					
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			YES					
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
	52	Weight		Consumption		200 KG				

Notes: (1) Valve opens upon increasing the variable.
(2) No flow in normal operation.
(3) Design temperature = -104 / 60 OC.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARIS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30TV 50072					
	2	Client Reference	Requisition No.	Item	1541-01		15018			
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number								
	5	Service			Quench Line To D 509					
	6	P&ID No.			0021-50-07					
Inlet line	7	Diameter	Number				3"-ER50028A-DJ01-C			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		4 in					
	10	Line schedule	Piping class		10S		DJ01			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal							
	14	Cp/Cv	Compressibility							
	15	Density min	Density nom	Density max		477.3		kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure	Critical Temperature		50.32 bar-a					
	18	Fluid	Phase	State		Ethylene		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	7840		kg/h	
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	-48		°C	
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	11.39		bar-a	
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	9.88		bar	
	23	CV	Min.	Norm.	Max.			10		
	24	Noise	Min.	Norm.	Max.					dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 26				
27	Fd	Internal / Mfr		FI (Cf)			0.927			
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type	Body material		Single Seat Globe		A 351 Gr. CF8M			
	30	Design Pressure	Min.	Max.	bar-g		12.3		bar-g	
	31	Design Temperature	Min.	Max.						
	32	Max.DP closed valve			11.75		bar			
	33	Valve end con.& rating	Seat leakage class		2 in - 300 lb ANSI RF		CLASS V			
	34	Plug type	Plug material		Contoured		316 S.S. + STELLITE			
	35	Plug dim.	Plug form/law						LINEAR	
	36	Seat type	Q.ty	Material	Threaded		316 S.S. + STELLITE			
	37	Packing mat.	Lubricator		KELVAR PTFE					
	38	Bonnet type			Extended					
39										
Actuator	40	Direction of action								
	41	Spring range			21 TO 45					
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			YES					
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
	52	Weight	Consumption		57 KG					

Notes: (1) Design temperature = -104 / 60 OC
(2) Valve opens upon increasing the variable.
(3) Mixed phase at valve outlet: % vt of vaporization: 27.5 vapor density: 2.9 kg/m3.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE		Sheet 19		of 30	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30UV 50102					
	2	Client Reference	Requisition No.	Item	1541-01		15019			
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex				
	4	Serial Number								
	5	Service							From C501 Stage3 Outl	
	6	P&ID No.							0021-50-08	
Inlet line	7	Diameter	Number		4"-PR50046A-EB01-N					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		4 in					
	10	Line schedule	Piping class		STD		EB01			
Operating Conditions	11	Calculation Results From:			Internal <input type="radio"/> Manufacturer <input checked="" type="radio"/> Both <input type="radio"/>					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal					0.009	cP	
	14	Cp/Cv	Compressibility					1.18	0.951	
	15	Density min	Density nor	Density max		5.5			kg/m3	
	16	Vapour Pressure at T nom.								
	17	Critical Pressure			Critical Temperature					
	18	Fluid	Phase	State		Liquid				
	19	Flow	Min.	Norm.	Max.	Unit	4041		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	15		C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	2.9		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.4		bar	
	23	CV	Min.	Norm.	Max.	79.9				
	24	Noise	Min.	Norm.	Max.	86.9				dba
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 81				
27	Fd	Internal / Mfr		FI (Cf)		/		0.850		
28	Fluid tending to		Air-Fail Position						OPEN	
Valve Body	29	Body type		Body material					ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.					
	31	Design Temperature		Min.	Max.					
	32	Max.DP closed valve								
	33	Valve end con. & rating		Seat leakage class		3 in - 300 lb ANSI RF		CLASS VI (TSO)		
	34	Plug type		Plug material		Eccentric rotary		316L S.S. + STELLITE		
	35	Plug dim.		Plug form/flaw		Red. trim		LINEAR		
	36	Seat type		Q.ty	Material					SS 316 PTFE SOFT SEAT
	37	Packing mat.		Lubricator					KELVAR PTFE WITH VITON O RINGS	
	38	Bonnet type		Integral extended						
Actuator	40	Direction of action								
	41	Spring range							7 TO 15	
Positioner	42	Type		Input signal						
	43	Air supply		Action dir.						
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device							YES	
	47	Pressure reducing valve							YES	
	48	Pressure gauge							YES	
	49	Handwheel								
	50	Solenoid valve		Spec. No.		YES				
51	Pos.detector		Spec. No.		YES (2 nos. of limit switch)					
52	Weight		Consumption		48 KG					

Notes: 1) Air volume tank is required. The capacity shall be sufficient to allow three strokes.
2) This is an on-off valve.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARIS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 50105						
	2	Client Reference	Requisition No.	Item	1541-01		15020				
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex					
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		12" - PR50006A-EA01-P						
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		12 in						
	10	Line schedule	Piping class		20		EA01				
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both		
	12	Sour service		Special conditions							
	13	Molecular Weight		Viscosity at @ normal		42.08					
	14	Cp/Cv		Compressibility		1.24		0.832			
	15	Density min	Density nor	Density max				30		kg/m3	
	16	Vapour Pressure at T nom.									
	17	Critical Pressure		Critical Temperature							
	18	Fluid	Phase	State		Propylene		Gas		Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit			86026		kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit			82		°C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit			17.45		bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit			0.35		bar
	23	CV	Min.	Norm.	Max.			997.1			
	24	Noise	Min.	Norm.	Max.			<70		dBA	
	25	Required CV									
26	Selected CV		Internal / Mfr				/ 1300				
27	Fd	Internal / Mfr		FI (Ci)				0.726			
28	Fluid tending to		Air-Fail Position								
Valve Body	29	Body type		Body material							
	30	Design Pressure		Min.	Max.	bar-g		20.5		bar-g	
	31	Design Temperature		Min.	Max.			105			
	32	Max. DP closed valve				4.4		bar			
	33	Valve end con. & rating		Seat leakage class		10 in - 300 lb ANSI RF		CLASS VI (TSO)			
	34	Plug type		Plug material							
	35	Plug dim.		Plug form/law							
	36	Seat type		Q.ty	Material				316 S.S.+PTFE SOFT SEA		
	37	Packing mat.		Lubricator							
	38	Bonnet type		Integral extended							
	Actuator	40	Direction of action								
41		Spring range									
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply		Action dir.		4 BAR-G					
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve									
	48	Pressure gauge									
	49	Handwheel									
	50	Solenoid valve		Spec. No.							
51	Pos. detector		Spec. No.								
	52	Weight		Consumption		210 KG					

Notes: (1) Valve closes upon increasing the variable.

					INSTRUMENT SPECIFICATION			TECHNIP			
					Control Valve					PARIS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE						
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE						
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General Data	1	Tag No.			30PV 50121			
	2	Client Reference	Requisition No.	Item	1541-01		15021	
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe		
	4	Serial Number						
	5	Service						
	6	P&ID No.						
Inlet line	7	Diameter	Number		8"-PR50007A-EB01-N			
	8	Line schedule	Piping class					
Outlet line	9	Diameter	Number		10 in			
	10	Line schedule	Piping class		20 EB01			
Operating Conditions	11	Calculation Results From:			Internal <input type="radio"/> Manufacturer <input checked="" type="radio"/> Both <input type="radio"/>			
	12	Sour service	Special conditions					
	13	Molecular Weight	Viscosity at @ normal					
	14	Cp/Cv	Compressibility					
	15	Density min	Density nor	Density max		40.5 kg/m3		
	16	Vapour Pressure atT nom.						
	17	Critical Pressure			Critical Temperature			
	18	Fluid	Phase	State		Propylene Gas Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	63663 kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	45 :C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	19.5 bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	18 bar	
	23	CV	Min.	Norm.	Max.	136.4		
	24	Noise	Min.	Norm.	Max.	83.1 dBA		
	25	Required CV						
26	Selected CV			Internal / Mfr / 250				
27	Fd	Internal / Mfr		FI (Cf)	/ 0.975			
28	Fluid tending to		Air-Fail Position					
Valve Body	29	Body type		Body material				
	30	Design Pressure	Min.	Max.	bar-g 20.5 bar-g			
	31	Design Temperature	Min.	Max.	90			
	32	Max.DP closed valve		20.5 bar				
	33	Valve end con & rating	Seat leakage class		8 in - 300 lb ANSI RF CLASS V			
	34	Plug type	Plug material					
	35	Plug dim.	Plug form/law					
	36	Seat type	Q.ty	Material				
	37	Packing mat.	Lubricator					
	38	Bonnet type	STANDARD (T = -54 Deg. C)					
Actuator	40	Direction of action						
	41	Spring range						
Positioner	42	Type	Input signal					
	43	Air supply	Action dir.					
	44	Protection						
Accessories	45	Booster relay						
	46	Locking device						
	47	Pressure reducing valve						
	48	Pressure gauge						
	49	Handwheel						
	50	Solenoid valve	Spec. No.					
51	Pos.detector	Spec. No.						
52	Weight		Consumption					

Notes: (1) Valve opens upon increasing the variable.
(2) Design temperature = 0 / 90 OC to be suitable for -48 OC and 0 bar_g
(3) Supply includes 8" LO-DB plate (CV=650).

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30LV 50122					
	2	Client Reference	Requisition No.	Item	1541-01		15022			
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		16"-PR50033A-EB01-C					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		18 in					
	10	Line schedule	Piping class		10		DB01			
Operating Conditions	11	Calculation Results From:								
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal					0.055	cP	
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	478.7	478.7	486.2	kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure	Critical Temperature							
	18	Fluid	Phase	State		Propylene	Liquid	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	61095	505198	555718	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	40.6	40.6	37.1	°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	18.63	18.01	16.52	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	12.06	11.37	9.87	bar
	23	CV	Min.	Norm.	Max.		46.86	423	494.8	
	24	Noise	Min.	Norm.	Max.					dBA
	25	Required CV								
26	Selected CV Internal / Mfr									
27	Fd	Internal / Mfr	FI (Cf)	/ 900		0.920@max.				
28	Fluid tending to		Air-Fail Position			Close				
Valve Body	29	Body type		Body material				A 351 Gr. CF8M		
	30	Design Pressure	Min.	Max.	bar-g		20.7 bar-g			
	31	Design Temperature	Min.	Max.						
	32	Max.DP closed valve			15.2 bar					
	33	Valve end con. & rating	Seat leakage class			10 in - 300 lb ANSI RF	CLASS IV			
	34	Plug type		Plug material				316 S.S. + STELLITE		
	35	Plug dim.		Plug form/flaw				Full trim =%		
	36	Seat type		Q.ty	Material		Clamped in		316 S.S. + STELLITE	
	37	Packing mat.		Lubricator						
	38	Bonnet type		STANDARD (T= - 48 Deg. C)						
39										
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal				Smart	4w20 mA 24Vdc HART		
	43	Air supply	Action dir.				4 BAR-G			
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve								
	48	Pressure gauge								
	49	Handwheel								
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
	52	Weight		Consumption		760 KG				

Notes: (1) Valve opens upon increasing the variable
(2) Mixed phase at valve outlet: % wt of vaporization: 25.4 vapor density: 13.62 kg/m3
(3) Design temperature = -48 / 90 OC

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE			
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.				30PV 50132A							
	2	Client Reference		Requisition No.		Item		1541-01		15023			
	3	Supplier		Model		DRESSER FLOW CONTROL		Butterfly Flangeless					
	4	Serial Number											
	5	Service										Gas PR to D503	
	6	P&ID No.										0021-50-10	
Inlet line	7	Diameter		Number				28"-PR50010A-DB01-C					
	8	Line schedule		Piping class									
Outlet line	9	Diameter		Number		28 in							
	10	Line schedule		Piping class		10		DB01					
Operating Conditions	11	Calculation Results From:				<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both			
	12	Sour service		Special conditions									
	13	Molecular Weight		Viscosity at @ normal		42.08		0.009 cP					
	14	Cp/Cv		Compressibility		1.2		0.904					
	15	Density min	Density nor	Density max	12.8	12.8	11.9	kg/m3					
	16	Vapour Pressure at T nom.											
	17	Critical Pressure		Critical Temperature									
	18	Fluid		Phase		State		Propylene		Gas		Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	52862	190740	209814	kg/h			
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	34	34	29.9	°C			
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.98	6.93	6.46	bar-a			
	22	DP	QMin.	Q Norm.	Q Max.	Unit	0.57	0.45	0.05	bar			
	23	CV	Min.	Norm.	Max.		916.1	3448	11725				
	24	Noise	Min.	Norm.	Max.		76.7	85	<70	dBA			
	25	Required CV											
26	Selected CV Internal / Mfr										/ 31000		
27	Fd	Internal / Mfr		FI (Ci)		/		0.681@max.					
28	Fluid tending to		Air-Fail Position						Open				
Valve Body	29	Body type		Body material		Butterfly		A 351 Gr. CF8M					
	30	Design Pressure		Min.	Max.	bar-g		15 bar-g					
	31	Design Temperature		Min.	Max.								
	32	Max.DP closed valve				9.6 bar							
	33	Valve end con.& rating		Seat leakage class		24 in - 150 lb ANSI RF		CLASS IV					
	34	Plug type		Plug material				A 351 Gr. CF8M					
	35	Plug dim.		Plug form/law				=%					
	36	Seat type		Q.ty	Material			Incolloy 825					
	37	Packing mat.		Lubricator		PTFE							
	38	Bonnet type											
39													
Actuator	40	Direction of action											
	41	Spring range											
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART					
	43	Air supply		Action dir.		4 BAR-G							
	44	Protection										IP-65 EEXi-a (Cenelec)	
Accessories	45	Booster relay										YES	
	46	Locking device											
	47	Pressure reducing valve										YES	
	48	Pressure gauge										YES	
	49	Handwheel										YES	
	50	Solenoid valve		Spec. No.									
51	Pos.detector		Spec. No.										
	52	Weight		Consumption		1040 KG							

Notes: (1) Valve closes upon increasing the variable.
(2) Design temperature = -48 / 60 OC.
(3) Actuator model no. is B1JARRU32. Valve model is LIC.

					INSTRUMENT SPECIFICATION			TECHNIP			
					Control Valve					PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE						
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE						
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General Data	1	Tag No.			30PV 50132B				
	2	Client Reference	Requisition No.	Item	1541-01		15024		
	3	Supplier	Model		DRESSER FLOW CONTROL		Butterfly Flangeless		
	4	Serial Number							
	5	Service			Anti Surge Line to D505				
	6	P&ID No.			0021-50-11				
Inlet line	7	Diameter	Number				20" PR50010A-DB01-C		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		28 in				
	10	Line schedule	Piping class		10		DB01		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		42.08				
	14	Cp/Cv	Compressibility		1.22		0.881		
	15	Density min	Density nor	Density max				13.1	kg/m3
	16	Vapour Pressure at T nom.							
	17	Critical Pressure			Critical Temperature				
	18	Fluid	Phase	State		Propylene		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	301851		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	8.8		°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.3		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.64		bar
	23	CV	Min.	Norm.	Max.			5066	
	24	Noise	Min.	Norm.	Max.			100.2	dBA
25	Required CV								
26	Selected CV Internal / Mfr			/ 13700					
27	Fd Internal / Mfr			FI (Cf)		/			
28	Fluid tending to		Air-Fail Position				Open		
29	Body type		Body material		Butterfly		316 S.S. (ASTM A351 GR CF8M)		
30	Design Pressure		Min.	Max.	bar-g		15	bar-g	
31	Design Temperature		Min.	Max.					
32	Max.DP closed valve				14.35 bar				
33	Valve end con.& rating		Seat leakage class		16 in - 150 lb ANSI RF		CLASS V		
34	Plug type		Plug material						
35	Plug dim.		Plug form/law						
36	Seat type		Q.ty	Material					
37	Packing mat.		Lubricator						
38	Bonnet type								
39									
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal		Smart		4-20 mA 24Vdc HART		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Genelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			YES				
	50	Solenoid valve	Spec. No.						
51	Pos.detector	Spec. No.							
52	Weight	Consumption		480 KG					

- Notes: (1) Valve opens upon increasing the variable.
(2) Design temperature = -48 / 60 OC.
(3) Flowrate to be finalised with compressor vendor.
(4)
(5) Valve supplied with one multihole plate 20" Dia.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	02/04/2003	REVISED		Sheet 25		of 30	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision	Code: 507	Dwg. No.: 6465C 30 SP 1541 50	Rev.: 2		

General Data	1	Tag No.			30TV 50141					
	2	Client Reference	Requisition No.	Item	1541-01		15025			
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number								
	5	Service			Quench To D 504					
	6	P&ID No.			0021-50-11					
Inlet line	7	Diameter	Number		6"-PR50015A-DB01-C					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		6 in					
	10	Line schedule	Piping class		STD		DB01			
Operating Conditions	11	Calculation Results From:			Internal		● Manufacturer) Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal						
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max		541		kg/m3		
	16	Vapour Pressure atT nom.								
	17	Critical Pressure		Critical Temperature		46.2 bar-a				
	18	Fluid	Phase	State		Propylene		Liquid		Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	52336		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	3.5		°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.5		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3.1		bar	
	23	CV	Min.	Norm.	Max.					
	24	Noise	Min.	Norm.	Max.	92.29		dBA		
25	Required CV									
26	Selected CV		Internal / Mfr		/ 113					
27	Fd	Internal / Mfr		FI (Cf)		/		0.903		
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M		
	30	Design Pressure		Min.	Max.	bar-g		15.4 bar-g		
	31	Design Temperature		Min.	Max.					
	32	Max.DP closed valve				13 bar				
	33	Valve end con.& rating		Seat leakage class		4 in - 300 lb ANSI RF		CLASS V		
	34	Plug type		Plug material		Contoured		316 S.S. + STELLITE		
	35	Plug dim.		Plug form/law		LINEAR				
	36	Seat type		Q.ty	Material	Threaded		316 S.S. + STELLITE		
	37	Packing mat.		Lubricator		KELVAR PTFE				
	38	Bonnet type				Extended (EB)				
39										
Actuator	40	Direction of action								
	41	Spring range			21 TO 45					
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			YES					
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
	52	Weight		Consumption		200 KG				

Notes: (1) Design temperature : -48 / 60 OC
(2) Valve opens upon increasing the variable.
(3) Mixed phase at valve outlet: % wt of vaporization: 11.8 vapor density: 7.3 kg / m3.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 50143					
	2	Client Reference	Requisition No.	Item	1541-01		15026			
	3	Supplier	Model	DRESSER FLOW CONTROL		30000 Series Vanmax				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		12"-PR50022A-DB01-C					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		12 in					
	10	Line schedule	Piping class		20		DB01			
Operating Conditions	11	Calculation Results From:								
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal							
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	566.2	566.2	566.1	kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure	Critical Temperature							
	18	Fluid	Phase	State		Propylene	Liquid	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	22368	244311	268742	kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	-13.9	-13.9	-13.9	°C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	7.61	6.8	6.52	bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	3.91	3.08	2.79	bar
	23	CV	Min.	Norm.	Max.		19 05	239	276.2	
	24	Noise	Min.	Norm.	Max.					dBA
	25	Required CV								
26	Selected CV Internal / Mfr									
27	Fd	Internal / Mfr		FI (Cf)		/	0.839@max.			
Valve Body	28	Fluid tending to		Air-Fail Position		Close				
	29	Body type		Body material		A 351 Gr. CF8M				
	30	Design Pressure	Min.	Max.	bar-g		16.9 bar-g			
	31	Design Temperature	Min.	Max.						
	32	Max. DP closed valve			14.2 bar					
	33	Valve end con. & rating	Seat leakage class		8 in - 300 lb ANSI RF		CLASS IV			
	34	Plug type	Plug material							
	35	Plug dim.	Plug form/flaw							
	36	Seat type	Q. ty	Material		316 S.S. + STELLITE				
	37	Packing mat.	Lubricator							
38	Bonnet type		Integral extended							
39										
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve								
	48	Pressure gauge								
	49	Handwheel								
	50	Solenoid valve	Spec. No.							
51	Pos. detector	Spec. No.								
52	Weight		Consumption		95 KG					

- Notes: (1) Design temperature: -48 / 60 OC
(2) Valve closes upon increasing the variable.
(3) Mixed phase at valve outlet: % wt of vaporization: 2.4 vapor density: 6.95 kg / m3.
(4) Adjustment at position G (CV=420).

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30TV 50152					
	2	Client Reference	Requisition No.	Item	1541-01		15027			
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		8"-PR50017A-DB01-C					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		16 in					
	10	Line schedule	Piping class		10		DB01			
Operating Conditions	11	Calculation Results From:			Internal		● Manufacturer		Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal							
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	541		kg/m3			
	16	Vapour Pressure at T nom.								
	17	Critical Pressure	Critical Temperature		46.2 bar-a					
	18	Fluid	Phase	State		Propylene		Liquid		Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	192208		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	3.5		°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.52		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.89		bar	
	23	CV	Min.	Norm.	Max.	330				
	24	Noise	Min.	Norm.	Max.			dBA		
	25	Required CV								
	26	Selected CV		Internal / Mfr		1575				
27	Fd	Internal / Mfr		FI (Cf)	/		0.919			
28	Fluid tending to		Air-Fail Position			Close				
Valve Body	29	Body type		Body material		A 351 Gr. CF8M				
	30	Design Pressure		Min.	Max.	bar-g		15.4 bar-g		
	31	Design Temperature		Min.	Max.					
	32	Max.DP closed valve		14.8 bar						
	33	Valve end con.& rating		Seat leakage class		8 in - 300 lb ANSI RF		CLASS V		
	34	Plug type		Plug material		BALANCED		316 S.S. + STELLITE		
	35	Plug dim.		Plug form/flaw		=%				
	36	Seat type		Q.ty	Material	Clamped in		316 S.S. + STELLITE		
	37	Packing mat.		Lubricator		KELVAR PTFE				
	38	Bonnet type		STANDARD (T= - 48 Deg.C)						
39										
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve		YES						
	48	Pressure gauge		YES						
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		563 KG					

Notes: (1) Design temperature: -48 / 60 OC
(2) Valve opens upon increasing the variable.
(3) Mixed phase at valve outlet: % wt of vaporization: 21.6 vapor density: 3.65 kg /m3.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 50701A						
	2	Client Reference	Requisition No.	Item	1541-01		15028				
	3	Supplier	Model	DRESSER FLOW CONTROL		Camflex Flangeless					
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		8"-TC65004A-DA04-N						
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		8 in						
	10	Line schedule	Piping class		20		DA04				
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal						0.51 cP		
	14	Cp/Cv	Compressibility								
	15	Density min	Density nor	Density max	986	986	986	kg/m3			
	16	Vapour Pressure at T nom.			0.15 bar-a						
	17	Critical Pressure		Critical Temperature		221.3 bar-a		374.15 °C			
	18	Fluid	Phase	State		TC		Liquid		1 Phase	
	19	Flow	Min.	Norm.	Max.	Unit	70000	165000	208000	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	54	54	54	°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	8.2	7.9	7.6	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	1.2	0.9	0.6	bar	
	23	CV	Min.	Norm.	Max.		74.71	204.3	318		
	24	Noise	Min.	Norm.	Max.		<70	70.7	<70	dBA	
	25	Required CV									
26	Selected CV			Internal / Mfr		/ 500					
27	Fd	Internal / Mfr		FI (Cf)		/		0.759@max.			
28	Fluid tending to		Air-Fail Position								
CLOSE											
Valve Body	29	Body type		Body material						ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g		8 bar-g			
	31	Design Temperature		Min.	Max.	70					
	32	Max.DP closed valve		8 bar							
	33	Valve end con.& rating		Seat leakage class				6 in - 300 lb ANSI RF		CLASS IV	
	34	Plug type		Plug material						Eccentric rotary	
	35	Plug dim.		Plug form/flaw						Full trim	
	36	Seat type		Q.ty	Material		316 S.S.				
	37	Packing mat.		Lubricator							
	38	Bonnet type		Integral extended							
39											
Actuator	40	Direction of action									
	41	Spring range									
Positioner	42	Type	Input signal			Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.			4 BAR-G					
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve									
	48	Pressure gauge									
	49	Handwheel									
	50	Solenoid valve		Spec. No.							
51	Pos.detector		Spec. No.								
	52	Weight		Consumption		100 KG					

Notes: 1) Molecular weight = 18.
2) Valve opens upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 50701B						
	2	Client Reference	Requisition No.	Item	1541-01		15029				
	3	Supplier	Model		DRESSER FLOW CONTROL		Camflex Flangeless				
	4	Serial Number									
	5	Service			Steam Cond STC 501						
	6	P&ID No.			0041-50-03						
Inlet line	7	Diameter	Number				10"-TC65004A-DA04-N				
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		10 in						
	10	Line schedule	Piping class		20		DA04				
Operating Conditions	11	Calculation Results From:			Internal		● Manufacturer		Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal					0.512 cP			
	14	Cp/Cv	Compressibility								
	15	Density min	Density nor	Density max	986	986	986	kg/m3			
	16	Vapour Pressure at T nom.			0.15 bar-a						
	17	Critical Pressure		Critical Temperature							
	18	Fluid	Phase	State		TC		Liquid		1 Phase	
	19	Flow	Min.	Norm.	Max.	Unit	67000	165000	208000	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	54	54	54	°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	5.5	6.1	6.9	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.5	5.1	5.9	bar	
	23	CV	Min.	Norm.	Max.	29.85		90.18		149	
	24	Noise	Min.	Norm.	Max.	83.7		81.5		78.4 dBA	
	25	Required CV									
26	Selected CV			Internal / Mfr		/ 230					
27	Fd		Internal / Mfr		Fi (Cf)		/		0.870@max.		
28	Fluid tending to		Air-Fail Position						CLOSE		
Valve Body	29	Body type		Body material				ASTM A216 GR WCC			
	30	Design Pressure		Min.	Max.			7 bar-g			
	31	Design Temperature		Min.	Max.			70			
	32	Max.DP closed valve									
	33	Valve end con.& rating		Seat leakage class		4 in - 300 lb ANSI RF		CLASS IV			
	34	Plug type		Plug material		Eccentric Rotary		316L S.S. + STELLITE			
	35	Plug dim.		Plug form/law		Full trim		LINEAR			
	36	Seat type		Q.ty	Material			316 SS Stellite hard faced			
	37	Packing mat.		Lubricator		KEVLAR PTFE WITH VITON O RINGS					
	38	Bonnet type				Integral extended					
39											
Actuator	40	Direction of action									
	41	Spring range			7 TO 15						
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply		Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)						
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve			YES						
	48	Pressure gauge			YES						
	49	Handwheel									
	50	Solenoid valve		Spec. No.							
51	Pos.detector		Spec. No.								
52	Weight		Consumption		49 KG						

Notes: 1) Valve supplied with one multiholes plate 4" Dia.
2) Molecular weight = 18.
3) Valve opens upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP		 PARIS PETROCHEMICAL COMPANY	
					Control Valve		 6465C30		Sheet 30 of 30	
1	T.G.	FR	FR	14/10/2002	ISSUED FOR PURCHASE					
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								Rev. 1		

UNIT 60

TECHNIP9TH OLEFIN COMPLEX

ETHANE CRACKING PLANT



PARS PETROCHEMICAL COMPANY

CONTRACTOR DOCUMENT N°							OWNER DOCUMENT N°						
Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page	Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page
6465C	30	SP	1541	60	3	1/33	3930	30	SP	1541	60	3	1/33

CONTROL VALVES DATA SHEETS**(SECTION 60)**



Pages modified under this revision: 33.

3	02/04/03	Revised					T.GRANDRY	F.REGARD	J.M ANBRY				
2	15/10/02	Issue for purchase					T.GRANDRY	F.REGARD	P.E.CROUZIER				
1	10/07/02	Issue for purchase					T.GRANDRY	F.REGARD	P.E.CROUZIER				
0	03/05/02	Issue for purchase					S.SRIRAM	T.GRANDRY	P.E.CROUZIER				
Rev	Date DD/MM/YY	STATUS					WRITTEN BY (name & visa)	CHECKED BY (name & visa)	APPROVED BY (name & visa)				
DOCUMENT REVISIONS													

Sections changed in last revision are identified by a vertical line in the right margin



General Data	1	Tag No.			30LV 60001A					
	2	Client Reference	Requisition No.	Item	1541-01		16001			
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number								
	5	Service			DW To TK616					
	6	P&ID No.			0021-60-01					
Inlet line	7	Diameter	Number				8"-DW65001A-DJ03-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		8 in					
	10	Line schedule	Piping class		10S		DJ03			
Operating Conditions	11	Calculation Results From:			Internal		● Manufacturer		Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal				0.85		cP
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max	996	996	996	kg/m3		
	16	Vapour Pressure at T nom.			0.04		bar-a			
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		DW		Liquid		Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	44000	100000	252000	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	27	27	27	°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.6	5.8	4.3	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.6	3.8	2.3	bar
	23	CV	Min.	Norm.	Max.		23.85	59.65	194.1	
	24	Noise	Min.	Norm.	Max.		80.3	82.6	83.4	dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 400				
27	Fd	Internal / Mfr	FI (Cf)			/		0.921@max.		
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type		Body material				A351 Gr. CF8M		
	30	Design Pressure		Min.	Max.	bar-g		7 bar-g		
	31	Design Temperature		Min.	Max.			65		
	32	Max.DP closed valve					7		bar	
	33	Valve end con.& rating		Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		Contoured		316 S.S.		
	35	Plug dim.		Plug form/law				-%		
	36	Seat type		Q.ty	Material	Screwed		316 S.S.		
	37	Packing mat.		Lubricator		KELVAR PTFE				
	38	Bonnet type				STANDARD				
39										
Actuator	40	Direction of action								
	41	Spring range			21 TO 45					
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		283 KG					

Notes: (1) NORMALLY NO FLOW
(2) VALVE CLOSSES UPON INCREASING THE VARIABLE

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARIS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code 507		Dwg No : 6465C 30 SP 1541 60	
							Sheet 2		of	
							Rev : 2			

General Data	1	Tag No.			30LV 60001B					
	2	Client Reference	Requisition No.	Item	1541-01		16002			
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number								
	5	Service			TC To TK616					
	6	P&ID No.			0021-60-01					
Inlet line	7	Diameter	Number		10"-TC65001A-DA04-N					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		10 in					
	10	Line schedule	Piping class		20		DA04			
Operating Conditions	11	Calculation Results From:			Internal		● Manufacturer		□ Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal		0.51		cP		
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max	986	986	986	kg/m3		
	16	Vapour Pressure at T nom.			0.15 bar-a					
	17	Critical Pressure		Critical Temperature		221.3 bar-a				
	18	Fluid	Phase	State		TC		Liquid		Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	101200	253000	276000	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	54	54	54	°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.9	6.75	6.7	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.9	4.75	4.7	bar
	23	CV	Min.	Norm.	Max.		53.8	143.2	159.1	
	24	Noise	Min.	Norm.	Max.		84.4	84.4	84.9	dB(A)
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 195				
27	Fd	Internal / Mfr		FI (Ci)		/		0.903@max.		
28	Fluid tending to		Air-Fail Position		Close					
Valve Body	29	Body type		Body material		ASTM A216 GR WCC				
	30	Design Pressure	Min.	Max.	bar-g		8 bar-g			
	31	Design Temperature	Min.	Max.	70					
	32	Max.DP closed valve			8 bar					
	33	Valve end con.& rating	Seat leakage class		4 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type	Plug material		Contoured		416 SS			
	35	Plug dim.	Plug form/law		=%					
	36	Seat type	Q.ty	Material		Screwed		416 SS		
	37	Packing mat.	Lubricator		KELVAR PTFE					
	38	Bonnet type		STANDARD						
39										
Actuator	40	Direction of action								
	41	Spring range			21 TO 45					
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
52	Weight		Consumption		128 KG					

Notes: (1) Valve closes upon increasing the variable -

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 6007				
	2	Client Reference	Requisition No.	Item	1541-01		16003		
	3	Supplier	Model		DRESSER FLOW CONTROL		Camflex Flangeless		
	4	Serial Number							
	5	Service			Polish Feed Wtr to W601				
	6	P&ID No.			0021-60-01				
Inlet line	7	Diameter	Number				8"-DW65003A-DJ03-N		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		8 in				
	10	Line schedule	Piping class		10S		DJ03		
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal <input checked="" type="checkbox"/> Manufacturer <input type="checkbox"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal						
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max			986	kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		DW		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	274000		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	54		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	4.5		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	2.3		bar
	23	CV	Min.	Norm.	Max.				
	24	Noise	Min.	Norm.	Max.			83.7	dBA
25	Required CV								
26	Selected CV Internal / Mfr			/ 300					
27	Fd	Internal / Mfr	FI (Cf)	/		0.880			
28	Fluid tending to		Air-Fail Position				Open		
Valve Body	29	Body type		Body material				A 351 Gr. CF8M	
	30	Design Pressure	Min.	Max.	bar-g		5 bar-g		
	31	Design Temperature	Min.	Max.					
	32	Max.DP closed valve				5 bar			
	33	Valve end con.& rating	Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		Eccentric rotary		316 S.S. + STELLITE	
	35	Plug dim.		Plug form/flaw		Red. trim		LINEAR	
	36	Seat type		Q.ty	Material			316 S.S.	
	37	Packing mat.		Lubricator		KELVAR PTFE WITH VITON O RINGS			
	38	Bonnet type				Integral extended			
39									
Actuator	40	Direction of action							
	41	Spring range			7 TO 24				
Positioner	42	Type	Input signal		Field Bus		Field Bus		
	43	Air supply	Action dir.		4 BAR-G				
44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve	Spec. No.						
51	Pos.detector	Spec. No.							
52	Weight		Consumption		100 KG				

Notes: (1) Normally no flow
(2) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE		Sheet 4		of	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE		Rev 2			
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General Data	1	Tag No.			30PV 60008A					
	2	Client Reference	Requisition No.	Item	1541-01		16004			
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number								
	5	Service			TC To OSBL					
	6	P&ID No.			0021-60-01					
Inlet line	7	Diameter	Number					10"-TC65006A-DA04-N		
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		2	in				
	10	Line schedule	Piping class		STD	DA04				
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal				0.51 cP		
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max	986	986	986	kg/m3		
	16	Vapour Pressure atT nom.			0.15 bar-a					
	17	Critical Pressure		Critical Temperature		221.3				
	18	Fluid	Phase	State		TC	Liquid		1 Phase	
	19	Flow	Min.	Norm.	Max.	Unit	1800	22600	276000 kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	54	54	54 :C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.9	6.75	6.7 bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3.4	1.6	0.4 bar	
	23	CV	Min.	Norm.	Max.		1.141			
	24	Noise	Min.	Norm.	Max.		<70	dBA		
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 3.8				
27	Fd			Internal / Mfr		FI (CI)		0.928		
28	Fluid tending to		Air-Fail Position					CLOSE		
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	8	bar-g			
	31	Design Temperature		Min.	Max.	70	:C			
	32	Max.DP closed valve				8	bar			
	33	Valve end con.& rating		Seat leakage class		1	in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material		Contoured		SS 416		
	35	Plug dim.		Plug form/law		Red. trim		=%		
	36	Seat type		Q.ty	Material	Threaded		SS 416		
	37	Packing mat.		Lubricator		KEVLAR PTFE				
	38	Bonnet type				STANDARD				
39										
Actuator	40	Direction of action								
	41	Spring range			3 TO 15					
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
	52	Weight		Consumption		38 KG				

- Notes: 1) Molecular weight = 18.
2) Valve opens upon increasing the variable.
3) Flow rate indicated is the total flow rates for valves A & B ; flow splitting between the two items to be selected to assure effective control from the minimum to the maximum flowrate.
(4) For valve B Maximum operating flow to be 90000 kg/h Valve to be fully opened for 276000 kg/h.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARIS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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							Rev 2			



General Data	1	Tag No.			30PV 60008B				
	2	Client Reference	Requisition No.	Item	1541-01		16005		
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number							
	5	Service			TC To OSBL				
	6	P&ID No.			0021-60-01				
Inlet line	7	Diameter	Number			10"-TC65006A-DA04-N			
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number	10	in				
	10	Line schedule	Piping class	20		DA04			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal			0.51		cP	
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	986	986	986	kg/m3	
	16	Vapour Pressure at T nom.			0.15		bar-a		
	17	Critical Pressure	Critical Temperature			221.3		bar-a	
	18	Fluid	Phase	State		TC		Liquid	
	19	Flow	Min.	Norm.	Max.	Unit	22600	90000	276000
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	54	54	54
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	6.75	6.3	6.7
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	1.6	0.4	0.715
	23	CV	Min.	Norm.	Max.		20.87	167.6	398.3
	24	Noise	Min.	Norm.	Max.		<70	<70	70.3
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 400			
27	Fd	Internal / Mfr		FI (Cf)			0.922@max.		
28	Fluid tending to		Air-Fail Position				CLOSE		
Valve Body	29	Body type	Body material		Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure	Min.	Max.	8	bar-g			
	31	Design Temperature	Min.	Max.	70	°C			
	32	Max.DP closed valve			8		bar		
	33	Valve end con.& rating	Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type	Plug material		Contoured		SS 416		
	35	Plug dim.	Plug form/flaw				=%		
	36	Seat type	Q.ty	Material	Threaded		SS 416		
	37	Packing mat.	Lubricator		KEVLAR PTFE				
	38	Bonnet type			STANDARD				
39									
Actuator	40	Direction of action							
	41	Spring range			21 TO 45				
Positioner	42	Type	Input signal		Field Bus		Field Bus		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel							
	50	Solenoid valve	Spec. No.						
51	Pos.detector	Spec. No.							
52	Weight	Consumption		283 KG					

Notes: 1) Molecular weight = 18.
2) Valve opens upon increasing the variable.
3) Flow rate indicated is the total flow rates for valves A & B ; flow splitting between the two items to be selected to assure effective control from the minimum to the maximum flowrate.
(4) Maximum operating flow to be 90000 kg/h Valve to be fully opened for 276000 kg/h.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE		Sheet 6		of	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30FV 60011					
	2	Client Reference	Requisition No.	Item	1541-01		16006			
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe			
	4	Serial Number								
	5	Service			Polish Wtr To D603					
	6	P&ID No.			0021-60-02					
Inlet line	7	Diameter	Number				6'-DW65005A-DJ03-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		6 in					
	10	Line schedule	Piping class		10S		DJ03			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal						
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max				986		kg/m3
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		DW		Liquid		Single Phase
	19	Flow	Min.	Norm.	Max.	Unit			103500	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit			54	°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit			8.6	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit			6.6	bar
	23	CV	Min.	Norm.	Max.			47.64		
	24	Noise	Min.	Norm.	Max.			79.1		dBA
	25	Required CV								
	26	Selected CV			Internal / Mfr		/ 64			
	27	Fd	Internal / Mfr		FI (Cf)	/		0.975		
28	Fluid tending to		Air-Fail Position				Open			
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M		
	30	Design Pressure		Min.	Max.	bar-g		8.5 bar-g		
	31	Design Temperature		Min.	Max.			70		
	32	Max.DP closed valve					8.5 bar			
	33	Valve end con.& rating		Seat leakage class		3 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		BALANCED		316 S.S. + STELLITE		
	35	Plug dim.		Plug form/law		Full trim		LODB Two stages Linear		
	36	Seat type		Q.ty	Material	Clamped in		316 S.S. + STELLITE		
	37	Packing mat.		Lubricator		KEVLAR PTFE				
	38	Bonnet type				STANDARD				
39										
Actuator	40	Direction of action								
	41	Spring range			3 TO 15					
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		107 KG					

Notes: (1) Normally no flow
(2) Valve closes upon increasing the variable
(3) Valve Dia. 3"x 2" x 3"

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARIS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE		Sheet 7		of	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 60021					
	2	Client Reference	Requisition No.	Item	1541-01		16007			
	3	Supplier		Model	DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number								
	5	Service			Condensate From D602					
	6	P&ID No.			0021-60-03					
Inlet line	7	Diameter		Number			4" LC65002A-DA04-H			
	8	Line schedule		Piping class						
Outlet line	9	Diameter		Number	4 in					
	10	Line schedule		Piping class		STD		DA04		
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal <input checked="" type="radio"/> Manufacturer <input type="checkbox"/> Both					
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal		0.29		cP		
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max	959	959	959	kg/m3		
	16	Vapour Pressure at T nom.			1 bar-a					
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		STEAM COND.		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	12000	21900	47900	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	100	100	100	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	9.5	9	8.7	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.5	3.5	0.3	bar
	23	CV	Min.	Norm.	Max.		6.701	13.87	103.6	
	24	Noise	Min.	Norm.	Max.		<70	70.3	<70	dBA
	25	Required CV								
26	Selected CV Internal / Mfr			/ 195						
27	Fd	Internal / Mfr	FI (Cf)			0.918@max.				
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		9.6 bar-g		
	31	Design Temperature		Min.	Max.			115		
	32	Max.DP closed valve			9.6		bar			
	33	Valve end con & rating		Seat leakage class		4 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		Contoured		SS 416		
	35	Plug dim.		Plug form/flaw		Full trim		=%		
	36	Seat type		Q.ty	Material	Threaded		AISI 416		
	37	Packing mat.		Lubricator		KELVAR PTFE				
	38	Bonnet type				STANDARD				
Actuator	40	Direction of action								
	41	Spring range			21 TO 45					
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve		Spec. No.						
	51	Pos.detector		Spec. No.						
	52	Weight		Consumption		128 KG				

Notes: (1) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
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General Data	1	Tag No.			30LV 60023					
	2	Client Reference	Requisition No.	Item	1541-01		16008			
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		8"-LC65004A-DA04-H					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		8 in					
	10	Line schedule	Piping class		20		DA04			
Operating Conditions	11	Calculation Results From:			() Internal		● Manufacturer () Both			
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal					0.17 cP		
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	905	908	912	kg/m3		
	16	Vapour Pressure at T nom.			6.02 bar-a					
	17	Critical Pressure		Critical Temperature		221.3 bar-a				
	18	Fluid	Phase	State		Condensate		Liquid	1 Phase	
	19	Flow	Min.	Norm.	Max.	Unit	46500	92800	124650	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	162	159	155	°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.84	6.25	6.16	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3.78	2.73	1.11	bar
	23	CV	Min.	Norm.	Max.		65.86	169.1	183.7	
	24	Noise	Min.	Norm.	Max.					dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 300				
27	Fd	Internal / Mfr		FI (CI)		/		0.762@max.		
28	Fluid tending to		Air-Fail Position							
29	Body type		Body material							
30	Design Pressure		Min.	Max.	bar-g		7.4 bar-g			
31	Design Temperature		Min.	Max.	175					
32	Max.DP closed valve		7.4 bar							
33	Valve end con.& rating		Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
34	Plug type		Plug material							
35	Plug dim.		Plug form/law							
36	Seat type		Q.ty	Material	316 SS Stellite hard faced					
37	Packing mat.		Lubricator							
38	Bonnet type		Integral extended							
39										
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.							
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve								
	48	Pressure gauge								
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		120 KG					

Notes: 1) Molecular weight = 18.
2) Mixed phase at outlet valve : 5.5% wt. of vapourisation, vapour density : 1.7 Kg/m3.
3) Valve opens upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARIS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 60031					
	2	Client Reference	Requisition No.	Item	1541-01		16009			
	3	Supplier	Model		DRESSER FLOW CONTROL		Butterfly Flangeless			
	4	Serial Number								
	5	Service			Polish Wtr To D603					
	6	P&ID No.			0021-60-04					
Inlet line	7	Diameter	Number				8"-DW65005A-DJ03-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		8 in					
	10	Line schedule	Piping class		10S		DJ03			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal <input checked="" type="radio"/> Manufacturer <input type="checkbox"/> Both					
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal				0.51 cP			
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	986	986	986	kg/m3		
	16	Vapour Pressure at T nom.			0.15 bar-a					
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		DW		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	79000	252416	295800	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	54	54	54	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	8.6	7.7	7.3	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3.8	2.5	0.3	bar
	23	CV	Min.	Norm.	Max.		47.36	187.4	667.5	
	24	Noise	Min.	Norm.	Max.		81.6	83.9	71	dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 1500				
27	Fd	Internal / Mfr		FI (Ci)	/		0.700@max.			
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type		Body material		Butterfly		A351 Gr. CF8M		
	30	Design Pressure		Min.	Max.	bar-g		8.5 bar-g		
	31	Design Temperature		Min.	Max.			70		
	32	Max.DP closed valve				8.5 bar				
	33	Valve end con.& rating		Seat leakage class		6 in - 150 lb ANSI RF		CLASS IV		
	34	Plug type		Plug material				A351 Gr. CF8M		
	35	Plug dim.		Plug form/law				=%		
	36	Seat type		Q.ty	Material			Incolloy 825		
	37	Packing mat.		Lubricator		PTFE				
	38	Bonnet type								
39										
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		46 KG					

Notes: (1) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve					
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 60032				
	2	Client Reference	Requisition No.	Item	1541-01		16010		
	3	Supplier	Model		DRESSER FLOW CONTROL		30000 Series Varimax		
	4	Serial Number							
	5	Service			D603 SC Deaerator				
	6	P&ID No.			0021-60-04				
Inlet line	7	Diameter	Number				14" LP65003A-DA04-H		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		16 in				
	10	Line schedule	Piping class		10		DA04		
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal <input checked="" type="checkbox"/> Manufacturer <input type="checkbox"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		18		0.017 cP		
	14	Cp/Cv	Compressibility		1.32		0.97		
	15	Density min	Density nor	Density max	3.29		3.04		
	16	Vapour Pressure at T nom.			2.67		kg/m3		
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		LP STEAM		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	10400	33000	40600
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	170	170	170
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	6.4	6	5.5
	22	DP	QMin.	Q Norm.	Q Max.	Unit	3.7	3.25	2.72
	23	CV	Min.	Norm.	Max.		173	597.2	790.2
	24	Noise	Min.	Norm.	Max.		81.3	84.7	84.3
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 1000			
27	Fd		Internal / Mfr	FI (Cf)			0.819@max.		
28	Fluid tending to		Air-Fail Position				Close		
Valve Body	29	Body type		Body material				ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g		7 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max. DP closed valve				7 bar			
	33	Valve end con. & rating		Seat leakage class		12 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material		Rotary		316 S.S.	
	35	Plug dim.		Plug form/law				LINEAR	
	36	Seat type		Q.ty	Material			316 S.S.	
	37	Packing mat.		Lubricator		KELVAR PTFE			
	38	Bonnet type				Integral extended			
39									
Actuator	40	Direction of action							
	41	Spring range			7 TO 25				
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART	
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection			IP-65 EEXi-a (Cenelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			YES				
	50	Solenoid valve		Spec. No.					
51	Pos. detector		Spec. No.						
52	Weight		Consumption		221 KG				

Notes: (1) Design pressure : 7 + FV
(2) Valve closes upon increasing the variable
(3) Adjustment at position A (CV=1000).

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.			30LV 60034A							
	2	Client Reference	Requisition No.	Item	1541-01		16011					
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex						
	4	Serial Number										
	5	Service										
	6	P&ID No.										
Inlet line	7	Diameter	Number		4"-BW65001A-DA04-H							
	8	Line schedule	Piping class									
Outlet line	9	Diameter	Number		6 in							
	10	Line schedule	Piping class		STD		DA04					
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both			
	12	Sour service		Special conditions								
	13	Molecular Weight		Viscosity at @ normal								
	14	Cp/Cv		Compressibility								
	15	Density min	Density nor	Density max			937		kg/m3			
	16	Vapour Pressure at T nom.										
	17	Critical Pressure		Critical Temperature								
	18	Fluid	Phase	State		STEAM COND.		Liquid		Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit			25000		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit			130		°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit			4.5		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit			3.5		bar	
	23	CV	Min.	Norm.	Max.			23.86				
	24	Noise	Min.	Norm.	Max.					dBA		
	25	Required CV										
26	Selected CV		Internal / Mfr				/ 30					
27	Fd		Internal / Mfr		FI (Cf)		/		0.860			
28	Fluid tending to		Air-Fail Position									
29	Body type		Body material									
30	Design Pressure		Min.	Max.	bar-g		5.5		bar-g			
31	Design Temperature		Min.	Max.			150					
32	Max.DP closed valve				5.5 bar							
33	Valve end con.& rating		Seat leakage class		2 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)					
34	Plug type		Plug material		Eccentric rotary		SOLID STELLITE					
35	Plug dim.		Plug form/law		Red. trim		ON-OFF					
36	Seat type		Q.ty	Material			SS 316 Stellite hard faced					
37	Packing mat.		Lubricator									
38	Bonnet type		Integral extended									
39												
Actuator	40	Direction of action										
	41	Spring range										
Positioner	42	Type	Input signal									
	43	Air supply	Action dir.									
	44	Protection										
Accessories	45	Booster relay										
	46	Locking device										
	47	Pressure reducing valve		YES								
	48	Pressure gauge		YES								
	49	Handwheel		NO								
	50	Solenoid valve		Spec. No.	YES							
	51	Pos.detector		Spec. No.								
52	Weight		Consumption		20 KG							

Notes: (1) Normally no flow
(2) On/off valve with limit stop CV=24.

					INSTRUMENT SPECIFICATION			TECHNIP			
					Control Valve					PARS PETROCHEMICAL COMPANY	
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General Data	1	Tag No.			30LV 60034B				
	2	Client Reference	Requisition No.	Item	1541-01		16012		
	3	Supplier		Model	DRESSER FLOW CONTROL		21000 Series Globe		
	4	Serial Number							
	5	Service			Utility Wtr from Header				
	6	P&ID No.			0021-60-04				
Inlet line	7	Diameter		Number			3'-UW65033A-DA01-N		
	8	Line schedule		Piping class					
Outlet line	9	Diameter		Number	3 in				
	10	Line schedule		Piping class		STD		DA01	
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both
	12	Sour service		Special conditions					
	13	Molecular Weight		Viscosity at @ normal					
	14	Cp/Cv		Compressibility					
	15	Density min	Density nor	Density max			996	kg/m ³	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		UW		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	21700		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	27		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	5		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4		bar
	23	CV	Min.	Norm.	Max.			12.78	
	24	Noise	Min.	Norm.	Max.			77.9	dBA
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 13			
27	Fd	Internal / Mfr		FI (Cf)			0.900		
28	Fluid tending to		Air-Fail Position				Close		
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g		7 bar-g	
	31	Design Temperature		Min.	Max.			65	
	32	Max.DP closed valve					7 bar		
	33	Valve end con.& rating		Seat leakage class		1.5 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material		Contoured		SS 416	
	35	Plug dim.		Plug form/law				ON-OFF	
	36	Seat type		Q.ly	Material	Threaded		AISI 416	
	37	Packing mat.		Lubricator		KELVAR PTFE			
	38	Bonnet type				STANDARD			
Actuator	40	Direction of action							
	41	Spring range			6 TO 30				
Positioner	42	Type		Input signal					
	43	Air supply		Action dir.					
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve		Spec. No.	YES				
	51	Pos.detector		Spec. No.					
	52	Weight		Consumption	47 KG				

Notes: (1) Normally no flow
(2) On/off valve

					INSTRUMENT SPECIFICATION		TECHNIP		 PARS PETROCHEMICAL COMPANY
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General Data	1	Tag No.			30PV 60102A						
	2	Client Reference	Requisition No.	Item	1541-01		16014				
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe					
	4	Serial Number									
	5	Service			Wet Flare To Flare Sys						
	6	P&ID No.			0031-60-72						
Inlet line	7	Diameter	Number				6"-P65005A-DA03-N				
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		3 in						
	10	Line schedule	Piping class		STD		DA03				
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both		
	12	Sour service		Special conditions							
	13	Molecular Weight		Viscosity at @ normal		30					
	14	Cp/Cv		Compressibility		1.2		0.95			
	15	Density min	Density nor	Density max		8.3		8.2		kg/m3	
	16	Vapour Pressure at T nom.									
	17	Critical Pressure		Critical Temperature							
	18	Fluid	Phase	State		ETHANE		Gas		Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	1250	19052		kg/h	
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	55	55		°C	
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	7.2	7.1		bar-a	
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	5.9	5.7		bar	
	23	CV	Min.	Norm.	Max.	10.62		164.2			
	24	Noise	Min.	Norm.	Max.	<70		77.3		dBA	
	25	Required CV									
26	Selected CV		Internal / Mfr		/ 190						
27	Fd	Internal / Mfr		F1 (Cf)		/		0.975			
28	Fluid tending to		Air-Fail Position				Close				
Valve Body	29	Body type		Body material				ASTM A216 GR WCC			
	30	Design Pressure		Min.	Max.	bar-g		8.4		bar-g	
	31	Design Temperature		Min.	Max.			80			
	32	Max.DP closed valve				8.4 bar					
	33	Valve end con.& rating		Seat leakage class		0 - 300 lb ANSI RF		CLASS V			
	34	Plug type		Plug material		BALANCED		17-4 PH			
	35	Plug dim.		Plug form/law		Full trim		LO-DB 2 STAGE LINEAR			
	36	Seat type		Q.ty	Material	Clamped in		AISI 410			
	37	Packing mat.		Lubricator		KELVAR PTFE					
	38	Bonnet type				STANDARD					
39											
Actuator	40	Direction of action									
	41	Spring range			21 TO 45						
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply		Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)						
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve			YES						
	48	Pressure gauge			YES						
	49	Handwheel			NO						
	50	Solenoid valve		Spec. No.		YES					
51	Pos.detector		Spec. No.		YES (2nos. limit switch)						
52	Weight		Consumption		507 KG						

Notes: (1) Valve closes upon increasing the variable
(2) Valve body size is 8" * 6" * 8".

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 60192B					
	2	Client Reference	Requisition No.	Item	1541-01		16015			
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe				
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		8"-P65004A-DA03-N					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		3 in					
	10	Line schedule	Piping class		STD		DA03			
Operating Conditions	11	Calculation Results From:			Internal <input type="radio"/> Manufacturer <input checked="" type="radio"/> Both <input type="radio"/>					
	12	Sour service		Special conditions						
	13	Molecular Weight	Viscosity at @ normal							
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	8.3		7.7		kg/m3	
	16	Vapour Pressure at T nom.								
	17	Critical Pressure			Critical Temperature					
	18	Fluid	Phase	State		ETHANE		Gas	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	1250	19052	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	55	55	°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	7.2	6.7	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	5.9	5.3	bar	
	23	CV	Min.	Norm.	Max.	10.7		175.3		
	24	Noise	Min.	Norm.	Max.	<70		76.4		dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 190				
27	Fd	Internal / Mfr		FI (Cf)		/		0.975		
28	Fluid tending to		Air-Fail Position							
29	Body type		Body material							
30	Design Pressure		Min.	Max.	bar-g		8.4 bar-g			
31	Design Temperature		Min.	Max.	80					
32	Max.DP closed valve		8.4 bar							
33	Valve end con.& rating		Seat leakage class		0 - 300 lb ANSI RF		CLASS V			
34	Plug type		Plug material							
35	Plug dim.		Plug form/law		Full trim		LO-DB 2 STAGE LINEAR			
36	Seat type		Qty	Material	Clamped in		AISI 410			
37	Packing mat.		Lubricator							
38	Bonnet type		STANDARD							
39										
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.							
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve		YES						
	48	Pressure gauge		YES						
	49	Handwheel								
	50	Solenoid valve		Spec. No.		YES				
51	Pos.detector		Spec. No.		YES (2 nos. limit switch)					
52	Weight		Consumption		507 KG					

Notes: (1) Valve closes upon increasing the variable
(2) Valve body size is 8" * 6" * 8".

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30LV 60121					
	2	Client Reference	Requisition No.	Item	1541-01		16016			
	3	Supplier	Model		DRESSER FLOW CONTROL		Camflex Flangeless			
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter	Number		2"-P65003A-DA03-P					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		3 in					
	10	Line schedule	Piping class		STD		DA03			
Operating Conditions	11	Calculation Results From:								
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal							
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max		996		kg/m3		
	16	Vapour Pressure atT nom.								
	17	Critical Pressure	Critical Temperature							
	18	Fluid	Phase	State		Oily Water		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	10300		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	48		°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	3.8		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	0.4		bar	
	23	CV	Min.	Norm.	Max.	19.08				
	24	Noise	Min.	Norm.	Max.	<70				dBA
	25	Required CV								
26	Selected CV Internal / Mfr							/ 20		
27	Fd	Internal / Mfr		FI (CI)		/		0.689		
28	Fluid tending to		Air-Fail Position						Close	
Valve Body	29	Body type		Body material					ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g		5.7	bar-g	
	31	Design Temperature		Min.	Max.	85				
	32	Max.DP closed valve		5.7						bar
	33	Valve end con.& rating		Seat leakage class		2 in - 300 lb ANSI RF		CLASS VI (IEC 534-4)		
	34	Plug type		Plug material					Eccentric rotary	SOLID STELLITE
	35	Plug dim.		Plug form/law					Full trim	ON-OFF
	36	Seat type		Q.ty	Material		316 S.S. PTFE SOFT SEAT			
	37	Packing mat.		Lubricator						KELVAR PTFE WITH VITON O RINGS
	38	Bonnet type		Integral extended						
Actuator	40	Direction of action								
	41	Spring range							7 TO 15	
Positioner	42	Type	Input signal							
	43	Air supply	Action dir.							
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve		YES						
	48	Pressure gauge		YES						
	49	Handwheel							NO	
	50	Solenoid valve		Spec. No.		YES				
51	Pos.detector		Spec. No.							
52	Weight		Consumption		17 KG					

Notes: (1) On/off valve
(2) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE			
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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General Data	1	Tag No.				30PV 60122A				
	2	Client Reference		Requisition No.	Item	1541-01		16017		
	3	Supplier		Model		DRESSER FLOW CONTROL		41000 Series Globe		
	4	Serial Number								
	5	Service								
	6	P&ID No.								
Inlet line	7	Diameter		Number		10"-NG30001A-DA03-N				
	8	Line schedule		Piping class						
Outlet line	9	Diameter		Number		10 in				
	10	Line schedule		Piping class		20		DA03		
Operating Conditions	11	Calculation Results From:								
	12	Sour service		Special conditions		Internal		● Manufacturer		
	13	Molecular Weight		Viscosity at @ normal		16.7		0.01 cP		
	14	Cp/Cv		Compressibility		1.3		0.98		
	15	Density min	Density nor	Density max	7		7		kg/m3	
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid		Phase	State		Fuel gas		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	2041	5103	20827	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit				
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	12.95	10.68	8.36	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	8.95	6.68	4.36	bar
	23	CV	Min.	Norm.	Max.		12.53	40.93	217.7	
	24	Noise	Min.	Norm.	Max.		74.2	79.1	83.2	dBA
	25	Required CV								
26	Selected CV		Internal / Mfr		/ 300					
27	Fd		Internal / Mfr		F1 (Cf)		/		0.940	
28	Fluid tending to		Air-Fail Position		Close					
Valve Body	29	Body type		Body material		ASTM A216 GR WCC				
	30	Design Pressure		Min.	Max.	bar-g		17 bar-g		
	31	Design Temperature		Min.	Max.	85				
	32	Max.DP closed valve				14 bar				
	33	Valve end con.& rating		Seat leakage class		6 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		BALANCED		17-4 PH		
	35	Plug dim.		Plug form/law		Full trim		LO-DB LINEAR		
	36	Seat type		Q.ty	Material	Clamped in		AISI 410		
	37	Packing mat.		Lubricator		KELVAR PTFE				
	38	Bonnet type				STANDARD				
Actuator	40	Direction of action								
	41	Spring range								
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve								
	48	Pressure gauge								
	49	Handwheel								
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
	52	Weight		Consumption		279 KG				

- Notes: (1) Density @ 48°C
(2) Ambient temperature (max 48°C min 5°C)
(3) Qmax at start-up with 4 furnaces operating at 80% load on start-up fuel
(4) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 60122B				
	2	Client Reference	Requisition No.	Item	1541-01		16018		
	3	Supplier	Model		DRESSER FLOW CONTROL		30000 Series Varimax		
	4	Serial Number							
	5	Service						Fuel Gas To Wet Flare	
	6	P&ID No.						0021-60-12	
Inlet line	7	Diameter	Number			20"-FG65001A-DA03-N			
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number			14 in			
	10	Line schedule	Piping class			10 DA03			
Operating Conditions	11	Calculation Results From:			() Internal (●) Manufacturer () Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal					4	
	14	Cp/Cv	Compressibility					1.39 1	
	15	Density min	Density nor	Density max			0.87 kg/m3		
	16	Vapour Pressure at T nom.							
	17	Critical Pressure			Critical Temperature				
	18	Fluid	Phase	State		FUEL GAS Gas		Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	22000 kg/h		
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	48 C		
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	5.85 bar-a		
	22	DP	QMin.	Q Norm.	Q Max.	Unit	2.05 bar		
	23	CV	Min.	Norm.	Max.	757.5			
	24	Noise	Min.	Norm.	Max.	83 dBA			
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 1000			
27	Fd	Internal / Mfr		FI (Cf)		/ 0.814			
28	Fluid tending to		Air-Fail Position				Close		
Valve Body	29	Body type		Body material				ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g		5.5 bar-g	
	31	Design Temperature		Min.	Max.	85			
	32	Max.DP closed valve		5.5 bar					
	33	Valve end con. & rating		Seat leakage class		12 in - 300 lb ANSI RF		CLASS VI (IEC 534-4)	
	34	Plug type		Plug material				Rotary 316 S.S.	
	35	Plug dim.		Plug form/law				LINEAR	
	36	Seat type		Q.ty	Material			316 SS with PTFE-NI Inset	
	37	Packing mat.		Lubricator					KELVAR PTFE
	38	Bonnet type		Integral extended					
39									
Actuator	40	Direction of action							
	41	Spring range						7 TO 25	
Positioner	42	Type		Input signal			Smart 4w20 mA 24Vdc HART		
	43	Air supply		Action dir.			4 BAR-G		
Accessories	44	Protection						IP-65 EEXi-a (Cenelec)	
	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve		YES					
	48	Pressure gauge		YES					
	49	Handwheel						NO	
50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.						
52	Weight		Consumption			221 KG			

Notes: (1) Valve opens upon increasing the variable
(2) Adjustment at position A (CV=1000).

					INSTRUMENT SPECIFICATION		TECHNIP				
					Control Valve				PARS PETROCHEMICAL COMPANY		
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE						
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE						
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General Data	1	Tag No.			30LV 60211						
	2	Client Reference	Requisition No.	Item	1541-01		16019				
	3	Supplier	Model	DRESSER FLOW CONTROL		Camflex Flangeless					
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		3"-WD65001A-DA01-N						
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		3 in						
	10	Line schedule	Piping class		STD		DA01				
Operating Conditions	11	Calculation Results From:			Internal <input type="radio"/> Manufacturer <input checked="" type="radio"/> Both <input type="radio"/>						
	12	Sour service		Special conditions							
	13	Molecular Weight		Viscosity at @ normal							
	14	Cp/Cv		Compressibility							
	15	Density min	Density nor	Density max		993		kg/m3			
	16	Vapour Pressure at T nom.									
	17	Critical Pressure		Critical Temperature							
	18	Fluid	Phase	State		WD		Liquid	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	20850		kg/h		
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	38		°C		
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	5.5		bar-a		
	22	DP	QMin.	Q Norm.	Q Max.	Unit	2.75		bar		
	23	CV	Min.	Norm.	Max.	14.9					
	24	Noise	Min.	Norm.	Max.	<70				dBA	
	25	Required CV									
26	Selected CV		Internal / Mfr		/ 15						
27	Fd	Internal / Mfr		FI (Ci)		/		0.850			
Valve Body	28	Fluid tending to		Air-Fail Position				Close			
	29	Body type		Body material						ASTM A216 GR WCC	
	30	Design Pressure		Min.	Max.	bar-g		7.5 bar-g			
	31	Design Temperature		Min.	Max.	100					
	32	Max.DP closed valve		7.5 bar							
	33	Valve end con.& rating		Seat leakage class		1.5 in -300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type		Plug material						Eccentric rotary	SOLID STELLITE
	35	Plug dim.		Plug form/law						Full trim	LINEAR
	36	Seat type		Q.ty	Material		316 S.S.				
	37	Packing mat.		Lubricator						KELVAR PTFE WITH VITON O RINGS	
38	Bonnet type		Integral extended								
39											
Actuator	40	Direction of action									
	41	Spring range							7 TO 15		
Positioner	42	Type	Input signal		Field Bus		Field Bus				
	43	Air supply	Action dir.		4 BAR-G						
	44	Protection							IP-65 EEXi-a (Cenelec)		
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve							YES		
	48	Pressure gauge							YES		
	49	Handwheel							NO		
	50	Solenoid valve		Spec. No.		YES					
51	Pos.detector		Spec. No.		YES (1No. low limit switch)						
	52	Weight		Consumption		15 KG					

Notes: (1) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARIS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 60211A							
	2	Client Reference	Requisition No.	Item	1541-01		16020					
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe					
	4	Serial Number										
	5	Service			Nitrogen To D651							
	6	P&ID No.			0021-60-22							
Inlet line	7	Diameter	Number		1 1/2"-N65004A-DA01-N							
	8	Line schedule	Piping class									
Outlet line	9	Diameter	Number		1.5 in							
	10	Line schedule	Piping class		XS		DA03					
Operating Conditions	11	Calculation Results From:			Internal		● Manufacturer		() Both			
	12	Sour service		Special conditions								
	13	Molecular Weight		Viscosity at @ normal		28						
	14	Cp/Cv		Compressibility		1.4		0.99				
	15	Density min	Density nor	Density max		7.3		kg/m3				
	16	Vapour Pressure at T nom.										
	17	Critical Pressure		Critical Temperature								
	18	Fluid	Phase	State		N2		Gas		Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	55		kg/h			
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	48		°C			
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	7		bar-a			
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.5		bar			
	23	CV	Min.	Norm.	Max.			0.4912				
	24	Noise	Min.	Norm.	Max.			<70		dBA		
	25	Required CV										
26	Selected CV			Internal / Mfr		/ 1.7						
27	Fd	Internal / Mfr		FI (Cf)	/		0.938					
28	Fluid tending to		Air-Fail Position				Close					
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC				
	30	Design Pressure		Min.	Max.	bar-g		10.5		bar-g		
	31	Design Temperature		Min.	Max.			75				
	32	Max.DP closed valve				10.5 bar						
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)				
	34	Plug type		Plug material		Contoured		SS 416				
	35	Plug dim.		Plug form/law		-		%				
	36	Seat type		Q.ty	Material	Threaded		AISI 416				
	37	Packing mat.		Lubricator		KELVAR PTFE						
	38	Bonnet type				STANDARD						
39												
Actuator	40	Direction of action										
	41	Spring range			3 TO 15							
Positioner	42	Type		Input signal		Field Bus		Field Bus				
	43	Air supply		Action dir.		4 BAR-G						
	44	Protection			IP-65 EEXi-a (Cenelec)							
Accessories	45	Booster relay										
	46	Locking device										
	47	Pressure reducing valve			YES							
	48	Pressure gauge			YES							
	49	Handwheel			NO							
	50	Solenoid valve		Spec. No.								
	51	Pos.detector		Spec. No.								
	52	Weight		Consumption		38 KG						

Notes: (1) Valve closes upon increasing the variable --

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARIS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 60211B					
	2	Client Reference	Requisition No.	Item	1541-01		16021			
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number								
	5	Service			D651 N2 Line To Atm					
	6	P&ID No.			0021-60-22					
Inlet line	7	Diameter	Number				1 1/2"-N65004A-DA03-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		1.5 in					
	10	Line schedule	Piping class		XS		DA01			
Operating Conditions	11	Calculation Results From:			Internal		● Manufacturer		Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal		28				
	14	Cp/Cv		Compressibility		1.4		0.99		
	15	Density min	Density nor	Density max				2.62		kg/m3
	16	Vapour Pressure atT nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		N2		Gas		Single Phase
	19	Flow	Min.	Norm.	Max.	Unit			55	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit			48	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit			2.5	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit			1.4	bar
	23	CV	Min.	Norm.	Max.			1.432		
	24	Noise	Min.	Norm.	Max.			<70		dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 3.8				
27	Fd	Internal / Mfr		F1 (Cf)		/		0.929		
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		3.5		bar-g
	31	Design Temperature		Min.	Max.			100		
	32	Max.DP closed valve				3.5 bar				
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		Contoured		SS 416		
	35	Plug dim.		Plug fom/law				-%		
	36	Seat type		Q.ty	Material	Threaded		AISI 416		
	37	Packing mat.		Lubricator		KELVAR PTFE				
	38	Bonnet type				STANDARD				
39										
Actuator	40	Direction of action								
	41	Spring range			3 TO 15					
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
Accessories	44	Protection			IP-65 EEXi-a (Cenelec)					
	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve		Spec. No.						
	51	Pos.detector		Spec. No.						
	52	Weight		Consumption		38 KG				

Notes: (1) Flow based on a desalinated water filling rate of 21 m3/h
(2) Valve opens upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP		 PARS PETROCHEMICAL COMPANY		
					Control Valve		 DARABAD				
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE						
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE						
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General Data	1	Tag No.			30PV 60404		
	2	Client Reference	Requisition No.	Item	1541-01		16022
	3	Supplier	Model		DRESSER FLOW CONTROL	41000 Series Globe	
	4	Serial Number					
	5	Service					
	6	P&ID No.					
Inlet line	7	Diameter	Number		16"-HP65015A-GE01-H		
	8	Line schedule	Piping class				
Outlet line	9	Diameter	Number		16		
	10	Line schedule	Piping class		60 GA02		
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal <input checked="" type="checkbox"/> Manufacturer <input type="checkbox"/> Both		
	12	Sour service	Special conditions				
	13	Molecular Weight	Viscosity at @ normal		18	0.02 cP	
	14	Cp/Cv	Compressibility		1.37	0.94	
	15	Density min	Density nor	Density max		14.71	kg/m3
	16	Vapour Pressure at T nom.					
	17	Critical Pressure	Critical Temperature				
	18	Fluid	Phase	State		STEAM	Gas 1 Phase
	19	Flow	Min.	Norm.	Max.	Unit	156000 kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	400 °C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	43 bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	2 bar
	23	CV	Min.	Norm.	Max.	1099	
	24	Noise	Min.	Norm.	Max.	74 dBA	
	25	Required CV					
26	Selected CV Internal / Mfr / 1400						
27	Fd	Internal / Mfr		FI (Ci)	0.910		
28	Fluid tending to		Air-Fail Position				
Valve Body	29	Body type		Body material			ASTM A216 GR WCC
	30	Design Pressure	Min.	Max.		47 bar-g	
	31	Design Temperature	Min.	Max.		425	
	32	Max.DP closed valve			47 bar		
	33	Valve end con.& rating	Seat leakage class		12 in - 600 lb ANSI RF		CLASS IV (IEC 534-4)
	34	Plug type	Plug material			BALANCED	CA6NM (Nitr.)
	35	Plug dim.	Plug form/law			Full trim	LINEAR
	36	Seat type	Q.ty	Material		Clamped in	AISI 410
	37	Packing mat.	Lubricator				
	38	Bonnet type	STANDARD				
	39						
Actuator	40	Direction of action					
	41	Spring range					
Positioner	42	Type	Input signal			Smart	4w20 mA 24Vdc HART
	43	Air supply	Action dir.				4 BAR-G
	44	Protection					
Accessories	45	Booster relay					
	46	Locking device					
	47	Pressure reducing valve					
	48	Pressure gauge					
	49	Handwheel					
	50	Solenoid valve	Spec. No.				
51	Pos.detector	Spec. No.					
	52	Weight	Consumption			1210 KG	

- Notes: 1) Critical pressure = 221 Bar (a).
2) Line 27 = 47b_g + FV.
3) Valve opens upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARIS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30TV 60402					
	2	Client Reference	Requisition No.	Item	1541-01		16023			
	3	Supplier	Model	DRESSER FLOW CONTROL		78000 Series Globe				
	4	Serial Number								
	5	Service			Boiler Feed Water					
	6	P&ID No.			0031-60-47					
Inlet line	7	Diameter	Number		2" -BW65014A-JA01-H					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		2 in					
	10	Line schedule	Piping class		160		JA01			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal		18.02				
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max						
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		Steam		Steam		
	19	Flow	Min.	Norm.	Max.	Unit	0	1100	10100	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	130	130	130	°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	147.3	141.9	138.3	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit				
	23	CV	Min.	Norm.	Max.					
	24	Noise	Min.	Norm.	Max.			0.135	1.305	
	25	Required CV					<70		71.7	dba
26	Selected CV		Internal / Mfr				/ 1.8			
27	Fd	Internal / Mfr		FI (Cf)			/		0.992	
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		172 bar-g		
	31	Design Temperature		Min.	Max.					
	32	Max.DP closed valve								
	33	Valve end con. & rating		Seat leakage class		2 in - 1500 lb ANSI RTJ		CLASS V		
	34	Plug type		Plug material				SS 410		
	35	Plug dim.		Plug form/law		Red. trim		Anti Cavit. multi stage LINEAR		
	36	Seat type		Q.ty	Material	Combined in cage		AISI 410		
	37	Packing mat.		Lubricator		KELVAR PTFE				
	38	Bonnet type				STANDARD				
39										
Actuator	40	Direction of action								
	41	Spring range			35 TO 43					
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			YES					
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		85 KG					

Notes: 1) Service conditions to be confirmed later.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30TV 60406A					
	2	Client Reference	Requisition No.	Item	1541-01		16024			
	3	Supplier	Model	DRESSER FLOW CONTROL		78000 Series Globe				
	4	Serial Number								
	5	Service			HP Steam					
	6	P&ID No.			0031-60-46					
Inlet line	7	Diameter	Number		3"-BW65012A-JA01-P					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		3 in					
	10	Line schedule	Piping class		160		JA01			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal							
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max						
	16	Vapour Pressure atT nom.								
	17	Critical Pressure	Critical Temperature							
	18	Fluid	Phase	State		Liquid				
	19	Flow	Min.	Norm.	Max.	Unit	5388	21904	29633	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	130	130	130	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	147.3	141.2	137.5	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	105.5	95.7	88.62	bar
	23	CV	Min.	Norm.	Max.		0.6291	2.686	3.776	
	24	Noise	Min.	Norm.	Max.		<70	72.4	73.2	dba
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 5				
27	Fd	Internal / Mfr		F1 (Cf)	/		0.992			
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		172 bar-g		
	31	Design Temperature		Min.	Max.			150		
	32	Max.DP closed valve								
	33	Valve end con.& rating		Seat leakage class		2 in - 1500 lb ANSI RTJ		CLASS V		
	34	Plug type		Plug material		BALANCED		SS 410		
	35	Plug dim.		Plug form/law		Full trim		Anti-cavit. multi stage LINEAR		
	36	Seat type		Q.ty	Material	Combined in Cage		SS 410		
	37	Packing mat.		Lubricator		KEVLAR PTFE				
	38	Bonnet type				STANDARD				
39										
Actuator	40	Direction of action								
	41	Spring range			35 TO 43					
Positioner	42	Type	Input signal		Smart		4x20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			YES					
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		85 KG					

Notes: 1) Service conditions to be confirmed.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30TV 60406B					
	2	Client Reference	Requisition No.	Item	1541-01		16025			
	3	Supplier	Model	DRESSER FLOW CONTROL		78000 Series Globe				
	4	Serial Number								
	5	Service							HP Steam	
	6	P&ID No.							0031-60-46	
Inlet line	7	Diameter	Number			3"-BW65012A-JA01-P				
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number			3 in				
	10	Line schedule	Piping class			160 JA01				
Operating Conditions	11	Calculation Results From:			Internal		● Manufacturer		Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal							
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max						
	16	Vapour Pressure at T nom.								
	17	Critical Pressure			Critical Temperature					
	18	Fluid	Phase	State			Liquid			
	19	Flow	Min.	Norm.	Max.	Unit	5388	21904	29633	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	130	130	130	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	147.3	141.2	137.5	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	105.5	95.7	88.62	bar
	23	CV	Min.	Norm.	Max.		0.5291	2.686	3.776	
	24	Noise	Min.	Norm.	Max.		<70	72.4	73.2	dba
25	Required CV									
26	Selected CV Internal / Mfr			/ 5						
27	Fd Internal / Mfr		FI (Cf)		/			0.992		
28	Fluid tending to		Air-Fail Position			Close				
Valve Body	29	Body type	Body material			Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure	Min.	Max.	bar-g		172 bar-g			
	31	Design Temperature	Min.	Max.						
	32	Max.DP closed valve								
	33	Valve end con.& rating	Seat leakage class			2 in - 1500 lb ANSI RTJ		CLASS V		
	34	Plug type	Plug material						SS 410	
	35	Plug dim.	Plug form/law						Anti-cavit. multi stage LINEAR	
	36	Seat type	Q.ty	Material	Combined in Cage			SS 410		
	37	Packing mat.	Lubricator						KEVLAR PTFE	
	38	Bonnet type	STANDARD							
39										
Actuator	40	Direction of action								
	41	Spring range							35 TO 43	
Positioner	42	Type	Input signal					Smart	4w20 mA 24Vdc HART	
	43	Air supply	Action dir.					4 BAR-G		
	44	Protection							IP-65 EEXi-a (Cenelec)	
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve						YES		
	48	Pressure gauge						YES		
	49	Handwheel							YES	
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
52	Weight	Consumption						85 KG		

Notes: 1) Service conditions to be confirmed.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.				30PV 60411				
	2	Client Reference	Requisition No.	Item	1541-01			16026		
	3	Supplier	Model	DRESSER FLOW CONTROL		78000 Series Globe				
	4	Serial Number								
	5	Service							BFW To E602	
	6	P&ID No.							0031-60-42	
Inlet line	7	Diameter	Number					3"-BW65009A-JA01-H		
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		3	in				
	10	Line schedule	Piping class		160	JA01				
Operating Conditions	11	Calculation Results From:							Internal <input type="radio"/> Manufacturer <input checked="" type="radio"/> Both <input type="radio"/>	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal					0.21	cP	
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	0.934	0.934	0.934	kg/m3		
	16	Vapour Pressure at T nom.							2.7 bar-a	
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		BFW	Liquid	Single Phase		
	19	Flow	Min.	Norm.	Max.	Unit	3100	11300	28300	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	130	130	130	°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	147.3	141.9	138.7	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	111.1	101.2	97.7	bar
	23	CV	Min.	Norm.	Max.		0.353	1.348	3.437	
	24	Noise	Min.	Norm.	Max.		<70	<70	73.6	dba
	25	Required CV								
26	Selected CV Internal / Mfr								/ 5	
27	Fd	Internal / Mfr		FI (Cf)				0.975		
28	Fluid tending to		Air-Fail Position			Close				
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure	Min.	Max.	bar-g		172 bar-g			
	31	Design Temperature	Min.	Max.						
	32	Max.DP closed valve			172		bar			
	33	Valve end con.& rating	Seat leakage class			2 in	- 1500 lb ANSI RTJ		CLASS IV (IEC 534-4)	
	34	Plug type	Plug material						SS 410	
	35	Plug dim.	Plug form/flaw						Anti cavit. multi stage LINEAR	
	36	Seat type	Q.ty	Material		Combined in cage		AISI 410		
	37	Packing mat.	Lubricator						KELVAR PTFE	
	38	Bonnet type	STANDARD							
39										
Actuator	40	Direction of action								
	41	Spring range							35 TO 43	
Positioner	42	Type	Input signal					Smart	4w20 mA 24Vdc HART	
	43	Air supply	Action dir.					4 BAR-G		
	44	Protection							IP-65 EEXi-a (Cenelec)	
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve						YES		
	48	Pressure gauge						YES		
	49	Handwheel							NO	
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
	52	Weight	Consumption					80 KG		

Notes: (1) VALVE CLOSES UPON INCREASING THE VARIABLE

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.				30TV 60416					
	2	Client Reference	Requisition No.	Item	1541-01			16027			
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe					
	4	Serial Number									
	5	Service							Boiler Feed Water		
	6	P&ID No.							0031-60-46		
Inlet line	7	Diameter	Number					2"-BW65015A-GA02-H			
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		2 in						
	10	Line schedule	Piping class		STD		GA02				
Operating Conditions	11	Calculation Results From:			Internal		● Manufacturer		Both		
	12	Sour service		Special conditions							
	13	Molecular Weight		Viscosity at @ normal							
	14	Cp/Cv		Compressibility							
	15	Density min	Density nor	Density max							
	16	Vapour Pressure at T nom.									
	17	Critical Pressure			Critical Temperature						
	18	Fluid	Phase		State			Liquid			
	19	Flow	Min.	Norm.	Max.	Unit	370	2000	8500	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	130	130	130	°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	40.6	40.7	40.7	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit					
	23	CV	Min.	Norm.	Max.						
	24	Noise	Min.	Norm.	Max.	<70	74.4	81.1	dBA		
25	Required CV										
26	Selected CV			Internal / Mfr		/6					
27	Fd	Internal / Mfr		FI (CI)		/		0.918@max.			
28	Fluid tending to		Air-Fail Position			Close					
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC			
	30	Design Pressure		Min.	Max.	bar-g		44 bar-g			
	31	Design Temperature		Min.	Max.						
	32	Max.DP closed valve									
	33	Valve end con. & rating		Seat leakage class		1 in - 600 lb ANSI RF		CLASS V			
	34	Plug type		Plug material		Contoured		440C			
	35	Plug dim.		Plug form/law		Red. trim		=%			
	36	Seat type		Q.ty	Material	Threaded		AISI 440C			
	37	Packing mat.		Lubricator		KELVAR PTFE					
	38	Bonnet type				STANDARD					
39											
Actuator	40	Direction of action									
	41	Spring range									11 TO 23
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply		Action dir.		4 BAR-G					
	44	Protection									IP-65 EEXi-a (Cenelec)
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve		YES							
	48	Pressure gauge		YES							
	49	Handwheel									YES
	50	Solenoid valve		Spec. No.							
51	Pos.detector		Spec. No.								
52	Weight		Consumption		44 KG						

Notes: 1) Service conditions to be confirmed.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30TV 60426						
	2	Client Reference	Requisition No.	Item	1541-01		16028				
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe					
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		2'-BW65011A-GA02-P						
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		2 in						
	10	Line schedule	Piping class		STD		GA02				
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both		
	12	Sour service		Special conditions							
	13	Molecular Weight		Viscosity at @ normal							
	14	Cp/Cv		Compressibility							
	15	Density min	Density nor	Density max							
	16	Vapour Pressure at T nom.									
	17	Critical Pressure		Critical Temperature							
	18	Fluid	Phase	State			Liquid				
	19	Flow	Min.	Norm.	Max.	Unit	620	3500	10600	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	130	130	130	:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	40.6	40.6	40.7	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	35.04	34.16	31.65	bar	
	23	CV	Min.	Norm.	Max.		0.1256	0.718	2.266		
	24	Noise	Min.	Norm.	Max.		<70	76.8	78.7	dBA	
	25	Required CV									
26	Selected CV Internal / Mfr										
27	Fd	Internal / Mfr	FI (Cf)	/ 2.8							
28	Fluid tending to		Air-Fail Position								
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC			
	30	Design Pressure		Min.	Max.	bar-g		44 bar-g			
	31	Design Temperature		Min.	Max.						
	32	Max.DP closed valve									
	33	Valve end con.& rating		Seat leakage class		1 in - 600 lb ANSI RF		CLASS V			
	34	Plug type		Plug material							
	35	Plug dim.		Plug form/flaw							
	36	Seat type		Q.ty	Material	Combined in cage		AISI 410			
	37	Packing mat.		Lubricator							
	38	Bonnet type		STANDARD							
Actuator	40	Direction of action									
	41	Spring range									
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply		Action dir.		4 BAR-G					
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve									
	48	Pressure gauge									
	49	Handwheel									
	50	Solenoid valve		Spec. No.							
51	Pos.detector		Spec. No.								
	52	Weight		Consumption		44 KG					

Notes: 1) Service conditions to be confirmed.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 60427						
	2	Client Reference	Requisition No.	Item	1541-01		16029				
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe					
	4	Serial Number									
	5	Service			Low Pressure Steam						
	6	P&ID No.			0031-60-47						
Inlet line	7	Diameter	Number				14"-LP65063A-DA04-H				
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		16 in						
	10	Line schedule	Piping class		10		DA04				
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal		18		0.02 cP				
	14	Cp/Cv	Compressibility			1.35					
	15	Density min	Density nor	Density max	3.65		3.65		3.93 kg/m3		
	16	Vapour Pressure at T nom.									
	17	Critical Pressure	Critical Temperature								
	18	Fluid	Phase	State		LP STEAM		Gas		Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	35000	58000	65000	kg/m	
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	170	170	190	:C	
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	7.2	7.2	7.2	bar-a	
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	5.9	5.6	5.5	bar	
	23	CV	Min.	Norm.	Max.	466.4		788.5		896.3	
	24	Noise	Min.	Norm.	Max.	115.1		115.5		115.1 dBA	
	25	Required CV									
26	Selected CV			Internal / Mfr		/ 1000					
27	Fd	Internal / Mfr		FI (Ct)					0.904		
28	Fluid tending to		Air-Fail Position					Close			
Valve Body	29	Body type		Body material					ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		7		bar-g	
	31	Design Temperature		Min.	Max.			220			
	32	Max.DP closed valve			7		bar				
	33	Valve end con.& rating		Seat leakage class			10 in - 300 lb ANSI RF		CLASS V		
	34	Plug type		Plug material			BALANCED		17-4 PH		
	35	Plug dim.		Plug form/flaw			Full trim		LINEAR		
	36	Seat type		Q.ty	Material		Clamped in		AISI 410		
	37	Packing mat.		Lubricator			KELVAR PTFE				
	38	Bonnet type		STANDARD							
39											
Actuator	40	Direction of action									
	41	Spring range			20 TO 50						
Positioner	42	Type		Input signal		Smart		4w20 mA 24Vdc HART			
	43	Air supply		Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)						
Accessories	45	Booster relay			YES						
	46	Locking device									
	47	Pressure reducing valve			YES						
	48	Pressure gauge			YES						
	49	Handwheel			NO						
	50	Solenoid valve		Spec. No.							
	51	Pos.detector		Spec. No.							
	52	Weight		Consumption		760 KG					

Notes: (1) NORMALLY NO FLOW OPERATES IN CASE OF CLOSED VALVE ON LP STEAM USERS
(2)
(3) VALVE OPENS UPON INCREASING THE VARIABLE
(4) LINE 27 = 7 b g + FV
(5) SUPPLY INCLUDES 16" LO-DB PLATE.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No: 6465C 30 SP 1541 60	Sheet 29	of
									Rev : 2	



General Data	1	Tag No.			30UV 60001					
	2	Client Reference	Requisition No.	Item	1541-01		16030			
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe			
	4	Serial Number			41005					
	5	Service			HP Steam To STP602 A					
	6	P&ID No.			0021-60-04					
Inlet line	7	Diameter	Number		10"-HP65001A-GA02-H					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		10"					
	10	Line schedule	Piping class		XS					
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal						
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max						
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		Steam				
	19	Flow	Min.	Norm.	Max.	Unit				
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	370		.C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	40.5		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit				
	23	CV	Min.	Norm.	Max.		1)	1)	1)	
	24	Noise	Min.	Norm.	Max.		1)	1)	1)	dBA
	25	Required CV								
26	Selected CV Internal / Mfr			/ 1000						
27	Fd	Internal / Mfr	FI (Ci)	/						
Valve Body	28	Fluid tending to		Air-Fail Position		TO OPEN		Close		
	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		47 bar-g		
	31	Design Temperature		Min.	Max.	425				
	32	Max.DP closed valve				47 bar				
	33	Valve end con.& rating		Seat leakage class		10 in - 600 lb ANSI RFS		CLASS IV (standard)		
	34	Plug type		Plug material		BALANCED		A 487 Gr CA6NM Nitrided		
	35	Plug dim.		Plug form/law		Full trim				
	36	Seat type		Q.ty	Material	Clamped in		AISI 410		
	37	Packing mat.		Lubricator		GRAPHITE				
	38	Bonnet type				STANDARD				
	39									
Actuator	40	Direction of action								
	41	Spring range			Piston actuator L300 SR (f) 76					
Positioner	42	Type		Input signal		Without				
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection								
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve		Spec. No.	YES EEx (ia) IIC T6					
51	Pos.detector		Spec. No.	YES Two limit switch						
52	Weight		Consumption		700 KG					

Notes: 1) ON-OFF VALVE NO CALCULATION

					INSTRUMENT SPECIFICATION		TECHNIP		 PARS PETROCHEMICAL COMPANY	
					Control Valve		 GARBANI			
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
1	T.G.	FR	FR	10/07/2002	ISSUE FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No. : 6465C 30 SP 1541 60	Sheet 30	of
										Rev.: 2



General Data	1	Tag No.			30UV 60221				
	2	Client Reference	Requisition No.	Item	DELETED			DELETED	
	3	Supplier		Model					
	4	Serial Number							
	5	Service							
	6	P&ID No.			0021-60-23				
Inlet line	7	Diameter		Number					
	8	Line schedule		Piping class					
Outlet line	9	Diameter		Number	8"				
	10	Line schedule		Piping class	60				
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both
	12	Sour service		Special conditions					
	13	Molecular Weight		Viscosity at @ normal					
	14	Cp/Cv		Compressibility					
	15	Density min	Density nor	Density max					
	16	Vapour Pressure at T nom.							
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		Steam			
	19	Flow	Min.	Norm.	Max.	Unit			
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	370		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	40.5		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit			
	23	CV	Min.	Norm.	Max.	1)		1)	
	24	Noise	Min.	Norm.	Max.	1)		1)	
	25	Required CV							
26	Selected CV Internal / Mfr			/ 640					
27	Fd Internal / Mfr			FI (Cf)		/			
28	Fluid tending to		Air-Fail Position		TO OPEN		Close		
Valve Body	29	Body type		Body material		ASTM A216 GR WCC			
	30	Design Pressure		Min.	Max.	bar-g		47 bar-g	
	31	Design Temperature		Min.	Max.	425			
	32	Max.DP closed valve			47 bar				
	33	Valve end con.& rating		Seat leakage class		0 - 600 lb ANSI RFS		CLASS IV (standard)	
	34	Plug type		Plug material		BALANCED		A 487 Gr C6NM Nitrided	
	35	Plug dim.		Plug form/law		Full trim			
	36	Seat type		Q.ty	Material	Clamped in		AISI 410	
	37	Packing mat.		Lubricator		GRAPHITE			
	38	Bonnet type				STANDARD			
39									
Actuator	40	Direction of action							
	41	Spring range			Piston actuator L300 SR (f) 64				
Positioner	42	Type		Input signal		Without			
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel							
	50	Solenoid valve		Spec. No.		YES			
51	Pos.detector		Spec. No.		YES Two limit switch				
52	Weight		Consumption						


Notes: 1) ON-OFF VALVE NO CALCULATION

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
							Sheet 31		of	
No.	By	Chk	Appr	Date	Revision	Code: 507	Dwg. No: DELETED		Rev	

General Data	1	Tag No.			30UV 60222						
	2	Client Reference	Requisition No.	Item	DELETED						
	3	Supplier	Model								
	4	Serial Number									
	5	Service									
	6	P&ID No.			0021-60-23						
Inlet line	7	Diameter	Number								
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number			8"					
	10	Line schedule	Piping class			60					
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal								
	14	Cp/Cv	Compressibility								
	15	Density min	Density nor	Density max							
	16	Vapour Pressure at T nom.									
	17	Critical Pressure	Critical Temperature								
	18	Fluid	Phase	State		Steam					
	19	Flow	Min.	Norm.	Max.	Unit					
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	370		°C		
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	40.5		bar-a		
	22	DP	Q Min.	Q Norm.	Q Max.	Unit					
	23	CV	Min.	Norm.	Max.		1)	1)	1)		
	24	Noise	Min.	Norm.	Max.		1)	1)	1)	dBA	
	25	Required CV									
26	Selected CV Internal / Mfr			/ 640							
27	Fd Internal / Mfr			/							
28	Fluid tending to		Air-Fail Position		TO OPEN		Close				
Valve Body	29	Body type	Body material			ASTM A216 GR WCC					
	30	Design Pressure	Min.	Max.	bar-g	47		bar-g			
	31	Design Temperature	Min.	Max.	425						
	32	Max. DP closed valve	47			bar					
	33	Valve end con. & rating	Seat leakage class		0 - 600 lb ANSI RFS		CLASS IV (standard)				
	34	Plug type	Plug material			BALANCED		A 487 Gr CA6NM Nitrided			
	35	Plug dim.	Plug form/law			Full trim					
	36	Seat type	Q.ty	Material		Clamped in		AISI 410			
	37	Packing mat.	Lubricator			GRAPHITE					
	38	Bonnet type	STANDARD								
39											
Actuator	40	Direction of action									
	41	Spring range			Piston actuator L300 SR (f) 64						
Positioner	42	Type	Input signal			Without					
	43	Air supply	Action dir.			4 BAR-G					
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve			YES						
	48	Pressure gauge			YES						
	49	Handwheel									
	50	Solenoid valve	Spec. No.		YES						
	51	Pos. detector	Spec. No.		YES Two limit switch						
52	Weight	Consumption									



Notes: 1) ON-OFF VALVE NO CALCULATION

					INSTRUMENT SPECIFICATION		TECHNIP		 PARS PETROCHEMICAL COMPANY	
					Control Valve		 Sheet 32 of			
No.	By	Chk	Appr	Date	Revision	Code 507	Dwg No	DELETED	Rev :	

General Data	1	Tag No.			30PCV 60063			
	2	Service			W606 /P1A&B DischTo Tank			
	3	P&ID No.			0021-60-07			
Inlet line	4	Diameter	Number	1/2 in		1/2" CH65008A-DA10-H		
	5	Line Schedule	Piping class	XS				
Outlet line	6	Diameter	Number	1/2"				
	7	Line schedule	Piping class	XS				
Operating Conditions	8	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both			
	9	Fluid	Phase	State	DMDS	Liquid	Single Phase	
	10	Sour service	Special conditions					
	11	Molecular Weight	Viscosity at @ normal					
	12	Cp/Cv	Compressibility					
	13	Dens min	Dens nor	Dens max		1063	kg/m3	
	14	Vapour Pressure at T nom.						
	15	Critical Pressure	Critical Temperature		47	bar-a		
	16	Flow	Min.	Norm.	Max.	Unit	60	Al/h
	17	Temp.	QMin.	Q Norm.	Q Max.	Unit	48	:C
	18	Press.	QMin.	Q Norm.	Q Max.	Unit	10	bar-a
	19	DP	QMin.	Q Norm.	Q Max.	Unit	8.75	bar
	20	CV	Min.	Norm.	Max.		/	/ 0.02426
	21	Noise	Min.	Norm.	Max.		/	/ <70 dBA
	22	Required CV						
	23	Selected CV	Internal / Mfr		/ 0.05			
	24	Fd	Internal / Mfr	FI (Cf)	/		0.98	
	25	Fluid tending to						
	Valve Body	26	Type of control					
		27	Design Pressure	Min.	Max.	bar-g		11.5 bar-g
		28	Design Temperature	Min.	Max.			65 :C
		29	Max.DP closed valve					
30		Body type	Body material		Single Seat Globe		316 L	
31		Valve end con.& rating	Seat leakage class		0.5 in 300 lb ANSI RF		ANSI IV (standard)	
32		Trim type	Trim material		LINEAR CONTOURED		See note 	
33								
Press. contr. Actuator	34	Packing mat.	Lubricator		Carbon/PTFE+Kalrez "O" Ring		No	
	35	Bonnet type						
Temp. contr. Accessories	36	Type of pilot						
	37	Spring range	Set point					
	38	Bulb filling fluid						
	39	Bulb material						
	40	Ext. length	Ins. length					
Thermowell	41	Capillary type						
	42	Capill.mat.	Length					
	43							
	44	Material	Size & rating					
Purchase	45	Standard No.						
	46	Insertion length						
	47	Manufacturer						
	48	Model						
	49	Client Reference	Requisition No.	Item	1541-01	16033		
	50	Serial Number						
	51	Weight						
	52							

Notes: Other mounted accessories:
Pressure controller Model 2707-S/78 (Mounting valve)
Range 0-0.35 bar
Connection 1/4" NPT-F
Trim material: Plug: stellite N°12
Seat: stellite N°6



					INSTRUMENT SPECIFICATION		TECHNIP			
					Self Act. Control Valve				PARS PETROCHEMICAL COMPANY	
3	T.G.	FR	FR	02/04/2003	REVISED					
2	T.G.	FR	FR	15/10/2002	ISSUED FOR PURCHASE					
0	T.G.	FR	FR	11/07/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 506	Dwg. No.: 6465C 30 SP 1541 60	Sheet 33 of 33	
							Rev.: 3			

UNIT 70

TECHNIP9TH OLEFIN COMPLEX

ETHANE CRACKING PLANT



PARS PETROCHEMICAL COMPANY

CONTRACTOR DOCUMENT N°							OWNER DOCUMENT N°						
Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page	Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page
6465C	30	SP	1541	70	2	1/23	3930	30	SP	1541	70	2	1/23

CONTROL VALVES DATA SHEETS**(SECTION 70)**

Pages modified under this revision: 4, 12.

2	02/04/03	Revised					T.GRANDRY	F.REGARD	J.MAUBRY				
1	17/10/02	Issue for purchase					T.GRANDRY	F.REGARD	P.E.CROUZIER				
0	03/05/02	Issue for purchase					S.SRIRAM	T.GRANDRY	P.E.CROUZIER				
Rev	Date DD/MM/YY	STATUS					WRITTEN BY (name & visa)	CHECKED BY (name & visa)	APPROVED BY (name & visa)				
DOCUMENT REVISIONS													

Sections changed in last revision are identified by a vertical line in the right margin



General Data	1	Tag No.			30PV 70092		
	2	Client Reference	Requisition No.	Item	1541-01		17001
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe	
	4	Serial Number					
	5	Service			C2 Boil Off From E704		
	6	P&ID No.			0021-70-11		
Inlet line	7	Diameter	Number			4" CF70001A-EA01-N	
	8	Line schedule	Piping class				
Outlet line	9	Diameter	Number	6 in			
	10	Line schedule	Piping class	STD		DA07	
Operating Conditions	11	Calculation Results From:			Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both		
	12	Sour service	Special conditions				
	13	Molecular Weight	Viscosity at @ normal		28.05		
	14	Cp/Cv	Compressibility		1.33		
	15	Density min	Density nor	Density max			0.89
	16	Vapour Pressure at T nom.					22.6
	17	Critical Pressure		Critical Temperature			
	18	Fluid	Phase	State		Ethylene	Gas
	19	Flow	Min.	Norm.	Max.	Unit	7220
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	45
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	19
	22	DP	QMin.	Q Norm.	Q Max.	Unit	17.5
	23	CV	Min.	Norm.	Max.	21.94	
	24	Noise	Min.	Norm.	Max.	70.4	
	25	Required CV					
26	Selected CV			Internal / Mfr		/ 30	
27	Fd	Internal / Mfr		FI (CI)	0.975		
28	Fluid tending to		Air-Fail Position		Close		
Valve Body	29	Body type	Body material		ASTM A216 GR WCC		
	30	Design Pressure	Min.	Max.	bar-g		24.2 bar-g
	31	Design Temperature	Min.	Max.	60		
	32	Max.DP closed valve				24.2 bar	
	33	Valve end con.& rating	Seat leakage class		0 - 300 lb ANSI RF		CLASS V
	34	Plug type	Plug material		BALANCED		17-4 PH
	35	Plug dim.	Plug form/law		Red. trim		LO-DB 2 STAGE LINEAR
	36	Seat type	Q.ty	Material	Clamped in		SS 410
	37	Packing mat.	Lubricator		KEVLAR PTFE		
	38	Bonnet type			STANDARD		
39							
Actuator	40	Direction of action					
	41	Spring range			21 TO 45		
Positioner	42	Type	Input signal		Field Bus		Field Bus
	43	Air supply	Action dir.		4 BAR-G		
	44	Protection			IP-65 EEXi-a (Cenelec)		
Accessories	45	Booster relay					
	46	Locking device					
	47	Pressure reducing valve			YES		
	48	Pressure gauge			YES		
	49	Handwheel			NO		
	50	Solenoid valve	Spec. No.				
51	Pos.detector	Spec. No.					
	52	Weight	Consumption		134 KG		

- Notes: (1) Valve opens upon increasing the variable
(2) Valve body size is 4" * 2" * 4".

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE		Sheet 2		of 23	
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No	6465C 30 SP 1541 70	
									Rev : 1	



General Data	1	Tag No.			30FV 70021					
	2	Client Reference	Requisition No.	Item	1541-01		17002			
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number								
	5	Service			C2 Prod From TK701					
	6	P&ID No.			0021-70-12					
Inlet line	7	Diameter	Number				4"-P40017A-EJ01-C			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		4 in					
	10	Line schedule	Piping class		10S		EJ01			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal						
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max				568.6		kg/m3
	16	Vapour Pressure atT nom.								
	17	Critical Pressure		Critical Temperature		50.3 bar-a				
	18	Fluid	Phase	State		Ethylene		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit			31860	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit			-102	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit			37.7	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit			36.7	bar
	23	CV	Min.	Norm.	Max.			8.619		
	24	Noise	Min.	Norm.	Max.					dba
	25	Required CV								
	26	Selected CV		Internal / Mfr				/ 31		
	27	Fd		Internal / Mfr		FI (Cf)		/		0.939
28	Fluid tending to		Air-Fail Position						Open	
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M		
	30	Design Pressure		Min.	Max.	bar-g		39.9 bar-g		
	31	Design Temperature		Min.	Max.			-104		
	32	Max.DP closed valve				39.9 bar				
	33	Valve end con.& rating		Seat leakage class		3 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		Contoured		SS 316 FULLY STELLITED		
	35	Plug dim.		Plug form/law		Red. trim		=%		
	36	Seat type		Q.ty	Material	Threaded		316 S.S. FULL STELLITE		
	37	Packing mat.		Lubricator		KEVLAR PTFE				
	38	Bonnet type				Extended (EB)				
Actuator	40	Direction of action								
	41	Spring range			3 TO 15					
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Hand/wheel			NO					
	50	Solenoid valve	Spec. No.							
51	Pos.detector	Spec. No.								
	52	Weight		Consumption		97 KG				

Notes: (1) Valve closes upon increasing the variable
(2) Outlet vapor fraction: 1.9%wt vapor density=2.06 kg/m3.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE		Sheet 3		of 23	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code. 507	Dwg. No.: 6465C 30 SP 1541 70		Rev. 1

General Data	1	Tag No.			30PV 70023A				
	2	Client Reference	Requisition No.	Item	1541-01		17003		
	3	Supplier	Model		DRESSER FLOW CONTROL		41000 Series Globe		
	4	Serial Number							
	5	Service			C2 To TK701 From E507				
	6	P&ID No.			0021-70-12				
Inlet line	7	Diameter	Number				4"-P70057A-EJ01-C		
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		4 in				
	10	Line schedule	Piping class		10S				
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		28.05				
	14	Cp/Cv	Compressibility		1.35		0.875		
	15	Density min	Density nor	Density max			27.27	kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		Ethylene		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	1805		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	45		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	22.5		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	21.5		bar
	23	CV	Min.	Norm.	Max.			4.48	
	24	Noise	Min.	Norm.	Max.			70.3	dBA
	25	Required CV							
26	Selected CV		Internal / Mfr		/ 8				
27	Fd		Internal / Mfr		/		0.975		
28	Fluid tending to		Air-Fail Position				Close		
Valve Body	29	Body type	Body material		Single Seat Globe		A 351 Gr. CF8M		
	30	Design Pressure	Min.	Max.	bar-g		24.2 bar-g		
	31	Design Temperature	Min.	Max.			-104		
	32	Max.DP closed valve			24.2 bar				
	33	Valve end con.& rating	Seat leakage class		0 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type	Plug material		BALANCED		17-4 PH		
	35	Plug dim.	Plug form/law				LO-DB LINEAR		
	36	Seat type	Q.ty	Material	Clamped in		410 S.S.		
	37	Packing mat.	Lubricator		KEVLAR PTFE				
	38	Bonnet type			STANDARD				
	39								
Actuator	40	Direction of action							
	41	Spring range			6 TO 30				
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve	Spec. No.						
51	Pos.detector	Spec. No.							
	52	Weight	Consumption		79 KG				

Notes: (1) Valve closes upon increasing the variable.
(2) Design temperature = -104 / 60°C
(3) Valve body is 3" x 2" x 3"

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS FERROCHEMICAL COMPANY	
2	T.G.	FR	FR	02/04/2003	REVISED					
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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									Rev.: 2	



General Data	1	Tag No.			30PV 70023B					
	2	Client Reference	Requisition No.	Item	1541-01		17004			
	3	Supplier		Model	DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number								
	5	Service			C2 To TK701 From E507					
	6	P&ID No.			0021-70-12					
Inlet line	7	Diameter		Number			2"-P70058A-EJ01-C			
	8	Line schedule		Piping class						
Outlet line	9	Diameter		Number	2 in					
	10	Line schedule		Piping class	10S		DJ01			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal		28.05		0.01 cP		
	14	Cp/Cv		Compressibility		1.25		0.61		
	15	Density min	Density nor	Density max		65.1		65.1 kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid		Phase	State		Ethylene		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	400	440	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-11.6	-11.6	:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	31	29.7	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	30	28.7	bar	
	23	CV	Min.	Norm.	Max.		0.576	0.662		
	24	Noise	Min.	Norm.	Max.		<70	<70	dBA	
	25	Required CV								
	26	Selected CV			Internal / Mfr		/ 0.9			
	27	Fd		Internal / Mfr	FI (Cf)	/		0.975@max.		
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M		
	30	Design Pressure		Min.	Max.	bar-g		35 bar-g		
	31	Design Temperature		Min.	Max.			-104		
	32	Max.DP closed valve				35 bar				
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		LODB Two stage Linear		316 S.S. + STELLITE		
	35	Plug dim.		Plug form/flaw				Linear		
	36	Seat type		Q.ty	Material	Combined with cage		K500 MONEL		
	37	Packing mat.		Lubricator		KEVLAR PTFE				
	38	Bonnet type				Extended (EB)				
	39									
Actuator	40	Direction of action								
	41	Spring range			3 TO 15					
Positioner	42	Type		Input signal		Smart		4-20 mA 24Vdc HART		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXI-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			YES					
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		44 KG					

Notes: (1) Valve opens upon increasing the variable
(2) Design temperature = -104 / 60 OC

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE		Sheet 5		of 23	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 70023C						
	2	Client Reference	Requisition No.	Item	1541-01		17005				
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex					
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		14"-P70012A-DJ01-C						
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		14 in						
	10	Line schedule	Piping class		10S		DJ04				
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal		28.05		0.005 cP				
	14	Cp/Cv	Compressibility		1.31		0.97				
	15	Density min	Density nor	Density max				2.21		kg/m3	
	16	Vapour Pressure at T nom.									
	17	Critical Pressure			Critical Temperature						
	18	Fluid	Phase	State		Ethylene		Gas		1 Phase	
	19	Flow	Min.	Norm.	Max.	Unit			7220	kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit			-103	:C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit			1.08	bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit			30	mbar	
	23	CV	Min.	Norm.	Max.			1057			
	24	Noise	Min.	Norm.	Max.			<70		dba	
	25	Required CV									
	26	Selected CV Internal / Mfr				/ 1750					
	27	Fd	Internal / Mfr		FI (CI)		/				
28	Fluid tending to		Air-Fail Position			CLOSE					
Valve Body	29	Body type		Body material							
	30	Design Pressure		Min.	Max.	bar-g		0.1			
	31	Design Temperature		Min.	Max.	-104					
	32	Max.DP closed valve				0.1 bar					
	33	Valve end con.& rating		Seat leakage class		12 in - 300 lb ANSI RF		CLASS VI (TSO)			
	34	Plug type		Plug material							
	35	Plug dim.		Plug form/law							
	36	Seat type		Q.ty	Material			316 S.S. PTFE SOFT SEAT			
	37	Packing mat.		Lubricator							
	38	Bonnet type		Integral extended							
39											
Actuator	40	Direction of action									
	41	Spring range									
Positioner	42	Type	Input signal		Smart		4-20 mA 24Vdc HART				
	43	Air supply	Action dir.		4 BAR-G						
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve		YES							
	48	Pressure gauge		YES							
	49	Handwheel									
	50	Solenoid valve		Spec. No.							
51	Pos.detector		Spec. No.								
	52	Weight		Consumption		275 KG					

Notes: 1) Valve opens upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30FV 70024				
	2	Client Reference	Requisition No.	Item	1541-01		17006		
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number			4"-P40017A-EJ01-C			
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number			4 in			
	10	Line schedule	Piping class			10S		DJ01	
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal						
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max		568.6		kg/m3	
	16	Vapour Pressure atT nom.							
	17	Critical Pressure	Critical Temperature			50.3 bar-a			
	18	Fluid	Phase	State		Ethylene	Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	31860		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-102		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	37.7		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	36.7		bar
	23	CV	Min.	Norm.	Max.	8.619			
	24	Noise	Min.	Norm.	Max.				
	25	Required CV							
	26	Selected CV Internal / Mfr				/ 31			
27	Fd	Internal / Mfr		FI (Ci)	/		0.939		
28	Fluid tending to	Air-Fail Position			Open				
Valve Body	29	Body type	Body material			Single Seat Globe		A 351 Gr. CF8M	
	30	Design Pressure	Min.	Max.	bar-g		39.9 bar-g		
	31	Design Temperature	Min.	Max.	-104				
	32	Max.DP closed valve				39.9 bar			
	33	Valve end con.& rating	Seat leakage class			3 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type	Plug material			Contoured		Fully Stellite	
	35	Plug dim.	Plug form/law			=%			
	36	Seat type	Q.ty	Material		Threaded		316 S.S. FULL STELLITE	
	37	Packing mat.	Lubricator			KEVLAR PTFE			
	38	Bonnet type				Extended (EB)			
39									
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal			Field Bus		Field Bus	
	43	Air supply	Action dir.			4 BAR-G			
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel							
	50	Solenoid valve	Spec. No.						
51	Pos.detector	Spec. No.							
52	Weight	Consumption			97 KG				

Notes: (1) Valve closes upon increasing the variable
(2) Outlet vapor fraction: 1.9%wt vapor density=2.06 kg/m3.

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 PARIS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE			
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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					Code: 507	Dwg. No: 6465C 30 SP 1541 70		Rev: 1



General Data	1	Tag No.			30LV 70041		
	2	Client Reference	Requisition No.	Item	1541-01		17007
	3	Supplier	Model	DRESSER FLOW CONTROL		41000 Series Globe	
	4	Serial Number					
	5	Service			E701 C2 Prod Vaporizer		
	6	P&ID No.			0021-70-13		
Inlet line	7	Diameter	Number		8"-P70011A-EJ01-C		
	8	Line schedule	Piping class				
Outlet line	9	Diameter	Number		8 in		
	10	Line schedule	Piping class		10S		EJ01
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal <input checked="" type="radio"/> Manufacturer <input type="checkbox"/> Both		
	12	Sour service	Special conditions				
	13	Molecular Weight	Viscosity at @ normal			0.17 cP	
	14	Cp/Cv	Compressibility				
	15	Density min	Density nor	Density max		567 567 kg/m3	
	16	Vapour Pressure atT nom.			1.02 bar-a		
	17	Critical Pressure	Critical Temperature			50.3 bar-a	
	18	Fluid	Phase	State		Ethylene Liquid Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	12621 126214 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-102.2 -102.2 :C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	39.63 31.96 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	10.62 0.7 bar
	23	CV	Min.	Norm.	Max.	5.966 234.1	
	24	Noise	Min.	Norm.	Max.	81.5 73.8 dBA	
	25	Required CV					
26	Selected CV Internal / Mfr			/ 360			
27	Fd	Internal / Mfr	FI (CI)		/ 0.915@norml		
28	Fluid tending to		Air-Fail Position		Close		
Valve Body	29	Body type	Body material			A 351 Gr. CF8M	
	30	Design Pressure	Min.	Max.	bar-g 39.3 bar-g		
	31	Design Temperature	Min.	Max.			
	32	Max.DP closed valve			39.3 bar		
	33	Valve end con.& rating	Seat leakage class		6 in - 300 lb ANSI RF CLASS IV (IEC 534-4)		
	34	Plug type	Plug material			BALANCED 316 S.S. + STELLITE	
	35	Plug dim.	Plug form/flaw			Full trim =%	
	36	Seat type	Q.ty	Material		Clamped in 316 S.S. + STELLITE	
	37	Packing mat.	Lubricator			KEVLAR PTFE	
	38	Bonnet type				STANDARD (T= - 104 Deg.)	
39							
Actuator	40	Direction of action					
	41	Spring range			6 TO 30		
Positioner	42	Type	Input signal		Smart 4-20 mA 24Vdc HART		
	43	Air supply	Action dir.		4 BAR-G		
	44	Protection			IP-65 EEXi-a (Cenelec)		
Accessories	45	Booster relay					
	46	Locking device					
	47	Pressure reducing valve			YES		
	48	Pressure gauge			YES		
	49	Handwheel			NO		
	50	Solenoid valve	Spec. No.		YES		
51	Pos.detector	Spec. No.		YES (1No. low limit switch)			
52	Weight	Consumption		279 KG			

Notes: (1) Design temperature : -104°C+60°C
(2) Valve closes upon increasing the variable

					INSTRUMENT SPECIFICATION		TECHNIP		 PARS PETROCHEMICAL COMPANY	
					Control Valve		 Sheet 8 of 23			
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.				30PV 70042					
	2	Client Reference	Requisition No.	Item	1541-01		17008				
	3	Supplier	Model		DRESSER FLOW CONTROL		35000 Series Camflex				
	4	Serial Number									
	5	Service				Methanol To E702					
	6	P&ID No.				0021-70-13					
Inlet line	7	Diameter	Number				6"-LC70001A-DA04-P				
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		10 in						
	10	Line schedule	Piping class		20		DA04				
Operating Conditions	11	Calculation Results From:				<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service		Special conditions							
	13	Molecular Weight		Viscosity at @ normal							
	14	Cp/Cv		Compressibility							
	15	Density min	Density nor	Density max				920		kg/m3	
	16	Vapour Pressure atT nom.									
	17	Critical Pressure		Critical Temperature		221 bar-a					
	18	Fluid	Phase	State		Condensate LP		Liquid		Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit			34675		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit			146.2		°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit			4.3		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit			2.9		bar
	23	CV	Min.	Norm.	Max.			99.03			
	24	Noise	Min.	Norm.	Max.					dBA	
	25	Required CV									
26	Selected CV Internal / Mfr				/ 138						
27	Fd	Internal / Mfr		FI (Ci)	/		0.735				
28	Fluid tending to		Air-Fail Position				Close				
Valve Body	29	Body type		Body material				ASTM A216 GR WCC			
	30	Design Pressure		Min.	Max.	bar-g		7		bar-g	
	31	Design Temperature		Min.	Max.			220			
	32	Max.DP closed valve				7 bar					
	33	Valve end con.& rating		Seat leakage class		4 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type		Plug material		Eccentric rotary		316L S.S. + STELLITE			
	35	Plug dim.		Plug form/flaw		Red. trim		LINEAR			
	36	Seat type		Q.ty	Material			316 S.S Stellite hard faced			
	37	Packing mat.		Lubricator		KEVLAR PTFE WITH VITON O RINGS					
	38	Bonnet type				Integral extended					
39											
Actuator	40	Direction of action									
	41	Spring range				7 TO 15					
Positioner	42	Type		Input signal		Smart		4-20 mA 24Vdc HART			
	43	Air supply		Action dir.		4 BAR-G					
	44	Protection				IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve				YES					
	48	Pressure gauge				YES					
	49	Handwheel				NO					
	50	Solenoid valve		Spec. No.							
51	Pos.defector		Spec. No.								
52	Weight		Consumption		62 KG						

Notes: (1) Mixed phase at outlet valve : 7.1 % wt of vaporization vapor density : 0.9 kg/m3
(2) Valve closes upon increasing the variable no flow in normal operation

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE		Sheet 9		of 23	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30TV 70048				
	2	Client Reference	Requisition No.	Item	1541-01		17009		
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number							
	5	Service			C2 from E702				
	6	P&ID No.			0021-70-13				
Inlet line	7	Diameter	Number		4"-ME70002A-DA03-H				
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		4 in				
	10	Line schedule	Piping class		STD DA03				
Operating Conditions	11	Calculation Results From:			Internal		● Manufacturer		Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal						
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	694		694	kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure	Critical Temperature		33.9 bar-a				
	18	Fluid	Phase	State		Methanol	Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	1189	11891	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	105.3	105.3	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	4.46	4.11	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	0.46	0.11	bar
	23	CV	Min.	Norm.	Max.		2.441	50.06	
	24	Noise	Min.	Norm.	Max.		<70	<70	dba
	25	Required CV							
26	Selected CV	Internal / Mfr		/ 81					
27	Fd	Internal / Mfr		FI (Cf)		/	0.765@max.		
28	Fluid tending to	Air-Fail Position		Close					
Valve Body	29	Body type	Body material		A 351 Gr. CF3M				
	30	Design Pressure	Min.	Max.	bar-g		5.5 bar-g		
	31	Design Temperature	Min.	Max.					
	32	Max.DP closed valve				0.5 bar			
	33	Valve end con.& rating	Seat leakage class		3 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type	Plug material		Eccentric rotary		316L S.S. + STELLITE		
	35	Plug dim.	Plug form/flaw		Red. trim		LINEAR		
	36	Seat type	Q.ly	Material			316 S.S.		
	37	Packing mat.	Lubricator		KEVLAR PTFE WITH VITON O RINGS				
	38	Bonnet type				Integral extended			
39									
Actuator	40	Direction of action							
	41	Spring range			7 TO 15				
Positioner	42	Type	Input signal		Smart	4-20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G				
Accessories	44	Protection			IP-65 EEXi-a (Cenelec)				
	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve	Spec. No.						
	51	Pos.detector	Spec. No.						
	52	Weight	Consumption		48 KG				

Notes: (1) Design temperature : -120C/1250C
(2) Valve closes upon increasing the variable
(3) No flow in normal operation

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30FV 70061		
	2	Client Reference	Requisition No.	Item	1541-01		17010
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe	
	4	Serial Number					
	5	Service			C2 To E432 From TK703		
	6	P&ID No.			0021-70-14		
Inlet line	7	Diameter	Number				3'-P70028A-DJ01-C
	8	Line schedule	Piping class				
Outlet line	9	Diameter	Number		4 in		
	10	Line schedule	Piping class		10S		DJ01
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal <input checked="" type="checkbox"/> Manufacturer <input type="checkbox"/> Both		
	12	Sour service	Special conditions				
	13	Molecular Weight	Viscosity at @ normal				
	14	Cp/Cv	Compressibility				
	15	Density min	Density nor	Density max			544.7 kg/m ³
	16	Vapour Pressure at T nom.					
	17	Critical Pressure	Critical Temperature		48.8 bar-a		
	18	Fluid	Phase	State		Ethane Liquid Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	23980 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-87 °C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	11.3 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	10.3 bar
	23	CV	Min.	Norm.	Max.	12.71	
	24	Noise	Min.	Norm.	Max.	dBA	
	25	Required CV					
26	Selected CV Internal / Mfr			/ 31			
27	Fd	Internal / Mfr	FI (Cf)			0.925	
28	Fluid tending to		Air-Fail Position		Open		
Valve Body	29	Body type	Body material		Single Seat Globe		A 351 Gr. CF8M
	30	Design Pressure	Min.	Max.	bar-g		13.5 bar-g
	31	Design Temperature	Min.	Max.			-95
	32	Max.DP closed valve			13.5 bar		
	33	Valve end con.& rating	Seat leakage class		3 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)
	34	Plug type	Plug material		Contoured		316 S.S. + STELLITE
	35	Plug dim.	Plug form/law				-%
	36	Seat type	Q.ty	Material	Threaded		316 S.S. + STELLITE
	37	Packing mat.	Lubricator		KEVLAR PTFE		
	38	Bonnet type			Extended (EB)		
39							
Actuator	40	Direction of action					
	41	Spring range			3 TO 15		
Positioner	42	Type	Input signal		Smart		4-20 mA 24Vdc HART
	43	Air supply	Action dir.		4 BAR-G		
	44	Protection			IP-65 EEXi-a (Cenelec)		
Accessories	45	Booster relay					
	46	Locking device					
	47	Pressure reducing valve			YES		
	48	Pressure gauge			YES		
	49	Handwheel			NO		
	50	Solenoid valve	Spec. No.				
	51	Pos.detector	Spec. No.				
	52	Weight	Consumption		97 KG		

Notes: (1) Valve closes upon increasing the variable
(2) Outlet vapor fraction: 1.2%wt vapor density=2.02 kg/m³.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARIS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE		Sheet 11		of 23	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 70063A				
	2	Client Reference	Requisition No.	Item	1541-01		17011		
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number							
	5	Service			Ethane Vap From E429				
	6	P&ID No.			0021-70-14				
Inlet line	7	Diameter	Number		3"-P70023A-DJ01-C				
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		3 in				
	10	Line schedule	Piping class		10S		DJ01		
Operating Conditions	11	Calculation Results From:			<input type="radio"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="radio"/> Both
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		30.2				
	14	Cp/Cv	Compressibility		1.3		0.88		
	15	Density min	Density nor	Density max	13.3		11.6		kg/m3
	16	Vapour Pressure aT nom.							
	17	Critical Pressure		Critical Temperature					
	18	Fluid	Phase	State		ETHANE		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	236		384 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-39.4		-41.5 :C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	7.42		6.51 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	6.4		5.38 bar
	23	CV	Min.	Norm.	Max.	1.565		2.89	
	24	Noise	Min.	Norm.	Max.	72.5		79.7 dBA	
	25	Required CV							
26	Selected CV			Internal / Mir		/ 8			
27	Fd	Internal / Mir		FI (CI)	/		0.950		
28	Fluid tending to		Air-Fail Position		Close				
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M	
	30	Design Pressure		Min.	Max.	bar-g		9 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve				9 bar			
	33	Valve end con.& rating		Seat leakage class		1.5 in - 300 lb ANSI RF / 2		CLASS V	
	34	Plug type		Plug material		Contoured		316 S.S. + STELLITE	
	35	Plug dim.		Plug form/law		LO-DB LINEAR			
	36	Seat type		Q.ty	Material	Threaded		316 S.S. + STELLITE	
	37	Packing mat.		Lubricator		KEVLAR PTFE			
	38	Bonnet type				Extended (EB)			
39									
Actuator	40	Direction of action							
	41	Spring range			21 TO 45				
Positioner	42	Type		Input signal		Smart		4-20 mA 24Vdc HART	
	43	Air supply		Action dir.		4 BAR-G			
	44	Protection			IP-65 EEXi-a (Cenelec)				
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve			YES				
	48	Pressure gauge			YES				
	49	Handwheel			NO				
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
52	Weight		Consumption		47 KG				

Notes: (1) No flow in normal operation
(2) Valve closes upon increasing the variable
(3) Design temperature : -88°C/+60°C

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	02/04/2003	REVISED					
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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							Rev.: 2			



General Data	1	Tag No.			30PV 70063B					
	2	Client Reference	Requisition No.	Item	1541-01		17012			
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number								
	5	Service			C2 Refrig From D508					
	6	P&ID No.			0021-70-14					
Inlet line	7	Diameter	Number				4"-ER70001A-DJ01-C			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		4 in					
	10	Line schedule	Piping class		10S		DJ01			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal				0.11 cP		
	14	Cp/Cv		Compressibility						
	15	Density min	Density nor	Density max	519		516		kg/m3	
	16	Vapour Pressure at T nom.			4.78 bar-a					
	17	Critical Pressure		Critical Temperature		50.3 bar-a				
	18	Fluid	Phase	State		Ethylene		Liquid		Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	410	8979		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-72	-75		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	5.71	4.89		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.61	3.48		bar
	23	CV	Min.	Norm.	Max.			0.540		14.75
	24	Noise	Min.	Norm.	Max.					dba
	25	Required CV								
26	Selected CV Internal / Mfr			/ 26						
27	Fd	Internal / Mfr		FI (Cf)			0.914@max.			
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type		Body material		Single Seal Globe		A 351 Gr. CF8M		
	30	Design Pressure		Min.	Max.	bar-g		13.3 bar-g		
	31	Design Temperature		Min.	Max.					
	32	Max.DP closed valve			13.3 bar					
	33	Valve end con.& rating		Seat leakage class		2 in - 300 lb ANSI RF		CLASS V		
	34	Plug type		Plug material		Contoured		316 S.S. + STELLITE		
	35	Plug dim.		Plug form/law		Red. trim		=%		
	36	Seat type		Q.ty	Material	Threaded		316 S.S. + STELLITE		
	37	Packing mat.		Lubricator		KEVLAR PTFE				
	38	Bonnet type				Extended (EB)				
39										
Actuator	40	Direction of action								
	41	Spring range			21 TO 45					
Positioner	42	Type		Input signal		Smart		4-20 mA 24Vdc HART		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve		Spec. No.						
	51	Pos.detector		Spec. No.						
52	Weight		Consumption		69 KG					

Notes: (1) Mixed phase at outlet valve : 14.1 % wt of vaporization vapor density : 3.0 kg/m3
(2) Valve opens upon increasing the variable
(3) Design temperature : -104°C/+60°C

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARA PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE		Sheet 13		of 23	
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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									Rev : 1	



General Data	1	Tag No.			30PV 70063C					
	2	Client Reference	Requisition No.	Item	1541-01		17013			
	3	Supplier		Model	DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number								
	5	Service			Ethane From TK703					
	6	P&ID No.			0021-70-14					
Inlet line	7	Diameter		Number			14"-P70029A-DJ01-C			
	8	Line schedule		Piping class						
Outlet line	9	Diameter		Number	14 in					
	10	Line schedule		Piping class	10S		DJ04			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal		30.06		0.005 cP		
	14	Cp/Cv		Compressibility		1.26				
	15	Density min	Density atT nom	Density max			2.17		kg/m3	
	16	Vapour Pressure atT nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		Etane BOG		Gas		1 Phase
	19	Flow	Min.	Norm.	Max.	Unit	7453		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-87.5		°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	1.08		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	18		mbar	
	23	CV	Min.	Norm.	Max.			1413		
	24	Noise	Min.	Norm.	Max.			<70		dBA
	25	Required CV								
26	Selected CV		Internal / Mfr		/ 1750					
27	Fd		Internal / Mfr		FI (Ci)		/		0.718	
28	Fluid tending to		Air-Fail Position				CLOSE			
Valve Body	29	Body type		Body material		A 351 Gr. CF3M				
	30	Design Pressure		Min.	Max.	0.1		bar-g		
	31	Design Temperature		Min.	Max.	-95				
	32	Max.DP closed valve			0.1		bar			
	33	Valve end con.& rating		Seat leakage class		12 in - 300 lb ANSI RF		CLASS VI (TSO)		
	34	Plug type		Plug material		Eccentric rotary		316L S.S. + STELLITE		
	35	Plug dim.		Plug form/law		Full trim		LINEAR		
	36	Seat type		Q.ty	Material			316 S.S. PTFE SOFT SEAT		
	37	Packing mat.		Lubricator		KEVLAR PTFE WITH VITON O RINGS				
	38	Bonnet type		Integral extended						
Actuator	40	Direction of action								
	41	Spring range			7 TO 24					
Positioner	42	Type		Input signal		Smart		4-20 mA 24Vdc HART		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			YES					
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
	52	Weight		Consumption		275 KG				

Notes: 1) Valve opens upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30FV 70064					
	2	Client Reference	Requisition No.	Item	1541-01		17014			
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe			
	4	Serial Number								
	5	Service			C2 To E432 From TK703					
	6	P&ID No.			0021-70-14					
Inlet line	7	Diameter	Number		3"-P70028A-DJ01-C					
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		4 in					
	10	Line schedule	Piping class		10S		DJ01			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal							
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	544.7		kg/m3			
	16	Vapour Pressure at T nom.								
	17	Critical Pressure	Critical Temperature		48.8 bar-a					
	18	Fluid	Phase	State		Ethane		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	23980		kg/h	
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-87		°C	
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	11.3		bar-a	
	22	DP	QMin.	Q Norm.	Q Max.	Unit	10.3		bar	
	23	CV	Min.	Norm.	Max.			12.71		
	24	Noise	Min.	Norm.	Max.					dba
	25	Required CV								
26	Selected CV Internal / Mfr			/ 31						
27	Fd	Internal / Mfr	FI (Cf)	/		0.925				
Valve Body	28	Fluid tending to	Air-Fail Position				Open			
	29	Body type	Body material				A 351 Gr. CF8M			
	30	Design Pressure	Min.	Max.	bar-g		13.5 bar-g			
	31	Design Temperature	Min.	Max.			-95			
	32	Max.DP closed valve			13.5 bar					
	33	Valve end con.& rating	Seat leakage class		3 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)			
	34	Plug type	Plug material		Contoured		316 S.S. + STELLITE			
	35	Plug dim.	Plug form/law		Red trim		=%			
	36	Seat type	Qty	Material	Threaded		316 S.S. + STELLITE			
	37	Packing mat.	Lubricator		KEVLAR PTFE					
Actuator	38	Bonnet type			Extended (EB)					
	39									
	40	Direction of action								
Positioner	41	Spring range			3 TO 15					
	42	Type	Input signal		Smart		4-20 mA 24Vdc HART			
	43	Air supply	Action dir.		4 BAR-G					
Accessories	44	Protection			IP-65 EEXi-a (Cenelec)					
	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve	Spec. No.							
	51	Pos.detector	Spec. No.							
	52	Weight	Consumption		97 KG					

Notes: (1) Valve closes upon increasing the variable
(2) Outlet vapor fraction: 1.2%wt vapor density=2.02 kg/m3.

						INSTRUMENT SPECIFICATION		TECHNIP			
						Control Valve				PARIS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE		Sheet 15		of 23		
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE		Code: 507		Dwg No. 6465C 30 SP 1541 70		
No.	By	Chk	Appr	Date	Revision		Rev: 1				



General Data	1	Tag No.			30FV 70065				
	2	Client Reference	Requisition No.	Item	1541-01		17015		
	3	Supplier	Model		DRESSER FLOW CONTROL		21000 Series Globe		
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number		6"-P70027A-EJ01-C				
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		10 in				
	10	Line schedule	Piping class		40S		EJ01		
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal <input checked="" type="radio"/> Manufacturer <input type="checkbox"/> Both				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal						
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max	524		524 kg/m3		
	16	Vapour Pressure at T nom.			2.46 bar-a				
	17	Critical Pressure		Critical Temperature		49 bar-a			
	18	Fluid	Phase	State		Ethane		Liquid	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	55300		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-69		:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	18.25		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	16.98		bar
	23	CV	Min.	Norm.	Max.	24.37			
	24	Noise	Min.	Norm.	Max.	dBA			
	25	Required CV							
26	Selected CV Internal / Mfr			/ 47					
27	Fd Internal / Mfr		FI (Cf)		/		0.918		
28	Fluid tending to		Air-Fail Position			Close			
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M	
	30	Design Pressure		Min.	Max.	bar-g		22.8 bar-g	
	31	Design Temperature		Min.	Max.				
	32	Max.DP closed valve				22.8 bar			
	33	Valve end con.& rating		Seat leakage class		3 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)	
	34	Plug type		Plug material		Contoured		316 S.S. + STELLITE	
	35	Plug dim.		Plug fom/law		Red. trim		=%	
	36	Seat type		Q.ty	Material	Threaded		316 S.S. + STELLITE	
	37	Packing mat.		Lubricator		KEVLAR PTFE			
	38	Bonnet type		Extended (EB)					
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal		Smart		4w20 mA 24Vdc HART		
	43	Air supply	Action dir.		4 BAR-G				
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve		YES					
	48	Pressure gauge		YES					
	49	Handwheel							
	50	Solenoid valve	Spec. No.						
	51	Pos.detector	Spec. No.						
	52	Weight		Consumption		97 KG			

Notes: (1) Mixed phase at outlet valve : 6.5 % wt of vaporization.vapor density : 2.1 kg/m3
(2) Valve closes upon increasing the variable
(3) No flow in normal operation
(4) Design temperature : -90°C/+60°C

					INSTRUMENT SPECIFICATION		TECHNIP	
					Control Valve		 PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE			
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE			
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					Code: 507	Dwg No.: 6465c 30 sp 1541 70		Rev : 1



General Data	1	Tag No.			30PV 70081A					
	2	Client Reference	Requisition No.	Item	1541-01		17016			
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number								
	5	Service			C2 for TK702					
	6	P&ID No.			0021-70-15					
Inlet line	7	Diameter	Number				1 1/2-P70021A-EA11-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		1.5 in					
	10	Line schedule	Piping class		XS		DA03			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service		Special conditions						
	13	Molecular Weight		Viscosity at @ normal		28.05		0.01 cP		
	14	Cp/Cv		Compressibility		1.25		0.785		
	15	Density min	Density nor	Density max		44.3		39.9 kg/m3		
	16	Vapour Pressure at T nom.								
	17	Critical Pressure		Critical Temperature						
	18	Fluid	Phase	State		Ethylene		Gas		Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	350		420 kg/h	
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	27		27 °C	
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	30.9		28.5 bar-a	
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	16.9		14.5 bar	
	23	CV	Min.	Norm.	Max.			0.653		0.8639
	24	Noise	Min.	Norm.	Max.			<70		70.9 dBA
	25	Required CV								
26	Selected CV			Internal / Mfr		/ 1.7				
27	Fd		Internal / Mfr		FI (Ci)		/		0.919@max.	
28	Fluid tending to		Air-Fail Position					Close		
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		35 bar-g		
	31	Design Temperature		Min.	Max.			60		
	32	Max.DP closed valve					35 bar			
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS V		
	34	Plug type		Plug material		Contoured		SS 416		
	35	Plug dim.		Plug form/law				=%		
	36	Seat type		Q.ty	Material	Threaded		SS 416		
	37	Packing mat.		Lubricator		KEVLAR PTFE				
	38	Bonnet type				STANDARD				
39										
Actuator	40	Direction of action								
	41	Spring range			6 TO 30					
Positioner	42	Type		Input signal		Field Bus		Field Bus		
	43	Air supply		Action dir.		4 BAR-G				
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve		Spec. No.						
51	Pos.detector		Spec. No.							
52	Weight		Consumption		38 KG					

Notes: (1) Valve closes upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE		Sheet 17		of 23	
0	S.S.	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
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General Data	1	Tag No.			30PV 70081B						
	2	Client Reference	Requisition No.	Item	1541-01		17017				
	3	Supplier	Model		DRESSER FLOW CONTROL		Camflex Flangeless				
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		1 1/2-P70034A-DA03-N						
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		2 in						
	10	Line schedule	Piping class		STD		DA 03				
Operating Conditions	11	Calculation Results From:			Internal		● Manufacturer		Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal		28.05		0.01 cP				
	14	Cp/Cv	Compressibility		1.25		0.92				
	15	Density min	Density nor	Density max		16.08		17.71		kg/m3	
	16	Vapour Pressure at T nom.									
	17	Critical Pressure			Critical Temperature						
	18	Fluid	Phase		State		Ethylene		Gas		Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	290.4		351.9		kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	45		45		°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	15.3		14.9		bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	2.113		1.713		bar
	23	CV	Min.	Norm.	Max.	2.567		3.907			
	24	Noise	Min.	Norm.	Max.	<70		<70		dBA	
	25	Required CV									
26	Selected CV			Internal / Mfr		/ 5.6					
27	Fd	Internal / Mfr		FI (Cf)		/		0.740@max.			
28	Fluid tending to		Air-Fail Position								
		Close									
Valve Body	29	Body type		Body material							
			ASTM A216 GR WCC								
	30	Design Pressure		Min.	Max.	bar-g		15		bar-g	
	31	Design Temperature		Min.	Max.	60					
	32	Max.DP closed valve			15 bar						
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS VI (TSO)			
	34	Plug type		Plug material							
			eccentric rotary								
	35	Plug dim.		Plug form/law		Red. trim		LINEAR			
	36	Seat type		Q.ty	Material	316 S.S. PTFE SOFT SEAT					
37	Packing mat.		Lubricator								
		KEVLAR PTFE WITH VITON O RINGS									
38	Bonnet type		Integral extended								
39											
Actuator	40	Direction of action									
	41	Spring range									
		7 TO 15									
Positioner	42	Type	Input signal		Field Bus		Field Bus				
	43	Air supply	Action dir.		4 BAR-G						
44	Protection										
		IP-65 EEXi-a (Cenelec)									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve		YES							
	48	Pressure gauge		YES							
	49	Handwheel									
			NO								
50	Solenoid valve		Spec. No.								
51	Pos.detector		Spec. No.								
52	Weight		Consumption		14 KG						

Notes: (1) Valve opens upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg No	6465C 30 SP 1541 70	
								Sheet 18	of 23	
								Rev	1	



General Data	1	Tag No.			30FV 70082					
	2	Client Reference	Requisition No.	Item	1541-01		17018			
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe				
	4	Serial Number								
	5	Service			C3+ Cut To TK702					
	6	P&ID No.			0021-70-15					
Inlet line	7	Diameter	Number				4"-P70040A-EA01-N			
	8	Line schedule	Piping class							
Outlet line	9	Diameter	Number		4 in					
	10	Line schedule	Piping class		STD		EA01			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="radio"/> Manufacturer		<input type="checkbox"/> Both	
	12	Sour service	Special conditions							
	13	Molecular Weight	Viscosity at @ normal				0.123 cP			
	14	Cp/Cv	Compressibility							
	15	Density min	Density nor	Density max	592	592	592	kg/m3		
	16	Vapour Pressure at T nom.			13.1 bar-a					
	17	Critical Pressure		Critical Temperature		59.8 bar-a				
	18	Fluid	Phase	State		C3+		Liquid	Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	4277	10691	12830	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	45	45	45	°C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	22.7	19.9	18.5	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	4.8	2	0.5	bar
	23	CV	Min.	Norm.	Max.		2.944	11.45	28.07	
	24	Noise	Min.	Norm.	Max.		66.3	64.6	56.5	dBA
	25	Required CV								
26	Selected CV Internal / Mfr			/ 46						
27	Fd	Internal / Mfr	FI (Cf)					0.912@max.		
28	Fluid tending to		Air-Fail Position				Close			
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC		
	30	Design Pressure		Min.	Max.	bar-g		26.5 bar-g		
	31	Design Temperature		Min.	Max.			60		
	32	Max.DP closed valve			26.5 bar					
	33	Valve end con.& rating		Seat leakage class		2 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
	34	Plug type		Plug material		Contoured		SS 416		
	35	Plug dim.		Plug form/law		Full trim		=%		
	36	Seat type		Q.ty	Material	Threaded		SS 416		
	37	Packing mat.		Lubricator		CARBON-PTFE + Note 1				
	38	Bonnet type				STANDARD				
39										
Actuator	40	Direction of action								
	41	Spring range			21 TO 45					
Positioner	42	Type	Input signal		Field Bus		Field Bus			
	43	Air supply	Action dir.		4 BAR-G					
	44	Protection			IP-65 EEXi-a (Cenelec)					
Accessories	45	Booster relay								
	46	Locking device								
	47	Pressure reducing valve			YES					
	48	Pressure gauge			YES					
	49	Handwheel			NO					
	50	Solenoid valve	Spec. No.							
	51	Pos.detector	Spec. No.							
	52	Weight		Consumption		51 KG				

Notes: (1) Low emission packing L13.
(2) Valve closes upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP		 PARS PETROCHEMICAL COMPANY	
					Control Valve		 Sheet 19 of 23			
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507	Dwg. No.: 6465C 30 SP 1541 70	Rev. 1	

General Data	1	Tag No.			30FV 70091						
	2	Client Reference	Requisition No.	Item	1541-01		17019				
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex					
	4	Serial Number									
	5	Service			Off Spec C2 From TK704						
	6	P&ID No.			0021-70-16						
Inlet line	7	Diameter	Number				4" P40047A-EJ01-C				
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		4 in						
	10	Line schedule	Piping class		STD		EB01				
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both		
	12	Sour service	Special conditions								
	13	Molecular Weight	Viscosity at @ normal					0.07 cP			
	14	Cp/Cv	Compressibility								
	15	Density min	Density nor	Density max	445.7		452.4		kg/m3		
	16	Vapour Pressure at T nom.			18 bar-a						
	17	Critical Pressure	Critical Temperature		50.3 bar-a						
	18	Fluid	Phase	State		Ethylene		Liquid		Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	12626	13889		kg/h	
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	-32.6	-35.7		°C	
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	18	16.5		bar-a	
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	4	2.5		bar	
	23	CV	Min.	Norm.	Max.			15.84		19.34	
	24	Noise	Min.	Norm.	Max.					dBA	
	25	Required CV									
26	Selected CV Internal / Mfr					/ 20					
27	Fd	Internal / Mfr	FI (CI)			/		0.685@max.			
28	Fluid tending to		Air-Fail Position				Close				
Valve Body	29	Body type		Body material				A 351 Gr. CF3M			
	30	Design Pressure	Min.	Max.	bar-g		23.6		bar-g		
	31	Design Temperature	Min.	Max.			-54				
	32	Max.DP closed valve			23.6 bar						
	33	Valve end con.& rating	Seat leakage class		2 - 300 lb ANSI RF		CLASS IV (IEC 534-4)				
	34	Plug type	Plug material		Eccentric rotary		SOLID STELLITE				
	35	Plug dim.	Plug form/law		Full trim		LINEAR				
	36	Seat type	Q.ty	Material				316 SS Stellite hard faced			
	37	Packing mat.	Lubricator		KEVLAR PTFE WITH VITON O RINGS						
	38	Bonnet type	Integral extended								
39											
Actuator	40	Direction of action									
	41	Spring range			7 TO 15						
Positioner	42	Type	Input signal		Field Bus		Field Bus				
	43	Air supply	Action dir.		4 BAR-G						
	44	Protection			IP-65 EEXi-a (Cenelec)						
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve			YES						
	48	Pressure gauge			YES						
	49	Handwheel			NO						
	50	Solenoid valve	Spec. No.								
51	Pos.detector	Spec. No.									
52	Weight	Consumption		20 KG							

Notes: (1) Downstream vapor fraction is 10.3%wt vapor density= 22.0 kg/m3
(2) Valve closes upon increasing the variable.
(3) Selected CV not higher than 120% of Calculated CV

					INSTRUMENT SPECIFICATION		TECHNIP		 	
					Control Valve					
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507		Dwg No.: 6465C 30 SP 1541 70	
							Sheet 20		of 23	
							Rev 1			



General Data	1	Tag No.			30PV 70091			
	2	Client Reference	Requisition No.	Item	1541-01		17020	
	3	Supplier	Model		DRESSER FLOW CONTROL	21000 Series Globe		
	4	Serial Number						
	5	Service			Boil Off From TK704			
	6	P&ID No.			0021-70-16			
Inlet line	7	Diameter	Number		3" P70060A-EJ01-N			
	8	Line schedule	Piping class					
Outlet line	9	Diameter	Number		3 in			
	10	Line schedule	Piping class		10S DJ04			
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal <input checked="" type="radio"/> Manufacturer <input type="checkbox"/> Both			
	12	Sour service	Special conditions					
	13	Molecular Weight	Viscosity at @ normal		28.05		0.01 cP	
	14	Cp/Cv	Compressibility		1.25		0.72	
	15	Density min	Density nom	Density max	40.3		kg/m3	
	16	Vapour Pressure at T nom.						
	17	Critical Pressure		Critical Temperature				
	18	Fluid	Phase	State		Ethylene	Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	370	kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-27	:C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	21	bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	19.5	bar
	23	CV	Min.	Norm.	Max.	0.831		
	24	Noise	Min.	Norm.	Max.	71.1		dBa
	25	Required CV						
26	Selected CV Internal / Mfr			/ 1.5				
27	Fd Internal / Mfr		FI (Cf)		/		0.975	
28	Fluid tending to		Air-Fail Position		Close			
Valve Body	29	Body type		Body material		Single Seat Globe		A 351 Gr. CF8M
	30	Design Pressure		Min.	Max.	bar-g		23 bar-g
	31	Design Temperature		Min.	Max.	-104		
	32	Max.DP closed valve				23 bar		
	33	Valve end con.& rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS V
	34	Plug type		Plug material		LODB Two stage Linear 316 S.S. + STELLITE		
	35	Plug dim.		Plug form/law		Linear		
	36	Seat type		Q.ty	Material	Combined with cage		500K MONEL
	37	Packing mat.		Lubricator		KEVLAR PTFE		
	38	Bonnet type				Extended (EB)		
39								
Actuator	40	Direction of action						
	41	Spring range			6 TO 30			
Positioner	42	Type	Input signal		Field Bus		Field Bus	
	43	Air supply	Action dir.		4 BAR-G			
	44	Protection			IP-65 EEXi-a (Cenelec)			
Accessories	45	Booster relay						
	46	Locking device						
	47	Pressure reducing valve			YES			
	48	Pressure gauge			YES			
	49	Handwheel			NO			
	50	Solenoid valve	Spec. No.					
51	Pos.defector	Spec. No.						
	52	Weight		Consumption		38 KG		

Notes: (1) Valve opens upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code. 507		Dwg. No.: 6465C 30 SP 1541 70	
							Sheet 21		of 23	
							Rev.: 1			



General Data	1	Tag No.			30PV 70094A						
	2	Client Reference	Requisition No.	Item	1541-01		17021				
	3	Supplier	Model	DRESSER FLOW CONTROL		21000 Series Globe					
	4	Serial Number									
	5	Service									
	6	P&ID No.									
Inlet line	7	Diameter	Number		2"-P70020A-EA11-N						
	8	Line schedule	Piping class								
Outlet line	9	Diameter	Number		2 in						
	10	Line schedule	Piping class		STD		EB01				
Operating Conditions	11	Calculation Results From:			<input type="checkbox"/> Internal		<input checked="" type="checkbox"/> Manufacturer		<input type="checkbox"/> Both		
	12	Sour service		Special conditions							
	13	Molecular Weight		Viscosity at @ normal		28.05		0.01 cP			
	14	Cp/Cv		Compressibility		1.25		0.78			
	15	Density min	Density nor	Density max	45		45		kg/m3		
	16	Vapour Pressure at T nom.									
	17	Critical Pressure			Critical Temperature						
	18	Fluid	Phase	State		Ethylene		Gas		Single Phase	
	19	Flow	Min.	Norm.	Max.	Unit	797		797		kg/h
	20	Temp.	Q Min.	Q Norm.	Q Max.	Unit	27		27		°C
	21	Press.	Q Min.	Q Norm.	Q Max.	Unit	30.6		28.3		bar-a
	22	DP	Q Min.	Q Norm.	Q Max.	Unit	12.6		10.3		bar
	23	CV	Min.	Norm.	Max.	1.585		1.77			
	24	Noise	Min.	Norm.	Max.	73.9		73.3		dBA	
	25	Required CV									
26	Selected CV Internal / Mfr										
27	Fd	Internal / Mfr		FI (CI)		/ 3.8		0.922@max.			
28	Fluid tending to		Air-Fail Position								
Valve Body	29	Body type		Body material		Single Seat Globe		ASTM A216 GR WCC			
	30	Design Pressure		Min.	Max.	bar-g		35 bar-g			
	31	Design Temperature		Min.	Max.			0			
	32	Max.DP closed valve				35 bar					
	33	Valve end con. & rating		Seat leakage class		1 in - 300 lb ANSI RF		CLASS V			
	34	Plug type		Plug material		Contoured		SS 416			
	35	Plug dim.		Plug form/law				= %			
	36	Seat type		Q.ty	Material	Threaded		SS 416			
	37	Packing mat.		Lubricator		KEVLAR PTFE					
	38	Bonnet type				STANDARD					
	39										
Actuator	40	Direction of action									
	41	Spring range									
Positioner	42	Type		Input signal		Field Bus		Field Bus			
	43	Air supply		Action dir.		4 BAR-G					
	44	Protection									
Accessories	45	Booster relay									
	46	Locking device									
	47	Pressure reducing valve				YES					
	48	Pressure gauge				YES					
	49	Handwheel									
	50	Solenoid valve		Spec. No.							
51	Pos.detector		Spec. No.								
52	Weight		Consumption		38 KG						

Notes: (1) Valve closes upon increasing the variable.
(2) Design temperature = 0 / 60 °C

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 507		Dwg No. 6465C 30 SP 1541 70	
							Sheet 22		of 23	
							Rev. 1			

General Data	1	Tag No.			30PV 70094B				
	2	Client Reference	Requisition No.	Item	1541-01		17022		
	3	Supplier	Model	DRESSER FLOW CONTROL		35000 Series Camflex			
	4	Serial Number							
	5	Service							
	6	P&ID No.							
Inlet line	7	Diameter	Number		3"-P70044A-EB01-C				
	8	Line schedule	Piping class						
Outlet line	9	Diameter	Number		4 in				
	10	Line schedule	Piping class		STD		DB01		
Operating Conditions	11	Calculation Results From:			Internal <input type="radio"/> Manufacturer <input checked="" type="radio"/> Both <input type="radio"/>				
	12	Sour service	Special conditions						
	13	Molecular Weight	Viscosity at @ normal		28.05		0.01 cP		
	14	Cp/Cv	Compressibility						
	15	Density min	Density nor	Density max		33.9		33.9 kg/m3	
	16	Vapour Pressure at T nom.							
	17	Critical Pressure			Critical Temperature				
	18	Fluid	Phase	State		Ethylene		Gas	Single Phase
	19	Flow	Min.	Norm.	Max.	Unit	370		4230 kg/h
	20	Temp.	QMin.	Q Norm.	Q Max.	Unit	-32.6		-32.6 °C
	21	Press.	QMin.	Q Norm.	Q Max.	Unit	18		18 bar-a
	22	DP	QMin.	Q Norm.	Q Max.	Unit	5.6		3.5 bar
	23	CV	Min.	Norm.	Max.	1.251		17.72	
	24	Noise	Min.	Norm.	Max.	<70		78 dBA	
	25	Required CV							
26	Selected CV			Internal / Mfr		/ 30			
27	Fd	Internal / Mfr		FI (Cf)		/		0.772@max.	
28	Fluid tending to		Air-Fail Position						
29	Body type		Body material						
30	Design Pressure		Min.	Max.	bar-g		23 bar-g		
31	Design Temperature		Min.	Max.	-54				
32	Max.DP closed valve		23 bar						
33	Valve end con.& rating		Seat leakage class		1.5 in - 300 lb ANSI RF		CLASS IV (IEC 534-4)		
34	Plug type		Plug material						
35	Plug dim.		Plug form/law		Full trim		LINEAR		
36	Seat type		Q.ty	Material	316 S.S.				
37	Packing mat.		Lubricator						
38	Bonnet type		Integral extended						
39									
Actuator	40	Direction of action							
	41	Spring range							
Positioner	42	Type	Input signal		Field Bus		Field Bus		
	43	Air supply	Action dir.						
	44	Protection							
Accessories	45	Booster relay							
	46	Locking device							
	47	Pressure reducing valve							
	48	Pressure gauge							
	49	Handwheel							
	50	Solenoid valve		Spec. No.					
51	Pos.detector		Spec. No.						
52	Weight		Consumption						

Notes: (1) Valve opens upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Control Valve				PARIS PETROCHEMICAL COMPANY	
1	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision	Code 507	Dwg No.	6465C 30 SP 1541 70		Rev 1

UNIT 80

TECHNIP9TH OLEFIN COMPLEX

ETHANE CRACKING PLANT



PARS PETROCHEMICAL COMPANY

CONTRACTOR DOCUMENT N°							OWNER DOCUMENT N°						
Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page	Project N°	Unit	Doc. Type	Material Code	Serial N°	Rev.	Page
6465C	30	SP	1541	80	3	1/5	3930	30	SP	1541	80	3	1/5

CONTROL VALVES DATA SHEETS**(SECTION 80)**

Pages modified under this revision: 2.

3	02/04/03	Revised					T.GRANDRY	F.REGARD	J.M.AUBRY				
2	17/10/02	Issue for purchase					T.GRANDRY	F.REGARD	P.E.CROUZIER				
1	10/07/02	Issue for purchase					T.GRANDRY	F.REGARD	P.E.CROUZIER				
0	03/05/02	Issue for purchase					S.SRIRAM	T.GRANDRY	P.E.CROUZIER				
Rev	Date DD/MM/YY	STATUS					WRITTEN BY (name & visa)	CHECKED BY (name & visa)	APPROVED BY (name & visa)				

DOCUMENT REVISIONS

Sections changed in last revision are identified by a vertical line in the right margin

General Data	1	Tag No.		30PCV 80043			
	2	Service		Nitrogen To TK804			
	3	P&ID No.		0021-80-04			
Inlet line	4	Diameter	Number		1 1/2"-N80007A-DA03-N		
	5	Line Schedule	Piping class				
Outlet line	6	Diameter	Number		1.5 in		
	7	Line schedule	Piping class		XS DA03		
Operating Conditions	8	Calculation Results From:		<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both			
	9	Fluid	Phase	State	N2 Gas 1 Phase		
	10	Sour service	Special conditions				
	11	Molecular Weight	Viscosity at @ normal		28 0.02 cP		
	12	Cp/Cv	Compressibility		1.4 0.99		
	13	Dens min	Dens nor	Dens max		2.1 kg/m3	
	14	Vapour Pressure at T nom.					
	15	Critical Pressure		Critical Temperature			
	16	Flow	Min.	Norm.	Max.	Unit	10.5 kg/h
	17	Temp.	QMin.	Q Norm.	Q Max.	Unit	48 °C
	18	Press.	QMin.	Q Norm.	Q Max.	Unit	2 bar-a
	19	DP	QMin.	Q Norm.	Q Max.	Unit	0.9 bar
	20	CV	Min.	Norm.	Max.	/ / / 0.357	
	21	Noise	Min.	Norm.	Max.	/ / / <70 dBA	
	22	Required CV					
23	Selected CV		Internal / Mfr		/ 0.6		
24	Fd	Internal / Mfr	FI (CF)		/ 0.900		
25	Fluid tending to						
Valve Body	26	Type of control					
	27	Design Pressure	Min.	Max.	3.5 bar-g		
	28	Design Temperature	Min.	Max.	60 °C		
	29	Max.DP closed valve					
	30	Body type	Body material			A 351 Gr. CF3M	
	31	Valve end con.& rating	Seat leakage class			1 in 300 lb ANSI RF CLASS IV (standard)	
	32	Trim type	Trim material				STELLITED
Press. contr. Actuator	34	Packing mat.	Lubricator		KEVLAR PTFE		
	35	Bonnet type					
Temp. contr. Accessories	36	Type of pilot					
	37	Spring range	Set point		6 TO 20 PSI		
	38	Bulb filling fluid					
	39	Bulb material					
	40	Ext. length	Ins. length				
Thermowell	41	Capillary type					
	42	Capill.mat.	Length				
	43						
Purchase	44	Material	Size & rating				
	45	Standard No.					
	46	Insertion length					
Purchase	47	Manufacturer					
	48	Model					
	49	Client Reference	Requisition No.	Item	1541-01	18001	
	50	Serial Number					
	51	Weight				38 KG	
	52						

Notes: 1) Air failure position : Close.
2) Flowrate is based on methanol filling rate of 5 cubic. meter / hr.
3) Valve opens upon increasing the variable.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Self Act. Control Valve				PARS PETROCHEMICAL COMPANY	
3	T.G.	FR	FR	02/04/2003	REVISED					
2	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 506	Dwg. No.:	6465C 30 SP 1541 80	
								Sheet 2	of 5	
								Rev.: 3		



General Data	1	Tag No.			30PCV 80045			
	2	Service			Methanol To Users			
	3	P&ID No.			0021-80-04			
Inlet line	4	Diameter	Number				2"-ME80003A-EA21-N	
	5	Line Schedule	Piping class					
Outlet line	6	Diameter	Number		1.5 in			
	7	Line schedule	Piping class		XS		DA03	
Operating Conditions	8	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both			
	9	Fluid	Phase	State	CH3OH		Liquid 1 Phase	
	10	Sour service		Special conditions				
	11	Molecular Weight		Viscosity at @ normal		0.44 cP		
	12	Cp/Cv		Compressibility				
	13	Dens min	Dens nor	Dens max		756 kg/m3		
	14	Vapour Pressure at T nom.			0.04 bar-a			
	15	Critical Pressure		Critical Temperature		73.8 bar-a		
	16	Flow	Min.	Norm.	Max.	Unit	2270 kg/h	
	17	Temp.	Q Min.	Q Norm.	Q Max.	Unit	48 :C	
	18	Press.	Q Min.	Q Norm.	Q Max.	Unit	35 bar-a	
	19	DP	Q Min.	Q Norm.	Q Max.	Unit	16 bar	
	20	CV	Min.	Norm.	Max.	/ / / 0.7573		
	21	Noise	Min.	Norm.	Max.	/ / / 71 dBA		
	22	Required CV						
23	Selected CV			Internal / Mfr		/ 1.2		
24	Fd	Internal / Mfr	FI (Ci)		/ 0.920			
25	Fluid tending to							
Valve Body	26	Type of control						
	27	Design Pressure	Min.	Max.		39 bar-g		
	28	Design Temperature	Min.	Max.		78 :C		
	29	Max. DP closed valve						39 bar
	30	Body type	Body material			A 351 Gr. CF3M		
	31	Valve end con.& rating	Seat leakage class			1 in 300 lb ANSI RF CLASS IV (standard)		
32	Trim type	Trim material			Full trim STELLITED			
33								
Press. contr. Actuator	34	Packing mat.	Lubricator		KEVLAR PTFE			
	35	Bonnet type						
Temp. contr. Accessories	36	Type of pilot						
	37	Spring range	Set point		150 TO 450 PSI			
	38	Bulb filling fluid						
	39	Bulb material						
	40	Ext. length	Ins. length					
Thermowell	41	Capillary type						
	42	Capill.mat.	Length					
	43							
Purchase	44	Material	Size & rating					
	45	Standard No.						
	46	Insertion length						
	47	Manufacturer						DRESSER FLOW CONTROL
	48	Model						535V
	49	Client Reference	Requisition No.	Item	1541-01	18002		
	50	Serial Number						
	51	Weight						38 KG
52								

Notes: 1) Molecular weight = 32.
2) Valve closes upon downstream pressure increasing.

					INSTRUMENT SPECIFICATION		TECHNIP			
					Self Act. Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
0	S.S	TG	FR	03/05/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Code: 506		Dwg. No.: 6465C 30 SP 1541 80	
							Sheet 3		of 5	
							Rev.: 2			

General Data	1	Tag No.			30PCV 80029				
	2	Service			WO From P802 To TK802				
	3	P&ID No.			0021-80-03				
Inlet line	4	Diameter	Number		2	in	2"-WO65001-A		
	5	Line Schedule	Piping class		STD		EA 21		
Outlet line	6	Diameter	Number		2				
	7	Line schedule	Piping class		STD				
Operating Conditions	8	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	9	Fluid	Phase	State	Wash oil	Liquid	Single Phase		
	10	Sour service	Special conditions						
	11	Molecular Weight	Viscosity at @ normal			2.5		cP	
	12	Cp/Cv	Compressibility						
	13	Dens min	Dens nor	Dens max			900	kg/m3	
	14	Vapour Pressure at T nom.							
	15	Critical Pressure		Critical Temperature					
	16	Flow	Min.	Norm.	Max.	Unit	5000	Al/h	
	17	Temp.	Q Min.	Q Norm.	Q Max.	Unit	48	:C	
	18	Press.	Q Min.	Q Norm.	Q Max.	Unit	37.1	bar-a	
	19	DP	Q Min.	Q Norm.	Q Max.	Unit	36.1	bar	
	20	CV	Min.	Norm.	Max.		/	/ 0.9969	
	21	Noise	Min.	Norm.	Max.		/	/ 72.1 dBA	
	22	Required CV							
	23	Selected CV			Internal / Mfr		/ 1.3		
	24	Fd	Internal / Mfr	FI (Cf)			/	0.975	
	25	Fluid tending to			TO OPEN				
	Valve Body	26	Type of control			SELF ACTUATED PRESSURE CONTROL			
		27	Design Pressure	Min.	Max.	bar-g		39.1	bar-g
		28	Design Temperature	Min.	Max.			65	:C
		29	Max.DP closed valve			39.1 bar			
		30	Body type	Body material		Single Seat Globe		ASTM A216 GR WCC	
		31	Valve end con.& rating	Seat leakage class		1 in 300 lb ANSI RF		ANSI IV (standard)	
		32	Trim type	Trim material		ANTICAVITATION		AISI 410	
	33								
	34	Packing mat.	Lubricator		KEVLAR PTFE		No		
	35	Bonnet type			INTEGRAL				
Press. contr. Actuator	36	Type of pilot			EXT. PILOT PRESSURE CONTROL				
	37	Spring range	Set point				1 bar		
Temp. contr. Accessories	38	Bulb filling fluid							
	39	Bulb material							
	40	Ext. length	Ins. length						
	41	Capillary type							
	42	Capill.mat.	Length						
	43								
Thermowell	44	Material	Size & rating						
	45	Standard No.							
	46	Insertion length							
Purchase	47	Manufacturer			DRESSER FLOW CONTROL				
	48	Model			21000 Series Globe				
	49	Client Reference	Requisition No.	Item	1541-01		18003		
	50	Serial Number							
	51	Weight			38 KG				
	52								

Notes: Other mounted accessories:
Pressure controller Model 2707-S/78 (Mounting valve)
Range 0-1.4bar
Connection 1/4" NPT-F

					INSTRUMENT SPECIFICATION		TECHNIP	
					Self Act. Control Valve		 	
2	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE			
1	T.G.	FR	FR	10/07/2002	ISSUED FOR PURCHASE			
No.	By	Chk	Appr	Date	Revision		Code: 506	Dwg. No.: 6465C 30 SP 1541 80
							Sheet 4	of 5
							Rev.: 2	

General Data	1	Tag No.			30PCV 80049				
	2	Service			Methanol To TK 804				
	3	P&ID No.			0021-80-04				
Inlet line	4	Diameter	Number			2"-ME80003A-EA21-N			
	5	Line Schedule	Piping class			EA 21			
Outlet line	6	Diameter	Number			2			
	7	Line schedule	Piping class			STD			
Operating Conditions	8	Calculation Results From:			<input type="radio"/> Internal <input checked="" type="radio"/> Manufacturer <input type="radio"/> Both				
	9	Fluid	Phase	State	Methanol			Liquid Single Phase	
	10	Sour service		Special conditions					
	11	Molecular Weight	Viscosity at @ normal			0.44 cP			
	12	Cp/Cv		Compressibility					
	13	Dens min	Dens nor	Dens max		764	764	764	kg/m3
	14	Vapour Pressure at T nom.			0.04 bar-a				
	15	Critical Pressure		Critical Temperature		73.8 bar-a			
	16	Flow	Min.	Norm.	Max.	Unit	2420 kg/h		
	17	Temp.	QMin.	Q Norm.	Q Max.	Unit	48 :C		
	18	Press.	QMin.	Q Norm.	Q Max.	Unit	35 bar-a		
	19	DP	QMin.	Q Norm.	Q Max.	Unit	34.2 bar		
	20	CV	Min.	Norm.	Max.	/	/	/ 0.5366	
	21	Noise	Min.	Norm.	Max.	/	/	/ <70 dBA	
	22	Required CV							
23	Selected CV			Internal / Mfr				/ 1.3	
24	Fd Internal / Mfr		FI (Cf)		/			0.975	
25	Fluid tending to							TO OPEN	
Valve Body	26	Type of control							SELF ACTUATED PRESSURE CONTROL
	27	Design Pressure	Min.	Max.	bar-g			39 bar-g	
	28	Design Temperature	Min.	Max.				48 :C	
	29	Max. DP closed valve							39 bar
	30	Body type	Body material			Single Seat Globe		ASTM A216 GR WCC	
	31	Valve end con.& rating	Seat leakage class			1 in 300 lb ANSI RF		ANSI IV (standard)	
	32	Trim type	Trim material			ANTICAVITATION		AISI 410	
33									
	34	Packing mat.	Lubricator			KEVLAR PTFE		No	
	35	Bonnet type			INTEGRAL				
Press. contr. Actuator	36	Type of pilot							EXT. PILOT PRESSURE CONTROL
	37	Spring range	Set point					0.8 bar	
Temp. contr. Accessories	38	Bulb filling fluid							
	39	Bulb material							
	40	Ext. length	Ins. length						
	41	Capillary type							
	42	Capill.mat.	Length						
43									
Thermowell	44	Material	Size & rating						
	45	Standard No.							
	46	Insertion length							
Purchase	47	Manufacturer							DRESSER FLOW CONTROL
	48	Model							21000 Series Globe
	49	Client Reference	Requisition No.	Item	1541-01			18004	
	50	Serial Number							
	51	Weight							38 KG
52									

Notes: Other mounted accessories:
Pressure controller Model 2707-S/78 (Mounting valve)
Range 0-1.4bar
Connection 1/4" NPT-F

					INSTRUMENT SPECIFICATION		TECHNIP			
					Self Act. Control Valve				PARS PETROCHEMICAL COMPANY	
2	T.G.	FR	FR	17/10/2002	ISSUED FOR PURCHASE					
1	T.G.	FR	FR	10/07/2002	ISSUED FOR PURCHASE					
No.	By	Chk	Appr	Date	Revision		Sheet 5 of 5			
					Code: 506	Dwg. No.: 6465C 30 SP 1541 80		Rev.: 2		

DRESSER MASONNEILAN
DATA SHEETS




UNIT 10

INSTRUMENT DATA SHEETS

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PREVIOUS COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
2003.01.09 12:07:18 +01'00'
<none>

STATUS CERTIFIED "FINAL"
ISSUED BY : S. LEGE
DATE : 23/10/02

1	23/10/02	UP-DATE
0	08/10/02	FIRST ISSUE
REV	DATE	DESCRIPTION
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY 	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007 EQUIPMENT NAME: <p style="text-align: center;">Control valves</p>
	Project: 3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	
	DOCUMENT TITLE : Instrument Data Sheets	DOCUMENT CODE : A 3101
	PURCHASE ORDER : 02-4648 (Unit 10)	Sheet 01 of 21 Rev. 1

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N° : 2-04648-01 REVISION : 0
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-03
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.001 SPEC 1

ITEM : 001 QTY : 9 ENGINEER : SL
 TAG : 30FV 10101 TO 30FV 10901 REVISION : 3 04-09-02
 MN ITEM : 001 V0

SPECIFICATION SHEET : VARIPAK REV

MODEL : 28-28270-59/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 0.025 TO 0.010
 SET AT : 55 %
 BODY
 MATERIAL : AISI 316L OR ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED (F TO F: 102 mm)
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : INTEGRAL
 PACKING : CARBON / PTFE + KALREZ "O" RING (*)
 TRIM : LINEAR CONTOURED
 PLUG : STELLITE 12
 SEAT : STELLITE 6
 FLOW DIRECTION : FLOW TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)
 ACTUATOR : PNEUMATIC WITH SPRING AND DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 3-15
 SUPPLY PRESSURE : 18 psi - 125 kPa - 1.25 bar
 MAX SHUT OFF DELTA P : 9.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 100 %
 ACTION - CHARACTERISTIC : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 GAUGES MATERIAL : STD
 ELECTRICAL CONNECTION : M 20

SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : UNPAINTED (ST ST BODY)

SPECIAL NOTES : (*) L6 LOW EMISSION PACKING DESIGN
 : PLEASE REFER TO ATTACHED APPENDIX 5C
 : 8, 9 & 10 FOR DETAILS.
 : TIGHTNESS LEVEL 10-6 mbar.l/s HELIUM

VALVE CODIFICATION : TAG N°S 30FV 10101/10301/10501/10701
 : /10901: VALVE MODEL N° 28-28170-49
 : TAG N°S 30FV 10201/10401/10601/10801
 : VALVE MODEL N° 28-28270-59

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-01
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL Nr	: 2-04648-02	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 04-10-02

PAGE : V0.002 SPEC 1

ITEM	: 002	QTY	: 9	ENGINEER	: SL
TAG	: 30FV 10102 TO 30FV 10902	REVISION	: 2	07-10-02	
SERVICE	: ETHANE FEED	MN ITEM	: 002	V0	

SPECIFICATION SHEET	: CONTROL VALVE	REV	
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MODEL	: 33-36424/FR10/TZID-C
BODY TYPE	: GLOBE
NOMINAL SIZE	: DN 150 (NPS 6)
FLOW COEFFICIENT Cv	: 1030
BODY MATERIAL	: ASTM A 216 Gr WCB - CARBON STEEL
CONNECTION TYPE	: FLANGED
RATING	: ANSI 300
FINISH	: RF Ra 3.2-6.3 um
BOLTING	: WITHOUT (INTEGRAL BONNET)
PACKING	: FLEXIBLE GRAPHITE

TRIM TYPE	: SEGMENTED BALL
CHARACTERISTIC	: EQUAL PERCENT
PLUG TYPE	: BALL
MATERIAL	: SS 317 HARD CHROMIUM PLATED
SEAL RINGS MATERIAL	: SS 316
GUIDING	: TOP AND BOTTOM
MATERIAL	: SOLID STELLITE
FLOW DIRECTION	: INTO SEAL RING SIDE
LEAKAGE	: CLASS IV (IEC 534-4)

ACTUATOR	: SPRING DIAPHRAGM
SIZE	: N° 33 / SIZE C (140 SQ INCH)
AIR FAILURE POSITION	: CLOSED
BENCH RANGE	: 9-16
AIR SUPPLY	: 25 psi - 180 kPa - 1.8 bar
HANDWHEEL	: WITHOUT
MAX SHUT OFF DELTA P	: 11.5 bar
AIR SET	: SAMI FR10 GAUGE
POSITIONER	: HART TZID-C
ENCLOSURE	: EEx ia IIC T6
INPUT SIGNAL	: 4-20 mA
OPERATING RANGE	: 0-100 %
ACTION	: DIRECT
CAM CHARACTERISTIC	: LINEAR
GAUGES	: SUPPLY-OUTPUT
MATERIAL GAUGES	: STD
ELECTRICAL CONNECTION	: M 20
SERIAL PLATE LANGUAGE	: ENGLISH
TUBING MATERIAL	: STAINLESS STEEL
FITTINGS	: SWAGELOK (1/4" OD TUBING)
UNITS	: bar g
PAINTING	: OTA 1858E

SPECIAL NOTES

SHAFT MATERIAL	: 17-4 PH
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CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-02
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N°	: 2-04648-03	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 04-10-02

PAGE : V0.003 SPEC 1

ITEM	: 003	QTY	: 9	ENGINEER	: SL
TAG	: 30FV 10104 TO 30FV 10904	REVISION	: 2	07-10-02	
SERVICE	: ETHANE FEED	MN ITEM	: 003	V0	

SPECIFICATION SHEET	: CONTROL VALVE	REV	
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MODEL	: 33-36424/FR10/TZID-C
BODY TYPE	: GLOBE
NOMINAL SIZE	: DN 150 (NPS 6)
FLOW COEFFICIENT Cv	: 1030
BODY MATERIAL	: ASTM A 216 Gr WCB - CARBON STEEL
CONNECTION TYPE	: FLANGED
RATING	: ANSI 300
FINISH	: RF Ra 3.2-6.3 um
BOLTING	: WITHOUT (INTEGRAL BONNET)
PACKING	: FLEXIBLE GRAPHITE

TRIM TYPE	: SEGMENTED BALL
CHARACTERISTIC	: EQUAL PERCENT
PLUG TYPE	: BALL
MATERIAL	: SS 317 HARD CHROMIUM PLATED
SEAL RINGS MATERIAL	: SS 316
GUIDING	: TOP AND BOTTOM
MATERIAL	: SOLID STELLITE
FLOW DIRECTION	: INTO SEAL RING SIDE
LEAKAGE	: CLASS IV (IEC 534-4)

ACTUATOR	: SPRING DIAPHRAGM
SIZE	: N° 33 / SIZE C (140 SQ INCH)
AIR FAILURE POSITION	: CLOSED
BENCH RANGE	: 9-16
AIR SUPPLY	: 25 psi - 180 kPa - 1.8 bar
HANDWHEEL	: WITHOUT
MAX SHUT OFF DELTA P	: 11.5 bar
AIR SET	: SAMI FR10 GAUGE
POSITIONER	: HART TZID-C
ENCLOSURE	: EEx ia IIC T6
INPUT SIGNAL	: 4-20 mA
OPERATING RANGE	: 0-100 %
ACTION	: DIRECT
CAM CHARACTERISTIC	: LINEAR
GAUGES	: SUPPLY-OUTPUT
MATERIAL GAUGES	: STD
ELECTRICAL CONNECTION	: M 20
SERIAL PLATE LANGUAGE	: ENGLISH
TUBING MATERIAL	: STAINLESS STEEL
FITTINGS	: SWAGELOK (1/4" OD TUBING)
UNITS	: bar g
PAINTING	: OTA 1858E

SPECIAL NOTES

SHAFT MATERIAL	: 17-4 PH
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Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-02
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N°	: 2-04648-04	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 04-10-02

PAGE : V0.004 SPEC 1

ITEM	: 004	QTY	: 9	ENGINEER	: SL
TAG	: 30FV 10106 TO 30FV 10906	REVISION	: 4	07-10-02	
SERVICE	: DILUTION STEAM	MN ITEM	: 004	V0	

SPECIFICATION SHEET	: 41005	REV	
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MODEL	: 87-41935/HW/FR10/TZID-C
BODY TYPE	: GLOBE
NOMINAL SIZE	: DN 150 (NPS 6)
FLOW COEFFICIENT	: Cv 230
BODY MATERIAL	: CARBON STEEL - ASTM A 216 Gr WCC
CONNECTION TYPE	: FLANGED
RATING	: ANSI 300
FINISH	: RF Ra 3.2-6.3 um
BONNET	: STANDARD
PACKING	: KEVLAR PTFE
BOLTING	: B7 / 2H
TRIM TYPE	: CAGE GUIDED
CHARACTERISTIC/TYPE	: LO-DB / LINEAR
PLUG TYPE	: SEAL RING BALANCED
MATERIAL	: 17-4 PH
SEAL RINGS MATERIAL	: GRAPHITE + NI-RESIST BACKUP
CAGE MATERIAL	: ASTM A 487 Gr CA6NM CHROME PLATED
SEAT TYPE	: CLAMPED IN
MATERIAL	: AISI 410
FLOW DIRECTION	: TENDS TO OPEN
LEAKAGE	: CLASS IV (IEC 534-4)

ACTUATOR	: MULTI-SPRING AND DIAPHRAGM
SIZE	: 16
AIR FAILURE POSITION	: OPENED
BENCH RANGE	: 3-15
AIR SUPPLY	: 25 psi - 180 kPa - 1.8 bar
YOKE	: STD
HANDWHEEL	: SIDE MOUNTED
MAX SHUT OFF DELTA P	: 9.3 bar
FOR ATMOSPHERE	: TROPICAL
AIR SET	: SAMI FR10 GAUGE
POSITIONER	: HART TZID-C
INPUT SIGNAL	: 4-20 mA
OPERATING RANGE	: 0-100 %
ACTION - CAM CHARACT.	: DIRECT - EQUAL PERCENT
GAUGES	: SUPPLY-OUTPUT
MATERIAL GAUGES	: STD
ELECTRICAL CONNECTION	: M20
SERIAL PLATE LANGUAGE	: ENGLISH
TUBING MATERIAL	: STAINLESS STEEL
FITTINGS	: SWAGELOK (3/8" OD TUBING)
UNITS	: bar g
PAINTING	: OTA 1858E

Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-02
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N°	: 2-04648-05	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 04-10-02

PAGE : V0.005 SPEC 1

ITEM	: 005	QTY	: 9	ENGINEER	: SL
TAG	: 30FV 10108 TO 30FV 10908	REVISION	: 3	07-10-02	
SERVICE	: ETHANE FEED	MN ITEM	: 005	V0	

SPECIFICATION SHEET	: 41005	REV	
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MODEL	: 87-41935/HW/FR10/TZID-C
BODY TYPE	: GLOBE
NOMINAL SIZE	: DN 150 (NPS 6)
FLOW COEFFICIENT	: Cv 230
BODY MATERIAL	: CARBON STEEL - ASTM A 216 Gr WCC
CONNECTION TYPE	: FLANGED
RATING	: ANSI 300
FINISH	: RF Ra 3.2-6.3 um
BONNET	: STANDARD
PACKING	: KEVLAR PTFE
BOLTING	: B7 / 2H
TRIM TYPE	: CAGE GUIDED
CHARACTERISTIC/TYPE	: LO-DB / LINEAR
PLUG TYPE	: SEAL RING BALANCED
MATERIAL	: 17-4 PH
SEAL RINGS MATERIAL	: GRAPHITE + NI-RESIST BACKUP
CAGE MATERIAL	: ASTM A 487 Gr CA6NM CHROME PLATED
SEAT TYPE	: CLAMPED IN
MATERIAL	: AISI 410
FLOW DIRECTION	: TENDS TO OPEN
LEAKAGE	: CLASS IV (IEC 534-4)

ACTUATOR	: MULTI-SPRING AND DIAPHRAGM
SIZE	: 16
AIR FAILURE POSITION	: OPENED
BENCH RANGE	: 3-15
AIR SUPPLY	: 25 psi - 180 kPa - 1.8 bar
YOKE	: STD
HANDWHEEL	: SIDE MOUNTED
MAX SHUT OFF DELTA P	: 9.3 bar
FOR ATMOSPHERE	: TROPICAL
AIR SET	: SAMI FR10 GAUGE
POSITIONER	: HART TZID-C
INPUT SIGNAL	: 4-20 mA
OPERATING RANGE	: 0-100 %
ACTION - CAM CHARACT.	: DIRECT - EQUAL PERCENT
GAUGES	: SUPPLY-OUTPUT
MATERIAL GAUGES	: STD
ELECTRICAL CONNECTION	: M20
SERIAL PLATE LANGUAGE	: ENGLISH
TUBING MATERIAL	: STAINLESS STEEL
FITTINGS	: SWAGELOK (3/8" OD TUBING)
UNITS	: bar g
PAINTING	: OTA 1858E

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-02
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N°	: 2-04648-06	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 04-10-02

PAGE : V0.006 SPEC 1

ITEM	: 006	QTY	: 9	ENGINEER	: SL
TAG	: 30FV 10112 TO 30FV 10912	REVISION	: 3	07-10-02	
		MN ITEM	: 006	V0	

SPECIFICATION SHEET : 41005 REV

MODEL : 87-41425/HW/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 100 x DN 50 x DN 100 (4" x 2")
 FLOW COEFFICIENT : Cv 35
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 1500
 FINISH : RTJ
 BONNET : STANDARD
 PACKING : CARBON/PTFE + GRAPHITE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARACTERISTIC/TYPE : STANDARD CAGE / =%
 PLUG TYPE : PILOT BALANCED
 MATERIAL : 17-4 PH
 SEAL RINGS MATERIAL : NI-RESIST CAST IRON
 CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16 (*)
 AIR FAILURE POSITION : OPENED
 BENCH/NET RANGE : 6-30/6-34
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 LIMIT STOP : LIMITS OPENING
 ADJUSTMENT : Cv 30
 MAX SHUT OFF DELTA P : 173 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E
 :
 SPECIAL NOTES : (*) MAX ALLOWABLE DYNAMIC PRESSURE
 : DROP (VALVE OPENED) IS 87 bar.

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-02
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N°	: 2-04648-07	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 04-10-02

PAGE : V0.007 SPEC 1

ITEM	: 007	QTY	: 9	ENGINEER	: SL
TAG	: 30FV 10119A TO 30FV 10919A	REVISION	: 3	07-10-02	
SERVICE	: DESIGN FUEL GAS	MN ITEM	: 007	V0	

SPECIFICATION SHEET	: 41005	REV	
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MODEL	: 88-41335/FR10/TZID-C
BODY TYPE	: GLOBE
NOMINAL SIZE	: DN 200 (NPS 8)
FLOW COEFFICIENT	: Cv 380
BODY MATERIAL	: CARBON STEEL - ASTM A 216 Gr WCC
CONNECTION TYPE	: FLANGED
RATING	: ANSI 300
FINISH	: RF Ra 3.2-6.3 um
BONNET	: STANDARD
PACKING	: KEVLAR PTFE
BOLTING	: B7 / 2H
TRIM TYPE	: CAGE GUIDED
CHARACTERISTIC/TYPE	: LO-DB / LINEAR
PLUG TYPE	: SPRING ENERGIZED SEAL RING BALANCED
MATERIAL	: 17-4 PH
SEAL RINGS MATERIAL	: CARBON GRAPHITE FILLED TFE
CAGE MATERIAL	: ASTM A 487 Gr CA6NM CHROME PLATED
SEAT TYPE	: CLAMPED IN
MATERIAL	: AISI 410
FLOW DIRECTION	: TENDS TO OPEN
LEAKAGE	: CLASS IV (IEC 534-4)
ACTUATOR	: MULTI-SPRING AND DIAPHRAGM
SIZE	: 16
AIR FAILURE POSITION	: CLOSED
BENCH RANGE	: 6-30
AIR SUPPLY	: 40 psi - 280 kPa - 2.8 bar
YOKE	: STD
HANDWHEEL	: WITHOUT
LIMIT STOP	: LIMITS OPENING
ADJUSTMENT	: Cv 340
MAX SHUT OFF DELTA P	: 11.5 bar
FOR ATMOSPHERE	: TROPICAL
AIR SET	: SAMI FR10 GAUGE
POSITIONER	: HART TZID-C
INPUT SIGNAL	: 4-20 mA
OPERATING RANGE	: 0-100 %
ACTION - CAM CHARACT.	: DIRECT - LINEAR
GAUGES	: SUPPLY-OUTPUT
MATERIAL GAUGES	: STD
ELECTRICAL CONNECTION	: M20
SERIAL PLATE LANGUAGE	: ENGLISH
TUBING MATERIAL	: STAINLESS STEEL
FITTINGS	: SWAGELOK (3/8" OD TUBING)
UNITS	: bar g
PAINTING	: OTA 1858E

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-01
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL Nr	: 2-04648-08	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 04-10-02

PAGE : V0.008 SPEC 1

ITEM	: 008	QTY	: 9	ENGINEER	: SL
TAG	: 30FV 10119B TO 30FV 10919B	REVISION	: 3	07-10-02	
		MN ITEM	: 008	V0	

SPECIFICATION SHEET	: 21000	REV	
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MODEL	: 88-21715/FR10/TZID-C
BODY TYPE	: GLOBE
NOMINAL SIZE	: DN 80 (NPS 3)
FLOW COEFFICIENT	: Cv 75
BODY MATERIAL	: CARBON STEEL - ASTM A 216 Gr WCC
CONNECTION TYPE	: FLANGED
RATING	: ANSI 300
FINISH	: RF Ra 3.2-6.3 um
BOLTING	: B7-2H
BONNET	: STANDARD
PACKING	: KEVLAR PTFE

TRIM	: LO-DB LINEAR
PLUG MATERIAL	: AISI 416
SEAT TYPE	: SCREWED
MATERIAL	: AISI 416
GUIDE BUSHING MATERIAL	: AISI 440C
FLOW DIRECTION	: TENDS TO OPEN
LEAKAGE	: CLASS IV (IEC 534-4)

ACTUATOR	: MULTI-SPRING AND DIAPHRAGM
SIZE	: 16
FAILURE POSITION	: CLOSED
BENCH RANGE	: 11-23
AIR SUPPLY	: 30 psi - 210 kPa - 2.1 bar
YOKE	: STD
HANDWHEEL	: WITHOUT
MAX SHUT OFF DELTA P	: 11.5 bar
FOR ATMOSPHERE	: TROPICAL
AIR SET	: SAMI FR10 GAUGE
POSITIONER	: HART TZID-C
INPUT SIGNAL	: 4-20 mA
OPERATING RANGE	: 0-100 %
ACTION - CAM CHARACT.	: DIRECT - LINEAR
GAUGES	: SUPPLY-OUTPUT
MATERIAL GAUGES	: STD
ELECTRICAL CONNECTION	: M20
SERIAL PLATE LANGUAGE	: ENGLISH
TUBING MATERIAL	: STAINLESS STEEL
FITTINGS	: SWAGELOK (3/8" OD TUBING)
UNITS	: bar g
PAINTING	: OTA 1858E

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-02
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N°	: 2-04648-09	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 04-10-02

PAGE : V0.009 SPEC 1

ITEM	: 009	QTY	: 9	ENGINEER	: SL
TAG	: 30FV 10122 TO 30FV 10922	REVISION	: 4	07-10-02	
		MN ITEM	: 009	V0	

SPECIFICATION SHEET	: CAMFLEX	REV	
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MODEL	: 35-35202/FR10/TZID-C
BODY TYPE	: GLOBE WITH ROTATING PLUG
NOMINAL SIZE	: DN 100 (NPS 4)
FLOW COEFFICIENT	: Cv 230
BODY	
MATERIAL	: ASTM A 216 Gr WCC - CARBON STEEL
CONNECTION TYPE	: FLANGED
RATING	: ANSI 300
FINISH	: RF Ra 3.2-6.3 um
PACKING	: KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG	: AISI 316L STELLITED
SEAT	: AISI 316
SEAT RETAINER	: AISI 316
SHAFT	: 17-4 PH
GUIDE BUSHINGS	: AISI 440C
FLOW DIRECTION	: TENDS TO CLOSE
LEAKAGE	: CLASS IV (IEC 534-4)

ACTUATOR	: PNEUMATIC WITH ROLLING DIAPHRAGM
AIR FAILURE POSITION	: CLOSED
MOUNTING POSITION	: 2
BENCH RANGE	: 7-15
AIR SUPPLY	: 25 psi - 180 kPa - 1.8 bar
HANDWHEEL	: WITHOUT
MAX SHUT OFF DELTA P FOR ATMOSPHERE	: 11.5 bar
AIR SET	: TROPICAL
POSITIONER	: SAMI FR10 GAUGE
INPUT SIGNAL	: HART TZID-C
OPERATING RANGE	: 4-20 mA
ACTION - CAM CHARACT.	: 0-100 %
GAUGES	: DIRECT - EQUAL PERCENT
MATERIAL GAUGES	: SUPPLY - OUTPUT
ELECTRICAL CONNECTION	: STD
SERIAL PLATE LANGUAGE	: M 20
TUBING MATERIAL	: ENGLISH
FITTINGS	: STAINLESS STEEL
UNITS	: SWAGelok ST ST (1/4 OD TUBING)
PAINTING	: bar g
	: OTA 1858E

Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-01
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N°	: 2-04648-10	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 04-10-02

PAGE : V0.010 SPEC 1

ITEM	: 010	QTY	: 9	ENGINEER	: SL
TAG	: 30FV 10123 TO 30FV 10923	REVISION	: 4	07-10-02	
		MN ITEM	: 010	V0	

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 230
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 11.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-02
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N°	: 2-04648-11	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 04-10-02

PAGE : V0.011 SPEC 1

ITEM	: 011	QTY	: 9	ENGINEER	: SL
TAG	: 30HV 10125 TO 30HV 10925	REVISION	: 5	07-10-02	
		MN ITEM	: 011	V0	
SPECIFICATION SHEET	: 41005			REV	
MODEL	: 88-41055/HW/FR10/TZID-C				
BODY TYPE	: GLOBE				
NOMINAL SIZE	: DN 150 x DN 50 x DN 150 (6" x 2")				
FLOW COEFFICIENT	: Cv 24				
BODY MATERIAL	: ASTM A 217 Gr WC9				
CONNECTION TYPE	: FLANGED				
RATING	: ANSI 2500				
FINISH	: RTJ				
BONNET	: STANDARD				
PACKING	: GRAPHITE				
BOLTING	: A 453 Gr 660 / GR8				
TRM TYPE	: CAGE GUIDED				
CHARACTERISTIC/TYPE	: LO-DB TWO STAGE / LINEAR				
PLUG TYPE	: SEAL RING BALANCED				
MATERIAL	: ASTM A 487 Gr CA6NM NITRIDED				
SEAL RINGS MATERIAL	: NI-RESIST CAST IRON (NITRIDED)				
CAGE MATERIAL	: ASTM A 487 Gr CA6NM NITRIDED				
SEAT TYPE	: CLAMPED IN				
MATERIAL	: AISI 316 STELLITED SEATING SURFACES				
FLOW DIRECTION	: TENDS TO OPEN				
LEAKAGE	: CLASS V (IEC 534-4)				
ACTUATOR	: MULTI-SPRING AND DIAPHRAGM				
SIZE	: 16				
AIR FAILURE POSITION	: CLOSED				
BENCH RANGE	: 37-45				
AIR SUPPLY	: 55 psi - 380 kPa - 3.8 bar				
YOKE	: STD				
HANDWHEEL	: SIDE MOUNTED				
MAX SHUT OFF DELTA P	: 120 bar				
FOR ATMOSPHERE	: TROPICAL				
AIR SET	: SAMI FR10 GAUGE				
POSITIONER	: HART TZID-C				
INPUT SIGNAL	: 4-20 mA				
OPERATING RANGE	: 0-100 %				
ACTION - CAM CHARACT.	: DIRECT - LINEAR				
GAUGES	: SUPPLY-OUTPUT				
MATERIAL GAUGES	: STD				
ELECTRICAL CONNECTION	: M20				
SERIAL PLATE LANGUAGE	: ENGLISH				
TUBING MATERIAL	: STAINLESS STEEL				
FITTINGS	: SWAGELOK (3/8" OD TUBING)				
UNITS	: bar g				
PAINTING	: OTA 1858E				

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N° : 2-04648-12 REVISION : 0
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-02
 DATED : 10-04-02
 DATED : 04-10-02

PAGE : V0.012 SPEC 1

ITEM : 012 QTY : 9 ENGINEER : SL
 TAG : 30HV 10126 TO 30HV 10926 REVISION : 3 07-10-02
 MN ITEM : 012 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 87-78103/HW/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 4.5
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 1500
 FINISH : RTJ
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : GRAPHITE

TRIM : ANTICAVITATION (FIVE STAGES) LINEAR
 PLUG MATERIAL : AISI 410 HARDENED
 SEAT TYPE : CLAMPED IN LINER SUPPORT
 MATERIAL : AISI 410 HARDENED
 CAGE MATERIAL : AISI 410 HARDENED
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : OPENED
 BENCH RANGE : 7.5-15
 AIR SUPPLY : 50 psi - 350 kPa - 3.5 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 MAX SHUT OFF DELTA P : 173 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - NEUTRAL
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N° : 2-04648-13 REVISION : 0
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-03
 DATED : 10-04-02
 DATED : 04-10-02

PAGE : V0.013 SPEC 1

ITEM : 013 QTY : 9 ENGINEER : SL
 TAG : 30TV 10117 TO 30TV 10917 REVISION : 4 07-10-02
 MN ITEM : 013 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 230
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 11.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E
 : P

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-02
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL Nr	: 2-04648-14	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 04-10-02

PAGE : V0.014 SPEC 1

ITEM	: 014	QTY	: 9	ENGINEER	: SL
TAG	: 30TV 10122 TO 30TV 10922	REVISION	: 4	07-10-02	
		MN ITEM	: 014	V0	

SPECIFICATION SHEET	: CAMFLEX	REV	
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MODEL	: 35-35202/FR10/TZID-C
BODY TYPE	: GLOBE WITH ROTATING PLUG
NOMINAL SIZE	: DN 100 (NPS 4)
FLOW COEFFICIENT	: Cv 230
BODY	
MATERIAL	: ASTM A 216 Gr WCC - CARBON STEEL
CONNECTION TYPE	: FLANGED
RATING	: ANSI 300
FINISH	: RF Ra 3.2-6.3 um
PACKING	: KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG	: AISI 316L STELLITED
SEAT	: AISI 316
SEAT RETAINER	: AISI 316
SHAFT	: 17-4 PH
GUIDE BUSHINGS	: AISI 440C
FLOW DIRECTION	: TENDS TO CLOSE
LEAKAGE	: CLASS IV (IEC 534-4)

ACTUATOR	: PNEUMATIC WITH ROLLING DIAPHRAGM
AIR FAILURE POSITION	: CLOSED
MOUNTING POSITION	: 2
BENCH RANGE	: 7-15
AIR SUPPLY	: 25 psi - 180 kPa - 1.8 bar
HANDWHEEL	: WITHOUT
MAX SHUT OFF DELTA P	: 11.5 bar
FOR ATMOSPHERE	: TROPICAL
AIR SET	: SAMI FR10 GAUGE
POSITIONER	: HART TZID-C
INPUT SIGNAL	: 4-20 mA
OPERATING RANGE	: 0-100 %
ACTION - CAM CHARACT.	: DIRECT - EQUAL PERCENT
GAUGES	: SUPPLY - OUTPUT
MATERIAL GAUGES	: STD
ELECTRICAL CONNECTION	: M 20
SERIAL PLATE LANGUAGE	: ENGLISH
TUBING MATERIAL	: STAINLESS STEEL
FITTINGS	: SWAGelok ST ST (1/4 OD TUBING)
UNITS	: bar g
PAINTING	: OTA 1858E
	: P

Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-02
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N°	: 2-04648-15	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 04-10-02

PAGE : V0.015 SPEC 1

ITEM	: 015	QTY	: 9	ENGINEER	: SL
TAG	: 30TV 10127 TO 30TV 10927	REVISION	: 4	07-10-02	
		MN ITEM	: 015	V0	

SPECIFICATION SHEET	: CAMFLEX	REV	
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MODEL	: 35-35202/FR10/TZID-C
BODY TYPE	: GLOBE WITH ROTATING PLUG
NOMINAL SIZE	: DN 100 (NPS 4)
FLOW COEFFICIENT	: Cv 230
BODY	
MATERIAL	: ASTM A 216 Gr WCC - CARBON STEEL
CONNECTION TYPE	: FLANGED
RATING	: ANSI 300
FINISH	: RF Ra 3.2-6.3 um
PACKING	: KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG	: AISI 316L STELLITED
SEAT	: AISI 316
SEAT RETAINER	: AISI 316
SHAFT	: 17-4 PH
GUIDE BUSHINGS	: AISI 440C
FLOW DIRECTION	: TENDS TO CLOSE
LEAKAGE	: CLASS IV (IEC 534-4)

ACTUATOR	: PNEUMATIC WITH ROLLING DIAPHRAGM
AIR FAILURE POSITION	: CLOSED
MOUNTING POSITION	: 2
BENCH RANGE	: 7-15
AIR SUPPLY	: 25 psi - 180 kPa - 1.8 bar
HANDWHEEL	: WITHOUT
MAX SHUT OFF DELTA P	: 11.5 bar
FOR ATMOSPHERE	: TROPICAL
AIR SET	: SAMI FR10 GAUGE
POSITIONER	: HART TZID-C
INPUT SIGNAL	: 4-20 mA
OPERATING RANGE	: 0-100 %
ACTION - CAM CHARACT.	: DIRECT - EQUAL PERCENT
GAUGES	: SUPPLY - OUTPUT
MATERIAL GAUGES	: STD
ELECTRICAL CONNECTION	: M 20
SERIAL PLATE LANGUAGE	: ENGLISH
TUBING MATERIAL	: STAINLESS STEEL
FITTINGS	: SWAGELOK ST ST (1/4 OD TUBING)
UNITS	: bar g
PAINTING	: OTA 1858E
	: P

CUSTOMER : TECHNIP
 ENQUIRY : ITB N° 041
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04648-16 REVISION : 0
 PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
 DATED : 07-09-02
 DATED : 10-04-02
 DATED : 04-10-02

PAGE : V0.016 SPEC 1

ITEM : 016 QTY : 9 ENGINEER : SL
 TAG : 30TV 10132 TO 30TV 10932 REVISION : 4 07-10-02
 MN ITEM : 016 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 230
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 11.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E
 : P

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-02
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N°	: 2-04648-17	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 04-10-02

PAGE : V0.017 SPEC 1

ITEM	: 017	QTY	: 9	ENGINEER	: SL
TAG	: 30TV 10137 TO 30TV 10937	REVISION	: 4	07-10-02	
		MN ITEM	: 017	V0	

SPECIFICATION SHEET	: CAMFLEX	REV	
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MODEL	: 35-35202/FR10/TZID-C
BODY TYPE	: GLOBE WITH ROTATING PLUG
NOMINAL SIZE	: DN 100 (NPS 4)
FLOW COEFFICIENT	: Cv 230
BODY	
MATERIAL	: ASTM A 216 Gr WCC - CARBON STEEL
CONNECTION TYPE	: FLANGED
RATING	: ANSI 300
FINISH	: RF Ra 3.2-6.3 um
PACKING	: KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG	: AISI 316L STELLITED
SEAT	: AISI 316
SEAT RETAINER	: AISI 316
SHAFT	: 17-4 PH
GUIDE BUSHINGS	: AISI 440C
FLOW DIRECTION	: TENDS TO CLOSE
LEAKAGE	: CLASS IV (IEC 534-4)

ACTUATOR

AIR FAILURE POSITION	: PNEUMATIC WITH ROLLING DIAPHRAGM
MOUNTING POSITION	: CLOSED
BENCH RANGE	: 2
AIR SUPPLY	: 7-15
HANDWHEEL	: 25 psi - 180 kPa - 1.8 bar
MAX SHUT OFF DELTA P FOR ATMOSPHERE	: WITHOUT
AIR SET	: 11.5 bar
POSITIONER	: TROPICAL
INPUT SIGNAL	: SAMI FR10 GAUGE
OPERATING RANGE	: HART TZID-C
ACTION - CAM CHARACT.	: 4-20 mA
GAUGES	: 0-100 %
MATERIAL GAUGES	: DIRECT - EQUAL PERCENT
ELECTRICAL CONNECTION	: SUPPLY - OUTPUT
SERIAL PLATE LANGUAGE	: STD
TUBING MATERIAL	: M 20
FITTINGS	: ENGLISH
UNITS	: STAINLESS STEEL
PAINTING	: SWAGELOK ST ST (1/4 OD TUBING)
	: bar g
	: OTA 1858E
	: P

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-02
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL Nr	: 2-04648-18	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 04-10-02

PAGE : V0.018 SPEC 1

ITEM	: 018	QTY	: 9	ENGINEER	: SL
TAG	: 30TV 10142 TO 30TV 10942	REVISION	: 4	07-10-02	
		MN ITEM	: 018	V0	

SPECIFICATION SHEET	: CAMFLEX	REV	
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MODEL	: 35-35202/FR10/TZID-C
BODY TYPE	: GLOBE WITH ROTATING PLUG
NOMINAL SIZE	: DN 100 (NPS 4)
FLOW COEFFICIENT	: Cv 230
BODY	
MATERIAL	: ASTM A 216 Gr WCC - CARBON STEEL
CONNECTION TYPE	: FLANGED
RATING	: ANSI 300
FINISH	: RF Ra 3.2-6.3 um
PACKING	: KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG	: AISI 316L STELLITED
SEAT	: AISI 316
SEAT RETAINER	: AISI 316
SHAFT	: 17-4 PH
GUIDE BUSHINGS	: AISI 440C
FLOW DIRECTION	: TENDS TO CLOSE
LEAKAGE	: CLASS IV (IEC 534-4)

ACTUATOR	: PNEUMATIC WITH ROLLING DIAPHRAGM
AIR FAILURE POSITION	: CLOSED
MOUNTING POSITION	: 2
BENCH RANGE	: 7-15
AIR SUPPLY	: 25 psi - 180 kPa - 1.8 bar
HANDWHEEL	: WITHOUT
MAX SHUT OFF DELTA P FOR ATMOSPHERE	: 11.5 bar
AIR SET	: TROPICAL
POSITIONER	: SAMI FR10 GAUGE
INPUT SIGNAL	: HART TZID-C
OPERATING RANGE	: 4-20 mA
ACTION - CAM CHARACT.	: 0-100 %
GAUGES	: DIRECT - EQUAL PERCENT
MATERIAL GAUGES	: SUPPLY - OUTPUT
ELECTRICAL CONNECTION	: STD
SERIAL PLATE LANGUAGE	: M 20
TUBING MATERIAL	: ENGLISH
FITTINGS	: STAINLESS STEEL
UNITS	: SWAGELOK ST ST (1/4 OD TUBING)
PAINTING	: bar g
	: OTA 1858E

Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 20139C
ENQUIRY	: ITB N° 041	DATED	: 07-09-01
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL Nr	: 2-04648-19	REVISION	: 0
PROJECT	: 9TH OLEFIN COMPLEX	DATED	: 15-10-02

PAGE : V0.019 SPEC 1

ITEM	: 019	QTY	: 9	ENGINEER	: SL
TAG	: 30UV 10127 TO 30UV 10927	REVISION	: 4	26-09-02	
		MN ITEM	: 019	V0	

SPECIFICATION SHEET : 41005 REV

MODEL	: 88-41415/FR10/496/SV/BR400
BODY TYPE	: GLOBE
NOMINAL SIZE	: DN 100 (NPS 4)
FLOW COEFFICIENT	: Cv 240
BODY MATERIAL	: CARBON STEEL - ASTM A 216 Gr WCC
CONNECTION TYPE	: FLANGED
RATING	: ANSI 1500
FINISH	: RTJ
BONNET	: STANDARD
PACKING	: KEVLAR PTFE
BOLTING	: B7 / 2H
TRIM TYPE	: CAGE GUIDED
CHARACTERISTIC/TYPE	: STANDARD CAGE / LINEAR
PLUG TYPE	: PILOT BALANCED
MATERIAL	: 17-4 PH
SEAL RINGS MATERIAL	: NI-RESIST CAST IRON
CAGE MATERIAL	: ASTM A 487 Gr C6NM CHROME PLATED
SEAT TYPE	: CLAMPED IN
MATERIAL	: AISI 410
FLOW DIRECTION	: TENDS TO CLOSE
LEAKAGE	: CLASS V (IEC 534-4)
ACTUATOR	: MULTI-SPRING AND DIAPHRAGM
SIZE	: 23
AIR FAILURE POSITION	: CLOSED
BENCH/NET RANGE	: 21-45
AIR SUPPLY	: 4 bar
YOKE	: STD
HANDWHEEL	: WITHOUT
MAX SHUT OFF DELTA P	: 173 bar
AIR SET	: SAMI FR10 GAUGE
POSITIONER	: WITHOUT
MATERIAL GAUGES	: STD
POSITION TRANSMITTER	: 496-458
ACTION	: 1 DETECTOR CLOSE
ENCLOSURE	: EEx ia IIC T6 + IP 65
ELECTRICAL CONNECTION	: M 20
SOLENOID VALVE	: 317 (JOUCOMATIC)
ACTION	: VENT'S ACTUATOR WHEN DEENERGIZED
TYPE	: 3 WAY-UNIVERSAL
BODY MATERIAL	: STAINLESS STEEL
PNEUMATIC CONNECTIONS	: 1/4"
VOLTAGE	: 24 V DC
ENCLOSURE	: EEx ia IIC T6 + IP65
ELECTRICAL CONNECTION	: M 20
SERIAL PLATE LANGUAGE	: ENGLISH
TUBING MATERIAL	: STAINLESS STEEL
FITTINGS	: SWAGELOK (3/8" OD TUBING)
UNITS	: bar g



Flow Control

Masoneilan

CUSTOMER : TECHNIP
ENQUIRY : ITB N° 041
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04648-19 REVISION : 0
PROJECT : 9TH OLEFIN COMPLEX

PROPOSAL : 20139C
DATED : 07-09-01
DATED : 10-04-02
DATED : 15-10-02

PAGE : V0.019 SPEC 2

ITEM : 019 QTY : 9 ENGINEER : SL
TAG : 30UV 10127 TO 30UV 10927 REVISION : 4 26-09-02
MN ITEM : 019 V0

OTHER MOUNTED ACCESSORIES : BOOSTER RELAY BR 400
PAINTING : OTA 1858E
NOTES : OPEN TO CLOSE : MAXIMUM 6 SECONDS
: CLOSE TO OPEN : 10 SECONDS

UNIT 20

TECHNIP



VENDOR DOCUMENT REVIEW

- 1 REVISE AND RESUBMIT
- 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
- 3 NO COMMENT - FINAL ISSUE

INSTRUMENT DATA SHEET

THIERRY GRANDRY - TECHNIP
2002.11.12 12:15:57 +01'00'
<none>

STATUS CERTIFIED "FINAL"
ISSUED BY : S. LEGE
DATE : 23/10/02

REV	DATE	DESCRIPTION
1	23/10/02	UP-DATE
0	08/10/02	FIRST ISSUE
TECHNIP 		NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY 
Project: 3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant		TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007 EQUIPMENT NAME: Control valves
DRESSER Flow Control		DOCUMENT TITLE : Instrument Data Sheets DOCUMENT CODE : A 3101
PURCHASE ORDER : 02-4909 (Unit 20)		Sheet 01 of 22 Rev. 1



Flow Control

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL N^o : 2-04909-01 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE20
DATED : - - -
DATED : 07-10-02

PAGE : V0.001 SPEC 1

ITEM : 12001 QTY : 1 ENGINEER : SL
TAG : 30 FV 20001 REVISION : 5 04-10-02
MN ITEM : 001 V0

SPECIFICATION SHEET : CONTROL VALVE RE

MODEL : S-LW5C/HW/FR10/TZID-C/BR400
BODY TYPE : BUTTERFLY
NOMINAL SIZE : DN 350 (NPS 14)
FLOW COEFFICIENT : Cv 5600
BODY/LINER MATERIALS : CARBON STEEL A 216 WCB (NO LINER)
CONNECTION TYPE : WAFER (FACE TO FACE 92 mm)
RATING : ANSI 150
FINISH : RF Ra 3.2-6.3 um
PACKING : PTFE

VANE : CF8M STAINLESS STEEL
SEAT : INCOLOY 825
SHAFT : 17-4 PH
LEAKAGE : CLASS IV (ANSI / FCI 70.2)
ACTUATOR : PNEUMATIC CYLINDER (SA)
AIR FAILURE POSITION : OPENED
AIR SUPPLY : 4 bar
HANDWHEEL : WITH
MAX SHUT OFF DELTA P : 7.8 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : HART TZID-C
INPUT SIGNAL : 4-20mA
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT - LINEAR
GAUGES : SUPPLY - OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (3/8" OD TUBING)
UNITS : bar g
OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
PAINTING : PROCEDURES T-12331 GB AND T1232GB

ADDITIONAL NOTE

VALVE MODEL N^o : S-LW5CBA14PACAT
ACTUATOR MODEL N^o : B1JARRU20

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04909-02 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - - -
 DATED : 07-10-02

PAGE : V0.002 SPEC 1

ITEM : 12002 QTY : 1 ENGINEER : SL
 TAG : 30 LV 20001 REVISION : 5 04-10-02
 MN ITEM : 002 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 230
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E
 : H

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04909-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE20
 DATED : - - -
 DATED : 07-10-02

PAGE : V0.003 SPEC 1

ITEM : 12003 QTY : 1 ENGINEER : SL
 TAG : 30 PV 20001 REVISION : 6 04-10-02
 MN ITEM : 003 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35102/FR10/TZID-C/496/SV
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 54
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

AIR FAILURE POSITION : PNEUMATIC WITH ROLLING DIAPHRAGM
 MOUNTING POSITION : OPENED
 BENCH RANGE : 1
 AIR SUPPLY : 7-15
 HANDWHEEL : 20 psi - 140 kPa - 1.4 bar
 MAX SHUT OFF DELTA P : WITHOUT
 FOR ATMOSPHERE : 5.5 bar
 AIR SET : TROPICAL
 POSITIONER : SAMI FR10 GAUGE
 INPUT SIGNAL : HART TZID-C
 OPERATING RANGE : 4-20 mA
 ACTION - CAM CHARACT. : 0-100 %
 GAUGES : DIRECT - EQUAL PERCENT
 MATERIAL GAUGES : SUPPLY - OUTPUT
 ELECTRICAL CONNECTION : STD
 POSITION TRANSMITTER : M 20
 ACTION : 496-458
 ENCLOSURE : 1 DETECTOR CLOSE
 ELECTRICAL CONNECTION : EEx ia IIC T6 + IP 65
 SOLENOID VALVE : M 20
 ACTION : 317 (JOUCOMATIC)
 TYPE : VENTS ACTUATOR WHEN DEENERGIZED
 BODY MATERIAL : 3 WAY-UNIVERSAL
 PNEUMATIC CONNECTIONS : STAINLESS STEEL
 VOLTAGE : 1/4"
 ENCLOSURE : 24 V DC
 ELECTRICAL CONNECTION : BEx ia IIC T6 + IP 65
 SERIAL PLATE LANGUAGE : M 20
 TUBING MATERIAL : ENGLISH
 : STAINLESS STEEL



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04909-03 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
DATED : - - -
DATED : 07-10-02

PAGE : V0.003 SPEC 2

ITEM : 12003 QTY : 1

ENGINEER : SL

TAG : 30 PV 20001

REVISION : 6 04-10-02

MN ITEM : 003 V0

FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)

UNITS : bar g

PAINTING : OTA 1858E



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04909-04 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
DATED : - - -
DATED : 07-10-02

PAGE : V0.004 SPEC 1

ITEM : 12004 QTY : 1 ENGINEER : SL
TAG : 30 PV 20022 A REVISION : 4 04-10-02
MN ITEM : 004 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 38-41335/HW/FR10/TZID-C/BR400
BODY TYPE : GLOBE
NOMINAL SIZE : DN 300 (NPS 12)
FLOW COEFFICIENT : Cv 840
BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
BONNET : STANDARD
PACKING : KEVLAR PTFE
BOLTING : B7 / 2H
TRIM TYPE : CAGE GUIDED
CHARISTIQUE/TYPE : LO-DB / LINEAR
PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
MATERIAL : 17-4 PH
SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
SEAT TYPE : CLAMPED IN
MATERIAL : AISI 410
FLOW DIRECTION : TENDS TO OPEN
LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING DIAPHRAGM CONVENTIONAL
SIZE : 18 L
AIR FAILURE POSITION : CLOSED
BENCH RANGE : 6-30
AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
YOKE : STD
HANDWHEEL : SIDE MOUNTED 8A
MAX SHUT OFF DELTA P : 22 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : HART TZID-C
INPUT SIGNAL : 4-20 mA
OPERATING RANGE : 0-100 %
ACTION : DIRECT - EQUAL PERCENTAGE
GAUGES : SUPPLY-OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (3/8" OD TUBING)
UNITS : bar g
OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04909-05 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - - -
 DATED : 15-10-02

PAGE : V0.005 SPEC 1

ITEM : 12005 QTY : 1 ENGINEER : SL
 TAG : 30 PV 20022B REVISION : 6 15-10-02
 MN ITEM : 005 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/TZID-C/496/SV
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 300
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

AIR FAILURE POSITION : PNEUMATIC WITH ROLLING DIAPHRAGM
 MOUNTING POSITION : CLOSED
 BENCH RANGE : 6
 AIR SUPPLY : 7-24
 HANDWHEEL : 40 psi - 280 kPa - 2.8 bar
 WITHOUT
 MAX SHUT OFF DELTA P : 14.8 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 POSITION TRANSMITTER : 496-458
 ACTION : 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20
 SOLENOID VALVE : 317 (JOUOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04909-05 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
DATED : - - -
DATED : 15-10-02

PAGE : V0.005 SPEC 2

ITEM : 12005 QTY : 1

ENGINEER : SL
REVISION : 6 15-10-02
MN ITEM : 005 V0

TAG : 30 PV 20022B

FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
UNITS : bar g
PAINTING : BODY UNPAINTED



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL N^o : 2-04909-06 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
DATED : - - -
DATED : 07-10-02

PAGE : V0.006 SPEC 1

ITEM : 12006 QTY : 1 ENGINEER : SL
TAG : 30 PV 20024 REVISION : 3 04-10-02
MN ITEM : 006 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41355/HW/78/FR10
BODY TYPE : GLOBE
NOMINAL SIZE : DN 200 (NPS 8)
FLOW COEFFICIENT : Cv 250
BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
BONNET : STANDARD
PACKING : KEVLAR PTFE
BOLTING : B7 / 2H
TRIM TYPE : CAGE GUIDED
CHARISTIQUE/TYPE : LO-DB TWO STAGE / LINEAR
PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
MATERIAL : 17-4 PH
SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
SEAT TYPE : CLAMPED IN
MATERIAL : AISI 410
FLOW DIRECTION : TENDS TO OPEN
LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
SIZE : 16
AIR FAILURE POSITION : CLOSED
BENCH RANGE : 21-45
AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
YOKE : STD
HANDWHEEL : SIDE MOUNTED
MAX SHUT OFF DELTA P : 8.4 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : FIELDBUS FOUNDATION FVP
OPERATING RANGE : 0-100 %
ACTION : DIRECT - EQUAL PERCENTAGE
GAUGES : SUPPLY-OUTPUT
MATERIAL GAUGES : STD (ST. STEEL CASE)
ELECTRICAL CONNECTION : M 20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (3/8" OD TUBING)
UNITS : bar g
PAINTING : OTA 1858E

CUSTOMER	: TECHNIP	PROPOSAL	: 90LE20
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: - -
SERIAL Nr	: 2-04909-07	REVISION	: 0
PROJECT	: BANDAR ASALUYE 9TH OLEFIN COMP	DATED	: 15-10-02

PAGE : V0.007 SPEC 1

ITEM	: 12007	QTY	: 1	ENGINEER	: SL
TAG	: 30 TV 20024			REVISION	: 5 15-10-02
				MN ITEM	: 007 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 300
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

AIR FAILURE POSITION : PNEUMATIC WITH ROLLING DIAPHRAGM
 MOUNTING POSITION : CLOSED
 BENCH RANGE : 6
 AIR SUPPLY : 7-24
 HANDWHEEL : 35 psi - 240 kPa - 2.4 bar
 MAX SHUT OFF DELTA P : WITHOUT
 FOR ATMOSPHERE : 7.4 bar
 AIR SET : TROPICAL
 POSITIONER : SAMI FR10 GAUGE
 OPERATING RANGE : FIELD BUS FOUNDATION FVP
 ACTION - CAM CHARACT. : 0-100 %
 GAUGES : DIRECT - EQUAL PERCENT
 MATERIAL GAUGES : SUPPLY - OUTPUT
 ELECTRICAL CONNECTION : STD (ST. STEEL CASE)
 SERIAL PLATE LANGUAGE : M 20
 TUBING MATERIAL : ENGLISH
 FITTINGS : STAINLESS STEEL
 UNITS : SWAGELOK ST ST (1/4 OD TUBING)
 PAINTING : bar g
 : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04909-08 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - - -
 DATED : 07-10-02

PAGE : V0.008 SPEC 1

ITEM : 12008 QTY : 1 ENGINEER : SL
 TAG : 30 PDV 20031 REVISION : 4 04-10-02
 MN ITEM : 008 V0

SPECIFICATION SHEET : VARIMAX REV

MODEL : 30-30122/HW/FR10/FVP/BR400
 BODY TYPE : ROTARY GLOBE
 NOMINAL SIZE : DN 400 (NPS 16)
 RATED Cv - MIN/MAX : 1395 TO 4830
 ADJUSTED Cv : 2860
 TRIM TYPE : STANDARD
 FLOW TO : OPEN
 BODY MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 EXTENSION : STANDARD
 PACKING : KEVLAR PTFE
 OPTION : EMISSION FREE SEAL (VITON O RINGS)

TRIM SET - MATERIALS : T1
 PLUG : AISI 316
 SEAT RING : AISI 316
 SEAT RETAINER : ASTM A 351 Gr CF8M
 SHAFT : 17-4 PH STAINLESS STEEL
 GUIDE BUSHINGS : AISI 440C
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING OPPOSED ROLLING DIAPHRAGM
 ATA N^o : 9
 ADJUSTMENT : D
 BENCH RANGE : 7-25
 AIR TO : CLOSE
 AIR FAILURE POSITION : OPENED
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 MOUNTING POSITION : 1
 HANDWHEEL : WITH
 MAX SHUT OFF DELTA P : 7.4 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
 PAINTING : OTA 1858E

SPECIAL NOTE : ADJUSTED Cv SHALL NOT EXCEED 2860
 : TAKING INTO ACCOUNT MAX DP CLOSED



Masoneilan

Flow Control

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04909-08 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
DATED : - - -
DATED : 07-10-02

PAGE : V0.008 SPEC 2

ITEM : 12008

QTY : 1

ENGINEER : SL

TAG : 30 PDV 20031

REVISION : 4 04-10-02

MN ITEM : 008 V0

: VALVE OF 7.4 bar AND MINIMUM SUPPLY
: PRESSURE OF 4 bar.

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04909-09 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - - -
 DATED : 07-10-02

PAGE : V0.009 SPEC 1

ITEM : 12009 QTY : 1 ENGINEER : SL
 TAG : 30 LDV 20051 REVISION : 3 04-10-02
 MN ITEM : 009 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 1.7
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 9.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04909-10 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - -
 DATED : 07-10-02

PAGE : V0.010 SPEC 1

ITEM : 12010 QTY : 1 ENGINEER : SL
 TAG : 30 FV 20061 REVISION : 4 04-10-02
 MN ITEM : 010 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 230
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 2.2 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E
 : H

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04909-11 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - -
 DATED : 07-10-02

PAGE : V0.011 SPEC 1

ITEM : 12011 QTY : 1 ENGINEER : SL
 TAG : 30 LV 20071 REVISION : 5 04-10-02
 MN ITEM : 011 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/TZID-C/496/SV
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 300
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-24
 AIR SUPPLY : 45 psi - 310 kPa - 3.1 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 14.7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 POSITION TRANSMITTER : 496-458
 ACTION : 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20
 SOLENOID VALVE : 317 (JOUOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6 + IP65
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04909-11 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
DATED : - - -
DATED : 07-10-02

PAGE : V0.011 SPEC 2

ITEM : 12011 QTY : 1

ENGINEER : SL
REVISION : 5 04-10-02
MN ITEM : 011 V0

TAG : 30 LV 20071

FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
UNITS : bar g
PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04909-12 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE20
 DATED : - - -
 DATED : 07-10-02

PAGE : V0.012 SPEC 1

ITEM : 12012 QTY : 1 ENGINEER : SL
 TAG : 30 FV 20071 REVISION : 4 04-10-02
 MN ITEM : 012 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41935/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 300
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARACTERISTIC/TYPE : LO-DB / LINEAR
 PLUG TYPE : SEAL RING BALANCED
 MATERIAL : 17-4 PH
 SEAL RINGS MATERIAL : GRAPHITE + NI-RESIST BACKUP
 CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 8.3 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04909-13 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE20
 DATED : - - -
 DATED : 07-10-02

PAGE : V0.013 SPEC 1

ITEM : 12013 QTY : 1 ENGINEER : SL
 TAG : 30 LV 20081 REVISION : 5 04-10-02
 MN ITEM : 013 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21014-2S/HW/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 2.8
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 600
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : ANTICAVITATION (TWO STAGES) LINEAR
 PLUG MATERIAL : AISI 410
 SEAT TYPE : COMBINED IN CAGE
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 11-23
 AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 MAX SHUT OFF DELTA P : 44 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E



Flow Control

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL N^o : 2-04909-14 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
DATED : - - -
DATED : 07-10-02

PAGE : V0.014 SPEC 1

ITEM : 120014 QTY : 1 ENGINEER : SL
TAG : 30 FV 20081 REVISION : 3 04-10-02
MN ITEM : 014 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
BODY TYPE : GLOBE
NOMINAL SIZE : DN 100 (NPS 4)
FLOW COEFFICIENT : C_v 195
BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
BOLTING : B7-2H
BONNET : STANDARD
PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
PLUG MATERIAL : AISI 416
SEAT TYPE : SCREWED
MATERIAL : AISI 416
GUIDE BUSHING MATERIAL : AISI 440C
FLOW DIRECTION : TENDS TO OPEN
LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
SIZE : 10
FAILURE POSITION : CLOSED
BENCH RANGE : 21-45
AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
YOKE : STD
HANDWHEEL : WITHOUT
MAX SHUT OFF DELTA P : 9.5 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : FIELDBUS FOUNDATION FVP
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT - LINEAR
GAUGES : SUPPLY-OUTPUT
MATERIAL GAUGES : STD (ST.STEEL CASE)
ELECTRICAL CONNECTION : M 20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (1/4" OD TUBING)
UNITS : bar g
PAINTING : OTA 1858E

Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 90LE20
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: - - -
SERIAL N ^o	: 2-04909-15	REVISION	: 0
PROJECT	: BANDAR ASALUYE 9TH OLEFIN COMP	DATED	: 07-10-02

PAGE : V0.015 SPEC 1

ITEM	: 12015	QTY	: 1	ENGINEER	: SL
TAG	: 30 PV 20083 A			REVISION	: 6 04-10-02
				MN ITEM	: 015 V0

SPECIFICATION SHEET : CONTROL VALVE REV

MODEL	: L1D/HW/FR10/TZID-C/BR400
BODY TYPE	: BUTTERFLY
NOMINAL SIZE	: DN 400 (NPS 16)
FLOW COEFFICIENT	: Cv 9100
BODY/LINER MATERIALS	: CARBON STEEL A 216 WCB
CONNECTION TYPE	: WAFER (FACE TO FACE 165mm)
RATING	: ANSI 300
FINISH	: RF Ra 3.2-6.3 um
PACKING	: GRAPHITE
VANE	: CF8M STAINLESS STEEL
SEAT	: INCOLOY 825
SHAFT	: 17-4 PH
LEAKAGE	: CLASS IV (ANSI / FCI 70.2)
ACTUATOR	: PNEUMATIC CYLINDER (SA)
AIR FAILURE POSITION	: OPENED
BENCH RANGE	: SPECIAL
AIR SUPPLY	: 4 bar
HANDWHEEL	: WITH
MAX SHUT OFF DELTA P FOR ATMOSPHERE	: 18.6 bar
AIR SET	: TROPICAL
POSITIONER	: SAMI FR10 GAUGE
INPUT SIGNAL	: HART TZID-C
OPERATING RANGE	: 4-20 mA
GAUGES	: 0-100 %
MATERIAL GAUGES	: SUPPLY - OUTPUT
ELECTRICAL CONNECTION	: STD
SERIAL PLATE LANGUAGE	: M20
TUBING MATERIAL	: ENGLISH
FITTINGS	: STAINLESS STEEL
UNITS	: SWAGELOK (3/8" OD TUBING)
OTHER MOUNTED ACCESSORIES	: bar g
PAINTING	: BOOSTER RELAY MODEL BR400
	: PROCEDURES T-12331 GB AND T1232 GB

ADDITIONAL NOTE

VALVE MODEL N ^o	: L1DMH16PACAF
ACTUATOR MODEL N ^o	: B1JARRU32



Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 90LE20
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: - -
SERIAL Nr	: 2-04909-16	REVISION	: 0
PROJECT	: BANDAR ASALUYE 9TH OLEFIN COMP	DATED	: 07-10-02
		PAGE	: V0.016 SPEC 1

ITEM	: 12016	QTY	: 1	ENGINEER	: SL
TAG	: 30 PV 20083 B			REVISION	: 5 04-10-02
				MN ITEM	: 016 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 38-41935/HW/FR10/TZID-C/BR400
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 400 (NPS 16)
 FLOW COEFFICIENT : Cv 1360
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB / LINEAR
 PLUG TYPE : SEAL RING BALANCED
 MATERIAL : 17-4 PH
 SEAL RINGS MATERIAL : GRAPHITE + NI-RESIST BACKUP
 CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING DIAPHRAGM CONVENTIONAL
 SIZE : 18 L
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 10-34
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED 8A
 MAX SHUT OFF DELTA P : 18.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
 PAINTING : OTA 1858E



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04909-17 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE20
 DATED : - -
 DATED : 15-10-02

PAGE : V0.017 SPEC 1

ITEM : 12017 QTY : 1 ENGINEER : SL
 TAG : 30 LV 20091 REVISION : 4 15-10-02
 MN ITEM : 017 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 300
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-24
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 19.4 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E




UNIT 30

INSTRUMENT DATA SHEETS

VENDOR DOCUMENT REVIEW	
<input type="checkbox"/>	REVISE AND RE-SUBMIT
<input type="checkbox"/>	RE-REVIEWED AS FINAL BY VENDOR, CURRENT DATE INDICATED
<input checked="" type="checkbox"/>	NO COMMENTS - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
2003.04.11 11:38:28 +01'00'
<none>

STATUS CERTIFIED "FINAL"
ISSUED BY : S. LEGE
DATE : 04/04/03

2	04/04/03	UP-DATE
1	23/10/02	UP-DATE
0	08/10/02	FIRST ISSUE
REV	DATE	DESCRIPTION
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007
		EQUIPMENT NAME: Control valves
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	
	DOCUMENT TITLE : Instrument Data Sheets	DOCUMENT CODE : A 3101
	PURCHASE ORDER : 02-4910 (Unit 30)	Sheet 01 of 42
		Rev. 2



CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04910-01 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.001 SPEC 1

ITEM : 13001 QTY : 1 ENGINEER : SL
TAG : 30 PV 30002 REVISION : 5 04-10-02
MN ITEM : 001 V0

SPECIFICATION SHEET : CONTROL VALVE REV

MODEL : S-L1C/FR10/FVP/BR400
BODY TYPE : BUTTERFLY
NOMINAL SIZE : DN 600 (NPS 24)
FLOW COEFFICIENT : Cv 16500
BODY/LINER MATERIALS : CARBON STEEL A 216 WCB
CONNECTION TYPE : WAFER (FACE TO FACE 154 mm)
RATING : ANSI 150
FINISH : RF Ra 3.2-6.3 um
PACKING : PTFE
VANE : CF8M STAINLESS STEEL
SEAT : INCOLOY 825
SHAFT : 17-4 PH
LEAKAGE : CLASS V (ANSI / FCI 70.2)
ACTUATOR : PNEUMATIC CYLINDER (SA)
AIR FAILURE POSITION : CLOSED
AIR SUPPLY : 4 bar
HANDWHEEL : WITHOUT
MAX SHUT OFF DELTA P : 3.5 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : FIELDBUS FOUNDATION FVP
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT
GAUGES : SUPPLY - OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M 20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (3/8" OD TUBING)
UNITS : bar g
OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
PAINTING : PROCEDURES T-12331 GB AND T1232 GB

ADDITIONAL NOTES

VALVE MODEL N° : S-L1CMA24PACA
ACTUATOR MODEL N° : B1JU32

CUSTOMER : TECHNIP PROPOSAL : 90LE30
 CUST. ORDER : 6465C30.1541 01 0 10007 DATED : 10-04-02
 SERIAL Nr : 2-04910-02 REVISION : 0 DATED : 07-10-02
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PAGE : V0.002 SPEC 1

ITEM : 13002 QTY : 1 ENGINEER : SL
 TAG : 30 LV-30004 REVISION : 3 18-07-02
 MN ITEM : 002 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 3.8
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : CARBON-PTFE + LIVE LOADING (*)

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 6.1 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - NEUTRAL
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

ADDITIONAL NOTE : (*) LOW EMISSION PACKING DESIGN L13
 : PLS REFER TO ATTACHED DOCUMENTS FOR
 : DETAILS.

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04910-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.003 SPEC 1

ITEM : 13003 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30022 REVISION : 3 18-07-02
 MN ITEM : 003 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 1.7
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : CARBON-PTFE + LIVE LOADING (*)

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 6.1 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - NEUTRAL
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

ADDITIONAL NOTE : (*) LOW EMISSION PACKING DESIGN L13
 : PLS REFER TO ATTACHED DOCUMENTS FOR
 : DETAILS.

Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 9OLE30
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N ^o	: 2-04910-04	REVISION	: 0
PROJECT	: BANDAR ASALUYE 9TH OLEFIN COMP	DATED	: 15-10-02
		PAGE	: V0.004 SPEC 1

ITEM	: 13004	QTY	: 1	ENGINEER	: SL
TAG	: 30 LDV 30024			REVISION	: 3 18-07-02
				MN ITEM	: 004 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 50
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : SOLID STELLITE
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 5.85 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E



CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04910-05 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.005 SPEC 1

ITEM : 13005 QTY : 1 ENGINEER : SL
TAG : 30 LV 30032 REVISION : 3 18-07-02
MN ITEM : 005 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/FVP
BODY TYPE : GLOBE WITH ROTATING PLUG
NOMINAL SIZE : DN 40 (NPS 1.5)
FLOW COEFFICIENT : Cv 30
BODY
MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
CONNECTION TYPE : FLANGELESS
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : SOLID STELLITE
SEAT : AISI 316
SEAT RETAINER : AISI 316
SHAFT : 17-4 PH
GUIDE BUSHINGS : AISI 440C
FLOW DIRECTION : TENDS TO CLOSE
LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
AIR FAILURE POSITION : CLOSED
MOUNTING POSITION : 2
BENCH RANGE : 7-15
AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
HANDWHEEL : WITHOUT
MAX SHUT OFF DELTA P : 4.8 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : FIELDBUS FOUNDATION FVP
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
GAUGES : SUPPLY - OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M 20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
UNITS : bar g
PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-06 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.006 SPEC 1

ITEM : 13006 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30042 REVISION : 3 18-07-02
 MN ITEM : 006 V0

SPECIFICATION SHEET : CAMPLEX REV

MODEL : 35-35202/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 8.4
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : SOLID STELLITE
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 8.8 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-07 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-10-02

PAGE : V0.007 SPEC 1

ITEM : 13007 QTY : 1 ENGINEER : SL
 TAG : 30 UV 30051 REVISION : 4 18-07-02
 MN ITEM : 007 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35502/FR10/496/77-6/SV/LS/TANK
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 200
 BODY :
 MATERIAL : ASTM A 216 Gr. WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 PTFE SOFT SEAT
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS VI (IEC 534-4)

ACTUATOR

: PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : OPENED
 MOUNTING POSITION : 5
 BENCH RANGE : 7-24
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 HANDWHEEL : WITHOUT
 LIMIT STOP : LIMITS OPENING
 ADJUSTMENT : AROUND Cv 140
 MAX SHUT OFF DELTA P : 21 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : WITHOUT
 MATERIAL GAUGES : STD
 POSITION TRANSMITTER : 496-558
 ACTION : 1 DETECTOR OPEN + 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20 (TWO ENTRY ADAPTOR)
 LOCK UP VALVE : 77-6
 SOLENOID VALVE : 317 (JOUOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4" NPT
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6 + IP65
 ELECTRICAL CONNECTION : 1/2" NPTF x M20 ADAPTOR
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04910-07 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
DATED : 10-04-02
DATED : 18-10-02

PAGE : V0.007 SPEC 2

ITEM : 13007 QTY : 1

ENGINEER : SL
REVISION : 4 18-07-02
MN ITEM : 007 V0

TAG : 30 UV 30051

PAINTING : OTA 1858E

ADDITIONAL NOTE

: A CAPACITY WILL BE SUPPLIED TO
: ENSURE MAINTAIN IN CLOSED POSITION
: IN CASE OF AIR FAILURE.
: THE VOLUME OF THIS CAPACITY SHALL BE
: SUFFICIENT TO ALLOW THREE STROKES.
: (36 LITER).

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-08 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.008 SPEC 1

ITEM : 13008 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30052 REVISION : 4 19-07-02
 MN ITEM : 008 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 5.6
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : SOLID STELLITE
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 14.3 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04910-09 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.009 SPEC 1

ITEM : 13009 QTY : 1 ENGINEER : SL
 TAG : 30 FV 30071 REVISION : 4 04-09-02
 MN ITEM : 009 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 1.7
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 25.3 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - NEUTRAL
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-10 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.010 SPEC 1

ITEM : 13010 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30071 REVISION : 3 18-07-02
 MN ITEM : 010 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 5.6
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : SOLID STELLITE
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

: PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 3.3 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-11 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.011 SPEC 1

ITEM : 13011 QTY : 1 ENGINEER : SL
 TAG : 30 TV 30071 REVISION : 4 19-07-02
 MN ITEM : 011 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 81
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 1'0007
 SERIAL Nr : 2-04910-12 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.012 SPEC 1

ITEM : 13012 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30073 REVISION : 4 19-07-02
 MN ITEM : 012 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 5.6
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : SOLID STELLITE
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 3.28 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-13 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.013 SPEC 1

ITEM : 13013 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30075 REVISION : 5 18-07-02
 MN ITEM : 013 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21715/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 4
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : ANTICAVITATION LINEAR
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 19.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 90LE30
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N ^o	: 2-04910-14	REVISION	: 0
PROJECT	: BANDAR ASALUYE 9TH OLEFIN COMP	DATED	: 07-10-02
		PAGE	: V0.014 SPEC 1

ITEM	: 13014	QTY	: 1	ENGINEER	: SL
TAG	: 30 LV 30093			REVISION	: 3 18-07-02
				MN ITEM	: 014 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 1.7
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 17.2 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP PROPOSAL : 9OLE30
 CUST. ORDER : 6465C30 1541 01 0 10007 DATED : 10-04-02
 SERIAL Nr : 2-04910-15 REVISION : 0 DATED : 18-10-02
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP
 PAGE : V0.015 SPEC 1

ITEM : 13015 QTY : 1 ENGINEER : SL
 REVISION : 4 18-07-02
 TAG : 30 UV 30101 MN ITEM : 015 V0

SPECIFICATION SHEET : 21000 REV.

MODEL : 87-21105/FR10/496/77-6/SV/LS/TANK
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 31
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED ON-OFF
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : SCREWED
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 GUIDE BUSHING MATERIAL : SOLID STELLITE
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : OPENED
 BENCH RANGE : 3-15
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 LIMIT STOP : LIMITS OPENING
 ADJUSTMENT : Cv AROUND 18
 MAX SHUT OFF DELTA P : 36.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : WITHOUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 POSITION TRANSMITTER : 496-558
 ACTION : 1 DETECTOR OPEN + 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20 (TWO ENTRY ADAPTOR)
 LOCK UP VALVE : 77-6
 SOLENOID VALVE : 317 (JOUCOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6 + IP65
 ELECTRICAL CONNECTION : 1/2" NPTF x M20 ADAPTOR
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)

Flow Control

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04910-15 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
DATED : 10-04-02
DATED : 18-10-02
PAGE : V0.015 SPEC 2

ITEM : 13015
TAG : 30 UV 30101

QTY : 1

ENGINEER : SL
REVISION : 4 18-07-02
MN ITEM : 015 V0

UNITS : bar g
PAINTING : BODY UNPAINTED

ADDITIONAL NOTE : A CAPACITY WILL BE SUPPLIED TO
: ENSURE MAINTAIN IN CLOSED POSITION
: IN CASE OF AIR FAILURE.
: THE VOLUME OF THIS CAPACITY SHALL BE
: SUFFICIENT TO ALLOW THREE STROKES.

Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 90LE30
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL Nr	: 2-04910-16	REVISION	: 0
PROJECT	: BANDAR ASALUYE 9TH OLEFIN COMP	DATED	: 07-10-02
		PAGE	: V0.016 SPEC 1

ITEM	: 13016	QTY	: 1	ENGINEER	: SL
				REVISION	: 3 18-07-02
TAG	: 30 LV 30102			MN ITEM	: 016 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/78/FR10
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 138
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

: PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 14.1 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-17 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.017 SPEC 1

ITEM : 13017 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30103 REVISION : 4 18-07-02
 MN ITEM : 017 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 3.8
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 20 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N° : 2-04910-18 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.018 SPEC 1

ITEM : 13018 QTY : 1 ENGINEER : SL
 REVISION : 4 19-07-02
 TAG : 30 TV 30104 MN ITEM : 018 V0

SPECIFICATION SHEET : CONTROL VALVE REV

MODEL : LW5C/HW/FR10/FVP/BR400
 BODY TYPE : BUTTERFLY
 NOMINAL SIZE : DN 300 (NPS 12)
 FLOW COEFFICIENT : Cv 7300
 BODY/LINER MATERIALS : ST ST A 351 Gr CF8M
 CONNECTION TYPE : WAFER (FACE TO FACE 83 mm)
 RATING : ANSI 150
 FINISH : RF Ra 3.2-6.3 um
 PACKING : PTFE

VANE : STAINLESS STEEL A 351 Gr CF8M
 SEAT : INCOLOY 825
 SHAFT : 17-4 PH
 LEAKAGE : CLASS IV (IEC 534-4)
 ACTUATOR : PNEUMATIC CYLINDER (SA)
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 4 bar
 HANDWHEEL : WITH
 MAX SHUT OFF DELTA P : 9.58 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
 PAINTING : BODY UNPAINTED

ADDITIONAL NOTE

VALVE MODEL N° : LW5CBA12AACAT
 ACTUATOR MODEL N° : BIJRRU20



Flow Control

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04910-19 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.019 SPEC 1

ITEM : 13019 QTY : 1 ENGINEER : SL
TAG : 30 TV 30107. REVISION : 3 18-07-02
MN ITEM : 019 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
BODY TYPE : GLOBE
NOMINAL SIZE : DN 25 (NPS 1)
FLOW COEFFICIENT : Cv 3.8
BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
BOLTING : B7-2H
BONNET : STANDARD
PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
PLUG MATERIAL : AISI 416
SEAT TYPE : SCREWED
MATERIAL : AISI 416
GUIDE BUSHING MATERIAL : AISI 440C
FLOW DIRECTION : TENDS TO OPEN
LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
SIZE : 6
FAILURE POSITION : CLOSED
BENCH RANGE : 3-15
AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
YOKE : STD
HANDWHEEL : WITHOUT
MAX SHUT OFF DELTA P : 12.6 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : FIELDBUS FOUNDATION FVP
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT - LINEAR
GAUGES : SUPPLY-OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M 20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGelok (1/4" OD TUBING)
UNITS : bar g
PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-20 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 22-10-02

PAGE : V0.020 SPEC 1

ITEM : 13020 QTY : 1 ENGINEER : SL
 TAG : 30 KV 30141 REVISION : 3 18-07-02
 MN ITEM : 020 V0

SPECIFICATION SHEET : 41005 REV.

MODEL : 88-41315/FR10/496/SV/LS
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 100 x DN 50 x DN 100 (4" x 2")
 FLOW COEFFICIENT : Cv 75
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : STANDARD CAGE / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : STELLITED AISI 316
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : AISI 316 CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 LIMIT STOP : LIMITS OPENING
 ADJUSTMENT : Cv AROUND 59
 MAX SHUT OFF DELTA P : 36.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : WITHOUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 POSITION TRANSMITTER : 496-558
 ACTION : 1 DETECTOR OPEN + 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20 (TWO ENTRY ADAPTOR)
 SOLENOID VALVE : 317 (JOUOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : 316 STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6
 ELECTRICAL CONNECTION : ISO M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04910-20 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
DATED : 10-04-02
DATED : 22-10-02

PAGE : V0.020 SPEC 2

ITEM : 13020 QTY : 1 ENGINEER : SL
REVISION : 3 18-07-02
TAG : 30 KV 30141 MN ITEM : 020 V0

FITTINGS : SWAGELOK (1/4" OD TUBING)
UNITS : bar g
PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-21 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-10-02

PAGE : V0.021 SPEC 1

ITEM : 13021 QTY : 1 ENGINEER : SL
 TAG : 30 KV 30142 REVISION : 4 18-07-02
 MN ITEM : 021 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/496/SV
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 138
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 PTFE SOFT SEAT
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS VI (IEC 534-4)

ACTUATOR

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 HANDWHEEL : WITHOUT
 LIMIT STOP : WITHOUT
 MAX SHUT OFF DELTA P : 36.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : WITHOUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 POSITION TRANSMITTER : 496-558
 ACTION : 1 DETECTOR OPEN + 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20 (TWO ENTRY ADAPTOR)
 SOLENOID VALVE : 317 (JOUCOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : 316 STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6
 ELECTRICAL CONNECTION : ISO M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-22 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-10-02

PAGE : V0.022 SPEC 1

ITEM : 13022 QTY : 1 ENGINEER : SL
 REVISION : 3 18-07-02
 TAG : 30 KV 30143 MN ITEM : 022 V0

SPECIFICATION SHEET : 41005 REV.

MODEL : 88-41315/FR10/496/SV/LS
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 100 x DN 50 x DN 100 (4" x 2")
 FLOW COEFFICIENT : Cv 75
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : STANDARD CAGE / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : STELLITED AISI 316
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : AISI 316 CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 LIMIT STOP : LIMITS OPENING
 ADJUSTMENT : Cv AROUND 59
 MAX SHUT OFF DELTA P : 36.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : WITHOUT
 MATERIAL GAUGES : STD (ST.STEEL CASE)
 POSITION TRANSMITTER : 496-558
 ACTION : 1 DETECTOR OPEN + 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20 (TWO ENTRY ADAPTOR)
 SOLENOID VALVE : 317 (JOUCOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : 316 STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6
 ELECTRICAL CONNECTION : ISO M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TIRING MATERIAL : STAINLESS STEEL



Flow Control

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL N^o : 2-04910-22 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
DATED : 10-04-02
DATED : 18-10-02
PAGE : V0.022 SPEC 2

ITEM : 13022 QTY : 1 ENGINEER : SL
TAG : 30 KV 30143 REVISION : 3 18-07-02
MN ITEM : 022 V0
FITTINGS : SWAGELOK (1/4" OD TUBING)
UNITS : bar g
PAINTING : BODY UNPAINTED



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-23 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 18-10-02

PAGE : V0.023 SPEC 1

ITEM : 13023 QTY : 1 ENGINEER : SL
 TAG : 30 KV 30144 REVISION : 4 18-07-02
 MN ITEM : 023 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/496/SV
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 138
 BODY MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 PTFE SOFT SEAT
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS VI (IEC 534-4)

ACTUATOR

AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 HANDWHEEL : WITHOUT
 LIMIT STOP : WITHOUT
 MAX SHUT OFF DELTA P : 36.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : WITHOUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 POSITION TRANSMITTER : 496-558
 ACTION : 1 DETECTOR OPEN + 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20 (TWO ENTRY ADAPTOR)
 SOLENOID VALVE : 317 (JOUOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : 316 STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6
 ELECTRICAL CONNECTION : ISO M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP PROPOSAL : 9OLE30
 CUST. ORDER : 6465C30 1541 01 0 10007 DATED : 10-04-02
 SERIAL Nr : 2-04910-24 REVISION : 0 DATED : 07-10-02
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP
 PAGE : V0.024 SPEC 1

ITEM : 13024 QTY : 1 ENGINEER : SL
 TAG : 30 FV 30151 REVISION : 5 04-09-02
 MN ITEM : 024 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41335/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 150 x DN 100 x DN 150 (6" x 4")
 FLOW COEFFICIENT : Cv 195
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : STELLITED AISI 316
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : AISI 316 CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 11.7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-25 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.025 SPEC 1

ITEM : 13025 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30151 REVISION : 3 18-07-02
 MN ITEM : 025 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 3.8
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 4.95 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-26 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.026 SPEC 1

ITEM : 13026 QTY : 1 ENGINEER : SL
 TAG : 30 FV 30152 REVISION : 4 18-07-02
 MN ITEM : 026 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21715/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 75
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : LO-DB LINEAR
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : SCREWED
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 FAILURE POSITION : CLOSED
 BENCH RANGE : 11-23
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 11.3 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-27 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.027 SPEC 1

ITEM : 13027 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30153 REVISION : 4 18-07-02
 MN ITEM : 027 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21124EB/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 15
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 600
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : WITH EXTENSION EB
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : FULLY STELLITED AISI 316
 SEAT TYPE : CLAMPED IN
 MATERIAL : FULLY STELLITED AISI 316
 CAGE MATERIAL : ASTM A 487 Gr CA6NM
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 11-23
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 42.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-28 REVISION : 2
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
 DATED : 10-04-02
 DATED : 03-04-03

PAGE : V0.028 SPEC 1

ITEM : 13028 QTY : 1 ENGINEER : SL
 TAG : 30 PV 30153 REVISION : 5 04-09-02
 MN ITEM : 028 V0

SPECIFICATION SHEET : 41005 - REV.

MODEL : 37-41355/HW/FR10/TZID-C/BR400
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 300 (NPS 12)
 FLOW COEFFICIENT : Cv 600
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARACTERISTIC/TYPE : LO-DB TWO STAGE / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : STELLITED AISI 316
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : AISI 316 CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING DIAPHRAGM CONVENTIONAL
 SIZE : 18
 AIR FAILURE POSITION : OPENED
 BENCH RANGE : 3-15
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar 2
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED 8A
 MAX SHUT OFF DELTA P : 11.3 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : BOOSTER RELAY BR400
 PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP PROPOSAL : 90LE30
 CUST. ORDER : 6465C30 1541 01 0 10007 DATED : 10-04-02
 SERIAL Nr : 2-04910-29 REVISION : 0 DATED : 07-10-02
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP
 PAGE : V0.029 SPEC 1

ITEM : 13029 QTY : 1 ENGINEER : SL
 TAG : 30 TV 30154 REVISION : 4 18-07-02
 MN ITEM : 029 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21715/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 75
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : GRAPHITE

TRIM : LO-DB LINEAR
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : SCREWED
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 FAILURE POSITION : CLOSED
 BENCH RANGE : 11-23
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 11.3 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : ST. STEEL CONSTRUCTION
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04910-30 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.030 SPEC 1

ITEM : 13030 QTY : 1 ENGINEER : SL
 TAG : 30 TV 30155 REVISION : 4 04-09-02
 MN ITEM : 030 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41935/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 300
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB / LINEAR
 PLUG TYPE : SEAL RING BALANCED
 MATERIAL : STELLITED AISI 316
 SEAL RINGS MATERIAL : GRAPHITE + NI-RESIST BACKUP
 CAGE MATERIAL : AISI 316 CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 11.3 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-31 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.031 SPEC 1

ITEM : 13031 QTY : 1 ENGINEER : SL
 TAG : 30 FV 30161 REVISION : 6 04-09-02
 MN ITEM : 031 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 40 (NPS 1.5)
 FLOW COEFFICIENT : Cv 30
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : SOLID STELLITE
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 5.2 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01.0 10007
 SERIAL N^o : 2-04910-32 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.032 SPEC 1

ITEM : 13032 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30161 REVISION : 4 18-07-02
 MN ITEM : 032 V0

SPECIFICATION SHEET : CAMPLEX REV

MODEL : 35-35202/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 8.4
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : SOLID STELLITE
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 3.48 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-33 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.033 SPEC 1

ITEM : 13033 QTY : 1 ENGINEER : SL
 TAG : 30 PV 30162 REVISION : 3 18-07-02
 MN ITEM : 033 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 50
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : SOLID STELLITE
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 3.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELD BUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-34 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.034 SPEC 1

ITEM : 13034 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30164 REVISION : 4 19-07-02
 MN ITEM : 034 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 14
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : SOLID STELLITE
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 2.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E
 : P

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04910-35 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE30
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.035 SPEC 1

ITEM : 13035 QTY : 1 ENGINEER : SL
 TAG : 30 FV 30171 REVISION : 5 04-09-02
 MN ITEM : 035 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 40 (NPS 1.5)
 FLOW COEFFICIENT : Cv 18
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : SOLID STELLITE
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 2.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E
 : H

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04910-37 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.037 SPEC 1

ITEM : 13037 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30701B REVISION : 5 04-09-02
 MN ITEM : 037 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 135
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 10 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04910-38 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE30
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.038 SPEC 1

ITEM : 13036 QTY : 1 ENGINEER : SL
 TAG : 30 LV 30701A REVISION : 6 04-09-02
 MN ITEM : 038 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 300
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-24
 AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 10 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E



UNIT 40

INSTRUMENT DATA SHEETS

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY | TECHNIP
2003.04.08 11:56:48 +01'00'
<none>

STATUS CERTIFIED "FINAL"
ISSUED BY : S. LEGE
DATE : 04/04/03

3	04/04/03	UP-DATE
2	16/12/02	items 14009 : 496-458 added
1	23/10/02	UP-DATE
0	08/10/02	FIRST ISSUE
REV	DATE	DESCRIPTION
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007
		EQUIPMENT NAME:
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	Control valves
DRESSER Flow Control	DOCUMENT TITLE :	DOCUMENT CODE
	Instrument Data Sheets	A 3101
	PURCHASE ORDER :	Sheet
	02-4911 (Unit 40)	01 of 57
		Rev. 3

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-01 REVISION : 2
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40³
 DATED : 10-04-02
 DATED : 02-04-03

PAGE : V0.001 SPEC 1

ITEM : 14001 QTY : 1 ENGINEER : SL
 TAG : 30 HV 40033 REVISION : 3 03-04-03
 MN ITEM : 001 V0

SPECIFICATION SHEET : 41005 REV.

MODEL : 87-41315/FR10/TZID-C/496/SV/BR200 2
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 200 (NPS 8)
 FLOW COEFFICIENT : Cv 640
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B8 / GR8

TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : STANDARD CAGE / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : STELLITED AISI 316
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TPE
 CAGE MATERIAL : AISI 316 CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 AIR FAILURE POSITION : OPENED
 BENCH RANGE : 6-30
 AIR SUPPLY : 50 psi - 350 kPa - 3.5 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 36.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 POSITION TRANSMITTER : 496-458
 ACTION : 1 DETECTOR OPEN
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20
 SOLENOID VALVE : 317 (JOUOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04911-01 REVISION : 2
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
DATED : 10-04-02
DATED : 02-04-03

PAGE : V0.001 SPEC 2

ITEM : 14001 QTY : 1 ENGINEER : SL
TAG : 30 HV 40033 REVISION : 3 03-04-03
MN ITEM : 001 V0

ENCLOSURE : EEx ia IIC T6 + IP65
ELECTRICAL CONNECTION : M 20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (3/8" OD TUBING)
UNITS : bar g
OTHER MOUNTED ACCESSORIES: BOOSTER RELAY MODEL BR200
PAINTING : BODY UNPAINTED



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-02 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.002 SPEC 1

ITEM : 14002 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40051 REVISION : 4 18-07-02
 MN ITEM : 002 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41515 EB/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 100 x DN 50 x DN 100 (4" x 2")
 FLOW COEFFICIENT : Cv 75
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : CRYOGENIC EXTENDED (T -135 °C)
 PACKING : KEVLAR PTFE
 BOLTING : B8 / GR8
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : STANDARD CAGE / LINEAR
 PLUG TYPE : SEAL RING BALANCED
 MATERIAL : STELLITED AISI 316
 SEAL RINGS MATERIAL : NI-RESIST CAST IRON
 CAGE MATERIAL : AISI 316 CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS II (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 36.8 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELD BUS FOUNDATION
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-C2
 DATED : 07-10-02

PAGE : V0.003 SPEC 1

ITEM : 14003 QTY : 1 ENGINEER : SL
 TAG : 30 TV 40053 REVISION : 3 18-07-C2
 MN ITEM : 003 V0

SPECIFICATION SHEET : VARIMAX REV

MODEL : 30-30222/FR10/FVP
 BODY TYPE : ROTARY GLOBE
 NOMINAL SIZE : DN 150 (NPS 6)
 RATED Cv - MIN/MAX : 240 TO 550
 ADJUSTED Cv : 405
 TRIM TYPE : STANDARD
 FLOW TO : CLOSE
 BODY MATERIAL : ASTM A 351 Gr CF8M - STAINLESS STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 EXTENSION : STANDARD
 PACKING : KEVLAR PTFE
 OPTION : EMISSION FREE SEAL (VITON O RINGS)

TRIM SET - MATERIALS : T1
 PLUG : AISI 316
 SEAT RING : AISI 316
 SEAT RETAINER : ASTM A 351 Gr CF8M
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING OPPOSED ROLLING DIAPHRAGM
 ATA N^o : 5
 ADJUSTMENT : D
 BENCH RANGE : 7-25
 AIR TO : OPEN
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 MOUNTING POSITION : 2
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 0.0 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELD BUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04911-04 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40
DATED : 10-04-02
DATED : 15-10-02

PAGE : V0.004 SPEC 1

ITEM : 14004 QTY : 1 ENGINEER : SL
TAG : 30 LV 40053 REVISION : 4 18-07-02
MN ITEM : 004 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41525 EB/FR10/FVP
BODY TYPE : GLOBE
NOMINAL SIZE : DN 150 x DN 80 x DN 150 (6" x 3")
FLOW COEFFICIENT : Cv 140
BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
BONNET : CRYOGENIC EXTENDED (T -135 °C)
PACKING : KEVLAR PTFE
BOLTING : B8 / GR8
TRIM TYPE : CAGE GUIDED
CHARISTIQUE/TYPE : STANDARD CAGE / =%
PLUG TYPE : SEAL RING BALANCED
MATERIAL : STELLITED AISI 316
SEAL RINGS MATERIAL : NI-RESIST CAST IRON
CAGE MATERIAL : AISI 316 CHROME PLATED
SEAT TYPE : CLAMPED IN
MATERIAL : AISI 316 STELLITED SEATING SURFACES
FLOW DIRECTION : TENDS TO OPEN
LEAKAGE : CLASS II (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
SIZE : 16
AIR FAILURE POSITION : CLOSED
BENCH RANGE : 6-30
AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
YOKE : STD
HANDWHEEL : WITHOUT
MAX SHUT OFF DELTA P : 36.9 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : FIELD BUS FOUNDATION FVP
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT - LINEAR
GAUGES : SUPPLY-OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M 20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (3/8" OD TUBING)
UNITS : bar g
PAINTING : BODY UNPAINTED



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-05 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.005 SPEC 1

ITEM : 14005 QTY : 1 ENGINEER : SL
 REVISION : 4 18-07-02
 TAG : 30 LV 40061 MN ITEM : 005 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21115EB/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 31
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : CRYOGENIC EXTENSION (T -135 °C)
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED LINEAR
 PLUG MATERIAL : FULLY STELLITED AISI 316
 SEAT TYPE : SCREWED
 MATERIAL : FULLY STELLITED AISI 316
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : CLOSED
 BENCH RANGE : 11-23
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 36.8 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED



Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 90LE40
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL Nr	: 2-04911-06	REVISION	: 0
PROJECT	: BANDAR ASALUYE 9TH OLEFIN COMP	DATED	: 07-10-02

PAGE : V0.006 SPEC 1

ITEM	: 14006	QTY	: 1	ENGINEER	: SL
TAG	: 30 PV 40061 C	REVISION	: 5		: 04-09-02
		MN ITEM	: 006 V0		

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41435 EB/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 150 x DN 80 x DN 150 (6" x 3")
 FLOW COEFFICIENT : Cv 125
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : CRYOGENIC EXTENDED (T -135 °C)
 PACKING : KEVLAR PTFE
 BOLTING : B8 / GR8
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB / LINEAR
 PLUG TYPE : PILOT BALANCED
 MATERIAL : STELLITED AISI 316
 SEAL RINGS MATERIAL : NI-RESIST CAST IRON
 CAGE MATERIAL : AISI 316 CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 AIR FAILURE POSITION : CLOSED
 BENCH/NET RANGE : 21-45/13-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 36.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED



Flow Control

CUSTOMER : TECHNIP PROPOSAL : 9OLE40
CUST. ORDER : 6465C30 1541 01 0 10007 DATED : 10-04-02
SERIAL N^o : 2-04911-07 REVISION : 0 DATED : 07-10-02
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP
PAGE : V0.007 SPEC 1

ITEM : 14007 QTY : 1 ENGINEER : SL
TAG : 30 LV 40063 REVISION : 5 18-07-02
MN ITEM : 007 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125EB/FR10/FVP
BODY TYPE : GLOBE
NOMINAL SIZE : DN 50 (NPS 2)
FLOW COEFFICIENT : Cv 15
BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
BOLTING : B8 / GR8
BONNET : CRYOGENIC EXTENSION (T -135 °C)
PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
PLUG MATERIAL : FULLY STELLITED AISI 316
SEAT TYPE : SCREWED
MATERIAL : FULLY STELLITED AISI 316
GUIDE BUSHING MATERIAL : NITRONIC 60
FLOW DIRECTION : TENDS TO OPEN
LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
SIZE : 6
FAILURE POSITION : CLOSED
BENCH RANGE : 11-23
AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
YOKE : STD
HANDWHEEL : WITHOUT
MAX SHUT OFF DELTA P : 36.8 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : FIELDBUS FOUNDATION FVP
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT - LINEAR
GAUGES : SUPPLY-OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M 20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGelok (1/4" OD TUBING)
UNITS : bar g
PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP PROPOSAL : 90LE40
 CUST. ORDER : 6465C30 1541 01 0 10007 DATED : 10-04-02
 SERIAL Nr : 2-04911-08 REVISION : 0 DATED : 07-10-02
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP
 PAGE : V0.008 SPEC 1

ITEM : 14008 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40065 REVISION : 4 18-07-02
 MN ITEM : 008 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21115EB/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 3.8
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : CRYOGENIC EXTENSION (T -152 °C)
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED LINEAR
 PLUG MATERIAL : FULLY STELLITED AISI 316
 SEAT TYPE : SCREWED
 MATERIAL : FULLY STELLITED AISI 316
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 36.8 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-09 REVISION : 1
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 13-12-02

PAGE : V0.009 SPEC 1

ITEM : 14009 QTY : 1 ENGINEER : SL
 REVISION : 4 18-07-02
 TAG : 30 PV 40071 MN ITEM : 009 V0

SPECIFICATION SHEET : VARIMAX REV. 1

MODEL : 30-30222/FR10/FVP/496/SV 1
 BODY TYPE : ROTARY GLOBE
 NOMINAL SIZE : DN 200 (NPS 8)
 RATED Cv - MIN/MAX : 420 TO 950
 ADJUSTED Cv : 890
 TRIM TYPE : STANDARD
 FLOW TO : CLOSE
 BODY MATERIAL : ASTM A 351 Gr CF8M - STAINLESS STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 EXTENSION : STANDARD
 PACKING : KEVLAR PTFE
 OPTION : EMISSION FREE SEAL (VITON O RINGS)

TRIM SET - MATERIALS : TI
 PLUG : AISI 316
 SEAT RING : AISI 316
 SEAT RETAINER : ASTM A 351 Gr CF8M
 SHAFT : AISI 316
 GUIDE BUSHINGS : AISI 316 HARD FACED
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING OPPOSED ROLLING DIAPHRAGM
 ATA N^o : 7
 ADJUSTMENT : B
 BENCH RANGE : 7-25
 AIR TO : OPEN
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 45 psi - 310 kPa - 3.1 bar
 MOUNTING POSITION : 2
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 13.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 POSITION TRANSMITTER : 496-458 1
 ACTION : 1 DETECTOR CLOSE 1
 ENCLOSURE : BEx ia IIC T6 + IP 65 1
 ELECTRICAL CONNECTION : M 20 1
 SOLENOID VALVE : 317 (JOUCOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04911-09 REVISION : 1
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
DATED : 10-04-02
DATED : 13-12-02

PAGE : V0.009 SPEC 2

ITEM : 14009 QTY : 1 ENGINEER : SL
TAG : 30 PV 40071 REVISION : 4 18-07-02
MN ITEM : 009 V0

VOLTAGE : 24 V DC
ENCLOSURE : EEx ia IIC T6 + IP 65
ELECTRICAL CONNECTION : M 20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (1/4" OD TUBING)
UNITS : bar g
PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-10 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.010 SPEC :

ITEM : 14010 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40071 A REVISION : 4 04-09-02
 MN ITEM : 010 V0

SPECIFICATION SHEET : VARIMAX REV

MODEL : 30-30222/FR10/TZID-C
 BODY TYPE : ROTARY GLOBE
 NOMINAL SIZE : DN 200 (NPS 8)
 RATED Cv - MIN/MAX : 420 TO 950
 ADJUSTED Cv : 620
 TRIM TYPE : STANDARD
 FLOW TO : CLOSE
 BODY MATERIAL : ASTM A 351 Gr CF8M - STAINLESS STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 EXTENSION : STANDARD
 PACKING : KEVLAR PTFE
 OPTION : EMISSION FREE SEAL (VITON O RINGS)

TRIM SET - MATERIALS : T2
 PLUG : AISI 316
 SEAT RING : AISI 316 STELLITED SEATING SURFACE
 SEAT RETAINER : ASTM A 351 Gr CF8M
 SHAFT : 17-4 PH STAINLESS STEEL
 GUIDE BUSHINGS : AISI 316 HARD FACED
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING OPPOSED ROLLING DIAPHRAGM
 ATA N^o : 7
 ADJUSTMENT : E
 BENCH RANGE : 7-25
 AIR TO : OPEN
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 45 psi - 310 kPa - 3.1 bar
 MOUNTING POSITION : 2
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 30.7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 90LE40
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N ^o	: 2-04911-11	REVISION	: 0
PROJECT	: BANDAR ASALUYE 9TH OLEFIN COMP	DATED	: 07-10-02
		PAGE	: V0.011 SPEC 1

ITEM	: 14011	QTY	: 1	ENGINEER	: SL
TAG	: 30 FV 40071 B			REVISION	: 3 18-07-02
				MN ITEM	: 011 V0

SPECIFICATION SHEET	: 41005	REV	
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MODEL	: 87-41355/FR10/SV/LS
BODY TYPE	: GLOBE
NOMINAL SIZE	: DN 100 x DN 50 x DN 100 (4" x 2")
FLOW COEFFICIENT	: Cv 53
BODY MATERIAL	: STAINLESS STEEL - ASTM A 351 Gr CF8M
CONNECTION TYPE	: FLANGED
RATING	: ANSI 300
FINISH	: RF Ra 3.2-6.3 um
BONNET	: STANDARD (T -102°C)
PACKING	: KEVLAR PTFE
BOLTING	: B8 / GR8
TRIM TYPE	: CAGE GUIDED
CHARISTIQUE/TYPE	: ANTICAVITATION TWO STAGE / LINEAR
PLUG TYPE	: SPRING ENERGIZED SEAL RING BALANCED
MATERIAL	: STELLITED AISI 316
SEAL RINGS MATERIAL	: CARBON GRAPHITE FILLED TFE
CAGE MATERIAL	: AISI 316 CHROME PLATED
SEAT TYPE	: SPECIAL
MATERIAL	: AISI 316 STELLITED SEATING SURFACES
FLOW DIRECTION	: TENDS TO OPEN
LEAKAGE	: CLASS IV (IEC 534-4)

ACTUATOR	: MULTI-SPRING AND DIAPHRAGM
SIZE	: 10
AIR FAILURE POSITION	: OPENED
BENCH RANGE	: 3-15
AIR SUPPLY	: 25 psi - 180 kPa - 1.8 bar
YOKE	: STD
HANDWHEEL	: WITHOUT
LIMIT STOP	: LIMITS OPENING
ADJUSTMENT	: Cv AROUND 34
MAX SHUT OFF DELTA P	: 18.9 bar
FOR ATMOSPHERE	: TROPICAL
AIR SET	: SAMI FR10 GAUGE
POSITIONER	: WITHOUT
MATERIAL GAUGES	: STD
SOLENOID VALVE	: 317 (JOUCOMATIC)
ACTION	: VENTS ACTUATOR WHEN DEENERGIZED
TYPE	: 3 WAY-UNIVERSAL
BODY MATERIAL	: STAINLESS STEEL
PNEUMATIC CONNECTIONS	: 1/4"
VOLTAGE	: 24 V DC
ENCLOSURE	: EEx ia IIC T6 + IP65
ELECTRICAL CONNECTION	: 1/2" NPTF x M20 ADAPTOR
SERIAL PLATE LANGUAGE	: ENGLISH
TUBING MATERIAL	: STAINLESS STEEL
FITTINGS	: SWAGELOK (1/4" OD TUBING)
UNITS	: bar g
PAINTING	: BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-12 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.012 SPEC 1

ITEM : 14012 QTY : 1 ENGINEER : SL
 TAG : 30 PV 40073 REVISION : 5 18-07-02
 MN ITEM : 012 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21914EB/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 21
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH CRYOGENIC EXTENSION (T -135°C)
 PACKING : KEVLAR PTFE

TRIM : LO-DB (TWO STAGE) LINEAR
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 CAGE MATERIAL : AISI 304
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 50 psi - 350 kPa - 3.5 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 13.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N° : 2-04911-13 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 08-10-02

PAGE : V0.013 SPEC 1

ITEM : 14013 QTY : 1 ENGINEER : SL
 TAG : 30 TV 40075A REVISION : 5 18-07-02
 MN ITEM : 013 V0

SPECIFICATION SHEET : CONTROL VALVE REV

MODEL : L1D/HW/FR10/TZID-C/BR400
 BODY TYPE : BUTTERFLY
 NOMINAL SIZE : DN 300 (NPS 12)
 FLOW COEFFICIENT : Cv 5090
 BODY MATERIALS : ST ST A 351 Gr CF8M
 CONNECTION TYPE : WAFER (FACE TO FACE 114 mm)
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : PTFE

VANE : ST STEEL A 351 Gr CF8M
 SEAT : INCOLOY 825
 SHAFT : 17-4 PH
 LEAKAGE : CLASS IV (ANSI / FCI 70.2)
 ACTUATOR : PNEUMATIC CYLINDER (SA)
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 4 bar
 HANDWHEEL : WITH
 MAX SHUT OFF DELTA. P : 0.0 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
 PAINTING : BODY UNPAINTED

ADDITIONAL NOTES

VALVE MODEL N° : L1DMA12AACA
 ACTUATOR MODEL N° : B1JRRU20

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-14 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.014 SPEC 1

ITEM : 14014 QTY : 1 ENGINEER : SL
 TAG : 30 TV 40075B REVISION : 4 04-09-02
 MN ITEM : 014 V0

SPECIFICATION SHEET : VARIMAX REV

MODEL : 30-30222/FR10/TZID-C
 BODY TYPE : ROTARY GLOBE
 NOMINAL SIZE : DN 150 (NPS 6)
 RATED Cv - MIN/MAX : 240 TO 550
 ADJUSTED Cv : 460
 TRIM TYPE : STANDARD
 FLOW TO : CLOSE
 BODY MATERIAL : ASTM A 351 Gr CF8M - STAINLESS STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 EXTENSION : STANDARD
 PACKING : KEVLAR PTFE
 OPTION : EMISSION FREE SEAL (VITON O RINGS)

TRIM SET - MATERIALS : T1
 PLUG : AISI 316
 SEAT RING : AISI 316
 SEAT RETAINER : ASTM A 351 Gr CF8M
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING OPPOSED ROLLING DIAPHRAGM
 ATA N^o : 5
 ADJUSTMENT : C
 BENCH RANGE : 7-25
 AIR TO : OPEN
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 45 psi - 310 kPa - 3.1 bar
 MOUNTING POSITION : 2
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 0.0 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP PROPOSAL : 90LE40
 CUST. ORDER : 6465C30 1541 01 0 10007 DATED : 10-04-02
 SERIAL Nr : 2-04911-15 REVISION : 0 DATED : 07-10-02
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP
 PAGE : V0.015 SPEC 1

ITEM : 14015 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40093 REVISION : 5 04-09-02
 MN ITEM : 015 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 54
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 13.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : H

Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 90LE40
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N ^o	: 2-04911-16	REVISION	: 0
PROJECT	: BANDAR ASALUYE 9TH OLEFIN COMP	DATED	: 15-10-02

PAGE : V0.016 SPEC 1

ITEM	: 14016	QTY	: 1	ENGINEER	: SL
TAG	: 30 PV 40102			REVISION	: 5 18-07-02
				MN ITEM	: 016 V0

SPECIFICATION SHEET : CONTROL VALVE REV

MODEL : L1D/HW/FR10/TZID-C/NI7201/BR400/SV
 BODY TYPE : BUTTERFLY
 NOMINAL SIZE : DN 350 (NPS 14)
 FLOW COEFFICIENT : Cv 7470
 BODY MATERIALS : ST ST A 351 Gr CF8M (NO LINER)
 CONNECTION TYPE : WAFER (FACE TO FACE 127 mm)
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : PTFE

VANE : ST STEEL A 351 Gr CF8M
 SEAT : INCOLOY 825
 SHAFT : 17-4 PH
 LEAKAGE : CLASS IV (ANSI / FCI 70.2)
 ACTUATOR : PNEUMATIC CYLINDER (SA)
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 4 bar
 HANDWHEEL : WITH
 MAX SHUT OFF DELTA P : 25.3 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 ELECTRICAL CONNECTION : M 20
 POSITION TRANSMITTER : MODEL NI7201/XS1-L
 ACTION : 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20
 SOLENOID VALVE : NORGREN-HERION 2401112396202400
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx d IIC T5
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
 PAINTING : BODY UNPAINTED

ADDITIONAL NOTES

VALVE MODEL N^o : L1DMA14ACA



Flow Control

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL N° : 2-04911-16 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
DATED : 10-04-02
DATED : 15-10-02

PAGE : V0.016 SPEC 2

ITEM : 14016 QTY : 1
TAG : 30 PV 40102
ACTUATOR MODEL N° : B1JRRU25

ENGINEER : SL
REVISION : 5 18-07-02
MN ITEM : 016 V0

CUSTOMER	: TECHNIP	PROPOSAL	: 9OLE40
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N ^o	: 2-04911-17	REVISION	: 0
PROJECT	: BANDAR ASALUYE 9TH OLEFIN COMP	DATED	: 15-10-02
		PAGE	: V0.017 SPEC 1

ITEM	: 14017	QTY	: 1	ENGINEER	: SL
TAG	: 30 LV 40103			REVISION	: 3 18-07-02
				MN ITEM	: 017 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 138
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELD BUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-18 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.018 SPEC 1

ITEM : 14018 QTY : 1 ENGINEER : SL
 REVISION : 4 04-09-02
 TAG : 30 TV 40104 MN ITEM : 018 V0

SPECIFICATION SHEET : VARIMAX REV

MODEL : 30-30252/FR10/TZID-C/496/SV
 BODY TYPE : ROTARY GLOBE
 NOMINAL SIZE : DN 250 (NPS 10)
 RATED Cv - MIN/MAX : 250 TO 745
 ADJUSTMENT : 745
 TRIM TYPE : LO-DB - HIGH CAPACITY
 FLOW TO : CLOSE
 BODY MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 EXTENSION : STANDARD
 PACKING : KEVLAR PTFE
 OPTION : EMISSION FREE SEAL (VITON O RINGS)

TRIM SET - MATERIALS : T1
 PLUG : AISI 316
 SEAT RING : AISI 316
 SEAT RETAINER : ASTM A 351 Gr CF8M
 SHAFT : 17-4 PH STAINLESS STEEL
 GUIDE BUSHINGS : AISI 440C
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING OPPOSED ROLLING DIAPHRAGM
 ATA N° : 7
 ADJUSTMENT : A
 BENCH RANGE : 7-25
 AIR TO : OPEN
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 50 psi - 350 kPa - 3.5 bar
 MOUNTING POSITION : 2
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 POSITION TRANSMITTER : 496-458
 ACTION : 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20
 SOLENOID VALVE : 317 (JOUCOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL



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Flow Control

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04911-18 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.018 SPEC 2

ITEM : 14018 QTY : 1 ENGINEER : SL
REVISION : 4 04-09-02
TAG : 30 TV 40104 MN ITEM : 018 V0

PNEUMATIC CONNECTIONS : 1/4"
VOLTAGE : 24 V DC
ENCLOSURE : EEx ia IIC T6 + IP 65
ELECTRICAL CONNECTION : M 20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (1/4" OD TUBING)
UNITS : bar g
PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-19 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.019 SPEC 1

ITEM : 14019 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40108 REVISION : 3 18-07-02
 MN ITEM : 019 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21115/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 40 (NPS 1.5)
 FLOW COEFFICIENT : Cv 13
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : CARBON/PTFE + LIVE LOADING (*)

TRIM : SINGLE SEATED LINEAR
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 26.1 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

ADDITIONAL NOTE : LOW EMISSION PACKING DESIGN L13
 : PLS REFER TO ATTACHED DOCUMENT FOR
 : DETAILS.



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL N^o : 2-04911-20 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.020 SPEC 1

ITEM : 14020 QTY : 1 ENGINEER : SL
TAG : 30 PV 40121 REVISION : 6 04-09-02
MN ITEM : 020 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 38-41355/FR10/TZID-C/BR400
BODY TYPE : GLOBE
NOMINAL SIZE : DN 300 x DN 200 x DN 300 (12" x 8")
FLOW COEFFICIENT : Cv 340
BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
BONNET : STANDARD (T -104°C)
PACKING : KEVLAR PTFE
BOLTING : B8 / GR8
TRIM TYPE : CAGE GUIDED
CHARACTERISTIC/TYPE : LO-DB TWO STAGE / LINEAR
PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
MATERIAL : STELLITED AISI 316
SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
CAGE MATERIAL : AISI 316 CHROME PLATED
SEAT TYPE : CLAMPED IN
MATERIAL : AISI 316 STELLITED SEATING SURFACES
FLOW DIRECTION : TENDS TO OPEN
LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : SPRING DIAPHRAGM CONVENTIONAL
SIZE : 18 HPI
AIR FAILURE POSITION : CLOSED
BENCH RANGE : 20-50
AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
YOKE : STD
MAX SHUT OFF DELTA P : 25.3 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : HART TZID-C
INPUT SIGNAL : 4-20 mA
OPERATING RANGE : 0-100 %
ACTION : DIRECT - EQUAL PERCENTAGE
GAUGES : SUPPLY-OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (3/8" OD TUBING)
UNITS : bar g
OTHER MOUNTED ACCESSORIES : BOOSTER RELAY BR400
PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-21 REVISION : 2
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 02-04-03

PAGE : V0.021 SPEC 1

ITEM : 14021 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40121 REVISION : 4 03-04-03
 MN ITEM : 021 V0

SPECIFICATION SHEET : CAMFLEX REV.

MODEL : 35-35602/FR10/FVP 2
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 300
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-24
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 14.9 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELD BUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

H

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-22 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.022 SPEC 1

ITEM : 14022 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40121 REVISION : 4 04-09-02
 MN ITEM : 022 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35502/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 135
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

: PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : OPENED
 MOUNTING POSITION : 5
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : H

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-23 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.023 SPEC 1

ITEM : 14023 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40132 REVISION : 5 04-09-02
 MN ITEM : 023 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/TZID-C/496/SV
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 3.8
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 316
 SEAT TYPE : SCREWED
 MATERIAL : AISI 316
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 20 psi - 140. kPa - 1.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 36.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT.. : DIRECT - NEUTRAL
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 POSITION TRANSMITTER : 496-458
 ACTION : 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20
 SOLENOID VALVE : NORGREN-HERION 2401112396202400
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx d IIC T5
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04911-23 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.023 SPEC 2

ITEM : 14023 QTY : 1

ENGINEER : SL
REVISION : 5 04-09-02
MN ITEM : 023 V0

TAG : 30 FV 40132

TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (1/4" OD TUBING)
UNITS : bar g
PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-24 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.024 SPEC 1

ITEM : 14024 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40135 REVISION : 3 04-09-02
 MN ITEM : 024 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41355/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 190
 BODY MATERIAL : CARBON STEEL - ASTM. A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB TWO STAGE / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : 17-4 PH
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 11.7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-25 REVISION : 2
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 04-02-03

PAGE : V0.025 SPEC 1

ITEM : 14025 QTY : 1 ENGINEER : SL
 REVISION : 5 03-04-03
 TAG : 30 UV 40136 MN ITEM : 025 V0

SPECIFICATION SHEET : 21000 REV.

MODEL : 87-21105/FR10/496/77-6/SV/TANK 1
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 49
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED ON-OFF
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : OPENED
 BENCH RANGE : 3-15
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 LIMIT STOP : LIMITS OPENING
 ADJUSTMENT : Cv AROUND 30
 MAX SHUT OFF DELTA P : 25.3 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : WITHOUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 POSITION TRANSMITTER : 496-558
 ACTION : 1 DETECTOR OPEN + 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20 (TWO ENTRY ADAPTOR)
 LOCK UP VALVE : 77-6
 SOLENOID VALVE : NORGREN-HERION 2401112396202400 2
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx d IIC T5 2
 ELECTRICAL CONNECTION : 1/2" NPTF x M20 ADAPTOR
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)



CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04911-25 REVISION : 2
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40
DATED : 10-04-02
DATED : 04-02-03

PAGE : V0.025 SPEC 2

ITEM : 14025 QTY : 1

ENGINEER : SL
REVISION : 5 03-04-03
MN ITEM : 025 V0

TAG : 30 UV 40136

UNITS : bar g
PAINTING : OTA 1858E

ADDITIONAL NOTE : A CAPACITY WILL BE SUPPLIED TO
: ENSURE MAINTAIN IN CLOSED POSITION
: IN CASE OF AIR FAILURE.
: THE VOLUME OF THIS CAPACITY SHALL BE
: SUFFICIENT TO ALLOW THREE STROKES.



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04911-26 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.026 SPEC 1

ITEM : 14026 QTY : 1 ENGINEER : SL
TAG : 30 PV 40136 REVISION : 3 04-09-02
MN ITEM : 026 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/TZID-C
BODY TYPE : GLOBE WITH ROTATING PLUG
NOMINAL SIZE : DN 25 (NPS 1)
FLOW COEFFICIENT : Cv 14
BODY
MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : SOLID STELLITE
SEAT : AISI 316
SEAT RETAINER : AISI 316
SHAFT : AISI 316
GUIDE BUSHINGS : SOLID STELLITE
FLOW DIRECTION : TENDS TO CLOSE
LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM

AIR FAILURE POSITION : CLOSED
MOUNTING POSITION : 2
BENCH RANGE : 7-15
AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
HANDWHEEL : WITHOUT

MAX SHUT OFF DELTA P : 36.6 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : HART TZID-C

INPUT SIGNAL : 4-20 mA
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
GAUGES : SUPPLY - OUTPUT

MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M 20

SERIAL PLATE LANGUAGE : ENGLISH

TUBING MATERIAL : STAINLESS STEEL

FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)

UNITS : bar g

PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-27 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.027 SPEC 1

ITEM : 14027 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40137 REVISION : 5 04-09-02
 MN ITEM : 027 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 38-41355/HW/FR10/TZID-C/BR400
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 250 (NPS 10)
 FLOW COEFFICIENT : Cv 420
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARACTERISTIC/TYPE : LO-DB TWO STAGE / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : 17-4 PH
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING DIAPHRAGM CONVENTIONAL
 SIZE : 18
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED 8A
 MAX SHUT OFF DELTA P : 25.3 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : BOOSTER RELAY BR400
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-28 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP
 PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 15-10-02
 PAGE : V0.028 SPEC 1

ITEM : 14028 QTY : 1 ENGINEER : SL
 TAG : 30 TV 40137 REVISION : 6 04-09-02
 MN ITEM : 028 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 30
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : SOLID STELLITE
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 17.1 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E
 : H



Flow Control

Masonellan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-29 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.029 SPEC 1

ITEM : 14029 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40138 REVISION : 4 18-07-02
 MN ITEM : 029 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 1.7
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 316
 SEAT TYPE : SCREWED
 MATERIAL : AISI 316
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 36.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELD BUS FOUNDATION FF
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-30 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.030 SPEC 1

ITEM : 14030 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40139 REVISION : 5 04-09-02
 MN ITEM : 030 V0

SPECIFICATION SHEET : VARIMAX REV

MODEL : 30-30623/FR10/TZID-C
 BODY TYPE : FLANGELESS
 NOMINAL SIZE : DN 200 (NPS 8)
 RATED Cv - MIN/MAX : 420 TO 950
 ADJUSTED Cv : 950
 TRIM TYPE : STANDARD
 FLOW TO : CLOSE
 BODY MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 EXTENSION : STANDARD
 PACKING : KEVLAR PTFE
 OPTION : EMISSION FREE SEAL (VITON O RINGS)

TRIM SET - MATERIALS : T1
 PLUG : AISI 316
 SEAT RING : AISI 316
 SEAT RETAINER : ASTM A 351 Gr CF8M
 SHAFT : 17-4 PH STAINLESS STEEL
 GUIDE BUSHINGS : AISI 440C
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING OPPOSED ROLLING DIAPHRAGM
 ATA N° : 5
 ADJUSTMENT : A
 BENCH RANGE : 7-25
 AIR TO : OPEN
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 MOUNTING POSITION : 6
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 7.4 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-31 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.031 SPEC 1

ITEM : 14031 QTY : 1 ENGINEER : SL
 TAG : 30 TV 40139 REVISION : 4 04-09-02
 MN ITEM : 031 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21114/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 1.7
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : GRAPHITE

TRIM : SINGLE SEATED LINEAR
 PLUG MATERIAL : AISI 440C
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 440C
 CAGE MATERIAL : AISI 304
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 18.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP PROPOSAL : 9OLE40
 CUST. ORDER : 6465C30 1541 01 0 10007 DATED : 10-04-02
 SERIAL N^o : 2-04911-32 REVISION : 0 DATED : 07-10-02
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP
 PAGE : V0.032 SPEC 1

ITEM : 14032 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40151 REVISION : 4 18-07-02
 MN ITEM : 032 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41935/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 150
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB / LINEAR
 PLUG TYPE : SEAL RING BALANCED
 MATERIAL : 17-4 PH
 SEAL RINGS MATERIAL : GRAPHITE + NI-RESIST BACKUP
 CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS III (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-33 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.033 SPEC 1

ITEM : 14033 QTY : 1 ENGINEER : SL
 REVISION : 3 18-07-02
 TAG : 30 TV 40158 MN ITEM : 033 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41555/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 100 x DN 50 x DN 100 (4" x 2")
 FLOW COEFFICIENT : Cv 12
 BODY MATERIAL : ASTM A 217 Gr WC9
 CONNECTION TYPE : FLANGED
 RATING : ANSI 2500
 FINISH : RTJ
 BONNET : STANDARD
 PACKING : GRAPHITE
 BOLTING : A 453 Gr 660 / GR8
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB TWO STAGE / LINEAR
 PLUG TYPE : SEAL RING BALANCED
 MATERIAL : ASTM A 487 Gr CA6NM NITRIDED
 SEAL RINGS MATERIAL : NI-RESIST CAST IRON (NITRIDED)
 CAGE MATERIAL : ASTM A 487 Gr CA6NM NITRIDED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS II (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 120 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELD BUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E



Flow Control

Masonellan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL N^o : 2-04911-33 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
DATED : 10-04-02
DATED : 07-10-02

PAGE : V1.033 SPEC 1

ITEM : 14033 QTY : 1

ENGINEER : SL

TAG : 30 TV 40158

REVISION : 3 18-07-02

MN ITEM : 033 V1

SPECIFICATION SHEET : LO-DB PLATE

REV

MODEL : PLATE

TO BE MOUNTED DOWNSTREAM : VALVE TAGGED 30TV 40158

NOMINAL SIZE : DN 100 (NPS 4)

FLOW COEFFICIENT : Cv 95

HOUSING MATERIAL : F22

MOUNTING : CLAMPED BETWEEN LINE FLANGES

RATING : ANSI 2500

FINISH : RTJ

SERIAL PLATE LANGUAGE : ENGLISH

UNITS : bar g

PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP PROPOSAL : 90LE40
 CUST. ORDER : 6465C30 1541 01 0 10007 DATED : 10-04-02
 SERIAL N^o : 2-04911-34 REVISION : 0 DATED : 07-10-02
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP
 PAGE : V0.034 SPEC 1

ITEM : 14034 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40171 REVISION : 6 04-09-02
 MN ITEM : 034 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 81
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT-OFF DELTA P : 9.2 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY OTA1422E OR TS239 IN OPTION

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-35 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.035 SPEC 1

ITEM : 14035 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40181 REVISION : 4 04-09-02
 MN ITEM : 035 V0

SPECIFICATION SHEET : VARIMAX REV

MODEL : 30-30222/HW/FR10/TZID-C/BR400
 BODY TYPE : ROTARY GLOBE
 NOMINAL SIZE : DN 300 (NPS 12)
 RATED Cv - MIN/MAX : 805 TO 2400
 ADJUSTED Cv : 1260
 TRIM TYPE : STANDARD
 FLOW TO : CLOSE
 BODY MATERIAL : ASTM A 351 Gr CF8M - STAINLESS STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 EXTENSION : STANDARD
 PACKING : KEVLAR PTFE
 OPTION : EMISSION FREE SEAL (VITON O RINGS)

TRIM SET - MATERIALS : T3
 PLUG : AISI 316 STELLITED SEATING SURFACE
 SEAT RING : AISI 316 STELLITED SEATING SURFACE
 SEAT RETAINER : ASTM A 351 Gr CF8M
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING OPPOSED ROLLING DIAPHRAGM
 ATA N° : 9
 ADJUSTMENT : E
 BENCH RANGE : 7-25
 AIR TO : OPEN
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 MOUNTING POSITION : 2
 HANDWHEEL : WITH
 MAX SHUT OFF DELTA P : 10 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
 PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP PROPOSAL : 90LE40
 CUST. ORDER : 6465C30 1541 01 0 10007 DATED : 10-04-02
 SERIAL Nr : 2-04911-36 REVISION : 0 DATED : 07-10-02
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP
 PAGE : V0.036 SPEC 1

ITEM : 14036 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40181 REVISION : 4 04-09-02
 MN ITEM : 036 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/TZID-C/496/SV
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 200
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-24
 AIR SUPPLY : 45 psi - 310 kPa - 3.1 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 22.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 POSITION TRANSMITTER : 496-458
 ACTION : 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20
 SOLENOID VALVE : 317 (JOUCOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6 + IP65
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04911-36 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.036 SPEC 2

ITEM : 14036 QTY : 1

ENGINEER : SL

TAG : 30 LV 40181

REVISION : 4 04-09-02

MN ITEM : 036 V0

FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)

UNITS : bar g

PAINTING : BODY UNPAINTED

: H



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04911-37 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.037 SPEC 1

ITEM : 14037 QTY : 1 ENGINEER : SL
TAG : 30 FV 40182A REVISION : 5 04-09-02
MN ITEM : 037 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41325/FR10/TZID-C/496/SV
BODY TYPE : GLOBE
NOMINAL SIZE : DN 150 x DN 100 x DN 150 (6" x 4")
FLOW COEFFICIENT : Cv 225
BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
BONNET : STANDARD (T -104 °C)
PACKING : KEVLAR PTFE
BOLTING : B8 / GR8
TRIM TYPE : CAGE GUIDED
CHARISTIQUE/TYPE : STANDARD CAGE / =%
PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
MATERIAL : STELLITED AISI 316
SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
CAGE MATERIAL : AISI 316 CHROME PLATED
SEAT TYPE : CLAMPED IN
MATERIAL : AISI 316 STELLITED SEATING SURFACES
FLOW DIRECTION : TENDS TO OPEN
LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
SIZE : 16
AIR FAILURE POSITION : CLOSED
BENCH RANGE : 21-45
AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
YOKE : STD
HANDWHEEL : WITHOUT
MAX SHUT OFF DELTA P : 11.6 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : HART TZID-C
INPUT SIGNAL : 4-20 mA
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT - NEUTRAL
GAUGES : SUPPLY-OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M20
POSITION TRANSMITTER : 496-458
ACTION : 1 DETECTOR CLOSE
ENCLOSURE : EEx ia IIC T6 + IP 65
ELECTRICAL CONNECTION : M 20
SOLENOID VALVE : 317 (JOUCOMATIC)
ACTION : VENTS ACTUATOR WHEN DEENERGIZED
TYPE : 3 WAY-UNIVERSAL
BODY MATERIAL : STAINLESS STEEL
PNEUMATIC CONNECTIONS : 1/4"
VOLTAGE : 24 V DC
ENCLOSURE : EEx ia IIC T6 +IP 65



Masoneilan

Flow Control

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL N^o : 2-04911-37 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.037 SPEC 2

ITEM : 14037 QTY : 1
TAG : 30 FV 40182A

ENGINEER : SL
REVISION : 5 04-09-02
MN ITEM : 037 V0

ELECTRICAL CONNECTION : M 20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (3/8" OD TUBING)
UNITS : bar g
PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-38 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.038 SPEC 1

ITEM : 14038 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40182 B REVISION : 3 04-09-02
 MN ITEM : 038 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/HW/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 300
 BODY

MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM

AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-24
 AIR SUPPLY : 45 psi - 310 kPa - 3.1 bar
 HANDWHEEL : WITH
 MAX SHUT OFF DELTA P : 24.1 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : H



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL N^o : 2-04911-39 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.039 SPEC 1

ITEM : 14039 QTY : 1 ENGINEER : SL
TAG : 30 PV 40184 REVISION : 4 04-09-02
MN ITEM : 039 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 38-41355/FR10/TZID-C
BODY TYPE : GLOBE
NOMINAL SIZE : DN 200 (NPS 8)
FLOW COEFFICIENT : Cv 300
BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
BONNET : STANDARD (-104 °C)
PACKING : KEVLAR PTFE
BOLTING : B8 / GR8
TRIM TYPE : CAGE GUIDED
CHARACTERISTIC/TYPE : LO-DB TWO STAGE / LINEAR
PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
MATERIAL : STELLITED AISI 316
SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
CAGE MATERIAL : AISI 316 CHROME PLATED
SEAT TYPE : CLAMPED IN
MATERIAL : AISI 316 STELLITED SEATING SURFACES
FLOW DIRECTION : TENDS TO OPEN
LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : SPRING DIAPHRAGM CONVENTIONAL
SIZE : 18
AIR FAILURE POSITION : CLOSED
BENCH RANGE : 20-50
AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
YOKE : STD
HANDWHEEL : WITHOUT
MAX SHUT OFF DELTA P : 21.3 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : HART TZID-C
INPUT SIGNAL : 4-20 mA
OPERATING RANGE : 0-100 %
ACTION : DIRECT - EQUAL PERCENTAGE
GAUGES : SUPPLY-OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (3/8" OD TUBING)
UNITS : bar g
PAINTING : BODY UNPAINTED



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL N^o : 2-04911-40 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP.

PROPOSAL : 90LE40
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.040 SPEC 1

ITEM : 14040 QTY : 1 ENGINEER : SL
TAG : 30 PV 40201 REVISION : 5 04-09-02
MN ITEM : 040 V0

SPECIFICATION SHEET : VARIMAX REV

MODEL : 30-30222/HW/FR10/TZID-C/BR400
BODY TYPE : ROTARY GLOBE
NOMINAL SIZE : DN 300 (NPS 12)
RATED Cv - MIN/MAX : 805 TO 2400
ADJUSTED Cv : 2140
TRIM TYPE : STANDARD
FLOW TO : CLOSE
BODY MATERIAL : ASTM A 351 Gr CF8M - STAINLESS STEEL
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
EXTENSION : STANDARD
PACKING : KEVLAR PTFE
OPTION : EMISSION FREE SEAL (VITON O RINGS)

TRIM SET - MATERIALS : T3
PLUG : AISI 316 STELLITED SEATING SURFACE
SEAT RING : AISI 316 STELLITED SEATING SURFACE
SEAT RETAINER : ASTM A 351 Gr CF8M
SHAFT : 17-4 PH STAINLESS STEEL
GUIDE BUSHINGS : AISI 316 HARD FACED
LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING OPPOSED ROLLING DIAPHRAGM
ATA N^o : 9
ADJUSTMENT : B
BENCH RANGE : 7-25
AIR TO : OPEN
AIR FAILURE POSITION : CLOSED
AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
MOUNTING POSITION : 2
HANDWHEEL : WITH
MAX SHUT OFF DELTA P : 14.9 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : HART TZID-C
INPUT SIGNAL : 4-20 mA
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
GAUGES : SUPPLY - OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (3/8" OD TUBING)
UNITS : bar g
OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
PAINTING : BODY UNPAINTED



Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 90LE40
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N ^o	: 2-04911-41	REVISION	: 0
PROJECT	: BANDAR ASALUYE 9TH OLEFIN COMP	DATED	: 07-10-02

PAGE : V0.041 SPEC 1

ITEM	: 14041	QTY	: 1	ENGINEER	: SL
TAG	: 30 LV 40207			REVISION	: 4 04-09-02
				MN ITEM	: 041 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/ER10/TZID-C

BODY TYPE : GLOBE WITH ROTATING PLUG

NOMINAL SIZE : DN 250 (NPS 10)

FLOW COEFFICIENT : Cv 1300

BODY

MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M

CONNECTION TYPE : FLANGED

RATING : ANSI 300

FINISH : RF Ra 3.2-6.3 um

VALVE DRILLED >OR=8" : SELLERS

PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED

SEAT : AISI 316 STELLITE HARD FACED

SEAT RETAINER : AISI 316

SHAFT : AISI 316

GUIDE BUSHINGS : AISI 316 STELLITE HARD BORE

FLOW DIRECTION : TENDS TO CLOSE

LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM

AIR FAILURE POSITION : CLOSED

MOUNTING POSITION : 2

BENCH RANGE : 7-24

AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar

HANDWHEEL : WITHOUT

MAX SHUT OFF DELTA P FOR ATMOSPHERE : 1 bar

AIR SET : TROPICAL

POSITIONER : SAMI FR10 GAUGE

INPUT SIGNAL : HART TZID-C

OPERATING RANGE : 4-20 mA

ACTION - CAM CHARACT. : 0-100 %

GAUGES : DIRECT - EQUAL PERCENT

MATERIAL GAUGES : SUPPLY - OUTPUT

ELECTRICAL CONNECTION : STD

SERIAL PLATE LANGUAGE : M 20

TUBING MATERIAL : ENGLISH

FITTINGS : STAINLESS STEEL

UNITS : SWAGELOK ST ST (1/4 OD TUBING)

PAINTING : bar g

: BODY UNPAINTED

: H



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-42 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.042 SPEC 1

ITEM : 14042 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40211 A REVISION : 6 04-09-02
 MN ITEM : 042 V0

SPECIFICATION SHEET : VARIMAX REV

MODEL : 30-30122/HW/FR10/TZID-C/BR400
 BODY TYPE : ROTARY GLOBE
 NOMINAL SIZE : DN 300 (NPS 12)
 RATED Cv - MIN/MAX : 750 TO 2600
 ADJUSTED Cv : 2235
 TRIM TYPE : STANDARD
 FLOW TO : OPEN
 BODY MATERIAL : ASTM A 351 Gr CF8M - STAINLESS STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 EXTENSION : STANDARD
 PACKING : KEVLAR PTFE
 OPTION : EMISSION FREE SEAL (VITON O RINGS)

TRIM SET - MATERIALS : T1
 PLUG : AISI 316
 SEAT RING : AISI 316
 SEAT RETAINER : ASTM A 351 Gr CF8M
 SHAFT : AISI 316
 GUIDE BUSHINGS : AISI 316 HARD FACED
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING OPPOSED ROLLING DIAPHRAGM
 ATA N° : 9
 ADJUSTMENT : B
 BENCH RANGE : 7-25
 AIR TO : CLOSE
 AIR FAILURE POSITION : OPENED
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 MOUNTING POSITION : 1
 HANDWHEEL : WITH
 MAX SHUT OFF DELTA P : 5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-43 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40^W
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.043 SPEC 1

ITEM : 14043 QTY : 1 ENGINEER : SL
 TAG : 30 FV 40211 B REVISION : 3 18-07-02
 MN ITEM : 043 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35102/FR10/LS/SV
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 200 (NPS 8)
 FLOW COEFFICIENT : Cv 340
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

: PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : OPENED
 MOUNTING POSITION : 1
 BENCH RANGE : 7-24
 AIR SUPPLY : 50 psi - 350 kPa - 3.5 bar
 HANDWHEEL : WITHOUT
 LIMIT STOP : LIMITS OPENING
 ADJUSTMENT : AROUND Cv 310
 MAX SHUT OFF DELTA P : 5.4 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : WITHOUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 POSITION TRANSMITTER : WITHOUT
 SOLENOID VALVE : 317 (JOUCOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : BRASS
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 48 V DC
 ENCLOSURE : IP 54
 ELECTRICAL CONNECTION : PACKING GLAND - OD WIRE 11 mm
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : H



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL N^o : 2-04911-44 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.044 SPEC 1

ITEM : 14044 QTY : 1 ENGINEER : SL
TAG : 30 FV 40212 REVISION : 5 04-09-02
MN ITEM : 044 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21114EB/FR10/TZID-C
BODY TYPE : GLOBE
NOMINAL SIZE : DN 25 (NPS 1)
FLOW COEFFICIENT : Cv 6
BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
BOLTING : B8 / GR8
BONNET : WITH EXTENSION EB (T -104 °C)
PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED LINEAR
PLUG MATERIAL : AISI 316
SEAT TYPE : CLAMPED IN
MATERIAL : AISI 316
CAGE MATERIAL : AISI 304
GUIDE BUSHING MATERIAL : NITRONIC 60
FLOW DIRECTION : TENDS TO OPEN
LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
SIZE : 6
FAILURE POSITION : CLOSED
BENCH RANGE : 3-15
AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
YOKE : STD
HANDWHEEL : WITHOUT
MAX. SHUT OFF DELTA P : 21.3 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : HART TZID-C
INPUT SIGNAL : 4-20 mA
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENTAGE
GAUGES : SUPPLY-OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (1/4" OD TUBING)
UNITS : bar g
PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-45 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40³
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.045 SPEC 1

ITEM : 14045 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40222 REVISION : 4 18-07-02
 MN ITEM : 045 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21115EB/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 31
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -104 °C)
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED LINEAR
 PLUG MATERIAL : FULLY STELLITED AISI 316
 SEAT TYPE : SCREWED
 MATERIAL : FULLY STELLITED AISI 316
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : CLOSED
 BENCH RANGE : 11-23
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 25.2 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04911-46 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE40²
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.046 SPEC 1

ITEM : 14046 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40224 REVISION : 4 18-07-02
 MN ITEM : 046 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 200 (NPS 8)
 FLOW COEFFICIENT : Cv 340
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-24
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 9.2 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : P



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04911-47 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE40
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.047 SPEC 1

ITEM : 14047 QTY : 1 ENGINEER : SL
 TAG : 30 LV 40226 REVISION : 3 18-07-02
 MN ITEM : 047 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 138
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

AIR FAILURE POSITION : PNEUMATIC WITH ROLLING DIAPHRAGM
 MOUNTING POSITION : CLOSED
 BENCH RANGE : 2
 AIR SUPPLY : 7-15
 HANDWHEEL : 25 psi - 180 kPa - 1.8 bar
 MAX SHUT OFF DELTA P : WITHOUT
 FOR ATMOSPHERE : 13 bar
 AIR SET : TROPICAL
 POSITIONER : SAMI FR10 GAUGE
 OPERATING RANGE : FIELD BUS FOUNDATION FVP
 ACTION - CAM CHARACT. : 0-100 %
 GAUGES : DIRECT - EQUAL PERCENT
 MATERIAL GAUGES : SUPPLY - OUTPUT
 ELECTRICAL CONNECTION : STD
 SERIAL PLATE LANGUAGE : M 20
 TUBING MATERIAL : ENGLISH
 FITTINGS : STAINLESS STEEL
 UNITS : SWAGelok ST ST (1/4 OD TUBING)
 PAINTING : bar g
 : BODY UNPAINTED
 : H




UNIT 50

INSTRUMENT DATA SHEETS

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
2003.01.09 12:40:31 +01'00'
<none>

STATUS CERTIFIED "FINAL"
ISSUED BY : S. LEGE
DATE : 19/12/02

2	19/12/02	UP-DATE
1	23/10/02	UP-DATE
0	08/10/02	FIRST ISSUE
REV	DATE	DESCRIPTION
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY 	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007 EQUIPMENT NAME: <p style="text-align: center;">Control valves</p>
	Project: 3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	
	DOCUMENT TITLE : <p style="text-align: center;">Instrument Data Sheets</p>	DOCUMENT CODE : <p style="text-align: center;">A 3101</p>
	PURCHASE ORDER : <p style="text-align: center;">02-4912 (Unit 50)</p>	Sheet <p style="text-align: center;">01 of 35</p>
		Rev. <p style="text-align: center;">2</p>

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-01 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-10-02

PAGE : V0.001 SPEC 1

ITEM : 15001 QTY : 1 ENGINEER : SL
 TAG : 30 UV 50002 REVISION : 4 18-07-02
 MN ITEM : 001 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 87-21105EB/FR10/496/77-6/SV/TANK
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 31
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -54°C)
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED ON-OFF
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : SCREWED
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 GUIDE BUSHING MATERIAL : SOLID STELLITE
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : OPENED
 BENCH RANGE : 3-15
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 LIMIT STOP : WITHOUT
 MAX SHUT OFF DELTA P : 35 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : WITHOUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 POSITION TRANSMITTER : 496-558
 ACTION : 1 DETECTOR OPEN + 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20 (TWO ENTRY ADAPTOR)
 LOCK UP VALVE : 77-6
 SOLENOID VALVE : 317 (JOUOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6 + IP65
 ELECTRICAL CONNECTION : 1/2" NPTF x M20 ADAPTOR
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04912-01 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
DATED : 10-04-02
DATED : 18-10-02

PAGE : V0.001 SPEC 2

ITEM : 15001

QTY : 1

ENGINEER : SL

TAG : 30 UV 50002

REVISION : 4 18-07-02

MN ITEM : 001 V0

PAINTING

: BODY UNPAINTED

ADDITIONAL NOTE

: A CAPACITY WILL BE SUPPLIED TO
: ENSURE MAINTAIN IN CLOSED POSITION
: IN CASE OF AIR FAILURE.
: THE VOLUME OF THIS CAPACITY SHALL BE
: SUFFICIENT TO ALLOW THREE STROKES.

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-02 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.002 SPEC 1

ITEM : 15002 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50021 REVISION : 4 18-07-02
 MN ITEM : 002 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 92
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 15.2 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : H

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.003 SPEC 1

ITEM : 15003 QTY : 1 ENGINEER : SL
 TAG : 30 FV 50021 REVISION : 4 04-09-02
 MN ITEM : 003 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41355/HW/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 150
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB TWO STAGE / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : 17-4 PH
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 MAX SHUT OFF DELTA P : 35 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-04 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.004 SPEC 1

ITEM : 15004 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50022 A REVISION : 4 04-09-02
 MN ITEM : 004 V0

SPECIFICATION SHEET : VARIMAX REV

MODEL : 30-30222/HW/FR10/TZID-C
 BODY TYPE : ROTARY GLOBE
 NOMINAL SIZE : DN 250 (NPS 10)
 RATED Cv - MIN/MAX : 610 TO 1600
 ADJUSTED Cv : 1450
 TRIM TYPE : STANDARD
 FLOW TO : CLOSE
 BODY MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 EXTENSION : STANDARD
 PACKING : KEVLAR PTFE
 OPTION : EMISSION FREE SEAL (VITON O RINGS)

TRIM SET - MATERIALS : T1
 PLUG : AISI 316
 SEAT RING : AISI 316
 SEAT RETAINER : ASTM A 351 Gr CF8M
 SHAFT : 17-4 PH STAINLESS STEEL
 GUIDE BUSHINGS : AISI 440C
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING OPPOSED ROLLING DIAPHRAGM
 ATA N^o : 7
 ADJUSTMENT : B
 BENCH RANGE : 7-25
 AIR TO : OPEN
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 50 psi - 350 kPa - 3.5 bar
 MOUNTING POSITION : 2
 HANDWHEEL : WITH
 MAX SHUT OFF DELTA P : 6.94 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E



Flow Control

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL N^o : 2-04912-05 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.005 SPEC 1

ITEM : 15005 QTY : 1 ENGINEER : SL
TAG : 30 PV 50022B REVISION : 4 04-09-02
MN ITEM : 005 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125EB/FR10/TZID-C
BODY TYPE : GLOBE
NOMINAL SIZE : DN 150 (NPS 6)
FLOW COEFFICIENT : Cv 400
BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
BOLTING : B8 / GR8
BONNET : WITH EXTENSION EB (T -104°C)
PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
PLUG MATERIAL : AISI 316
SEAT TYPE : SCREWED
MATERIAL : AISI 316
GUIDE BUSHING MATERIAL : NITRONIC 60
FLOW DIRECTION : TENDS TO OPEN
LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
SIZE : 23
FAILURE POSITION : CLOSED
BENCH RANGE : 6-30
AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
YOKE : STD
HANDWHEEL : WITHOUT
MAX SHUT OFF DELTA P. : 0.5 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : HART TZID-C
INPUT SIGNAL : 4-20 mA
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT - NEUTRAL
GAUGES : SUPPLY-OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGelok (3/8" OD TUBING)
UNITS : bar g
PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-06 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.006 SPEC 1

ITEM : 15006 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50023 A REVISION : 4 04-09-02
 MN ITEM : 006 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 250
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-24
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 14.7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : H

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-07 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.007 SPEC 1

ITEM : 15007 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50023 B REVISION : 5 04-09-02
 MN ITEM : 007 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/HW/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 500
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

AIR FAILURE POSITION : PNEUMATIC WITH ROLLING DIAPHRAGM
 MOUNTING POSITION : CLOSED
 BENCH RANGE : 2
 AIR SUPPLY : 7-24
 HANDWHEEL : 40 psi - 280 kPa - 2.8 bar
 WITH
 MAX SHUT OFF DELTA P : 6.85 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : H

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-08 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.008 SPEC 1

ITEM : 15008 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50031 REVISION : 4 18-07-02
 MN ITEM : 008 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41355/HW/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 100 x DN 50 x DN 100 (4" x 2")
 FLOW COEFFICIENT : Cv 30
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD (T°= -104°C)
 PACKING : KEVLAR PTFE
 BOLTING : B8 / GR8
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB TWO STAGE / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : STELLITED AISI 316
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : AISI 316 CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 MAX SHUT OFF DELTA P : 35 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELD BUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-09 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.009 SPEC 1

ITEM : 15009 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50031 REVISION : 5 04-09-02
 MN ITEM : 009 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21115EB/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 49
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -104 °C)
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED LINEAR
 PLUG MATERIAL : FULLY STELLITED AISI 316
 SEAT TYPE : SCREWED
 MATERIAL : FULLY STELLITED AISI 316
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : CLOSED
 BENCH RANGE : 11-23
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 24.2 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-19 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 18-10-02

PAGE : V0.019 SPEC 1

ITEM : 15019 QTY : 1 ENGINEER : SL
 TAG : 30 UV 50102 REVISION : 4 18-07-02
 MN ITEM : 019 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35102/FR10/496/77-6/SV/TANK
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 81
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 PTFE SOFT SEAT
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS VI (IEC 534-4)

ACTUATOR

AIR FAILURE POSITION : PNEUMATIC WITH ROLLING DIAPHRAGM
 MOUNTING POSITION : OPENED
 BENCH RANGE : 1
 AIR SUPPLY : 7-15
 HANDWHEEL : 25 psi - 180 kPa - 1.8 bar
 LIMIT STOP : WITHOUT
 MAX SHUT OFF DELTA P : WITHOUT
 FOR ATMOSPHERE : 20.5 bar
 AIR SET : TROPICAL
 POSITIONER : SAMI FR10 GAUGE
 MATERIAL GAUGES : WITHOUT
 POSITION TRANSMITTER : STD (ST. STEEL CASE)
 ACTION : 496-558
 ENCLOSURE : 1 DETECTOR OPEN + 1 DETECTOR CLOSE
 ELECTRICAL CONNECTION : EEx ia IIC T6 + IP 65
 LOCK UP VALVE : M 20 (TWO ENTRY ADAPTOR)
 SOLENOID VALVE : 77-6
 ACTION : YES
 TYPE : VENTS ACTUATOR WHEN DEENERGIZED
 BODY MATERIAL : 3 WAY-UNIVERSAL
 PNEUMATIC CONNECTIONS : STAINLESS STEEL
 VOLTAGE : 1/4" NPT
 ENCLOSURE : 24 V DC
 ELECTRICAL CONNECTION : EEx ia IIC T6 + IP65
 SERIAL PLATE LANGUAGE : 1/2" NPTF x M20 ADAPTOR
 TUBING MATERIAL : ENGLISH
 FITTINGS : STAINLESS STEEL
 UNITS : SWAGelok ST ST (1/4 OD TUBING)
 PAINTING : bar g
 : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-10 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LB50
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.010 SPEC 1

ITEM : 15010 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50033 REVISION : 3 18-07-02
 MN ITEM : 010 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 138
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 16.2 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : H

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-11 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.011 SPEC 1

ITEM : 15011 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50041 REVISION : 5 04-09-02
 MN ITEM : 011 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 54
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 9.9 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : H

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-12 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.012 SPEC 1

ITEM : 15012 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50043 REVISION : 5 04-09-02
 MN ITEM : 012 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 54
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

AIR FAILURE POSITION : PNEUMATIC WITH ROLLING DIAPHRAGM
 MOUNTING POSITION : CLOSED
 BENCH RANGE : 6
 AIR SUPPLY : 7-15
 HANDWHEEL : 20 psi - 140 kPa - 1.4 bar
 MAX SHUT OFF DELTA P : WITHOUT
 FOR ATMOSPHERE : 13.3 bar
 AIR SET : TROPICAL
 POSITIONER : SAMI FR10 GAUGE
 INPUT SIGNAL : HART TZID-C
 OPERATING RANGE : 4-20 mA
 ACTION - CAM CHARACT. : 0-100 %
 GAUGES : DIRECT - EQUAL PERCENT
 MATERIAL GAUGES : SUPPLY - OUTPUT
 ELECTRICAL CONNECTION : STD
 SERIAL PLATE LANGUAGE : M 20
 TUBING MATERIAL : ENGLISH
 FITTINGS : STAINLESS STEEL
 UNITS : SWAGelok ST ST (1/4 OD TUBING)
 PAINTING : bar g
 : BODY UNPAINTED
 : H

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-13 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP
 PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 15-10-02
 PAGE : V0.013 SPEC 1

ITEM : 15013 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50045 REVISION : 5 04-09-02
 MN ITEM : 013 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 20
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : SOLID STELLITE
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 25 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-14 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.014 SPEC 1

ITEM : 15014 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50051 REVISION : 5 04-09-02
 MN ITEM : 014 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125EB/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 208
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -104°C)
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : FULLY STELLITED AISI 316
 SEAT TYPE : SCREWED
 MATERIAL : FULLY STELLITED AISI 316
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 23
 FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 24.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - NEUTRAL
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-15 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.015 SPEC 1

ITEM : 15015 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50061 REVISION : 6 04-09-02
 MN ITEM : 015 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 138
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

AIR FAILURE POSITION : PNEUMATIC WITH ROLLING DIAPHRAGM
 MOUNTING POSITION : CLOSED
 BENCH RANGE : 6-
 AIR SUPPLY : 7-15
 HANDWHEEL : 25 psi - 180 kPa - 1.8 bar
 MAX SHUT OFF DELTA P : WITHOUT
 FOR ATMOSPHERE : 9.7 bar
 AIR SET : TROPICAL
 POSITIONER : SAMI FR10 GAUGE
 INPUT SIGNAL : HART TZID-C
 OPERATING RANGE : 4-20 mA
 ACTION - CAM CHARACT. : 0-100 %
 GAUGES : DIRECT - EQUAL PERCENT
 MATERIAL GAUGES : SUPPLY - OUTPUT
 ELECTRICAL CONNECTION : STD
 SERIAL PLATE LANGUAGE : M 20
 TUBING MATERIAL : ENGLISH
 FITTINGS : STAINLESS STEEL
 UNITS : SWAGelok ST ST (1/4 OD TUBING)
 PAINTING : bar g
 : BODY UNPAINTED
 : H

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-16 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 18-10-02

PAGE : V0.016 SPEC 1

ITEM : 15016 QTY : 1 ENGINEER : SL
 TAG : 30 TV 50062 REVISION : 5 04-09-02
 MN ITEM : 016 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21115EB/HW/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 47
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -104 °C)
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED LINEAR
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : SCREWED
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : CLOSED
 BENCH RANGE : 11-23
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 MAX SHUT OFF DELTA P : 8.3 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N_r : 2-04912-17 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 18-10-02

PAGE : V0.017 SPEC 1

ITEM : 15017 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50071 REVISION : 5 04-09-02
 MN ITEM : 017 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21914EB/HW/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 53
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -104°C)
 PACKING : KEVLAR PTFE

TRIM : LO-DB (TWO STAGE) LINEAR
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 CAGE MATERIAL : AISI 316
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 50 psi - 350 kPa - 3.5 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 MAX SHUT OFF DELTA P : 12 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-18 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 18-10-02

PAGE : V0.018 SPEC 1

ITEM : 15018 QTY : 1 ENGINEER : SL
 TAG : 30 TV 50072 REVISION : 5 04-09-02
 MN ITEM : 018 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21115EB/HW/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 26
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -104 °C)
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED LINEAR
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : SCREWED
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 50 psi - 350 kPa - 3.5 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 MAX SHUT OFF DELTA P : 11.75 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04912-19 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
DATED : 10-04-02
DATED : 18-10-02

PAGE : V0.019 SPEC 2

ITEM : 15019
TAG : 30 UV 50102

QTY : 1

ENGINEER : SL
REVISION : 4 18-07-02
MN ITEM : 019 V0

ADDITIONAL NOTE

: H
: A CAPACITY WILL BE SUPPLIED TO
: ENSURE MAINTAIN IN CLOSED POSITION
: IN CASE OF AIR FAILURE.
: THE VOLUME OF THIS CAPACITY SHALL BE
: SUFFICIENT TO ALLOW THREE STROKES.
:

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-20 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.020 SPEC 1

ITEM : 15020 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50105 REVISION : 5 04-09-02
 MN ITEM : 020 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/HW/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 250 (NPS 10)
 FLOW COEFFICIENT : Cv 1300
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 VALVE DRILLED >OR=8" : SELLERS
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : AISI 316L STELLITED
 SEAT : AISI 316 PTFE SOFT SEAT
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS VI (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-24
 AIR SUPPLY : 50 psi - 350 kPa - 3.5 bar
 HANDWHEEL : WITH
 MAX SHUT OFF DELTA P : 4.4 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E
 : H

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-21 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 18-10-02

PAGE : V0.021 SPEC 1

ITEM : 15021 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50121 REVISION : 5 04-09-02
 MN ITEM : 021 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41355/FR10/TZID-C/BR400
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 200 (NPS 8)
 FLOW COEFFICIENT : Cv 250
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD (T -54°C)
 PACKING : KEVLAR PTFE
 BOLTING : B8 / GR8
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB TWO STAGE / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : STELLITED AISI 316
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : AISI 316 CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 23
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 20.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
 PAINTING : BODY UNPAINTED



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-21 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V1.021 SPEC 1

ITEM : 15021 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50121 REVISION : 3 18-07-02
 MN ITEM : 021 V1

SPECIFICATION SHEET : LO-DB PLATE REV

MODEL : LO-DB PLATE

TO BE MOUNTED DOWNSTREAM : 30 PV 50121

NOMINAL SIZE : DN 200 (NPS 8)
 FLOW COEFFICIENT : Cv 650

HOUSING MATERIAL : AISI 316

MOUNTING : CLAMPED BETWEEN LINE FLANGES
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um

SERIAL PLATE LANGUAGE : ENGLISH
 UNITS : bar g
 PAINTING : UNPAINTED

Flow Control

WASHINGTON

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL NR : 2-04912-22 REVISION : 1
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 19-12-02

PAGE : V0.022 SPEC 1

ITEM : 15022 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50122 REVISION : 5 19-12-02
 MN ITEM : 022 V0

SPECIFICATION SHEET : 41005 REV. 1

MODEL : 38-41325/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 250 (NPS 10)
 FLOW COEFFICIENT : Cv 900
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD (MINUS -48°C)
 PACKING : KEVLAR PTFE
 BOLTING : B8 / GR8
 TRIM TYPE : CAGE GUIDED
 CHARACTERISTIC/TYPE : STANDARD CAGE / =%
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : STELLITED AISI 316
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : AISI 316 CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING DIAPHRAGM CONVENTIONAL
 SIZE : 18
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 8-30
 AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 15.2 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELÖK (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N° : 2-04912-23 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 08-10-02

PAGE : V0.023 SPEC 1

ITEM : 15023 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50132 A REVISION : 4 08-10-02
 MN ITEM : 023 V0

SPECIFICATION SHEET : CONTROL VALVE REV

MODEL : L1C/HW/FR10/TZID-C/BR400
 BODY TYPE : BUTTERFLY
 NOMINAL SIZE : DN 600 (NPS 24)
 FLOW COEFFICIENT : Cv 31000
 BODY/LINER MATERIALS : ST ST A 351 Gr CF8M
 CONNECTION TYPE : WAFER (FACE TO FACE 154 mm)
 RATING : ANSI 150
 FINISH : RF Ra 3.2-6.3 um
 PACKING : PTFE

VANE : ST STEEL A 351 Gr CF8M
 SEAT : INCOLOY 825
 SHAFT : 17-4 PH
 LEAKAGE : CLASS IV (ANSI / FCI 70.2)
 ACTUATOR : PNEUMATIC CYLINDER (SA)
 AIR FAILURE POSITION : OPENED
 AIR SUPPLY : 4 bar
 HANDWHEEL : WITH
 MAX SHUT OFF DELTA P : 9.6 bar
 FOR ATMOSPHERE : TROPICAL 1
 AIR SET : SAMI FR10 GAUGE 1
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING) 1
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
 PAINTING : BODY UNPAINTED

ADDITIONAL NOTES

VALVE MODEL N° : L1CMA24ACA
 ACTUATOR MODEL N° : B1JARRU32

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-24 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 08-10-02

PAGE : V0.024 SPEC 1

ITEM : 15024 QTY : 1 ENGINEER : SL
 TAG : 30 PV 50132 B REVISION : 3 08-10-02
 MN ITEM : 024 V0

SPECIFICATION SHEET : CONTROL VALVE REV

MODEL : LIC/HW/FR10/TZID-C/BR400
 BODY TYPE : BUTTERFLY
 NOMINAL SIZE : DN 400 (NPS 16)
 FLOW COEFFICIENT : Cv 13700
 BODY/LINER MATERIALS : ST ST A 351 Gr CF8M
 CONNECTION TYPE : WAFER (FACE TO FACE 102 mm)
 RATING : ANSI 150
 FINISH : RF Ra 3.2-6.3 um
 PACKING : PTFE

VANE : ST STEEL A 351 Gr CF8M
 SEAT : INCOLOY 825
 SHAFT : 17-4 PH
 LEAKAGE : CLASS V (ANSI / FCI 70.2)

ACTUATOR : PNEUMATIC CYLINDER (SA)
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE :
 AIR SUPPLY : 4 bar
 HANDWHEEL : WITH
 MAX SHUT OFF DELTA P : 14.35 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
 PAINTING : BODY UNPAINTED

ADDITIONAL NOTES

VALVE MODEL N^o : L1CMA16ACA
 ACTUATOR MODEL N^o : B1JARRU25

DOWNSTREAM PLATE : PLEASE REFER TO ATTACHED DATA SHEET



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04912-24 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
DATED : 10-04-02
DATED : 07-10-02

PAGE : V1.024 SPEC 1

ITEM : 15024 QTY : 1 ENGINEER : SL
TAG : 30 PV 50132 B REVISION : 3 04-09-02
MN ITEM : 024 V1

SPECIFICATION SHEET : LO-DB PLATE REV

MODEL : PLATE

NOMINAL SIZE : DN 500 (NPS 20)
FLOW COEFFICIENT : Cv 3130

HOUSING MATERIAL : AISI 316

MOUNTING : CLAMPED BETWEEN LINE FLANGES
RATING : ANSI 150
FINISH : RF Ra 3.2-6.3 um

SERIAL PLATE LANGUAGE : ENGLISH
UNITS : bar g
PAINTING : UNPAINTED

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-25 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.025 SPEC 1

ITEM : 15025 QTY : 1 ENGINEER : SL
 TAG : 30 TV 50141 REVISION : 4 18-07-02
 MN ITEM : 025 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21115EB/HW/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 113
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED LINEAR
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : SCREWED
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 50 psi - 350 kPa - 3.5 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 MAX SHUT OFF DELTA P : 13 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-26 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.026 SPEC 1

ITEM : 15026 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50143 REVISION : 4 04-09-02
 MN ITEM : 026 V0

SPECIFICATION SHEET : VARIMAX REV

MODEL : 30-30222/FR10/TZID-C
 BODY TYPE : ROTARY GLOBE
 NOMINAL SIZE : DN 200 (NPS 8)
 RATED Cv - MIN/MAX : 420 TO 950
 ADJUSTED Cv : 420
 TRIM TYPE : STANDARD
 FLOW TO : CLOSE
 BODY MATERIAL : ASTM A 351 Gr CF8M - STAINLESS STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 EXTENSION : STANDARD
 PACKING : KEVLAR PTFE
 OPTION : EMISSION FREE SEAL (VITON O RINGS)

TRIM SET - MATERIALS : T3
 PLUG : AISI 316 STELLITED SEATING SURFACE
 SEAT RING : AISI 316 STELLITED SEATING SURFACE
 SEAT RETAINER : ASTM A 351 Gr CF8M
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING OPPOSED ROLLING DIAPHRAGM
 ATA N^o : 5
 ADJUSTMENT : G
 BENCH RANGE : 7-25
 AIR TO : OPEN
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 MOUNTING POSITION : 2
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 14.2 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-27 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.027 SPEC 1

ITEM : 15027 QTY : 1 ENGINEER : SL
 TAG : 30 TV 50152 REVISION : 4 18-07-02
 MN ITEM : 027 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41325/HW/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 200 (NPS 8)
 FLOW COEFFICIENT : Cv 575
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD (T° = -48°C)
 PACKING : KEVLAR PTFE
 BOLTING : B8 / GR8
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : STANDARD CAGE / =%
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : STELLITED AISI 316
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : AISI 316 CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 23
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 MAX SHUT OFF DELTA P : 14.8 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELD BUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04912-28 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE50
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.028 SPEC 1

ITEM : 15028 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50701A REVISION : 5 04-09-02
 MN ITEM : 028 V0

SPECIFICATION SHEET : CAMPLEX REV

MODEL : 35-35602/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 500
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-24
 AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 8 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E
 : H

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04912-29 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.029 SPEC 1

ITEM : 15029 QTY : 1 ENGINEER : SL
 TAG : 30 LV 50701B REVISION : 4 04-09-02
 MN ITEM : 029 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 230
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 8 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04912-29 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE50
DATED : 10-04-02
DATED : 07-10-02

PAGE : V1.029 SPEC 1

ITEM : 15029 QTY : 1 ENGINEER : SL
TAG : 30 LV 50701B REVISION : 2 18-07-02
MN ITEM : 029 V1

SPECIFICATION SHEET : LO-DB PLATE REV

MODEL : ANTI-CAVITATION PLATE

TO BE MOUNTED DOWNSTREAM : VALVE TAGGED 30 LV 50701B

NOMINAL SIZE : DN 100 (NPS 4)
FLOW COEFFICIENT : CV 156

HOUSING MATERIAL : ASTM A 105

MOUNTING : CLAMPED BETWEEN LINE FLANGES
RATING : ANSI 150
FINISH : RF Ra 3.2-6.3 um

SERIAL PLATE LANGUAGE : ENGLISH
UNITS : bar g
PAINTING : OTA 1422E OR TS239 IN OPTION




UNIT 60

INSTRUMENT DATA SHEETS

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY - TECHNIP
2003.01.29 14:43:40 +01'00'
<none>

STATUS CERTIFIED "FINAL"
ISSUED BY : S.LEGE
DATE :24/01/03

3	24/01/03	Valves 30 PV 60102A/B up-dated (BR 200 added)	
2	16/12/02	Valve 30 UV 60001 added	
1	23/10/02	Up-date	
0	08/10/02	FIRST ISSUE	
REV	DATE	DESCRIPTION	
 NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY		TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007	
 Project: 3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant		EQUIPMENT NAME: Control valves	
		DOCUMENT TITLE : Instrument Data Sheets	
PURCHASE ORDER : 02-4913 (Unit 60)		DOCUMENT CODE : A 3101	Sheet 01 of 37
		Rev. 3	

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-01 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE6Q
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.001 SPEC 1

ITEM : 16001 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60001 A REVISION : 4 07-10-02
 MN ITEM : 001 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/ER10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 400
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 316
 SEAT TYPE : SCREWED
 MATERIAL : AISI 316
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 23
 FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : BODY: UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-02 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE68
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.002 SPEC 1

ITEM : 16002 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60001B REVISION : 5 07-10-02
 MN. ITEM : 002 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/ER10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 195
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 10 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04913-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.003 SPEC 1

ITEM : 16003 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60007 REVISION : 5 07-10-02
 MN ITEM : 003 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35502/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 300
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR

AIR FAILURE POSITION : OPENED
 MOUNTING POSITION : 5
 BENCH RANGE : 7-24
 AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04913-04 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.004 SPEC 1

ITEM : 16004 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60008A REVISION : 4 07-10-02
 MN ITEM : 004 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 3.8
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 8 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-05 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.005 SPEC 1

ITEM : 16005 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60008B REVISION : 4 07-10-02
 MN ITEM : 005 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/ER10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 400
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 23
 FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 8 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-06 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.006 SPEC 1

ITEM	: 16006	QTY	: 1	ENGINEER	: SL
TAG	: 30 FV 60011			REVISION	: 4 07-10-02
				MN ITEM	: 006 V0
SPECIFICATION SHEET	: 41005				REV
MODEL	: 87-41355/ER10/FVP				
BODY TYPE	: GLOBE				
NOMINAL SIZE	: DN 80 x DN 50 x DN 80 (3" x 2")				
FLOW COEFFICIENT	: Cv 64				
BODY MATERIAL	: STAINLESS STEEL - ASTM A 351 Gr CF8M				
CONNECTION TYPE	: FLANGED				
RATING	: ANSI 300				
FINISH	: RF Ra 3.2-6.3 um				
BONNET	: STANDARD				
PACKING	: KEVLAR PTFE				
BOLTING	: B7 / 2H				
TRIM TYPE	: CAGE GUIDED				
CHARISTIQUE/TYPE	: LO-DB TWO STAGE / LINEAR				
PLUG TYPE	: SPRING ENERGIZED SEAL RING BALANCED				
MATERIAL	: STELLITED AISI 316				
SEAL RINGS MATERIAL	: CARBON GRAPHITE FILLED TFE				
CAGE MATERIAL	: AISI 316 CHROME PLATED				
SEAT TYPE	: CLAMPED IN				
MATERIAL	: AISI 316 STELLITED SEATING SURFACES				
FLOW DIRECTION	: TENDS TO OPEN				
LEAKAGE	: CLASS IV (IEC 534-4)				
ACTUATOR	: MULTI-SPRING AND DIAPHRAGM				
SIZE	: 10				
AIR FAILURE POSITION	: OPENED				
BENCH RANGE	: 3-15				
AIR SUPPLY	: 25 psi - 180 kPa - 1.8 bar				
YOKE	: STD				
HANDWHEEL	: WITHOUT				
MAX SHUT OFF DELTA P	: 8.5 bar				
FOR ATMOSPHERE	: TROPICAL				
AIR SET	: SAMI FR10 GAUGE				
POSITIONER	: FIELD BUS FOUNDATION FVP				
OPERATING RANGE	: 0-100 %				
ACTION - CAM CHARACT..	: DIRECT - EQUAL PERCENT				
GAUGES	: SUPPLY-OUTPUT				
MATERIAL GAUGES	: STD				
ELECTRICAL CONNECTION	: M 20				
SERIAL PLATE LANGUAGE	: ENGLISH				
TUBING MATERIAL	: STAINLESS STEEL				
FITTINGS	: SWAGELOK (1/4" OD TUBING)				
UNITS	: bar g				
PAINTING	: BODY UNPAINTED				

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-07 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.007 SPEC 1

ITEM : 16007 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60021 REVISION : 3 07-10-02
 MN ITEM : 007 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/EVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 195
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 9.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-08 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.008 SPEC 1

ITEM : 16008 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60023 REVISION : 3 07-10-02
 MN ITEM : 008 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/ER10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 300
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-24
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 7.4 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E
 : H

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N° : 2-04913-09 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.009 SPEC 1

ITEM : 16009 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60031 REVISION : 4 07-10-02
 MN ITEM : 009 V0

SPECIFICATION SHEET : CONTROL VALVE REV

MODEL : L1C/FR10/TZID-C
 BODY TYPE : BUTTERFLY
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 1500
 BODY MATERIALS : ST ST A351 Gr CF8M
 CONNECTION TYPE : WAFER (FACE TO FACE 70mm)
 RATING : ANSI 150
 FINISH : RF Ra 3.2-6.3 um
 PACKING : PTFE

VANE : CF8M STAINLESS STEEL
 SEAT : INCOLOY 825
 SHAFT : 17-4 PH
 LEAKAGE : CLASS IV (ANSI / FCI 70.2)
 ACTUATOR : PNEUMATIC CYLINDER (SA)
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 8.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

ADDITIONAL NOTE

VALVE MODEL N° : L1CMA06AACA
 ACTUATOR MODEL N° : B1JUL0

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-10 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.010 SPEC 1

ITEM : 16010 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60032 REVISION : 5 07-10-02
 MN ITEM : 010 V0

SPECIFICATION SHEET : VARIMAX REV

MODEL : 30-30242/HW/FR10/TZID-C
 BODY TYPE : ROTARY GLOBE
 NOMINAL SIZE : DN 300 (NPS 12)
 RATED Cv - MIN/MAX : 400 TO 1000
 ADJUSTED Cv : 1000
 TRIM TYPE : LO-DB
 FLOW TO : CLOSE
 BODY MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 EXTENSION : STANDARD
 PACKING : KEVLAR PTFE
 OPTION : EMISSION FREE SEAL (VITON O RINGS)

TRIM SET - MATERIALS : T1
 PLUG : AISI 316
 SEAT RING : AISI 316
 SEAT RETAINER : ASTM A 351 Gr CF8M
 SHAFT : 17-4 PH STAINLESS STEEL
 GUIDE BUSHINGS : AISI 440C
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING OPPOSED ROLLING DIAPHRAGM
 ATA N° : 7
 ADJUSTMENT : A
 BENCH RANGE : 7-25
 AIR TO : OPEN
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 MOUNTING POSITION : 2
 HANDWHEEL : WITH
 MAX SHUT OFF DELTA P : 7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-11 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.011 SPEC 1

ITEM : 16011 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60034A REVISION : 4 07-10-02
 MN ITEM : 011 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/SV/LS
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 30
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : SOLID STELLITE
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 LIMIT STOP : LIMITS OPENING
 ADJUSTMENT : Cv AROUND 24
 MAX SHUT OFF DELTA P : 5.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : WITHOUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 SOLENOID VALVE : 317 (JOUOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6 + IP65
 ELECTRICAL CONNECTION : 1/2" NPTF x M20 ADAPTOR
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E
 : H

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04913-12 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0:012 SPEC 1

ITEM : 16012 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60034B REVISION : 2 07-10-02
 MN ITEM : 012 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21105/FR10/SV
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 40 (NPS 1.5)
 FLOW COEFFICIENT : Cv 13
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED ON-OFF
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 LIMIT STOP : WITHOUT
 MAX SHUT OFF DELTA P : 7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : WITHOUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 SOLENOID VALVE : YES
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6 + IP65
 ELECTRICAL CONNECTION : 1/2" NPTF x M20 ADAPTOR
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-14 REVISION : 2
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 14-01-03

PAGE : V0.014 SPEC 1

ITEM : 16014 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60102 A REVISION : 4 22-01-03
 MN ITEM : 014 V0

SPECIFICATION SHEET : 41005 REV.

MODEL : 88-41355/FR10/TZID-C/496/SV/BR200 2
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 200 x DN 150 x DN 200 (8" x 6")
 FLOW COEFFICIENT : Cv 190
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB TWO STAGE / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : 17-4 PH
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 8.4 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 POSITION TRANSMITTER : 496-558
 ACTION : 1 DETECTOR OPEN + 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20 (TWO ENTRY ADAPTOR)
 SOLENOID VALVE : 317(JOUOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6 + IP65

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04913-14 REVISION : 2
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
DATED : 10-04-02
DATED : 14-01-03

PAGE : V0.014 SPEC 2

ITEM : 16014 QTY : 1

ENGINEER : SL

TAG : 30 PV 60102 A

REVISION : 4 22-01-03

MN ITEM : 014 V0

ELECTRICAL CONNECTION : M 20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (3/8" OD TUBING)
UNITS : bar g
OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR200
PAINTING : OTA 1858E

2

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04913-15 REVISION : 2
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 14-01-03

PAGE : V0.015 SPEC 1

ITEM : 16015 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60102 B REVISION : 4 23-01-03
 MN ITEM : 015 V0

SPECIFICATION SHEET : 41005 REV.

MODEL : 88-41355/FR10/TZID-C/496/SV/BR200 2
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 200 x DN 150 x DN 200 (8" x 6")
 FLOW COEFFICIENT : Cv 190
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB TWO STAGE / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : 17-4 PH
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 8.4 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 POSITION TRANSMITTER : 496-558
 ACTION : 1 DETECTOR OPEN + 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20 (TWO ENTRY ADAPTOR)
 SOLENOID VALVE : 317 (JOUOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6 + IP65



Flow Control

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04913-15 REVISION : 2
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP
PROPOSAL : 9OLE60
DATED : 10-04-02
DATED : 14-01-03
PAGE : V0.015 SPEC 2

ITEM : 16015 QTY : 1 ENGINEER : SL
TAG : 30 PV 60102 B REVISION : 4 23-01-03
MN ITEM : 015 V0

ELECTRICAL CONNECTION : M 20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGelok (3/8" OD TUBING)
UNITS : bar g
OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR200 2
PAINTING : OTA 1858E



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04913-16 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.016 SPEC 1

ITEM : 16016 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60121 REVISION : 4 07-10-02
 MN ITEM : 016 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/SV
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 20
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : SOLID STELLITE
 SEAT : AISI 316 PTFE SOFT SEAT
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS VI (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 LIMIT STOP : WITHOUT
 MAX SHUT OFF DELTA P : 5.7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : WITHOUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 SOLENOID VALVE : 317 (JOUOMATIC)
 ACTION : VENT'S ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6 + IP65
 ELECTRICAL CONNECTION : 1/2" NPTF x M20 ADAPTOR
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E
 : H

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-17 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE69
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.017 SPEC 1

ITEM : 16017 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60122 A REVISION : 4 07-10-02
 MN ITEM : 017 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41335/ER10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 300
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : 17-4 PH
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 14 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E



Flow Control

CUSTOMER	: TECHNIP	PROPOSAL	: 9OLE60
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL Nr	: 2-04913-18	REVISION	: 0
PROJECT	: BANDAR ASALUYE 9TH OLEFIN COMP	DATED	: 15-10-02

PAGE : V0.018 SPEC 1

ITEM	: 16018	QTY	: 1	ENGINEER	: SL
TAG	: 30 PV 60122 B			REVISION	: 5 07-10-02
				MN ITEM	: 018 V0

SPECIFICATION SHEET : VARIMAX REV

MODEL : 30-30662/FR10/TZID-C
 BODY TYPE : ROTARY GLOBE
 NOMINAL SIZE : DN 300 (NPS 12)
 RATED Cv - MIN/MAX : 400 TO 1000
 ADJUSTED Cv : 1000
 TRIM TYPE : LO-DB - SOFT SEAT
 FLOW TO : CLOSE
 BODY MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 EXTENSION : STANDARD
 PACKING : KEVLAR PTFE
 OPTION : EMISSION FREE SEAL (VITON O RINGS)

TRIM SET - MATERIALS : T4
 PLUG : AISI 316
 SEAT RING : AISI 316 WITH PTFE-NI INSERT
 SEAT RETAINER : ASTM A 351 Gr CF8M
 SHAFT : 17-4 PH STAINLESS STEEL
 GUIDE BUSHINGS : AISI 440C
 LEAKAGE : CLASS VI (IEC 534-4)

ACTUATOR : SPRING OPPOSED ROLLING DIAPHRAGM
 ATA N° : 7
 ADJUSTMENT : A
 BENCH RANGE : 7-25
 AIR TO : OPEN
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 45 psi - 310 kPa - 3.1 bar
 MOUNTING POSITION : 6
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 5.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-19 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.019 SPEC 1

ITEM : 16019 QTY : 1 ENGINEER : SL
 TAG : 30 LV 60211 REVISION : 4 07-10-02
 MN ITEM : 019 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/ER10/FVP/496/SV
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 40 (NPS 1.5)
 FLOW COEFFICIENT : Cv 15
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : SOLID STELLITE
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 LIMIT STOP : WITHOUT
 MAX SHUT OFF DELTA P : 7.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 POSITION TRANSMITTER : 496-458
 ACTION : 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20
 SOLENOID VALVE : 317 (JOUCOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6 + IP65
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04913-19 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.019 SPEC 2

ITEM : 16019 QTY : 1 ENGINEER : SL
TAG : 30 LV 60211 REVISION : 4 07-10-02
MN ITEM : 019 V0

FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
UNITS : bar g
PAINTING : OTA 1858E
: H

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-20 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.020 SPEC 1

ITEM : 16020 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60211 A REVISION : 4 07-10-02
 MN ITEM : 020 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 1.7
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 10.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-21 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.021 SPEC 1

ITEM : 16021 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60211B REVISION : 5 07-10-02
 MN ITEM : 021 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 3.8
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 3.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-22 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.022 SPEC 1

ITEM : 16022 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60404 REVISION : 5 07-10-02
 MN ITEM : 022 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 38-41915/FR10/TZID-C/BR400
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 300 (NPS 12)
 FLOW COEFFICIENT : Cv 1400
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 600
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : GRAPHITE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARACTERISTIC/TYPE : STANDARD CAGE / LINEAR
 PLUG TYPE : SEAL RING BALANCED
 MATERIAL : ASTM A 487 Gr CA6NM NITRIDED
 SEAL RINGS MATERIAL : GRAPHITE + NI-RESIST BACKUP
 CAGE MATERIAL : ASTM A 487 Gr CA6NM NITRIDED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : SPRING DIAPHRAGM CONVENTIONAL
 SIZE : 24
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 6-28
 AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
 YOKE : STD
 MAX SHUT OFF DELTA P : 47 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (3/8" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
 PAINTING : OTA 1858E



Flow Control

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04913-23 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
DATED : 10-04-02
DATED : 15-10-02

PAGE : V0.023 SPEC 1

ITEM : 16023 QTY : 1 ENGINEER : SL
TAG : 30 TV 60402 REVISION : 2 07-10-02
SERVICE : DESUPERHEATING VALVE MN ITEM : 023 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-78121/HW/FR10/TZID-C
BODY TYPE : GLOBE
NOMINAL SIZE : DN 50 (NPS 2)
FLOW COEFFICIENT : Cv 1.8
BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
CONNECTION TYPE : FLANGED
RATING : ANSI 1500
FINISH : RTJ
BOLTING : B7-2H
BONNET : STANDARD
PACKING : CARBON + PTFE

TRIM : ANTICAVITATION (MULTI-STAGES) LINEAR
PLUG MATERIAL : AISI 410
SEAT TYPE : COMBINED IN CAGE
MATERIAL : AISI 410
CAGE MATERIAL : AISI 410
GUIDE BUSHING MATERIAL : AISI 440C
FLOW DIRECTION : TENDS TO OPEN
LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
SIZE : 10
FAILURE POSITION : CLOSED
BENCH RANGE : 35-43
AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
YOKE : STD
HANDWHEEL : SIDE MOUNTED
MAX SHUT OFF DELTA P : 147.3 bar (TO BE CONFIRMED)
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : HART TZID-C
INPUT SIGNAL : 4-20 mA
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENTAGE
GAUGES : SUPPLY-OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (1/4" OD TUBING)
UNITS : bar g
PAINTING : OTA 1858E

CUSTOMER	: TECHNIP	PROPOSAL	: 90LE60
ENQUIRY	: DESUPERHEATING VALVE	DATED	: - - -
CUST. ORDER	: 6465C30 1541 01 0 10007	DATED	: 10-04-02
SERIAL N ^o	: 2-04913-24	REVISION	: 0
PROJECT	: BANDAR ASALUYE 9TH OLEFIN COMP	DATED	: 15-10-02
		PAGE	: V0.024 SPEC 1

ITEM	: 16024	QTY	: 1	ENGINEER	: SL
TAG	: 30 TV 60406 A	REVISION	: 3	07-10-02	
SERVICE	: DESUPERHEATING VALVE	MN ITEM	: 024 V0		

SPECIFICATION SHEET : 21000 REV

MODEL : 88-78128/HW/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 5
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 1500
 FINISH : RTJ
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : CARBON + PTFE

TRIM : ANTICAVITATION (MULTI-STAGES) LINEAR
 PLUG MATERIAL : AISI 410
 SEAT TYPE : COMBINED IN CAGE
 MATERIAL : AISI 410
 CAGE MATERIAL : AISI 410
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : CLOSED
 BENCH RANGE : 35-43
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 MAX SHUT OFF DELTA P : 147.3 bar (TO BE CONFIRMED)
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-25 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.025 SPEC 1

ITEM : 16025 QTY : 1 ENGINEER : SL
 TAG : 30 TV 60406 B REVISION : 3 07-10-02
 MN ITEM : 025 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-78128/HW/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 5
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 1500
 FINISH : RTJ
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : CARBON + PTFE

TRIM : ANTICAVITATION (MULTI-STAGES) LINEAR
 PLUG MATERIAL : AISI 410
 SEAT TYPE : COMBINED IN CAGE
 MATERIAL : AISI 410
 CAGE MATERIAL : AISI 410
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : CLOSED
 BENCH RANGE : 35-43
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 MAX SHUT OFF DELTA P : 147.3 bar (TO BE CONFIRMED)
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-26 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.026 SPEC 1

ITEM : 16026 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60411 REVISION : 5 07-10-02
 MN ITEM : 026 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-78128/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 5
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 1500
 FINISH : RTJ
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : CARBON + PTFE

TRIM : ANTICAVITATION (MULTI-STAGES) LINEAR
 PLUG MATERIAL : AISI 410
 SEAT TYPE : COMBINED IN CAGE
 MATERIAL : AISI 410
 CAGE MATERIAL : AISI 410
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : CLOSED
 BENCH RANGE : 35-43
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 172 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-27 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.027 SPEC 1

ITEM : 16027 QTY : 1 ENGINEER : SL
 TAG : 30 TV 60416 REVISION : 3 07-10-02
 SERVICE : DESUPERHEATING VALVE MN ITEM : 027 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21124/HW/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 6
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 600
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 440C
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 440C
 CAGE MATERIAL : AISI 304
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 11-23
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 MAX SHUT OFF DELTA P : 40.7 bar (TO BE CONFIRMED)
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI PR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-28 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.028 SPEC 1

ITEM : 16028 QTY : 1 ENGINEER : SL
 TAG : 30 TV 60426 REVISION : 3 07-10-02
 SERVICE : DESUPERHEATING VALVE MN ITEM : 028 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21014-2S/HW/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 2.8
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 600
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : ANTICAVITATION (TWO STAGES) LINEAR
 PLUG MATERIAL : AISI 416
 SEAT TYPE : COMBINED IN CAGE
 MATERIAL : AISI 416
 CAGE MATERIAL : AISI 416
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 11-23
 AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 MAX SHUT OFF DELTA P : 40.7 bar (TO BE CONFIRMED)
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E



Flow Control

Masonellan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-29 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.029 SPEC 1

ITEM : 16029 QTY : 1 ENGINEER : SL
 TAG : 30 PV 60427 REVISION : 5 07-10-02
 MN ITEM : 029 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 38-41315/FR10/TZID-C/BR400
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 250 (NPS 10)
 FLOW COEFFICIENT : Cv 1000
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARACTERISTIC/TYPE : STANDARD CAGE / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : 17-4 PH
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : SPRING DIAPHRAGM CONVENTIONAL
 SIZE : 18
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 20-50
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar -
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : BOOSTER RELAY MODEL BR400
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04913-30 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
DATED : 10-04-02
DATED : 15-10-02

PAGE : V0.030 SPEC 1

ITEM : 16029 QTY : 1 ENGINEER : SL
TAG : 30 PV 60427 REVISION : 3 07-10-02
MN ITEM : 030 V0

SPECIFICATION SHEET : LO-DB PLATE REV

MODEL : PLATE

TO BE MOUNTED DOWNSTREAM : VALVE TAGGED 30 PV 60427

NOMINAL SIZE : DN 400 (NPS 16)
FLOW COEFFICIENT : CV 2000

HOUSING MATERIAL : ASTM A 105

MOUNTING : CLAMPED BETWEEN LINE FLANGES
RATING : ANSI 150
FINISH : RF Ra 3.2-6.3 um

SERIAL PLATE LANGUAGE : ENGLISH
UNITS : bar g
PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-31 REVISION : 1
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 13-12-02

PAGE : V0.031 SPEC 1

ITEM : 031 QTY : 1 ENGINEER : SL
 TAG : 30 UV 60001 REVISION : 0 15-10-02
 MN ITEM : 031 V0

SPECIFICATION SHEET : 41005 REV.

MODEL : 68-41915/SAMI/496/SV
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 250 (NPS 10)
 FLOW COEFFICIENT : Cv 1000
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 600
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : GRAPHITE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : STANDARD CAGE / LINEAR
 PLUG TYPE : SEAL RING BALANCED
 MATERIAL : ASTM A 487 Gr CA6NM NITRIDED
 SEAL RINGS MATERIAL : GRAPHITE + NI-RESIST BACKUP
 CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PISTON ACTUATOR (SR)
 SIZE : L 300 SR (f) 76
 AIR FAILURE POSITION : CLOSED
 AIR SUPPLY : 4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 47 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI + GAUGE
 POSITIONER : WITHOUT
 MATERIAL GAUGES : STD (ST. STEEL CASE)
 POSITION TRANSMITTER : 496-558
 ACTION : 1 DETECTOR OPEN + 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20
 SOLENOID VALVE : JOUCOMATIC 317 SERIES
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : 316 STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6
 ELECTRICAL CONNECTION : ISO M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (3/8" OD TUBING)
 UNITS : bar.g
 PAINTING : BODY: OTA 1858 E

DRESSER

Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04913-31 REVISION : 1
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLEG0
DATED : 10-04-02
DATED : 13-12-02

PAGE : V0.031 SPEC 2

ITEM : 031

QTY : 1

ENGINEER : SL

TAG : 30 UV 60001

REVISION : 0 15-10-02

MN ITEM : 031 V0

: ACTUATOR: SUBSUPPLIER STD PROCEDURE

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-33 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.033 SPEC 1

ITEM : 033 QTY : 1 ENGINEER : SL
 TAG : 30 PCV 60063 REVISION : 1 07-10-02
 MN ITEM : 033 V0

SPECIFICATION SHEET : VARIPAK REV

MODEL : 27-28260-51/FR10/2707
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 15 (NPS 0.5)
 FLOW COEFFICIENT : Cv 0.05 TO 0.02
 SET AT : 65 %

BODY
 MATERIAL : AISI 316L OR ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED (F TO F: 102 mm)
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um

BONNET : INTEGRAL
 PACKING : CARBON / PTFE + KALREZ "O" RING (*)
 TRIM : LINEAR CONTOURED
 PLUG : STELLITE 12
 SEAT : STELLITE 6
 FLOW DIRECTION : FLOW TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH SPRING AND DIAPHRAGM
 AIR FAILURE POSITION : OPENED
 MOUNTING POSITION : 2
 BENCH RANGE : 3-15
 SUPPLY PRESSURE : 18 psi - 125 kPa - 1.25 bar
 MAX SHUT OFF DELTA P : 11.5 bar
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : PNEUMATIC INTEGRAL 7700
 INPUT SIGNAL : 3-15 psi OR EQUAL (bar, kPa)
 OPERATING RANGE : 100 %
 ACTION - CHARACTERISTIC : DIRECT - LINEAR
 GAUGES : SIGNAL-OUTPUT
 GAUGES MATERIAL : STD

SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : PRESSURE CONTROLLER MODEL 2707
 PAINTING : UNPAINTED (ST ST BODY)

SPECIAL NOTES : (*) L6 LOW EMISSION PACKING DESIGN
 : PLEASE REFER TO ATTACHED APPENDIX 5C
 : 8, 9 & 10 FOR DETAILS.
 : TIGHTNESS LEVEL 10-6 mbar.1/s HELIUM



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04913-33 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE60
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V1.033 SPEC 1

ITEM : 033 QTY : 1 ENGINEER : SL
 TAG : 30 PCV 60063 REVISION : 0 07-10-02
 MN ITEM : 033 V1

SPECIFICATION SHEET : CONTROLLER REV

MODEL : 2707-S/FR10

MECHANISM : PROPORTIONAL
 ACTION : DIRECT
 OUTPUT SIGNAL : 0.2-1 bar OR EQUAL (kPa)

MOUNTING : VALVE OR SURFACE
 ITEM : TAG 30PCV 60063

PRESSURE ELEMENT
 RANGE : 0-0.35 bar
 TYPE : BELLOWS
 MATERIAL : STAINLESS STEEL
 GAUGES : SUPPLY - OUTPUT

AIR SET : SAMI FR10 GAUGE

APPLICATION : STANDARD
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNCONNECTED FITTINGS : WITHOUT (1/4" NPTF CONNECTIONS)
 UNITS : bar g

UNIT 70

INSTRUMENT DATA SHEETS

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY TECHNIP
2002.12.20 10:30:43 +01'00'
<none>

STATUS CERTIFIED "FINAL"
ISSUED BY : S. LEGE
DATE : 16/12/02

2	16/12/02	Up-dated items 17007 and 17020	
1	23/10/02	Up-date	
0	08/10/02	FIRST ISSUE	
REV	DATE	DESCRIPTION	
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY		TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007
			EQUIPMENT NAME:
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant		Control valves
	DOCUMENT TITLE : Instrument Data Sheets		DOCUMENT CODE : A 3101
	PURCHASE ORDER : 02-4914 (Unit 70)		Sheet 01 of 25
			Rev. 2

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-01 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.001 SPEC 1

ITEM : 17001 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70002 REVISION : 3 18-07-02
 MN ITEM : 001 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41355/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 100 x DN 50 x DN 100 (4" x 2")
 FLOW COEFFICIENT : Cv 30
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B7 / 2H
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB TWO STAGE / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : 17-4 PH
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 24.2 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELD BUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-02 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.002 SPEC 1

ITEM : 17002 QTY : 1 ENGINEER : SL
 TAG : 30 FV 70021 REVISION : 5 18-07-02
 MN ITEM : 002 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 87-21125EB/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 31
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -104 °C)
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : FULLY STELLITED AISI 316
 SEAT TYPE : SCREWED
 MATERIAL : FULLY STELLITED AISI 316
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : OPENED
 BENCH RANGE : 3-15
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 39.9 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.003 SPEC 1

ITEM : 17003 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70023 A REVISION : 5 04-09-02
 MN ITEM : 003 V0

SPECIFICATION SHEET : 41005 REV

MODEL : 88-41335/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 80 x DN 50 x DN 80 (3" x 2")
 FLOW COEFFICIENT : Cv 8
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B8 / GR8
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : LO-DB / LINEAR
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : 17-4 PH
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : ASTM A 487 Gr CA6NM CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 24.2 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-04 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.004 SPEC 1

ITEM : 17004 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70023B REVISION : 5 04-09-02
 MN ITEM : 004 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21014-2S EB/HW/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : CV 0.9
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -104 °C)
 PACKING : KEVLAR PTFE

TRIM : LO-DB (TWO STAGE) LINEAR
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : COMBINED WITH CAGE
 MATERIAL : MONEL K 500
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 3-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 YOKE : STD
 HANDWHEEL : SIDE MOUNTED
 MAX SHUT OFF DELTA P : 35 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENTAGE
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-05 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.005 SPEC 1

ITEM : 17005 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70023C REVISION : 6 04-09-02
 MN ITEM : 005 V0

SPECIFICATION SHEET : CAMPLEX REV

MODEL : 35-35602/HW/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 300 (NPS 12)
 FLOW COEFFICIENT : Cv 1750
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 PTFE SOFT SEAT
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : AISI 316 STELLITE HARD BORE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS VI (IEC 534-4)

ACTUATOR

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-24
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 HANDWHEEL : WITH
 MAX SHUT OFF DELTA P : 0.1 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : H

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N_r : 2-04914-06 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.006 SPEC 1

ITEM : 17006 QTY : 1 ENGINEER : SL
 TAG : 30 FV 70024 REVISION : 4 18-07-02
 MN ITEM : 006 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 87-21125/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 31
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -104°C)
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : FULLY STELLITED AISI 316
 SEAT TYPE : SCREWED
 MATERIAL : FULLY STELLITED AISI 316
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : OPENED
 BENCH RANGE : 3-15
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 39.9 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-07 REVISION : 1
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
 DATED : 10-04-02
 DATED : 13-12-02

PAGE : V0.007 SPEC 1

ITEM : 17007 QTY : 1 ENGINEER : SL
 TAG : 30 LV 70041 REVISION : 5 11-12-02
 MN ITEM : 007 V0

SPECIFICATION SHEET : 41005 REV.

MODEL : 88-41325/FR10/TZID-C/496/SV
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 150 (NPS 6)
 FLOW COEFFICIENT : Cv 360
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BONNET : STANDARD
 PACKING : KEVLAR PTFE
 BOLTING : B8 / GR8
 TRIM TYPE : CAGE GUIDED
 CHARISTIQUE/TYPE : STANDARD CAGE / =%
 PLUG TYPE : SPRING ENERGIZED SEAL RING BALANCED
 MATERIAL : STELLITED AISI 316
 SEAL RINGS MATERIAL : CARBON GRAPHITE FILLED TFE
 CAGE MATERIAL : AISI 316 CHROME PLATED
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 16
 AIR FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 39.3 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 POSITION TRANSMITTER : 496-458
 ACTION : 1 DETECTOR CLOSE
 ENCLOSURE : EEx ia IIC T6 + IP 65
 ELECTRICAL CONNECTION : M 20
 SOLENOID VALVE : 317 (JOUCOMATIC)
 ACTION : VENTS ACTUATOR WHEN DEENERGIZED
 TYPE : 3 WAY-UNIVERSAL
 BODY MATERIAL : STAINLESS STEEL
 PNEUMATIC CONNECTIONS : 1/4"
 VOLTAGE : 24 V DC
 ENCLOSURE : EEx ia IIC T6 + IP65

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04914-07 REVISION : 1
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
DATED : 10-04-02
DATED : 13-12-02

PAGE : V0.007 SPEC 2

ITEM : 17007

QTY : 1

ENGINEER : SL

TAG : 30 LV 70041

REVISION : 5 11-12-02

MN ITEM : 007 V0

ELECTRICAL CONNECTION : M 20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGelok (3/8" OD TUBING)
UNITS : bar g
PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-08 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.008 SPEC 1

ITEM : 17008 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70042 REVISION : 4 04-09-02
 MN ITEM : 008 V0

SPECIFICATION SHEET : CAMPLEX REV

MODEL : 35-35202/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 100 (NPS 4)
 FLOW COEFFICIENT : Cv 138
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : 17-4 PH
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 7 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-09 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.009 SPEC 1

ITEM : 17009 QTY : 1 ENGINEER : SL
 TAG : 30 TV 70048 REVISION : 4 04-09-02
 MN ITEM : 009 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 81
 BODY MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : AISI 316L STELLITED
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 0.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : H

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-10 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.010 SPEC 1

ITEM : 17010 QTY : 1 ENGINEER : SL
 TAG : 30 FV 70061 REVISION : 6 04-09-02
 MN ITEM : 010 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 87-21125/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 31
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -95°C)
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : SCREWED
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : OPENED
 BENCH RANGE : 3-15
 AIR SUPPLY : 30 psi - 210 kPa - 2.1 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 13.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - NEUTRAL
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-11 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.011 SPEC 1

ITEM : 17011 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70063A REVISION : 5 04-09-02
 MN ITEM : 011 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21715/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 40 (NPS 1.5)
 FLOW COEFFICIENT : Cv 8
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -104 °C)
 PACKING : KEVLAR PTFE

TRIM : LO-DB LINEAR
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : SCREWED
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 9 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - NEUTRAL
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL N^o : 2-04914-12 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.012 SPEC 1

ITEM : 17012 QTY : 1 ENGINEER : SL
TAG : 30 PV 70063B REVISION : 6 04-09-02
MN ITEM : 012 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125EB/FR10/TZID-C
BODY TYPE : GLOBE
NOMINAL SIZE : DN 50 (NPS 2)
FLOW COEFFICIENT : Cv 26
BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
BOLTING : B8 / GR8
BONNET : WITH EXTENSION EB (T -104 °C)
PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
SEAT TYPE : SCREWED
MATERIAL : AISI 316 STELLITED SEATING SURFACES
GUIDE BUSHING MATERIAL : NITRONIC 60
FLOW DIRECTION : TENDS TO OPEN
LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
SIZE : 6
FAILURE POSITION : CLOSED
BENCH RANGE : 21-45
AIR SUPPLY : 50 psi - 350 kPa - 3.5 bar
YOKE : STD
HANDWHEEL : WITHOUT
MAX SHUT OFF DELTA P : 13.3 bar
FOR ATMOSPHERE : TROPICAL
AIR SET : SAMI FR10 GAUGE
POSITIONER : HART TZID-C
INPUT SIGNAL : 4-20 mA
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT - NEUTRAL
GAUGES : SUPPLY-OUTPUT
MATERIAL GAUGES : STD
ELECTRICAL CONNECTION : M20
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (1/4" OD TUBING)
UNITS : bar g
PAINTING : BODY UNPAINTED

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-13 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.013 SPEC 1

ITEM : 17013 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70063C REVISION : 5 04-09-02
 MN ITEM : 013 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/HW/FR10/TZID-C
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 300 (NPS 12)
 FLOW COEFFICIENT : Cv 1750
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : AISI 316L STELLITED
 SEAT : AISI 316 PTFE SOFT SEAT
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : AISI 316 STELLITE HARD BORE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS VI (IEC 534-4)

ACTUATOR

AIR FAILURE POSITION : PNEUMATIC WITH ROLLING DIAPHRAGM
 MOUNTING POSITION : CLOSED
 BENCH RANGE : 6
 AIR SUPPLY : 7-24
 HANDWHEEL : 40 psi - 280 kPa - 2.8 bar
 WITH
 MAX SHUT OFF DELTA P : 0.1 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : H

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-14 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.014 SPEC 1

ITEM : 17014 QTY : 1 ENGINEER : SL
 TAG : 30 FV 70064 REVISION : 5 04-09-02
 MN ITEM : 014 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 87-21125EB/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 31
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -95°C)
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : SCREWED
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : OPENED
 BENCH RANGE : 3-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 13.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - NEUTRAL
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-15 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.015 SPEC 1

ITEM : 17015 QTY : 1 ENGINEER : SL
 TAG : 30 FV 70065 REVISION : 5 04-09-02
 MN ITEM : 015 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125EB/FR10/TZID-C
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 80 (NPS 3)
 FLOW COEFFICIENT : Cv 47
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -90 °C)
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : SCREWED
 MATERIAL : AISI 316 STELLITED SEATING SURFACES
 GUIDE BUSHING MATERIAL : NITRONIC 60
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 10
 FAILURE POSITION : CLOSED
 BENCH RANGE : 11-23
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 22.8 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : HART TZID-C
 INPUT SIGNAL : 4-20 mA
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - NEUTRAL
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N_r : 2-04914-16 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.016 SPEC 1

ITEM : 17016 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70081 A REVISION : 3 18-07-02
 MN ITEM : 016 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 1.7
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 35 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-17 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 15-10-02

PAGE : V0.017 SPEC 1

ITEM : 17017 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70081 B REVISION : 2 18-07-02
 MN ITEM : 017 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35602/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 5.6
 BODY
 MATERIAL : ASTM A 216 Gr WCC - CARBON STEEL
 CONNECTION TYPE : FLANGELESS
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : SOLID STELLITE
 SEAT : AISI 316 PTFE SOFT SEAT
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : AISI 440C
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS VI (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 6
 BENCH RANGE : 7-15
 AIR SUPPLY : 20 psi - 140 kPa - 1.4 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 15 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E
 : H

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-18 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.018 SPEC 1

ITEM : 17018 QTY : 1 ENGINEER : SL
 TAG : 30 FV 70082 REVISION : 3 18-07-02
 MN ITEM : 018 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 46
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : CARBON-PTFE + LIVE LOADING (*)

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 21-45
 AIR SUPPLY : 55 psi - 380 kPa - 3.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 26.5 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

ADDITIONAL NOTE : (*) LOW EMISSION PACKING DESIGN L13
 : PLS REFER TO ATTACHED DOCUMENTS FOR
 : DETAILS.



Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-19 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.019 SPEC 1

ITEM : 17019 QTY : 1 ENGINEER : SL
 TAG : 30 FV 70091 REVISION : 2 18-07-02
 MN ITEM : 019 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 50 (NPS 2)
 FLOW COEFFICIENT : Cv 20
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS

PLUG : SOLID STELLITE
 SEAT : AISI 316 STELLITE HARD FACED
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 23.6 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : H

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N_r : 2-04914-20 REVISION : 1
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 13-12-02

PAGE : V0.020 SPEC 1

ITEM : 17020 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70091 REVISION : 3 14-11-02
 MN ITEM : 020 V0

SPECIFICATION SHEET : 21000 REV. 1

MODEL : 88-21014-2S EB/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : CV 1.5
 BODY MATERIAL : STAINLESS STEEL - ASTM A 351 Gr CF8M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B8 / GR8
 BONNET : WITH EXTENSION EB (T -104 °C)
 PACKING : KEVLAR PTFE

TRIM : LO-DB (TWO STAGE) LINEAR
 PLUG MATERIAL : AISI 316 STELLITED SEATING SURFACES
 SEAT TYPE : COMBINED WITH CAGE
 MATERIAL : MONEL K 500
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 40 psi - 280 kPa - 2.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT

MAX SHUT OFF DELTA P : 35 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04914-21 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE70
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.021 SPEC 1

ITEM : 17021 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70094 A REVISION : 4 19-07-02
 MN ITEM : 021 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 88-21125/FR10/FVP
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : Cv 3.8
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : SINGLE SEATED EQUAL PERCENT
 PLUG MATERIAL : AISI 416
 SEAT TYPE : SCREWED
 MATERIAL : AISI 416
 GUIDE BUSHING MATERIAL : AISI 440C
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS V (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : CLOSED
 BENCH RANGE : 6-30
 AIR SUPPLY : 35 psi - 240 kPa - 2.4 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 35 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI PR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY-OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 PAINTING : OTA 1858E

Flow Control

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04914-22 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE70
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.022 SPEC 1

ITEM : 17022 QTY : 1 ENGINEER : SL
 TAG : 30 PV 70094 B REVISION : 2 18-07-02
 MN ITEM : 022 V0

SPECIFICATION SHEET : CAMFLEX REV

MODEL : 35-35202/FR10/FVP
 BODY TYPE : GLOBE WITH ROTATING PLUG
 NOMINAL SIZE : DN 40 (NPS 1.5)
 FLOW COEFFICIENT : Cv 30
 BODY
 MATERIAL : STAINLESS STEEL-ASTM A 351 Gr CF3M
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 PACKING : KEVLAR PTFE WITH VITON "O" RINGS

TRIM MATERIALS
 PLUG : SOLID STELLITE
 SEAT : AISI 316
 SEAT RETAINER : AISI 316
 SHAFT : AISI 316
 GUIDE BUSHINGS : SOLID STELLITE
 FLOW DIRECTION : TENDS TO CLOSE
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : PNEUMATIC WITH ROLLING DIAPHRAGM
 AIR FAILURE POSITION : CLOSED
 MOUNTING POSITION : 2
 BENCH RANGE : 7-15
 AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 23 bar
 FOR ATMOSPHERE : TROPICAL
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : FIELDBUS FOUNDATION FVP
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - EQUAL PERCENT
 GAUGES : SUPPLY - OUTPUT
 MATERIAL GAUGES : STD
 ELECTRICAL CONNECTION : M 20
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGelok ST ST (1/4 OD TUBING)
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : H




UNIT 80

INSTRUMENT DATA SHEETS

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISE AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

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STATUS CERTIFIED "FINAL"
 ISSUED BY : S. LEGE
 DATE : 16/12/02

2	16/12/02	Item 18001 up-dated : 536 V	
1	23/10/02	UP-DATED	
0	08/10/02	FIRST ISSUE	
REV	DATE	DESCRIPTION	
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY		TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007
			EQUIPMENT NAME:
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant		Control valves
	DOCUMENT TITLE : Instrument Data Sheets		DOCUMENT CODE : A 3101
	PURCHASE ORDER : 02-4915 (Unit 80)		Sheet 01 of 07
			Rev. 2

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^o : 2-04915-01 REVISION : 1
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE80
 DATED : 10-04-02
 DATED : 13-12-02

PAGE : V0.001 SPEC 1

ITEM : 18001 QTY : 1 ENGINEER : SL
 TAG : 30 PCV 80043 REVISION : 3 14-11-02
 MN ITEM : 001 V0

SPECIFICATION SHEET : 500 REV.

MODEL : UPSTREAM PRESSURE REGULATOR 536V 1
 TYPE : 536V 1
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT Cv : Cv 0.6
 BODY TYPE : STANDARD
 BODY MATERIAL : ASTM A 351 Gr CF3M - STAINLESS STEEL
 CONNECTION TYPE : FLANGED (F TO F: 160 mm)
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 PACKING : KEVLAR PTFE

TRIM MATERIALS : SINGLE SEATED
 CHARACTERISTIC : LINEAR
 PLUG TYPE : LINEAR CONTOURED
 MATERIAL : N6 STELLITE
 SEAT TYPE : CLAMPED IN
 MATERIAL : 17-4 PH
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : REGULATING SPRING DIAPHRAGM
 SIZE : 5
 BENCH RANGE : 10-40 psi 1
 RANGE / SET POINT : 28.98 Psi (2 bar) 1
 CONNECTION : 1/2" NPT 1
 SERIAL PLATE LANGUAGE : ENGLISH
 UNITS : bar g
 PAINTING : BODY UNPAINTED
 : ACTUATOR OTA 1848E 1



Flow Control

Masoneilan

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL Nr : 2-04915-02 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE80
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.002 SPEC 1

ITEM : 18002 QTY : 1 ENGINEER : SL
 TAG : 30 PCV 80045 REVISION : 2 05-08-02
 MN ITEM : 002 V0

SPECIFICATION SHEET : 500 REV

MODEL : DOWNSTREAM PRESSURE REGULATOR 535V
 TYPE : 535V
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT Cv : Cv 1.2
 BODY TYPE : STANDARD
 BODY MATERIAL : ASTM A 351 Gr CF3M - STAINLESS STEEL
 CONNECTION TYPE : FLANGED (F TO F: 160 mm)
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 PACKING : KEVLAR PTFE

TRIM MATERIALS : SINGLE SEATED
 CHARACTERISTIC : LINEAR
 PLUG TYPE : LINEAR CONTOURED
 MATERIAL : N6 STELLITE
 SEAT TYPE : CLAMPED IN
 MATERIAL : 17-4 PH
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : REGULATING SPRING DIAPHRAGM
 SIZE : 3 1/2
 BENCH RANGE : 150 - 450 Psi
 RANGE / SET POINT : 275.36 psi (19 bar)
 CONNECTION : 1/2" NPT
 SERIAL PLATE LANGUAGE : ENGLISH
 UNITS : bar g
 PAINTING : BODY UNPAINTED

CUSTOMER : TECHNIP
 CUST. ORDER : 6465C30 1541 01 0 10007
 SERIAL N^r : 2-04915-03 REVISION : 0
 PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE80
 DATED : 10-04-02
 DATED : 07-10-02

PAGE : V0.003 SPEC 1

ITEM : 18003 QTY : 1 ENGINEER : SL
 TAG : 30 PCV 80029 REVISION : 1 26-09-02
 MN ITEM : 003 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 87-21014-2S/FR10/4711P/2707
 BODY TYPE : GLOBE
 NOMINAL SIZE : DN 25 (NPS 1)
 FLOW COEFFICIENT : CV 1.3
 BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
 CONNECTION TYPE : FLANGED
 RATING : ANSI 300
 FINISH : RF Ra 3.2-6.3 um
 BOLTING : B7-2H
 BONNET : STANDARD
 PACKING : KEVLAR PTFE

TRIM : ANTICAVITATION (TWO STAGES) LINEAR
 PLUG MATERIAL : AISI 410
 SEAT TYPE : CLAMPED IN
 MATERIAL : AISI 410
 CAGE MATERIAL : AISI 410
 FLOW DIRECTION : TENDS TO OPEN
 LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
 SIZE : 6
 FAILURE POSITION : OPENED
 BENCH RANGE : 3-15
 AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
 YOKE : STD
 HANDWHEEL : WITHOUT
 MAX SHUT OFF DELTA P : 39.1 bar
 AIR SET : SAMI FR10 GAUGE
 POSITIONER : 4711P
 INPUT SIGNAL : 3-15 psi OR EQUAL (bar, kPa)
 OPERATING RANGE : 0-100 %
 ACTION - CAM CHARACT. : DIRECT - LINEAR
 GAUGES : SUPPLY - SIGNAL - OUTPUT
 MATERIAL GAUGES : STD
 SERIAL PLATE LANGUAGE : ENGLISH
 TUBING MATERIAL : STAINLESS STEEL
 FITTINGS : SWAGELOK (1/4" OD TUBING)
 UNITS : bar g
 OTHER MOUNTED ACCESSORIES : PRESSURE CONTROLLER MODEL 2707
 PAINTING : OTA 1858E



Flow Control

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04915-03 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 9OLE80
DATED : 10-04-02
DATED : 07-10-02

PAGE : V1.003 SPEC 1

ITEM : 18003 QTY : 1 ENGINEER : SL
TAG : 30 PCV 80029 REVISION : 0 26-09-02
MN ITEM : 003 V1

SPECIFICATION SHEET : CONTROLLER REV

MODEL : 2707-S/FR10

MECHANISM : PROPORTIONAL
ACTION : DIRECT
OUTPUT SIGNAL : 0.2-1 bar OR EQUAL (kPa)

MOUNTING : VALVE OR SURFACE
ITEM : TAG 30PCV 80029

PRESSURE ELEMENT
RANGE : 0-1.4 bar
TYPE : BELLOWS
MATERIAL : STAINLESS STEEL
GAUGES : SUPPLY - OUTPUT

AIR SET : SAMI FR10 GAUGE

APPLICATION : STANDARD
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGELOK (1/4" OD TUBING)
UNCONNECTED FITTINGS : WITHOUT (1/4" NPTF CONNECTIONS)
UNITS : bar g



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04915-04 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE80
DATED : 10-04-02
DATED : 07-10-02

PAGE : V0.004 SPEC 1

ITEM : 18004 QTY : 1 ENGINEER : SL
TAG : 30 PCV 80049 REVISION : 1 26-09-02
MN ITEM : 004 V0

SPECIFICATION SHEET : 21000 REV

MODEL : 87-21014-2S/FR10/4711P/2707
BODY TYPE : GLOBE
NOMINAL SIZE : DN 25 (NPS 1)
FLOW COEFFICIENT : CV 1.3
BODY MATERIAL : CARBON STEEL - ASTM A 216 Gr WCC
CONNECTION TYPE : FLANGED
RATING : ANSI 300
FINISH : RF Ra 3.2-6.3 um
BOLTING : B7-2H
BONNET : STANDARD
PACKING : KEVLAR PTFE

TRIM : ANTICAVITATION (TWO STAGES) LINEAR
PLUG MATERIAL : AISI 410
SEAT TYPE : CLAMPED IN
MATERIAL : AISI 410
CAGE MATERIAL : AISI 410
FLOW DIRECTION : TENDS TO OPEN
LEAKAGE : CLASS IV (IEC 534-4)

ACTUATOR : MULTI-SPRING AND DIAPHRAGM
SIZE : 6
FAILURE POSITION : OPENED
BENCH RANGE : 3-15
AIR SUPPLY : 25 psi - 180 kPa - 1.8 bar
YOKE : STD
HANDWHEEL : WITHOUT
MAX SHUT OFF DELTA P : 39 bar
AIR SET : SAMI FR10 GAUGE
POSITIONER : 4711P
INPUT SIGNAL : 3-15 psi OR EQUAL (bar, kPa)
OPERATING RANGE : 0-100 %
ACTION - CAM CHARACT. : DIRECT - LINEAR
GAUGES : SUPPLY - SIGNAL - OUTPUT
MATERIAL GAUGES : STD
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGelok (1/4" OD TUBING)
UNITS : bar g
OTHER MOUNTED ACCESSORIES : PRESSURE CONTROLLER MODEL 2707
PAINTING : OTA 1858E



Flow Control

Masoneilan

CUSTOMER : TECHNIP
CUST. ORDER : 6465C30 1541 01 0 10007
SERIAL Nr : 2-04915-04 REVISION : 0
PROJECT : BANDAR ASALUYE 9TH OLEFIN COMP

PROPOSAL : 90LE80
DATED : 10-04-02
DATED : 07-10-02

PAGE : V1.004 SPEC 1

ITEM : 18004 QTY : 1 ENGINEER : SL
TAG : 30 PCV 80049 REVISION : 0 26-09-02
MN ITEM : 004 V1

SPECIFICATION SHEET : CONTROLLER REV

MODEL : 2707-S/FR10

MECHANISM : PROPORTIONAL
ACTION : DIRECT
OUTPUT SIGNAL : 0.2-1 bar OR EQUAL (kPa)

MOUNTING : VALVE OR SURFACE
ITEM : TAG 30PCV 80049

PRESSURE ELEMENT
RANGE : 0-1.4 bar
TYPE : BELLOWS
MATERIAL : STAINLESS STEEL
GAUGES : SUPPLY - OUTPUT

AIR SET : SAMI FR10 GAUGE

APPLICATION : STANDARD
SERIAL PLATE LANGUAGE : ENGLISH
TUBING MATERIAL : STAINLESS STEEL
FITTINGS : SWAGelok (1/4" OD TUBING)
UNCONNECTED FITTINGS : WITHOUT (1/4" NPTF CONNECTIONS)
UNITS : bar g

PART 3

INSTRUCTION NOTICES SUMMARY

	Title / description	Instruction n°
1	21000 Series Control Valves Instructions	EH 10204 E
2	Cage-type Control Valves 41005 Series	EH 3600 E
3	VariPak-28000 Series A Microflow Valve with Actuator Having a Built-in Cv adjuster Instructions	EH 45004 E
4	Series 35002 Camflex II Valve Instructions	EF 50004 E
5	Varimax™ 30000 Series Control Valve	EN 3000
6	Types 78100 Special Control Valves Instructions	181932 E
7	87/88 Series Spring Diaphragm Actuator Instructions	ER 8788 E
8	Spring-Diaphragm Actuator Instructions	ER30004 E
9	10900 Series Actuators For use with 500 Regulators Instructions	176420 E
10	Models 496-4 and 496-5 Rotary position detectors Instructions	ES70054 E
11	Model BR400 Booster Relay	ES0400
12	535 V Reducing and 535 V-50 Differential Pressure Regulators Instructions	176419 E
13	536V Back Pressure Microflow Regulators Instructions	182037 E
14	77-6 Air Lock-up Valve Instructions	EY 7725 E
15	FVP FIELDBUS Valve Positioner	EW4000
16	NELDISC Metal seated butterfly valves Series L1 and L2	2 L1 71
17	METAL SEATED NELDISC BUTTERFLY VALVES Series LW, LG, DIN rated	2 LW 70
18	PNEUMATIC CYLINDER ACTUATORS Series BJ and BIJ	6 BJ 71
19	LIMIT SWITCHES Series NI700	7 NI 72
20	Paramax™ Series 36004 Control Ball Valve Instructions	EM6004
21	NORGREN HERION	24011
22	ACTUATOR TYPE L 300 SR(f) / 76 SPRING RETURN (Fail Close)	A 182 - 1
23	AIR FILTER REGULATOR TYPE FR 10	SAMI
24	LOW POWER SOLEINOID VALVES Series 317	ASCO
25	INTELLIGENT POSITIONER TZID-C	42/18-64 EN

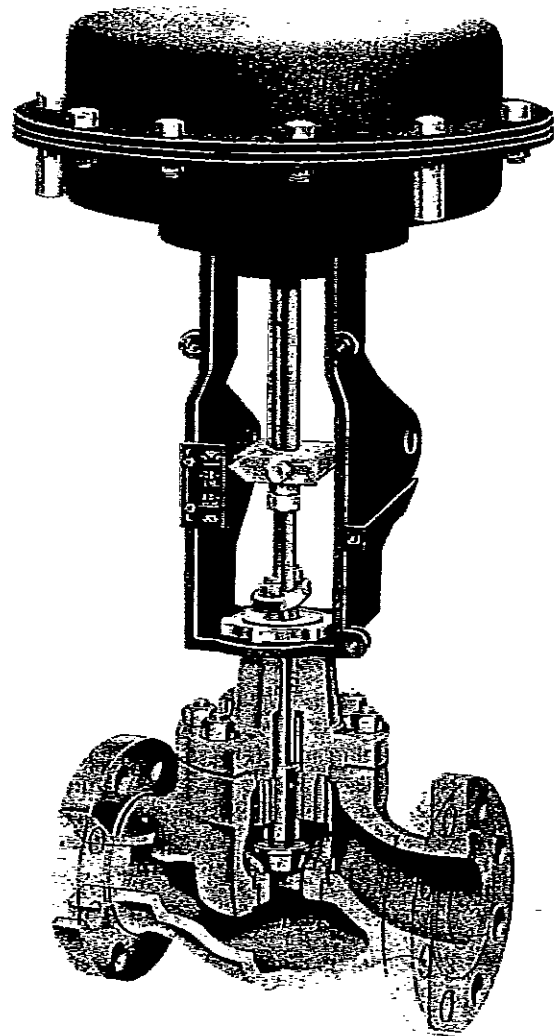
21000 Series Control Valves Instructions

MASONEILAN®

21000 Series Control Valves

Instructions

Instruction
No EH 10204 E
Rév. B - 03/98



INSTRUCTION MANUAL

MASONEILAN



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1. Introduction

The following instructions should be thoroughly reviewed and understood prior to installing, operating or performing maintenance on this equipment. Throughout the text, safety and/or caution notes will appear and must be strictly adhered to, otherwise, serious injury or equipment malfunction could result.

Masoneilan has a highly skilled After Sales Department available for start-up, maintenance and repair of our valves and component parts.

Arrangements for this service can be made through your local Masoneilan Representative or After Sales Department. When performing maintenance use only Masoneilan replacement parts. Parts are obtainable through your local Masoneilan Representative or Spare Parts Department. When ordering parts always include Model and Serial Number of the unit being repaired.

2. General

These installation and maintenance instructions apply to all sizes and ratings of the Masoneilan 21000 Series control valves regardless of the type of trim used.

21000 Series single ported top guided control valves are designed with built in versatility making them well-suited to handle a wide variety of process applications.

Standard construction offers a contoured plug (21100 Series) with a threaded seat ring or a quick change seat ring. The heavy top plug guiding provides maximum support to ensure plug stability.

A series of reduced area trim is available to provide wide flow range capabilities in all valve sizes.

Tight Shutoff Class IV leakage is standard. Optional constructions (one of which is the 21600 Series soft seat

plug) meet IEC 534-4 and ANSI/FCI 70.2 Class V and VI requirements.

An optional Low Emission LE Packing is available to assure compliance with the fugitive emission containment requests.

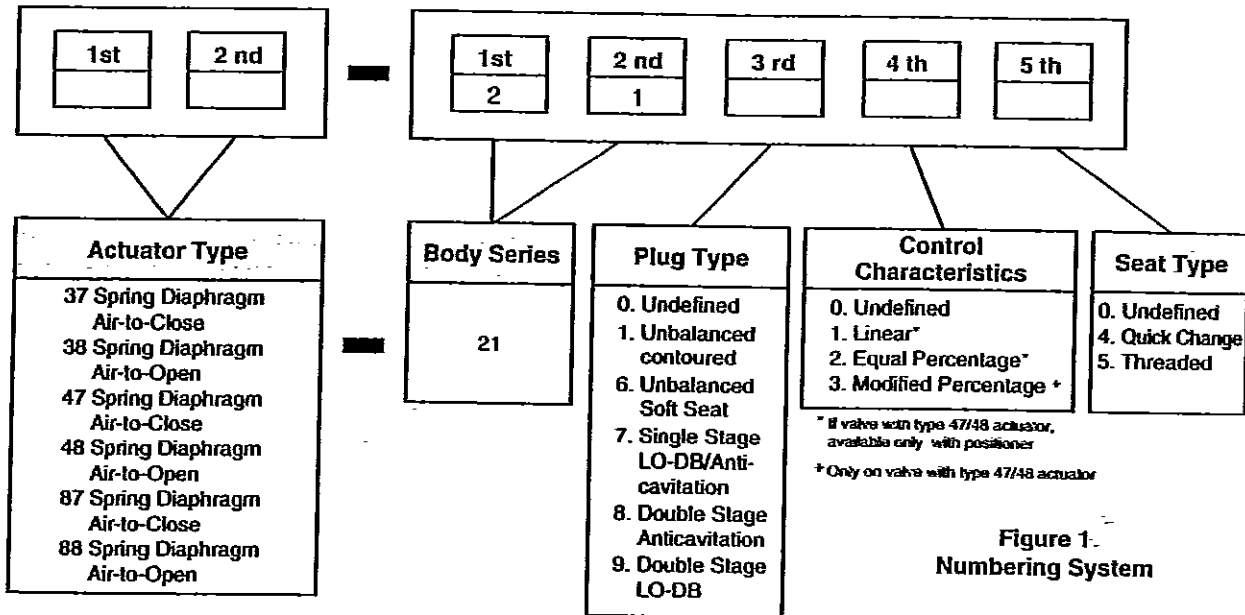
Replacing the conventional plug with the single stage LO-DB design (21700 Series) provides excellent noise attenuation or cavitation control.

The 21800 Series double stage anticavitation valve is derived from the 21700 single stage anticavitation valve through a modification to the cage and plug. Substitution of the standard cage with an anticavitation cage permits the pressure drop to be split between the two stages efficiently.

The 21900 Series double stage LO-DB valve is also derived from the 21700 single stage LO-DB valve through a modification to the cage and plug. Substitution of the standard cage, with a LO-DB cage permits the pressure drop to be split between the two stages efficiently.

In 21800/900 Series designs, enlargement of the plug head up to the cage diameter permits simultaneous throttling of the plug C_v and the cage C_v . It also provides optimum allocation of the pressure drop between the two stages along the entire plug travel.

Recommended spare parts required for maintenance are listed in Parts Reference on page 14. The model number, size, rating and serial number of the valve are shown on the identification tag located on the actuator. Refer to Figures 1 for 21000 series numbering system.



3. Unpacking

Care must be exercised when unpacking the valve to prevent damage to the accessories and component parts. Should any problems arise, contact the local Masoneilan Representative or After Sales Department.

4. Installation

4.1 Before installing the valve in the line, clean piping and valve of all foreign material such as welding chips, scale, oil, grease or dirt. Gasket surfaces should be thoroughly cleaned to insure leak-proof joints.

4.2 To allow for in-line inspection, maintenance or removal of the valve without service interruption, provide a manually operated stop valve on each side of the 21000 Series valve with a manually operated throttling valve mounted in the by-pass line. (See Figure 2).

4.3 The valve must be installed so that the controlled substance will flow through the valve in the direction indicated by the flow arrow located on the body.

- With contoured plug (21100/600) or LO-DB plug (21700/900) :flow-to-open
- On anticavitation design (21700/800) :flow-to-close

4.4. In case of a heat-insulated installation, *do not insulate the valve bonnet* and take protection measures related to personal safety.

5. Air Piping

The actuators are designed to accept 1/4" NPT air supply piping. Use 1/4" OD tubing (4 x 6 mm) or equivalent for all air lines. If the supply air line exceeds 25 feet in length (7 meters) or if the valve is equipped with volume boosters, 3/8" tubing (6 x 8 mm) is preferred. All connections must be free of leaks.

Caution : Do not exceed supply pressure indicated on serial plate on the yoke of actuator.

6. Body Disassembly

Access to the internal components of the body should be accomplished with the actuator removed. To remove the actuator from the body, refer to the actuator instruction No ER8788E for a type 87/88 multispring actuator, No ER20004E for a type 47/48 ΣF actuator, or to Section 9.3.1 of this manual in case of a 37/38 spring diaphragm actuator.

Caution: Prior to performing maintenance on the valve, isolate the valve and vent the process pressure. Shut off the supply air line and pneumatic or electric signal line.

6.1 Threaded Trim (Figure 12 or 14)

After removing the actuator, disassemble the body using the following procedure:

- If a leak detection circuit is connected on the lateral NPT port of the bonnet, disconnect the pipe from this one.
- Remove body stud nuts (10).
- Remove bonnet (8), plug stem (1) and plug (16) together as one unit.

Note: Spiral wound body gaskets (11) are standard in the 21000 Series design and it is imperative that a new gasket be installed each time the valve is disassembled.

- Remove packing flange stud nuts (3), packing flange (4) and packing follower (5).
- Remove plug (16) and plug stem (1) from the bonnet (8).

Caution: Care must be taken to avoid damage to the plug and plug guide.

F. Remove old packing (6) [and optional lantern ring (7) if a leak detection circuit has been installed]. Refer to Figure 5.

G. Bonnet (8), plug (16), bushing (12) and seat ring (14) may now be inspected for wear and service damage. After determining the maintenance required, proceed to the appropriate Section of these instructions.

6.2 Quick-Change Trim (Figure 13 or 15)

After removing the actuator, disassemble the body using the following procedure:

A. If a leak detection circuit is connected on the lateral NPT port of the bonnet, disconnect the pipe from this one.

B. Remove body stud nuts (10).

C. Remove bonnet (8), plug stem (1) and plug (16) together as one unit.

D. Since the cage (13), seat ring (14) and seat ring gasket (15) are held in place by the bonnet, they may now be removed.

Note: In case of a 900-1500-2500 ANSI Class valve, a gasket (15) is provided between the cage (13) and the bonnet (8). See Figure 16.

Note: Spiral wound gaskets (11 & 15) are standard in the 21000 Series design and it is imperative that new gaskets be installed each time the valve is disassembled.

E. Remove packing flange stud nuts (3), packing flange (4) and packing follower (5).

F. Remove plug (16) and plug stem (1) from the bonnet (8).

Caution: Care must be taken to avoid damage to the plug and plug guide.

G. Remove old packing (6) [and optional lantern ring (7) if a leak detection circuit has been installed]. Refer to Figure 5.

H. All components may now be inspected for wear and service damage. After determining the maintenance required, proceed to the appropriate Section of this instruction manual.

7. Maintenance/Repair

The purpose of this section is to assist maintenance personnel by suggesting methods of component maintenance which is largely dependent on the tools and machine shop equipment available.

7.1 Threaded Seat Ring Removal (Figure 12 or 14)

Threaded seat rings (14) are installed tightly at the point of manufacture and after years of service, they are often difficult to remove.

To facilitate removal, seat ring wrenches can be fabricated to engage the seat ring lugs and adapted to a shock wrench. If the ring is exceptionally resistant to removal, the application of heat or penetrating oil should be helpful.

Caution: When using heating devices, insure that proper safety practices are observed. Such items as the flammability and toxicity of the controlled substance must be considered and proper precautions taken.

7.2 Bushing Removal

The bushing (12) is a press fit into the bonnet and does not normally require replacement. If necessary, it may be pulled or machined out. When machining the bushing out, care must be taken to maintain proper dimensions and tolerances. These will be furnished upon request.

7.3 Lapping Seats

Lapping is the process of working the valve plug against the seat ring, with an abrasive, to produce a close fit. When valve leakage becomes excessive, lapping becomes necessary. The plug and seat ring seating surfaces should be free of large scratches or dents and the contact surfaces of the seats should be as narrow as possible. This may require dressing both parts in a lathe. The seating surface of the plug is 28 degrees and that of the seat ring is 30 degrees (relative to the centerline axis). For the lapping operation, a good grade of fine grinding compound is required.

The compound should be mixed with a small quantity of lubricant such as graphite. This will slow the cutting rate and prevent tearing of the seating surfaces. The amount of lapping required depends on the materials, condition of seating surfaces and accuracy of machining. If a short period of lapping does not visibly improve seating, there is usually no advantage in continuing as too much lapping may result in rough seats. The only remedy is replacement or re-machining of one or both parts. When lapping new plug and seat ring, begin with medium compound and finish with fine.

Caution: Before lapping, plug and stem must be true. (See pinning operation, item 7.5).

7.3.A Threaded Trim (Figure 12 or 14)

(1) Clean body gasket surface areas.

(2) When seat has been removed, insure that the sealing surface in the body bridge and the threads are thoroughly cleaned.

Note: A sealant compatible with the process should be applied sparingly to the seat ring threads and sealing shoulder.

(3) Install and tighten seat ring using fabricated wrench used for removal.

Caution: Do not over-tighten. Do not strike directly seat ring lugs. This could distort the seat ring resulting in unwarranted seat leakage.

(4) Apply lapping compound at several spots equally spaced around the seating area of the plug.

(5) Insert the stem and plug assembly carefully into the body until it is seated.

(6) Place bonnet (8) on the body and fasten the bonnet to the body using four body stud nuts (10), spaced equally apart, apply slight pressure and tighten evenly.

Caution: Do not tighten nuts to torque specifications at this time. The bonnet is used temporarily for guiding purposes only.

(7) Insert two or three pieces of packing (6) into the packing box to assist in guiding the stem and plug during lapping.

(8) Screw a drilled and tapped rod with a T-handle on to the plug stem and secure with a locknut. (See Figure 4).

Note: As an alternative, drill a hole through a flat piece of steel and fasten to the plug stem using two locknuts.

(9) Applying a slight pressure on the stem, rotate the stem in short oscillating strokes, 8 to 10 times. Repeat this step as necessary.

Note: The plug should be lifted and turned 90° between repeating Step (9). This intermittent lifting is required to keep the plug and seat ring concentric during lapping.

(10) After completion of the lapping operation, remove bonnet and plug. The seat area of the seat ring and the plug must be cleaned of all lapping compound in preparation for reassembly. Don't remove seat ring.

7.3.B Quick-Change Trim (Figure 13 or 15)

(1) Clean body gasket surface areas.

(2) Install a new seat ring gasket (15) and insert seat ring (14) in the body.

Note: Gasket (15) is temporarily placed to hold the seat ring during lapping.

It is imperative to use a new gasket or a false part having the same geometrical characteristics in order to insure the correct position of the seat ring during lapping.

This gasket (or similar part) can be kept after lapping for future use.

The gasket used for lapping must not be reused for the body reassembly.

(3) Apply grinding compound at several spots equally spaced around the seating area of the seat ring.

(4) Insert the cage (13) into the body.

(5) Insert the stem and plug assembly carefully into the body until it is seated.

(6) Place bonnet (8) on the body.

Caution: Insure that the seat ring (14), cage (13) and bonnet (8) are properly aligned.

(7) Fasten the bonnet to the body using four body stud nuts (10), spaced equally apart, apply slight pressure and tighten evenly.

Caution: Do not tighten nuts to torque specifications at this time. The bonnet is used temporarily for guiding purposes only.

(8) Insert two or three pieces of packing into the packing box to assist in guiding the stem and plug during lapping.

(9) Screw a drilled and tapped rod with a T-handle on to the plug stem and secure with a locknut. (See Figure 4).

Note: As an alternative, drill a hole through a flat piece of steel and fasten to the plug stem using two locknuts.

(10) Applying a slight pressure on the stem, rotate the stem in short oscillating strokes 8 to 10 times. Repeat this step as necessary.

Note: The plug should be lifted and turned 90° between repeating Step (10). This intermittent lifting is required to keep the plug and seat ring concentric during lapping.

(11) After completion of the lapping operation, remove bonnet and internal parts. The seat area of the seat ring and the plug must be cleaned of all lapping compound in preparation for reassembly.

7.4 LO-DB Plug (Figure 8, 14 or 15)

The procedures used for performing maintenance on a valve equipped with LO-DB plug (21700/800/900 Series) are the same as those used for Threaded or Quick Change Trim.

Caution: Maintenance of the plug should be limited to cleaning of the ports and the maintenance or machining which may be required under Section 7.3, Lapping and 7.5, Pinning.

7.5 Plug Stem Pinning

Plug stem pinning during field assembly may be divided into two parts:

- Replacing old plug and old stem,
- Replacing only old stem,

Replacing Plug and Stem

If it is necessary to replace the plug, then the plug stem must be replaced at the same time. The original pin hole in an old stem will not provide satisfactory results and might seriously impair strength of the assembly.

A. Reference Marking on the Plug Stem

Measure the depth of the pilot recess in the plug (X in Figure 9) and make a reference mark to the plug stem at the same distance, from the thread.

Note: While pinning is being performed, care must be taken not to damage the seating surface or plug guide. Always use a soft metal or plastic vise jaws with a cylindrical machining to hold the plug guide area (see Figure 9).

B. Screwing Stem into Plug

- Hold the plug guide in a vise.
- Lock one nut against another one to the end of the new plug stem and, using a wrench on the upper nut, screw the stem *solidly* into the plug.

When properly assembled, the reference mark (see section A above) should be flush with the end of the guide section.

C. Drilling the New Parts

- If the plug is already full drilled, (in case of 440 C stainless steel, hardened material or solid stellite), then drill the stem to the same diameter as the plug skank hole.

- If the plug guide area has a center mark,

Place the plug guide on a V-block and, using a size of drill bit suitable to either,

- match the hole size in the plug, or
- match the "C" diameter (see Figure 9),

drill the plug-stem assembly.

- If the plug guide area does not have any hole or any center mark,

- Measure the "D" dimension according to plug guide diameter and stem diameter, (see Figure 9).

- Place the plug guide on a V-block and, by means of a center punch, make a center mark on the plug guide area.

- Using a suitable size drill bit, drill the plug-stem assembly.

In all cases: After drilling, remove any burrs from the plug guide by making a slight chamfer.

D. Pinning the Plug-Stem Assembly

1. Select the correct size pin according to plug guide diameter and stem diameter (see Figure 9). Apply a small amount of grease on it, and hand place the pin to the hole inlet.
2. By means of an hammer, introduce the pin into the hole. Complete the pinning operation, taking care to ensure that the pin is recessed by the same amount at both sides, (see Figure 9).
3. After the plug has been pinned, it should be placed in a lathe to insure it is running "true."

The stem should be placed in a collet with the plug guide against it and the plug should be struck. Alignment of plug stem can be performed by means of a soft faced mallet.

Replacing Only Old Stem

A. Removing Old Pin and Stem From the Plug

1. Place the plug guide on a V-block, and using a drift punch, drive out the old pin.

Note: If it is necessary to drill out the pin, a drill bit somewhat smaller than the pin should be used and the remainder of the pin driven out.

2. Hold the plug guide in a vise, (see bordered note in the above paragraph A).
3. Lock one nut against another at the end of the plug stem. Using a wrench on the lower nut, unscrew the stem from the plug. The stem is removed by turning it anti-clockwise.

B. Screwing Stem to Plug

Refer to paragraph B of the above chapter "REPLACING PLUG AND STEM".

C. Drilling the New Stem

Place the plug guide on a V-block and, using a suitable size drill bit, drill the stem using the hole in the plug as a guide.

Note: If the hole in the plug guide has been slightly damaged while removing of the old pin, choose a drill bit and a pin with a diameter somewhat larger than the normal pin.

D. Pinning

Select the correct size pin according to the plug guide diameter and pin hole diameter. Proceed as described in part D of the previous section, taking care not to damage the plug guide area.

Ensure plug stem alignment following pinning operation.

7.6 Packing Box (Figures 12 to 15)

Packing box maintenance is one of the principle action items of routine servicing. Tightness of the packing is maintained by packing compression. Compression is achieved by *evenly* tightening the packing flange nuts (3) against the packing flange (4). Care must be taken not to over tighten as this could prevent smooth operation of the valve. If all compression is used up and the valve leaks, new packing is required.

Caution: Valve must be isolated and the pressure vented before performing packing box maintenance.

Proceed as follows:

7.6.1 Kevlar/PTFE Rings (Standard) (Figures 12 to 15)

Note: The Kevlar/PTFE packing rings have a skive cut allowing packing replacement without disconnect the plug stem from actuator connector or actuator stem.

- A. Loosen and remove packing flange nuts (3).

B. Raise packing flange (4), and packing follower (5) up the valve stem.

Note: They may be taped in place to keep them out of the way before proceeding.

C. By means of a hook remove packing (6), insuring not to damage the sealing surface of packing box or plug stem.

Note: On valve equipped with an optional leak detection connection, the lantern ring (7) must also be removed.

D. Replace packing rings (6).

Note: Cram rings one by one into packing box. The skive cut of each packing ring must be placed about 120 degrees apart.

Note: On valves equipped with an optional leak detection connection, refer to Figure 10 for correct amount of rings to place under the lantern ring (7).

E. Replace packing follower (5) and packing flange (4).

F. Replace and tighten packing stud nuts (3).

Caution: Do not overtighten.

G. Put valve back in service and tighten packing only as much as is necessary to stop leaking.

Note: In an emergency, string packing may be used as a temporary repair only. It must be replaced with the correct packing as soon as possible.

7.6.2 Expanded Graphite Rings (Optional) (Figure 6)

Note: Expanded graphite packing rings replacement requires disconnecting the plug stem from the actuator connector or actuator stem and removal of the actuator.

A. Remove actuator from the body S/A. Refer to actuator instruction No ER8788E for a type 87/88 actuator and No ER20004E for a Type 47/48 Σ F Actuator. Refer to Section 9.3.1 Actuator Removal in this instruction for a Type 37/38 Spring Diaphragm Actuator.

B. Loosen and remove packing flange nuts (3).

C. Remove packing flange (4), and packing follower (5) from the plug stem.

D. By means of a hook remove packing (6), insuring not to damage the sealing surface of packing box or plug stem.

Note: On valve equipped with an optional leak detection connection, the lantern ring (7) must also be removed.

E. Replace new packing set (6); first one back-up ring (Carbon/Graphite/Inconel braided ring), then expanded graphite rings (smooth rings), and finally another braided back-up ring. (Refer to Figure 6).

Note: Cram rings one by one into packing box.

Note: On valve equipped with an optional leak detection connection, refer to Figure 10 for correct arrangement according to valve size.

F. Place packing follower (5) and packing flange (4).

G. Assemble and tighten packing stud nuts (3).

Caution: Do not overtighten.

H. Proceed to appropriate instructions for actuator and valve assembly adjustment.

I. Place valve back in service and tighten packing only as much as is necessary to stop leaking.

7.6.3 (Low Emission) PACKING™ (Optional) (Figure 7)

The Masoneilan LE Packing is a high performance packing system capable of containing fugitive emissions well below the specifications of the most severe recommendations. It is also available in a firesafe design.

The packing is provided as a set of five pieces. It consists of two adapter rings and three V-rings, an alternating pattern of Perfluoroelastomer (PFE) and long carbon fiber filled Teflon (PTFE) V-rings are used.

This packing, applied properly, exhibits very little cold flow (or creep). Consequently, it can prevent the major cause of fugitive emissions from a control valve. The LE Packing system can directly replace conventional packing, requiring no modification to the control valve or actuator.

A spring loaded, two-piece follower assembly is used to maintain a constant load on the packing, and is necessary for thermal cycling applications. As the definition of thermal cycling can vary, and processes are potentially subject to unpredicted thermal gradient, LE Packing is only available with the spring loaded follower.

Installation should be performed as detailed in the following paragraphs

7.6.3.1. Preparation

7.6.3.1.1 Stem

Inspect stem for any nicks or scratches and quality of finish. Reject the stem for any of these reasons as they may damage packing.

Note: A properly etched part number on the stem in the packing area will have no adverse effect on the performance of the packing.

Stem finish should be 3-7 AARH finish degree, (Ra 0,1/0,2).

7.6.3.1.2 Packing Box

Note: Bonnets that have a leak detection hole or lube hole are unacceptable for use with the preferred packing arrangement shown in Figure 7.

Packing box should be clean and free of burrs, rust and any foreign matter. Parts can be cleaned with denatured alcohol.

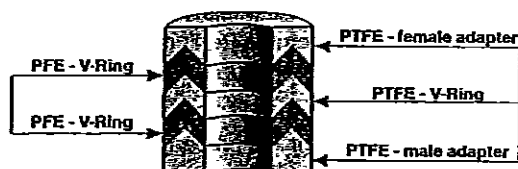
Note: Packing box finish should be conform to 125 AARH finish degree (Ra 3,2), or better.

The packing box may be bored or honed oversize by up to 0,38 mm (0.015") above the nominal diameter to improve the finish. For instance, a nominal 22,22 mm (0.875") packing box may be bored or honed up to 22,60 mm (0.890") and the LE Packing will still seal properly.

Packing box must be finished to the bottom of the bore.

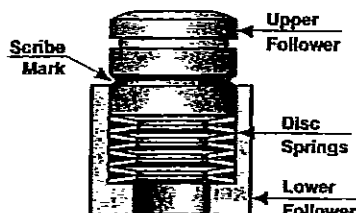
7.6.3.1.3 Packing

Inspect packing rings. Do not use packing if any nicks or scratches on packing are observed. Check packing and ensure that it is in the proper arrangement (see Figure below). PFE material can be identified by the gloss black molded finish. PTFE material has a dull black machined finish.



7.6.3.1.4 Spring Loaded Follower

The spring loaded follower consists of an upper and lower follower and eight (8) disc springs (see Figure below). The springs are installed inside the lower follower and positioned alternately. The assembly is held together by tape, which must be removed before installation.



7.6.3.2 Packing Installation

- The packing must be lubricated with Krytox[®] fluorinated grease prior to installation (Krytox GPL206 or equivalent).
- Packing should be lubricated as a set (not individually) to minimize getting lubricant into the V's of the packing.
- Packing will be lubricated with a generous application to the O.D. and I.D. of the packing.
Note: All exposed surfaces of the packing set must be covered with the lubricant.

- PFE/PTFE is to be installed as a set. Carefully slide the packing set down the stem. Do not cock or force the packing on the threads.

If packing set separates while on the stem, do not remove. To put the set back together, continue installing the remaining pieces.

- Gently press the packing into the packing box. Do not tap the packing down into the box.
- The spring loaded follower is installed on top of the packing. This follower is installed as an assembly held together by tape. This tape should be removed after assembly. Proper assembly of the packing box will leave the top of the Lower Follower 6 to 13 mm (0.25 - 0.50 inches) above the bonnet.

A groove is scribed into the O.D. of the upper follower. The packing flange is tightened evenly until the top of the Lower Follower aligns even with the groove in the Upper Follower.

Note: This is the optimum loading for this packing. Further tightening will shorten life of the packing. Thread locking compound can be used on packing nuts.

- The packing should be checked for leakage.
- Packing load should be checked after the valve has cycled approximately 500 times. Adjust if necessary. No further adjustment should be required for the life of the packing.

7.7 Soft Seat Plug (Figure 3)

The soft seat plug used in the 21000 Series valve has a replaceable insert. To remove and replace the insert, proceed as follows.

Caution: The shank OD is the plug guide. Extreme care must be taken to prevent scoring or marring this surface. Failure to do so could result in damage to the guide bushing and destruction of the plug.

- Loosen set screw until the head of the set screw is flush with the OD of the shank.

Note: On 3/4"- 2" valve, the plug tip has a machined groove into which a bar can be inserted for removal. On 3"- 8" valves, the plug tip has two machined holes into which a tool, (fabricated with appropriate size pins), can be inserted for removal.

- Carefully place plug sub-assembly into a soft jaw vice, holding the plug by the flats provided on the upper end of the shank.

Caution: When using a vise to hold the shank, extreme care must be taken not to damage the plug shank.

- Using the appropriate tool, unscrew plug tip (counter-clockwise) from the shank sub - assembly.
- Remove insert O-ring (3"- 8" only) and insert retainer (3"- 8" only) and discard old insert and O-ring.
- Thoroughly clean all remaining metallic components and install new insert and O-ring as follows, (according to valve size):

For 3/4" - 2" valves :

- a. Place new insert on shank and insert retainer as shown in Figure 3.
- b. Install plug tip into shank sub-assembly hand tighten and insure plug tip seats evenly against insert.

For 3" - 8" valves :

- a. Apply a light coat of lubricant to the O-ring and install on insert retainer.

Caution: Insure any lubricant used is compatible with service conditions.

- b. Install new insert on insert retainer, assembling as shown in Figure 3.
 - c. Install plug tip into insert retainer sub - assembly insuring the plug tip seats evenly on the insert.
- F. Carefully place the plug sub-assembly into a soft jaw vise, holding the plug by the flats provided on the upper end of the shank.

Caution: When using a vise to hold the shank, extreme care must be taken not to damage the plug shank.

- G. Using the appropriate tool used during disassembly, firmly tighten the plug tip.

Caution: The plug tip must be tightened, allowed to set for approximately 4 hours, re-tightened, allowed to set for 4 hours, then tightened one more time. The aim for this tightening sequence is to allow the insert material to "cold flow" into place on the plug sub-assembly.

- H. After following the above tightening sequence, securely tighten set screw. Plug is ready for assembly into a valve.

8. Valve Body Reassembly

After completion of the required maintenance the valve should be reassembled using the following procedures :

Note: If any of the following steps were completed during maintenance, proceed to the next step.

8.1 Threaded Trim (Figure 12 or 14)

- A. Clean all gasketed surfaces.
- B. Apply a small amount of sealant to the seat ring threads and sealing shoulder and install.

Note: A sealant compatible with the process should be applied sparingly.

- C. Install and tighten seat ring using wrench used for removal.

Caution: Do not over-tighten. Do not strike seat ring lugs directly. This could distort the seat ring resulting in unwarranted seat leakage.

Note: Valve should be lapped before final assembly. See Section 7.3.A.

- D. Carefully install plug and stem assembly.

- E. Install body gasket (11).

Note: Spiral wound body gaskets (11) are standard in the 21000 Series design and it is imperative that a new gasket be installed each time the valve is disassembled.

- F. Install bonnet (8) and body stud nuts (10). Bonnet must be positioned so the packing flange studs are at a right angle to the flow center line.

Caution: Tighten nuts (10) until metal to metal contact is obtained with proper bolt torque. Refer to Figure 11 for proper bolt torque and tightening sequence specifications.

- G. Insert packing (6) [and lantern ring (7) on valve equipped with an optional leak detection connection]. Refer to Section 7.6 to apply proper order and procedure for packing box filling (standard or optional design).

- H. Install packing follower (5), and packing flange (4).

- I. Install packing flange stud nuts (3).

Caution: Do not overtighten (See Section 7.6 "Packing Box").

- J. If a leak detection circuit was installed, connect it on the lateral NPT port of the bonnet. If not, insure that the 1/4" NPT plug is remained in place. (Figure 5).

- K. For actuator to body assembly and plug stem adjustment, proceed to the actuator instruction No ER8788E for a type 87/88 actuator, No ER20004E for a type 47/48 Σ F actuator, or to Section 9.3.2 of this manual for a 37/38 spring diaphragm actuator.

8.2 Quick-Change Trim (Figure 13 or 15)

- A. Clean all gasketed surfaces.

- B. Install seat ring gasket (15) and seat ring (14).

Note: Spiral wound gaskets (11 & 15) are standard in the 21000 Series design and it is imperative that a new gasket be installed each time the valve is disassembled.

- C. Install cage (13).

- D. Carefully install plug and stem assembly.

Note: Valve should be lapped before final assembly. See Section 7.3.B.

- E. Install body gasket (11).

Note: In case of a 900-1500-2500 ANSI Class valves, a gasket (15) is provided between the cage (13) and the bonnet (9). See Figure 16.

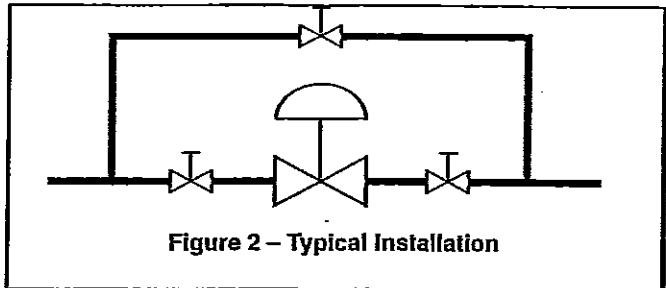


Figure 2 - Typical Installation

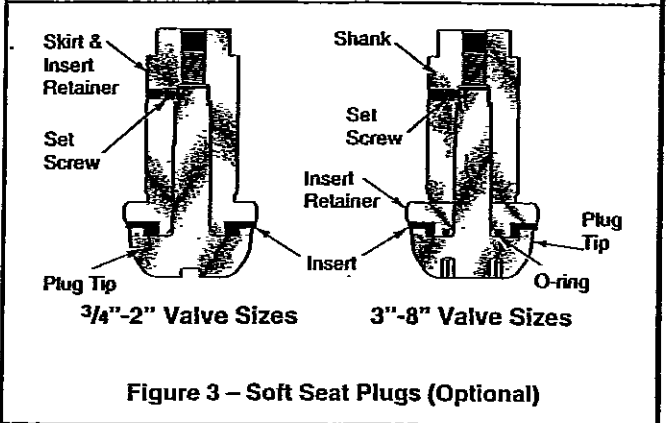


Figure 3 - Soft Seat Plugs (Optional)

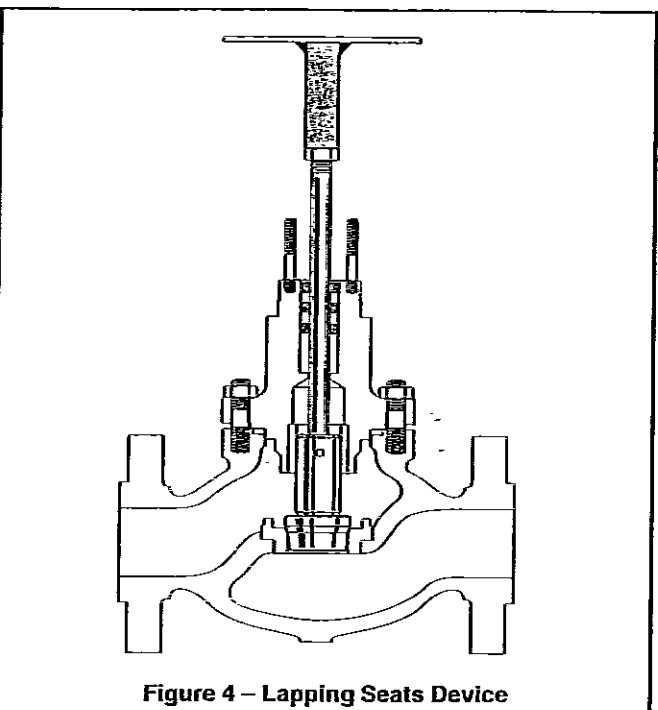


Figure 4 - Lapping Seats Device

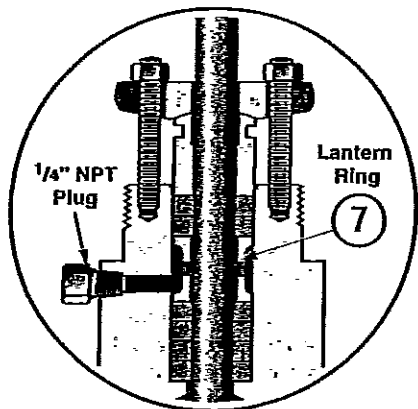


Figure 5 - Leak Detection Connection (Optional)

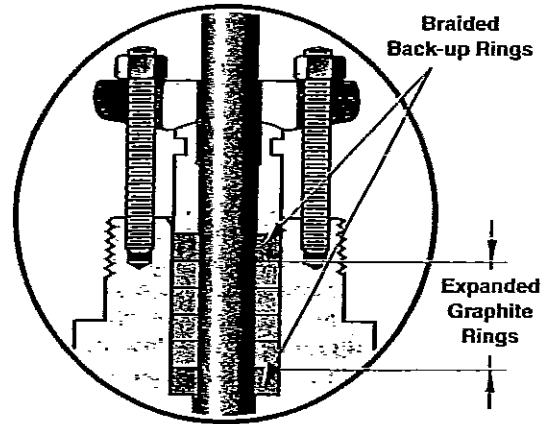


Figure 6 - Expanded Graphite Rings Arrangement (Optional)

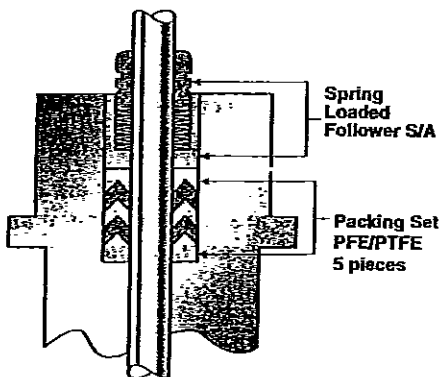


Figure 7
 LE (Low Emission) Packing Arrangement (Optional)

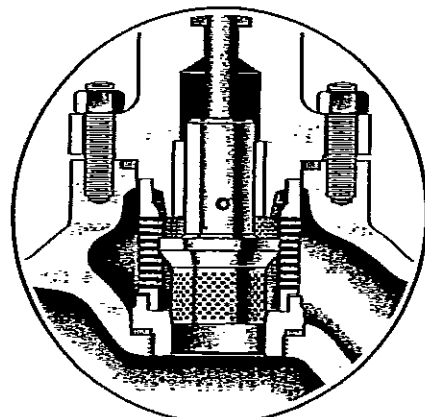


Figure 8
 LO-DB (Type 21900) and Anticavitation (Type 21800)
 Two-Stages Trim (Optional)

F. Install bonnet (8) and body stud nuts (10) and tighten. Bonnet must be positioned so the packing flange studs are at a right angle to the flow center line.

Caution: Care must be taken to assure that the cage, seat and bonnet are properly aligned in the body. Tighten nuts (10) until metal to metal contact is obtained with proper bolt torque. Refer to Figure 11 for proper bolt torque and tightening sequence specifications.

G. Insert packing (6) [and lantern ring (7) on valve equipped with an optional leak detection connection]. Refer to Section 7.6 to apply proper order and procedure for packing box filling (standard or optional design).

H. Install packing follower (5) and packing flange (4).

I. Install packing flange stud nuts (3).

Caution: Do not overtighten (See Section "7.6. Packing Box").

J. If a leak detection circuit was installed, connect it on the lateral NPT port of the bonnet. If not, insure that the 1/4" NPT plug is remained in place. (Figure 5).

K. For actuator to body assembly and plug stem adjustment, proceed to the actuator instruction No ER8788E for a type 87/88 multispring actuator, No ER20004E for a type 47/48 Σ F actuator, or to Section 9.3.2 of this manual for a 37/38 spring diaphragm actuator.

9. Actuators

9.1 Types 87/88 Actuators

Refer to Instruction No ER 8788 E for removal, maintenance, assembly and adjustment.

9.2 Types 47/48 Σ F Actuators

Refer to Instruction No ER 20004 E for removal, maintenance, assembly and adjustment.

9.3 Types 37/38 Actuators (Figure 17)

Refer to Instruction No ER 30004 E for the maintenance. For removal, assembly and adjustment, see the below Sections.

9.3.1 Actuator Removal.

Sizes No 9, 11 & 13

Air-to-Extend Actuator (Type 37)

1. Shut off air supply pressure and disconnect air lines at the actuator. Loosen stem locknuts (22), turn them down to the threaded end of plug stem (1) and lock. For a size No 13, disengage the locking plate (55) from actuator stem (26).

2. By means of a wrench applied over the locknuts, turn the plug stem (1) out of actuator stem (26).

Note: In case of lower plug stroke, [during this operation and after removing drive nut (19)], it may be necessary to lift the actuator while unscrewing plug stem, because the length engaged into actuator stem is larger than the valve stroke.

Caution: Do not allow the plug to turn on the seat during this operation.

3. After the plug stem is unscrewed and actuator removed, remove locking plate (55), locknuts (22) and travel indicator (23) from the plug stem.

Air-to-Retract Actuator (Type 38)

1. Retract actuator stem (26) and plug by applying air pressure. Loosen stem locknuts (22), turn them down until threaded end of plug stem (1) and lock. For a size No 13, disengage the locking plate (55) from actuator stem (26).

2. By means of a wrench applied over the locknuts, turn the plug stem (1) out of actuator stem (26).

Note: In case of lower plug stroke, [during this operation and after removing drive nut (19)], it may be necessary to lift the actuator while unscrewing plug stem, because the length engaged into actuator stem is larger than the valve stroke.

Caution: Do not allow the plug to turn on the seat during this operation.

3. After the plug stem is unscrewed and actuator removed, remove locking plate (55), locknuts (22) and travel indicator (23) from the plug stem. Shut off air pressure and disconnect air lines at the actuator.

Sizes No 15, 18 & 18L

Air-to-Extend Actuator (Type 37)

Shut off air supply and disconnect air lines at the actuator. Remove nut (53), screw (52) and clamps (51). Unscrew drive nut (19), then remove actuator from the valve.

Air-to-Retract Actuator (Type 38)

Retract actuator stem and plug by applying air pressure. Remove nut (53), screw (52) and clamps (51). Unscrew drive nut (19), then remove actuator from the valve. Shut off air pressure and disconnect air lines at the actuator.

9.3.2 Actuator Assembly and Adjustment

Sizes 9, 11 & 13

1. Push plug stem (1) down until the plug seats, then replace locknuts (22) and travel indicator (23) (and locking plate (55) on No 13 actuators).

2a. Air-to-Extend Actuator (Type 37) :

- Install actuator on bonnet with drive nut (19). Turn plug stem (1) into actuator stem (26) as far as it will go.

Caution: Do not allow the plug to turn on the seat during this operation.

- Connect a temporary supply air line on actuator. Apply maximum air pressure of spring range stamped on serial plate. Turn plug stem out of actuator stem until plug is seated. Relieve air pressure and unscrew plug stem (1) an additional half turn *out of* actuator stem (26).
- Tighten stem locknuts (22) against actuator stem [or locking plate (55)]. Relieve air pressure, then adjust travel indicator scale (56). Travel indicator (23) should indicate "open" when air pressure is relieved.

2b. Air-to-Retract Actuator (Type 38) :

- Connect a temporary supply air line on actuator. Admit sufficient air pressure to retract actuator stem to full stroke. Install actuator on bonnet with drive nut (19).
- Turn plug stem (1) into actuator stem (26) as far as it will go. Relieve air pressure until minimum of spring range stamped on serial plate.

Turn plug stem out of actuator stem until plug is seated. Increase air pressure and turn plug stem an additional one full turn *out of* actuator stem.

Caution: Do not allow the plug to turn on the seat during this operation.

- Tighten stem locknuts (22) against actuator stem [or locking plate (55)]. Relieve air pressure, then adjust travel indicator scale (56). Travel indicator (23) should indicate "closed" when air pressure is relieved.

Sizes No 15, 18 & 18L

1. Push plug stem (1) down until the plug seats.

2a. Air-to-Extend Actuator (Type 37) :

- Install actuator on bonnet with drive nut (19). Connect a temporary supply air line on actuator. Apply maximum air pressure of spring range stamped on serial plate.
- Install the stem clamps (51) and travel indicator pointer (23). The amount of thread engagement of both stems should be approximately equal. Slightly tighten clamp nut (53). Relieve air supply pressure.
- Unscrew plug stem (1) a half turn *out of* stem clamps (51). Tighten clamp nut (53), then adjust travel indicator scale (56) in regard of the indicator pointer (23). Travel indicator pointer (23) should indicate "open" when air pressure is relieved.

Caution: Do not allow the plug to turn on the seat during this operation.

2b. Air-to-Retract Actuator (Type 38):

- Connect a temporary supply air line on actuator. Admit sufficient air pressure to retract actuator stem to full stroke. Install actuator on bonnet with drive nut (19).
- Relieve air pressure to minimum of spring range stamped on serial plate. Install stem clamps (51) and travel indicator pointer (23). Slightly lighten clamp nut (53). The amount of thread engagement of both stems should be approximately equal.
- Increase pressure and turn plug stem an additional one full turn *out of* stem clamps (51). Tighten clamp nut (53), relieve air pressure then adjust travel indicator scale (56) in regard of the indicator pointer (23). Travel indicator pointer (23) should indicate "closed" when air pressure is relieved.

Caution: Do not allow the plug to turn on the seat during this operation.

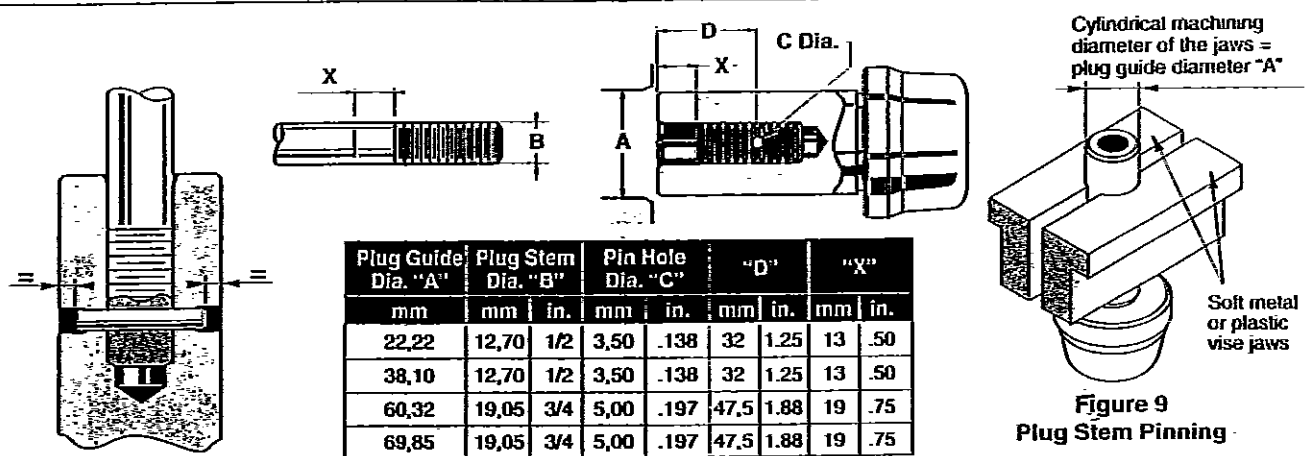
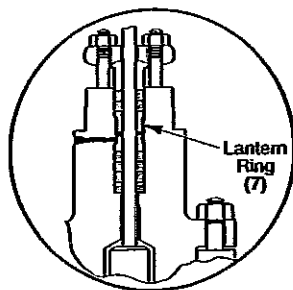


Figure 9
Plug Stem Pinning

Packing box with Kevlar/PTFE packing rings



Valve Dia.		Quantity of Packing Rings (6)					
		Kevlar/PTFE			Expanded Graphite w/ backup Rings		
mm	in.	Above Lantern Ring (7)	Below Lantern Ring (7)	Total	Above Lantern Ring (7)	Below Lantern Ring (7)	Total
20 to 100	3/4 to 4	3	3	6	3	3	6
150	6	4	3	7	3	4	7
200	8	4	4	8	4	4	8

Packing box with Expanded Graphite packing rings and Back-up rings

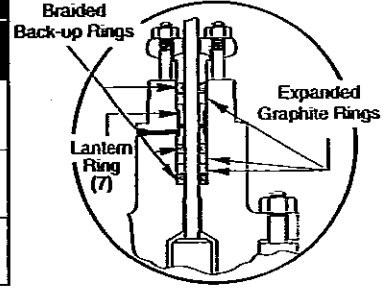


Figure 10 - Packing Rings Arrangements on Packing Box with Optional Leak Detection Connection

Valve Dia.		ANSI Class	Stud (9)		Req'd. Torque								
					Carbon Steel Studs				Stainless Steel Studs				
					Min.		Max.		Min.		Max.		
mm	in.		Size	Qty	Ft. Lbs.	daN.m	Ft. Lbs.	daN.m	Ft. Lbs.	daN.m	Ft. Lbs.	daN.m	
25-40	1-11/2	900	1"-8NC-2A	4	230	31	250	34	170	23	184	25	
					260	35	295	40					
					295	40	370	50					
20 to 50	3/4 to 2	150-300	1/2"-13NC-2A	8	33	4,5	37	5	26	3,5	30	4	
					400-600	40	5,5	48	6,5				
80	3	150	5/8"-11NC-2A	6	60	8	63	8,5	33	4,5	37	5	
			300	5/8"-11NC-2A	6	60	8	63	8,5	66	9	74	10
			400-600	3/4"-10NC-2A	8	140	19	148	20				
100	4	150-300	5/8"-11NC-2A	8	63	8,5	70	9,5					
			400-600	1"-8NC-2A	8	207	28	220	30	170*	23*	184*	25*
150	6	150-300	5/8"-11NC-2A	12	63	8,5	66	9	52	7	59	8	
			400-600	1"-8NC-2A	12	207	28	221	30	207	28	221	30
200	8	150-300	1 1/4"-8NC-2A	12	192	26	207	28	192	26	207	28	

* Only on 21000 threaded trim valves. For quick-change trim valves, use following torques.....

207	28	221	30
-----	----	-----	----

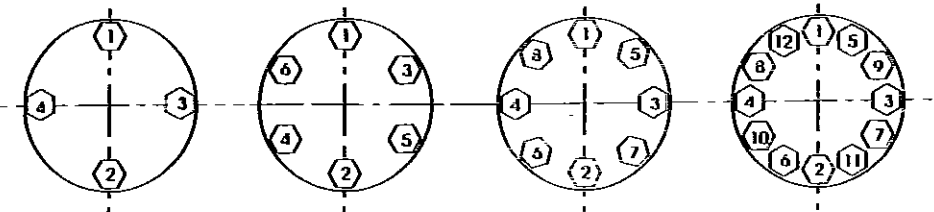


Figure 11 - Torques Sequences and Values for nuts (10)

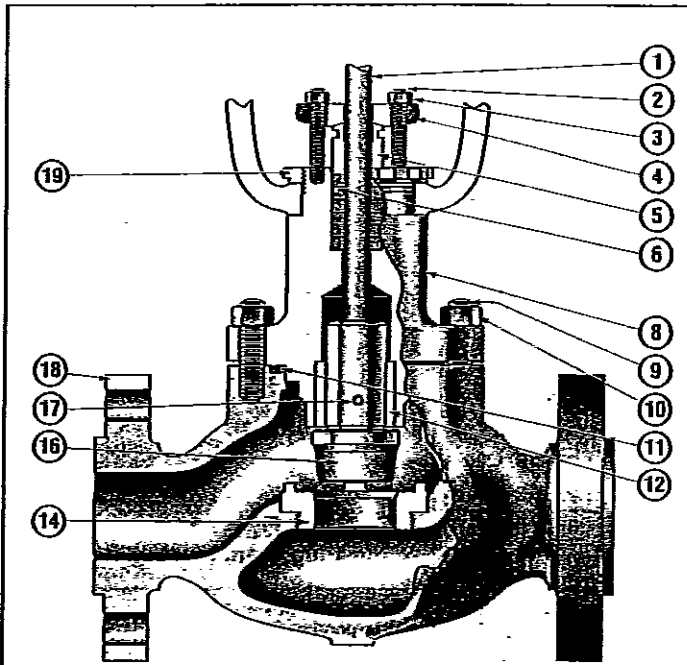


Figure 12

Threaded Seat ring - Contoured Plug - Full Capacity

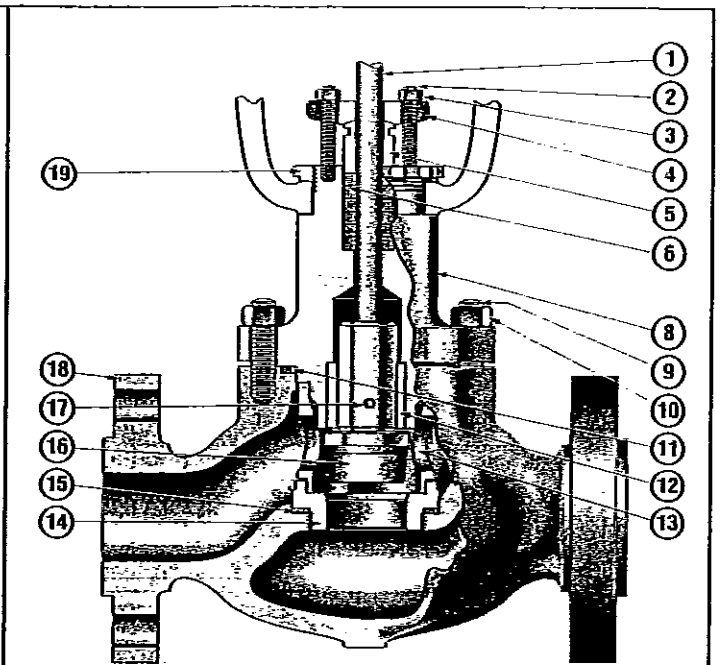


Figure 13

Quick Change Trim - Contoured Plug - Full Capacity

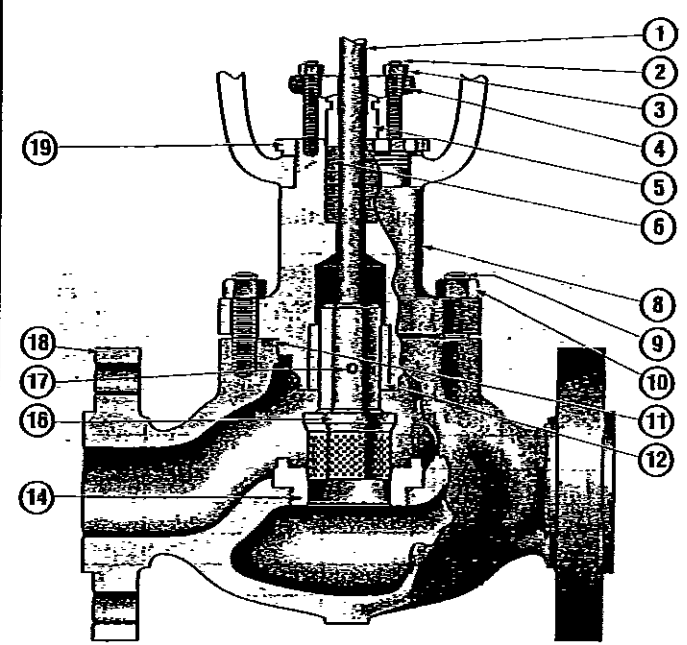


Figure 14

Threaded Seat ring - LO-DB Plug

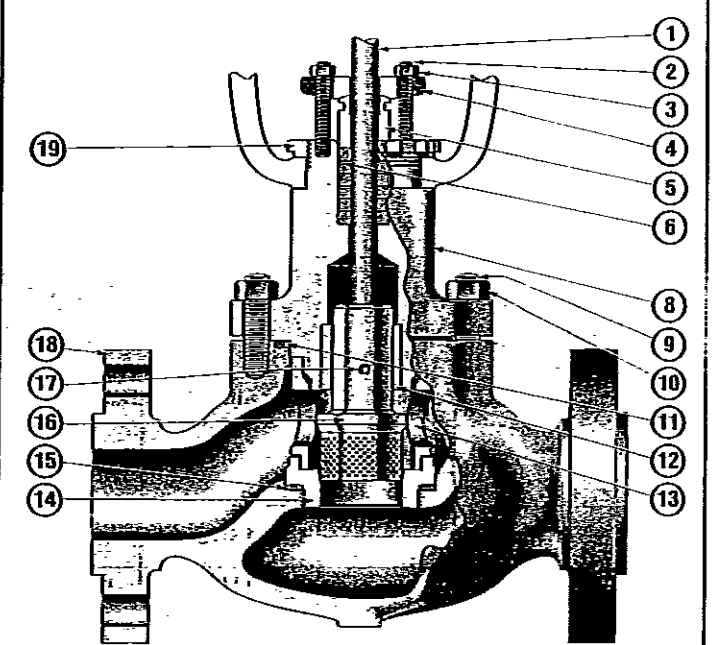


Figure 15

Quick Change Trim - LO-DB Plug

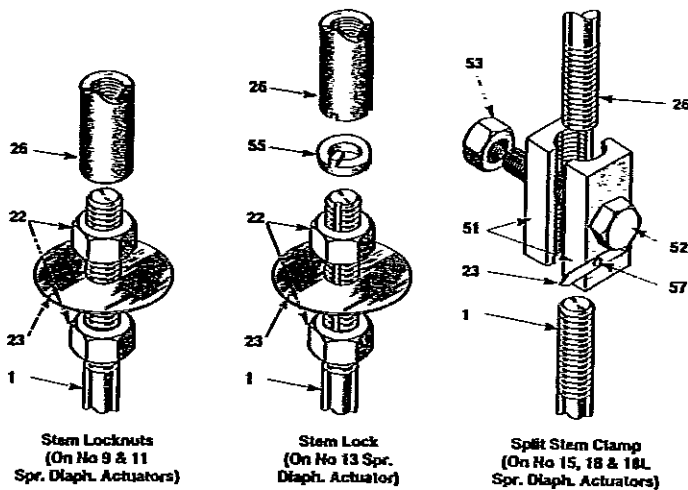
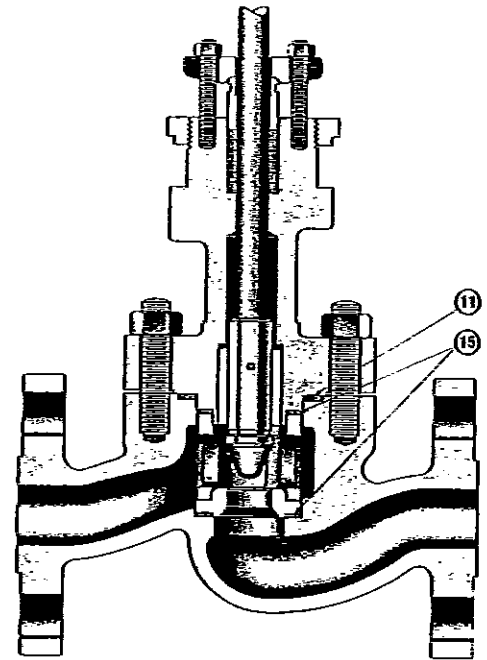
PARTS REFERENCE

Ref.	Part Name	Ref.	Part Name	Ref.	Part Name
● 1	Plug Stem	8	Bonnet	● 15	Seat Ring Gasket *
2	Packing Flange Stud	9	Body Stud	● 16	Plug
3	Packing Flange Stud Nut	10	Body Stud Nut	● 17	Plug Pin
4	Packing Flange	● 11	Body Gasket	18	Body Pin
5	Packing Follower	12	Plug Guide Bushing (Incl. w/ref. 8)	19	Drive Nut
● 6	Packing	● 13	Cage *		
7	Lantern Ring (optional)	● 14	Seat Ring		

● Recommended spare parts

* Only on Quick Change Trim

Figure 16
21000 Series
3/4" to 2" Valve Sizes
900, 1500, 2500 ANSI Class



Ref.	Part Name
1	Plug Stem
22	Locknut
23	Travel Indicator (pointer)
26	Actuator Stem
51	Stem Clamp
52	Hex. Head Screw
53	Clamp Nut
55	Locking Plate
56	Travel Indicator Scale
57	Screw

Detail of the Three Stem Connector Types

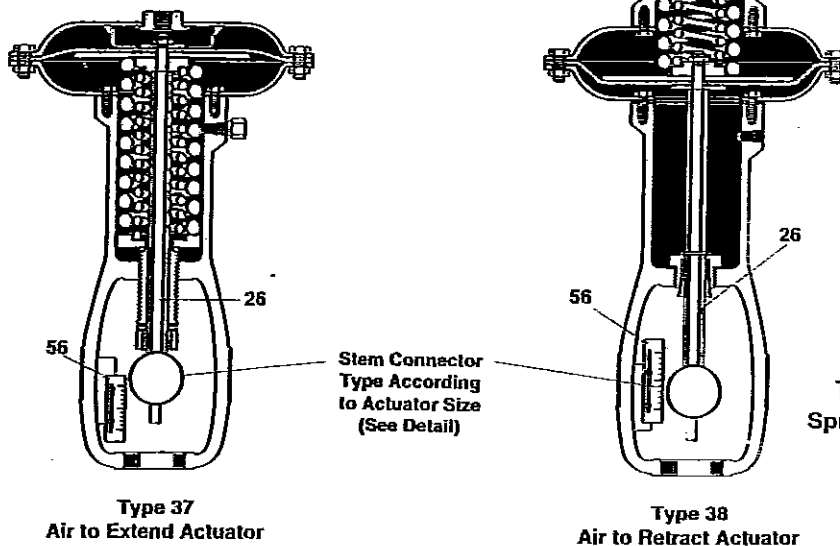


Figure 17
Types 37/38 Masoneilan
Spring-Diaphragm Actuators

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MASONEILAN

Cage-type Control Valves 41005 Series

Instruction manual for Cage-type control valves 41005 series

Instruction manual

N° EH 3600 E

Rev. A 04/00

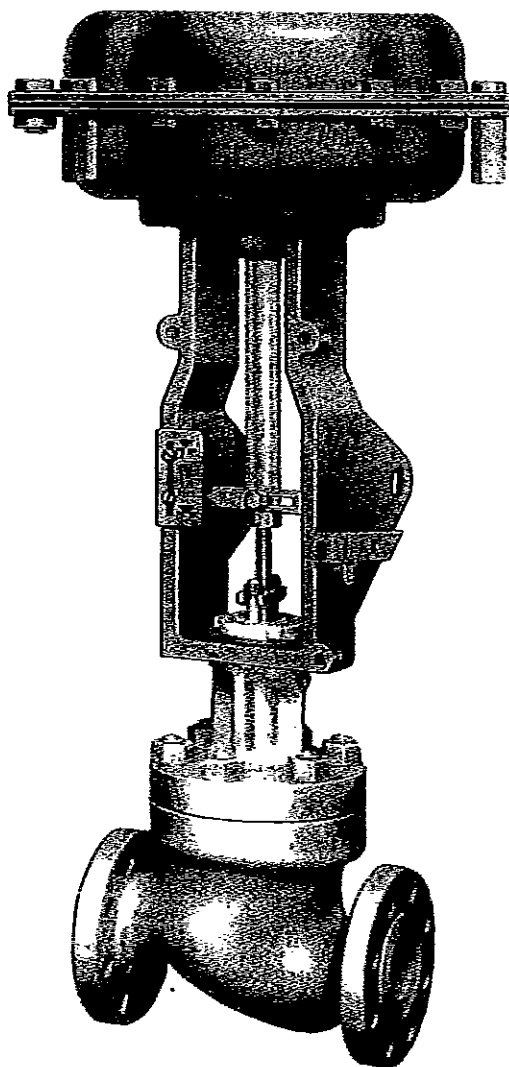
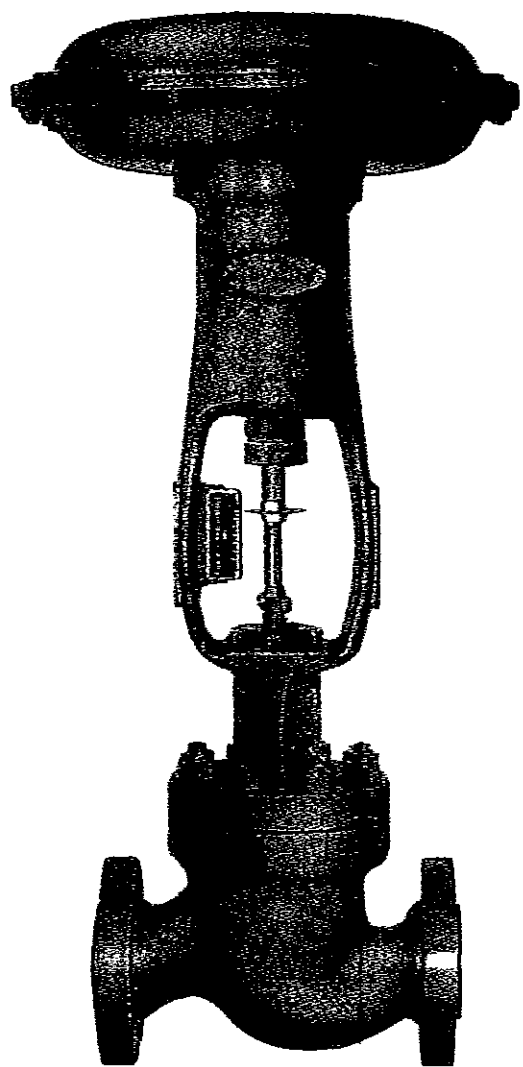


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1 - GENERAL

IMPORTANT

This document contains all the instructions required for the installation, operation and maintenance of the equipment. Regular maintenance, strict observance of these instructions and the use of manufacturer's replacement parts will guarantee optimum operation and reduce maintenance costs.

Foreword

When using the document, the user should refer to the master plans at the end of the document, produced on fold-out pages to facilitate consultation.

1.1. FIELD OF APPLICATION

The following instructions are designed to guide the user through the installation and maintenance of 50 to 400 mm 41005 series valves for all pressure categories.

1.2. SERIAL PLATE

The serial plate is usually fixed to the side of the actuator yoke. It indicates, amongst other things, the type of valve, the pressure category, the material used for the pressurised chamber and the air supply pressure of the actuator.

1.3. AFTER SALES SERVICE

Masonellan offers its clientele an After Sales Service comprising highly qualified technicians, for the operation, maintenance and repair of its equipment. To benefit from this service, contact our local representative or the After Sales Service of the factory whose address is given at the end of the document.

1.4. SPARE PARTS

When carrying out maintenance operations, only manufacturer's replacement parts must be used, obtained through our local representatives or our Spare Parts Service.

When ordering spare parts, the model and serial numbers indicated on the manufacturer's serial plate must be given.

The recommended spare parts are indicated in the parts list included in this instruction manual.

1.5. ACTUATOR AND OTHER ACCESSORIES

The valve is equipped with an actuator; like all the other valve accessories, actuators are the subject of special instructions which provide information on the electric and pneumatic connections. The instruction manuals to be used for standard actuators are n° ER30004F for types 37/38, n° ER87884F for types 87/88.

2 – NUMBERING SYSTEM

ACTUATOR TYPE	BODY SERIES	STANDARD BALANCING VALVE	TYPE AND CHARACTERISTICS OF TRIM	DESIGN SERIES
<p>- CONVENTIONAL</p> <p>37 – Air-to-close 38 – Air-to-open</p> <p>- CYLINDER</p> <p>84 – Air-to-close 85 – Air-to-open</p> <p>- MULTISPRING</p> <p>87 – Air-to-close 88 – Air-to-open</p>	<p>41</p> <p>Cage guided globe</p>	<p>0. Undefined</p> <p>3. With elastomeric seal + "tec ring" spring</p> <p>4. With pilot plug</p> <p>5. With metal ring</p> <p>6. With PTFE ring</p> <p>9. With graphite ring</p>	<p>0. Undefined</p> <p>1. Standard cage / Linear</p> <p>2. Standard cage / Equal percentage</p> <p>3. Lo-dB@ / Single stage anti-cavitation / Linear</p> <p>4. Lo-dB@ single stage with diffuser / Linear</p> <p>5. Lo-dB@ double stage / Linear</p>	<p>5</p>

N.B.

This instruction manual describes all the standard options in the 41005 valve series. To satisfy the particular conditions of your application, Masoneilan may have had to develop a special option which is the subject of an additional clause to this instruction manual. In this case, the instructions given in the additional clause always take precedence over the general instructions.

3 - INSTALLATION

3.1. CLEANNESSE OF PIPING

Before installing the valve in the line, clean piping and valve of all foreign material such as welding chips, scale, oil, grease or dirt. Gasket surfaces must be thoroughly cleaned to insure leak-free joints.

3.2. ISOLATING BY-PASS VALVE

To allow for in-line inspection, maintenance and removal of the valve without service interruption, provide a manually operated stop valve on each side of the control valve and a manually operated throttling valve in the by-pass line.

3.3. HEAT INSULATION

In case of heat insulated installation, do not insulate the valve bonnet and take protection measures related to personal safety.

3.4. HYDRAULIC TEST AND CLEANING OF LINES

During this operation, the control valve must not be used as an isolating valve. This means that the valve must always be opened before carrying out pressure tests in the process line, cleaning of pipes, etc, otherwise equipment damages or destroying of seal rings could result.

3.5. FLOW DIRECTION

The valve must be installed so that the controlled substance will flow through the valve in the direction indicated by the flow arrow located on the body.

4 - DISASSEMBLY

4.1. REMOVAL OF ACTUATOR (FIGURES 16 AND 17)

Access to the internal components of the body should be accomplished with the actuator removed. To carry out this operation, follow the instructions below and refer to the special actuator instructions, reference ER 87884 F for a type 87/88 actuator and ER 300004 for the type 37/38 actuator.

4.1.1. DISCONNECTION OF INSTRUMENTS

Disconnect all mechanical couplings between the positioner and the other instruments on the one hand and the valve stem / actuator stem coupling on the other hand.

4.1.2 PLUG STEMS SCREWED INTO THE ACTUATOR STEM

In the case of air-to-retract actuators, apply sufficient air pressure on the diaphragm to retract the stem completely.

Caution: During this operation, make sure that the plug does not turn when it is seated. If the plug travel is very small and there is a large amount of plug stem inside the actuator, it may be necessary to remove the yoke nut and lift the actuator so that the plug is not touching the seat.

4.1.3. STEMS ATTACHED WITH A STEM CONNECTOR

In the case of air-to-retract actuators, apply sufficient air pressure on the diaphragm to retract the stem completely.

Loosen the screws and remove the stem connector.

Danger: Prior to disassembly, vent the process pressure and isolate the valve if necessary.

4.1.4. REMOVAL OF ACTUATOR

Disconnect all the ingoing and outgoing air and electrical connections from the actuator.

Loosen the yoke nut or attachment screws and lift the actuator, making sure that the concentricity and/or the thread of the bonnet is not damaged.

4.2. OPENING OF THE PRESSURISED CHAMBER (FIGURES 14 AND 15)

N.B. The valve must always be reassembled with new packing rings and gaskets; before disassembly, make sure that the appropriate parts are available.

- A. Remove the packing flange nuts (3) then remove the packing flange (4) and the packing follower (23).
- B. Check that the exposed part of the valve plug stem (1) is clean enough for the bonnet (7) to be removed easily.
- C. Remove the body stud nuts (8).
- D. By means of a pad eye secured instead of the actuator, lift the bonnet (7) up and separate it from the valve body (18). During this operation, the valve plug stem (1) must be pushed downwards so that the valve plug remains in the valve body (18).
- E. Remove the spring washer (17) and the body gasket (10).
- F. In the case of type 41305, 41505, 41605 and 41905 valves, remove the valve plug stem (1) and valve plug (15) assembly from the cage by pulling the valve plug stem upward, then remove the cage (16).

Caution: Because of the cage gasket (31), the cage can sometimes be lifted along with the valve plug. If this should happen, press down on the cage so that it remains in the body. If the cage is lifted along with the valve plug, it could slip during handling and fall.

In the case of a 41905 series valve [equipped with a graphite ring (45)], make sure that the ring is not damaged during the operation.

In the case of a 41405 valve, remove the valve plug and body cage assembly by pulling the valve plug stem upward; in this case, the valve plug has a shoulder which prevents the cage from falling.

- G. In the case of 41405 valves, remove the valve plug from the cage by pulling on the end of the valve plug stem.
- H. Remove the valve body (18), the seat ring (13) and the seat ring gasket (14).

- I. Remove the packing (6), the packing spacer (5) and the guide bushing (22) from the bonnet (7).

N.B. A packing spacer (5) is only mounted when the bonnet has a side connection.

4.3. DISASSEMBLY OF VALVE PLUG STEM (1)

The valve plug stem is screwed and pinned into the valve plug (15).

To dismantle the stem, the valve plug must be held as indicated below, taking care not to damage the guiding surfaces; the plug stem pin (9) is then removed. By means of flats or using a nut and counter-nut on the end of the stem, unscrew the stem taking care not to apply a bending moment which could deform it.

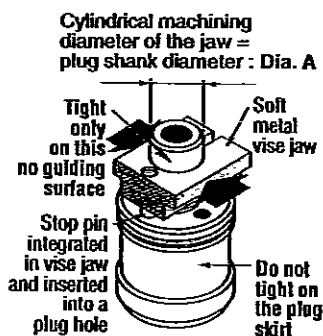


Figure 1

4.4. DISASSEMBLY OF THE AUXILIARY PILOT PLUG

When the valve is of the 41405 type:
In the case of 50, 80 or 100 mm (2", 3" or 4") valves (figure 14)

Exert a sufficient force on the auxiliary pilot plug (20) to compress the spring washers (12). The retaining ring (19) can then be removed, releasing the auxiliary pilot plug and spring washers.

In the case of 150 to 400 mm (6" to 16") valves (Figure 14)

To carry out this operation safely, screws of the diameter and length indicated in the table in figure 2 must be used. Thread the socket head cap screws through the holes in the auxiliary pilot plug (20). Tighten until the retainer ring (19) can be removed. Loosen the screws gradually. Remove the auxiliary pilot plug and the spring (12).

Valve size		Pilot Dismounting Screws Size		
mm	in.	Qty	Length (mm)	Dia.
150	6	2	57	1/4"- 20 UNC 2A
200	8	2	70	3/8"- 16 UNC 2A
250	10	2	63,5	
300	12	3	101,5	
400	16	3	63,5	

Figure 2

5 – MAINTENANCE – REPAIR

5.1. PACKING BOX

Tightness of the packing box is obtained by compression of the packing (6). Compression must be achieved by evenly tightening the packing flange nuts (3) on the packing flange (4). Periodical re-tightening of the packing flange nuts is required to maintain tightness.

Make sure that the packing is not over tightened as this could prevent smooth operation of the valve. If a leak persists after the packing has been compressed to a maximum, the packing needs to be changed.

A packing spacer (5) is only mounted when the bonnet has a side connection.

5.1.1 Kevlar/PTFE, Carbon/PTFE and pure PTFE packing rings

Kevlar/PTFE, carbon/PTFE and pure PTFE packing rings are cut in such a way that they can be replaced without having to separate the valve plug stem from the actuator stem.

- A. Unscrew and remove the packing flange nuts (3).
- B. Lift the packing flange (4) and packing follower (23) up along the valve stem.
- C. By means of a puller, remove the packing (6) and packing spacer (5), taking care not to damage the sealing surface of the packing box lantern or the valve plug stem.
- D. Replace the packing rings, with the cut in each ring placed about 120° from the next, pressing them down one at a time and respecting the table below.

KEVLAR/PTFE and pure PTFE packing box			
Number of rings			
N.D. mm (in.)	Without side connection	With side connection	
		On top of packing spacer	Under packing spacer
50 (2")	6	2	4
80 - 100 (3" - 4")	8	3	5
150 à 500 (6" à 16")	7	2	5

Figure 3

- E. Put the follower (23) and the packing flange (4) back on.
- F. Screw and tighten the packing flange nuts (3) without crumpling the packing rings.
- G. Put the valve back into service and check for tightness.

5.1.2 Graphite packing ring

To carry out this operation, the valve plug stem must be removed. See chapter on actuator disassembly.

- A. Loosen and remove packing flange nuts (3)
- B. Remove packing flange (4), and packing follower (23) from the plug stem
- C. Remove packing rings (6), insuring not to damage the sealing surface of packing box or plug stem.
- D. Replace new packing set (6) ; first one back-up ring (Carbon/Graphite/Inconel braided ring), then expanded graphite rings (smooth rings), at last, one other braided back-up ring.

DN. mm (in.)	Number of rings		
	Braided	Graphite	Braided
50 (2")	1	4	1
80 - 100 (3" - 4")	1	6	1
150 à 500 (6" à 16")	1	4	1

Figure 4

- E. Put the follower (23) and packing flange (4) back on.
- F. Screw and moderately tighten the packing flange nuts (3).
- G. Reassemble the valve plug stem (see chapter on actuator re-assembly).
- H. Open and close the valve several times then tighten the packing.
- I. Put the valve back into service and check for tightness.

5.2. REPAIR OF PARTS

Before re-assembly, the parts must be carefully examined in order to eliminate any scratched, worn or damaged parts.

5.2.1 Guiding surfaces

The guiding surfaces of the cage and valve plug, the guide bushing, and the guiding surfaces of the plug stem and auxiliary pilot plug must be checked in particular. If there is only slight damage, a light abrasive can be used. Otherwise the part must be replaced as soon as possible (see paragraph on spare parts).

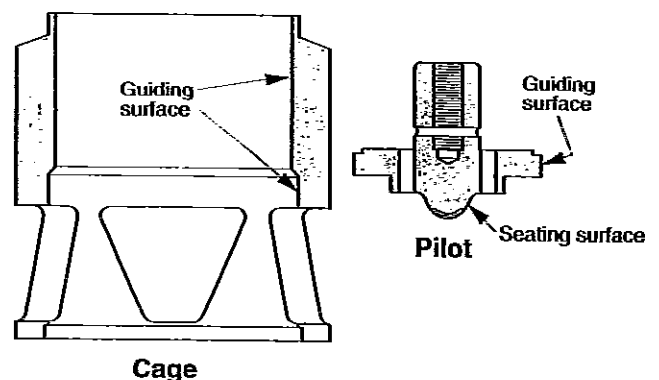


Figure 5

5.2.2 Sealing surfaces (figure 6)

If the surface of the auxiliary pilot plug (20) is damaged, the auxiliary pilot plug must be replaced (see paragraph on spare parts).

The seating surface (3), valve seat (15) and auxiliary pilot plug seat (20) faces must be completely free of dents, wear and scratches.

If the auxiliary pilot plug seat in the valve plug (15) and/or other valve plug or seating surfaces show signs of slight deterioration, they can be touched up on a lathe.

However, not more than 0.25 mm of metal must be removed in the case of a 50, 80 or 100 mm (2", 3" or 4") valve or more than 0.4 mm in the case of a 150 to 400 mm (6" to 16") valve. Make sure that the seating angle indicated in Figure 6 is respected.

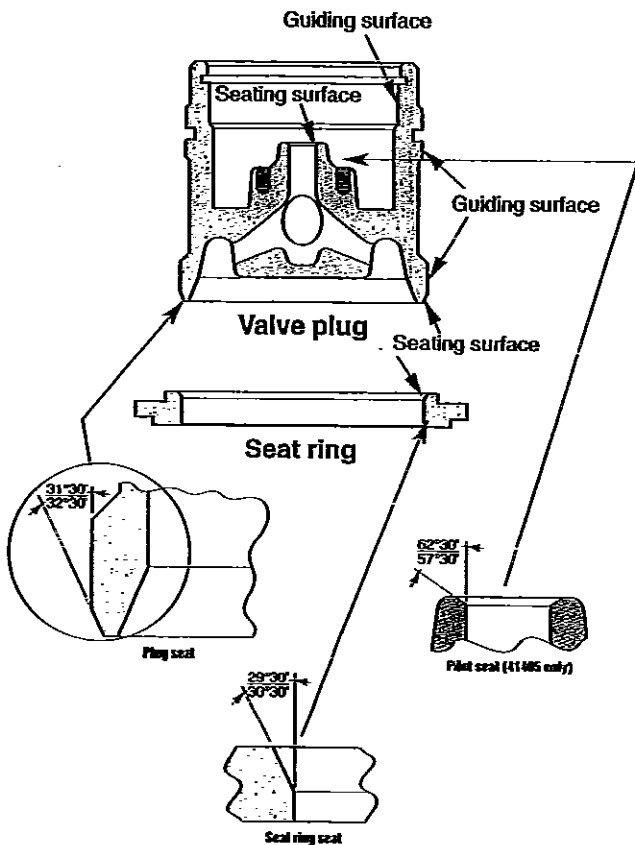


Figure 6

If a slight defect exists on any of the above seating surfaces, lapping can be envisaged, in which case the following must be respected:

- Put the seat ring (13) in the body, noting the angle.
- In the case of 41305, 41505, 41605 and 41905 valves, put the cage (16) on the seat ring.
- Spread a fine layer of high quality sealing compound on the seating surface.
- In the case of 41405 valves, assemble the valve plug, cage and stem (15)-(16)-(1).
- In the case of 41305, 41505, 41605 and 41905 valves, assemble the valve plug (15) and stem (1).
- Assemble the bonnet (7) and its guide bushing (22).
- Place an appropriate tool on the valve plug stem (1) to turn it.
- Lap by slightly rotating the valve plug or the auxiliary pilot plug in alternative directions. After several rotations, lift the valve plug, turn it 90°, and start again.

- Lapping can be repeated, but must be limited as much as possible so that the seat remains sufficiently narrow to guarantee tightness.
- Disassemble the parts, clean them and put them back, respecting the initial angle

5.2.3 Gasket seats

Gasket seats must be free of dents, scratches and corrosion; otherwise, they will need to be repaired.

5.2.4 Rings and gaskets

Spiral-wound gaskets (10), (14) and (36) must always be changed after disassembly. Rings (35), (40) or (45) can be reused if they are free of scratches, erosion and corrosion.

5.2.5 Valve plug, valve plug stem

If the valve plug has to be changed, then the stem must also be completely changed to guarantee correct pinning of the assembly. If only the valve plug stem has to be changed, then the valve plug can be reused.

6 – RE-ASSEMBLY OF VALVE

6.1. PINNING THE VALVE PLUG STEM

The valve plug (15) and stem (1) assembly consists of a rod threaded into the valve plug and pinned in place.

If the valve plug (15) [or the auxiliary pilot plug (20) in the case of a 41405 valve] needs to be replaced, it is recommended using a new stem. The hole in the original pin of an old stem often prevents satisfactory results from being obtained and can seriously impair the mechanical strength of the stem-valve assembly.

Assembly is carried out as follows:

6.1.1 Reference marking on the valve plug stem

Make a reference mark on the valve plug stem at a distance "X" (Figures 7 and 8) equivalent to the stem recess in the valve plug.

N.B. For shouldered plug stems with two flats, the above marking is unnecessary.

6.1.2 Screwing in the valve plug stem

To carry out this operation, the valve plug must be prevented from moving by holding the plug shank with an appropriate tool.

Valve plug stem diameter B	Metric pin diameter C	Anglo Saxon pin diameter C	F	D	Distance		Torque T		
					X	E	Non-shouldered stem	Shouldered stem	
mm (in)	mm (in)	Mm	In	Mm (in)	mm (in)	mm (in)	mm (in)	daN.m(Fl.lbs)	daN.m(Fl.lbs)
12.7 (1/2)	20 (.79)	3.5	0.14	18 (.70)	23 (.91)	6 (.24)	17 (11/16)	5 (37)	6 (44)
15.87 (5/8)	25.5 (.98)	5.0	0.2	24 (.95)	28 (1.1)	8 (.30)	22 (7/8)	16 (118)	16 (118)
19.05 (3/4)	35 (1.38)	5.0	0.2	30 (1.2)	45 (1.77)	19 (.75)	27 (11/16)	16 (118)	16 (118)
25.4 (1.0)	44.5 (1.66)	5.0	0.2	40 (1.58)	47.5 (1.88)	25 (.98)	30 (11/4)	16 (118)	25 (184)

Figure 7

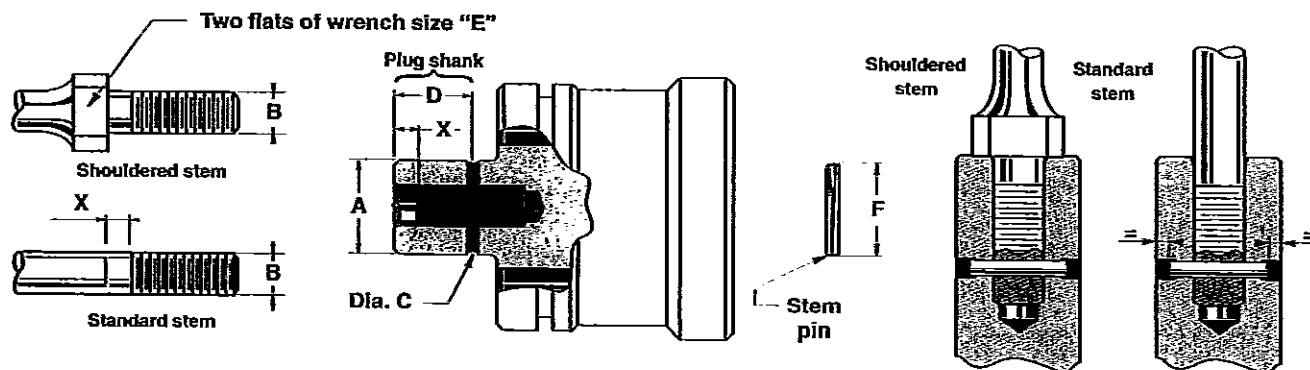


Figure 8

Screw two nuts on to the end of the new plug stem and lock them together. Screw the valve plug stem solidly into the plug, checking that the reference mark is level with the end of the plug shank. If the stem has flats, apply a torque "T" using a wrench of dimension "E".

6.1.3 Drilling the pin hole (figures 7 and 8)

N.B. For this operation, it is recommended clamping the valve plug-stem assembly by the plug shank to avoid damaging the guiding surfaces; particular care must be taken so that the pin hole goes through the valve plug axis.

If the valve plug is new, drill a hole of diameter "C" at a distance "D" from the end of the valve plug; choose the diameter "C" from the table according to the type of pin used (metric or Anglo Saxon pin).

If the hole is already drilled in the valve plug, use the hole as a guide to drill through the valve plug.

6.1.4 Pinning

By means of an hammer, introduce the pin into the hole. Complete the pinning operation, taking care to ensure that the pin is recessed by the same amount at both sides.

Using a ball tooling and hammer, caulk the pin hole edge of the plug.

Place the assembly in the soft jaw chuck of a lathe to check alignment of the two parts; correct any alignment defects.

6.2. ASSEMBLY OF RING OR SPRING-ENERGISED SEAL RING

6.2.1 41305 valve (Figure 9)

These valves have spring-energised seal rings. To insert the ring in the valve plug groove, place it over the conical top of the valve, making sure that the open side faces upwards, then push down evenly with the hand until the gasket slips into the groove.

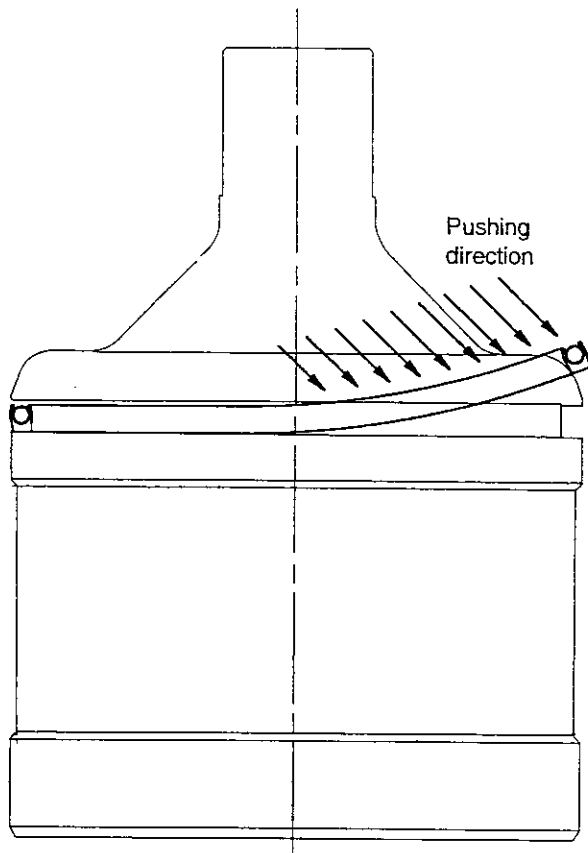


Figure 9

6.2.2 41405 and 41505 valves (Figures 14 et 15)

These valves are equipped with metal rings; the inner ring has a straight cut while the outer ring has a staggered cut.

To insert the rings into the cage groove, open the rings slightly by hand and slide them, one after the other, along the plug making sure that the parts are not damaged.

N.B. The cuts in the outer and inner rings are to be placed at about 180° from each other.

6.2.3 41605 valve (Figures 14 et 15)

These valves are equipped with an inner elastomeric ring and a PTFE gasket.

Insert the elastomeric ring (41) in the groove.

Place the PTFE gasket (40) in boiling water at a temperature of 100°C to 160°C for a few minutes to facilitate insertion, then slide along the plug until it slips into the groove.

For optimum insertion of the ring, a Serflex type ring compressor can be used to compress the ring in the groove for several minutes.

6.2.4 41905 valve (Figures 14 and 15)

These valves are equipped with rings; the inner metal ring has a straight cut and the outer ring is made of graphite.

The new graphite seal ring (45) is supplied in the form of a closed ring in which a notch must be cut before being inserted.

Caution: Graphite seal rings are fragile and the following operations must be carried out very carefully.

Using a sharp blade, make a notch in the graphite ring. Hold the ring on either side of the notch between the thumb and index and bend until it breaks.

Using a very fine file, adjust each end of the ring so that its external circumference corresponds to the internal circumference of the inside diameter of the cage (16).

To adjust the length of the ring correctly, insert the new graphite ring into the cage, with the ring against the inner wall of the hole in the cage, allowing minimum play between the two ends of the ring.

To insert the inner ring, then the graphite ring into the cage groove, slightly open the rings by hand and slide them one after the other along the plug, taking care not to damage the parts.

N.B. The cuts on each ring are to be placed at about 180° from each other.

6.3. ASSEMBLY OF VALVE PLUG AND CAGE 41405. (FIGURE 14)

6.3.1 Assembly of valve plug and auxiliary pilot plug

Assemble, as appropriate, the flat spring washers or the coil springs then the valve plug/plug stem assembly.

Using the same tools as those used for disassembly (see chapter on disassembly), compress the springs so that the retaining ring can be inserted in the groove of the main plug.

6.3.2 Assembly of cage

Place the cage over the valve plug assembly via the top of the plug stem. When doing so, take particular care to position the ring correctly.

6.4. ASSEMBLY OF THE PARTS INSIDE THE VALVE BODY

Proceed as follows:

- After checking that the surfaces are perfectly clean, place the seat gasket in the valve body, making sure that it is centred as well as possible.
- Mount the seat or the diffuser seat.
- Mount the cage or the cage/valve plug/stem assembly in the case of 41405 valves.
- In the case of valves other than 41405 valves, insert the valve plug/stem/ring assembly into the cage taking particular care as it goes past the ring or spring-energised seal ring.
- In the case of valves with a N.D. less than 150 (6"), place the body/cage gasket in the valve body, making sure that it is centred as well as possible.
- In the case of valves with a N.D. equal to or greater than 150 (6"), insert either the cage gasket or the flat spring washer with the concave side upwards, depending on the type of valve, then place the body gasket in the valve body making sure that it is centred as well as possible.

6.5. ASSEMBLY OF BONNET

Check that the packing ring (6), the spacer (5) and the guide bushing (22) have been removed from the bonnet.

Position the bonnet (7) above the valve, so that the packing flange studs (2) are perpendicular to the flow direction of the valve.

Thread the bonnet (7) onto the valve stem (1) and push it down carefully until it goes into the valve body studs (21) and takes up its correct position.

Grease the threads of the valve body studs (21) and the bearing surfaces of the body stud nuts (8).

Screw on the boy stud nuts by hand. Tighten the nuts lightly and evenly so that the internal parts are held in place. The face of the bonnet should be parallel to the upper face of the body.

Slide the guide bushing (22) onto the valve plug stem and let it drop to the bottom of the packing box housing.

6.6. TIGHTENING OF BODY STUD NUTS

6.6.1. Alignment of internal parts

In order to achieve perfect alignment of the body and the valve plug, a force must be applied to the plug stem during tightening of the bonnet which results in correct relative positioning of the two parts.

The force can be applied with the pneumatic actuator as follows:

Place the actuator on the valve bonnet (7) by means of the yoke nut (33) or attachment screws and connect the valve plug stem to the actuator stem. See chapter on actuators for installation instructions.

Caution: During this operation, make sure that the plug does not turn when it is seated. If the plug travel is very small and there is a large amount of plug stem inside the actuator, it may be necessary to remove the yoke nut and lift the actuator so that the plug is not touching the seat.

Align the internal parts as follows:

In the case of air-to-extend actuators, supply air to the actuator at the maximum pressure indicated on the serial plate and in the case of spring-to-extend actuators, do not supply air to the actuator, so that the optimum positioning of the valve plug and seat can be obtained.

Evenly tighten the nuts (8) by applying the torque and tightening sequence indicated in the table in figure 10.

TORQUE

Valve body stud/BONNET

BODY		Nuts (8)		Torque	
Nominal size (in)	Pressure categorie ASME	Size (in)	No.	m.N	ft.lb
2	150/300	3/4 10	6	140	104
	600	3/4 10	6	220	163
	900	7/8 9	8	210	156
	1500	7/8 9	8	300	222
3	150/300	3/4 10	8	180	133
	600	3/4 10	8	220	163
	900	1 1/4 8	6	760	563
	1500	1 1/4 8	6	1100	815
4	150/300	7/8 9	8	230	170
	600	7/8 9	8	350	259
	900	1 1/2 8	6	1200	889
	1500	1 1/2 8	6	1850	1370
6	150/300	1 8	8	440	326
	600	1 8	12	320	237
	900	1 3/4 8	8	1850	1370
	1500	1 3/4 8	8	1850	1370
8	150/300	1 1/4 8	8	710	526
	600	1 1/4 8	12	650	481
	900	1 3/4 8	8	1850	1370
	1500	1 3/4 8	8	2400	1778
10	150/300	1 1/2 8	8	1150	852
	600	1 1/2 8	12	1150	852
	900	1 3/4 8	12	1850	1370
	1500	1 3/4 8	12	2200	1630
12	150/300	1 1/2 8	8	1250	926
	600	1 1/2 8	12	1150	852
	900	1 1/2 8	16	1250	926
	1500	1 3/4 8	16	2200	1630
16	150/300	1 1/2 8	12	1150	852
	600	1 1/2 8	16	1250	826
	900	1 1/2 8	20	1500	1111
	1500	1 3/4 8	20	2600	1926

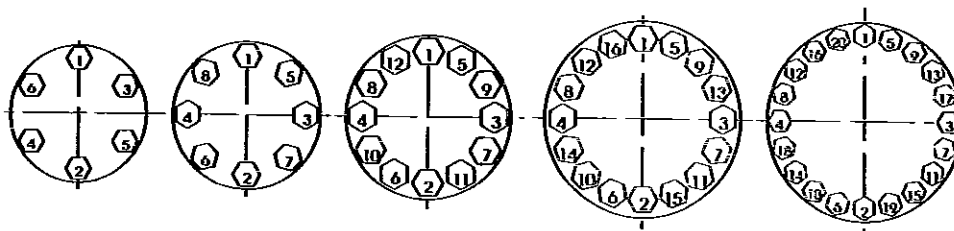


Figure 10

6.7. ASSEMBLY OF PACKING BOX

To assemble the packing box, proceed as indicated in the maintenance chapter, paragraph 5.1.1 or 5.1.2.

7 - ACTUATOR

7.1. Coupling of actuator type 88 n° 6 (figure 17)

- A. Tightly screw the two hex nuts (1) onto the plug stem.
- B. Push down the actuator and, at the same time, screw on the yoke nut (33), then the bottom stem connector (2). As soon as it becomes possible, insert the valve stem into the actuator stem. The stem must be inserted far enough so that when there is no air in the actuator, the valve plug does not touch the seat.
- C. Tighten the yoke nut.
- D. Unscrew the valve plug stem until the valve plug comes into contact with the seat. Do not turn the valve plug on the seat as this could damage the sealing surfaces.
- E. Supply air to the actuator until the stem has travelled at least 10 mm.
- F. Screw the plug stem the number of turns N1 specified in figure 11. CAUTION: in the case of 41405 valves, use the N2 valve so ensure tightness of the pilot plug.
- G. Screw the 2 nuts (1) as far as they will go and check that operation is correct.
- H. Use the pointer (7) to set the travel scale (9) to the closed valve position.

7.2. COUPLING OF ACTUATOR TYPE 87 N° 7 (FIGURE 17)

- A. Tightly screw the two hex nuts (1) onto the plug stem.
- B. Push down the actuator and, at the same time, screw on the yoke nut (33), then the bottom stem connector (2). As soon as it becomes possible, insert the valve stem into the actuator stem. The stem must be inserted far enough so that, when there is no air in the actuator, the valve plug does not touch the seat.
- C. Tighten the yoke nut.
- D. Supply air to the actuator at the final pressure.
- E. Use the pointer (7) to set the travel scale (9) to the open valve position.
- F. Supply the actuator with air at a sufficiently high pressure to obtain a travel equal to the nominal travel of the valve less dimension A in figure 12.
- G. Unscrew the plug stem until the valve plug is in contact with the seat. Do not turn the valve plug on the seat as this could damage the sealing surfaces.
- H. Screw the 2 nuts (1) as far as they will go and check that operation is correct.

7.3. COUPLING OF ACTUATOR TYPE 87 N° 10, 16 ET 23 (FIGURE 17)

- A. Tightly screw hex nut (1) onto the plug stem.
- B. Screw the top stem connector assembly tightly onto the actuator stem.
- C. Push down the actuator and, at the same time, screw on the yoke nut (33), then the bottom stem connector assembly by screwing until they come into contact with the hex nut (1).
- D. Push down the actuator and tighten the yoke nut.
- E. Supply the actuator with air at the initial pressure indicated on the spring scale.
- F. Position the stem connector assembly at distance "X" indicated in figure 13.
- G. Use the pointer (7) to set the travel scale (9) to the open valve position.

- H. Supply the actuator with air at a high enough pressure to obtain a travel equal to the nominal travel of the valve.

CAUTION in the case of the 41405 valves, reduce the travel by value A indicated in figure 12.

- I. With the plug correctly positioned on the seat, unscrew the bottom stem connector assembly until it comes into contact with the top stem connector. Tighten the socket head cap screws (5), nuts (1) and (32) and check that operation is correct.

Diameter of plug stem	N1 (turn)	N2 41405 (turn)	a mm (in)
1"	1.25	4.75	2.3 (0.09)
3/4"	1.25	4.25	2.0 (0.08)
5/8"	1.5	3.5	2.0 (0.08)
1/2"	1.5	3	1.9 (0.075)

Figure 11: Actuator 88 – seating valve

7.4. COUPLING OF ACTUATOR TYPE 88 N° 10, 16 AND 23 (FIGURE 17)

- A. Tightly screw hex nut (1) onto the plug stem.
- B. Tightly screw the top stem connector assembly onto the actuator stem.
- C. Push down the actuator and, at the same time, screw on the yoke nut (33), then the bottom stem connector assembly by screwing until they come into contact with the hex nut (1).
- D. Push down the actuator and tighten the yoke nut.
- E. Unscrew the top stem connector to respect dimension "X" in figure 12.
- F. With the plug correctly positioned on the seat, unscrew the bottom stem connector assembly to bring it into contact with the top stem connector.

- G. Supply air to the actuator until the stem has travelled at least 10 mm.
- H. Unscrew the top stem connector the number of turns N1 specified in figure 11 then lock manually with hex nut (1). CAUTION: for 41405 valves, use the N2 valve so ensure tightness of the pilot plug.
- I. Release the pressure in the actuator. Use pointer (7) to set the travel scale (9) to the actuator supply pressure so that the two stem connectors come into contact and tighten the socket head cap screws (5) and nuts (1) and (32).
- J. Shut off the closed valve pressure and check that operation is correct.

Nominal diameter of valve (inches)	Class ANSI	Value A mm (inches)
2	150, 300 or 600	2.5 (0.1)
20	900 or 1500	2 (0.08)
3 et 4	150, 300 or 600	3 (0.12)
6		5 (0.2)
8		6 (0.24)
10, 12 et 16	900 or 1500	7 (0.275)

Figure 12: Pilot plug travel

Dimension of actuator	Travel		X Actuator 17		X Actuator 88	
	mm	inches	mm	inches	mm	inches
10	20	0,8	130	5,12	117,3	4,62
10	38	1,5	138,2	5,44	178,3	7,02
16	20	0,8	203,2	8,00		
16	38	1,5	228,6	8,50		
16	51	2,0	235,7	9,28		
16	63,5	2,5	241,3	9,50		
23	20	0,8	209,5	8,25		
23	38	1,5	218,9	8,62		
23	51	2,0	231,6	9,12		
23	63,5	2,5	243,6	9,59		

Figure 13: Position of top stem connector

7.5. COUPLING OF ACTUATOR TYPE 37 (FIGURE 16)

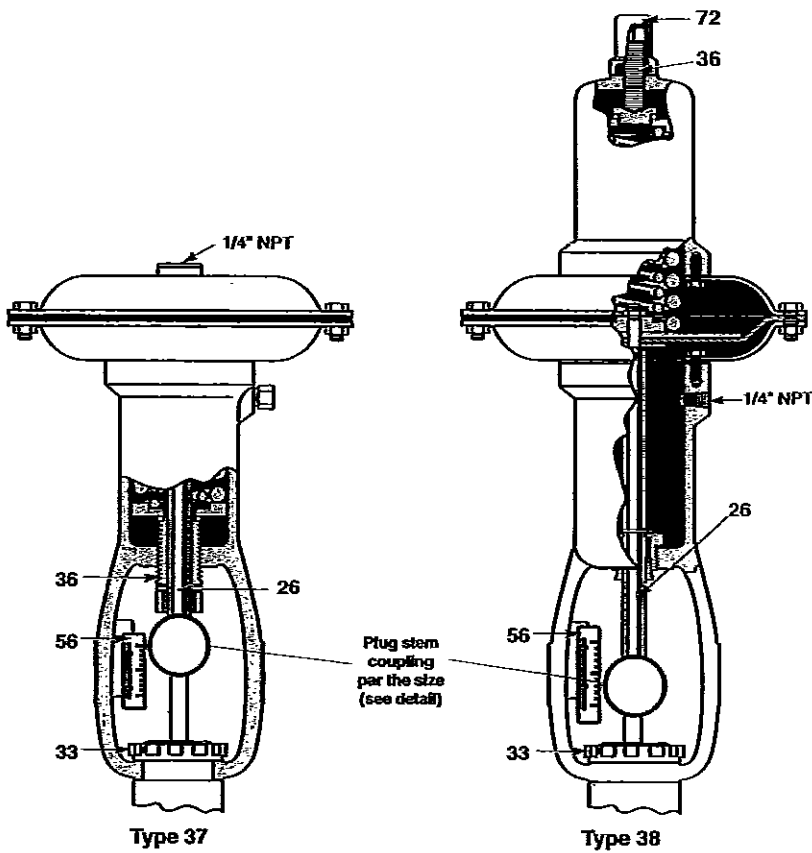
- A. Push down on the plug stem (1) until the plug rests is seated.**
- B. Attach the actuator to the valve bonnet with the yoke nut (33) or attachment screws. Apply a sufficient pressure to the diaphragm to extend the actuator stem by the normal valve travel for valves 41305, 41505, 41605 and 41905 and the travel minus the value of A in figure 12 for 41405 valves.**
- C. Assemble the two parts of the stem connector (51) and the point (58). The number of threads inside the stem connection must be approximately equal for each stem. Tighten screw(s) (52).**
- D. Check that the travel of the actuator stem corresponds to the normal travel of the valve and that the closed position is obtained for the maximum spring range indicated on the serial plate.**
- E. Shut off the air pressure. Use the pointer (58) to set the travel scale (56). The pointer (58) must indicate "open" when the air pressure is nil.**

- D. Check that the travel of the actuator stem corresponds to the effective travel of the valve and that the closed position is obtained for the minimum spring range indicated on the serial plate.**
- E. Shut off the air pressure. Use the pointer (58) to set the travel scale (56). The pointer (58) must indicate "open" when the air pressure is nil.**

7.6. AIR-TO-RETRACT ACTUATOR (TYPE 38) (FIGURE 16)

- A. Connect a temporary air supply line to the actuator. Apply sufficient pressure to the diaphragm to retract the actuator stem completely. Attach the actuator to the valve bonnet with the yoke nut (33) or attachment screws.**
- B. Shut off the air pressure completely. Increase the air pressure to retract the actuator stem by the value of A in table 11.**
- C. Assemble the two stem connectors (51) and the pointer (58). The number of threads inside the stem connection must be approximately equal for each stem. Tighten screw(s) (52).**

Figure 16
 SPRING AND DIAPHRAM
 ACTUATOR types 37/38



PARTS REFERENCE

- 1 Valve plug stem
- 26 Actuator stem
- 27 Stem nut
- 33 Drive nut
- 36 Spring adjustor
- 51 Coupling
- 52 Coupling screw
- 53 Coupling nut
- 56 Travel indicator scale
- 57 Machine screw
- 58 Travel indicator
- 72 Spring barrel cap

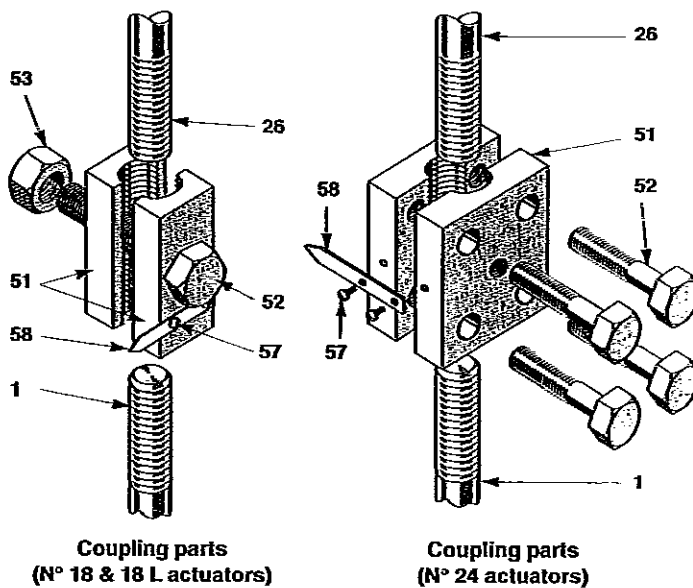
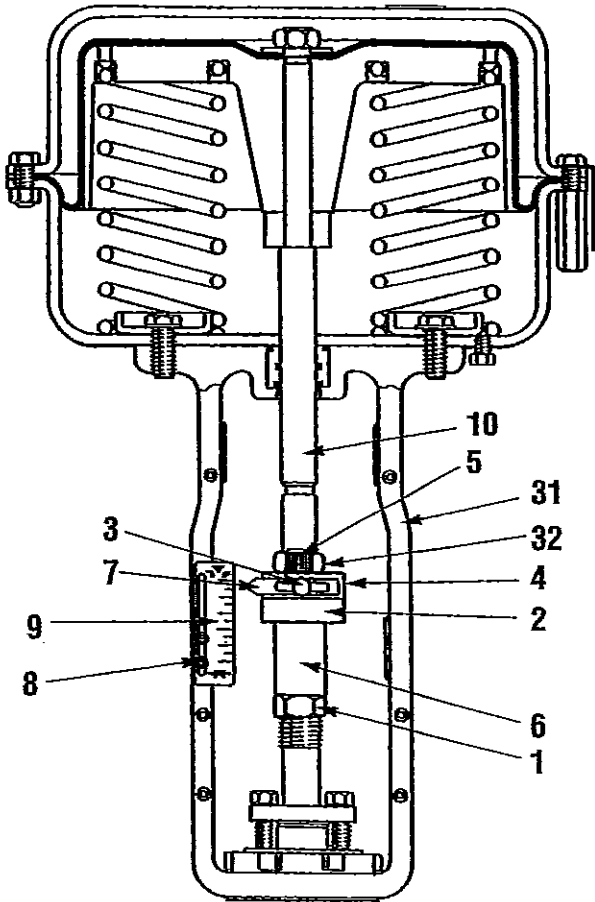
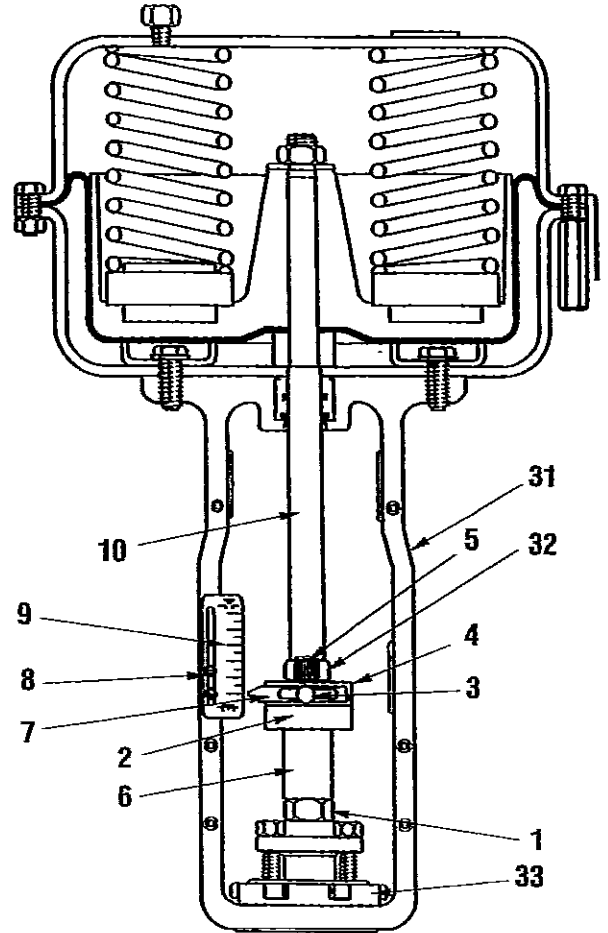


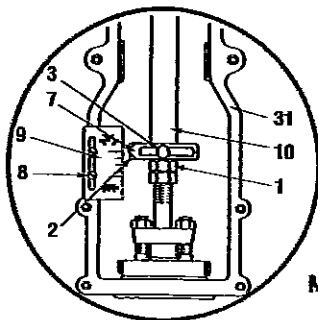
Figure 17
 SPRING
 DIAPHRAM ACTUATORS
 Types 87/88 Multispring



Modèle 87
 N° 10-16-23



Modèle 88
 N° 10-16-23



Modèle 87
 N° 6

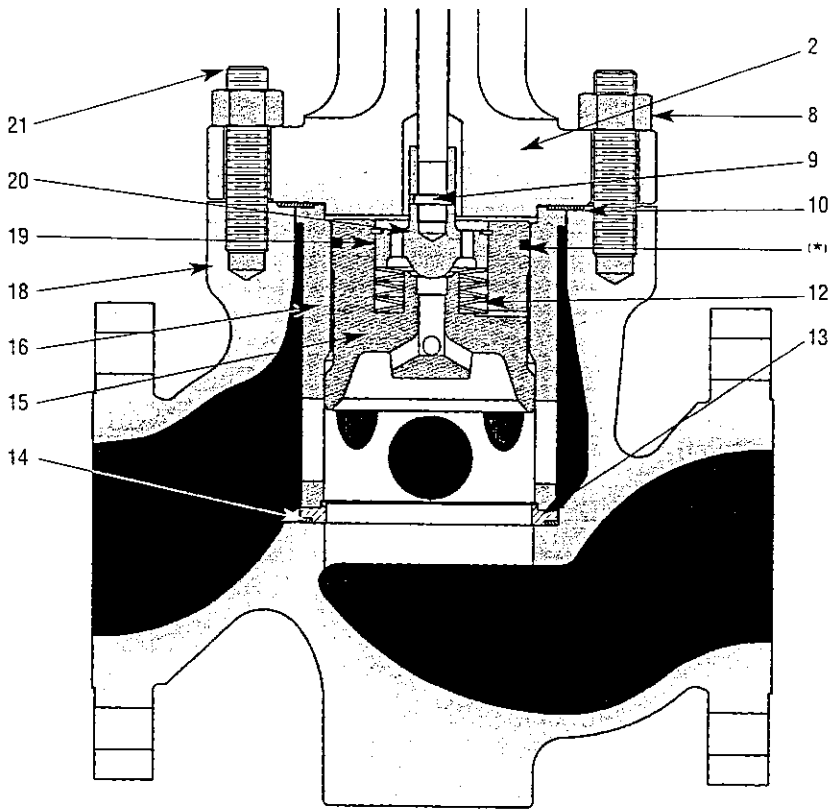
PARTS REFERENCE

Ref. No	Description
1	Hex Nut
2	Stem Connector, bottom
3	Cap Screw, Hex head
* 4	Stem Connector, top
* 5	Cap Screw, soc, head
* 6	Connector Insert
7	Pointer
8	Screw, Pan head
9	Scale - Travel
10	Actuator stem
31	Yoke, machining
*32	Lock Nut

* Not provided for Size 6 Actuator

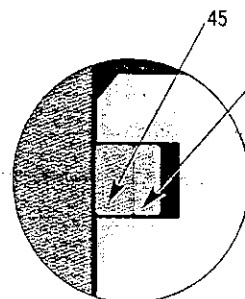
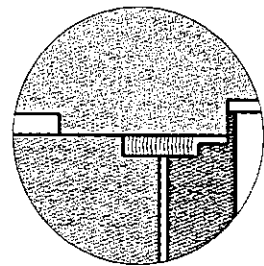
Body sub-assembly

Figure 14
Internal parts 41405
2' to 4"

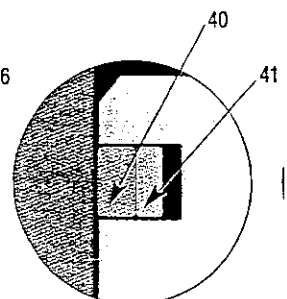


2" to 4"

with

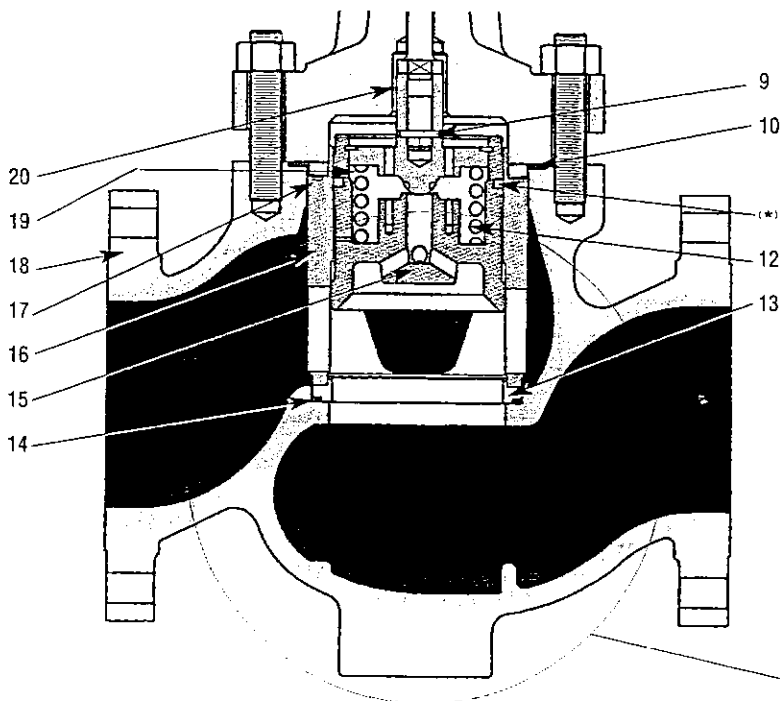


41905



41605

6' to 16"



Diffuser option

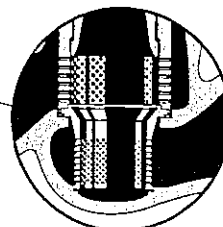
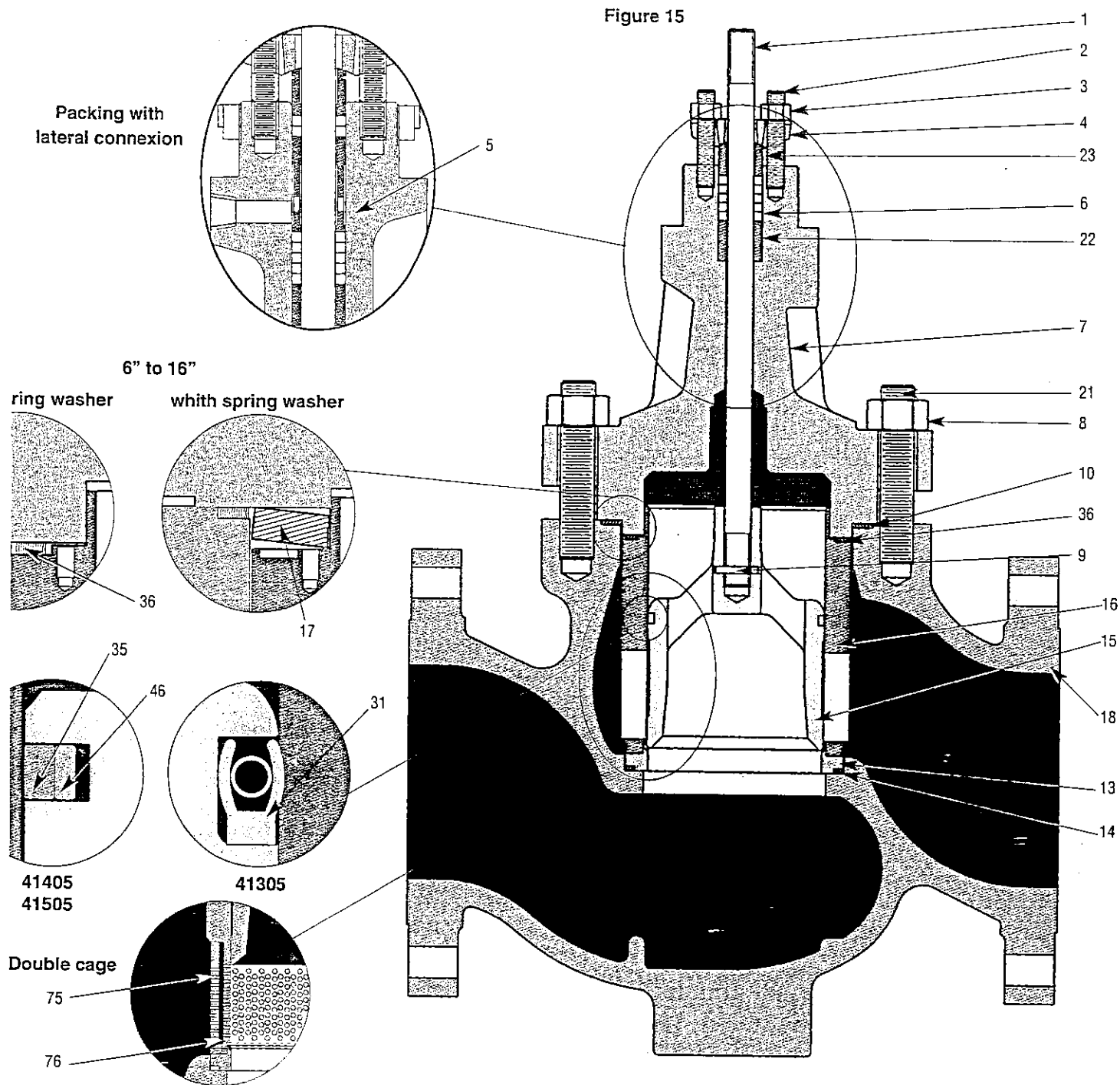


Figure 15



PARTS REFERENCE

Ref.	Parts Name	Ref.	Parts Name	Ref.	Parts Name
1	Valve Plug Stem	13	Seat Ring	31	Tec Seal
2	Packing Flange Stud	● 14	Seat Ring Gasket	○ ● 35	Ni-resist @ Seat Ring
3	Packing Flange Nut	15	Valve Plug (or Piston)	36	Cage Gasket
4	Packing Flange	16	Cage	★ ● 40	PTFE Seat Ring
5	Packing Spacer	+ 17	Spring Washer	★ ● 41	Nordel @ Backup Ring
● 6	Packing	18	Valve Body	□ ● 45	Graphite Seat Ring
7	Bonnet	* 19	Retaining Ring	□ ● 46	Ni-resist @ Backup Ring
8	Valve Body Nut	* 20	Auxiliary Pilot Plug	▲ 50	Washer (Body nuts)
● 9	Plug Stem Pin	21	Valve Body Stud	75	Double cage
● 10	Body Gasket	22	Guide Bushing	76	Pin
* 12	Spring (or Spring Washers Set)	23	Packing Follower		

* On 41405 Series Valves Only
 + On 6" to 16" Valves Sizes Only (150 to 400 mm)
 ★ On 41605 Series Valves Only

● Recommended Spare Parts
 □ On 41905 Series Valves Only
 ○ On 41405/505 Series Valves Only

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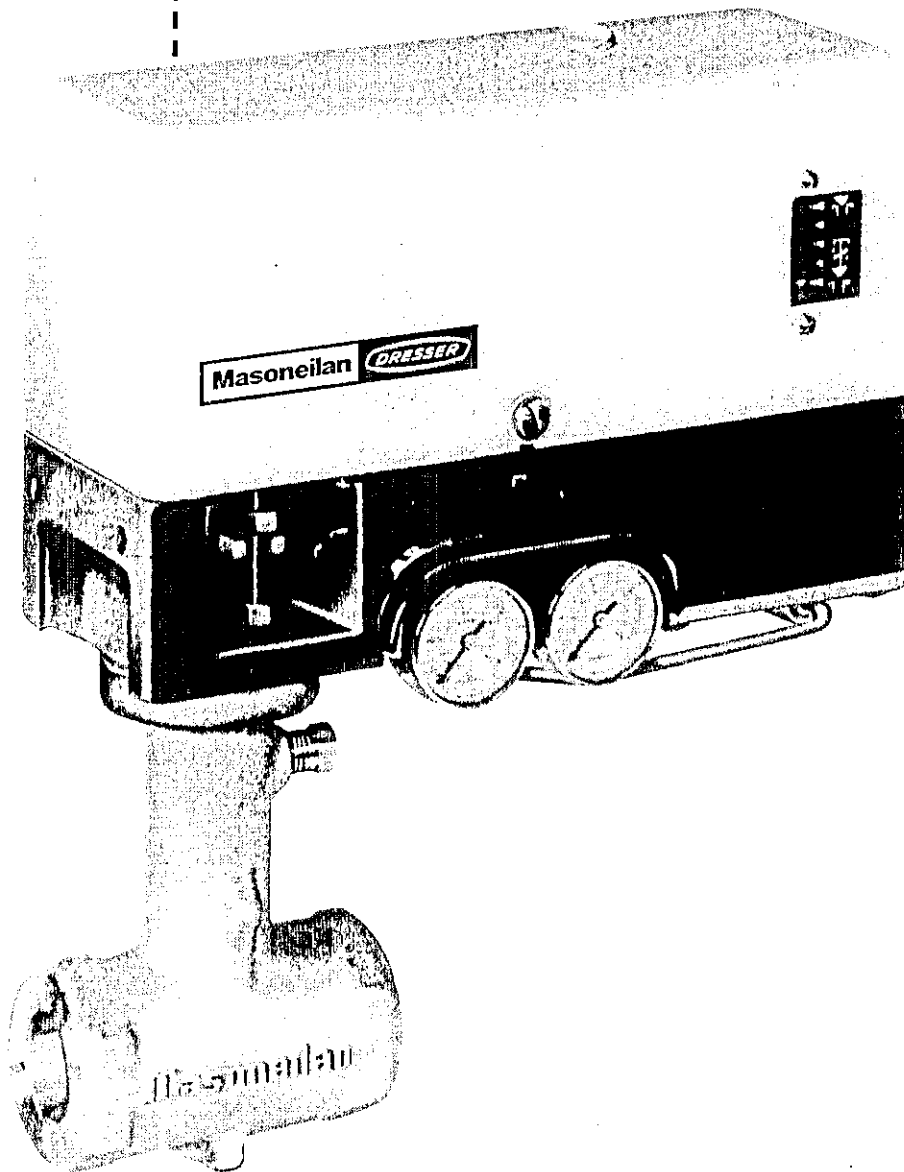
VariPak-28000 Series
A Microflow Valve with Actuator
Having a Built-in Cv adjuster Instructions

MASONEILAN®

VariPak-28000 Series

A Microflow Valve with Actuator
Having a Built-in C_v adjuster Instructions

Instruction
No EH 45004 E
Rev. D 04/2002



INSTRUCTION MANUAL

MASONEILAN





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General

These installation, operation and maintenance instructions apply to the Masoneilan VariPak* 28000 Series Control Valves and include parts reference list and recommended spare parts (see page 12)

The following instructions should be thoroughly reviewed and understood prior to installing, operating or performing maintenance on this equipment.

Non-compliance with these rules and caution notes of this instruction may cause malfunction or serious damage to this device.

*Registered patent

Parts

When performing maintenance use only Masoneilan replacement parts. Parts are obtainable through your local Masoneilan Representative or Spare Parts

Department. When ordering parts always include Serial Number of the unit being repaired.

After Sales Department

Masoneilan has a highly skilled After Sales Department available for start-up, maintenance and repair of our valves and instruments. Contact the nearest Masoneilan Sales Office or Representative or After Sales Department of Conde-sur-Noireau plant.

Training

A regularly scheduled training school is conducted at our Conde-sur-Noireau plant to train customer service and instrumentation personnel in the operation, maintenance and application of our control valves and instruments. Arrangements for these services can be made through your local Masoneilan Representative or our Training Department of Condé-sur-Noireau plant.

operation

The Masoneilan VariPak 28000 Series Control Valve permits to avoid flow coefficient oversizing, a phenomenon practically inevitable with conventional microflow valves. Also, this patented Cv adjustment system permits the selection of a microflow valve from an estimate theoretic Cv as it is possible to make a subsequent fine adjustment to the Cv actually required. This new feature is the first of its kind and is the advantage of the VariPak valve over other microflow valves.

The flow coefficient Cv of the VariPak valve can be adjusted, for each plug and seat-ring combination, without any change in the pneumatic control signal.

Design

This adjustment is obtainable by means of a solid and simple system of crossed levers with an adjustable fulcrum. This operation can be easily done by hand before valve installation, but also when in operation.

For example, an application where a 0.006 theoretic Cv is required, can be handled by a VariPak with a 0.010 maximum Cv with the possibility to field calibrate from 0.004 to 0.010.

VariPak flow coefficients-Rated Cv

Plug and "at ring combination (trim)

Eight plugs and five seat rings can be used in

combination to obtain ten different plug and seat ring assemblies (see figure 2).

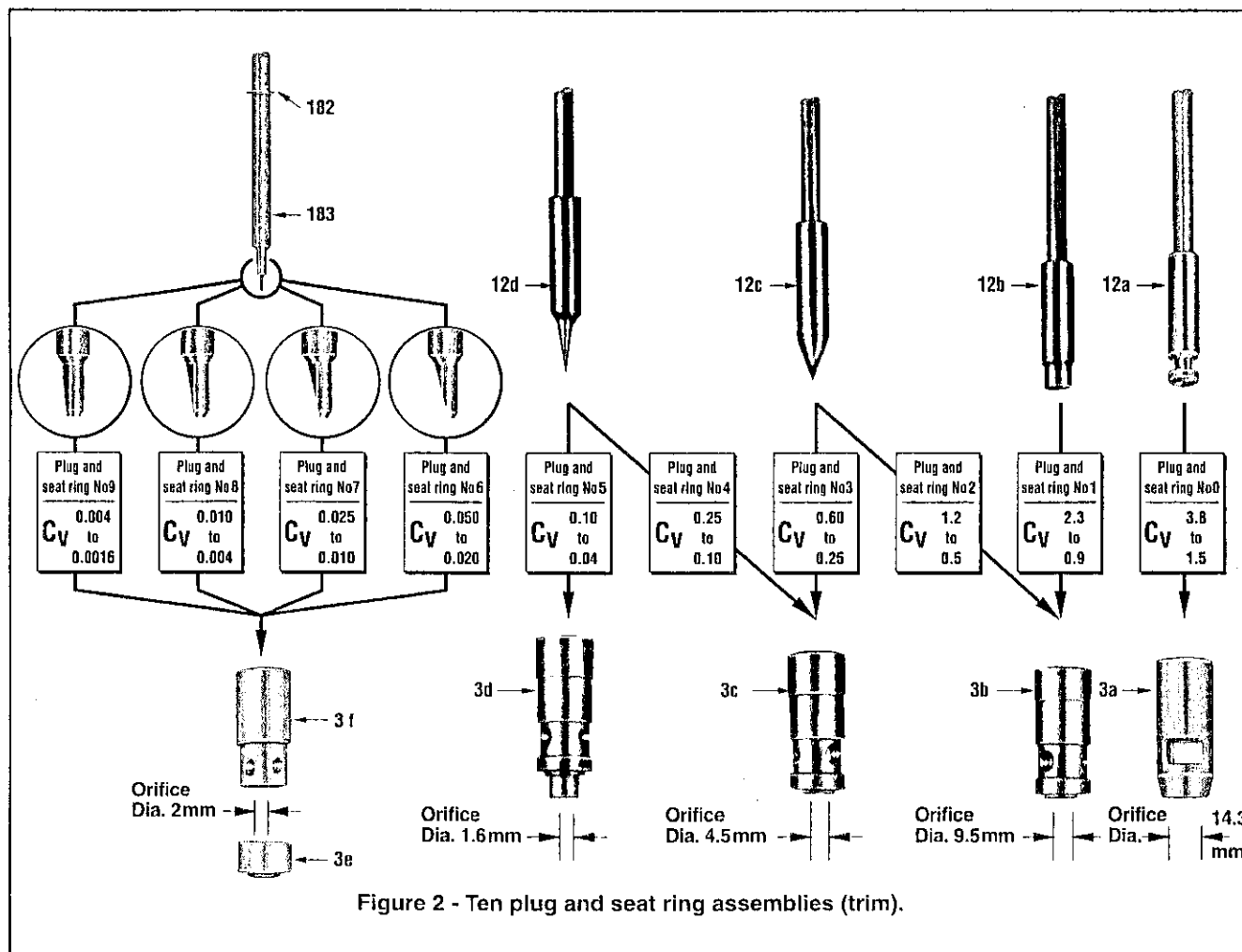
Each plug design and the seat ring orifice diameter permit to identify parts in relation to table of figure 2.

The four plugs corresponding to trim Nos 6 to 9 differ by the angle of the flat, machined on the point. The same seat ring (3e) and the same spacer (3f) are used in the four cases (see figure 2).

The below table (figure 1) permit to select the plug and seat ring combination to obtain the Cv or the Cv span required.

TRIM No	FLOW COEFFICIENT-RATED Cv							
	MIN.			RISK FREE				MAX.
9	0.0016	0.0020	0.0024	0.0028	0.0032	0.0036	0.0040	
8	0.004	0.005	0.006	0.007	0.008	0.009	0.010	
7	0.010	0.013	0.016	0.019	0.021	0.023	0.025	
6	0.020	0.025	0.030	0.035	0.040	0.045	0.050	
5	0.04	0.05	0.06	0.07	0.08	0.09	0.10	
4	0.10	0.13	0.16	0.19	0.21	0.23	0.25	
3	0.25	0.30	0.35	0.40	0.45	0.5	0.55	0.6
2	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2
1	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.3
0	1.5	1.9	2.3	2.6	2.9	3.2	3.5	3.8

Figure 1



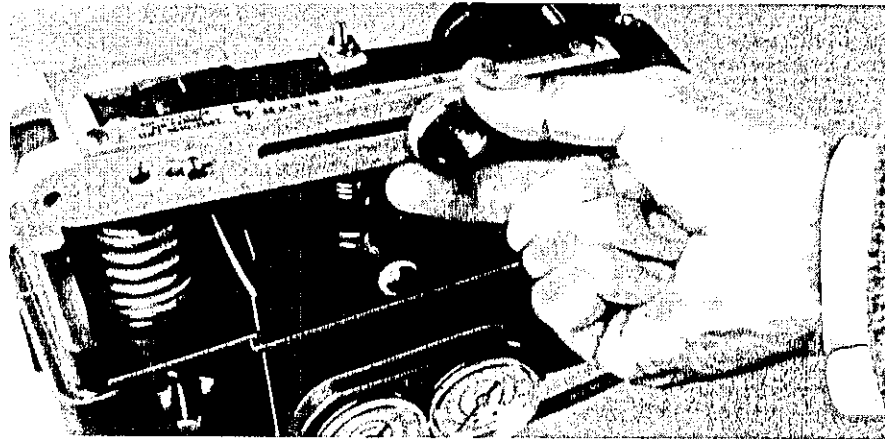


Figure 3 - Cv adjustment for each trim.

Changing the plug and seat ring combination (trim)

This operation can be easily performed for trim Nos 1 to 9 inclusive by simply changing the following parts:

- Plug and seat ring assembly (select the combination corresponding to the new Cv). (See figures 1 and 2).
- Cv adjustment plate (25).
- Actuator spring if needed (134) (check spring scale corresponding to the new Cv). (See table of figure 12).

These operations can be performed following instructions shown under paragraphs "Disassembly" and "Reassembly" of chapter "Maintenance", page 9.

- Change also serial plate (135) or change indications on existing plate.

CAUTION:

1. If the valve considered has 1/2" or 3/4" NPT threaded ends, its maximum capacity is respectively limited to trim Nos 9 to 3 inclusive or trim Nos 9 to 2 inclusive.
2. A trim Nos 9 to 1 cannot be installed in a VariPak body designed for a trim No 0. It is also impossible to install a trim No 0 in the valve body designed for the other numbers of trim.

Cv adjustment for each plug and seat ring combination (trim)

To adjust, move adjustment knob (24) along scale (25) fixed to the top of lever No 1 (21).

The adjustment scale (25) shows the available Cv values for the required plug and seat ring.

- Loosen knob (24) and slide it along lever to the required position. Tighten up knob.

Note: 1. This operation requires to move the lever No 2 either pneumatically (admit air in the actuator) or manually (lift the piston clevis (104b) with a screwdriver or a similar tool) in order to position the two lever slides strictly parallel.

2. Changing the Cv may require a slight zero adjustment to recalibrate the closing point.

Actuator

Only one actuator is required for the VariPak valve:
Direct action : Open on air failure or Reverse action: Close on air failure. Air action can be reversed by merely relocating two pivot pins followed by recalibration.

Proceed with instructions under paragraph "Reversing valve Action", page 6.

Handwheel (Figure 4)

The optional handwheel is located on top of the cover and fitted with a locking lever. Direct access to it does not require parts removal.

It basically consists of a threaded rod fitted with a handwheel (120) and lever arm stop (122). The threaded rod freely rests on the actuator bracket (108) and is guided through the cover (110) by means of the handwheel bushing (119). The stop (122) consists of a block screwed on the threaded rod guided in translation by the actuator bracket (108).

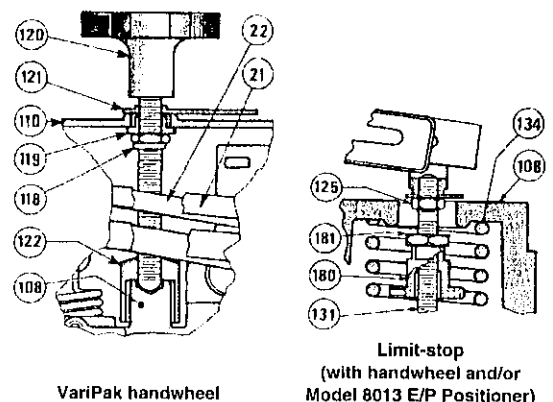


Figure 4

Clockwise rotation of the handwheel (120) moves the stop (122) up along the threaded rod and drives up lever No 2 (22) compressing the spring (134). This action provides for the closing of the valve equipped with an actuator mounted for direct action (open on air failure) and also the opening of the valve equipped with an actuator mounted for reverse action (close on air failure).

The return to automatic operation (neutral position) is accomplished by turning the handwheel anti-clockwise until stop (122) contacts bracket (108).

Note: During this operation the compression releases when stop (122) no longer contacts lever (22). Then, continue this operation until a slight tension reappears and tighten handwheel lock (121).

On valve equipped with a handwheel and/or Model 8013 Electropneumatic Positioner a limit stop is installed on piston stem (131) inside of the spring chamber. This device consists of a limit-stop nut (180) and lock-nut (181) to prevent damage to the plug and seat ring assembly and/or plug stem in the event of overstroke of actuator or handwheel.

Note: In the case of an air-to-open valve with a handwheel, the limit-stop is not operated and must be screwed down to the bottom of the piston.

Reversing valve action (Figures 4, 5, 19 and 21)

Caution: Valve must be isolated and pressure vented before disassembly.

1. Loosen cover screw (109) and remove cover (110). On valve equipped with a handwheel, loosen cover screw (109), back off handwheel lock (121) and turn handwheel (120) counterclockwise until cover floats free.
2. Adjust signal for closing of the valve. Slightly change signal so that the plug barely moves off the seat ring. Turn adjustment knob (24) to position of minimum Cv.
3. Loosen locknut (103) and, using a screwdriver applied at the plug stem end, turn anticlockwise through 1 3/4 turns. Shut off signal and pressure supplies. Slightly retighten locknut (103) against the clevis.
4. Loosen locknut (117) and fully unscrew take-up screw (116). Remove force balance spring (114) from spring clamp (115).
5. Remove retainer clips (112b) from the two pivot pins (184) and then pull out from lever No 1 and clevis (104a).

Note: This operation will be facilitated by relieving the load on the plug clevis exerted by conical compression spring (106). While driving out pins, using a screwdriver push on plug stem end.

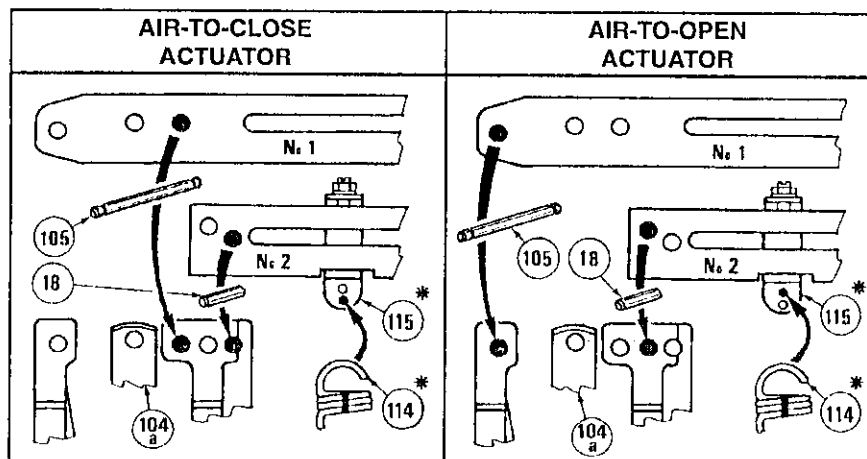
6. Remove the two retainer clips (112a) from pivot pin No 1 (105) and disengage it to uncouple lever No 1 from actuator bracket (108). Unscrew the adjustment knob (24) and slide it to the maximum Cv position. Disengage smooth end of adjustment pin (23) from lever slide No 2 while removing lever No 1.
7. Drive out pivot pin No 3 (18) and remove lever No 2 (22) from bracket.
8. Remove the two adjustment plate screws (26) and replace Cv adjustment plate (25) after having turned it over to adapt it to the new action.
9. Replace levers No 2 & 1 in sequence using for pivot pins (105) and (18) correct holes of levers and bracket for the new action of the actuator (see fig. 5).

Note: Ensure that the clevis (104a) is correctly positioned before placing lever No 1 on actuator bracket (108).

10. Put back adjustment knob (24) on minimum Cv position.
11. Couple clevis (104a) to lever No 1 (operation 12 under paragraph "Reassembly", page 14).
12. Hook spring (114) in the correct hole of spring clamp (115) (see figure 5).
13. Admit supply and signal pressures and complete calibration. Replace cover (110) with two screws (109). On valve equipped with a handwheel, replace cover, then turn handwheel clockwise to engage it in lever arm stop (122). Tighten cover screws (109).
14. Place valve back in service.

Note: 1. When replacing air-to-close actuator fitted with a handwheel by air-to-open actuator, place limit-stop in the neutral position by screwing it down to the piston end.

2. When replacing air-to-open actuator fitted with a Model 8013 EP Positioner by an air-to-close actuator, adjust the limit-stop to the opening position.



*Only with type 7700 Positioner

Figure 5 - Identification of pivot pin holes

installation

Preliminary steps

1. Before installing the valve in the line, clean piping of all foreign material such as welding chips, scale, oil, grease or dirt.
2. Record serial plate data for future reference.
3. For inspection of the valve without interrupting the process, provide a hand operated stop valve on either side of the VariPak with a hand-operated, throttling valve mounted in a bypass line.

Valve installation (Figures 8, 9 and 10)

Piping end connections: The body of the VariPak valve, rated at ANSI class 1500*, can be:

- **Installed between line flanges** of DN 25 (1") machined per the following standard: ISO-PN 10 to PN 250 (ANSI 150 - 300 - 600 - 900 & 1500 lb).

Use ASTM A 193 Gr B7 or equivalent low alloy steel line bolting for temperatures from - 20 F to + 650 F (29°C to + 350°C). Use ASTM A 193 Gr B8 Tx strain hardened stainless steel bolting for corrosive or cryogenic service. Complete line bolting sets in the above materials are available from Masoneilan on request.

- **Connected by flanges** of DN 25 machined per the following standards: ISO-PN 20, 50 & 100 (ANSI 150, 300 & 600 lb).

Place gaskets according to the process between the valve body and the pipe flanges.

On request, the VariPak valve body can be supplied with 1/2", 3/4" or 1" NPT threaded ends. Apply P.T.F.E. tape or sealing compound compatible with the process to the pipe threads.

Alignment: The installation of the valve on the line is made easy in consideration of its small weight and its reduced dimensions. To hold the valve body during installation of the studs. Special bosses are provided to center the valve in the line and prevent rotation before final tightening of the studs.

In all cases, the valve must be installed with flow tending to open. The flow arrow stamp on the body must be pointing in the direction of flow. install bolting and tighten evenly in criss-cross fashion.

Insulation: if required, insulate the valve as shown in Figure 11. Do not insulate higher than the shaded area.

Air piping (Figures 6 and 12)

- If an on-off valve: pipe actuating air line to the 1/8" NPT opening in the diaphragm cover (137).
- If a throttling valve: pipe supply and instrument signal lines to the appropriate connections in the positioner block (144). Use 1/4" O.D. tubing or equivalent for air lines.

Note: Be sure that supply air pressure is that value stamped on the serial plate.

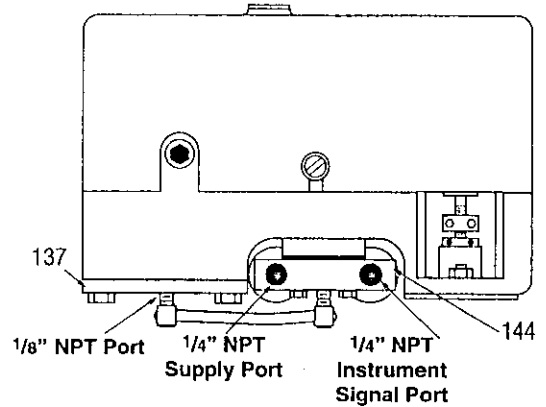


Figure 6 - VariPak air connections.

Limit switches (Figure 7)

On request, and in certain cases, limit switches can be provided. Limit switches are wired and adjusted to customer order. The black wire attaches to either the normally open or normally closed terminal on the upper limit switch; the black and white striped wire attaches to its common terminal. The red wire is connected in like manner to the lower limit switch; the red and white wire to its common terminal. To adjust switches, loosen mounting parts, stroke the valve to the desired position, adjust the position of the switch until it trips. Then tighten mounting parts (160, 161, 162).

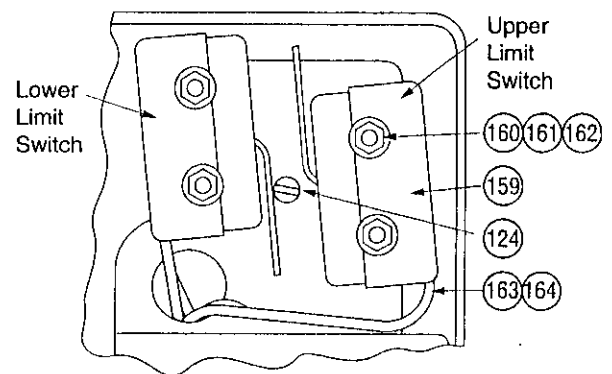


Figure 7 - Limit Switch Adjustment

* Except in case of body for maximum Cv 3.8: ANSI class 600

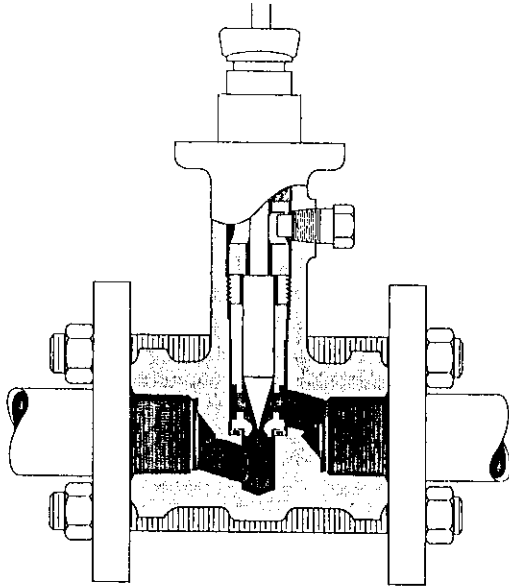


Figure 8 - VariPak installation flanged connections.

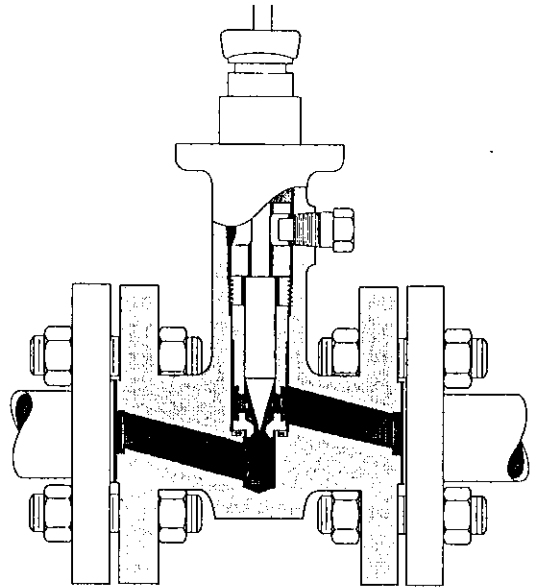


Figure 9 - Flanged VariPak body.

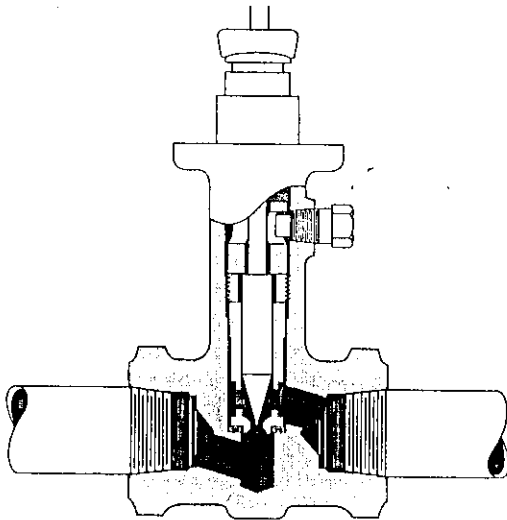


Figure 10 - VariPak installation screwed connections (option)

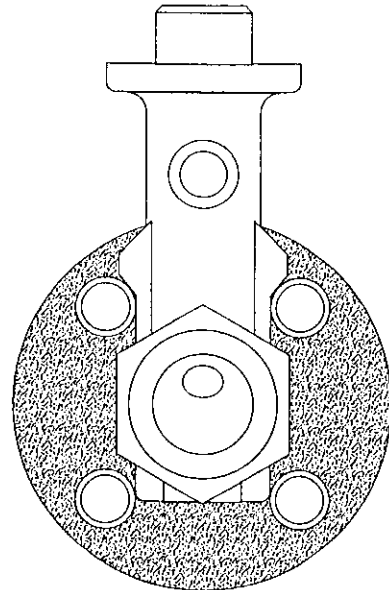


Figure 11 - Insulation for the VariPak valve.

Cv	Spring range (134)			Supply max.	
	m.bar	psi	color code	m.bar	psi
3.8 to 1.5	414 - 1660	6-24	Red	2100	30
2.3 to 0.9					
1.2 to 0.5					
0.6 to 0.25					
0.25 to 0.10	207 - 1035	3-15	Green	1250	18
0.10 to 0.04					
0.050 to 0.020					
0.025 to 0.010					
0.010 to 0.004					
0.004 to 0.0016					

Figure 12 - Spring ranges and supply pressures

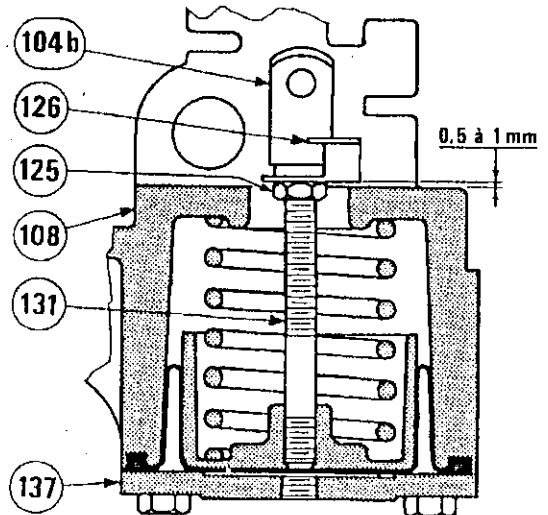


Figure 13 - Piston rod clevis (104b) adjustment.

calibration

The VariPak valve is factory-calibrated in relation to its construction elements specified on order. If, for some reason, the calibration has been disturbed (for ex.. following the reversing valve action, or following the changing of plug and seat-ring or one of its parts), it makes it necessary to proceed with the adjustments below or part of them in the following sequence:

1. Piston rod clevis (104b) adjustment.
2. Plug stem adjustment.
3. Limit-stop adjustment.
4. Cv adjustment.
5. Positioner start-up pressure adjustment.

1. Piston rod clevis (104b) adjustment

(Figures 13, 19, 20 and 21)

This adjustment should not be changed except if necessary to disassemble the piston S/A (131). Then, it should be made during reassembly before coupling the levers to clevises (chaps. MAINTENANCE- Reassembly. Step 11, page 14).

- With the piston against the diaphragm cover (137), turn clevis (104b) in such a manner that the distance between the actuator bracket top (108) and the indicator bottom (126) be between 0.5 mm and 1 mm. The use of a shim will facilitate the operation.
- Couple lever No 2 (22) to the clevis. Admit sufficient air pressure to disengage nut (125) and tighten it against the indicator. Take care that the indicator (126) is correctly positioned. Release air pressure.

2. Plug stem adjustment

(Figures 19, 20 and 21)

With levers No 1 & No 2 coupled, proceed as follows:

- Admit sufficient air pressure to actuator to extend the piston rod and place under the indicator (126) a 1.5 mm shim if an air-to-open actuator or a 25 mm shim if an air-to-close actuator. Release air pressure after placing the shim.

At this closing point without seating force, the slides of levers No 1 and No 2 must be strictly parallel. This characteristic permits to change the adjustment knob position to obtain the true required Cv.

- Loosen adjustment knob (24) and slide it over lever No 1 to position of maximum Cv on Cv adjustment plate (25). Tighten knob (24).
- Loosen locknut (103) and, using a screwdriver applied to the plug stem end, turn it until plug slightly touches the seat ring. If the valve was removed from the pipe, a bubble leakage test performed on a calibration bench will permit a very accurate adjustment. Using the screwdriver, keep plug stem in position and tighten locknut (103) against the clevis (104a).
- Admit air pressure again to disengage shim. Release air pressure.

Note: On air-to-open actuator, the shim thickness can be changed plus or minus one or two tenth of millimeter so that levers No 1 and 2 are in the parallel position and to obtain the required tightness at closing, especially for small Cv's (Cv < 0.10).

3. Limit-stop adjustment

(In case of actuator with handwheel and/or Model 8013 Electropneumatic Positioner). (See figure 4).

The VariPak valves equipped with handwheel and/or Model 8013 Electropneumatic Positioner have a limitstop device to avoid damage to the plug and seat ring, and/or plug stem in the event of overstroke of actuator or handwheel.

This device consists of a limit-stop nut (180) serving as a stop and screwed on the piston rod inside the spring chamber, and a locknut (181).

The adjustment of this device can be made right after the plug stem adjustment (see § 2).

- Remove the shim and admit the air supply pressure to close the valve. Turn locknut (181) on piston rod until it touches locknut (125). Turn limit-stop (180) on piston rod until it slightly touches the inside of the actuator bracket (108).
- While holding the limit-stop with a 12 mm wrench, tighten locknut (181). Release air pressure.

4. Cv adjustment

To adjust, move adjustment knob (24) along scale (25) fixed to the top of the lever No 1 (21). See paragraph "Cv adjustment for each plug and seat-ring combination", page 4.

5. Positioner start-up pressure adjustment

(Figures 18, 19, 20 and 21)

- Pipe air supply and instrument signal lines to the positioner.
- Set supply pressure in relation to the valve Cv (See figure 12).
- Set signal to minimum value if an air-to-open actuator or to the maximum value if an air-to-close actuator. Turn take-up screw (116) until piston rod just begins to move. Tighten locknut (117).

maintenance

Warning: Maintenance and/or disassembly should be performed with the valve, actuator and positioner free of all pressures.

Actuator diaphragm replacement

(Figures 14, 18 and 19)

Unscrew the two pressure connection nuts (138a) and pull tubing (140) out. Remove four cap screws (139). Remove diaphragm cover (137). Remove diaphragm (136). Form new diaphragm (136) and insert over the piston as shown (Fig. 14). Place the diaphragm roll into the bracket groove. Take necessary steps not to twist or bend the diaphragm during its replacement. Replace the diaphragm cover (137) with the four screws (139) and reconnect the pressure connection nuts (138a). Check tightness of connections.

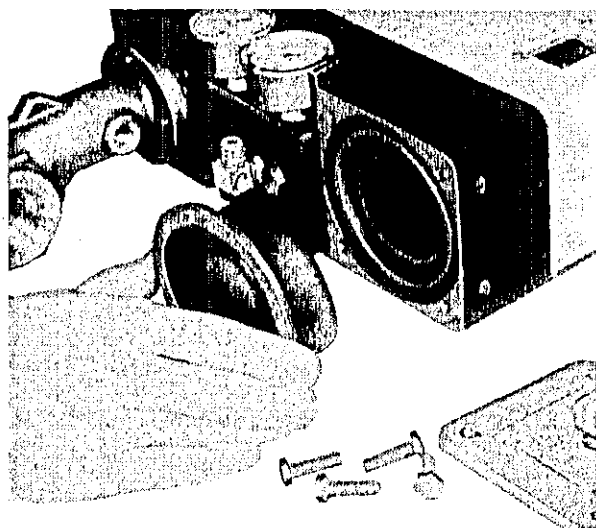


Figure 14 - Diaphragm replacement.

Adding packings (Figures 15 and 19)

To add a ring of packing, depressurize the valve, back off packing flange nuts (8b) all the way, lift the packing flange and follower and insert one ring of packing. Tighten nuts (8b) finger tight plus one full turn.

Disassembly (Figures 4, 18, 19, 20 and 21)

In some cases, it may be necessary to disassemble the VariPak valve, for example, to replace the plug and seat ring assembly (installation of new parts or change of maximum Cv), or also to change the packing in case of Cv max. < 0.6.

Note: In the case of Cv max. \geq 0.6 a quick way to replace the packing prevents full disassembly of the valve (page 13).

Caution: Valve must be isolated and pressure vented before disassembly.

1. Loosen cover screw (109) and remove cover (110). On valve equipped with a handwheel, loosen cover screw (109), back off handwheel lock (121) and turn handwheel (120) counterclockwise until cover floats free.

2. Adjust signal for closing of the valve. Slightly change signal so that the plug barely moves off the seat ring. Turn adjustment knob (24) to position of minimum Cv.
3. Loosen locknut (103) and, using a screwdriver applied at the plug stem end, turn anticlockwise through 1 3/4 turns. Shut off signal and pressure supplies. Slightly retighten locknut (103) against the clevis.
4. Loosen locknut (117) and fully unscrew take-up screw (116). Remove spring clamp (115) from lever No 2 and force balance spring (114) from positioner.
5. Remove retainer clips (112b) from the two pivot pins (184) and them pull out from lever No 1 and clevis (104a).

Note: This operation will be facilitated by relieving the load on the plug clevis exerted by conical compression spring (106). While driving out pins, using a screwdriver, push on plug stem end.

6. Remove the two retainer clips (112c) from pivot pin No 4 (124) and disengage it to uncouple piston clevis (104b) from lever No 2 (22).
7. Remove the two retainer clips (112a) from pivot pin No 1 (105) and disengage it to uncouple lever No 1 from actuator bracket (108). Disengage adjustment pin smooth end (23) from lever spline No 2 and remove adjustment knob (24) and adjustment pin (23) from lever No 1.
8. Drive out pivot pin No 3 (18) and remove lever No 2 (22).
9. Hold plug stem in place using a screwdriver put to its end and unlock nut (103). Unscrew clevis (104a) and locknut (103). Remove spring button (102), spring (106) and grommet plate (101).

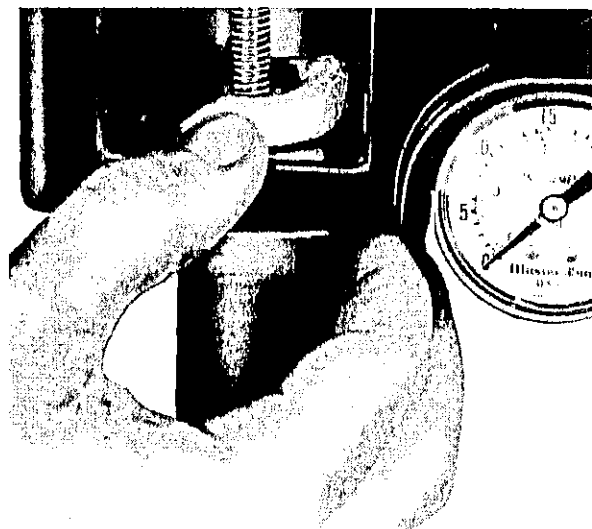


Figure 15 - Adding a ring of packing.

10. Remove the two packing flange nuts (8b), packing flange (10) and packing follower (9). Remove the two bracket securing nuts (8a) as well as the bracket (108).
11. Using a packing hook, remove the largest number of packing rings (6) from packing box. Remove safety pin (11) and pull plug stem to remove packing spacer (5), plug and stem, so as the remainder of packing rings.
12. Using a 9/16" or 14 mm piece of hex stock and a wrench, unlock and pull out seat ring retainer (4).
13. Pull out seat ring (3) then gasket (2) using a hook made from steel wire, diameter about 3 mm. Carefully fettle the hook end.

Note: 1. The VariPak seat ring with Cv max. < 0.10 consists of two parts: the seat ring proper (3e) and a spacer (3f). The small size of orifice of these parts does not allow for their removal by means of a hook. Therefore, it is necessary for this operation to remove the body from the pipe and turn it over and, if needed, to hit the bottom by means of a wooden mallet. Should the seat ring be jammed in its housing, it is possible to move it using a screwdriver inserted through the outlet orifice

2. VariPak valve with Cv max. 3.8 does not feature any seat ring gasket (2).

Reassembly (Figures 4, 18, 19, 20 and 21)

Before reassembly, clean thoroughly the inside of the valve body and parts. Gasket seating surfaces and surfaces in contact with others must be thoroughly cleaned. On reassembly, new seat ring gasket (2) and new packing (6) must be used.

1. Place a new seat ring gasket (2) in the valve body (13) and install the seat ring (3) taking care to correctly center the gasket on the seat ring shoulder. Orient it in such a manner that one of its ports lines up with the body outlet orifice.

Note: 1. In the event of a maximum Cv smaller than 0.10, the seat ring (3e) shall first be positioned on the new gasket (2) taking the same precautions as shown above. Next, engage spacer (3f) and orient one of its ports towards the body outlet orifice.

2. VariPak valve with Cv max. 3.8 does not feature any seat ring gasket (2).

2. Carefully apply Never Seez grease (or equivalent) on threads and bottom of retainer (4). With a 9/16" or 14 mm piece of hex stock and a wrench, torque the retainer to 59 ft-lb (8 daN.m) if a graphite gasket st. reinforced, or to 40 ft-lb (5.5 daN.m) if a glass filled P.T.F.E. gasket (see figure 16).

Note: In case of a valve with maximum Cv 3.8, torque the retainer to 30 ft-lb (4 daN.m).

3. Engage the plug and stem assembly in the seat ring. In the case of a maximum Cv < 0.10, ensure that there is no hard point during the stroking of the plug. In case of a hard point, loosen the retainer (4) and replace the seat ring (3e) in the correct position until the stem smoothly slides.

Slide spacer (5) aligning the hole in the spacer with the safety pin (11) hole in the valve body.

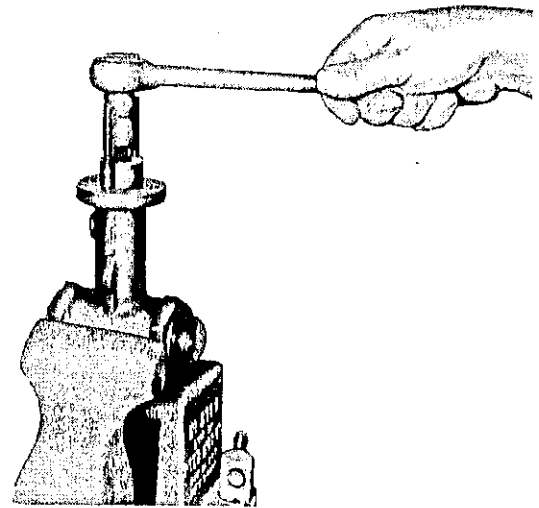


Figure 16 - Tightening the seat ring retainer (4)

Note: In the event of a maximum Cv smaller than 0.10 ensure that the retaining ring (182) is placed on the plug before engaging it in the spacer (3f). If the retaining ring is damaged, replace it.

4. Wrap the safety pin (11) with two turns of P.T.F.E. tape (Teflon). Screw it into the bonnet five and a half to six turns from where threads engagement starts.

Note: To find start of threads engagement, proceed as follows:

- a. Screw safety pin about one turn..
- b. Pull safety pin outwards while unscrewing it.

5. Install packing, positioning the skive cut of each packing ring 120° away from the cut of an adjacent ring. Slightly push down rings one after another using a tube 1/2" sch. 160 size. Install packing follower (9) on plug stem.
6. Install actuator bracket (108) and secure it with the two nuts (8a). Install packing flange (10) on plug stem. Hand tighten the two packing flange nuts (8b) adding one full turn with a wrench.
7. In the following sequence, place grommet plate (101), spring (106) and its spring button (102). (See position figure 21). Screw nut (103) and clevis (104a) on plug stem. Adjust nut and clevis without locking them together until the clevis holes are about 1,5 mm above the alignment of the pin holes in the actuator bracket (108). (See figure 17).

Note: Measuring this distance can be made easier by engaging pins (105), (184) and (18) in their respective hole.

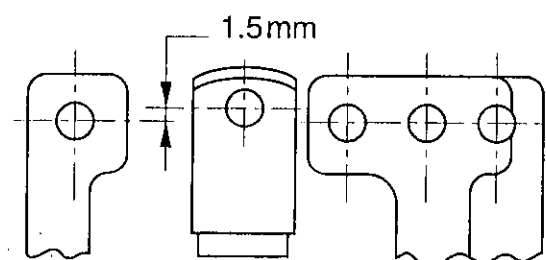


Figure 17 - Plug stem pre-adjustment.

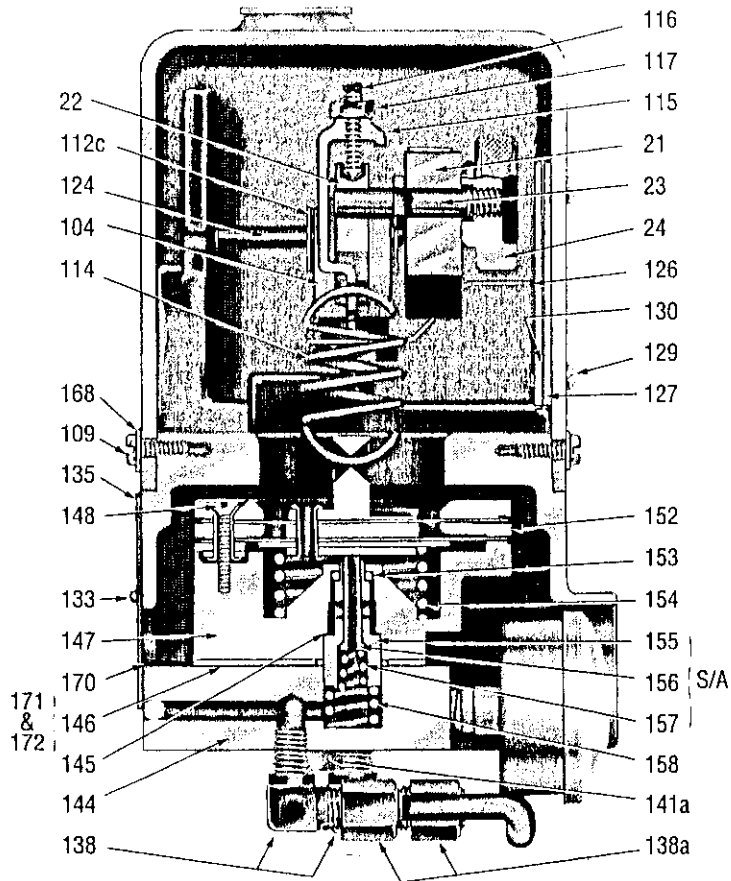


Figure 18 - Cross section of the VariPak actuator and its pneumatic positioner.

PARTS REFERENCE

REF.	Qty	PART NAME	REF.	Qty	PART NAME	REF.	Qty	PART NAME
▲■ 1	1	Pipe plug	104 (a,b)	2	Clevis	◆141 (a,b)	4	Screw
● 2	1	Seat ring gasket	105	1	Pivot pin No1	◆142	1	Output gauge
a	1	Seat ring C _v max. 3.8	106	1	Conical comp. spring	◆143	1	Instrument gauge
b	1	Seat ring C _v max. 2.3 & 1.2	●107	1	Grommet	◆144	1	Manifold block
* 3 c	1	Seat ring C _v max. 0.25 & 0.60	108	1	Actuator bracket	◆145	1to5	Shim
d	1	Seat ring C _v max. 0.10	109	2	Cover screw	●◆146	1	Gasket (includes 171 & 172)
e	1	Seat ring C _v max. < 0.10	110	1	Cover	◆147	1	Positioner block
□ 3f	1	Spacer (C _v max. < 0.10)	●112 (a,b,c)	6	Retainer clip	◆148	2	Slotted flat c. screw
4	1	Seat ring retainer	◇◆114	1	Force balance spring	●◆152	1	Positioner diaphragm s/a
5	1	Packing spacer	◆115	1	Spring clamp	●◆153	1	O-ring
6	4	Packing	◆116	1	Take-up screw	◇◆154	1	Spring
7	2	Packing flange stud	◆117	1	Locknut	○◆155	1	Sleeve
8 a	2	Packing flange nut	* 118	1	Handwheel locknut	○◆156	1	Spool
8 b	2	Mounting nut	* 119	1	Handwheel bushing	○◆157	1	Spring
9	1	Packing follower	* 120	1	Handwheel	◆158	1	Spring
10	1	Packing flange	* 121	1	Handwheel lock	△159	2	Switch
11	1	Safety pin	* 122	1	Lever arm stop	△160	4	Screw
a	1	Plug/stem C _v max. 3.8	123	1	Cover plug	△161	4	Washer
b	1	Plug/stem C _v max. 2.3	124	1	Pivot pin No 4	△162	4	Nut
* 12 c	1	Plug/stem C _v max. 1.2 & 0.6	125	1	Locknut	△163	4	Wire
d	1	Plug/stem C _v max. 0.25 & 0.10	126	1	Indicator	△164	4	Terminal
13 a	1	Body C _v max. < 3.8	127	1	Indicator plate	■165	1	Logo
b	1	Body C _v max. 3.8	129	2	Indicator plate screw	168	2	Cover washer
18	1	Pivot pin No 3 (22/108)	130	2	Speed nut	◆170	1	Signal decal
21	1	lever No 1	131	1	Piston s/a	■◆171	2	O-ring
22	1	lever No 2	133	2	Serial plate screw	■◆172	1	O-ring
23	1	Cv adjustment pin	134	1	Actuator spring	173	1	Cover plug
24	1	Cv adjustment knob	135	1	Serial plate	+ 180	1	Limit-stop
25	1	C _v adjustment pin	●136	1	Diaphragm	+ 181	1	Locknut
26	2	Adjustment plate screw	137	1	Diaphragm cover	182	1	Retaining ring (C _v max. < 0.10)
101	1	Grommet plate	◆138	2	Union elbow (Incl. 138a)	183	1	Plug (C _v max. < 0.10)
102	1	Spring button	139	4	Cover cap screw	184	2	Pivot pin No 2
103	1	Locknut	◆140	1	Tubing			

● Recommended spare parts.

□ Complete sub-assembly includes: plug-stem (183), retaining ring (182), seat ring (3e) and spacer (3f) (see figure 2).

◆ Only for pneumatic positioner.

* See Figure 2.

◇ Consult table figure 24.

* Only for handwheel (optional) (fig. 4).

○ Complete sub-assembly includes Ref. Nos 155, 156 and 157.

■ Not shown.

▲ Only for cast-bodies.

+ Only on actuator w/handwheel and/or Model 8013 E.P. Positioner (see fig. 4).

△ Only for the optional limit-switches adaptation ; quantity for two limit-switches (see fig. 7).

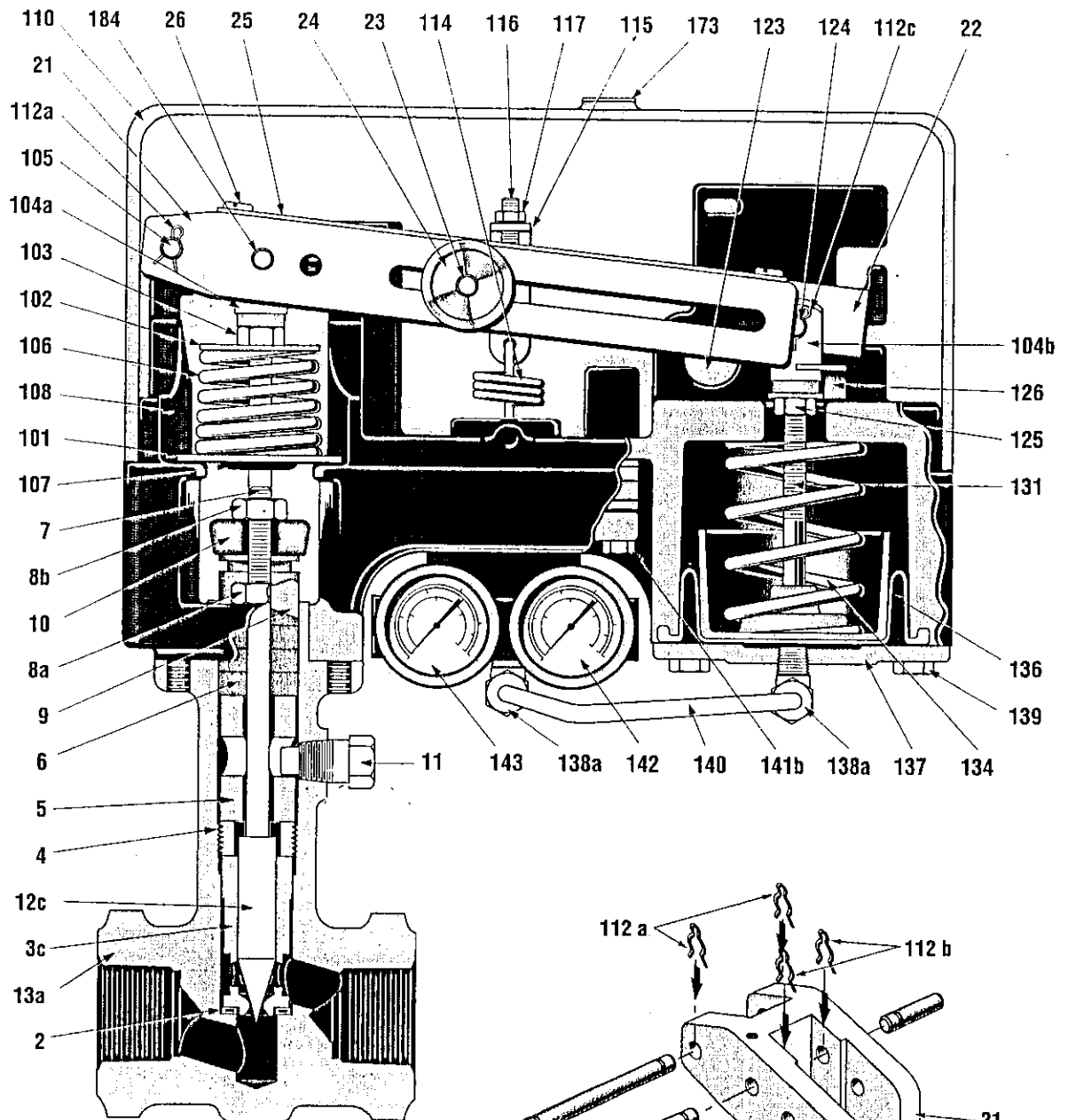


Figure 19 - VariPak valve closing by air failure with pneumatic positioner.

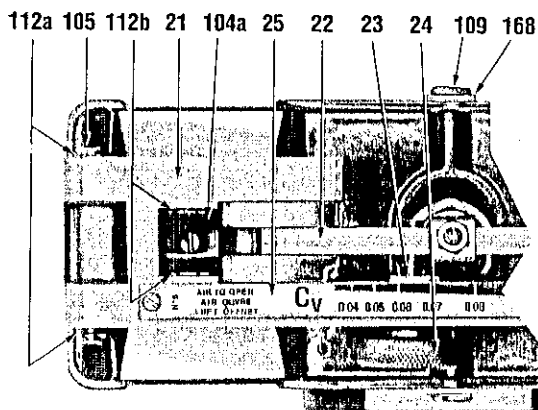


Figure 20 - Partial top view.

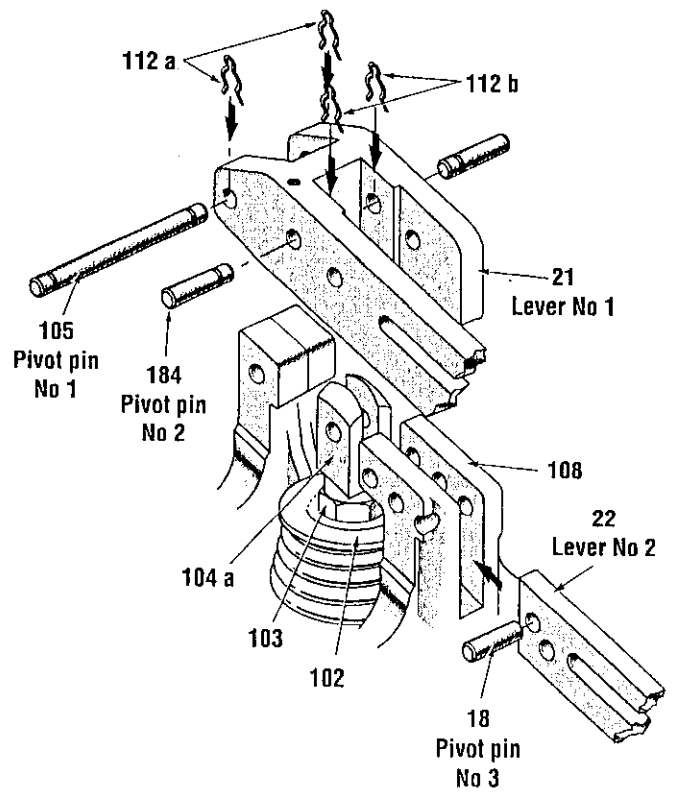


Figure 21 - Coupling detail of levers No 1 and 2.

- Pin lever No 2 (22) to bracket (108) using pin (18). Ensure that hole of lever No 2 destined for spring clamp (115) is located on the top and aligned with the force balance spring (114).

- Place adjustment pin (23) in slide of lever No 1 and screw knob (24) on its threaded end. Engage pin smooth end (23) into the slide of lever No 2 and mount lever No 1 on bracket (108). Couple lever No 1 to bracket (108) using pin (105) and the two retainer clips (112a).

Note: Ensure that the clevis (104a) is correctly positioned before placing lever No 1 on actuator bracket (108). To locate connecting holes of levers No 1 and 2 in relation with desired action, see figure 5.

- Set adjustment knob (24) on position of minimum Cv.
- If the piston rod clevis (104b) has not been disturbed during disassembly, couple it to end of lever No 2 using pin (124) and the two retainer clips (112c).

Note: This operation will be facilitated by placing the piston rod in an intermediate position by admitting air to the diaphragm and by setting the knob in a position where the end of lever No 2 is left most accessible. If clevis (104b) has been disturbed, proceed with adjustment and coupling as described under "Calibration", paragraph 1, page 9.

- Couple clevis (104a) to lever No 1. To perform this operation push, by means of a screwdriver on plug stem end to align holes in clevis and lever No 1. Couple by means of the two pins (184) and retainer clips (112b)

Note: Clips insert on pins between the sides of the clevis and lever No 1.

- With take-up screw (116) fully unscrewed from spring clamp (115), place the latter in position after hooking force balance spring (114) first on the positioner spring bracket of the diaphragm S/A (152) and secondly on spring clamp (115).

Note: Spring clamp (115) has two holes. If a close on air failure actuator the spring must be hooked in the upper hole. In case of valve open on air failure, the spring must be hooked in the lower hole (see fig. 5).

- Admit supply and signal pressures and complete calibration. Replace cover (110) with two screws (109). In the event a handwheel is fitted, replace cover, then turn handwheel clockwise to engage it in lever arm stop (122). Tighten cover screws (109).

- If the valve has been removed from the line, reinstall it according to paragraph "Valve installation", page 7. Place the valve back in service.

Packing quick change method (for valves Cv max. 0.6 to 3.8 only) (Figures 19 and 22)

The fastest and simplest way to replace packing is to remove the entire actuator without disturbing actuator parts or calibration. However, this is not recommended for valves with a small Cv ($Cv < 0.6$) due to the very fineness of their plug. In this event, disassemble the valve to replace the packing (see under "Disassembly" page 10).

Vent the valve pressure and proceed as follows:

- Be sure plug is off the seat ring. With an air-to-open valve, admit air pressure under the diaphragm or turn the handwheel to move the plug off its seat ring.
- Remove safety pin (11) from body. The safety pin engages the packing spacer (5). The function of safety pin and spacer is to prevent the plug from being pushed out if the actuator is removed while the valve is still pressurized. The valve internal parts cannot be removed unless the safety pin is removed first. Remove two packing flange nuts (8b) and back off two mounting nuts (8a) as far as possible.
- With a block of wood and a mallet, if necessary, tap the actuator plug assembly off the valve. Clean the packing box and plug stem and carefully place new rings of packing around the stem. Position the skive cut of each packing ring 120° from that of the adjacent ring.

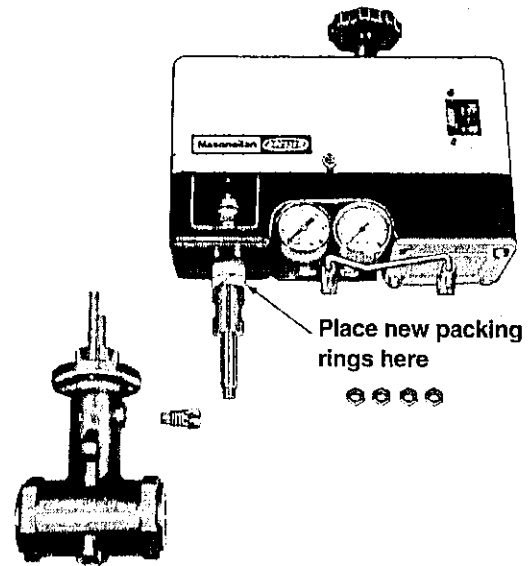


Figure 22 - Packing replacement
(only for Cv's 0.6 and larger).

4. Reassemble the actuator/plug assembly to the valve taking care: (a) to align hole in spacer (5) with safety pin hole ; (b) to replace two mounting nuts (8a) during assembly. Take extra care in guiding each ring into the packing box.

5. Wrap the safety pin (11) with two turns of P.T.F.E. tape (Teflon). **Screw it into the bonnet five and a half to six turns from where threads engagement starts.**

Note: To find start of threads engagement, proceed as follows:

- a. screw safety pin in about one turn,
- b. pull safety pin outwards while unscrewing it.

6. Replace packing follower, packing flange and flange nuts (8b). Tighten nuts finger tight plus one full turn. With an air-to-open actuator, vent the air pressure or turn the handwheel to move the plug back in contact with the seat ring. Place back in service.

Positioner maintenance

(Figures 18, 19, 23 and 24)

Shut off supply and signal pressures. By-pass and depressurize valve body.

1. Unscrew the two pressure connection nuts (138a) and pull tubing (140) out.
2. Unscrew cap screws (141a) and remove manifold block (144), spring (158), gasket (146) (incl. three O-rings) pilot valve assembly (155 to 157), shims (145) and O-ring (153).

Caution: Handle shims (145) carefully. They are delicate.

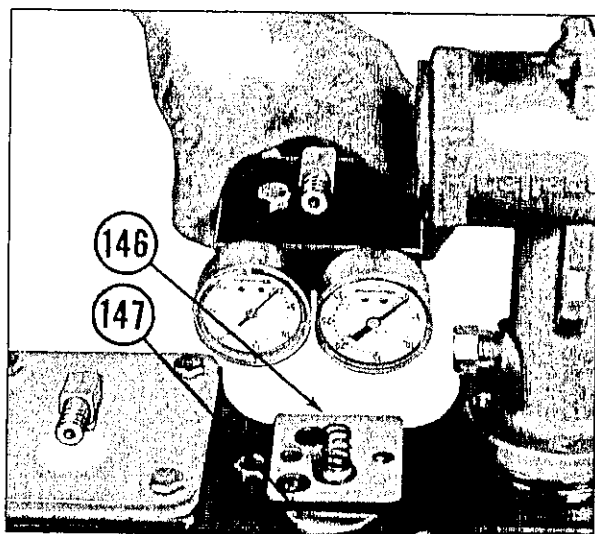


Figure 23 - Positioner assembly

Note orientation of block (147) and gasket (146).

3. Loosen locknut (117) and take-up screw (116) and unhook spring clamp (115) from lever (22).

4. Unscrew cap screws (141b) from positioner block (147) and remove positioner block from actuator bracket. Remove screws (148) to separate the positioner diaphragm assembly (152) and spring (154) from positioner block. Examine all parts for wear and replace if necessary.

5. Assemble positioner diaphragm assembly (152) with spring (154) to the block and tighten screws (148). Be sure that the small signal port O-ring is in its recess in the diaphragm assembly.

6. Assemble block assembly to actuator bracket.

Note: Orient the block (147) such that when the manifold block (144) is bolted on, the gauges will face in the right direction (Figure 23).

7. Install O-ring (153), shims (145), pilot valve assembly (155, 156, 157), gasket (146) (incl. three O-rings), spring (158) and manifold block (144). Tighten cap screws (141a), replace tubing (140) and tighten pressure connections nuts (138a).

Note: Gasket ports in (146) must align with ports in block (147).

8. Hook up spring clamp (115) on lever No 2 (22). Admit supply and signal pressures. Adjust start-up pressure following instructions under "calibration". Place back in service.

3-15 or 6-30 or 3-27	114 154	Yellow Red
3-9	114 154	White Blue
9-15	114 154	White Green
Color code for positioner springs (114 and 154)		

Figure 24

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Flow Control

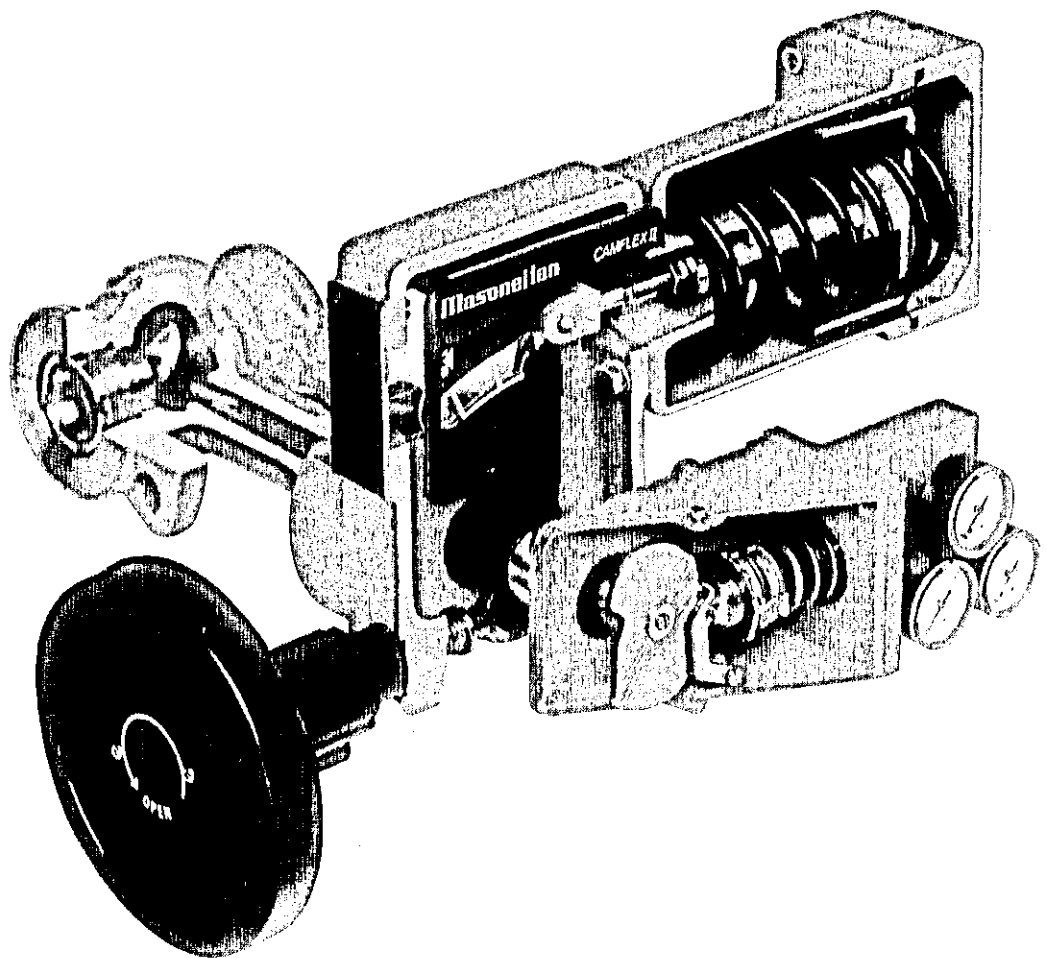
Series 35002 Camflex II Valve Instructions

MASONEILAN®

Series 35002 Camflex II

Valve Instructions

Instruction
No EF 50004 E
Rev. B - 05/2001



INSTRUCTION MANUAL

MASONEILAN



principle of operation

The concept of the Camflex II valve is based on an eccentrically rotating spherical plug contained in a free flow design ANSI Class 600 body. The plug seating surface is joined by flexible arms to a hub which slides onto a rotating shaft. The plug is free to center itself along the axis of the shaft. A positive seal between plug and seat is achieved by elastic deformation of the plug arms. The chamfered seat ring is fixed in the valve body by a threaded retainer.

The plug and shaft are rotated through an angle of 50° by a lever linked to a powerful spring-opposed rolling diaphragm actuator.

The solid disk-type handwheel and locking lever, provided as standard features on the Camflex II valve, are mounted on the yoke opposite the actuator. The handwheel may be used as a manual actuator or as a limit stop. A threaded hole in the opposite side of the yoke accommodates a cap screw and locknut which may be inserted as a limit stop in the other direction, or in combination with the handwheel to lock the valve in a selected position. **The handwheel on Camflex II is basically designed to be used for emergency action only.**

The characteristics for limit stop and handwheel threaded holes are 3/4" - 10 ACME 3G-RH.

The actuator is always mounted with air-loading to counter the dynamic torque on the plug. In Figure 1 the flow direction tends to open the plug and the actuator is

oriented to close it with increasing air pressure. The actuator spring force assists plug off-balance to open the valve on air failure. If the valve is to close on air failure, the body would be turned around in the line so that flow tends to close the plug and the actuator position would be reversed. Flow direction through the valve, i.e. valve orientation in the line, is therefore, determined by the desired air failure action.

The Camflex II valve has a modified linear flow characteristic which is the same in either flow direction. It can be easily transformed to an equal percentage when equipping the valve with a pneumatic positioner 4700 serie, an electropneumatic positioner 8013 serie or a SVI (Smart Interface Instrument). Reduced area trim (.4 factor) for a 60 % reduction in capacity is available on Camflex II valves, sizes 25 mm (1") through 300 mm (12"). .6 factor trim is also available for valve sizes 200 mm (8") through 300 mm (12").

The ability of the Camflex II valve to handle a wide range of process fluid temperatures is due to the long integrally cast bonnet. This affords ample radiation surface to normalize the packing temperature. Therefore, with self-lubricating TFE Aramid fiber packing, the valve handles temperatures from - 200°C to + 400°C (-320°F to +750°F). When insulating the valve, do not insulate the bonnet.

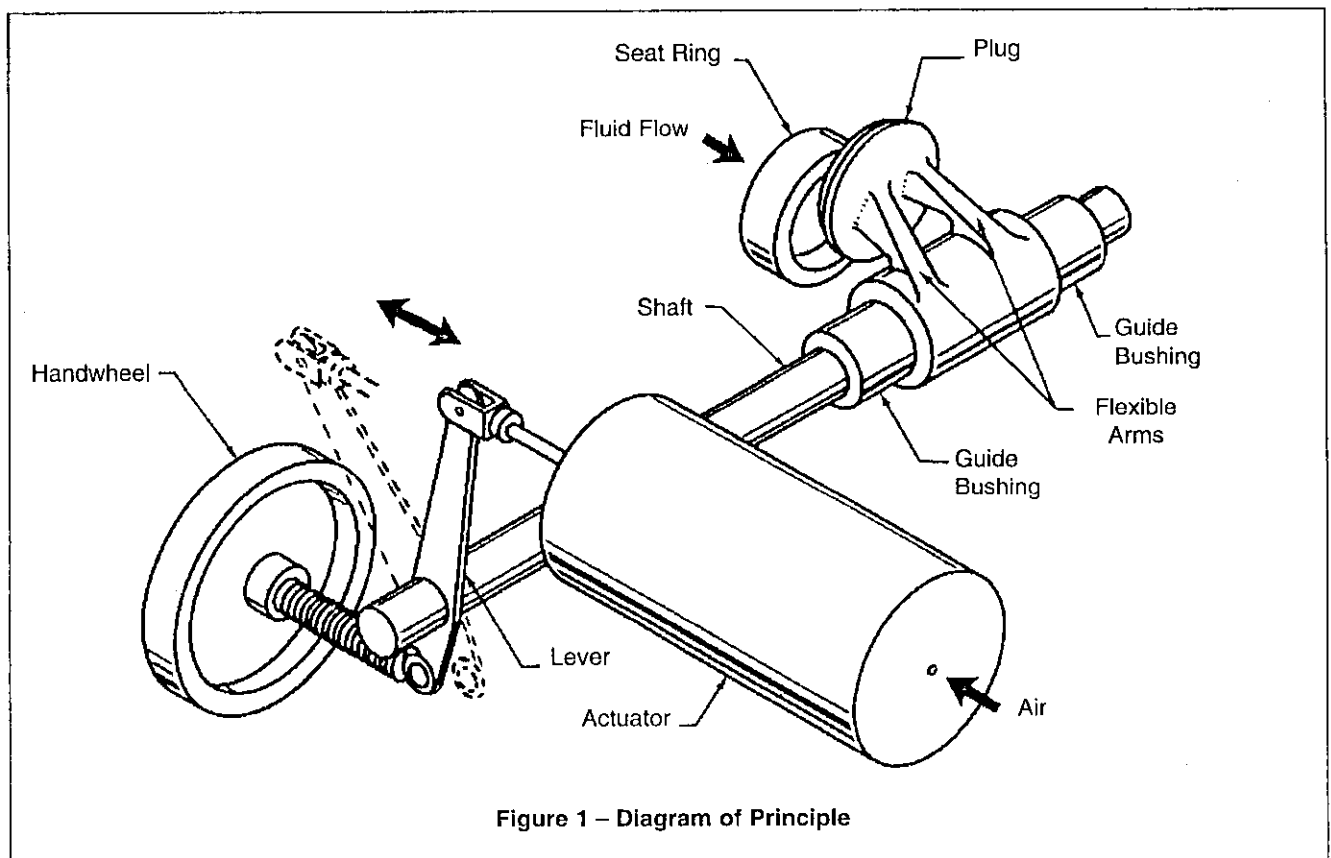


Figure 1 - Diagram of Principle

installation

Preliminary Steps (figures 5 and 6)

1. Before installing the valve in the line, clean piping of all foreign material such as welding chips, scale, oil, grease or dirt.
2. For inspection of the valve without interrupting the process, provide a hand operated stop valve on each side of the Camflex II with a hand operated throttling valve mounted in a bypass line.
3. Install valve in the line so that the flow tends to open the plug if valve is to open on air failure or flow tends to close the plug if valve is to close on air failure. Note : the position of the actuator relative to the body is determined by the flow direction through the valve. The thrust due to actuator air pressure must always counter the dynamic torque on the plug.
4. The front cover (21) shows the relative position of the plug (4) and seat ring (2) in the body. The valve action (air-to-open or air-to-close) is specified on the nameplate. In addition, flow direction through the valve is indicated by the flow arrow attached to the body.

Valve Body (figure 2)

1. Each size Camflex II valve body is flangeless and has a rating of ANSI Class 600. It may be installed with studs and nuts between machined flanges of the following standards : ANSI Class 150, 300, 400, 600 : AFNOR or DIN (PN 10 to PN 100 for valves sizes 25 mm (1") through 50 mm (2") ; PN 10 to PN 40 for valves sizes 80 mm (3") through 150 mm (6") : PN 10 to PN 64 for valves sizes 200 mm (8") and 250 mm (10") : PN 16 to PN 64 for valves sizes 300 mm (12").
2. Line flange bolting, suitable to the flange rating specified, can be provided with the Camflex II valve. The table on page 9 shows the quantities and dimensions of the bolting.
3. It is possible to install Camflex II valves in lines where the distance between flanges is established by ANSI or DIN. These mountings require the addition of spool pieces, inserted between the line and the valve body (on the end opposite the seat ring).

4. In case of an insulated installation, insulate the valve body only, not the integral extension bonnet.
5. For certain flange standards, through-bolting would normally pass through the area occupied by the integrally cast bonnet. To accommodate flange bolting, guide arms with threaded holes or slots are provided on the valve body. Short studs (142) with large washers (145) or cap screws (143) are used with guide arms (see figure 2).
6. Before placing the valve in the line, install the lower flange bolting to provide a kind of cradle. This will help support the valve while installing the remaining bolts.
7. Special bosses are provided on the lower part of the body to help position the valve in the line and prevent rotation prior to tightening of the flange bolts. Exercise great care to center the gaskets correctly in relation to the body and the pipe flanges.

Actuator

The actuator is mounted and adjusted as specified on the order and requires no further adjustment. **Before putting the valve into operation, back off the handwheel so that it will not interfere with the operation of the valve and tighten the handwheel lock (40).**

Air Piping (figures 6 and 10)

Air is admitted to the actuator through a 1/4" NPT tapped connection in the diaphragm case (107). The following table shows recommended tubing sizes and maximum allowable air pressure for each of the camflex II valve sizes. When the valve is equipped with a 78-4 air filter regulator (for use with a positioner) it is mounted on the bracket attached to the diaphragm case (107). Be careful to ensure that the filter-regulator is installed with the dripwell and draincock downwards. The connections for the Model 78-4 regulator are 1/4" NPT.

Valve Size		Actuator Inside diameter		Max. allowable Supply Pressure				Tubing size	
				Carbon Steel Construction		Stainless Steel Construction			
Inches	mm	Inches	mm	psi	bar	psi	bar	Inches	mm
1	25	4 1/2	114	20	1,4	20	1,4	1/4	4 x 6
1 1/2	40	4 1/2	114	25	1,8	25	1,8	1/4	4 x 6
2	50	4 1/2	114	30	2,1	30	2,1	1/4	4 x 6
3	80	6	152	30	2,1	30	2,1	1/4	4 x 6
4	100	6	152	45	3,1	45	3,1	1/4	4 x 6
6	150	7	178	65	4,5	45	3,1	1/4	4 x 6
8	200	7	178	75 *	5,2 *	55	3,8	1/4	4 x 6
10	250	7	178	75	5,2	65	4,5	1/4	4 x 6
12	300	7	178	75	5,2	75	5,2	1/4	4 x 6

* In case of 8" (200 mm) valve, carbon steel construction with soft-seat ring (PTFE), the max. allowable supply pressure is 70 psi (4,8 bar).

installation

Changing Actuator Position (fig. 3, 5, 6)

For each valve action (air-to-open or air-to-close) the actuator may be mounted in its standard position parallel to the pipe for lowest profile, or in any one of three other positions (see figure 3). Actuator position is usually determined by adjacent piping, obstacles of various types or air piping arrangements.

1. Bypass the Camflex II valve and relieve fluid pressure from the body.
2. In case of "air-to-open" valve, pressurize the actuator such that the lever (35) takes an intermediate position.
3. Remove bottom cover (30), cover screw (19), front cover (21) and rear cover (18).
4. Remove clip (22) and back off the clevis pin (24), Loosen set screw (37).
5. Disconnect air (or electric) lines from the actuator (or its accessories).
6. If a positioner is mounted on the actuator, remove the cam. (Caution : see instructions for positioner before removing cam). If the valve is not supplied with a positioner, remove screw (27) and shaft cover (26).
7. Remove the nuts (13) from the packing box studs (17) and yoke studs (14).
8. Pull out together the yoke (34), packing box flange (16) and lever (35).
9. Replace the actuator and yoke assembly in the new position, chosen from one of four possible positions for each valve action.

Note : If the actuator and yoke are to be rotated 90°, change the position of the packing box and yoke studs 90°. If the actuator and yoke are moved 180° from their original position, the packing box and yoke studs are not moved.

10. Reassemble the yoke (34), packing box flange (16) and lever (35), adjusting their position relative to the actuator. Be sure that lever has enough clearance to allow the plug to fully seat and unseat the valve. If necessary, adjust the lever accordingly.
11. Move lever (35) as far as possible along the shaft in the direction of the valve body. Tighten the set screw (37). Move the lever (35) and plug shaft (8) out until the shaft shoulders on the shaft bearing (25). Loosen set screw (37) and move lever (35) along the shaft until it contacts the shaft bearing. Retighten set screw (37). Hand tighten the two packing box stud nuts (13) to assure even compression of packing flange (16). The two packing box nuts should be finger tightened plus one full turn.
12. Reconnect air lines to the actuator and pressurize it such that the lever (35) takes a position as outlined in the paragraph below : "Actuator Stem Adjustment". Disconnect air lines from the actuator.
13. If a positioner is mounted on the valve, the cam must be repositioned (see instruction sheet of positioner). If no positioner is mounted on the valve, replace shaft cover (26) with screw (27). Reconnect air (or electric) lines to the actuator (or its accessories). Replace covers (30), (18) and (21). If necessary, refer to instruction sheet of positioner for calibration. Put the valve into operation.

NOTA : Figures 3 and 4B opposite, show Camflex valves from shaft end (observer facing stroke scale) schematically according to a convention permitting to simultaneously show the position of the actuator and the corresponding plug position :

- cross section of valve body shown inside a circle : in the background ;
- actuator and yoke : in the foreground.

Changing Valve Action (figures 3, 4, 5, 6)

Two possibilities :

A - There is enough room to have valve-actuator assembly as shown on fig. 4A

Proceed as follows :

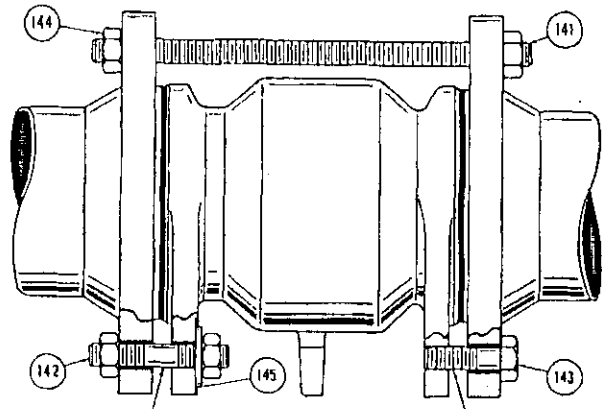
1. By-pass the valve and relieve fluid pressure from body. Remove cover screw (19), front cover (21), rear cover (18) and spring barrel boss cover (33).
2. For air-to-open valves, pressurize the actuator such that the lever (35) takes an intermediate position. Remove clevis pin clip (22) and clevis pin (24).
3. Disconnect air (or electric) lines from the actuator (or its accessories). Remove body-actuator assembly from the line and reinstall it after having rotated it 180° as shown on figure 4A. This reverses the flow direction through the valve (fig. 4A, steps 1 and 2).
4. Remove capscrews (101) and lock-washers (102). Separate actuator and install it on opposite side of yoke (34) with capscrews (101) and lock washers (102), applying proper torques. Refer to table of page 8 to proper screws torque values according to actuator size. Remove retaining ring (38) and washer (39). Remove handwheel (41), handwheel lock (40) and handwheel thread plug (36). Install handwheel (41) and handwheel lock (40) on opposite side of yoke from actuator. Replace washer (39), retaining ring (38) and handwheel thread plug (36) (fig. 4A, steps 3 and 4).
5. Connect an air line to the actuator and make a zero adjustment of actuator and lever (35) as outlined under "Actuator Stem Adjustment".
6. Reconnect air (or electric) lines to the actuator or its accessories). Replace rear cover (18) and front cover (21) with cover screws (19). Also replace the spring barrel boss cover (33). Do not forget to reverse the flow arrow plate (11). Also modify the characteristics stamped on the name plate (air action, type, etc).

B. There is not enough room to have valve-actuator assembly as shown on fig. 4A

Proceed as follows (fig. 4B).

1. Separate the actuator from the body assembly as outlined under Changing Actuator Position (Step 1 to 8) (fig. 4B steps 1 and 2).
2. Remove the valve body from the line and reinstall it after having rotated it 180° around the longitudinal axis of the plug shaft (8). This reverses the flow direction through the valve (fig. 4B step 3).
3. Install the actuator and yoke (34) assembly, as well as packing box flange (16) and lever (35) on the valve in a position symmetrically opposite its original position (in regard to valve body assembly) (fig. 4B, step 4).
4. Remove retaining ring (38) and washer (39). Remove handwheel (41), handwheel lock (40) and handwheel thread plug (36).
5. Remove spring barrel boss cover (33), capscrew (101) and lock washers (102).

Actuator Size		Dimension "A" for Actuator Stem Adjustment			
mm	Inches	Air to Close		Air to Open	
		mm	In.	mm	In.
114	4 1/2	9	.35	8	.32
152	6	12	.47	9	.35
178	7	19	.75	19	.75



Used on 50, 80, 100 and 150 mm (2", 3", 4" and 6") valves

Used on 200, 250 and 300 mm (8", 10" and 12") valves

Figure 2 - Line Flange Bolting

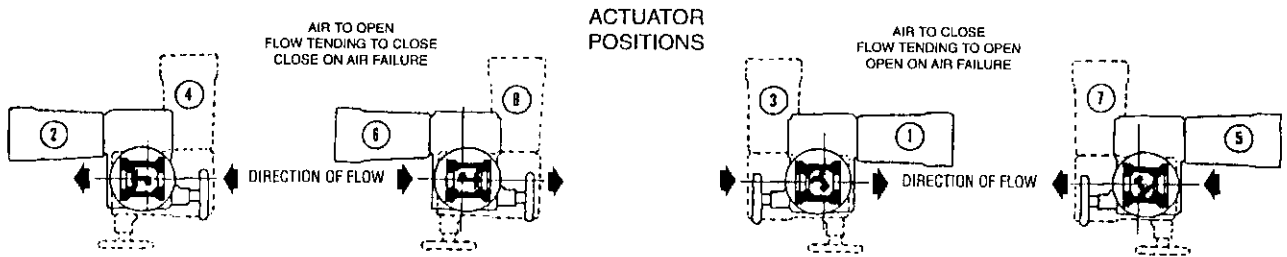


Figure 3 - Changing Actuator Position

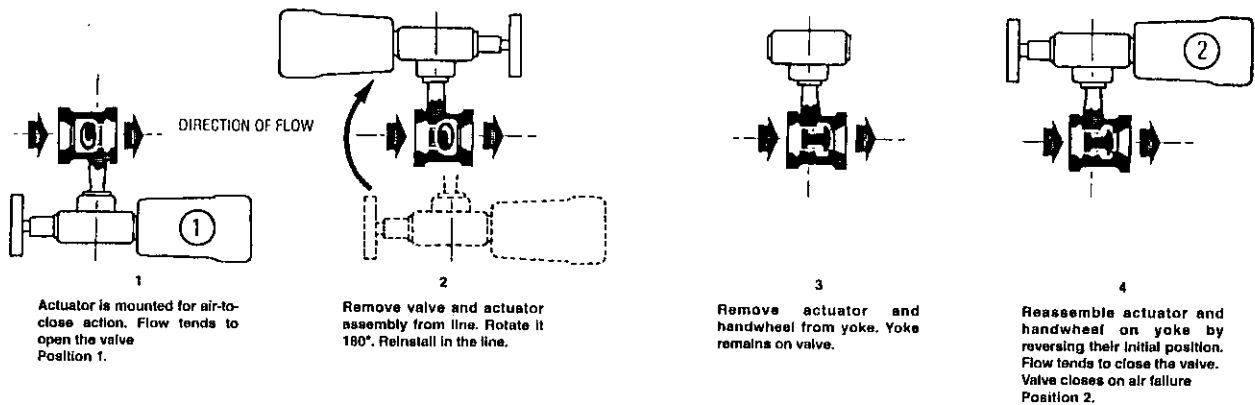


Figure 4A - Camflex II: Reversing Valve Action First example (Top View)

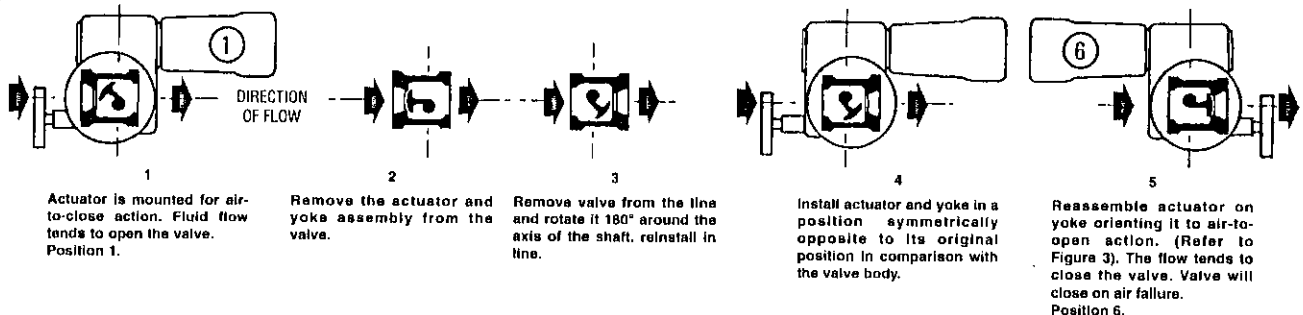


Figure 4B - Camflex II: Reversing Valve Action Second example

See bordered Note page 5

6. Fasten actuator into place on opposite side of yoke with capscrews (101) and lock washers (102), applying proper torque. Refer to table of page 8 to proper screws torque values according to actuator size. Replace spring barrel boss cover (33). (fig. 4B, step 5).
7. Install the handwheel (41) and handwheel lock (40) on opposite side of yoke from actuator. Replace washer (39), retaining ring (38) and handwheel thread plug (36). (fig. 4B, step 5).
8. Check using procedure outlined under "Changing Actuator Position" (step 10). Tighten yoke nuts (13). Complete assembly as in above steps 11 to 13 and as per "Actuator Stem Adjustment" procedure below.
9. Do not forget to reverse the flow arrow plate (11). Also modify the characteristics stamped on the name plate (air action, type).

Actuator Stem Adjustment (figures 5, 6)

1. With the actuator clevis (100) disconnected from the lever (35), manually close the plug against the seat ring.

2. A - On Air-to-close valve

Admit air pressure to actuator diaphragm so that the lever is stroked to an extreme position (piston shoulders against spring barrel). Use rule to position

actuator stem to a set point (yoke for instance). Reduce pressure to retract the stem position to dimension "A" as shown on table of page 5.

B - On Air-to-open valve

Remove pressure from the actuator. Use rule to position actuator stem to a set point (yoke for instance). Admit pressure to the actuator diaphragm to extend the stem position to dimension "A" as shown on table of page 5.

3. Adjust the position of the clevis (100) on the actuator stem, such that the holes in the lever and the clevis are aligned with the plug against the seat ring.

Note : Air-to-close actuator should be stroked to an intermediate position so that the clevis will clear the lever. The stem position shall be noted during the operation of step 2 above. In case of air-to-open actuator, manually pull out the lever (35) for each turn of the clevis.

4. When the clevis is adjusted, modify slightly pressure to actuator such that pinning do not take place with the lever in the "valve closed position". Pin the lever to the clevis (24). Replace clip (22) and tighten clevis locknut (111A). Admit pressure to close the valve and set indicator (54) on lever (35) for yellow indicator dot to be in line with "closed" on the travel indicator scale of the front cover (21).

maintenance - valve body

Camflex II valves are a standard line of control valves, i.e. standard parts and materials cover a wide range of applications. If emergency repairs ever become necessary, parts may be taken from any Camflex II valve of the same size in your stock.

Trim Replacement or Lapping

If the Camflex plug and seat ring are to be changed for any reason, follow the detailed trim lapping and installation instructions on pages 10 and 11.

Body Disassembly (figures 5, 6, 7, and 9)

1. Bypass the Camflex II valve and relieve fluid pressure from the body. Disconnect air (or electric lines) from the actuator (or its accessories) and remove the valve from the line.
2. In case of "Air-to-open" valve, pressurize the actuator such that the lever (35) takes an intermediate position.
3. Remove cover screw (19), front cover (21), rear cover (18) and bottom cover (30).
4. Remove clip (22) and back off the clevis pin (24). Remove air supplied at step 2.
5. If a positioner is mounted on the actuator, disconnect the cam from the plug shaft (8) (Caution : see instruction sheet of positioner before removing cam). If the valve is not equipped with positioner, remove the screw (27) and the shaft cover (26). Remove screws (101) and lock washers (102), then remove the actuator from the yoke (34).

6. Remove the safety pin (51).

The safety pin engages the packing box ring. The function of safety pin and retaining ring (50) is to prevent the shaft from being pushed out if the yoke is removed while the valve is still pressurized. The valve internal parts cannot be removed unless the safety pin is removed first.

Danger : It's absolutely necessary to reuse the safety pin (51) for the reassembly.

7. The simplest way to remove internal parts is to pull them all out of the body at once. Remove the stud nuts (13) from the packing flange studs (17) and yoke studs (14). With a mallet, tap the yoke off the body mounting flange and remove the yoke assembly, plug shaft with lever and internal parts.
8. If the plug shaft won't move easily, loosen the lever setscrew (37), tap off the yoke (34), lever (35), packing flange (16) and packing gland (15). Slide the lever onto the shaft backwards and tighten setscrew (37). Use a mallet to tap out the shaft and other parts.
9. If internal parts cannot be moved by tapping the tightened lever, remove the packing. Then by using a pipe nipple of suitable size between packing flange and tightened lever (35), and reversing the packing flange and nuts (13) as shown in figure 7, the shaft and internal parts may be jacked out of the body by unscrewing nuts (13). (See figure 7). For large valve sizes, the use of an additional washer, an other pipe nipple and ¼" - 28 NF screw to assist in holding the lever on is recommended. The nuts should be tightened flush with the end of the splines. The upper guide bushing and spacer tube may remain in the

body. They must be pulled out if complete disassembly is desired.

10. Remove the plug (4) through the end of the valve opposite the seat.
11. Pry out the lower guide bushing (6) with a screwdriver or similar tool inserted into the bushing groove provided for that purpose. If bushing is difficult to remove, fill the bushing (6) with grease and insert shaft. Tap lightly.
12. Remove retaining ring (50), packing (10) and other parts from the plug shaft.
13. Push out the ball bearing (25) from the yoke (34). It is a slip fit. Remove grommet (29).
14. To remove seat ring retainer (3), hold the body firmly and use a shock wrench or any other suitable tool capable of producing the torque required. A piece of steel plate clamped in a vice as in figure 9 may be used for small size valves (25, 40 and 50 mm - 1", 1½" and 2"). The dimensions of this steel plate are as listed in the table of page 11. Position the valve on the plate and, using the bonnet as a lever, unscrew the retainer and lift out the seat ring.
15. Examine all parts for damage due to erosion corrosion or wear. Replace all defective parts and all packing. Clean valve thoroughly prior to reassembly.

Body Reassembly (figures 5, 6, 8 and 9)

1. Before assembling Camflex II, lap the seat ring to its seating surface in the body as outlined under "seat ring lapping and installation" page 10. Install seat ring and tighten retainer finger tight.
2. Coat the lower guide bushing (6) with Molykote G and insert into the body with the groove towards the body center.
3. Coat the shaft (8), upper guide bushing (5) and spacer tube (7) with Molykote G. Place in order on the plug shaft.

WARNING : Do not forget snap retaining ring (50) into place (See "Body Disassembly" Step 6). If retaining ring has been damaged, do put a new one.

4. Replace the plug in the body. Align the axis of the hub with that of the lower guide bushing. Be sure the plug is oriented as shown in figure 8.
5. Insert the shaft assembly and engage the plug and the lower guide bushing.

Note : with the plug in the closed position the slot on the end of the shaft should be perpendicular to the pipe.

6. Install the packing box ring (9), bevel side out, and align its hole with the threaded port in the bonnet. Wrap the safety pin (51) with two turns of PTFE tape (Teflon). **Screw it into the bonnet from five and a half to six turns from where threads engagement starts.**

Note : To find start of threads engagement, proceed as follows :

- a - Screw safety pin in about one turn.
- b - Pull safety pin outwards while unscrewing it.

DANGER: As the safety pin is a specific part, it's absolutely necessary to reuse the original safety pin to prevent the shaft being pushed out.

7. Replace packing rings (10). The skive cut of each packing ring should be offset 120° from that of the adjacent ring.
8. At this point, install the seat ring per instructions on page 10. Replace the packing gland, flange and nuts and tighten the nuts a few turns. Use the lever (35) to close the plug during initial hand tightening of the seat ring. To produce the required torque, use a pneumatic torque wrench or any other suitable tool. Small size valve (25, 40 and 50 mm : 1", 1½" and 2") may be assembled as shown in figure 9, using the bonnet as a lever for tightening.
9. Coat the joints of yoke as well as the corresponding joints of the flange and cylindrical part of the valve body with Molykote G.
Remove packing flange, then replace yoke (34), packing box flange (16), lever (35), shaft bearing (25) and grommet (29). Be sure that the actuator yoke is in the correct quadrant for your installation (see figure 3). Be sure also that lever has enough clearance to allow the plug to fully seat and unseat the valve. If not so, remove yoke, lever and packing flange, reinstall parts and reposition lever correctly.

10. Move the lever (35) as far as possible along the shaft (8) in the direction of the valve body. Tighten set screw (37). Move the lever (35) and shaft (8) out until the shaft shoulders on the shaft bearing (25). Loosen set screw (37), move lever (35) until it contacts the shaft bearing. Tighten set screw (37). Tighten packing-box nuts (13) finger tight plus one full turn to assure evenly compression on packing flange.
11. Install actuator on yoke (34) with capscrews (101) and lock washers (102), applying proper torques. Refer to table of page 8 to proper screws torque values according to actuator size. Admit air pressure to the actuator. Connect lever (35) to clevis using procedure outlined under "Actuator Stem Adjustment", page 6.
12. If a positioner is mounted on the valve, connect the cam to the plug shaft, (see positioner instructions). If no positioner is mounted on the valve, replace shaft cover (26) with screw (27). Reconnect air (or electric) lines to the actuator (or its accessories). Replace bottom cover (30), rear cover (18) and front cover (21) with screws (19). Make a zero adjustment if necessary and put into operation.

Packing Replacement

1. Disconnect air (or electric) lines from the actuator (or its accessories) and depressurize the valve.
2. Remove yoke (34), lever (35), actuator assembly and packing box flange (16) and gland (15) using procedure outlined under Body Disassembly above (steps 2 to 5 and 8), (page 6).
3. Extract worn packing using an extractor and replace with new packing, (see table page 10). Press down the packing.
4. Reassemble the actuator assembly, yoke, lever, and packing box gland and flange. Tighten packing box

Actuator Size	Capscrew (101) Required Torque	
	(daN, m)	ft-lbs
4 1/2	1,5 - 3	10 - 20
6	1,5 - 3	10 - 20
7	4,0 - 11	30 - 80

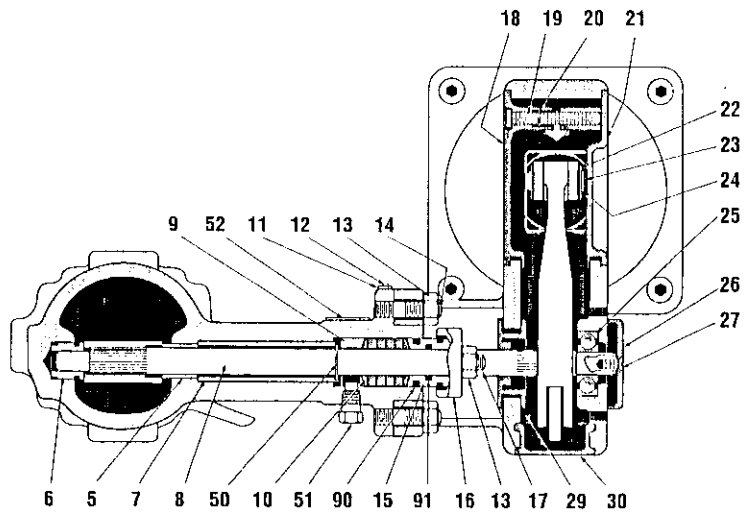
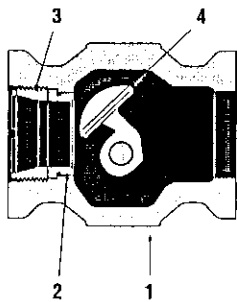


Figure 5
Camflex II Valve Body

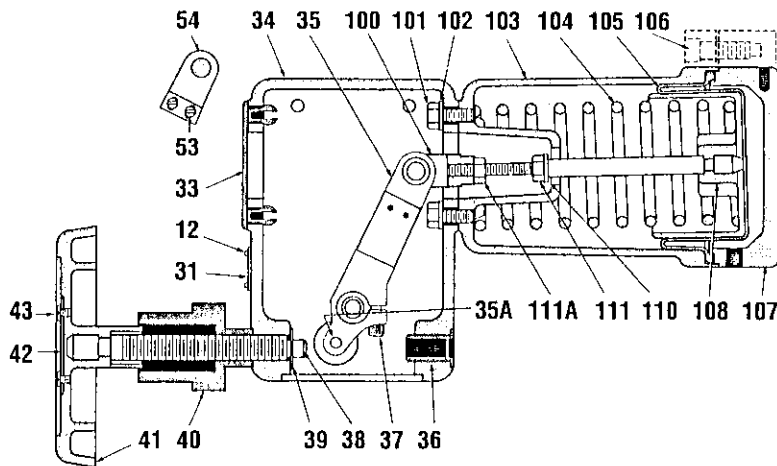


Figure 6 - Yoke, Actuator and Handwheel

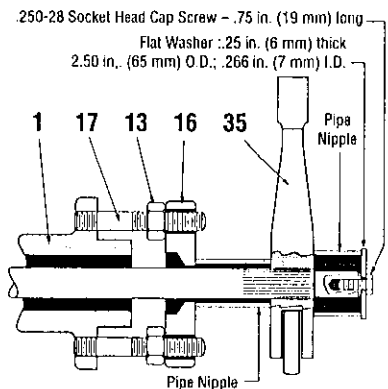


Figure 7
Extracting the Plug Shaft

PARTS REFERENCE

Ref.	Qty	Part Name	Ref.	Qty	Part Name	Ref.	Qty	Part Name
1	1	Body	21	1	Front Cover S/A	42	1	Direction Plate
2	1	Seat Ring	22	2	Clevis Pin Clip	43	2	Plate Screw
3	1	Retainer	23	1	Indicator Dot	50	1	Retaining Ring
4	1	Plug	24	1	Clevis Pin	51	1	Safety Pin
5	1	Upper Guide Bushing	25	1	Shaft Bearing	52	1	Warning Plate
6	1	Lower Guide Bushing	26	1	Shaft Cover	53	2	Indicator Screw
7	1	Spacer Tube	27	1	Cover Screw	54	1	Indicator
8	1	Shaft	29	1	Grommet	100	1	Clevis
9	1	Packing Box Ring	30	1	Bottom Cover	101	2 *	Cap Screw
10	1	Packing	31	1	Serial Plate	102	2 *	Lock Washer
11	1	Flow Arrow Plate	33	1	Boss Cover	103	1	Spring Barrel
12	4	Plate Screw	34	1	Yoke	104	1	Spring
13	4	Stud Nut	35	1	Lever S/A	105	1	Diaphragm
14	2	Yoke Stud	35A	1	Roller Bearing Pin	106	4	Cap Screw
15	1	Packing Gland	36	1	Handwheel Thread Plug	107	1	Diaphragm Case
16	1	Packing Flange	37	1	Lever Cap Screw	108	1	Piston
17	2	Packing Flange Stud	38	1	Handwheel Truarc Pin	110	1	Washer
18	1	Rear Cover	39	1	Handwheel Washer	111	1	Locknut
19	2	Cover Screw	40	1	Handwheel Lock	111A	1	Locknut
20	2	Screw Retainer	41	1	Handwheel			

● Recommended Spare Parts

* Qty 4 on Valve with N° 6 or 7 Actuator

line flange bolting – (length in mm)

Valve Rating	Long Studs (T) (141)				Nuts	Long Studs (T) (141)				Nuts	Long Studs (T) (141)				Nuts	
	Short Studs (G) (142)					Short Studs (G) (142)					Short Studs (G) (142)					
	Cap Screws (V) (143)					Cap Screws (V) (143)					Cap Screws (V) (143)					
	Qty.	Length	Diameter	Qty.	Qty.	Length	Diameter	Qty.	Qty.	Length	Diameter	Qty.	Qty.	Length	Diameter	Qty.
	1" (25 mm)					1 1/2" (40 mm)					2" (50 mm)					
ANSI	150		190	1/2" 13 UNC			190	1/2" 13 UNC			4T	230			8	
	300															
	400	4T	195	5/8" 11 UNC	8	4T	220	3/4" 10 UNC	8	4T	230	5/8" 11 UNC	18			
	600									2G	95					
AFNOR or DIN (PN)	10															
	16															
	25	4T	190	1/2" 13 UNC	8	4T	195	5/8" 11 UNC	8	4T	230	5/8" 11 UNC	8			
	40															
	64															
100		205	5/8" 11 UNC			230	3/4" 10 UNC			240	3/4" 10 UNC					
										250	7/8" 9 UNC					
	3" (80 mm)					4" (100 mm)					6" (150 mm)					
ANSI	150	4T	260	5/8" 11 UNC	8		290	5/8" 11 UNC	18	7T	350	3/4" 10 UNC	18			
	300					7T	290	5/8" 11 UNC	18	2G	115	3/4" 10 UNC	26			
	400	7T	305	3/4" 10 UNC	18	2G	305	3/4" 10 UNC	18				26			
	600	2G	115				360	7/8" 9 UNC	18	11T	410	7/8" 9 UNC	26			
AFNOR or DIN (PN)	10					7T	290	5/8" 11 UNC	18	2G	150	1" 8 UNC	26			
	16						95	5/8" 11 UNC	*D	7T	350	3/4" 10 UNC	18			
	25	7T	260	5/8" 11 UNC	18	2G	305	3/4" 10 UNC	18		115	3/4" 10 UNC	*B			
	40	2G	95		*A		115	3/4" 10 UNC	*B	7T	360	7/8" 9 UNC	18			
										140	7/8" 9 UNC	*C				
	8" (200 mm)					10" (250 mm)					12" (300 mm)					
ANSI	150	6T	350	3/4" 10 UNC	12	8T	420	7/8" 9 UNC	16	8T	470	7/8" 9 UNC	16			
	300		410	7/8" 9 UNC		8V	76			8V	76					
	400	10T	430	1" 8 UNC	20	12T	480	1" 8 UNC	24	12T	520	1 1/8" 8 UN	24			
	600	4V	102			8V	95	1" 8 UNC		8V	95					
AFNOR or DIN (PN)	10						520	1 1/8" 8 UN			570	1 1/4" 8 UN				
	16						108			108						
	25	6T	350	3/4" 10 UNC	12		520	1 1/4" 8 UN		16T	570		32			
	40	4V	76				120			8V	120					
	64						420	3/4" 10 UNC								
							76	7/8" 9 UNC		8T	470	7/8" 9 UNC	16			
							420			8V	76					
							76				480	1" 8 UNC				
							82	1" 8 UNC	16		82					
							460	1 1/8" 8 UN		12T	520	1 1/8" 8 UN	24			
							95			8V	95					
							510	1 1/4" 8 UN			540	1 1/4" 8 UN				
							93				100					

*Use one washer (145)
for each short stud
(see figure 2)

A : M16N (18 x 32 x 3) mm
B : M20N (22 x 40 x 3) mm
C : M22N (24 x 45 x 3) mm
D : L16N (18 x 40 x 3) mm

THREAD CLASSES
Studs and screws : 2A
Nuts : 2B

nuts evenly finger tight plus one full turn.

Adding Packing

This operation can be done without removing the yoke and actuator assembly. It is necessary, as with packing replacement, to bypass the valve and remove pressure from the valve.

1. Remove packing box nuts and move the flange (16) and gland (15) close to the lever.
2. Insert new packing ring (10), retighten nuts and put the valve into operation.

Valve size mm (inches)	25 (1)	40 (1 ½)	50 (2)	80 (3)	100 (4)	150 (6)	200 (8)	250 (10)	300 (12)
Quantity of Rings	7	7	7	7	8	7	6	6	6

Lubrication

Periodically lubricate the following parts with Molykote G or other suitable grease :

1. Roller bearing pin (35A).
2. Handwheel thread (41).

Note : Do not lubricate the external surface of the roller bearing in lever (35). Also the ball bearing (25) is permanently packed with grease and needs no further lubrication.

seat ring lapping and installation

In establishing and maintaining tight shutoff in the Masoneilan Camflex II Control Valves the method of installing seat rings becomes an important consideration. As the Camflex II closes, tight shutoff occurs through elastic deformation of the plug arms (figure 8). Actuator thrust, over and above that required for total contact only forces the plug deeper into tighter contact with the seat. When closing, the trailing edge of plug should contact the seat ring first. Additional torque by the actuator flexes the arms thus forcing the leading edge of the plug seating surface against the seat ring. If the leading edge of the plug contacts the seat ring first, leakage may result. The following outlines the assembly procedure necessary to assure tight shutoff for hard and soft seats (in the field).

Procedure for Hard Seats (figures 5, 8 and 9)

1. The shoulder of the new seat ring must be lapped to its mating surface on the body. Apply a small amount of fine compound to the seat and lightly lap by rotating seat ring in body. Clean the parts thoroughly before installation.
2. Apply a thin coat of John Crane Plastic Lead Seal n° 2 (or equivalent) to the seat ring shoulder that engages the body. Apply a small amount of suitable thread lubricant such as Molykote G (or equivalent) to the threads of the seat ring retainer and the surface that contacts the seat ring. For cryogenic service (-20° to -320° F; -30° to -200°C) substitute Crown N° 9008 Teflon spray (or equivalent) in place of Plastic Lead N° 2 and Molykote G. Assemble seat ring and retainer in the valve body. Hand tighten the retainer.

Seat Ring Alignment

Valve sizes 25, 40 and 50 mm (1", 1½" and 2")

Seat ring retainer (3) should be only finger tight. Manually close plug (4) with sufficient force to hold seat ring (2) in aligned position. Tighten retainer to minimum torque value specified in table page 11 (no paper shim required for these sizes).

Valve sizes 80, 100 and 150 mm (3", 4" and 6")

Tighten seat ring retainer (3) as required to firmly clamp seat ring (2) but still loose enough to allow alignment of seat ring when plug (4) is manually closed. Place a piece of paper approximately 25 mm (1") wide and 0,1 mm (.004") thick between the leading edge of the plug and seat ring (refer to figure 8). Manually close plug with sufficient force to align seat ring in body and clamp paper between plug and seat ring. Tighten retainer to minimum torque value specified in table page 11.

Valve sizes 200, 250 and 300 mm (8", 10" and 12")

Same procedure as for sizes 80, 100 and 150 mm (3", 4" and 6"), except use two thicknesses of paper between plug (4) and seat ring (2). The minimum torque value specified in table page 11 provides sufficient preload to insure seat ring joint integrity.

A check for correct seat ring installation and alignment should be made before reconnecting the lever (35) with the actuator clevis (100) by placing thin strips of paper approximately 6 mm (¼") wide at location where leading and trailing edges of plug contact seat ring. On sizes 25, 40 and 50 mm (1", 1½" and 2") when the plug is manually closed, both strips of paper must be clamped between plug and seat ring.

On sizes 80 through 300 mm (3" through 12"), manually closing the plug should clamp the paper strip at the plug trailing edge while the strip at the leading edge may be pulled out.

**Procedure for Soft Seats
 (figures 5, 8 and 9)**

Lap seat ring (2) to body and clean parts before installation. Apply Teflon spray (Crown N° 9008 or

equivalent) to seat ring retainer thread and the seat ring shoulder that engages body before assembly in body. Paper shims are not required for alignment of seat ring in body. Soft seat installation procedure is as follows : Assemble seat ring and retainer in body.

Disconnect actuator clevis (100) from lever (35) and manually close plug (4). Back off seat ring retainer (8) to allow seat ring to align and center on plug. Hold plug closed with lever and torque seat ring retainer to the minimum torque value in below table.

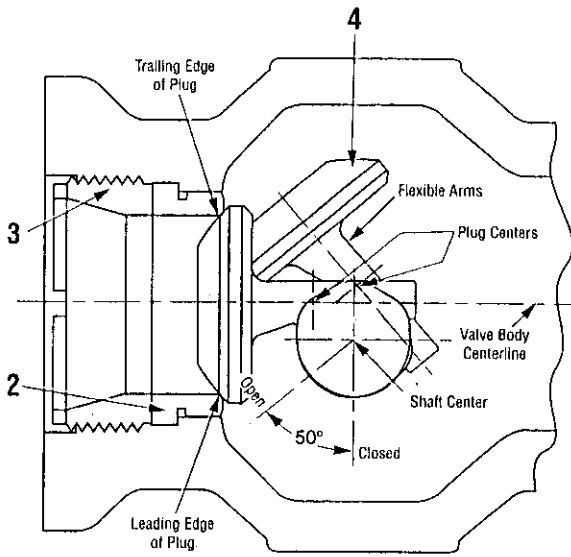


Figure 8
 View from Bonnet end of the Valve

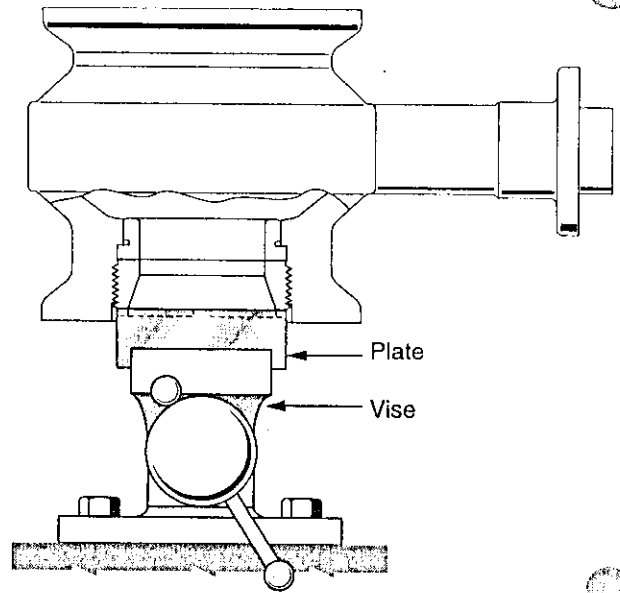


Figure 9
 Installing Seat for
 25, 40 and 50 mm
 (1", 1 1/2" and 2") Valves Only

Seat Ring Retainer Torque

Valve size		Minimum Torque		Plate Size	
Inches	mm	ft-lbs	daN.m	mm	Inches
1	25	60	8	5 x 25 x 75 long	3/16 x 1 x 3 long
1 1/2	40	95	13	5 x 35 x 75 long	3/16 x 1 3/8 x 3 long
2	50	100	14	5 x 50 x 75 long	3/16 x 2 x 3 long
3	80	290	40		
4	100	363	50		
6	150	825	114		
8	200	975	135		
10	250	1350	186		
12	300	2250	310		



maintenance - actuator

Diaphragm Replacement

Actuator Disassembly

1. Bypass the valve and shut off stop valves.
2. Remove four capscrews (106) and remove diaphragm case (107). Remove diaphragm (105) and rubber cement, which holds diaphragm in place on the piston (108). Use, if necessary, an acetone-based diluent.

Actuator Reassembly

1. Apply coating of Neoprene glue (or similar) on the bead and on the inner face of the diaphragm (105), on the piston (108) and in the spring barrel lip (103). (The inner face of the diaphragm in contact with the piston is marked with the inscription "Piston Side"; be careful to keep coating of Neoprene with limits corresponding to flat part of piston (see figure 11).
2. Center and adhere the diaphragm on the piston. Apply coating of talc to outer surface of diaphragm (see figure 11).
3. Roll the diaphragm carefully inside the spring barrel (103) until the bead engages the spring barrel lip. Press lightly and evenly the bead so as to get the two Neoprene-coated parts stuck together. Check there is no twisting of diaphragm inside spring barrel (see figure 12).
4. Adjust diaphragm case (107) to spring barrel after checking that air connection is on the correct side and the threaded holes of diaphragm case and the holes of spring barrel line up. The bead shall be clamped between lips of diaphragm case and spring barrel (see figure 13). Tighten four capscrews (106).

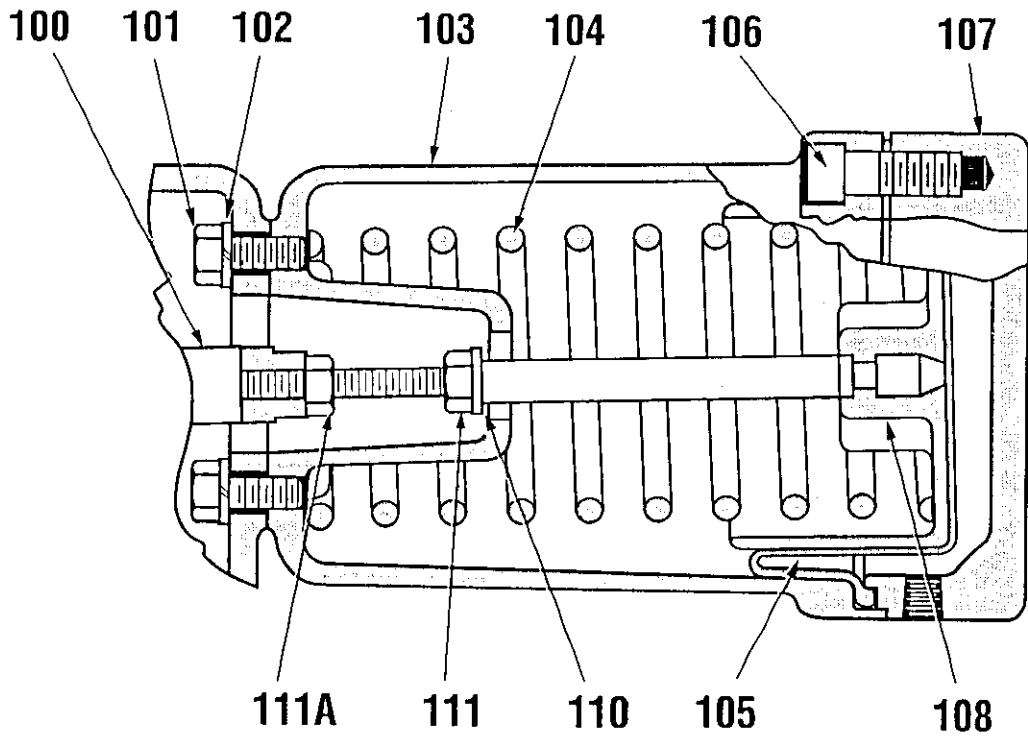


Figure 10
 Actuator

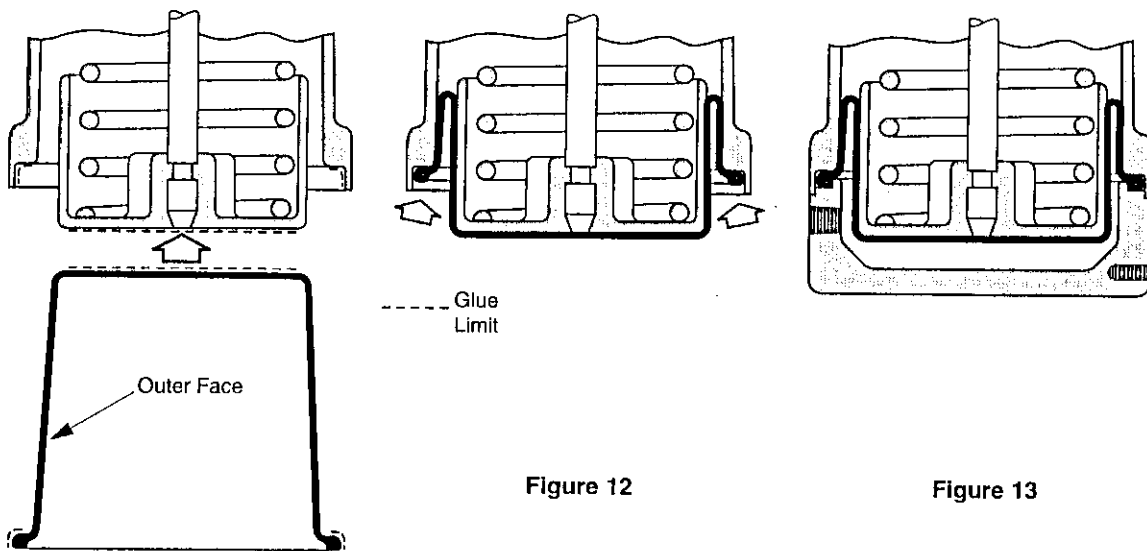


Figure 11

Figure 12

Figure 13

PARTS REFERENCE

Ref.	Qty	Part Name	Ref.	Qty	Part Name	Ref.	Qty	Part Name
100	1	Clevis	104	1	Spring	108	1	Piston
101	2 *	Cap Screw	●105	1	Diaphragm	110	1	Washer
102	2 *	Lock Washer	106	4	Cap Screw	111	1	Locknut
103	1	Spring Barrel	107	1	Diaphragm Case	111A	1	Locknut

● Recommended Spare Parts

* Qty 4 on Valve with N° 6 or 7 Actuator

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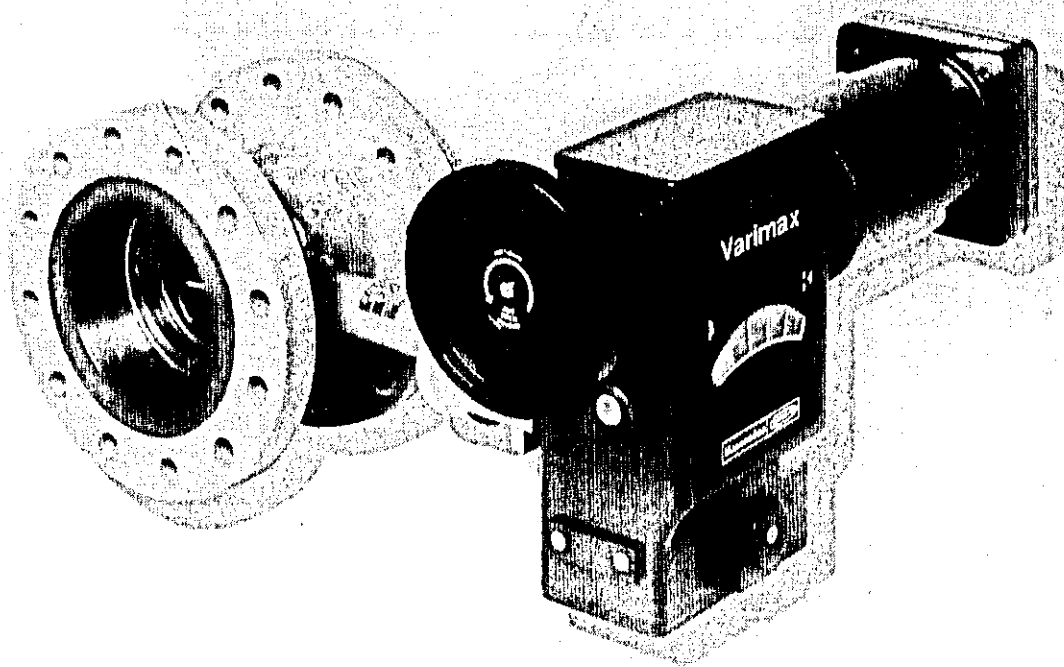
MASONEILAN

5

Varimax™ 30000 Series Control Valve

Instruction for Varimax™ 30000 Series Control Valve

Instruction
No EN 3000
Rev. B - 02/2001



The following instructions should be thoroughly reviewed and understood prior to installing, operating or performing maintenance on this equipment.

Throughout the text, safety and/or caution notes will appear and must be strictly adhered to, otherwise, serious injury or equipment malfunction could result.

Use of DANGER, WARNING, CAUTION and NOTE

The purpose of the instructions provided in the paragraphs entitled DANGER, WARNING, CAUTION and NOTE is to inform you of certain hazards that may be encountered and to provide important information.

- **DANGER:** An event which may lead to personal injury or death of one or more individuals.
- **WARNING:** An event which may lead to personal injury of one or more individuals.
- **CAUTION:** An event which may cause equipment damage or malfunction
- **NOTE:** Other important information.

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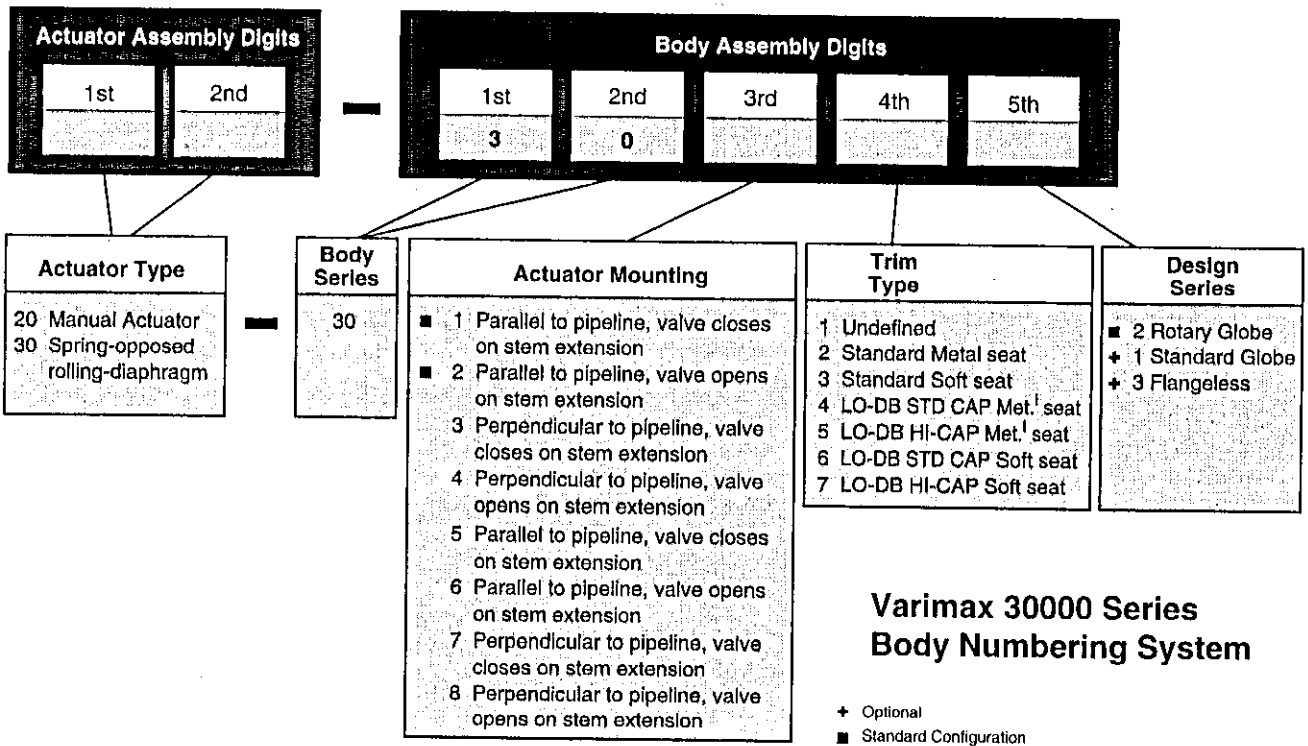
1. Introduction

1. Have spare parts on hand before starting. Use only genuine spare parts supplied by our local representatives or from our Spare Parts Department. When ordering parts, always stipulate the original order references of the equipment item in question, and particularly the serial number indicated on the manufacturer's identification plate. The recommended spare parts for maintenance purposes are indicated in the Parts Reference Table on page 27
2. Read the instructions carefully.
3. Study the figures carefully and identify each part.
4. Use the right tool for the job.
5. Insure all lubricants, sealants, gaskets and packing are compatible with the service.

6. Clean the valve parts thoroughly before reassembling.
7. Note changes made to the valve mode for future reference.
8. Work safely.
9. Arrangements for these services can be made through your authorized Masonellan Representative or District Sales Office. When performing maintenance use only Masonellan replacement parts. Parts are obtainable through your local Masonellan Representative or District Office.

2. General

These instructions are applicable to all dimensions and classes of the Varimax 30000 series control valve. The valve's type, dimensions and class are indicated on the manufacturer's identification plate located on the actuator. Refer to figure 1 for information concerning valve type identification



DN (NPS)	STANDARD CONFIGURATION			OPTIONAL			
	ROTARY GLOBE BODY			STANDARD GLOBE BODY		FLANGELESS BODY ⁽¹⁾	
	Face to face IEC 534-3-2 (EN558-1 and 2) Flanged			Face to face C.E.I. 534-3 (EN 558-1 et 2) Flanged (ANSI B16-10 Flanged)		Face to face API 609	
	PN 20-50 ISO 150-300 ASME	PN 100 ISO 600 ASME	DIN PN 16- 25-40-64	PN 20-50 ISO 150-300 ASME	PN 100 ISO 600 ASME	PN 20-50 ISO 150-300 ASME	PN 100 ISO 600 ASME
80 (3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
100 (4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
150 (6)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
200 (8)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
250 (10)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
300 (12)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
400 (16)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

⁽¹⁾ clamp between flanges.
 Available

Figure 1

3. Principle of Operation

3.1 Valve Body

The main parts of the Varimax valve body subassembly include the guide bushings (6 & 7), the seat ring (3), the shaft (8) and the plug (2). (See Figures 2, 21 & 23).

The concept of the Varimax valve is based on a double low eccentrically rotating plug, contained in a free flow design.

A positive seal between plug and seat is achieved by the very high geometrical accuracy and the care brought to machining of these parts.

Because of this, low torque is required to obtain high performance in closed position (seat leakage).

The seat ring is fastened in the valve body by a threaded retainer. The axis of the conical seating area of seat ring is not parallel to the axis of the valve body; so, a positioning washer insures the correct position of the seat ring in the body, with regard to the plug.

The rotation of the plug is achieved by the splined shaft, which is driven by the ATActuator.

The Varimax control valve also offers a wide range of plug/seat (Trim) configurations for operation in a large number of applications, (see figure 4).

- the standard plug, aerodynamically profiled to reduce operating torque and to improve the flow coefficient,
- the LO-DB plug / seat, designed for harsh service conditions with compressible fluids,
- the soft seat with PTFE-Ni insert allows class VI as I.E.C. 534-4 to be obtained (up to 205°C),
- the plug / reduced seat, for vaporization service (ex. 200x150x200: DN 150 plug / seat in a DN 200 body).

The inherent flow characteristic of the Varimax valve is a modified linear for both flow directions. This characteristic may be easily altered with the use of Models 4700P A pneumatic, or 8013 or 4700E, or S.V.I. (Smart Valve Instrument) type.

The Varimax valve has been designed to handle a wide range of process fluid temperatures.

The self-lubricating TFE Aramid fiber packing allows temperatures from -195 to +400°C.

The carbon steel yoke, serves as a body extension offering fire resistance and will accept both standard or high torque model ATActuators.

3.2 Connection

Three configurations of valve body, depending on the specific needs of the installation, are available. (See Figure 3):

- The **Rotary Globe Flanged**, is designed in accordance with CEI 534-3-2 (EN558-1 et 2) standard, (*Standard Configuration*).
- The **Standard Globe Flanged**, is designed in accordance with CEI 534-3 (ANSI B16-10 Flanged) (EN558-1 et 2) standards, (*Optional Configuration*).
- The **Flangeless body** (face to face API 609), clamped between pipe flanges, offers thin body face-to-face thus avoiding tie rods thermal extension problems on high temperature service, (*Optional Configuration*).

Figure 1 shows available sizes, ratings, connections and face-to-face, for each Varimax valve body configuration.

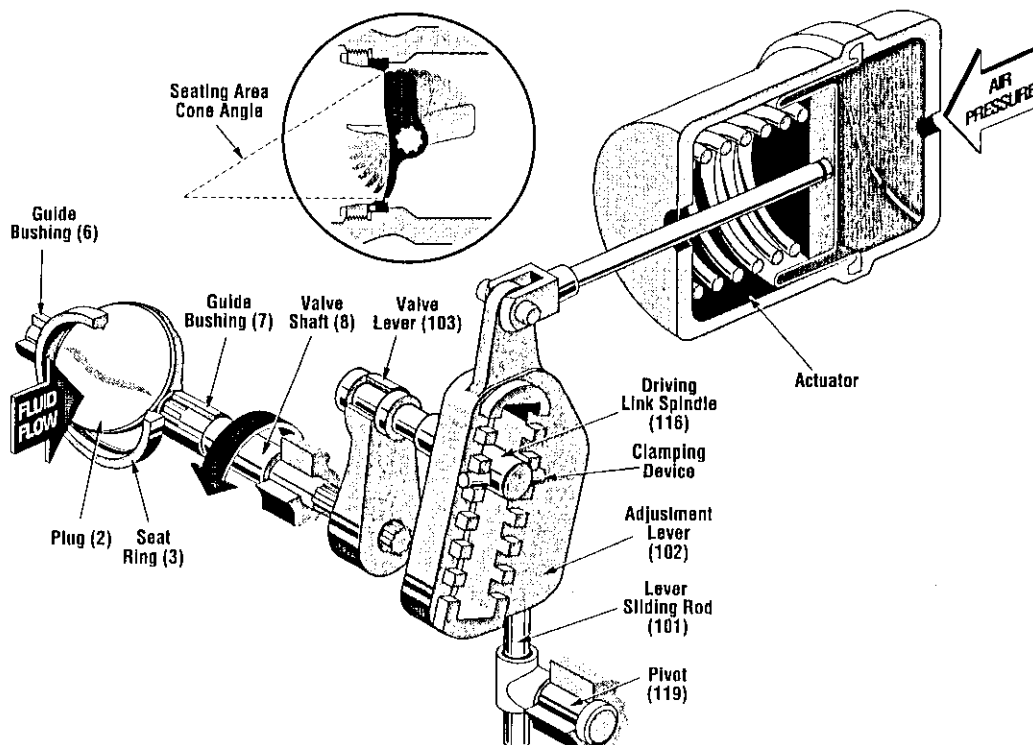


Figure 2: Principle of operation

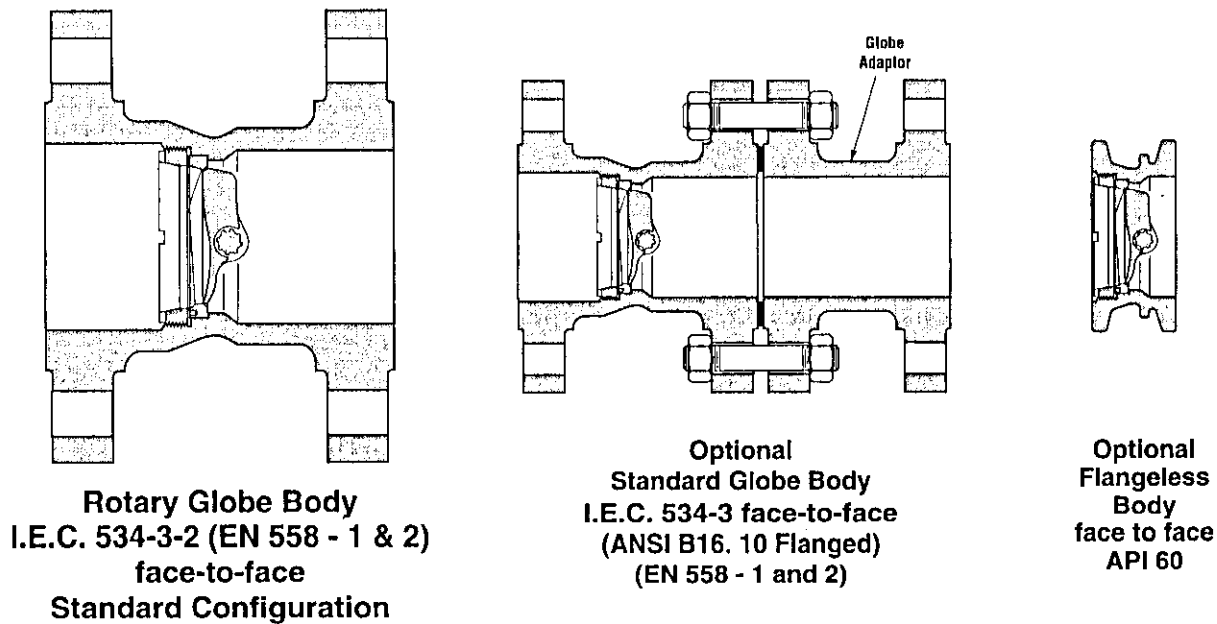


Figure 3: Three Varimax Valve Body Configurations

3.3 Actuator

The Varimax ATActuator (Adjustable Torque Actuator) offers a new technology which allows easy valve C_v adjustment. This operation can be performed without removing the valve from the line and with no modification of the body S/A.

It enables C_v adjustment between 100% and 40% of the maximum C_v . Furthermore, the available torque increases when the adjusted C_v is lowered, resulting in an increase in the allowable pressure drop.

The drive power of the ATActuator, provided by a spring opposed rolling diaphragm pneumatic motor, is applied to an adjustment lever linked to the valve lever.

The position of the linkage point, relative to the rotation axis of adjustment lever, induces the maximum angle of plug rotation. (See Figure 2).

The angular travel of the adjustment lever and its "closing" position being constant, it is not necessary to perform significant adjustments of instruments such as positioners, when changing valve C_v .

An optional subassembly handwheel unit can be easily mounted on the ATActuator. The auxiliary handwheel can be used to actuate the valve plug. A handwheel locking device secures the handwheel unit in place.

It is recommended that the actuator is mounted with air loading to counter the dynamic torque on the plug. (See Figure 2).

The front cover (118) shows the relative position of the plug (2) and seat ring (3) in the body (See Figure 22). The valve action (air-to-open or air-to-close) is specified on the nameplate. In addition, flow direction through the valve is indicated by the flow arrow (19) attached to the bonnet of the body.

4. Unpacking

Care must be exercised when unpacking the valve to prevent damage to the accessories and component parts. Should any problems arise, contact your Masoneilan Representative or the District Office.

Note: For ease of shipment and to prevent damage, valves equipped are shipped with the handwheel unassembled. Refer to following Section 5 for handwheel assembly procedures.

5. Auxiliary Handwheel Assembly (Refer to Figures 22 to 26)

As previously mentioned, the valve is shipped with the handwheel unit not assembled to the actuator. This adaptation doesn't require valve body or actuator disassembly. To assemble the handwheel, proceed as follows:

Warning: If the handwheel unit must be mounted on the valve already installed in the line, isolate the valve, vent the process pressure and shut off supply and signal air lines to the actuator, prior to performing this operation.

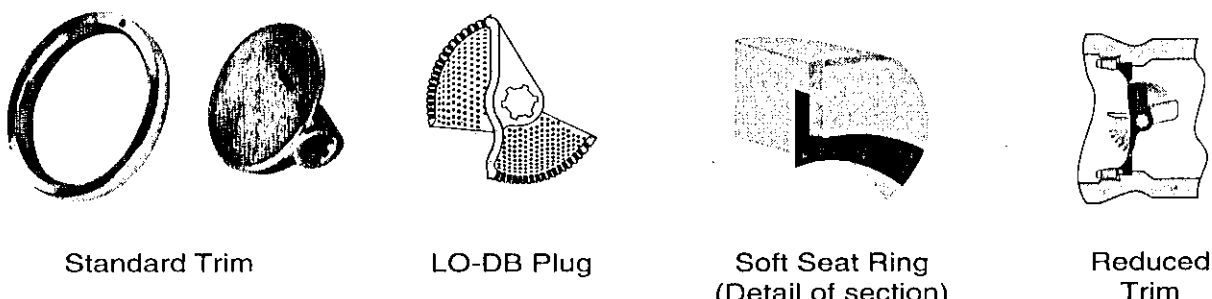


Figure 4: The Varimax Trim Choice

A. Connect a temporary air supply to the cylinder's inlet opening (125) and allow sufficient pressure to bring the adjustment lever to intermediate position (opening at approximately 50%).

B. The auxiliary handwheel unit is always installed on actuator case, at the opposite side of pneumatic cylinder. Remove top cover (111), side cover (137) and front cover (118). (See Figure 23).

Note: Turn the handwheel so that the drive nut reaches the end of the screw opposite the handwheel. This corresponds to the neutral position enabling the pneumatic ATA to operate. See figure 26 to lock and unlock the handwheel.

C. Install the handwheel unit as indicated by the Figure 16. Insure that the clips (106) of the pin (107) are placed between the forks of the drive nut (203). Secure handwheel unit on actuator case with two screws (213) and two washers (212).

Note: Pull up the handwheel unit toward the top of the actuator case before tightening the screws (213). Handwheel action is always the same as air action and opposes the spring.

D. Check the correct manual operation to full travel, adjust the drive nut (203) to the required position or to the neutral position, then replace top cover (111) and front cover (118). Place valve back in service. To lock and unlock the ATA's handwheel, refer to figure 27.

6. Installation

The Varimax valve has been assembled at the factory in accordance with specific instructions concerning flow direction and actuator mode. The valve must be installed so that the process will flow through the valve in the direction indicated by the flow arrow (19) located on the upper part of the integral valve bonnet. In addition, the valve actuator should be installed so the spring barrel is above the centerline of the shaft. To install the valve in the line, proceed as follows:

Caution: Any change in flow direction or actuator mode must be accomplished as outlined in this instruction, otherwise equipment malfunction could result.

A. Check the model number on the serial plate (109) against the numbering system described in Figure 1 to determine the valve mode.

B. Clean piping and valve of all foreign material such as welding chips, scale, oil, grease or dirt. Gasket surfaces should be thoroughly cleaned to insure leak proof connections.

C. To allow for in-line inspection, C_v adjustment, maintenance or removal of the valve without service interruption, provide a manually operated stop valve on each side of the Varimax valve with a manually operated throttling valve mounted in the by-pass line.

Caution:

- If a flanged Rotary Globe or Standard Globe Varimax is being installed, gaskets and valve bolting are installed and torqued using standard flange and line bolting criteria.
- If a flanged Standard Globe Varimax is being installed, the globe adaptor is factory mounted on the same side as the actuator cylinder, to minimize the valve overall dimensions. However, if necessary, it can be easily reversed in the field.
- If a Flangeless Varimax is being installed, install the lower flange bolting to provide a cradle which will help support the valve while installing the remaining bolts. Special bosses are provided on the body to center the valve in the line and prevent rotation prior tightening of the flange bolts. In case of an "Air-to-close" actuator, manually or pneumatically close the valve prior placing between the flanges of the line.

Once the flangeless valve has been installed, the plug should be manually rotated a few times to insure that it clears adjacent internal piping and flanges. It is not recommended that the plug be stroked, either using handwheel or actuator; it should be stroked manually such that, should interference occur, this will be readily determined and will prevent damage to the plug.

D. Place the valve in the line.

E. Select and install correct gaskets.

Note: Spiral wound gaskets, suitable for service conditions are recommended. Exercise great care to center the gaskets correctly in relation to the body and the pipe flanges.

F. Insert flange bolting, insuring the valve is centered in the line.

G. Tighten flange bolts evenly and firmly.

Caution: If the valve is to be insulated, do not insulate the valve bonnet.

Note: If the valve is equipped with a Type 20 Manual Actuator only, it may now be placed in service.

H. If valve is equipped with air operated actuator proceed to Section 7 on Air Supply Piping.

Tubing Size	ATA N°			
	5	7	9	13
mm	4x6	4x6	6x8	10x12
in.	1/4	1/4	3/8	1/2

Figure 5: Recommended air supply tube diameters

7. Air Supply Piping

Danger: do not exceed maximum air pressure indicated, personal injury and equipment malfunction could result.

All Varimax actuators and accessories feature a 1/4" NPT connection, except for the ATA No.13 connection which features a 1/2" NPT. The table in figure 5 indicates the recommended tube diameters for each ATA size. For supply pressure adjustment, refer to the manufacturer's identification plate, or following a modification, to the ΔP tables which can be found in the catalogues.

Caution: A safety standard equipment of the Varimax is the torque stop screw (145) located to the valve lever (103). (See Figures 22 & 23. This one bears against the actuator case at the end of the normal seating overstroke and so, avoids damage to the plug, seat ring or shaft.

NEVER REMOVE OR PUT OUT OF ORDER THE STOP SCREW (145) AND ITS LOCKNUT (146).

Air is admitted to the actuator by a 1/4" NPT or 1/2" NPT connection in the cover. Determine the correct supply pressure and tubing size, then connect air supply piping.

When the valve is equipped with a type 78 filter regulator (for use with a positioner), it is installed directly on the positioner. Be careful to insure that the filter-regulator is installed with the dripwell and draincock downwards. The connections for the Type 78 regulator are 1/4" NPT.

Note: When the valve is equipped with regulators or other accessories supplied by Masoneilan, only connections to those accessories are required since the piping to the actuator is connected at the factory. Some valves equipped with electrical accessories will require appropriate wiring. Refer to manufacturer's instructions for correct wiring information.

8. ATActuator

The ATActuator is factory mounted and adjusted according to customer order. In this case, no further adjustment is required.

If no C_V adjustment value is requested, the valve is delivered in **Intermediate position; this position is position "D" for ATA Nos. 5, 7, and 9 and position "B" for ATA No. 13.** This provides a means to either increase or decrease the nominal C_V should the service conditions change in operation.

Refer to Figure 7 for rated flow coefficient C_V according to valve size and refer to Section 10 to adjust actuator.

9. Placing in service

With the valve properly installed in the line and all air or electrical service connected, it is recommended that the valve be run through one cycle to insure proper functioning. Proceed as follows: (Refer to Figures 22 to 27).

A. Back off and lock the handwheel so that it will not interfere with the valve operation.

Note: If the valve is equipped with the optional limit-stops (129 or 154), they should also be backed off to prevent interference with the operation of the valve.

B. Apply correct air pressure to the actuator.

Note: Valve should function smoothly and with maximum pressure, the valve indicator (139) should show full open or full close depending on valve mode.

C. Relieve air pressure and return valve to normal mode.

D. Gradually open process lines to place the valve in service. If possible, completely open and close the valve to check that it is operating correctly.

E. If desired, the handwheel may be used as a limit-stop. Set in desired position and lock.

F. If the optional limit-stops are used, set and tighten locknut (130 or 153), (refer to Section 12)

10. C_V Adjustment (figures 6, 21, 22 & 23)

The Varimax ATA actuators offer users several possibilities for adjusting the required flow capacity C_V . There are seven possibilities for ATA Nos. 5, 7, and 9 and three for ATA No. 13. These C_V values are indicated on the C_V indicator plate (131).

They are also reference by letters, ranging from A to G in alphabetical order according to the size of the actuator. These letters are engraved on the rear of the case (100). (Refer to figure 7 for the C_V flow coefficients.

The C_V modification consists of moving the actuator case (100) and the adjustment lever (102) by an equal quantity of notches in relation to body assembly and valve lever (103).

Proceed as follows:

Warning: Isolate the valve and vent the process pressure. Shut off supply and signal lines to the actuator.

A. Connect a temporary air supply to the actuator inlet port located on the diaphragm case (125) and apply enough air pressure so the indicator dot (139) will move to an intermediate position corresponding to 25% of valve opening.

- B. Remove front cover, then top and bottom covers (111 & 118).
- C. Loosen and unscrew the clamping nut (115) sufficiently to disengage the clamping plate (117) from notches of adjustment lever (102). Leave in place clamping nut (115) on the driving link spindle (116). (See Figure 6, Step 1).
- D. Using an adjustable pin spanner, loosen and unscrew the yoke nut (23) enough to disengage the actuator case (100) from the notches of the yoke connection plate (27); leave the yoke nut (23) on the yoke (10), (see figure 6- phase 2).
- E. For ATA Nos 5, 7 and 9, If the Cv adjustment involves crossing of the "D" position, rotate the two rear covers (142 & 143) 180 degrees around the yoke (10).
- F. Position actuator case (100) so that the notch marked with appropriate letter (selected C_V) corresponds to the arrow engraved on the yoke connection plate (27) (See Figure 6, Step 3).
- G. Place the two rear covers (142 & 143) so that to close the actuator case (100), then tighten yoke nut (23) by means of the adjustable hook spanner.
- H. Place clamping plate (117) to adjustment lever (102) so that the index of the clamping plate corresponds to the appropriate letter (selected C_V). Tighten clamping nut (115) on the driving link spindle (116). (See Figure 6, Step 4).
- I. Replace top and bottom covers (111) and the front

cover (118). If the cam of positioner has only been removed, install the cam, connect pneumatic and/or electric lines on actuator and accessories and check positioner calibration. If necessary, calibrate positioner and/or accessories.

Note: The angular travel of the adjustment lever and its "closing" position being constant, it is not necessary to perform significant adjustments of instruments such as positioners, when changing valve C_V's.

- J. If positioner and/or any accessories has been removed, install and calibrate them. Place valve back in service. (Refer to specific instruction manual of instruments to proceed to installation and calibration).

11. Torque Stop Adjustment (figure 8)

Whenever disassembly has been performed, it is necessary to readjust the torque stop (145) as follows:

- A. When actuator clevis (136) is disconnected from the adjustment lever (102), manually push this lever to close the valve by applying the plug against the seat ring.
- B. Loosen the locknut (146) and screw the torque stop screw (145) until it contacts the left inner side of the actuator case (100). Then, unscrew the torque stop screw so as to obtain the "B" distance indicated by the Figure 8. The Figure 8 indicates the number of thread turns corresponding to each "B" distance. Tighten locknut (146).

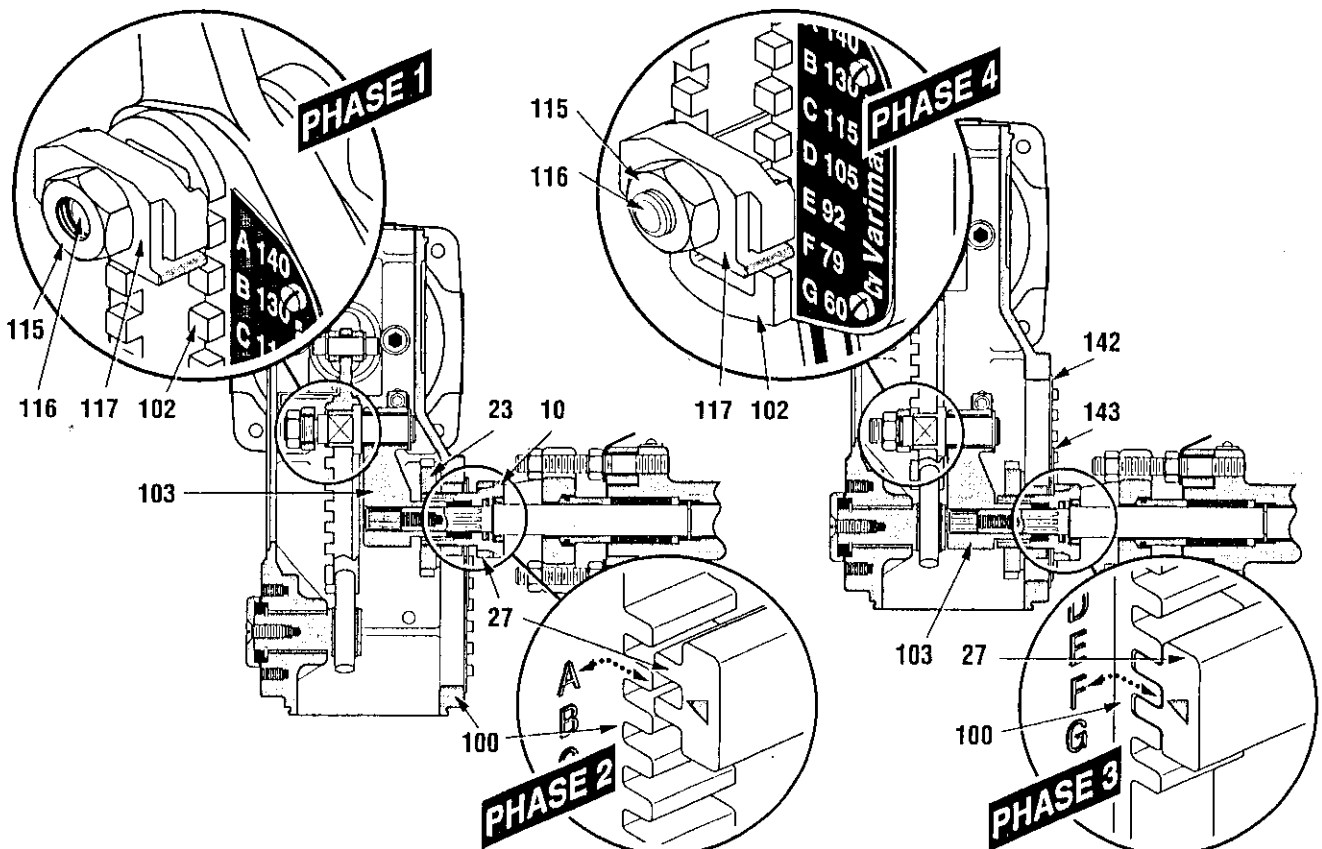


Figure 6: Valve Cv Adjustment

Rated Flow Coefficient C_v of the valves with Standard Plug

Valve Size		ATA N°	Flow Direction	Actuator Adjustment						
Full Area Trim In Inches (mm)	Flashing Service Trim In Inches			A	B	C	D ^①	E	F	G
3 (80)	4x3x4	5	Flow to Open	150	140	125	110	92	75	58
			Flow to Close	140	130	115	105	92	79	60
4 (100)	6x4x6	5	Flow to Open	275	245	215	185	155	125	91
			Flow to Close	250	225	205	185	160	140	105
6 (150)	8x6x8	5 & 7	Flow to Open	595	545	500	435	365	290	215
			Flow to Close	550	510	460	405	355	315	240
8 (200)	10x8x10	5 & 7	Flow to Open	1100	1010	920	805	675	540	395
			Flow to Close	950	890	800	705	620	545	420
10 (250)	12x10x12	7 & 9	Flow to Open	1800	1670	1430	1155	910	730	535
			Flow to Close	1600	1450	1295	1110	935	785	610
12 (300)	16x12x16	7 & 9	Flow to Open	2600	2235	1875	1540	1260	1005	750
			Flow to Close	2400	2140	1810	1520	1260	1035	805
16 (400)	—	9	Flow to Open	4830	4150	3485	2860	2340	1865	1395
			Flow to Close	4460	3975	3365	2825	2340	1925	1495
16 (400)	—	13	Flow to Open	4830	4150	3485	—	—	—	—
			Flow to Close	4460	3975	3365	—	—	—	—

Rated Flow Coefficient C_v of the valves with LO-DB Plug

Valve Size In Inches (mm)	ATA N°	Actuator Adjustment													
		A		B		C		D ^①		E		F		G	
		STAND. CAP.	HIGH CAP.	STAND. CAP.	HIGH CAP.	STAND. CAP.	HIGH CAP.	STAND. CAP.	HIGH CAP.	STAND. CAP.	HIGH CAP.	STAND. CAP.	HIGH CAP.	STAND. CAP.	HIGH CAP.
3 (80)	5	55	—	50	—	44	—	39	—	33	—	28	—	22	—
4 (100)	5	90	—	80	—	72	—	63	—	54	—	45	—	36	—
6 (150)	5 & 7	210	260	190	220	170	185	145	—	125	—	105	—	85	—
8 (200)	5 & 7	360	435	325	370	290	310	250	—	215	—	180	—	145	—
10 (250)	7 & 9	620	745	560	645	495	535	435	—	370	—	310	—	250	—
12 (300)	7 & 9	1000	1200	900	1035	800	865	700	—	600	—	500	—	400	—
16 (400)	9	1750	2100	1575	1810	1400	1510	1225	—	1050	—	875	—	700	—
	13	1750	2100	1575	1810	1400	1510	—	—	—	—	—	—	—	—

— Denotes no product offering

① When no specific adjustment is indicated on order, the Varimax will be delivered: Set at mid band setting "D" adjustment and Flow-to-Close.

Figure 7: Rated Flow Coefficient C_v

Valve Size			316 St. Steel Shaft ②		17-4 PH St. Steel Shaft ①		Nitronic 50 Shaft ③	
mm	Inches	ATA no	B (mm)	Number of Screw Turns	B (mm)	Number of Screw Turns	B (mm)	Number of Screw Turns
80	3	5	2.30	1 1/2	7.60	4 3/4	3.80	2 3/8
100	4	5	2.30	1 1/2	7.10	4 1/2	3.55	2 1/4
150	6	5	2.50	1 1/2	8.10	5	4.05	2 1/2
		7	3.30	1 1/2	9.90	5	4.95	2 1/2
200	8	5	2.50	1 1/2	8.10	5	4.05	2 1/2
		7	3.30	1 1/2	9.90	5	4.95	2 1/2
250	10	7	3.30	1 1/2	10.00	5	5.00	2 1/2
		9	3.30	1 1/2	11.00	4 3/4	5.50	2 3/8
300	12	7	3.30	1 1/2	10.00	5	5.00	2 1/2
		9	3.30	1 1/2	10.70	4 3/4	5.35	2 1/4
400	18	9	3.30	1 1/2	11.20	4 3/4	5.60	2 3/8
		13	3.30	1 1/2	11.20	4 3/4	5.60	2 3/8

① : In case of valve with 17-4 PH St. St. Shaft and Soft Seat Ring, the "B" values and number of screw turns must be limited at the half of those indicated.

② : The Indicated values are available for valves with Metal Seat Ring or Soft Seat Ring.

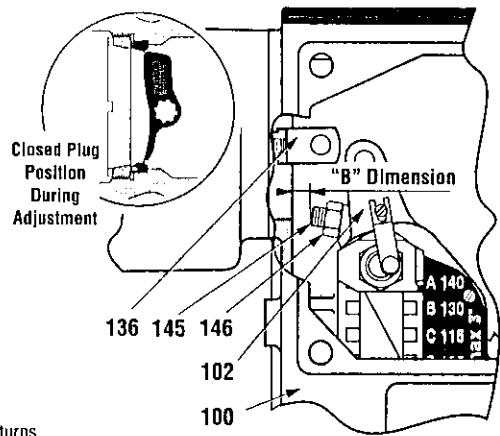


Figure 8: Torque Stop Adjustment

12. Limit-Stop Adjustment (figure 22)

The optional closing and opening limit-stops can be easily field mounted on the Varimax valves without any modification of the actuator (refer to figure 22).

- A. Remove the hole cover from the threaded hole corresponding to the selected limit-stop action (closing and opening). See Figure 22.
- B. Screw limit-stop screw (129) and locknut (130) on actuator case (100).
- C. Adjust length of the screw (129) in regard of the case inner side according to your required operating specifications. Valve plug travel ends shall be reached when the adjustment lever (102) will be against the limit-stop end. Lock nut (130) against actuator case. (See Figure 22).

13. Disassembly Procedures

Disassembly of the valve is necessary when:

- **Changing actuator position, changing valve action or changing actuator size:** refer to Sections 17, 18 or 19 of this instruction manual.
- **Replacement of an internal part of body S/A:** refer to Sections 13.2.2 & 13.3. for disassembly.
- **Replacement of an internal part in actuator case S/A:** refer to Section 13.2.3 for disassembly.
- **Replacement of an internal part of spring barrel S/A:** refer to Section 13.2.4 for disassembly.
- **Periodic general disassembly for maintenance,** refer to Sections 13.1, 13.2, 13.3.

13.1 Type 20 Manual Actuator (Figures 26 & 27)

The Type 20 Manual Actuator is designed to close the valve by rotating the handwheel in a clockwise direction.

For locking and unlocking the handwheel, see figure 26 "Locking Device of the Manual Actuator"

Danger: Prior to performing maintenance, isolate the valve and vent the process pressure.

To remove the manual actuator, proceed as follows:

- A. If required, remove the valve from the line.

Note: In case of Flangeless valve, manually close the valve before removal from the line.
- B. Remove top and bottom covers (111) and front cover (118).
- C. On valves supplied with optional limit-stops, (Figure 22) loosen nuts (130) and back off the limit-stop screws (129) so they will not interfere with the travel of the adjustment lever (102).
- D. If necessary, turn handwheel until the lever (102) will move to an intermediate position (travel about 50%).
- E. Unscrew and remove the screws (213) and washers (212), then remove the handwheel unit from actuator case (100).

Notes: The end of the handwheel unit must be raised while removing, (see Figure 17).

If the valve will be reassembled in the same orientation, it is recommended that the body to actuator case orientation be marked in relation to other. This will simplify reassembly.

At this time, changing flow direction through the valve body (changing valve action — first method) can be performed. Refer to Section 18.

- F. Manually apply the plug against the seat ring. Remove the two packing flange stud nuts (16). Straighten the anti-rotation strip of warning plates (21) and unscrew the two body stud nuts (16), (Figure 14).

- G. Pull out together actuator case S/A, yoke (10) and packing flange (15) until body stud nuts (16) and warning plates (21) may be removed from studs (17).
- H. Actuator case S/A, yoke and packing flange (15) may now be simultaneously separated from the body S/A.

Note: At this time, changing manual actuator position or changing flow direction through the valve body (changing valve action — second method), can be performed (refer to appropriate Section 17 or 18). It is also possible to continue to the body S/A and the actuator case disassemblies, (refer to Sections 13.3 and 13.2.3).

The Handwheel Unit used on the Type 20 Manual Actuator of the Varimax valve was designed as a low cost, non-replaceable item and therefore disassembly is not recommended.

13.2 Spring Barrel S/A (figures 22, 23 & 26)

Maintenance required on the internal components of the valve or reorientation of the actuator and body, requires that the spring barrel and actuator case be removed from the valve. On the Nos 7, 9 & 13 ATAactuators, for ease of handling and reassembly, it is recommended that the spring barrel be removed from the actuator case and then the actuator case separated from the valve body.

Danger: Prior to performing maintenance on the valve, isolate the valve, vent the process pressure and shut off supply and signal air lines to the actuator.

13.2.1 Removal Auxiliary Handwheel Unit

- A. Remove top cover (111) and front cover (118).
- B. Turn handwheel until the neutral position is reached. The drive nut (203) must be at the power screw end (202) opposite to handwheel.
- C. Connect a temporary supply air line to the NPT connection (1/4" NPT for ATA 5, 7 & 9 ; 1/2" NPT for ATA 13) on diaphragm case (125) and apply enough air pressure so the lever (102) will move to an intermediate position (open about 50%).
- D. Unscrew and remove the two screws (213) and washers (212), then remove the handwheel unit from actuator case (100).

Note: The end of the handwheel unit must be raised while removing, (see Figure 16).

The Auxiliary Handwheel Unit used on the Varimax valve was designed as a low cost, non-replaceable item and therefore disassembly is not recommended.

13.2.2 Removal Actuator from Body S/A

Note 1: For an operation on the actuator case, it is not absolutely necessary to remove the case S/A (see paragraph 13.2.3).

Note 2: If the valve will be reassembled in the same orientation, it is recommended that the body to actuator case orientation and the spring barrel to actuator case orientation be marked in relation to each other. This will simplify reassembly.

If any of the following steps were completed during removal of the auxiliary handwheel, proceed to the next step.

- A. If required, remove the valve from the line.

Note: In case of Flangeless valve with "Air-to-Close" actuator, pneumatically close the valve before remove it from the line. Remove air supply.

- B. Remove top and bottom covers (111) and, if no handwheel unit was mounted, side cover (137).

Note 1: If the valve is equipped with a positioner (Model 4607A or 8012/8013), removal of the cam and holder is only required before proceeding. Refer to the appropriate positioner instruction for procedures on cam removal.

Note 2: If access to pivot (119) is necessary, remove positioner or pivot cover (123).

Note 3: On valves supplied with the optional limit-stops, (Figure 22), loosen nuts (130) and back off the limit-stop screws (129) so they will not interfere with the travel of the adjustment lever (102).

- C. Connect a temporary air supply to the actuator port and, using a manual loading panel or regulated air supply, apply enough air pressure to the actuator so the lever will move to an intermediate position (open about 25%).
- D. Remove front cover (118). Remove the front clip (106) from clevis pin (107). Push clevis pin to free and remove the second clip (106), (Figure 23).
- E. By the front, remove clevis pin (107).
- F. Relieve air pressure from actuator enabling clevis (136) to disengage from lever (102).

Danger: Depending on the size and weight of the actuator, it is recommended that proper lift and support procedures be utilized when removing the spring barrel or actuator case (100).

- G. If No 7, 9 or 13 ATAactuator, insure spring barrel is properly supported. Loosen and remove capscrews (113) and lockwashers (114), then remove spring barrel S/A (127) from actuator case (100).

Note: At this time, changing flow direction through the valve body (changing valve action — first method) can be performed. Refer to Section 18.

- H. Manually apply the plug against the seat ring. Remove the two packing flange stud nuts (16). Straighten the anti-rotation strip of warning plates (21) and unscrew the two body stud nuts (16).
- I. Pull out together actuator S/A (or actuator case S/A if No 7, 9 or 13 ATA), yoke (10) and packing flange (15) until body stud nuts (16) and warning plates (21) may be removed from studs (17).
- J. Actuator S/A (or actuator case S/A), yoke (10) and packing flange (15) may now be separated from the body S/A at the same time.

Note: At this time, changing actuator position or changing flow direction through the valve body (changing valve action — second method), can be performed (refer to appropriate Section 17 or 18). It is also possible to continue with the body S/A, the actuator case or the spring barrel disassemblies, (refer to Sections 13.3, 13.2.3 and 13.2.4).

13.2.3 Actuator Case Disassembly

In some instances, it can be necessary to disassemble internal parts of the actuator case (to replace damaged pieces for example). For that, there is no need to remove actuator from body S/A.

Danger: If the valve is in line, isolate it and vent pressure. Shut off supply and signal lines to the actuator.

If the actuator has been already separated from the body S/A as indicated in Section 13.2.2, the internal parts of actuator case may be removed proceeding to Steps B to F of this Section.

If any of the following steps were completed during removal of the actuator, proceed to the next step.

- A. Disconnect the adjustment lever (102) from actuator clevis (136), proceeding to Steps B to F of the above Section 13.2.2.
- B. If the C_v adjustment of actuator is different than the "A" setting, place the actuator case in this position. After having removed indicator (138-139), the clamping nut (115) clamping plate (117), continue as described in steps D through G of section 10 (C_v adjustment).
- C. By means of a screwdriver, remove the retaining clip (148) from the lever sliding rod (101). Pull up the adjustment lever (102) so that its sliding rod (101) disengages pivot bearing (120). Remove adjustment lever and valve lever (103).
- D. If necessary, remove pivot (119) from the case (100) after removing retaining clip (122) and remove the driving link spindle (116) from the valve lever, after removing retaining clip (104).
- E. Remove bearings (105 & 144) from valve lever (103).

Note: On No 9 & 13 ATA, remove the two

Screws (150) and the accessories bracket (149) prior removing the retaining ring (122), (see Figure 24).

- F. Inspect all components and replace defective parts. Proceed to Section 15.2.2 for reassembly.

13.2.4 Spring Barrel Disassembly

The spring barrel S/A used on the Varimax valve was designed as a low cost non-replaceable item and therefore disassembly is not recommended. However, in some instances and for emergency purposes, spring barrel disassembly may be required:

If only the diaphragm (133) must be replaced, it is not necessary to remove actuator from body S/A or spring barrel from actuator case. Proceed as indicated to Section 14.2.

Note: If the valve is in line, isolate it and vent process pressure.

If all parts must be removed from the spring barrel, proceed as follows:

- A. Whatever the ATA size, first proceed to spring barrel removal as described in Section 13.2.2, Steps A to G.
- B. Loosen clevis locknut (135) and remove clevis (136) and locknut.
- C. Loosen and remove capscrews (112) then remove diaphragm case (125) and diaphragm (133).
- D. Remove piston (132) and spring (128) and inspect all components.
- E. Proceed to Section 15.2.1, for reassembly.

13.3 Valve Body (Refer to Figures 21 & 23)

Varimax valves are a standard line of control valves. i.e. standard parts and materials cover a wide range of applications. Parts are completely interchangeable with like valve size.

Maintenance to the internal components required on the Varimax valve can normally be easily determined since the seat ring and plug can be seen once the valve is removed from the line.

The following procedures outline the basic steps for disassembling the valve body completely. All steps should be read and understood before proceeding. It is recommended that both seat ring and plug be replaced if one or the other is damaged due to service.

After the actuator has been detached from the body and body has been removed from the line, disassemble the valve using the following procedure:

13.3.1 Plug and Internal Parts Removal

- A. On actuator case (100), unscrew yoke nut (23), then remove it with yoke washer (22) from the yoke (10). Disengage the yoke and the yoke connection plate (27) (on valve sizes larger than 2" — DN50) from actuator case. Remove the two rear covers (142 & 143) [and the spacer (26) on a High Torque ATA*], from the yoke.

* The larger ATA No on 6" to 16" (DN 150 to 400) valve sizes. (see table of paragraph 19)

Valve Size		Hex. Head Screw Dia.
Inches	mm	
3 - 4	80 - 100	1/4" 28 UNF
6 - 8	150 - 200	3/8" 16 UNC
10 - 12	250 - 300	
16	400	1/2" 13 UNC

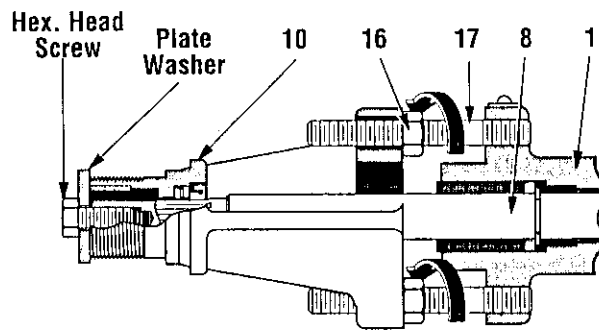


Figure 9: Shaft Extraction

B. Remove packing follower (14).

Note: Difficulty is sometimes encountered when removing the shaft from the plug due to excessive accumulation of deposits between the plug splines and the shaft. Application of heat to the plug shaft bore while using one of the following methods will facilitate removal.

Danger: When using heating devices, insure that proper safety practices are observed. Such items as the flammability and toxicity of the controlled substance must be considered and proper precautions taken.

C. The simplest way to remove internal parts is to pull them all out of the body at once. Screw the nuts (16) on studs (17) and install the yoke (10) on the shaft (8), (see figure 9).

D. Install a washer having an outside diameter larger than the end of yoke, then install a hex head screw at the shaft end. (see figure 9).

E. By unscrewing the nuts (16) against the yoke flange, as shown in figure 9, extract shaft (8) and internal parts from body. Remove extracting device from the shaft.

Caution: Insure that shaft teeth and plug teeth remain strictly aligned during this step. Hand hold the plug to avoid damaging it when the shaft is removed.

Note: The components which should come out with the shaft (8) are: packing (13), packing washer (12) and retaining ring (11).

F. Remove the plug (2) through the end of the body opposite the seat ring.

Note: On valve with a LO-DB plug, take care not to lose the two spacing washers (30 & 31) located on each side of the plug hub.

Identify upper and lower spacers (30 & 31) in preparation for reassembly and put in a safe place. On 16" — DN400 valve size, the two spacers are identical.

G. Remove packing rings (13), packing washer (12) and retaining ring (11) from the shaft.

H. Extract lower and upper guide bushings (6 & 7).

Note: The upper guide bushing (7) may be pushed through the body after removing the plug. A groove is provided on the bushings (6 & 7) for

prying out the bushings using a screwdriver or any similar tool. If the bushings are to be pried out, they should be pried from two sides to prevent jamming during removal.

If the lower bushing (6) does not come out easily, fill the bushing with grease, insert the shaft (8) into the valve insuring that the machined portion of the shaft starts into the lower guide bushing. Using a soft faced mallet, strike the end of the shaft lightly until the bushing is pushed out partially. Remove the shaft and complete removal of the bushing by prying it out using the groove provided.

Caution: Do not pry the bushings using the seat for leverage. If the bushing cannot be easily removed, proceed to Section 13.3.2 and remove the seat ring retainer, positioning washer and seat ring, then remove the bushings. Place a piece of soft stock (brass, etc.) between the inner seat shoulder and prying device to prevent damage to the seat sealing area of the body.

I. Using a screwdriver or any other similar tool, extract the radial seal ring (25) from the yoke. Also remove needle bearing (9) and counter plate (24).

Note: On 16" — DN400 valve size, the needle bearing (9) and the radial seal ring (25) are fitted on a spacer (32), centered on the shaft (8), (see figure 24).

J. If the bearing (18) is damaged in service, remove it by means of a blind hole bearing puller or equivalent. (see figure 10).

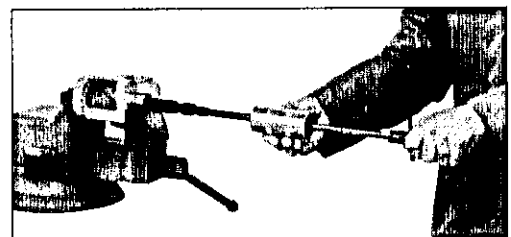


Figure 10: Extraction of Bearing (18)

K. Inspect all components, clean thoroughly in preparation for reassembly and replace defective parts and packing. Proceed to Section 15.1 for reassembly.

13.3.2 Seat Ring Removal

The following procedures outline the recommended method for removing the seat ring retainer (5) with the use of retainer tightening devices. Masonellan offers seat ring retainer tightening devices for the Varimax valves, 3" through 16" (DN80 through 400) sizes.

It is highly recommended that the devices be purchased to facilitate removal and reassembly of the seat ring (3) since SPECIFIC TORQUES MUST BE ACHIEVED to obtain tight shutoff and insure proper functioning of the valve.

Figure 11 shows the tightening construction devices for flanged or flangeless valve bodies, as well as for the optional LO-DB plug.

- A. Secure the bracket flange in a vise and secure the valve body, with seat ring facing up, on the bracket flange by means of two threaded rods and six nuts.

Caution: At this time, the plug must be already removed from valve body.

Caution: Care must be taken to avoid damage to the gasket face on the body.

- B. Place the spacer **B** so it engages retainer lugs (5). Place the retainer wrench **A** on spacer. In case of flangeless valve, the spacer **B** is not required: place directly the wrench **A** onto retainer (5). Install the holding plate **C** on the wrench then screw two nuts on the two threaded rods.

Note: The tightening of this flange must only hold the wrench on the retainer (5), but allow its rotation.

- C. Engage the wrench **A** with an impact wrench having a drive square (or suitable wrench) and loosen then remove retainer (5) by turning **counter-clockwise**.
- D. Lift out tools, retainer (5), positioning washer (4) and seat ring (3).
- E. Inspect all parts, clean thoroughly in preparation for reassembly and replace damaged parts. Proceed to Section 15.1 for reassembly.

14. Maintenance

14.1 Type 20 Manual Actuator or Auxiliary Handwheel Unit (Figures 26 & 27)

The Type 20 Manual Actuator or Auxiliary Handwheel Unit used on the Varimax valve was designed as a low cost non-replaceable item and therefore disassembly is not recommended.

No maintenance is required for these units. It is only recommended that a small amount of grease is periodically applied to the power screw (202).

14.2 Diaphragm Replacement (Figures 12, 22 & 23)

The recommended maintenance to be performed on the Varimax Spring Barrel S/A is limited to the replacement of the diaphragm (133). Removal of the actuator from the valve is not required. To replace the diaphragm, proceed as follows:

Danger: The valve must be isolated and free from any service pressure. All electrical or air pressure to component parts must be off. Pressure to the actuator must be relieved.

The drive nut (203) of the handwheel (204) and limit-stops (129 or 154) (optional) must be backed off to allow free travel of the lever (102).

- A. Bypass the valve, shut off stop valves and isolate valve in compliance with CAUTION note listed above.
- B. Shut off and disconnect air supply tubing to the actuator.
- C. Remove the four capscrews (112) from diaphragm case (125) and remove diaphragm case.
- D. Remove diaphragm (133).

Note: Diaphragm is glued to the top of the piston (132).

- E. Remove tape or glue from the top of the piston and clean thoroughly. If necessary, use a solvent such as acetone.
- F. Clean diaphragm case (125) and spring barrel (127) at the area that engages the diaphragm bead in preparation for reassembly.

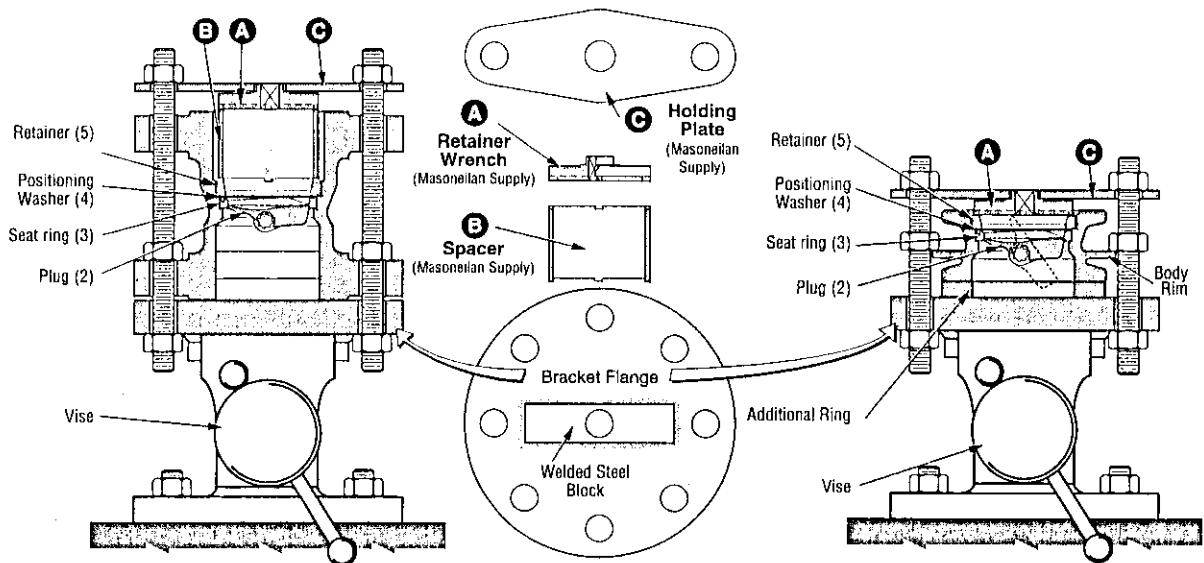
Note: To hold the diaphragm in place on the piston, an adhesive disc (adhesive both sides) or rubber cement is used. If rubber cement is used, it should be applied to both the piston and the diaphragm or in accordance with the manufacturer's directions for the adhesive used.

The recommended adhesives are: "3M High Track tape transfer adhesive", "3M Pressure" double face pressure-sensitive tape, Eastman 910 glue, Goodyear Plibond glue, Sader glue, Bostik 1465 or an equivalent of these products.

- G. Apply adhesive tape or cement to the top of the piston.

Note: Cement must be only applied on the plane area of the piston.

- H. If used, apply cement to the inner face of the bottom of the new diaphragm. The inscription "Piston Side" is printed on inner face of the diaphragm.



Note: During seat ring disassembly, the plug (2) must have been already removed from the valve body.

FLANGED BODY

Valve Size		Tool Kit Reference No (Parts A+B+C)
Inches	mm	
3	80	400098756-999
4	100	400098757-999
6	150	400098758-999
8	200	400098759-999
10	250	400098760-999
12	300	400098761-999
16	400	400102551-999

FLANGELESS BODY

- I. Center and adhere diaphragm (133) to the top of the piston (132). (See Figure 12, Step A). Coat external face of the diaphragm with a small amount of talc.
- J. Carefully roll the diaphragm (133) inside the spring barrel (127) until the bead on the diaphragm is installed in the groove of spring barrel (Figure 12, Step B).

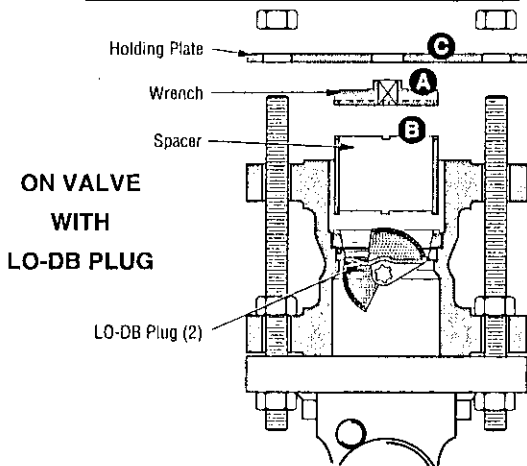


Figure 11: Seat Ring Retainer Removal and Seat Ring Alignment Devices

Caution: Ensure that the capscrew holes in the diaphragm case and spring barrel are aligned to prevent twisting of the diaphragm in aligning the holes. The diaphragm case (125) is normally assembled with the air inlet port placed on the bottom side of the actuator. Depending on the desired location, it can be placed in any desired position around the spring barrel which allows the capscrew holes to line up. However, it is recommended that the drain hole in the spring barrel be facing down to allow for draining of any moisture which may enter the spring barrel cylinder (127).

- K. Carefully place the diaphragm case (125) down over the piston (132) until it seats on spring barrel. (Figure 12, Step C).

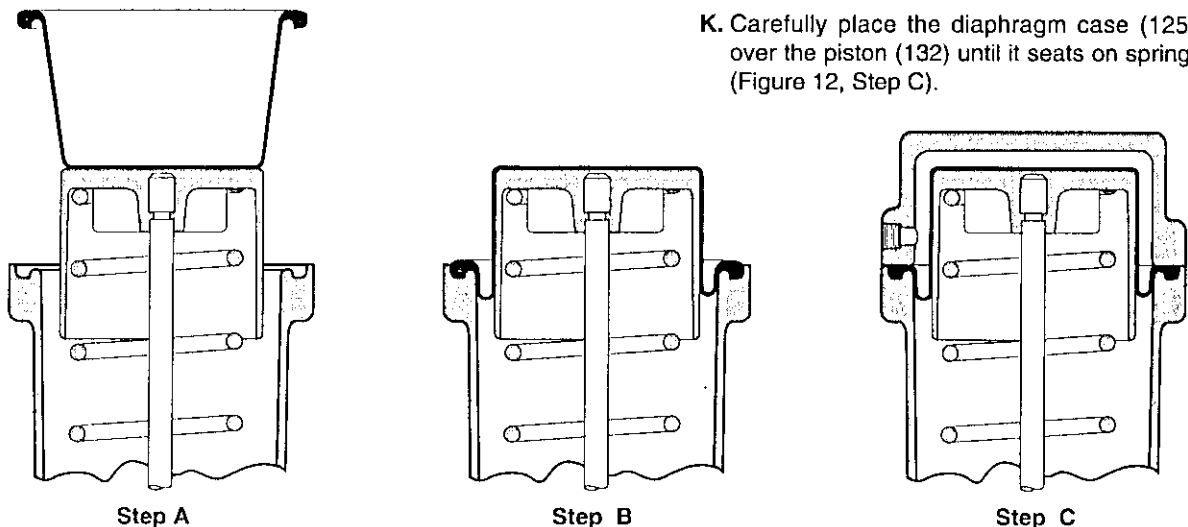


Figure 12: Diaphragm Replacement

- L. Insure that the diaphragm case (125) is evenly seated on the spring barrel (127), insert the four capscrews (112) and tighten evenly.
- M. Connect air supply line to diaphragm case (125).
- N. Turn on air supply and check for leaks.
- O. Reposition handwheel drive nut (203) and limit-stops (129 or 154), (optional) and place valve back in service.

14.3 Packing Replacement (figure 23)

Packing box maintenance is one of the principle chores of routine servicing. Tightness of the packing is maintained by packing compression. Compression is achieved by *evenly* tightening the packing flange nuts (16) against the packing flange (15). Care must be taken not to over tighten as this could prevent smooth operation of the valve. If all compression is used up and the valve leaks, new packing is required.

Danger: Valve must be isolated and the pressure vented before performing packing box maintenance.

- A. Disconnect air (or electric) lines from the actuator (or its accessories).
- B. Remove actuator S/A, yoke (10) and packing flange (15) using procedure outlined under 13.2.2. Actuator Removal.
- C. Remove packing follower (14), then extract worn packing (13) using an extractor and replace them with new packing (see Figure 13 for packing ring quantity). Shift the gap of each ring approximately 120° in relation to the adjacent rings. Replace the two O-rings (28 and 29) of the packing follower (14) if damaged.
- D. Install packing follower (14) and reassemble the actuator S/A, yoke (10) and packing flange (15) using procedure outlined under 15.2.2 Actuator Case Reassembly. Tighten packing box nuts (16) evenly finger tight plus one full turn.
- E. Perform actuator stem adjustment using procedure outlined under Section 16. Connect the pneumatic and electric lines to actuator and accessories.

Valve size	Inches	3	4	6	8	10	12	16
	mm	80	100	150	200	250	300	400
Quantity of PE rings		5	6	5	6	5	5	6

Figure 13
Quantity of Packing Rings

14.4 Adding Packing (figure 23)

This operation can be done without removing the yoke (10) and actuator assembly. It is necessary, as with packing replacement, to bypass the valve and remove pressure from the valve.

Comment: this operation may not be performed in the case of graphite packing.

- A. Remove packing box nuts (16) and slide the flange (15) and packing follower (14) toward the actuator case.
- B. Insert new packing rings (13). Retighten nuts (16) and put the valve into operation.

14.5 Seat Ring Shoulder Lapping (figure 14)

A new seat ring must be lapped against the sealing area in the body. To perform the lapping operation, proceed as follows:

- A. Clean the seat ring sealing area in the valve body and the seat ring shoulder.
- B. Evenly apply a small amount of *fine* grinding compound to the seat ring shoulder.
- C. Insert the seat ring into the body and lap *lightly* by rotating the seat ring, insuring that the entire seat ring sealing surface in the body is lapped.

Caution: Lapping must be performed in the mounting position of the seat ring (see figure 15).

Note: Figure 14 illustrates a simple tool which may be fabricated to facilitate this lapping operation on lower valve sizes (2" to 6"—DN50 to 150).

- D. Remove seat ring and clean thoroughly in preparation for reassembly.

15. Reassembly Procedures

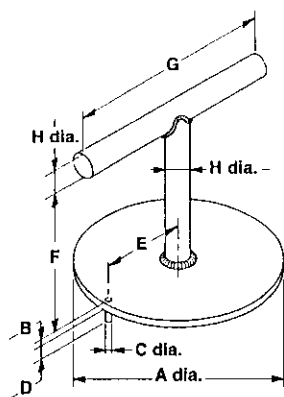
15.1 Valve Body (figures 11, 15, 21 & 23)

15.1.1 Plug and Internal Parts Reassembly

In establishing and maintaining tight shutoff in the Masoneilan Varimax Control Valves the method of installing seat rings becomes an important consideration. As the Varimax closes, tight shutoff occurs through the very high geometrical accuracy of seating areas of the plug and seat ring and their relative position. A lower actuator torque is required to obtain high quality tight shutoff when the seat ring alignment has been correctly performed.

The following outlines the assembly procedure necessary to assure tight shutoff for hard and soft seats (in the field).

Prior to reassembly, the valve body should be thoroughly cleaned.



Valve Size		Dimensions (Inches)								
Inches	mm	A dia.	B	C dia.	D	E	F	G	H dia.	
3	80	2.992 2.988	0.16	0.081 0.077	0.14	1.407	5.0	8.0	0.38	
4	100	3.897 3.893	0.16	0.081 0.077	0.14	1.840	6.0	10.0	0.50	
6	150	5.748 5.744	0.19	0.159 0.155	0.12	2.707	6.0	10.0	0.50	

Figure 14: Seat Ring Shoulder Lapping

A new seat ring must be lapped on the seat sealing area of the body (refer to above Section 14.5). Upon completion of the above, proceed as follows:

Caution: Lubricants and sealers are required during reassembly. Ensure that any lubricant used is compatible with service conditions.

- A. Put the valve body on a bench so that its seat ring shoulder is facing up. In case of lower valve sizes, clamp the body in a vise, taking care not to damage the seating surfaces of flanges.
- B. Install seat ring (3) in the proper orientation. (Refer to Figure 15).
- C. Install the positioning washer (4), insuring that its index pin is correctly located in the hole of the seat ring (3) and that the three notches are inserted in their corresponding slot of the body, (See Figure 21).

Caution: If one of these two points is not carried out, it is necessary to correctly reinstall the positioning washer and/or seat ring.

- D. Screw seat ring retainer (5) and hand tighten only. Turn over valve body so that seat ring retainer is facing down.

Note: At this time, seat ring, positioning washer and retainer are only temporarily mounted to easily install the plug and shaft in the body. They must be removed when the following steps will be performed, then reinstalled according to the seat ring Alignment procedure, (See 15.1.2 or 15.1.3).

- E. Coat lower and upper guide bushings (6 & 7) with recommended lubricant and insert them into the body.

Note: Groove in the guide bushings must be toward the body center. The guide bushing having the smaller inside diameter is the lower guide (6).

- F. Place retaining ring (11) in the groove provided on shaft (8).

Note: If the retaining ring has been damaged, it must be replaced.

- G. Coat the portion of the shaft (8) below the shoulder with the recommended lubricant.
- H. Place plug (2) in body so it rests on the seat ring (3).

Caution: With the plug resting squarely on the seat, the plug bore should be in line with upper and lower guide bushings. Insure that the plug is in the correct position in relation to seat ring. See Figure 15 inverted.

- I. Insert the shaft into the body (1) and engage upper guide bushing (7), plug hub (2) and lower guide bushing (6).

Note: For valves with LO-DB plugs DN 150 to 400, at the same time as the shaft passes into the guide bushings (6 and 7) and the hub of the plug, insert the upper spacing washer (30) between the upper guide bushing (7) of the LO-DB plug. Then insert lower spacer (31) between plug and lower guide (6). Ensure that each spacing washer is correctly located. On 16" — DN 400 valve size, both spacers are identical.

- J. Install the packing washer (12) over the shaft (8) and into the valve bonnet.

Note: On 16" — DN 400 valve size, ensure proper orientation of the packing washer (12), (see Figure 24).

- K. Install new packing (13) insuring that the skive cut of each piece of packing is offset approximately 120 degrees from adjacent pieces of packing.

Note: Refer to figure 13 for quantity of packing rings for each valve size.

- L. Install packing follower (14), insuring that it is thoroughly centered in the lantern of the packing box. Install two new O-rings (28 & 29) on packing follower.

- M. Install the counter plate (24) and the needle bearing (9) in the housing of the yoke (10).

- N. Using a hammer and a tube having an outside diameter slightly smaller than the bore of the bearing, insert the radial seal ring (25) into the yoke (10) (Refer to Figure 24 for seal ring position).

Note: On 16" — DN 400 valve size, install the needle bearing spacer (32) between the needle bearing (9) and the radial seal ring (25), Particular care must be given to the correct orientation of the needle bearing spacer (32), (see figure 24).

- O. If it is necessary to replace the bearing (18), perform with a press or any appropriate device.
- P. Determine correct valve to actuator orientation. If required, reposition body studs (17). (Refer to Figure 20).
- Q. Coat the joints of yoke as well as the corresponding joints of the flange and cylindrical part of the valve body with recommended lubricant.
- R. Together install the yoke S/A (10), the packing flange (15), the warning plates (21) and the nuts (16). Tighten the two body nuts (16) and fold back the anti-rotation strip of warning plates (21) on the body nuts (16).
- S. Install a hex head screw (see Figure 9) at the shaft end, then pull out the shaft toward the yoke such that its shoulder reaches the needle bearing (9), [or reaches the needle bearing spacer (32) on a 16" — DN 400 valve size].
- T. Tighten the two packing flange nuts (16) evenly finger tight plus one full turn.
- U. Remove retainer (5), positioning washer (4) and seat ring (3) from the body. Proceed to seat ring alignment as specified in the following Section 15.1.2 or 15.1.3.

15.1.2 Hard Seat Ring Alignment (figures 11 & 15)

- A. Place and secure valve body (1) in the device described in Figure 11 so that its seat ring shoulder is facing up. Check the proper position

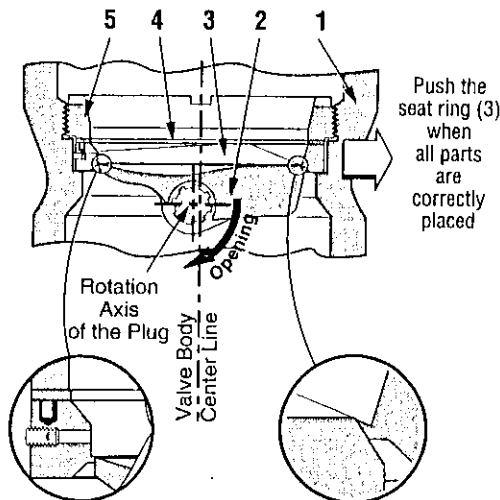


Figure 15
Plug and Seat Ring Alignment

of plug in the body.

Note: the actuator may have to be used for this reassembly position. Use the actuator in position A.

For valve having a nominal diameter greater than 150 mm, a chain hoist may be necessary to maintain the body.

Operations B through M must be carried out without interruption to avoid problems related to hardening of the sealing paste before the seat ring retainer (5) is properly tightened.

- B. For actuators which close by lack of air, supply them to the corresponding to the spring final. For actuators which open by lack of air, skip to the next step.
- C. Remove the set screw (99) located on the seat using a 2.5mm male Allen wrench for the 3" and 4" seats, or a 3mm Allen wrench for seats greater than 4" (see figure 15). Apply a fine coat of sealing paste on the shoulder of the seat which enters into the body. Fit the seat ring (3) into the body while orienting its seal faces with that of the plug (see figure 15).

Note: the sealing paste must comply with the valve's service characteristics.

- D. Apply a small quantity of lubricant on the threads of the seat ring retainer (5) and on both sides of the positioning washer (4).
- E. Fit the positioning washer (4), making sure that the indexing pin is correctly placed in the hole of the seat ring (3) and that the three pins are properly inserted in the corresponding notches of the body.

Caution: If one of these two points is not carried out, it is necessary to correctly reinstall the positioning washer and/or seat ring.

- F. Hand-tighten the seat ring retainer (5). Hand push the seat ring toward the opposite side of the index pin. (Refer to Figure 15).

Caution: Do not tighten the seat ring retainer to torque specifications at this time.

- G. Place the spacer (B) in the notches of the seat ring retainer (5), the place the operating key (A) on the spacer and tighten the screw nuts onto the threaded rods. Tighten the seat ring retainer (5) to 5% of the required torque value (see table below).

- H. With the actuator set in position A:

- For actuators closing by lack of air: Bleed the pressure from the actuator.
- For actuators opening by lack of air: Apply a pressure corresponding to the final value of the spring scale plus the initial value.
Example: Scale 7-25 Psi
- Pressure to be applied: $25 + 7 = 32$ Psi

- I. Valve operating in Flow-to-Open: skip directly to step M.

Valve operating in Flow-to-Close:

- Remove tools A, B and C from the valve (see figure 11).
- Open the flap 100%, then touch the set screw (99) on the centering of the seat in the body.

- J. Screw in the set screw (99) between 1/4 and 1/2 turn

- K. Close the valve with the actuator in the same manner as in step H.

- L. Replace tools A, B and C on the fixture.

- M. Apply the required torque on the seat ring retainer (5) (see values in the table opposite). Remove the tools from the valve and remove it from the retaining fixture.

Note: for valves operating in Flow-to-Open, touch the set screw (99) with the centering of the seat in the body once the seat has been properly blocked.

Valve Size		Required Torque			
		Min.		Max.	
Inches	mm	ft.lbs	daN.m	ft.lbs	daN.m
2	50	130	18	160	22
3	80	360	50	435	60
4	100	435	60	505	70
6	150	975	135	1085	150
8	200	1160	160	1305	180
10	250	1595	220	1810	250
12	300	2680	370	2895	400
16	400	2680	370	2895	400

15.1.3 Soft Seat Ring Alignment

- A. Proceed to seat ring shoulder lapping in the body and carefully clean the parts before reassembling. (Refer to Section 14.5).
- B. Apply Teflon spray (Crown No 9008 or equivalent) to seat ring retainer thread, to both sides of the positioning washer (4) and to the seat ring shoulder that engages body.
- C. Install and align the soft seat ring in the body proceeding to the above Section 15.1.2.

15.2 Spring Barrel S/A (figures 22 & 23)

15.2.1 Spring Barrel Reassembly

After the spring barrel has been disassembled using Section 13.2.4, reassemble proceeding as follows:

- A. Place spring (128) and piston (132) in spring barrel (127). Reassemble diaphragm (133) and diaphragm case (125), referring to Section 14.2, Steps F through L.
- B. Determine correct orientation and secure spring barrel S/A (127) on the actuator case (100) with the two screws (113) and two lockwashers (114). Tighten firmly.

- C. Connect a temporary air supply pressure to the actuator port and, using a manual loading panel or regulated air supply, apply enough air pressure to fully extend the actuator stem.

- D. Screw locknut (135) and clevis (136) on the actuator stem. Relieve all air pressure and disconnect the supply line.

15.2.2 Actuator Case Reassembly (see figure 23)

- A. Install the yoke connection plate (27) on the yoke end (10). Place the rear covers (142 & 143) on the yoke end. If a High Torque ATA* must be mounted, place the spacer (26) on the yoke end.

- B. Install actuator case (100) on the yoke (10) such that the notch marked with the letter "A" corresponds to the arrow engraved on the yoke connection plate (27). Place the yoke washer (22), then screw and lock the yoke nut (23) by means of an adjustable hook spanner.

- C. Install new bearings (105 & 144) and the driving link spindle (116) in the valve lever (103). If the clip (104) is damaged, use a new clip.

- D. Install the valve lever (103) on the shaft end and yoke end such that it makes an angle about 40 degrees in relation to vertical axis when the valve plug is in closed position.

- E. If the pivot (119) has been removed from the actuator case (100), install it with the clip (122). If the clip (122) is damaged, use a new clip.

- F. Insert the sliding rod (101) of the adjustment lever (102) in the pivot bearing (120) such that slide of lever engages the driving link spindle (116).

- G. Place the clamping plate (117) so that its index corresponds to the mark "A" on the lever (102). Screw and lock the clamping nut (115) on the driving link spindle (116). Install the retaining clip (148) in the groove of the lever sliding rod (101).

- a) Proceed to torque stop adjustment, referring to Section 11 of this instruction manual.

- b) Connect the actuator clevis (136) to adjustment lever (102), referring to Section 16 of this instruction manual.

- c) If necessary, adjust the valve to the required C_v as indicated to Section 10 of this instruction manual.

- d) If necessary, install the auxiliary handwheel unit on actuator as indicated to Section 5 of this instruction manual.

- e) If necessary, proceed to limit-stops adjustment, referring to Section 12 of this instruction manual.

- f) If no auxiliary handwheel is mounted, replace the side cover (137).

Note: If any of the following steps were completed during the steps a. to f., proceed to the next step.

* The larger ATA No on 6" to 16" (DN 150 to 400) valve sizes. (see table of paragraph 19)

- H. If the cam of positioner has only been removed, install the cam, connect pneumatic and/or electric lines on actuator and accessories and check positioner calibration. If necessary, calibrate positioner and/or accessories.

Note: The angular travel of the adjustment lever and its "closing" position being constant, it is not necessary to perform significant adjustments of instruments such as positioners, when the actuator is reassembled in the same action mode.

- I. If positioner and/or any accessories have been removed, install and calibrate them. Install the valve in the line and place back in service. (Refer to specific instruction manual of instruments to proceed to installation and calibration).

Note: In case of Flangeless valve with "Air-to-Close" actuator, manually or pneumatically close the valve before place it to the line.

15.3 Type 20 Manual Actuator (figure 27)

- A. To install actuator case S/A on the body S/A, refer to Section 15.2.2, Steps A to G.a.
- B. Manually close the valve and, if necessary, set indicator arm (138) on lever (102) for yellow indicator dot (139) to be in line with "Closed" mark on the travel indicator scale of the front cover (118). Remove front cover and tighten screw (140).
- C. If necessary, adjust the valve to the required C_V as indicated in Section 10 of this instruction manual.
- D. Manually move the adjustment lever (102) to an intermediate position (open about 50%).

Note: The handwheel unit for a Type 20 Manual Actuator is always installed on the right side of the actuator case.

- E. If the handwheel is locked, see figure 27 to unlock it. Hold the bracket (201) and turn handwheel such that the drive nut (203) reaches an intermediate position (about mid stroke).
- F. Install the handwheel unit in the actuator case as indicated by the Figure 17. Manually move the adjustment lever (102) to align the pin (107) with the forks of the drive nut (203). Position the pin (107) such that its clips (106) are placed between the two forks of the drive nut (203). Slightly lower handwheel unit such that the forks of the drive nut engages the pin of the adjustment lever.
- G. Secure handwheel unit on actuator case with two screws (213) and two washers (212).

Note: Pull up the handwheel unit toward the top of the actuator case before tightening the screws (213).

- H. Check the correct manual operation to full travel, set the drive nut to the required position then install top and bottom covers (111), front cover (118) and side cover (137).

Note: For locking and unlocking the handwheel, refer to figure 26.

- I. If necessary, proceed to limit-stops adjustment, referring to Section 12 of this instruction manual.
- J. Install the valve in the process line and place valve back in service.

Note: In case of Flangeless valve, manually close the valve before placing it to the line.

16. Actuator Stem Adjustment (figures 17, 22 et 23)

- When actuator clevis (136) is disconnected from the adjustment lever (102), manually push it **to close the valve by applying the plug against the seat ring**, (see Figure 17, Step A). Adjust indicator arm (138) on lever (102) for yellow indicator dot (139) to be in line with "Closed" mark on the travel indicator scale of the front cover (118), (See Figure 22). Remove front cover and tighten screw (140).

On Air-to-Open Valve

- Apply to the actuator diaphragm the spring initial (usually 7 or 3 psi — 0,5 or 0,2 bar). Adjust the position of the clevis (136) on actuator stem, so that the holes in the adjustment lever (102) and the clevis are aligned (when the plug is against the seat ring), (see Figure 17, Step B).

Note: Manually pull out the adjustment lever (102) for each turn of the clevis.

- With the clevis adjusted, slightly modify actuator air pressure such that easy pinning can be performed with the lever in an intermediate position. Pin the clevis (136) to adjustment lever (102) with clevis pin (107). Place clips (106) and tighten clevis lock-nut (135), (see Figure 17, Step C).
- Relieve air pressure.

On Air-to-Close Valve

- Fully screw clevis (136) and nut (135) on actuator stem. Apply air pressure to actuator diaphragm such that the actuator stem is fully extended [the piston (132) must be in contact against the spring barrel inner surface], (see Figure 17, Step B).
- Using a rule, measure the position of the clevis (136) with regard to a reference point [actuator case (100) for instance]. Relieve air pressure to retract actuator stem to the "A" dimension shown in Figure 17, Step B.
- Turn the clevis (136) on actuator stem until the holes in the adjustment lever (102) and the clevis are aligned (when the plug is against the seat ring).

Note: It is necessary to lift actuator stem up to disengage the clevis from the adjustment lever (102) for each turn of the clevis..

- Pin the clevis (136) to adjustment lever (102) with clevis pin (107). Replace clips (106) and tighten clevis locknut (135), (see Figure 17, Step C).
- Relieve air pressure.

17. Changing Actuator Position (Figures 20, 22 & 23)

For each valve action (air-to-open or air-to-close) the actuator may be mounted in its standard position parallel to the pipe for lowest profile, or in any one of three other positions, (see Figure 20). Actuator position is usually determined by adjacent piping, obstacles of various types or air piping arrangements.

For changing actuator position, proceed as follows:

Danger: Isolate the valve and vent the process pressure. Shut off supply and signal lines to the actuator.

A. If actuator is equipped with an auxiliary handwheel, remove it from actuator case (100) referring to Section 13.2.1. Remove actuator S/A from the body referring to Section 13.2.2, Steps B to F and H to J.

B. Replace together the actuator S/A with yoke (10), packing flange (15), warning plates (21) and nuts (16) in the new position, chosen from one of the three other positions for the same valve action.

Note: If the actuator and yoke are to be rotated 90 degrees, change the position of the body studs (17) 90 degrees (see figures 20 & 23).

If the actuator and yoke are moved 180 degrees from their original position, the body studs (17) are not moved, (see Figure 20).

C. Connect the actuator clevis (136) to adjustment lever (102), referring to Section 16 of this instruction manual.

D. If necessary, set the limit-stop screws (129 or 154) as indicated on Section 12 of this manual.

E. If necessary, install the auxiliary handwheel unit on actuator as indicated to Section 5 of this instruction manual.

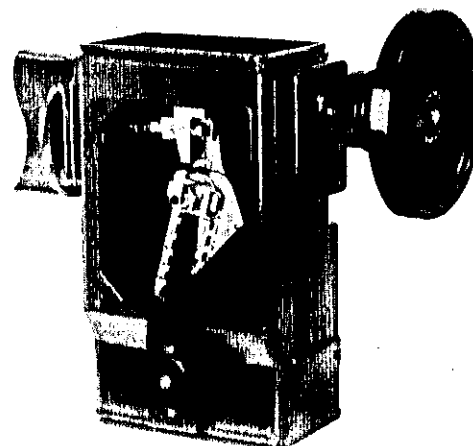
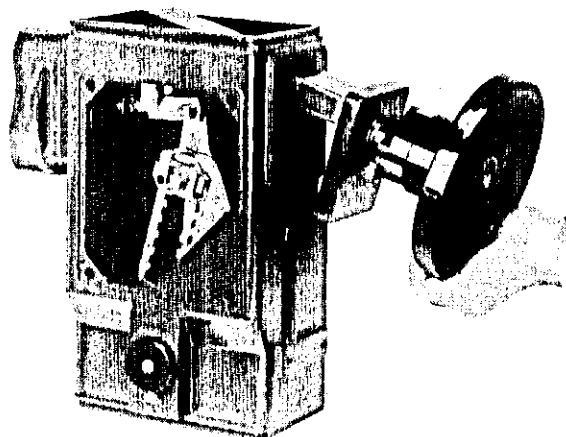


Figure 16
Handwheel Unit Removal and Installation on Actuator Case

F. If the cam of positioner only has been removed, reinstall the cam, connect pneumatic and/or electric lines on actuator and accessories and check positioner calibration. Calibrate if necessary.

Note: The angular travel of the adjustment lever and its "closing" position being constant, it is not necessary to perform significant adjustments of instruments such as positioners, when changing actuator position.

If positioner has been removed, calibrate it (Refer to specific instruction manual of positioner). Be careful to insure that the filter-regulator is installed with the dripwell and draincock downwards. Place valve back in service.

18. Changing Valve Action (Figures 18 to 23)

Changing service requirements or service conditions may require a change in flow direction through the Varimax valve. Figure 20 illustrates the various positions and flow directions in which the valve may be placed to accommodate requirements.

Caution: Changing the body position and flow direction could also require relocating the actuator. Insure that the actuator location and action are in accordance with the recommended positions and modes illustrated in Figure 20. The plug shaft is always rotated in a clockwise direction by the actuator to open the valve.

To change body position proceed as follows:

Danger: Isolate the valve and vent the process pressure. Shut off supply and signal lines to the actuator.

Refer to Figure 20 and determine which is the desired valve position, flow direction and which actuator position is required.

Two possibilities:

1. FIRST METHOD: There is enough room to change the valve-actuator assembly from Position 1 to Position 2 as shown on Figure 18.

A. Remove body-actuator assembly from the line and reinstall it after having rotated it 180 degrees. This reverses the flow direction through the valve. (Figure 18, Steps 1 & 2).

Note: In case of Flangeless valve with "Air-to-Close" actuator, manually or pneumatically close the valve before remove it from the line.

B. If actuator is equipped with an auxiliary handwheel, remove it from actuator case (100) referring to Section 13.2.1.

C. Uncouple actuator clevis (136) from adjustment lever (102) referring to Section 13.2.2, Steps B to F.

D. Remove capscrews (113) and lockwashers (114). Separate spring barrel S/A and install it on opposite side of actuator case (100). (Figure 18, Steps 3 & 4).

E. Connect the actuator clevis (136) to adjustment lever (102), referring to Section 16 of this instruction manual.

F. Install the auxiliary handwheel unit on actuator case (100) to opposite side of spring barrel, as indicated in Section 5 of this manual.

G. If necessary, adjust the limit-stop screws (129 or 154) as indicated on Section 12 of this manual.

H. Reverse the C_V indicator plate (131) on the adjustment lever (102) so that it corresponds to new flow direction through valve body

I. Replace top and bottom covers (111), front cover (118) and, if necessary, side cover (137). Do not forget to reverse the flow arrow plate (19). Also modify the characteristics stamped on the serial plate (109) (air action, type, etc).

J. If a positioner is mounted, install the cam according to the new valve action mode. Connect pneumatic and/or electric lines on actuator and accessories and calibrate positioner and/or accessories. (Refer to specific instruction manual of instruments to calibrate). Place valve back in service.

2. SECOND METHOD: There is not enough room to have valve-actuator assembly as shown on Figure 18 — Position 2.

A. Separate the actuator S/A, packing flange (15), warning plates (21) and yoke (10) from the body S/A, referring to Section 13.2.2, Steps B to F and H to J. (Figure 19, Steps 1 & 2).

B. Remove the valve body from the line and reinstall it after having rotated it 180 degrees around the longitudinal axis of the valve shaft (8). This reverses the flow direction through the valve. (Figure 18, Step 3).

Note: In case of Flangeless valve, manually close the valve before remove it from the line.

C. Reinstall, together, actuator S/A with yoke (10), packing flange (15), warning plates (21) and nuts

(16) on the valve body. (Figure 18, Step 4).

D. If actuator is equipped with an auxiliary handwheel, remove it from actuator case (100) referring to Section 13.2.1.

E. Remove capscrews (113) and lockwashers (114). Separate spring barrel S/A and install it on opposite side of actuator case (100). (Figure 18, Steps 5 & 6).

F. Connect the actuator clevis (136) to adjustment lever (102), referring to Section 16 of this instruction manual.

G. Install the auxiliary handwheel unit on actuator case (100) to opposite side of spring barrel, as indicated in Section 5 of this manual.

H. If necessary, adjust the limit-stop screws (129 or 154) as indicated on Section 12 of this manual.

I. Reverse the C_V indicator plate (131) on the adjustment lever (102) so that it corresponds to new flow direction through valve body.

J. Replace top and bottom covers (111), front cover (118) and, if necessary, side cover (137). Do not forget to reverse the flow arrow plate (19). Also modify the characteristics stamped on the serial plate (109) (air action, type, etc).

K. If a positioner is mounted, install the cam according to the new valve action mode. Connect pneumatic and/or electric lines on actuator and accessories and calibrate positioner and/or accessories. (Refer to specific instruction manual of instruments to calibrate). Place valve back in service.

19. Changing Actuator Size Figures 22, 23 & 25)

Changing service requirements such as pressure drop can require a change of actuator size. Each Varimax valve size is designed to accept two actuator sizes (except 3" and 4" valves which have only one actuator model) ; Standard and High Torque ATActuator. The opposite table shows the ATA Nos for each valve size.

Changing of actuator can be easily performed without removing or modification of the body S/A.

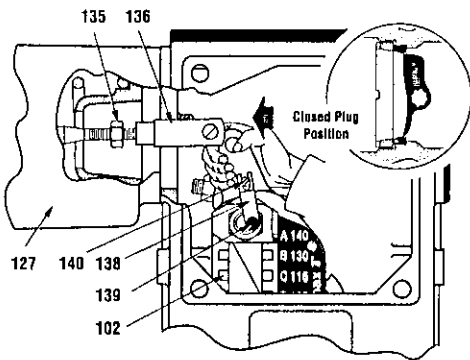
Danger: Isolate the valve and vent the process pressure. Shut off supply and signal lines to the actuator.

A. Remove top and bottom covers (111) and front cover (118). Remove internal parts of actuator case (100), proceeding to Section 13.2.3, Steps A to C.

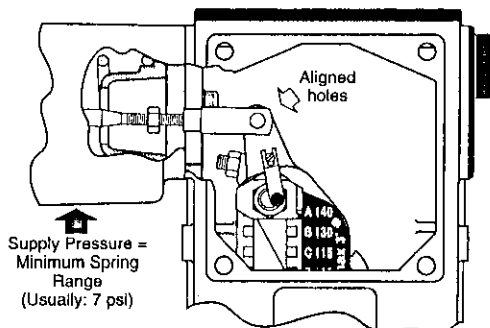
Note: Prior to removing actuator case (100) from the yoke (10), remove positioner and/or accessories.

B. By means of an adjustable hook spanner, unscrew and remove the yoke nut (23). Remove yoke washer (22) then actuator case (100) and spring barrel S/A from yoke end (10). Remove the two rear covers (142 & 143).

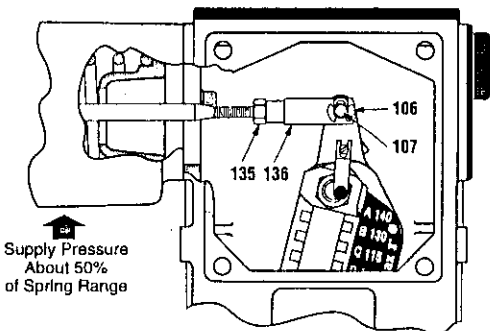
Air to Open



Step A: — Manually push the lever (102) to seat the plug.

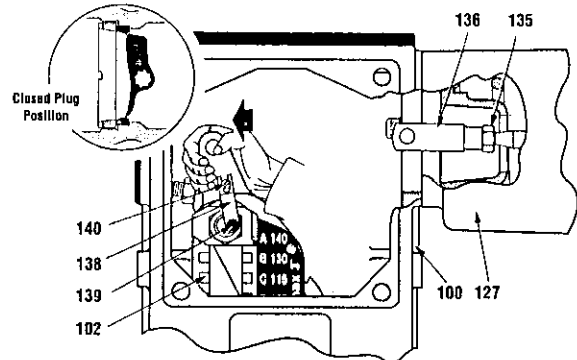


Step B: — Apply the supply pressure corresponding to the spring initial.
— Turn the clevis to allow pinning on the lever (102).

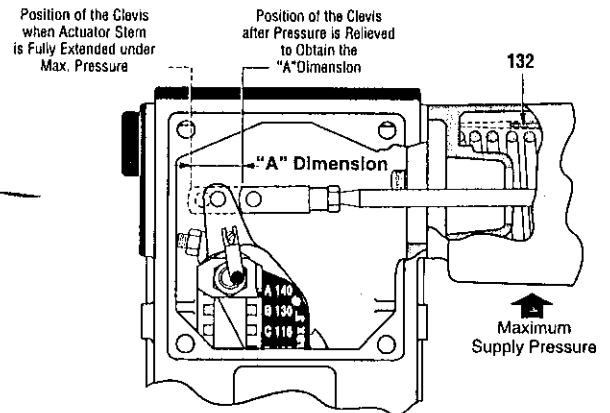


Step C: — Pin the clevis on lever.
— Tighten locknut (135).

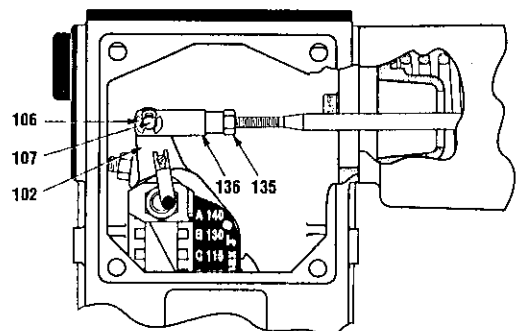
Air to Close



Step A: — Manually push the lever (102) to seat the plug.



Step B: — Apply the maximum supply pressure
— Position the actuator stem in preparation for pinning the clevis on the lever (102).



Step C: — Turn the clevis to allow pinning on the lever (102).
— Pin the clevis on the lever. Tighten locknut (135).

ATA N°	A dimension Inches (mm)
5	.79 (20)
7	1.30 (33)
9	1.77 (45)
13	1.77 (45)

Figure 17: Actuator Stem Adjustment

Note: If a Standard ATA is replaced by a High Torque ATA or conversely, the following parts related to new ATA must be provided and installed during changing actuator:

Spacer (26); valve lever (103); rear covers (142 & 143); yoke washer (22); yoke nut (23) and C_v Indicator plate (131).

Important: When ordering parts, always specify installed valve size and new ATA size.

If a High Torque ATA is replaced by a Standard ATA, the spacer (26) must be discarded. If a Standard ATA is replaced by a High Torque ATA the spacer (26) must be installed on the yoke.

C. Install the new actuator case (100) and its spring barrel on the yoke (10), referring to Section 15.2.2 of this instruction manual. If necessary, modify the valve characteristics on the serial plate (109). Place valve back in service.

Valve Size	Inches	3	4	6	8	10	12	16
	mm	80	100	150	200	250	300	400
ATA N°	Standard	-	-	5	5	7	7	9
	HI-TORQUE	5	5	7	7	9	9	13

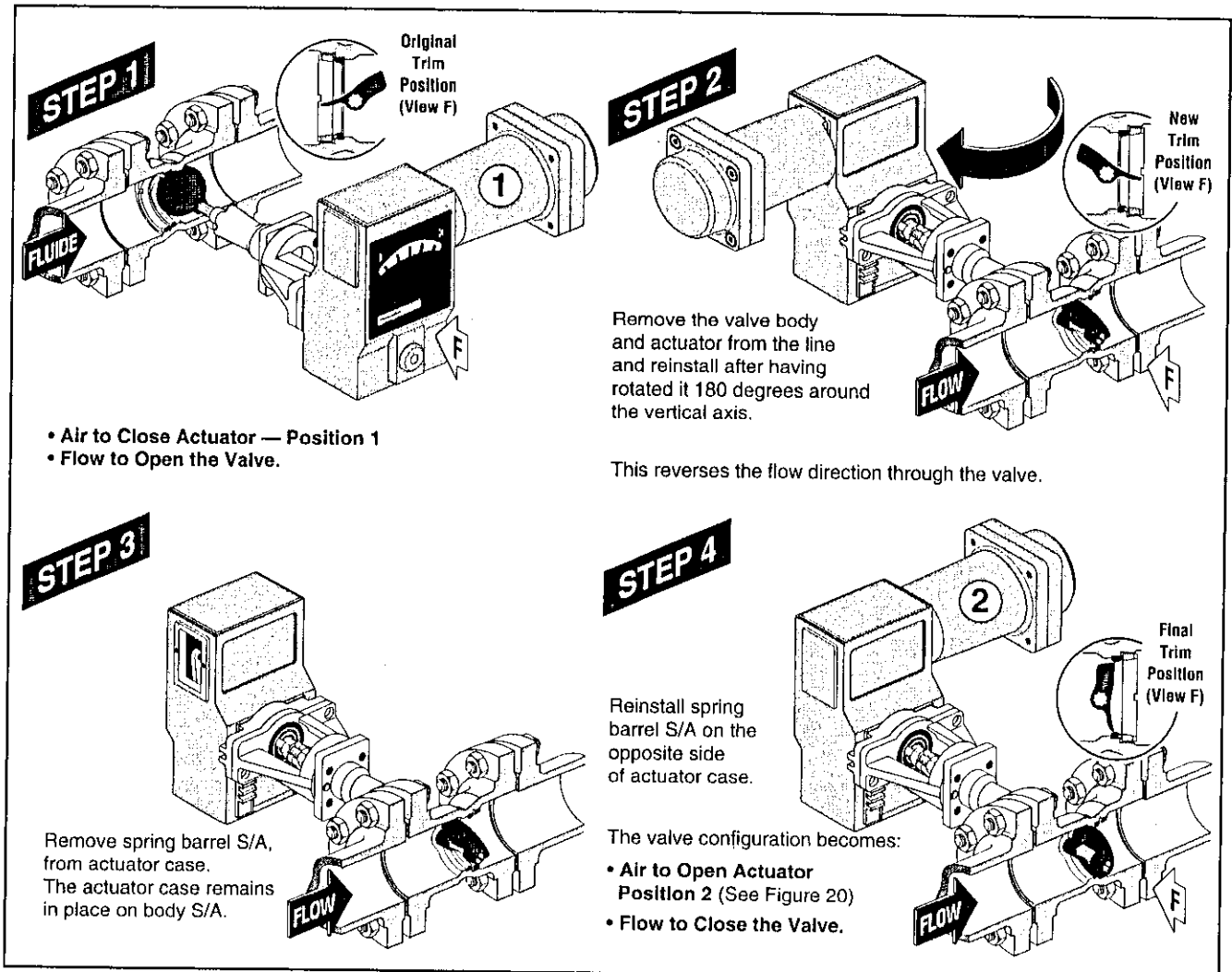
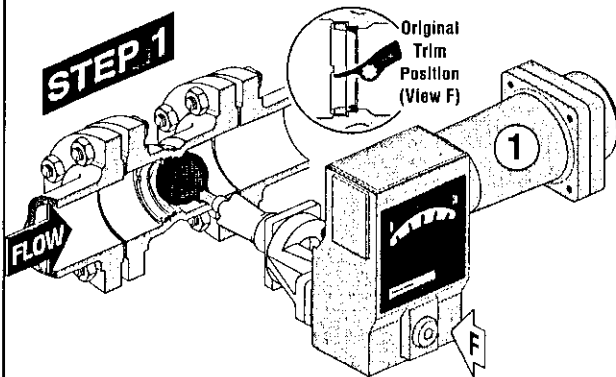
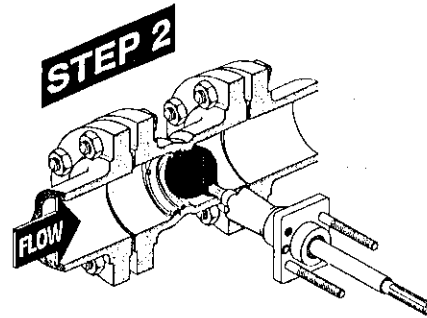


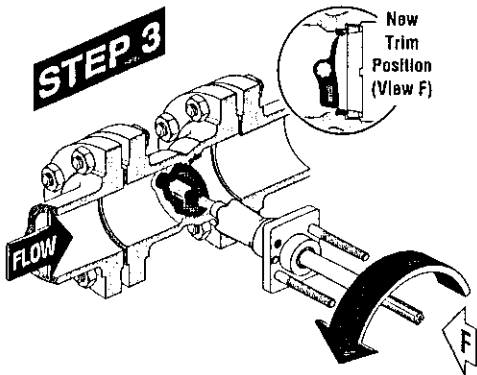
Figure 18: Changing Valve Action (First Method)



- Air to Close Actuator — Position 1
- Flow to Open the Valve.

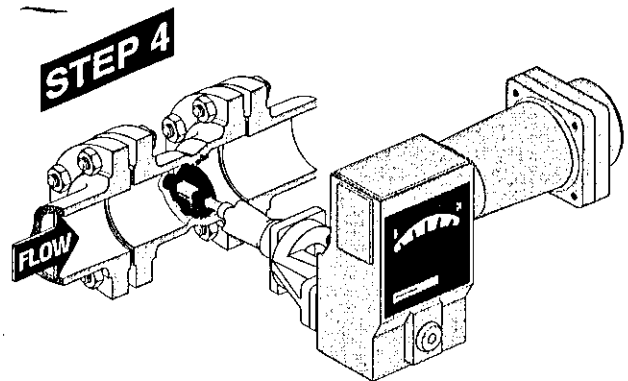


Remove actuator S/A, yoke (10), packing flange (15) and warning plate (21) from the body S/A.

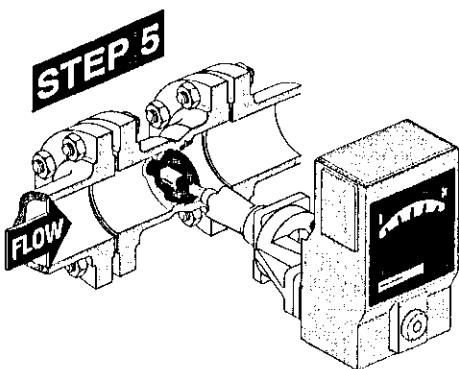


Remove the valve body from the line and reinstall after having rotated it 180 degrees around the valve shaft axis.

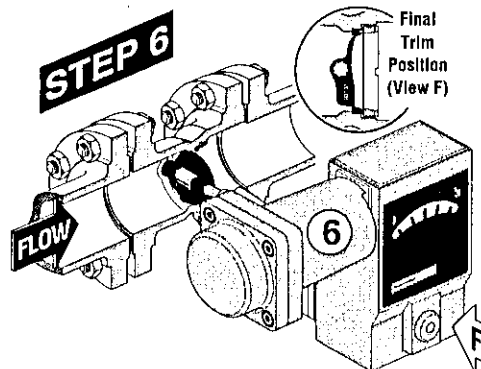
This reverses the flow direction through the valve.



Reinstall actuator S/A, yoke (10), packing flange (15) and warning plate (21) on the valve body.



Remove spring barrel S/A from actuator case.



Reinstall spring barrel S/A on the opposite side of actuator case.

- The valve configuration becomes:
- Air to Open Actuator — Position 6 (See Figure 20)
 - Flow to Close the Valve.

Figure 19: Changing Valve Action (Second Method)

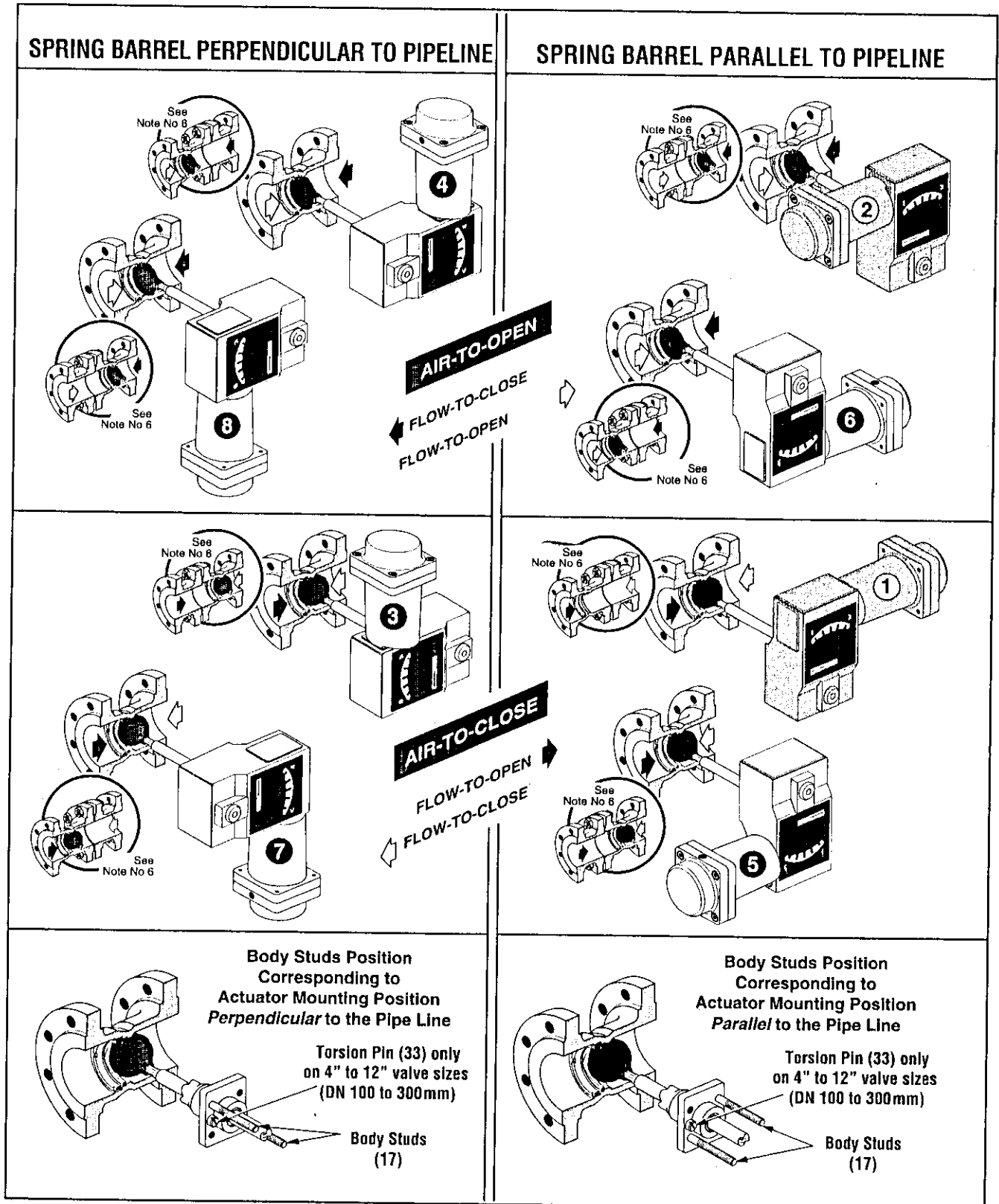


Figure 20: Changing Actuator Position

Notes:

1. Recommended actuator mounting positions are shaded.
2. Recommended flow directions are shown by the black arrows. } When no specific position is indicated on the specification sheet, the Varimax will be delivered: Air-to-Open, Position 2
3. Plug positions are shown in the initial position without air on actuator.
4. The above pictures and their actuator mounting code correspond to the eight available configurations of valve body/actuator assembly (factory start out) independently of the pipeline orientation. They allow to meet to all requirements of every field situations, but it is recommended to install the valve so that spring barrel is always placed above the pipeline (parallel or perpendicular to this).
5. Action and orientation field reversible without additional parts.
6. Globe adaptor position in relation to valve body, in the optional Std. Globe configuration. To minimize the overall dimensions, the globe adaptor will be mounted on the same side that the ATA cylinder. However, if necessary, the customer can easily and without any risk, field reverse the globe adaptor position.
7. Installation is assumed to be in horizontal pipeline for orientation of airstet and other accessories unless specified on order.

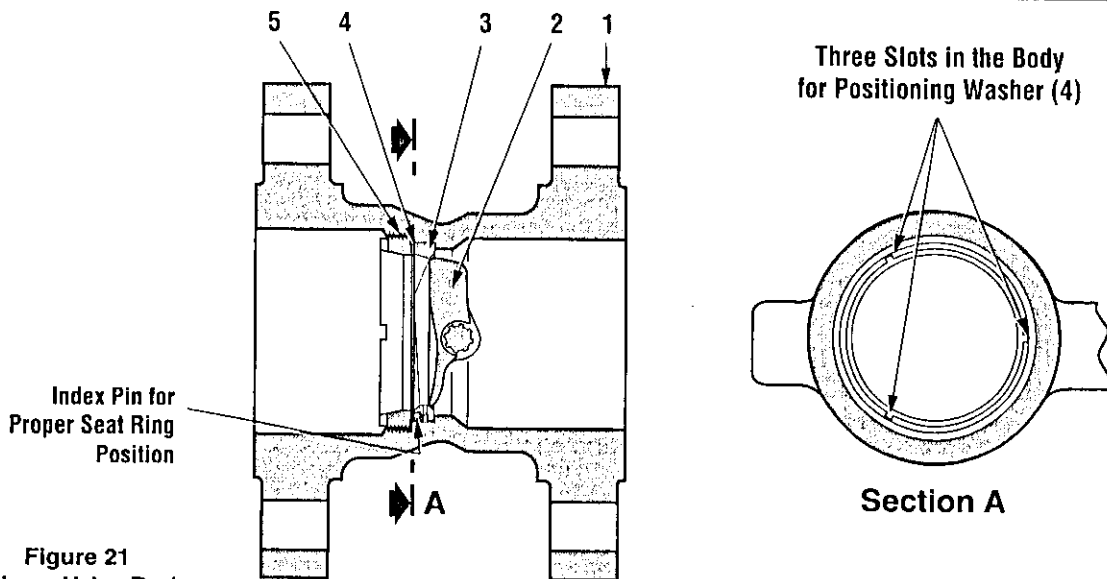


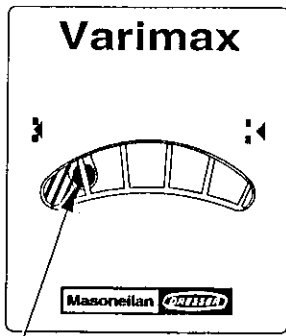
Figure 21
Varimax Valve Body
Subassembly

PARTS REFERENCE

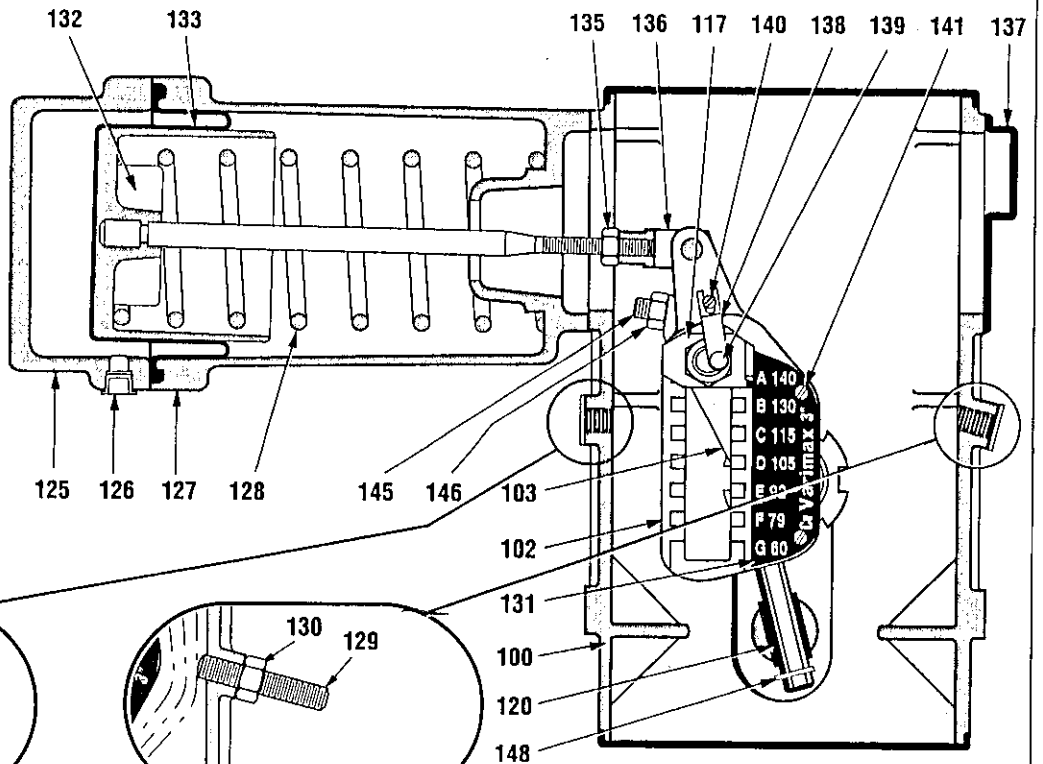
Ref.	Part Name	Ref.	Part Name	Ref.	Part Name
1	• Rotary Globe Body (Std Configuration)	101	Lever Sliding Rod (Included in 102)	144	Valve Lever Bearing
	• Standard Gl. Body (Optional [Ⓛ])	102	Adjust. ¹ Lever (Includes Ref. 101 & 148)	145	Torque Stop Screw
	• Flangeless Body (Optional [Ⓛ])	103	Valve Lever	146	Torque Stop Nut
2	• Standard Plug	104	Clip (Driving Link Spindle)	147	Adjust. ¹ Lever Pin (Not Shown)
	• LO-DB Plug (Optional [Ⓛ])	105	Valve Lever Bearing	148	Retaining Clip (Included in 102)
3	• Standard Seat Ring	106	Clip (Clevis Pin)	149	Accessories Bracket (ATA No 9 and No 13 only [Ⓛ])
	• Soft Seat Ring (Optional [Ⓛ])	107	Clevis Pin	150	Screw (Acc. Bracket ATA No 9 and No 13 only [Ⓛ])
4	Positioning Washer	108	Adjustment Lever Bearing	151	Screw (Front Cover ATA No 9 and No 13 only [Ⓛ])
5	Seat Ring Retainer	109	Serial Plate	152	Screw (Covers ATA No 9 and No 13 only [Ⓛ])
6	Lower Guide Bushing	110	Drive Screw (Serial Plate)	153	Smart Limit-Stop Nut
7	Upper Guide Bushing	111	Top & Bottom Covers	154	Smart Limit-Stop Screw
8	Shaft	112	Screw (Diaphragm Case)	155	Smart Limit-Stop Indicator Plate
9	Needle Bearing	113	Screw (Spring Barrel)	156	Drive Screw (Smart Limit-Stop)
10	Yoke	114	Washer (Spring Barrel)	201	Handwheel Bracket
11	Retaining Ring	115	Clamping Nut	202	Power Screw
12	Packing Washer	116	Driving Link Spindle	203	Drive Nut
• 13	Packing	117	Clamping Plate	204	Handwheel
14	Packing Follower	118	Front Cover	205	Screw
15	Packing Flange	119	Pivot	206	Indicator Plate
16	Stud Nut	120	Pivot Bearing	207	Ball Screw
17	Body Stud	121	Case Bearing	208	Pin
18	Bearing	122	Clip (Pivot)	209	Bearing
19	Flow Arrow	123	Pivot Cover	210	Bearing
20	Drive Screw	124	Screw (Pivot Cover)	211	O-ring
21	Warning Plate	125	Diaphragm Case	212	Washer (Handwheel Unit)
22	Yoke Washer	126	Caplug (Only for Shipment)	213	Screw (Handwheel Unit)
23	Yoke Nut	127	Spring Barrel	214	Screw (Indicator Plate)
24	Counter Plate	128	Actuator Spring	215	Bearing Retainer
• 25	Radial Seal Ring	129	Simple Limit-Stop Screw	216	Needle Bearing
26	Spacer (Only for High Torque ATA)	130	Simple Limit-Stop Nut	217	Needle Bearing (On Type 20 H/W only)
27	Yoke Connection Plate	131	Cv Indicator Plate	218	Retaining Ring [Ⓛ]
• 28	Inner O-ring (Optional EF Seal [Ⓛ])	132	Piston (Includes Piston Stem)	219	Counterplate [Ⓛ]
• 29	Outer O-ring (Optional EF Seal [Ⓛ])	• 133	Diaphragm	220	Pin [Ⓛ]
30	Upper Spacing Washer (Opt. LO-DB Plug [Ⓛ])	135	Nut (Clevis)	221	Handwheel lock [Ⓛ]
31	Lower Spacing Washer (Opt. LO-DB Plug [Ⓛ])	136	Clevis	222	Washer [Ⓛ]
32	Needle Bearing Spacer (16" V. Size [Ⓛ])	137	Side Cover	223	Screw [Ⓛ]
33	Torsion Pin [Ⓛ]	138	Indicator Stamping	224	Spring [Ⓛ]
40	Globe Adaptor (Optional Std. Gl. Body [Ⓛ])	139	Indicator Dot	225	Retaining Ring [Ⓛ]
• 41	Gasket (Optional Std. Gl. Body [Ⓛ])	140	Screw (Indicator Stamping)		
44	Bolting Set (Optional Std. Gl. Body [Ⓛ])	141	Screw (Cv Indicator Plate)		
99	Seat set screw	142	Rear Cover 1		
100	Case	143	Rear Cover 2		

• Recommended spare parts
[Ⓛ] Refer to Figure 25
[Ⓜ] Only on 16" (DN 400) Size-Ref. Fig. 24

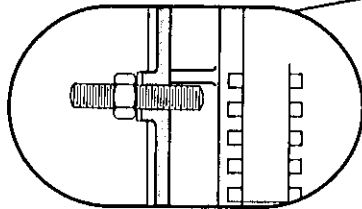
[Ⓝ] Only on No 9 and 13 ATA - Ref. Fig. 24
[Ⓞ] Only on No 9 ATA, Auxiliary HWL - Ref. Fig. 26
[Ⓟ] Only on 4" to 16" Sizes (DN 100 to 400) - Ref. Fig. 23



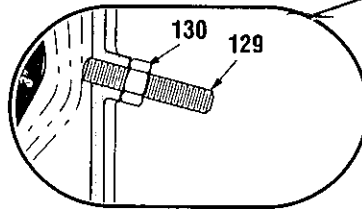
of Indicator Dot (139)
When the Plug is
Hand Closed by Pushing
of Adjustment Lever (102)
**Detail of
Front Cover (118)**



**Figure 22
ATActuator Subassembly**



**Detail of Optional
Simple Limit-Stop**



**Detail of Optional
Smart Limit-Stop**

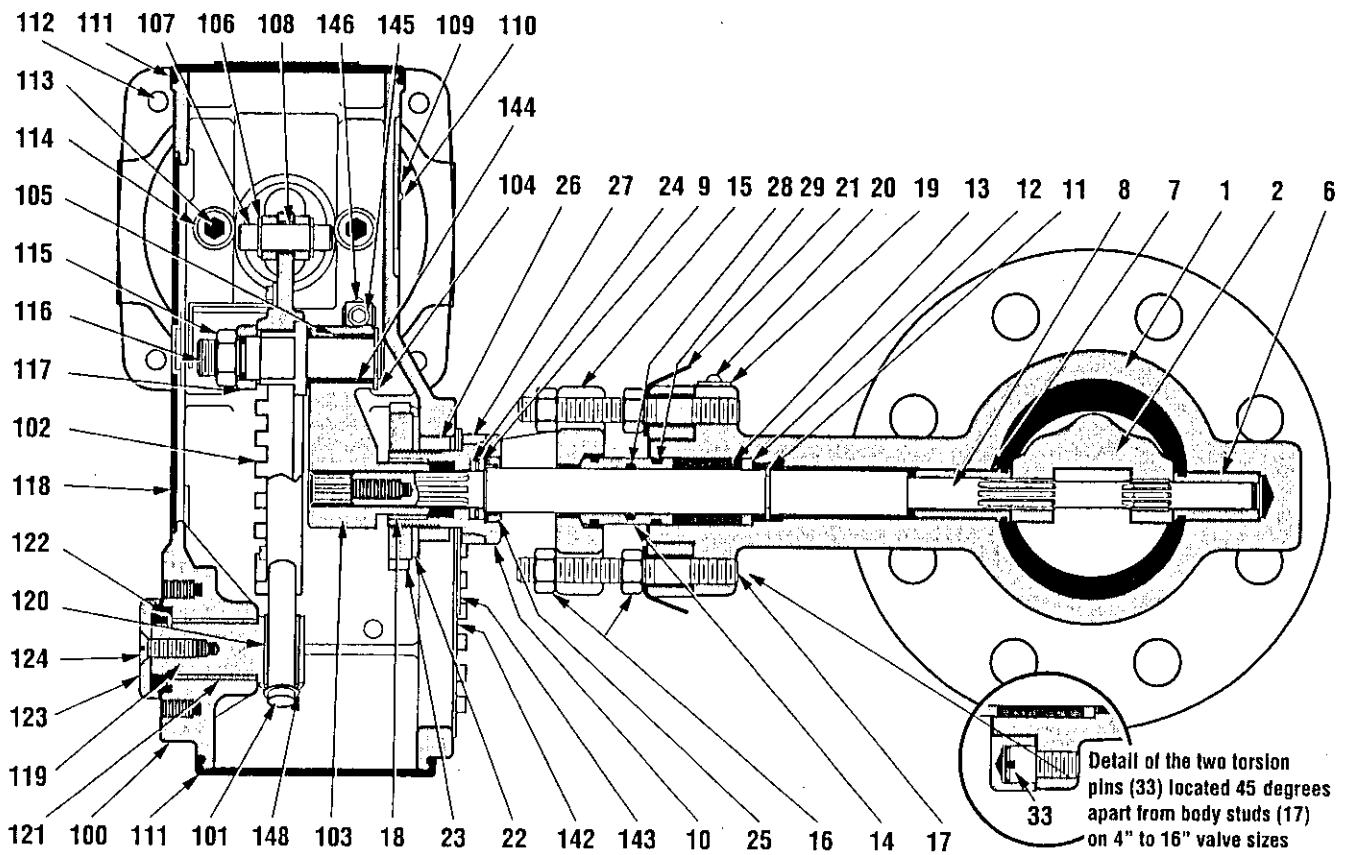


Figure 23: Valve Body S/A & ATActuator S/A

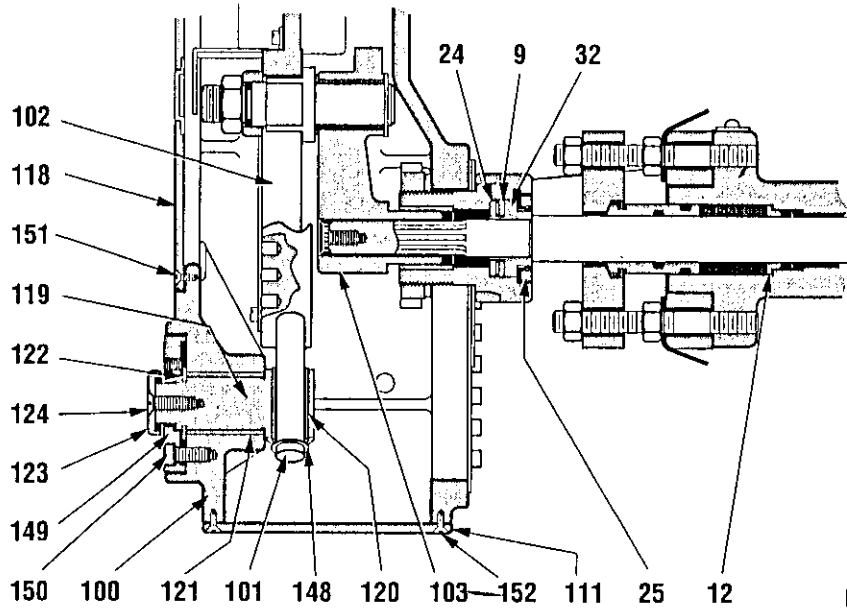
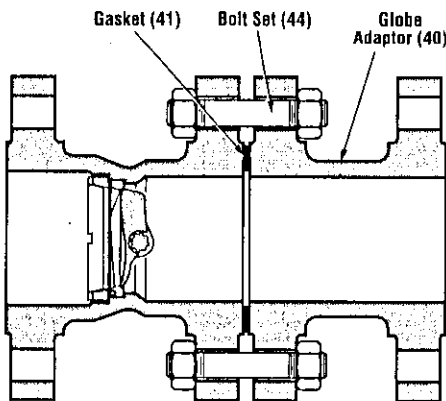
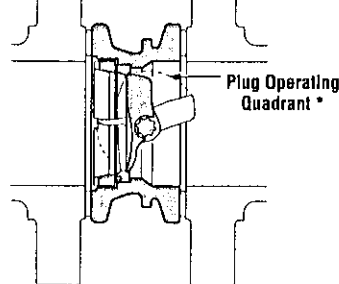


Figure 24
Design Particularities
of ATActuator No 9 and 13



Optional
Standard Globe Body

* Caution — Flangeless Valve Installation
This valve must be properly aligned
with the piping to prevent pipe interference
with the plug operating quadrant.



Optional
Flangeless
Body

Optional
Soft Seat Ring
(Section View
Detail)

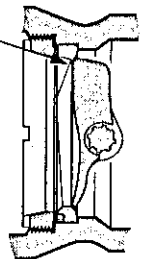
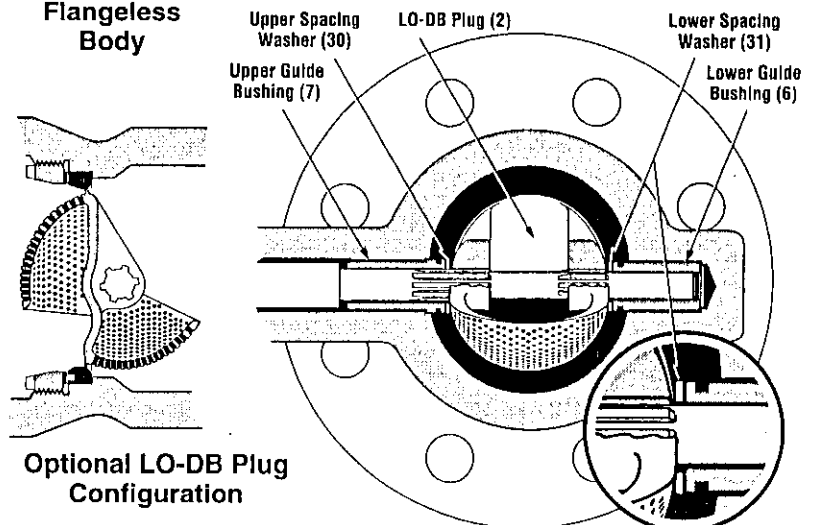
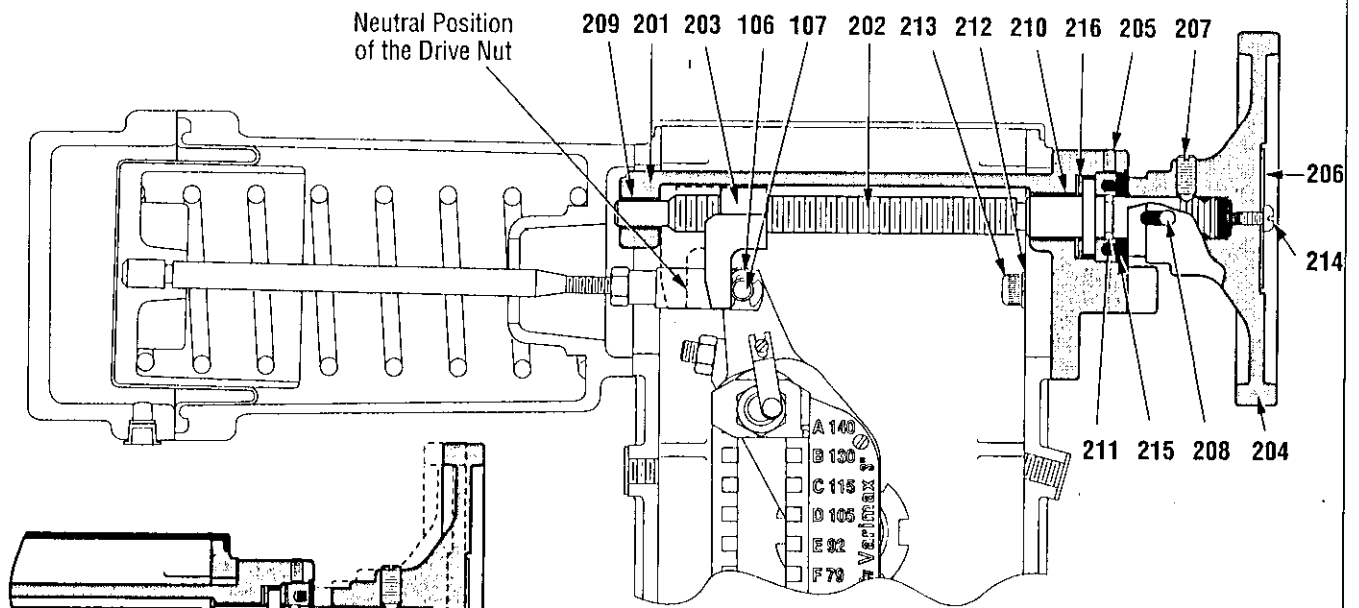


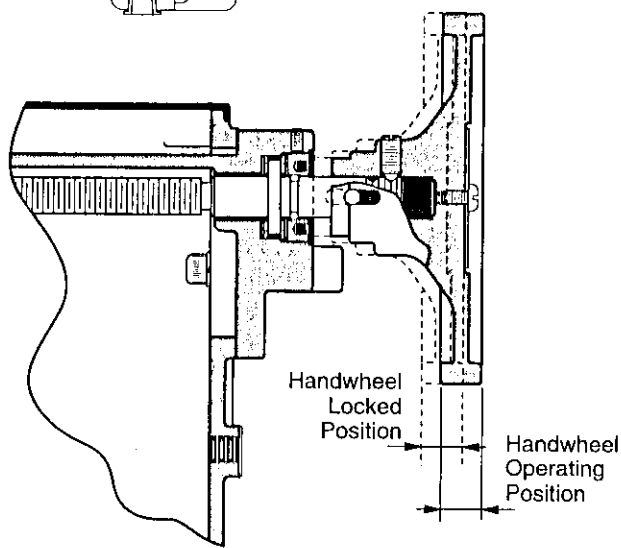
Figure 25
The Varimax Options



Optional LO-DB Plug
Configuration



Auxiliary Handwheel Unit
 on No 5 & 7 ATA



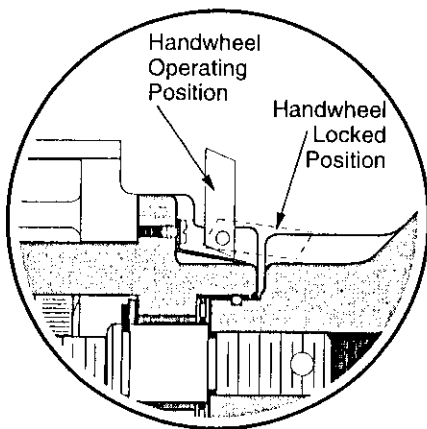
Locking Device of the
 Auxiliary Handwheel Unit
 on No 5 & 7 ATA



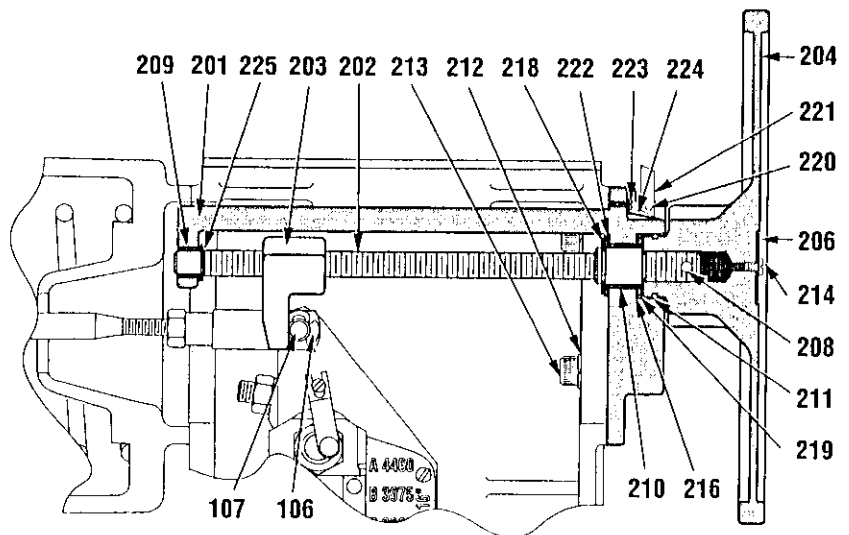
Handwheel Indicator
 Plate (206) when
 Air to Close Actuator



Handwheel Indicator
 Plate (206) when
 Air to Open Actuator

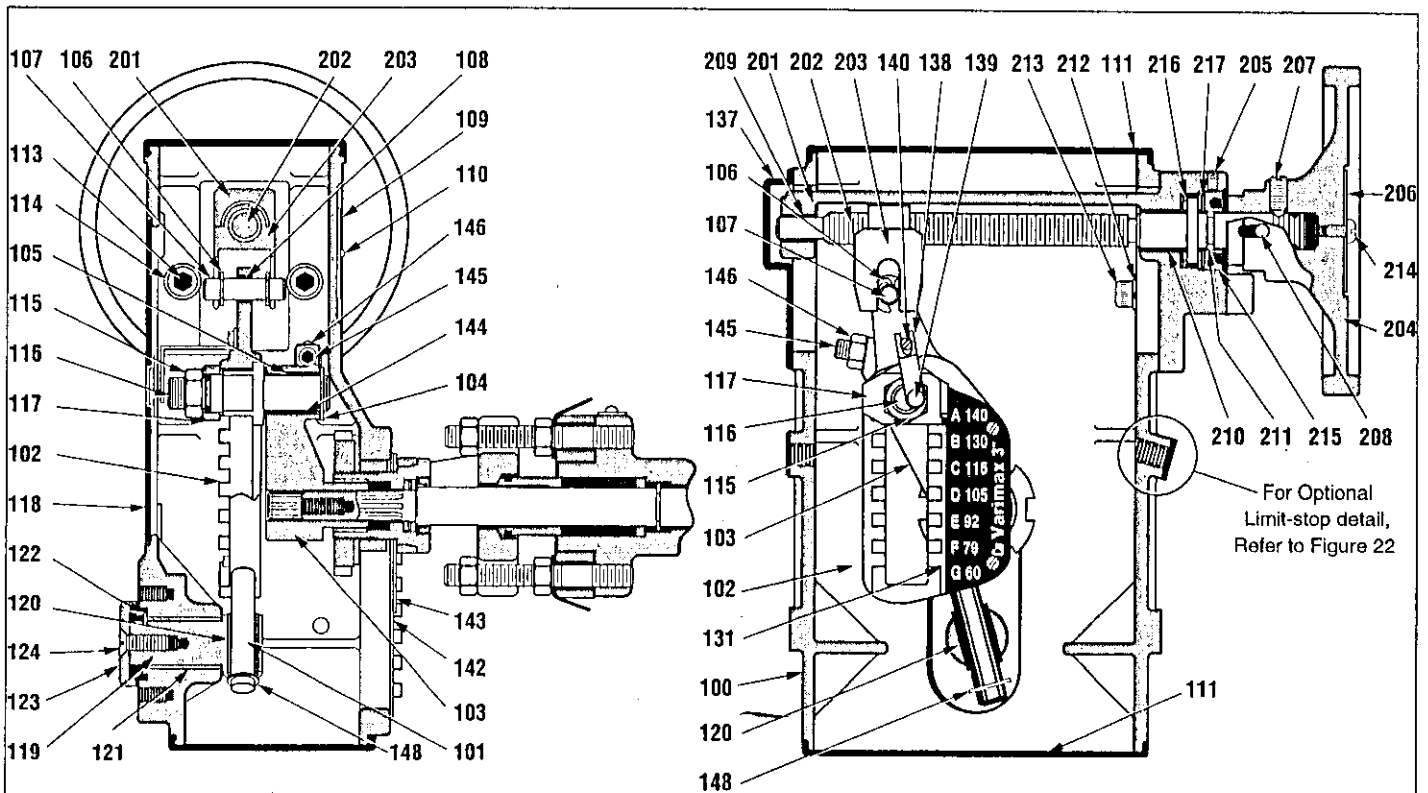


Locking Device of the
 Auxiliary Handwheel Unit
 on No 9 ATA



Auxiliary Handwheel Unit
 on No 9 ATA

Figure 26: Auxiliary Handwheel



Locking Device of the
Manual Actuator

Figure 27
Type 20 Manual Actuator

TRADEMARK INFORMATION

HART[®]
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Model 275 HART[®] Communicator
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EN3000 instruction addendum
" Instruction for Varimax™ 30000
Series Control Valve "
about the No 13 ATActuator

The whole of the instruction is applicable to the Varimax valves fitted out with No 13 ATActuator excepted the following sections and figures :

☞ Figure 5 :

Valve Size		ATA No	7-25 Actuator Spring Range												3-15 Actuator Spring Range												Tubing Size	
			Carbon Steel Constr.				Stainless St. Constr.				Carbon Steel Constr.				Stainless St. Constr.													
			17-4 PH Shaft		316 St. St. Shaft		Nitronic 50 Shaft		17-4 PH Shaft		316 St. St. Shaft		Nitronic 50 Shaft															
			Fl. to close	Fl. to open	Fl. to close	Fl. to open	Fl. to close	Fl. to open	Fl. to close	Fl. to open	Fl. to close	Fl. to open	Fl. to close	Fl. to open	Fl. to close	Fl. to open	Fl. to close	Fl. to open	Fl. to close	Fl. to open								
			Air to open	Air to close	Air to open	Air to close	Air to open	Air to close	Air to open	Air to close	Air to open	Air to close	Air to open	Air to close	Air to open	Air to close	Air to open	Air to close	Air to open	Air to close								
In.	mm		Psi	kPa	Psi	kPa	Psi	kPa	Psi	kPa	Psi	kPa	Psi	kPa	Psi	kPa	Psi	kPa	Psi	kPa	In.	mm						
16	400	13	60	420	60	420	60	420	60	420	60	420	60	420									3/8	6x8				

☞ Section 7 - indent 1 and 2 :

The No 13 ATActuator air supply connection is 1/2" NPT instead of 1/4" NPT.

☞ Section 8

- *indent 2 :*

The No 13 ATActuator mid band setting is the setting " B " instead of " D " .

☞ Section 10

- *indent 1 and 2 :*

The No 13 Varimax ATActuator allows to set three rated flow coefficient (Cv) instead of seven which are A, B and C instead of A, B, C, D, E, F and G.

- *indent A. :*

The No 13 ATActuator air supply connection is 1/2" NPT instead of 1/4" NPT.

☞ Figure 7

Rated Flow Coefficient (Cv) of the 16" valves with Standard Plug

Valve Size		Flow Direction	Actuator Adjustment		
Full Area Trim In Inches (mm)	Flashing Service Trim In Inches		A	B	C
16 (400)	---	Flow to Open Flow to Close	4830 4460	4150 3975	3485 3365

Rated Flow Coefficient (Cv) of the valves with Lo-dB Plug

Valve Size In Inches (mm)	Actuator Adjustment					
	A		B		C	
	Stand. Cap.	High Cap.	Stand. Cap.	High Cap.	Stand. Cap.	High Cap.
16 (400)	1750	2100	1575	1810	1400	1510

☞ Figure 8

Torque Stop Adjustment

Valve size		ATA No	316 St. Steel Shaft (2)			17-4 PH St. Steel Shaft (1)			Nitronic 50 Shaft (2)		
In.	mm		B		Number of Screw Turns	B		Number of Screw Turns	B		Number of Screw Turns
			In.	mm		In.	mm		In.	mm	
16	400	13	0.13	3,30	1 1/2	0.44	11,20	4 3/4	0.220	5,60	2 3/8

(1) : In case of valve with 17-4 PH St. St. Shaft and Soft Seat Ring, the " B " values and number of screw turns must be limited at the half of those indicated.

(2) : The indicated values are available for valves with Metal Seat Ring or Soft Seat Ring.

☞ Figure 18

Actuator Stem Adjustment

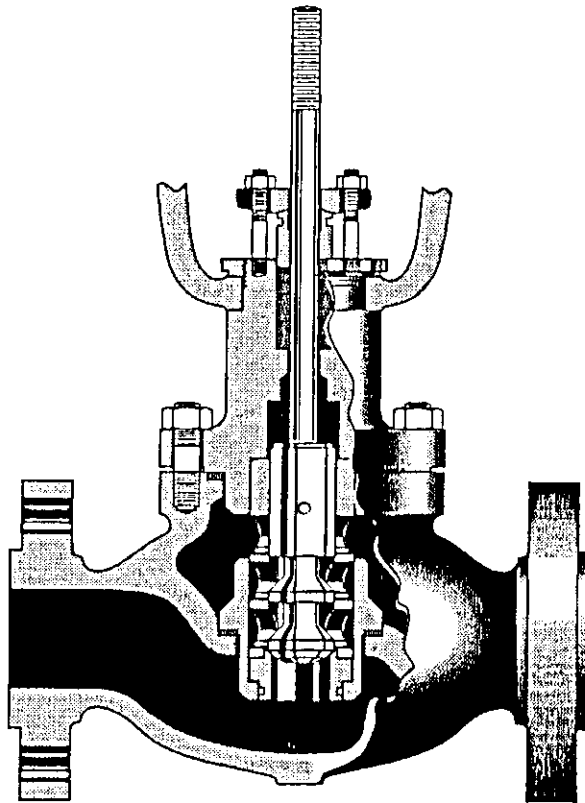
ATA No	A dimension In. (mm)
13	1.77 (45)

6

**Types 78100
Special Control Valves Instructions**

Instructions N° 181932 E
6/94

Types 78100 Special Control valves Instructions



Masoneilan 

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1. Introduction

The following instructions should be thoroughly reviewed and understood prior to installing, operating or performing maintenance on this equipment. Throughout the text, safety and/or caution notes will appear and must be strictly adhered to, otherwise, serious injury or equipment malfunction could result.

Masoneilan has a highly skilled After Sales Department available for start-up, maintenance and repair of our valves and component parts. In addition, a regularly scheduled training program is conducted at our Condé-sur-Noireau plant, to train customer service and instrumentation personnel in the operation, maintenance and application of our control valves and instruments.

Arrangements for these services can be made through your local Masoneilan Representative or Training Department. When performing maintenance use only Masoneilan replacement parts. Parts are obtainable through your local Masoneilan Representative or Spare Parts Department. When ordering parts always include Model and Serial Number of the unit being repaired.

Recommended spare parts required for maintenance are listed in Parts Reference of page 5. The model number, size, rating and serial number of the valve are shown on the identification tag located on the actuator.

2. General

These installation and maintenance instructions concern the Special Masoneilan 78100 Types Control Valves. They apply to valves with hard seat ring and PTFE soft-seat ring, as well as to valves with with balanced plug. Refer to separate instruction for actuator maintenance; Instruction No ER 3000 E for types 37/38 spring-diaphragm actuators.

These valves are always equipped with a positioner. Refer to separate instruction for positioners maintenance and adjustment. Stroke of the valve will be read with a comparator and the "closed valve" position will be appreciated with the process called "Air bubble process".

The special 78100 valves with globe body employs the principle of "Adiabatic Flow with Friction" to reduce pressure, much like the gradual pressure loss which occurs in a long pipe line. This effect is produced by reducing the fluid pressure through multiple small steps.

The cutaway illustrations on Page 5 show the main configurations of the valve. A multi-step plug (4) slides in a multi-bore liner (1L). Number of steps is defined from the service conditions.

The liner is held and is centered by a bracket (1S). The liner and bracket retain the hard faced seat ring (2). The entire assembly (liner-seat ring-bracket) is held in the body by the bonnet (8). Spiral wond gaskets (49&2G) seal off the fluid at the bonnet and liner's bracket joints.

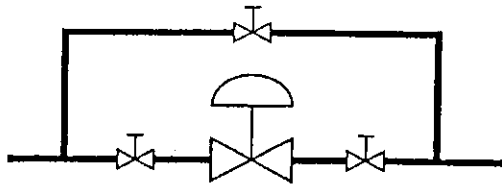


Figure 1

Sealing between seat ring and bracket is performed by the O-ring (2T).

The optional balanced trim (for high pressure drops) consists of a special plug, O-ring (4S) and Tec-ring gasket (4T).

In order to get a higher tightness, the 78100 valves can be equipped with a seat-ring with PTFE insert "soft-seat" (See Figure 8). The assembly and disassembly operations of valve body are identical to the one of hard seat valve. Meanwhile it is recommended to take supplementary precautions for the mounting of this special seat-ring in order to have it done in exceedingly clean conditions (total absence of foreign material).

3. Unpacking

Care must be exercised when unpacking the valve to prevent damage to the accessories and component parts. Should any problems arise, contact the local Masonellan Representative or After Sales Department.

4. Installation

4.1 Before installing the valve in the line, clean piping and valve of all foreign material such as welding chips, scale, oil, grease or dirt. Gasket surfaces should be thoroughly cleaned to insure leak-proof joints.

4.2 To allow for in-line inspection, maintenance or removal of the valve without service interruption, provide a manually operated stop valve on each side of the 78100 valve with a manually operated throttling valve mounted in the by-pass line. (See Figure 1).

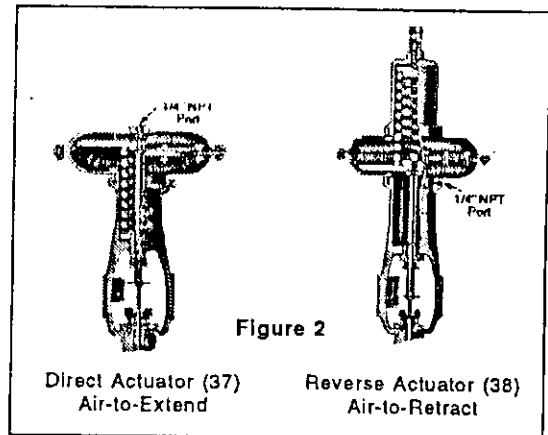
4.3 The valve must be installed so that the controlled substance will flow through the valve in the direction indicated by the flow arrow located on the body.

Caution: The 78100 valves must always be installed flow-to-open.

4.4 Where insulation of the valve body is required, do not insulate the valve bonnet.

5. Air Piping

The actuators are designed to accept 1/4" NPT air supply piping. Use 1/4" OD tubing (4 x 6 mm) or equivalent for all air lines. If the supply air line



exceeds 25 feet in length (7 meters) or if the valve is equipped with volume boosters, 3/8" tubing (6 x 8 mm) is preferred. All connections must be free of leaks.

Caution: Do not exceed supply pressure indicated on serial plate on the yoke of actuator.

6. Body Disassembly

Access to the internal components of the body should be accomplished with the actuator removed.

To remove the 37/38 spring-diaphragm actuator from the body, refer to actuator instruction in Section 9 of this manual.

Caution: Prior to performing maintenance on the valve, isolate the valve and vent the process pressure. Shut off supply air line and pneumatic or electric signal line.

After removing the actuator, disassemble the body using the following procedure:

A. Remove body stud nuts (48).

B. Remove bonnet (8), plug stem (5) and plug (4) as one unit.

Caution: Care must be taken during removing of plug and stem subassembly to avoid damage to the plug seat area and guiding areas of plug and liner (1L).

C. Since the bonnet has been removed, it is now possible to remove body gasket (49), liner (1L), [with "Tec-ring" gasket (4T) and O-ring (4S) in case of valve with optional balanced plug], liner's bracket (1S), seat ring (2), O-ring (2T) and gasket (2G) for liner's bracket.

D. Remove packing flange stud nuts (13), packing flange (11) and packing follower (10).

E. Remove plug (4) and plug stem (5) from the bonnet (8). In case of valve with optional balanced plug, remove also the "Tec-ring" gasket (4T) and the O-ring (4S).

Note: If new gaskets (2G & 49), "Tec-ring" gasket (4T) and O-rings (2T & 4S) are not available, care must be taken to preserve the old gaskets for re-use. Spiral wound flexitallc gaskets (2G & 49), "Tec-ring" gasket and O-rings are standard in the 78100 design and it is recommended that new parts be installed each time the valve is disassembled.

Caution: If the plug or plug stem must be re-used, care must be taken to avoid damage to these parts during the above step E.

F. Remove old packing (14).

G. All components may now be inspected for wear and service damage. After determining the maintenance required, proceed to the appropriate section of this instruction manual.

7. Maintenance/Repair

The purpose of this section is to assist maintenance personnel by suggesting methods of component maintenance which is largely dependent on the tools and machine shop equipment available.

7.1 Lapping Seat (Figures 3 & 4) (only on hard seat ring)

Lapping is the process of working the valve plug against the seat ring, with an abrasive, to produce a close fit. When valve leakage becomes excessive, lapping becomes necessary.

The plug and seat ring seating surfaces should be free of large scratches or dents and the contact surfaces of the seats should be as narrow as possible.

This may require dressing both parts in a lathe. Do not remove more than .030" (.8mm) from each part. If this is not sufficient, replace one or both parts. The seat surface of the plug is 45 degrees and that of the seat ring is 47 degrees, both from centerline axis.

For the lapping operation, a good grade of fine grinding compound is required. The compound should be mixed with a small quantity of lubricant such as graphite. This will slow the cutting rate and prevent tearing of the seating surfaces. The amount of lapping required depends on the materials, condition of seating surfaces and accuracy of machining.

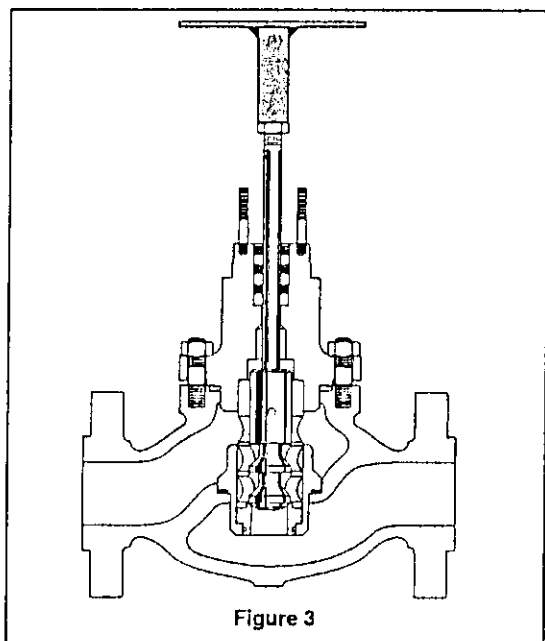


Figure 3

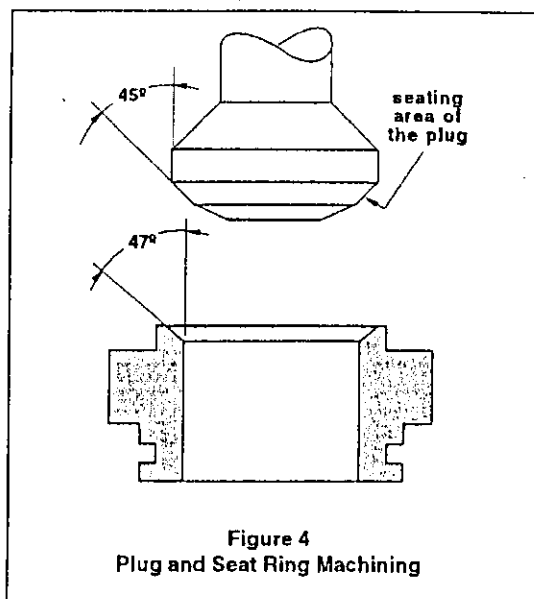


Figure 4
Plug and Seat Ring Machining

If a short period of lapping does not visibly improve seating, there is usually no advantage in continuing as too much lapping may result in rough seats. The only remedy is replacement or re-machining of one or both parts. When lapping new plug and seat ring, begin with medium compound and finish with fine.

Caution: Before lapping, plug and stem must be true. (See pinning operation, section 7.2).

- (1) Clean body gasket surface areas.
- (2) Install the liner's bracket (1S).
- (3) Apply grinding compound at several spots equally spaced around the seating area of the seat ring (2).
- (4) Insert the liner (1L) into the body.
- (5) Insert the stem and plug assembly carefully into the body until it is seated.

Caution: Do not allow compound to get on the liner and upper steps of the plug.

- (6) Place bonnet (8) on the body.

Caution: Insure that the seat ring (2), the liner (1L) and bonnet (8) are properly aligned.

- (7) Using four body stud nuts (6), spaced equally apart, fasten the bonnet to the body using only slight pressure and tighten evenly.

Caution: Do not tighten nuts to torque specifications indicated in the Figure 11 at this time. The bonnet is used temporarily for keeping purposes during lapping.

- (8) Insert two or three pieces of packing into the packing box to assist in guiding the stem and plug during lapping.

- (9) Screw a drilled and tapped rod with a T-handle on to the plug stem and secure with a locknut. (See Figure 3).

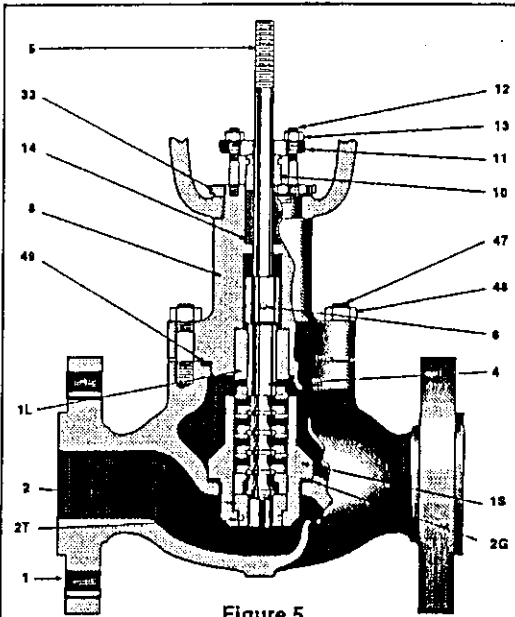


Figure 5
3/4" to 2" (20 to 50 mm)-6 steps-Type 78100 Valve

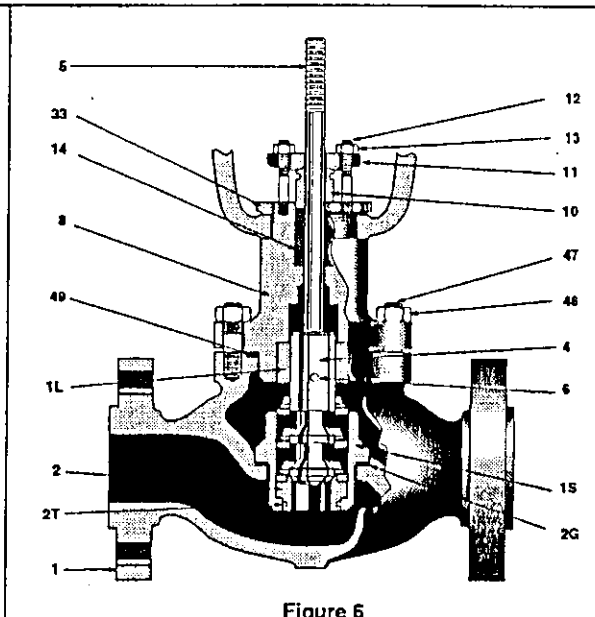


Figure 6
1 1/2" (40 mm)-3 or 5 steps (*) -Type 78100 Valve

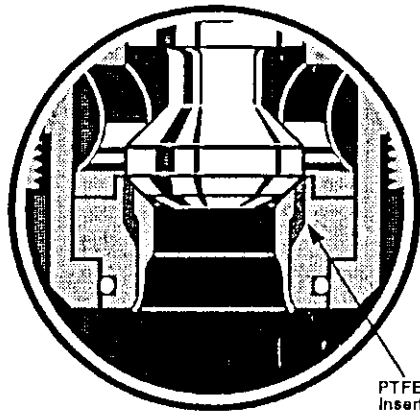


Figure 8
PTFE Soft-seat ring detail

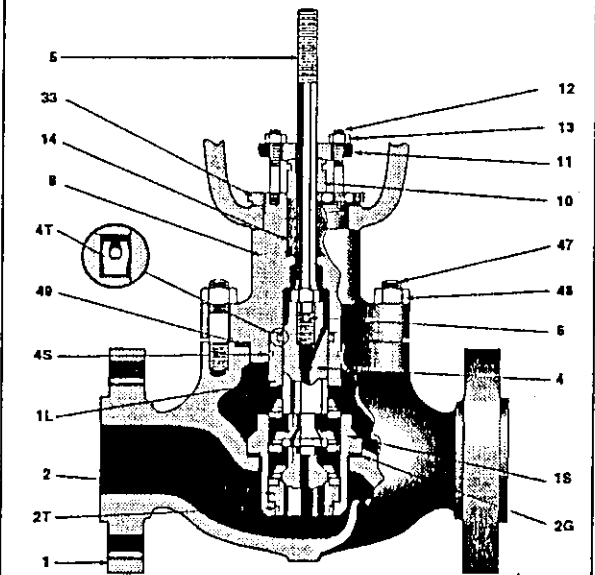


Figure 7
2 or 3" (50 or 80 mm)-3 or 5 steps (*) with balanced plug
Type 78100 Valve

(*): Number of steps according to service conditions

PARTS REFERENCE

Ref. No.	Part Name	Ref. No.	Part Name	Ref. No.	Part Name
1	Valve Body	● 4S	O-ring ϕ	12	Packing Stud
1L	Liner	● 4T	"Tec-ring" Gasket ϕ	13	Packing Stud Nut
1S	Liner's Bracket	5	Plug Stem	● 14	Packing Ring
2	Seat Ring	6	Plug Stem pin	33	Drive Nut
● 2G	Gasket w/ Liner's Bracket	8	Bonnet	47	Body Stud
● 2T	O-ring	10	Packing Follower	48	Body Stud Nut
4	Plug	11	Packing Flange	● 49	Body Gasket

● Recommended Spare parts

ϕ Only on balanced plug

Note: As an alternative, drill a hole through a flat piece of steel and fasten to the plug stem using two locknuts.

(10) Applying a slight pressure on the stem, rotate the stem in short oscillating strokes 8 to 10 times.

Note: The plug should be lifted and turned 90° before repeating Step 10. This intermittent lifting is required to keep the plug and seat ring concentric during lapping.

(11) After completing the lapping operation, the seat ring and plug must be cleaned of all lapping compound in preparation for reassembly.

7.2 Plug Stem Pinning

Plug stem pinning during field assembly may be divided into two parts:

- Replacing old plug and old stem,
- Replacing only old stem,

Replacing Plug and Stem

The plug (4) and stem (5) assembly consists of a shaft threaded into the plug and pinned in place. *If it is necessary to replace the plug, it is necessary to replace the plug stem at the same time.*

Note: In some cases, the plug stem has a shoulder with two flats to improve the strength of the assembling between plug and stem and to facilitate screwing and tightening.

To replace the stem (5) it is necessary to drill or drive out the pin (6) and unscrew the stem from the plug. *If it is only necessary to replace the stem (5), it is recommended to mount a new stem.* Indeed, the original pin hole in an old stem prevents satisfactory results and might seriously impair strength of the assembly.

Caution: Before to perform the following steps, measure and note the diameter of old plug stem (screwed part) and old pin and measure the distances "D" & "X". These notes would allow the exact identification of old parts characteristics, by means of table in Figure 9.

A. Reference Marking on the Plug Stem

Measure the depth of the pilot recess in the plug (X in Figure 9) and make a reference mark to the plug stem at the same distance, from the thread.

Note: This step is not necessary on a shouldered plug stem.

Note: While pinning is being performed, care must be taken not to damage the seating surface of plug guide. Always use a soft metal or plastic vise jaws with a cylindrical machining [inner Dia. of the liner (1L)] to hold the plug guide area (see Figure 9).

B. Screwing Stem into Plug

- Hold the plug guide in a vise.
- Lock one nut against another one to the end of the new plug stem and, using a wrench on the upper nut, screw the stem *solidly* into the plug. *When properly assembled, the reference mark (see § A) should be flush with the top of plug. In case of a shouldered plug stem, the shoulder must be tighten against the top of the plug.*

Note: In case of a shouldered plug stem, the two driving flats machined on the shoulder allow screwing of plug stem without using the two nuts at the stem end.

C. Drilling the New Parts

- If the plug is already full drilled, (in case of 440 C stainless steel, hardened material or solid stellite),
- If the plug guide area has a center mark, Place the plug guide on a V-block and, using a size of drill bit suitable to either,
 - match the hole size in the plug, or
 - match the "C" diameter (see Figure 9), drill the stem or the plug-stem assembly.
- If the plug guide area hasn't any hole or any center mark,
 - Measure the "D" dimension and mark it on guiding area of the plug, (see Figure 9).
 - Place the plug guide on a V-block and, by means of a center punch, make a center mark on the plug guide area.
 - Using a suitable size drill bit, drill the plug-stem assembly.

In all cases: After drilling, remove any burrs from the plug guide by making a slight chamfer.

D. Pinning the Plug Stem Assembly

1. Select the correct size pin. [Length of pin must be selected according to guiding part diameter of the plug (see Figure 9)]. Apply a small amount of grease on it, and hand place the pin to the hole inlet.
2. By means of an hammer, introduce the pin into the hole. Complete the pinning operation, taking care to ensure that the pin is recessed by the same amount at both sides, (see Figure 9).
3. After the plug has been pinned, it should be placed in a lathe to insure it is running "true". The stem should be placed in a collet with the plug guide against it and the plug should be struck. Alignment of plug stem can be performed by means of a soft faced mallet.

Replacing Only Old Stem

A. Removing Old Pin and Stem From the Plug

1. Place the plug guide on a V-block, and using a drift punch, drive out the old pin.

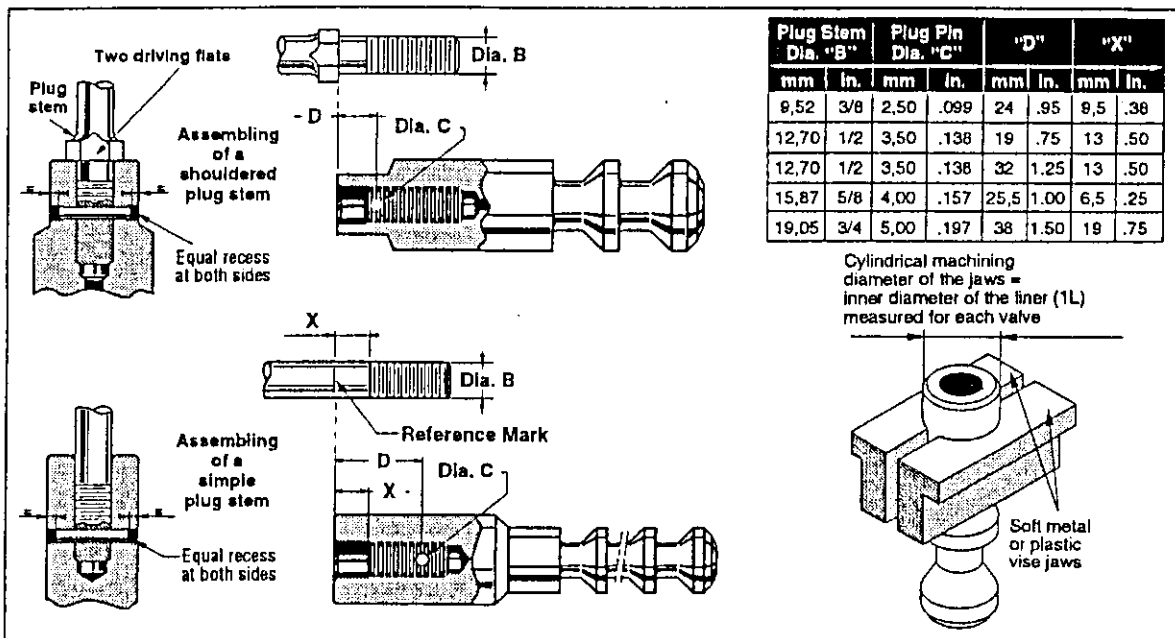


Figure 9

Note: If it is necessary to drill out the pin, a drill bit somewhat smaller than the pin should be used and the remainder of the pin driven out.

2. Hold the plug guide in a vise, (see bordered note in the paragraph A—page 6).
3. Lock one nut against another one to the end of the plug stem and, using a wrench on the lower nut, unscrew the stem from the plug. The stem is removed by turning it anti-clockwise.

Note: In case of a shouldered plug stem, the two flats machined on the shoulder allow unscrewing of plug stem without using the two nuts at the stem end.

B. Screwing Stem to Plug

Refer to paragraph B page 6.

C. Drilling the New Stem

Place the plug guide on a V-block and, using a suitable size drill bit, drill the stem using the hole in the plug as a guide.

Note: If the hole in the plug guide has been slightly damaged while removing of the old pin, choose a drill bit and a pin with a diameter somewhat larger than the normal pin.

D. Pinning

Select the correct size pin according to plug guide diameter and pin hole diameter. Proceed as described in the opposite paragraph D2, taking care not to damage the plug guide area.

Ensure plug stem alignment as indicated in the paragraph D3, page 6.

7.3 Packing Box (Figure 10)

Packing box maintenance is one of the principle chores of routine servicing. Tightness of the packing is maintained by packing compression.

Compression is achieved by *evenly* tightening the packing flange nuts (13) against the packing flange (11). Care must be taken not to over tighten as this could prevent smooth operation of the valve. If all compression is used up and the valve leaks, new packing is required.

Caution: Valve must be isolated and the pressure vented before performing packing box maintenance.

Proceed as follows:

7.3.1 Graphite Packing Rings

Note: Graphite packing rings replacement requires to disconnect the plug stem from actuator connector or actuator stem and removing of actuator.

A. Remove actuator from the body S/A. Refer to Section 9 - Actuator Removal - of this instruction.

B. Loosen and remove packing flange nuts (13).

C. Remove packing flange (11), and packing follower (10) from the plug stem.

D. By means of a hook, remove packing rings (14).

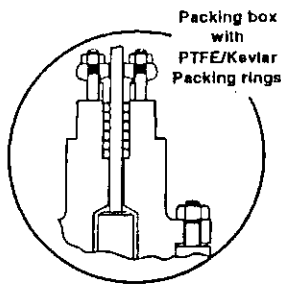
E. Replace new packing set (14); first one smooth ring, then braided graphite rings, at last, one other smooth ring. (Figure 10).

F. Place packing follower (10) and packing flange (11).

G. Place and tighten packing stud nuts (13).

Caution: Do not overtighten.

H. Proceed to appropriate instructions for actuator to body assembly and plug stem adjustment.



Valve Size		Quantity of Packing Rings (14)	
mm	in.	PTFE/Kevlar	Graphite
20 à 80	3/4 à 3	6	1 set

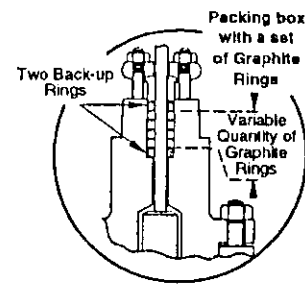


Figure 10

I. Place valve back in service and tighten packing only as much as is necessary to stop leaking.

7.3.2 PTFE/Kevlar Packing Rings

Note: The PTFE/Kevlar packing rings have a skive cut allowing packing replacement without disconnect the plug stem from actuator connector or actuator stem.

A. Loosen and remove packing flange nuts (13).

B. Raise packing flange (11), and packing follower (10) up the valve stem.

Note: They may be taped in place to keep them out of the way before proceeding.

C. By means of a hook remove packing (14).

D. Replace packing rings (14).

Note: The skive cut of each packing ring must be placed about 180 degrees apart.

E. Replace packing follower (10) and packing flange (11).

F. Replace and tighten packing stud nuts (13).

Caution: Do not overtighten.

G. Put valve back in service and tighten packing only as much as is necessary to stop leaking.

Note: In an emergency, string packing may be used as a temporary repair only. It must be replaced with the correct packing as soon as possible.

8. Valve Body Reassembly

After completion of the required maintenance the valve should be reassembled using the following procedures:

Note: If any of the following steps were completed during maintenance, proceed to the next step.

A. Clean all gasketed surfaces.

B. Install the gasket (2G) of liner's bracket in the body. Place a new O-ring (2T) in the groove of seat ring. Install the liner's bracket (1S), the seat ring (2) and the liner (1L) in the body.

CAUTION: In case of a 1" size, verify that the word "HAUT" or "TOP" appears at the top of the liner after this one has been inserted into its bracket (1S).

Note: In case of valve with balanced plug, install a new O-ring (4S) in the groove located at the upper part of the liner.

C. Carefully install plug and stem assembly (4 & 5) in the liner (1L).

Note: Valve should be lapped before final assembly. See Section 7.1.

Note: In case of valve with balanced plug, slide a new "Tec-ring" gasket (4T) over the plug stem and the plug, until it is inserted in the housing provided at the top of liner.

Caution: Care must be taken do not damage "Tec-ring" (4T) during this step. The open side of "Tec-ring" gasket must be facing up.

D. Install body gasket (49) in its housing of valve body (1) and, by means of a proper hoisting device, bring up bonnet (8) over plug stem and body, then slide down it until correct placing. Bonnet must be positioned so the packing flange studs are at a right angle to the flow center line.

Caution: Care must be taken to assure that the bonnet, seat ring, liner and body are properly aligned in order to avoid jamming of parts and damaging during lower of bonnet. Lower of bonnet must be performed slowly and squarely.

E. Screw body nuts (48) and begin evenly tighten by only a few of turns. Ensure there is no hard point during stroking of the plug, by moving plug stem to full stroke. In case of hard point, proper alignment of parts is not accomplished and Steps A to D must be performed again.

F. Tighten nuts (48) until metal to metal contact is obtained with proper bolt torque.

Caution: Refer to Figure 11 for proper bolt torque values and refer to Figure 12 for tightening sequence.

G. Insert packing rings (14) in the packing box.

H. Install packing follower (10) and packing flange (11).

I. Screw and tighten packing box nuts (13).

Caution: Do not overtighten (See section "7.3. Packing Box").

J. For actuator to body assembly and plug stem adjustment, proceed to the actuator instruction referring to Section 9 of this manual.

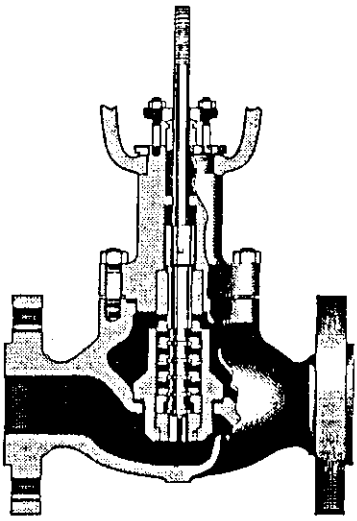
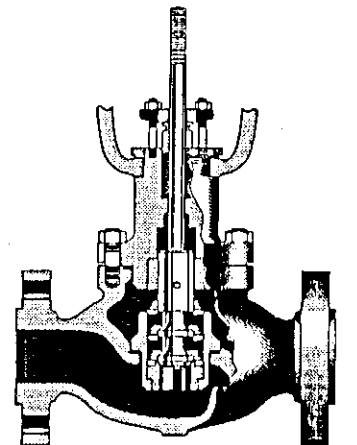
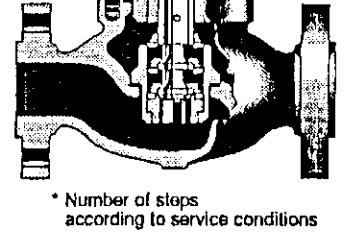
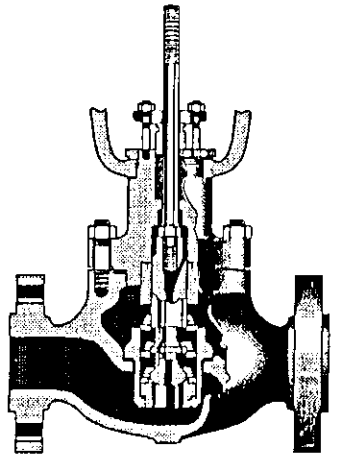
	CONFIGURATION	TRIM DESIGNATION	ENDS	STUDS & REQ.'D TORQUE
NON BALANCED PLUG		3/4" to 2" 6 Steps	3/4" to 2" ANSI 300-600	8 Studs Dia. 1/2"-13 NC 2A 6,5 daN. m
			1" or 1 1/2" ANSI 900-1500	6 Studs Dia. 5/8"-11 NC 2A 10 daN. m
		1 1/2" 3 Steps *	3/4" to 2" ANSI 300-600	8 Studs Dia. 1/2"-13 NC 2A 6,5 daN. m
			2" ANSI 900-1500	8 Studs Dia. 7/8"-9 NC 2A 30 daN. m
		1 1/2" 5 Steps *	2" ANSI 300-600	8 Studs Dia. 3/4"-10 NC 2A 20 daN. m
	<p>* Number of steps according to service conditions</p>			
BALANCED PLUG		2" 3 Steps *	3" ANSI 300-600	8 Studs Dia. 3/4"-10 NC 2A 20 daN. m
			3" ANSI 300-600	8 Studs Dia. 7/8"-9 NC 2A 26 daN. m
		2" 5 Steps *	3" ANSI 900	8 Studs Dia. 1"-8 NC 2A 40 daN. m
			6" ANSI 300-600	12 Studs Dia. 1"-8 NC 2A 35 daN. m
		3" 3 Steps	6" ANSI 900	8 Studs Dia. 1 3/4"-8 NC 2A 205 daN. m
<p>* Number of steps according to service conditions</p>				

Figure 11—Table of Configurations and Required Torques for Nuts (48)

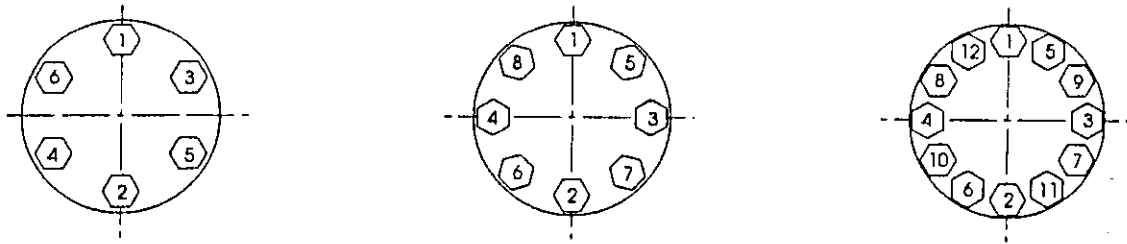


Figure 12 — Tightening sequence for nuts (48)

Continued from page 8

9. Types 37/38 Actuators

9.1 Actuator Removal

Nos 11 & 13 Actuators (Figure 13)

Air-to-Extend Actuator (Type 37)

1. Shut off air supply pressure and disconnect air lines at the actuator. Loosen stem locknuts (27), turn them down until threaded end of plug stem (17) and lock. If a size No 13, disengage the locking plate (55) from actuator stem (26).

2. By means of a wrench applied over the locknuts, turn the plug stem (5) out of actuator stem (26).

Note: In case of lower plug stroke, during this operation and after removing drive nut (33), it may be necessary to lift the actuator while unscrewing plug stem, because the length engaged into actuator stem is larger than the valve stroke.

Caution: Do not allow the plug to turn on the seat during this operation.

3. Plug stem being unscrewed and actuator removed, remove locking plate (55), locknuts (27) and travel indicator (58) from the plug stem.

Air-to-Retract Actuator (Type 38)

1. Retract actuator stem (26) and plug by applying air pressure. Loosen stem locknuts (27), turn them down until threaded end of plug stem (5) and lock. If a size No 13, disengage the locking plate (55) from actuator stem (26).

2. By means of a wrench applied over the locknuts, turn the plug stem (5) out of actuator stem (26).

Note: In case of lower plug stroke, during this operation and after removing drive nut (33), it may be necessary to lift the actuator while unscrewing plug stem, because the length engaged into actuator stem is larger than the valve stroke.

Caution: Do not allow the plug to turn on the seat during this operation.

3. Plug stem being unscrewed and actuator removed, remove locking plate (55), locknuts (27) and travel indicator (58) from the plug stem. Shut off air pressure and disconnect air lines at the actuator.

Nos 15 & 18 Actuators (Figure 13)

Air-to-Extend Actuator (Type 37)

Shut off air supply and disconnect air lines at the actuator.

Remove nut (53), screw (52) and clamps (51). Unscrew drive nut (33), then remove actuator from the valve.

Air-to-Retract Actuator (Type 38)

Retract actuator stem and plug by applying air pressure. Remove nut (53), screw (52) and clamps (51). Unscrew drive nut (33), then remove actuator from the valve. Shut off air pressure and disconnect air lines at the actuator.

9.2 Spring(s) Adjustment (Fig. 13)

Do not modify the setting of the actuator spring except when it is really necessary, to replace the diaphragm for example. In this case proceed as follows:

9.2.1 Hard Seat Valves With Air-to-Extend (Type 37) or Air-to-Retract (Type 38) Actuators

An air supply, with a gauge and regulator, should be piped to the 1/4" NPT connection located to upper diaphragm case (Type 37) or on the yoke (type 38).

Turn spring adjustor (36) to adjust spring compression so that the actuator stem (26) just begins to move when air pressure reaches minimum value of the range stamped on the serial plate. This movement is most easily detected by feeling the stem as air pressure is applied. *Caution: Adjust spring compression only when there is no air pressure on diaphragm.*

9.2.2 PTFE Soft-Seat Ring Valves With Air-to-Extend (Type 37) Actuator

Proceed as indicated in the above Section 9.2.1 - (hard seat valves).

9.2.3 PTFE Soft-Seat Ring Valves With Air-to-Retract (Type 38) Actuator

Connect an air supply with a gauge and a regulator to the 1/4" NPT air connection on the yoke. Adjust simultaneously air pressure and spring adjustor (36) so that the actuator stem (26) is retracted of .20"

(5mm) for 3/4", 1" and 1 1/2" (20, 25 et 40mm) valve sizes (trim) or .34" (8,5mm) for 2" and 3", (50 and 80 mm) valve sizes (trim) , when air pressure reaches minimum pressure (initial) of the spring range stamped on the serial plate.

9.3 Actuator Assembly and Adjustment

9.3.1 On Valves with Hard Seat Ring

Nos 11 & 13 Actuators (Figure 13)

1. Push plug stem (5) down until the plug seats, then replace locknuts (27) and travel indicator (58) (and locking plate (55) on No 13 actuators) at the plug stem end.

2a. If an Air-to-Extend Actuator (Type 37):

- Install actuator on bonnet with drive nut (33). Turn plug stem (17) into actuator stem (26) as far as it will go.

Caution: Do not allow the plug to turn on the seat during this operation.

- Connect a temporary supply air line on actuator. Apply to diaphragm maximum air pressure of spring range stamped on serial plate. Turn plug stem out of actuator stem until plug is seated.
- Tighten stem locknuts (27) against actuator stem [or locking plate (55)]. Relieve air pressure, then adjust travel indicator scale (56). Travel indicator (58) should indicate "open" when air pressure is relieved.

2b. If an Air-to-Retract Actuator (Type 38):

- Connect a temporary supply air line on actuator. Admit sufficient air pressure to retract actuator stem to full stroke. Install actuator on bonnet with drive nut (33).
- Turn plug stem (5) into actuator stem (26) as far as it will go. Relieve air pressure until minimum of spring range stamped on serial plate. Turn plug stem out of actuator stem until plug is seated. Increase air pressure and turn plug stem an additional one full turn *out* of actuator stem.

Caution: Do not allow the plug to turn on the seat during this operation.

- Tighten stem locknuts (27) against actuator stem [or locking plate (55)]. Relieve air pressure, then adjust travel indicator scale (56). Travel indicator (58) should indicate "closed" when air pressure is relieved.

Nos 15 & 18 Actuators (Figure 13)

1. Push plug stem (5) down until the plug seats.

2a. If an Air-to-Extend Actuator (Type 37):

- Install actuator on bonnet with drive nut (33). Connect a temporary supply air line on actuator. Apply to diaphragm maximum air pressure of spring range stamped on serial plate.

- Install the stem clamps (51) and travel indicator pointer (58). The amount of thread engagement of both stems should be approximately equal. Tighten clamp nut (53). Relieve air supply pressure.
- Adjust travel indicator scale (56) in regard of the indicator pointer (58). Travel indicator pointer (58) should indicate "open" when air pressure is relieved.

Caution: Do not allow the plug to turn on the seat during this operation.

2b. If an Air-to-Retract Actuator (Type 38):

- Connect a temporary supply air line on actuator. Admit sufficient air pressure to retract actuator stem to full stroke. Install actuator on bonnet with drive nut (33).
- Relieve air pressure until minimum of spring range stamped on serial plate. Install stem clamps (51) and travel indicator pointer (58). Slightly tighten clamp nut (53). The amount of thread engagement of both stems should be approximately equal.
- Increase pressure and turn plug stem an additional one full turn *out* of stem clamps (51). Tighten clamp nut (53), relieve air pressure then adjust travel indicator scale (56) in regard of the indicator pointer (58). Travel indicator pointer (58) should indicate "closed" when air pressure is relieved.

Caution: Do not allow the plug to turn on the seat during this operation.

9.3.2 On Valve with PTFE Soft Seat Ring

Nos 11, 13, 15 & 18, Type 37 Actuators (Figure 13)

The procedure is the same than the one used for the hard seat valves. However, the actuators allow a .14 in. (3,5mm) overtravel for the 3/4", 1" and 1 1/2" (20, 25 and 40mm) valves sizes (trim) and .28 in. (7mm) for the 2" and 3" (50 et 80mm) valves sizes (trim), guaranteeing a tightness in the case of partial wear or complete disappearance of the PTFE insert of seat-ring.

Besides, one must never exceed the supply pressure stamped on the serial plate.

Nos 11 & 13, Type 38 Actuators (Figure 13)

1. Apply sufficient air pressure to retract the actuator stem (26) as far as it will go.
2. Screw two locknuts (27) and travel indicator (58) until the end of the thread of the plug stem (5). Install locking plate (55).
3. Replace the actuator with drive nut (33) on the bonnet and turn on to the plug stem as far as it will go. Tighten drive nut (33). Relieve air pressure.

Caution: Do not allow the plug to turn on the seat during this operation.

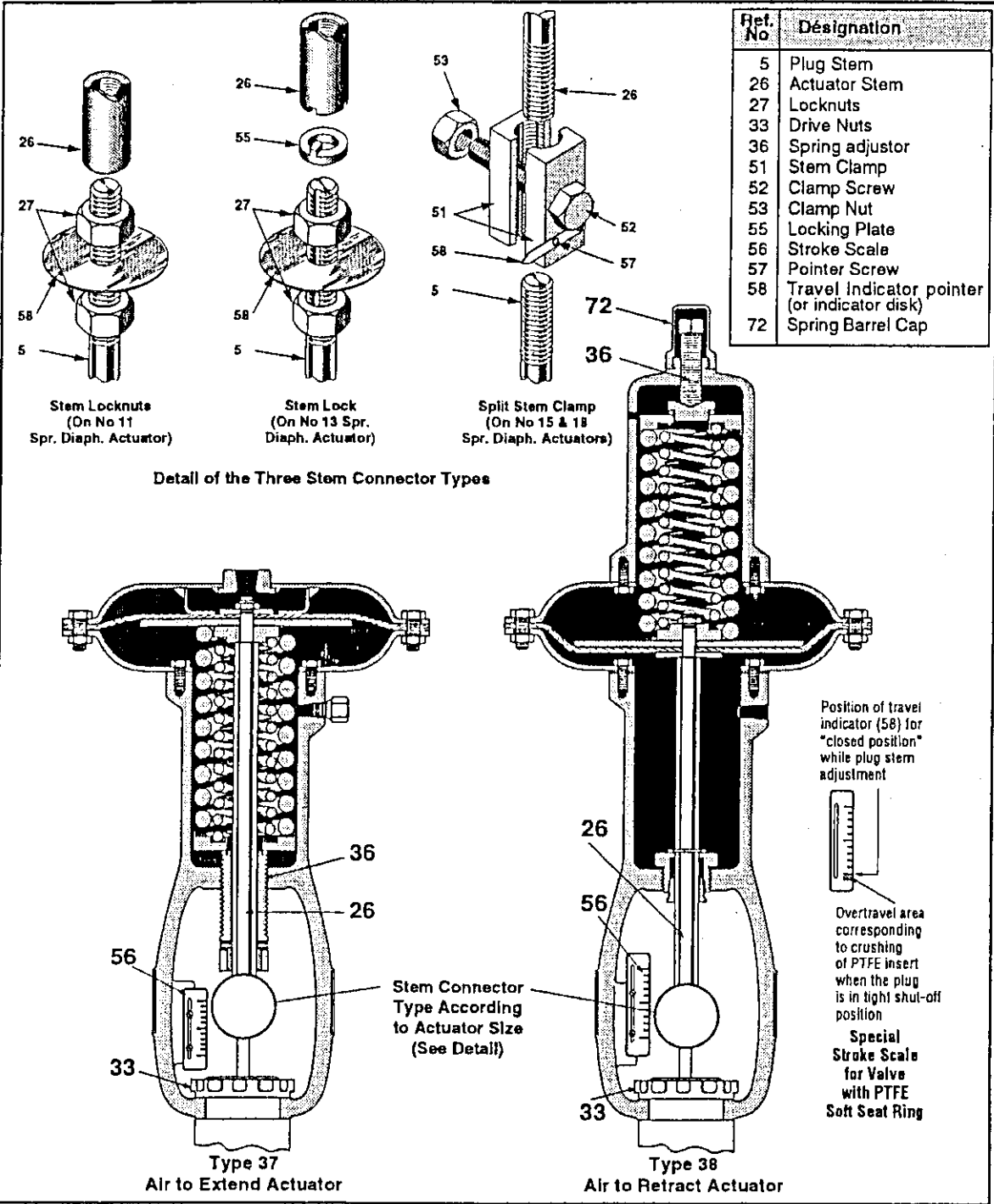


Figure 13
Masonellan Spring Diaphragm Actuators

4. Apply sufficient air pressure to retract the actuator stem (26) .2" (5 mm) (This step can be easier making marks on the stem).
5. Turn plug stem (using locknuts) out of actuator until the plug is seated.
6. Place locking-plate (55) into actuator stem and tighten nuts (27) and travel indicator (58).
7. Adjust positioner so that the valve just starts leaking for the signal corresponding to the valve closing.
8. Adjust indicator scale (56) so that the travel indicator (58) shows "closed".

Nos 15 & 18, Type 38 Actuators (Figure 13)

1. Move the plug to the closed position. Install actuator with drive nut (33) on the bonnet. Tighten drive nut (33).
2. Apply sufficient air pressure to retract the actuator stem (26) .20" (5 mm) for 1 1/2" (40 mm) valve size (trim) and .34" (8,5 mm) for 2" and 3" (50 and 80 mm) valve sizes (trim).
3. Install stem clamp (51). The amount of thread engagement of both stems should be approximately equal. Note: It may be necessary to raise or lower the actuator stem (26) slightly to mate the plug stem and actuator stem threads with those of the stem clamp (51). Tighten clamp nut (53). Fasten travel indicator (58).
4. Adjust positioner so that the valve just starts leaking for the signal corresponding to the valve closing.
5. Adjust indicator scale (56) so that the travel indicator (58) shows "closed".



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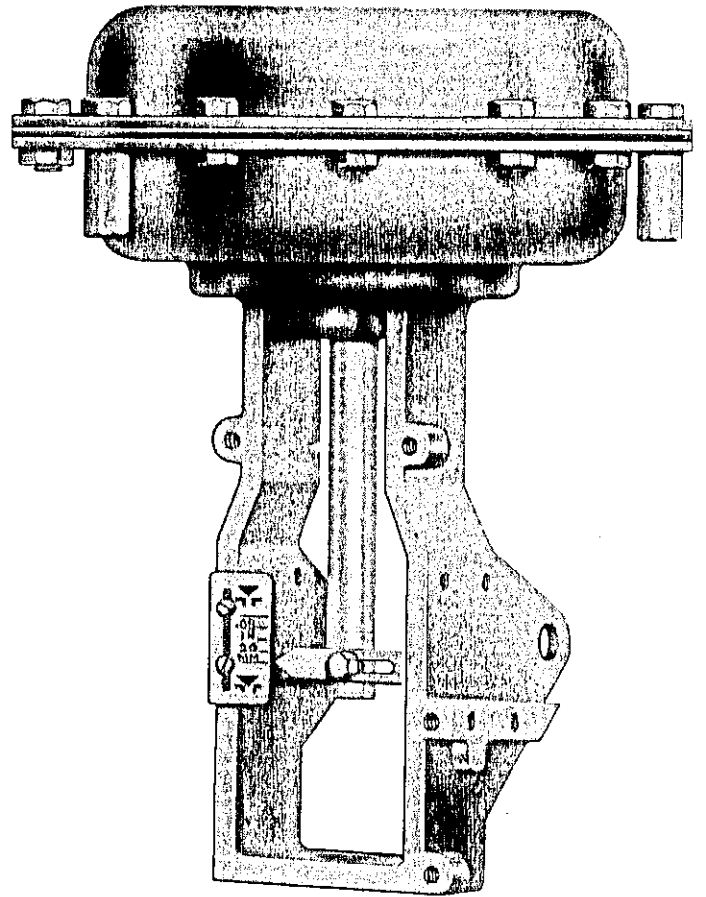
**87/88 Series Spring Diaphragm
Actuator Instructions**

MASONEILAN®

87/88 Series Spring Diaphragm Actuator Instructions

Instruction
No ER 8788 E
03/99

For complete listing of parts refer to Masonellan publication FR8788



INSTRUCTION MANUAL

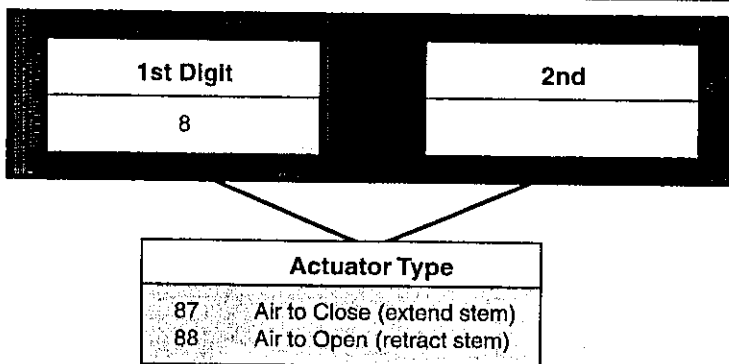
MASONEILAN



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The following instructions should be thoroughly reviewed and understood prior to installing, operating or performing maintenance on this equipment. Throughout the text, safety and/or caution notes will appear and must be strictly adhered to; otherwise, serious injury or equipment malfunction could result.



1. INTRODUCTION

The following instructions are designed to assist maintenance personnel in performing most of the maintenance required on the Model 87/88 actuator. Masoneilan has highly skilled service engineers available for start-up, maintenance and repair of our actuators and component parts. In addition, a regularly scheduled training program is conducted at the Training Center, to train customer service and instrumentation personnel in the operation, maintenance and application of our control valves and instruments. Arrangements for these services can be made through your Masoneilan Representative or Sales Office. When performing maintenance, use only Masoneilan replacement parts. Parts are obtainable through your local Masoneilan Representative or Sales Office. When ordering parts, always include Model and Serial Number of the unit being repaired.

2. GENERAL

These installation and maintenance instructions apply to the Masoneilan Model 87/88 actuator regardless of the valve body on which it is used. Actuator part numbers and recommended spare parts required for maintenance are listed in the Part Reference Table on page 12. The model number and action of the actuator are shown as part of the model number listed on the identification tag located on the actuator. The actuator size can be identified by means of the diaphragm case diameter indicated by the table of page 13.

3. ACTUATOR DESCRIPTION

The 87/88 Series are pneumatic spring diaphragm actuators which feature field reversibility (with no additional parts). Because of its multiple spring design, four standard spring ranges are achieved by varying spring quantity and placement. A molded rolling diaphragm and deep cases minimize area change, effecting a linear relationship between travel and air pressure.

Caution: For full automatic operation, the handwheel must be placed in the neutral position. If the handwheel is not in the neutral position, travel will be limited.

4. UNPACKING

Care must be exercised when unpacking the equipment to prevent damage to the accessories and component parts. Should any problems arise, contact your Masoneilan Representative or District Office.

5. AIR PIPING

The Model 87/88 actuator is designed to accept 1/4" NPT air supply connections. If the actuator has been supplied with accessories, they are piped at the factory.

Caution: Do not exceed pressure indicated on identification tag.

6. ACTUATOR REMOVAL

Maintenance on the valve body normally requires removal of the valve actuator. The steps in removal of the actuator are different depending on whether the actuator is air to close or air to open.

Note: Actuator action may be checked by referring to the valve identification tag. Model 87 indicates unit is air to close and Model 88 indicates unit is air to open.

6.1 Air to close Model 87, Size 6, with or without handwheel (Figure 2)

- A. Shut off air supply to actuator and rotate handwheel to the neutral position. [No force exerted on the stem connector by the pivot pins (33)].
- B. Disconnect air piping from diaphragm case.
- C. Check the travel indicator (7) against the travel scale (9) to insure that the plug is up (off the seat).
Note: No air pressure is required to the actuator since the spring pressure tends to open the valve.
- D. Loosen stem lock nuts (1).
- E. Re-tighten lock nuts (1) against each other so they will lock at a point that is not against the stem connector (2).

Caution: At this time provisions must be made to support and lift the actuator off the body using recommended lift supports and procedures.

- F. Loosen and remove drive nut.

Caution: Depending on stem length, it may be required to slightly raise the actuator off the body to enable the plug stem to disengage from the actuator stem. The actuator must be raised straight off the body to prevent stress on the plug stem.

- G. Turn the stem lock nut, (1), counterclockwise and loosen the plug stem until it disengages from the actuator stem (10).

Note: Do not allow the valve plug to drop or turn against the seat ring, as this could damage the seat and plug.

- H. Remove actuator from the valve body.

Caution: Care should be taken in handling the actuator to prevent damage to gauges, tubing, and component parts.

6.2 Air to open, Model 88, size 6, with handwheel

Caution: The stem connector (2) on this size is not fixed to the actuator stem and is a loose part with the plug stem removed. For safety, the handwheel must be in a free position and the actuator removed from the valve using procedure 6.3 Air to Open without handwheel.

6.3 Air to open, Model 88, size 6, no handwheel, (Figures 2 & 4)

Since removal of the valve plug stem from the actuator stem connector requires that the valve plug be off the seat, special provisions are necessary to assure that the valve is in the opened position. The actuator do not being equipped with a handwheel, proceed as follows:

Note: Since air supply piping connected to the actuator is normally rigid and the actuator will be moved, it is required that a manual loading panel with suitable flex tubing be used or some suitable type of flex connections be made between the supply piping and the actuator connection.

Caution: Unreasonably high stress placed on rigid piping could cause breaking of the air supply line. A flex connector is required.

- A. Shut off air supply to the actuator.
- B. Disconnect air supply piping to the actuator.
- C. Connect manual loading panel tubing to the lower diaphragm case tubing connector.
- D. Apply required air pressure through the manual loading panel to open the valve as is indicated by the travel indicator (7) and travel indicator scale (9).

Caution: Do not exceed pressure indicated on the tag (63) on the diaphragm case.

- E. Loosen stem lock nuts (1).
- F. Re-tighten stem lock nuts (1) against each other so they will lock at a point that is not against the actuator stem connector (2).

Caution: At this time provisions must be made to support and lift the actuator off the body using recommended lift supports and procedures.

- G. Loosen and remove drive nut.

Caution: Depending on stem length, it may be required to slightly raise the actuator off the body to enable the plug stem to disengage from the actuator stem. The actuator must be raised straight off the body to prevent stress on the plug stem.

- H. Turn the upper stem lock nut (1) counterclockwise and unscrew the valve plug stem until disengaged from the actuator stem (10).

Note: Do not allow the plug to drop or turn against the seat ring. This could damage the seat and plug.

- I. Remove actuator from the valve body and shut off air supply pressure.

Caution: Care should be taken in handling the actuator to prevent damage to gauges, tubing, and component parts. In addition, since a flex connection is made between the actuator and air piping, care must be taken not to exert pressure on the flex tubing or air piping.

6.4 Air to close Model 87, sizes 10-23, with and without handwheel, (Figure 3)

- A. Shut off air supply to actuator and rotate handwheel to the neutral position.
- B. Disconnect air piping from diaphragm case.
- C. Check the travel indicator (7) against the travel scale (9) to insure that the plug is up (off the seat).

Note: No air pressure is required to the actuator since the spring pressure tends to open the valve.

- D. Loosen stem lock nut (1).
- E. Remove cap screws (5) from stem connector (2, 4).
Note: Do not allow the valve plug to drop or turn against the seat ring, as this could damage the seat and plug.

Caution: At this time provisions must be made to support and lift the actuator off the body using recommended lift supports and procedures.

- F. Loosen and remove drive nut.

Caution: Progressively raise actuator off the body to enable the top stem connector (4) disengage the bottom stem connector (2). The actuator must be raised straight off the body to prevent stress on the plug stem.

- G. Remove bottom stem connector parts (1, 2, 6) from plug stem.
- H. Remove actuator from the valve.

6.5 Air to open, Model 88, Size 10-23, with or without handwheel, (Figure 4)

Since removal of the valve plug stem from the actuator stem connector requires that the valve plug be off the seat, special provisions are necessary to assure that the valve is in the opened position. Proceed as follows:

Note: Since air supply piping connected to the actuator is normally rigid and the actuator will be moved, it is required that a manual loading panel with suitable flex tubing be used or some suitable type of flex connections be made between the supply piping and the actuator connection.

Caution: Unreasonably high stress placed on rigid piping could cause breaking of the air supply line. A flex connector is required.

- A. Shut off air supply to the actuator and rotate handwheel to the neutral position.
- B. Disconnect air supply piping to the actuator.
- C. Connect manual loading panel tubing to the lower diaphragm case tubing connector.
- D. Apply required air pressure through the manual loading panel to open the valve as is indicated by the travel indicator (7) and stroke scale (9).

Caution: Do not exceed pressure indicated on the tag (63) on the diaphragm case.

- E. Loosen stem lock nuts (1).
- F. Remove cap screws (5) from stem connector (2, 4).
Note: Do not allow the valve plug to drop or turn against the seat ring, as this could damage the seat and plug.

Caution: At this time provisions must be made to support and lift the actuator off the body using recommended lift supports and procedures.

- G. Loosen and remove drive nut.

Caution: Progressively raise actuator off the body to enable the top stem connector (4) disengage the bottom stem connector (2). The actuator must be raised straight off the body to prevent stress on the plug stem.

- H. Remove bottom stem connector parts (1, 2, 6) from plug stem.
- I. Remove actuator from the valve and shut off air supply pressure.

7. MAINTENANCE

Caution: It is recommended that disassembly or assembly work on these actuators be done in an upright position.

7.1 Replacing diaphragm air to open actuators (Model 88), with or without handwheel, (Figure 4)

- A. Shut off air supply to the actuator, isolate the control valve process pressure to eliminate the valve from moving with spring tension removed.
- B. If valve is equipped with a handwheel, rotate handwheel to a neutral position.
- C. Remove diaphragm case cap screws and nuts (20 & 19).

Caution: Diaphragm case is under spring tension and is equipped with tension bolts (27, 28 & 56) which must be removed last.

- D. Remove tension bolts (27, 28 & 56) in multiple steps to relieve spring tension gradually. Remove upper diaphragm case (24).
- E. Note position of springs (21) and spring spacers (18) [if equipped] in the diaphragm plate (26), before to remove these parts.
- F. Remove cap screw (23) [size 6] or jam nut (23) [all other sizes] and diaphragm washer (22) [all sizes].
- G. Remove diaphragm plate (26) and diaphragm (25).
- H. Replace the new diaphragm (25) on the diaphragm plate (26).

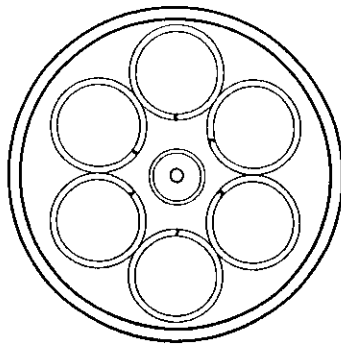


Figure 1

- I. Size 6 actuator coat the threads of cap screw (23) and the surfaces of washer (22) with Dupont Sealant Compound III or equal. All other sizes, coat the actuator stem threads (10) and the surfaces of washer (22) with Dupont Sealant Compound III or equal.
- J. Check placement of spacer (14), reassemble diaphragm (25), diaphragm plate (26), washer (22) then tighten fastener (23) in proper locations.
- K. Position springs (21) and spring spacers (18) [if used] in the diaphragm plate.

Note: Arrange springs so that the coil ends are pointed toward the actuator stem as shown in Figure 1. This step assures best actuator performance.

- L. Replace upper diaphragm case (24) and tension bolts (27, 28 & 56).

Note: Tension bolts should be spaced equally around the bolt circle of the case.

- M. Tighten the tension bolts (27, 28 & 56) in equal steps until the cases meet. Replace the remaining cap screws (20) and nuts (19).

Caution: Tighten cap screws and nuts evenly. Do not over-tighten as this could possibly warp the diaphragm cases. See Table 3 for torque values.

- N. If so equipped, rotate handwheel to the desired position.

7.2 Replacing diaphragm air to close (Model 87), actuator with handwheel (Figures 2 or 3 & 7)

Caution: The handwheel assembly can hold spring tension in the actuator when the diaphragm case is removed. To prevent possible injury, remove handwheel per the following procedure.

- A. Shut off air supply to the actuator, isolate the control process pressure to eliminate the valve plug from moving with spring tension removed.
- B. Rotate the handwheel (41) to a neutral position.
- C. Remove two handwheel pivot pins (33) which are mounted through the yoke and secure the handwheel pivot (36) in place, (see Figure 7).

- D. Let the complete handwheel assembly swing down and out of the way of the top stem connector (4) [bottom stem connector (2) on size 6 actuator].
- E. Proceed with the instructions for air to close actuators without handwheel (7.3).

7.3 Replacing diaphragm air to close (Model 87), actuator without handwheel (Figures 2 or 3 & 7)

- A. Shut off air supply to the actuator and remove air piping from the upper diaphragm case (24).
- B. Remove the two socket head cap screws (5) which hold the top and bottom stem connector (2 and 4) together.

Note: The size 6 actuator only has a bottom stem connector. For diaphragm replacement, the stem lock nuts (1) must be loosened. The plug stem is turned out at the actuator stem (10) in order to allow the actuator stem to rise with release of spring tension. Depending on stem length, it may be required, to allow this step, to separate the size 6 actuator off the valve body, as indicated in Section 6.1.

- C. Remove diaphragm case cap screws and nuts (20 & 19).

Caution: Diaphragm case is under spring tension and is equipped with tension bolts (27, 28 & 56) which must be removed last.

- D. Remove tension bolts (27, 28 & 56) in multiple steps to relieve spring tension gradually. Remove upper diaphragm case (24).
 - E. Remove cap screw (23) [size 6] or jam nut (23) [all other sizes] and diaphragm washer (22) [all sizes].
 - F. Replace new diaphragm (25) on the diaphragm plate (26).
 - G. Size 6 actuator coat the threads of cap screw (23) and the surfaces of washer (22) with Dupont Sealant Compound III or equal. All other sizes, coat the actuator stem threads (10) and the surfaces of washer (22) with Dupont Sealant Compound III or its equivalent. Install washer (22) and tighten fastener (23).
 - H. Replace upper diaphragm case (24) and tension bolts (27, 28 & 56).
- Note: Tension bolts should be spaced equally around the bolt circle of the case.*
- I. Tighten the tension bolts (27, 28 & 56) in equal steps until the cases meet. Replace the remaining cap screws (20) and nuts (19).

Caution: Tighten cap screws and nuts evenly. Do not over-tighten as this could possibly warp the diaphragm cases. See Table 3 for torque values.

- J. Position top and bottom stem connectors (2 and 4) and replace the two socket head cap screws (5) and recalibrate the seated position of the valve, (Section 10.2).

Note Size 6 actuator - Screw the plug stem back into the actuator stem (10) thru the bottom stem connector and recalibrate the seated position of the valve. If the actuator has been removed from the valve body, re-install it as indicated in Section 10.2).

Note: If the actuator has a handwheel, (Section 7.2), continue with the following steps:

- K. Swing handwheel assembly back up into place.
- L. Install the two pivot pins (33) in the yoke and engage them into the handwheel pivot (36).

7.4 Replace or repack handwheel bearing, size 6 and 10 actuators, (Figures 5 & 7)

- A. Rotate handwheel to a free position.
- B. Remove handwheel cap screw (20) and washer (42).
- C. Remove handwheel (41) and lock nut (43).
- D. Remove pivot pins (33) from the yoke which hold the handwheel pivot (36).
- E. Remove snap rings (46) and remove lever pin (45) to release handwheel assembly.
- F. Turn handwheel stem (39) until it clears traveling nut (40).
- G. Remove snap ring (38) and bearing ring (37) to release the handwheel stem (39) from the bearing.
- H. Remove snap ring (35) to release bearing (34).
- I. Replace or clean to repack bearing (34) with new grease.
- J. Bearing should be packed with Mobilux No. 2 grease or equal.

Note: It is important that bearing be packed, not just coated, with grease.

- K. To reassemble, reverse removal procedures from step (H) through (B).

7.5 Replace or repack handwheel bearing size 16 and 23 actuators, (Figures 6 & 7)

- A. Rotate handwheel to a free position.
- B. Remove pivot pins (33) which engage the handwheel pivot (36) thru the yoke.
- C. Remove snap rings (46) and remove lever pin (45) to release complete handwheel assembly.
- D. Remove snap ring (35) and slide the handwheel pivot (36) off the bearing (34).
- E. Remove cap screw (38) and end flange (37). This will release the bearing (34).
- F. Replace or clean to repack the bearing with new grease.
- G. Pack bearing (34) with Mobilux No. 2 grease or equal.

Note: It is important that the bearing be packed, not just coated, with grease.

- H. For remounting, reverse removal procedures from step (E) through (B).

7.6 Replace diaphragm seal and stem seal, air to open (Model 88) actuators, (Figure 2 or 4)

- A. Shut off air supply to the actuator, isolate the control valve process pressure to eliminate the valve from moving with spring tension removed.
- B. If valve is equipped with a handwheel, rotate handwheel to a free position.
- C. Remove diaphragm case cap screws and nuts (20 & 19).

Caution: Diaphragm case is under spring tension and is equipped with tension bolts (27, 28 & 56) which must be removed last.

- D. Remove tension bolts (27, 28 & 56) in multiple steps to relieve spring tension gradually. Remove upper diaphragm case (24).
- E. Note position of springs (21) and spring spacers (18) [if equipped] in the diaphragm plate (26).
- F. Remove springs (21) and spring spacers (18) if used.

On size 6 Actuator:

- G. Loosen lock nuts (1). Re-tighten lock nuts against each other so they will lock at a point that is not against the stem connector (2). By means of a wrench, hold the nuts (1) and plug stem. Turn the actuator stem (10) sub-assembly until it disengages from the plug stem and remove completely from actuator.

On size 10, 16 & 23 Actuators:

- G. Loosen lock nut (32) on actuator stem (10). Hold the connector device (2, 4, 6). Turn the actuator stem (10) sub-assembly and remove it when it clears the connector insert (6), (on size 6), or the top stem connector (4), (on sizes 16 & 23).

On all sizes:

- H. Remove case cap screws (16) to gain access to seal washers (15).

Note: If seal washers (15) replacement is the only maintenance, proceed to Step N.

- I. Remove lower diaphragm case (17) and stem bushing (30).

Note: Mark orientation of the case to the yoke.

- J. Replace stem wiper (11) and O-rings (12 & 13).
- K. Coat O-rings (12 & 13) and inside of stem bushing (30) with Dupont Compound III, (or equivalent).
- L. Install stem bushing (30) in the yoke with new O-rings (12 & 13).
- M. Place the diaphragm case (17) on the yoke.

- N. Coat the surface of the spring guides (29) in contact with the diaphragm case with Dupont Sealant Compound III or equivalent. Assemble spring guides (29), new seal washers (15), and cap screws (16) in this order.
- O. Re-install the actuator stem (10) sub-assembly into the yoke bushing. Turn actuator stem into insert (6), (size 10), or into the top stem connector (4), (size 16 & 23). In case of size 6 actuator, turn actuator stem on the plug stem after installing the stem connector (2). Turn until stem spacer (14) contacts the lower diaphragm case (17).
- P. Tighten lock nut (32) against connector insert (6), (size 10), or against the top stem connector (4), (on sizes 16 & 23). In case of size 6 actuator, lock the stem connector (2) and the two nuts (1) against the lower part of actuator stem.
- Q. Position springs (21) and spring spacers (18) [if used] in the diaphragm plate.

Note: Arrange springs so that the coil ends are pointed toward the actuator stem as shown in Figure 1. This step assures best actuator performance.

- R. Replace upper diaphragm case (24) and the tension bolts (27, 28 & 56).
- Note: Tension bolts should be spaced equally around the bolt circle of the case.*
- S. Tighten the tension bolts (27, 28 & 56) in equal steps until the cases meet. Replace the remaining cap screws (20) and nuts (19).

Caution: Tighten cap screws and nuts evenly. Do not over-tighten as this could possibly warp the diaphragm cases. See Table 3 for torque values.

- T. If necessary, recalibrate the seated position of the valve, (Section 10.1).

8. ACTUATOR RANGE

8.1 Actuator range change, air to open (Model 88).

- A. Shut off air supply to the actuator, isolate the control valve process pressure to eliminate the valve from moving with spring tension removed.
- B. If valve is equipped with a handwheel, rotate handwheel to a free position.
- C. Remove diaphragm case cap screws and nuts (20 & 19).

Caution: Diaphragm case is under spring tension and is equipped with tension bolts (27, 28 & 56) which must be removed last.

- D. Remove tension bolts (27, 28 & 56) in multiple steps to relieve spring tension gradually. Remove upper diaphragm case (24).
- E. Position springs (21) [and spring spacers (18), if new range uses them], in the diaphragm plate.

TABLE 1

ACTUATOR TRAVEL mm (in.)	SPRING COLOR
20 (0.8)	RED
38 (1.5)	BLUE
51 (2.0)	GREEN
64 (2.5)	YELLOW

TABLE 2

SPRING RANGE psi (m.bar)	NO. OF SPRINGS REQUIRED	SPRING POSITION ON DIAPHRAGM PLATE	SPRING SPACER (18) REQUIRED
3-15 (0,207-1,034)	3	BOTTOM	NO
6-30 (0,414-2,069)	6	BOTTOM	NO
11-23 (0,759-1,586)	3	PEDESTAL	YES*
21-45 (1,448-3,103)	6	PEDESTAL	YES*

* A spring spacer (18) is required on Size 10 for 38mm (1.5in.) travel only and on Sizes 16 and 23, for 38mm (1.5in.), 51mm (2.0in.) and 64mm (2.5in.) travels.

TABLE 3

Bolt/Nut Reference	Actuator Size			
	6	10	16	23
Yoke Cap Screw (16)	13,5 (120)	21,5 (190)	45 (400)	68 (600)
Case Bolt (19, 20) or Tension Bolt (27, 28)	7,5 (65)	12,5 (110)	17 (150)	19 (170)
Actuator Stem Nut (23) or Cap Screw (23)	3,5 (25)	7,5 (55)	13 (95)	20,5 (150)
Socket Head Cap Screw (5)	—	4,5 (35)	17 (125)	17 (125)
Stem Jam Nut (1, 32)	3,5 (25)	7,5 (55)	13 (95)	20,5 (150)
Pivot Pin (33)	8 (60)	8 (60)	11 (80)	11 (80)
Handwheel Cap Screw (20)	7,5 (65)	7,5 (65)	17 (150)	17 (150)
Handwheel Stem Cap Screw (38)	—	—	13,5 (100)	13,5 (100)

Numbers in standard type without parenthesis are in daN.m, numbers in standard type with parenthesis () are in foot pounds.

Numbers in italic type without parenthesis are in N.m; Numbers in italic type with parenthesis () are in inch pounds.

The listed values are nominal torques; Tolerance is: ± 10%

- F. Refer to Tables 1, 2 and 4 for spring information:

- a. For 11 and 21 psi (0,759 & 1,448 bar) initials, the springs are placed directly on the upper pedestals in the diaphragm plate (26).
- b. For 3 and 6 psi (0,207 & 0,414 bar) initials, the springs are placed in the bottom cavity in the diaphragm plate.
- c. For 11 and 21 psi (0,759 & 1,448 bar) initials **and travel ranges larger than 0.8" (20 mm)**, the spring spacers (18) are placed as shown in the cross sectional view, Figure 4.

Note: Spring spacers (18) are not required for 0.8" (20mm) travel ranges.

Note: Arrange springs so that the coil ends are pointed toward the actuator stem as shown in

Figure 1. This step assures best actuator performance.

- G. Replace upper diaphragm case (24) and tension bolts (27, 28 & 56).

Note: Tension bolts should be spaced equally around the bolt circle of the case.

- H. Tighten the tension bolts (27, 28 & 56) in equal steps until the cases meet. Replace the remaining cap screws (20) and nuts (19).

Caution: Tighten cap screws and nuts evenly. Do not over-tighten as this could possibly warp the diaphragm cases. See Table 3 for torque values.

- I. If so equipped, rotate handwheel to the desired position.

8.2 Actuator range change, air to close (Model 87)

Note: If actuator is equipped with a handwheel, please follow steps 7.2 A, B, C and D to disengage this assembly.

- A. Shut off air supply to the actuator and remove air piping from the upper diaphragm case (24).

- B. Remove the two socket head cap screws (5) which hold the top and bottom stem connector (2 and 4) together.

Note: The size 6 actuator only has a bottom stem connector (2). For access to springs, the stem lock nuts (1) must be loosened. The plug stem is turned out at the actuator stem (10) to allow the actuator stem to rise with release of spring tension. Depending on stem length, it may be required, to allow this step, to separate the size 6 actuator off the valve body, as indicated in Section 6.1.

- C. Remove diaphragm case cap screws and nuts (20 & 19).

Caution: Diaphragm case is under spring tension and is equipped with tension bolts (27, 28 & 56) which must be removed last.

- D. Remove tension bolts (27, 28 & 56) and compression nuts (28) in multiple steps to relieve spring tension gradually. Remove upper diaphragm case (24).

- E. Remove cap screw (23) [size 6] or jam nut (23) [all other sizes] and diaphragm washer (22).

- F. Remove diaphragm plate (26) and diaphragm (25).

- G. Place springs (21) over the spring guides (29).

- H. Refer to Tables 1, 2 and 4 for spring information:

a. For 11 and 21 psi (0,759 & 1,448 bar) initials, the springs are placed directly on the upper pedestals in the diaphragm plate (26).

b. For 3 and 6 psi (0,207 & 0,414 bar) initials, the springs are placed in the bottom cavity in the diaphragm plate.

c. For 11 and 21 psi (0,759 & 1,448 bar) initials **and travel ranges larger than 0.8" (20 mm)**, the

spring spacers (18) are placed as shown in the cross sectional view, Figure 4.

Note: Spring spacers (18) are not required for 0.8" (20 mm) travel ranges.

Note: Arrange springs so that the coil ends are pointed toward the actuator stem as shown in Figure 1. This step assures best actuator performance.

- I. Replace the diaphragm plate (26) on the actuator stem (10) and over the springs. To ensure the springs are properly located, check the view hole in the diaphragm plate. A spring should be seen.

- J. Install the diaphragm (25).

- K. Size 6 actuator coat the threads of cap screw (23) and the surfaces of washer (22) with Dupont Sealant Compound III or equal. All other sizes, coat the actuator stem threads (10) and the surfaces of washer (22) with Dupont Sealant Compound III or equal.

- L. Replace upper diaphragm case (24) and the tension bolts (27, 28 & 56).

Note: Tension bolts should be spaced equally around the bolt circle of the case.

- M. Tighten the tension bolts (27, 28 & 56) in equal steps until the cases meet. Replace the remaining cap screws (20) and nuts (19).

Caution: Tighten cap screws and nuts evenly. Do not over-tighten as this could possibly warp the diaphragm cases. See Table 3 for torque values.

- N. Position top and bottom stem connectors (2 and 4) and replace the two socket head cap screws (5) and recalibrate the seated position of the valve, (Section 10.2).

Note Size 6 actuator - Screw the plug stem back into the actuator stem (10) thru the bottom stem connector (2) and recalibrate the seated position of the valve. If the actuator has been removed from the valve body, re-install it as indicated in Section 10.2).

Note: If the actuator has a handwheel, (Section 7.2), continue with the following steps:

- O. Swing handwheel assembly back up into place.

- P. Install the two pivot pins (33) in the yoke and engage them into the handwheel pivot (36).

9. AIR ACTION CHANGES

9.1 Air to Open to Air to Close, (Model 88) to (Model 87)

- A. Shut off air supply to the actuator, isolate the control valve process pressure to eliminate the valve from moving with spring tension removed.

- B. If valve is equipped with a handwheel, rotate handwheel to a neutral position.

- C. Remove snap rings (46) and remove lever pin (45) to allow handwheel assembly to swing away from the stem connector (2-4).

- D. Remove the two socket head cap screws (5) which hold the top and bottom stem connector (2 and 4) together.

Note: The size 6 actuator only has a bottom stem connector (2). For changing of action, the stem lock nuts (1) must be loosened. The plug stem is turned out at the actuator stem (10) in order to allow the actuator stem to rise while springs installation in Model 87. Depending on stem length, it may be required, to allow this step, to separate the size 6 actuator off the valve body, as indicated in Section 6.3.

- E. Remove diaphragm case cap screws and nuts (20 & 19).

Caution: Diaphragm case is under spring tension and is equipped with tension bolts (27, 28 & 56) which must be removed last.

- F. Remove tension bolts (27, 28 & 56) in multiple steps to relieve spring tension gradually. Remove upper diaphragm case (24). Remove springs (21) and spacer (18), [if equipped].
- G. Remove cap screw (23) [size 6] or jam nut (23) [all other sizes] and diaphragm washer (22) [all sizes].
- H. Remove diaphragm plate (26) and diaphragm (25).
- I. Place springs (21) over the spring guides (29).
- J. Refer to Tables 1, 2 and 4 for spring information. Refer also to Section 8.1 F, Steps a., b., c.

Note: Spring spacers (18) are not required for 0.8" (20 mm) travel ranges.

Note: Arrange springs so that the coil ends are pointed toward the actuator as shown in Figure 1. This step assures best actuator performance.

- K. Invert and replace the diaphragm plate (26) on the actuator stem (10) and over the springs.

Note: To ensure the springs are properly located, check the view hole in the diaphragm plate. A spring should be seen.

- L. Install the diaphragm (25).
- M. Size 6 actuator coat the threads of cap screw (23) and the surfaces of washer (22) with Dupont Sealant Compound III or equal. All other sizes, coat the actuator stem threads (10) and the surfaces of washer (22) with Dupont Sealant Compound III or equal.
- N. Replace upper diaphragm case (24) and tension bolts (27, 28 & 56).
Note: Tension bolts should be spaced equally around the bolt circle of the case.
- O. Tighten the tension bolts (27, 28 & 56) in equal steps until the cases meet. Replace the remaining cap screws (20) and nuts (19).

Caution: Tighten cap screws and nuts evenly. Do not over-tighten as this could possibly warp the diaphragm cases. See Table 3 for torque values.

- P. Position top and bottom stem connectors (2 and 4) and replace the two socket head cap screws (5) and recalibrate the seated position of the valve, (Section 10.2).

Note Size 6 actuator - Screw the plug stem back into the actuator stem (10) thru the bottom stem connector (2) and recalibrate the seated position of the valve. If the actuator has been removed from the valve body, re-install it as indicated in Section 10.2.

Note: If the actuator has a handwheel, continue with the following steps:

- Q. Swing handwheel assembly back up into place. The handwheel (41) may have to be turned in order to position the lower pivot pins (33).
- R. With the pivot pins positioned on top of the stem connector (2 and 4), replace the lever pin (45) and snap rings (46).

9.2 Air to Close to Air to Open, (Model 87) to (Model 88)

Caution: The handwheel assembly can hold spring tension in the actuator when the diaphragm case is removed. To prevent possible injury, remove handwheel per the following procedure.

- A. Shut off air supply to the actuator, isolate the control process pressure to eliminate the valve from moving with spring tension removed.
- B. Rotate the handwheel (41) to a neutral position.
- C. Remove snap rings (46) and lever pins (45).
- D. The complete handwheel assembly can now swing out of the way of the top stem connector (2 & 4) [bottom stem connector (2) on the size 6 actuator].
- E. Proceed with the instructions for actuators without handwheel (9.3 Step B).

9.3 Air to Close to Air to Open, (Model 87) to (Model 88) without handwheel

- A. Shut off air supply to the actuator and remove air piping from the upper diaphragm case (24).
- B. Remove the two socket head cap screws (5) which hold the top and bottom stem connector (2 and 4) together.

Note: The size 6 actuator only has a bottom stem connector. For changing of action, the stem lock nuts (1) must be loosened. The plug stem is turned out at the actuator stem (10) in order to allow the actuator stem to rise with release of spring tension, while disassembly.

Depending on stem length, it may be required, to allow this step, to separate the size 6 actuator off the valve body, as indicated in Section 6.1.

- C. Remove diaphragm case cap screws and nuts (20 & 19).

Caution: Diaphragm case is under spring tension and is equipped with tension bolts (27, 28 & 56) which must be removed last.

- D. Remove tension bolts (27, 28 & 56) in multiple steps to relieve spring tension gradually. Remove upper diaphragm case (24).
- E. Remove cap screw (23) [size 6] or jam nut (23) [all other sizes] and diaphragm washer (22) [all sizes].
- F. Remove the diaphragm (25), diaphragm plate (26), springs (21) and spring spacers (18) if used.
- G. Invert the diaphragm (25) and diaphragm plate (26).
- H. Size 6 actuator coat the threads of cap screw (23) and the surfaces of washer (22) with Dupont Sealant Compound III or equal. All other sizes, coat the actuator stem threads (10) and the surfaces of washer (22) with Dupont Sealant Compound III or equal.
- I. Checking placement of spacer (14) reassemble diaphragm (25), diaphragm plate (26), washer (22) then tighten fastener (23) in proper locations.
- J. Position springs (21) and spring spacers (18) [if used] in the diaphragm plate.
- K. Refer to Tables 1, 2 and 4 for spring information. Refer also to Section 8.1 F, Steps a., b., c.

Note: Spring spacers (18) are not required for 0.8" (20 mm) travel ranges.

Note: Arrange springs so that the coil ends are pointed toward the actuator stem as shown in Figure 1. This step assures best actuator performance.

- L. Replace upper diaphragm case (24) and tension bolts (27, 28 & 56).
- Note: Tension bolts should be spaced equally around the bolt circle of the case.*
- M. Tighten the tension bolts (27, 28 & 56) in equal steps until the cases meet. Replace the remaining cap screws (20) and nuts (19).

Caution: Tighten cap screws and nuts evenly. Do not over-tighten as this could possibly warp the diaphragm cases. See Table 3 for torque values.

- N. Position top and bottom stem connectors (2 and 4) and replace the two socket head cap screws (5) and recalibrate the seated position of the valve, (Section 10.1).

Note Size 6 actuator - Screw the plug stem back into the actuator stem (10) thru the bottom stem connector (2) and recalibrate the seated position of the valve. If the actuator has been removed from the valve body, re-install it as indicated in Section 10.1).

Note: If the actuator has a handwheel, continue with the following steps.

- O. Swing the handwheel assembly back into place.

- P. It may require turning the handwheel (41) to position the lower pivot pins (33) under the stem connector (2-4), [bottom stem connector (2) on the size 6 actuator].

- Q. Install the lever pin (45) and snap rings (46).

10. ACTUATOR INSTALLATION ON VALVE BODY AND PLUG STEM ADJUSTMENT

Caution: SIZE 6 - The stem connector (2) is not fixed to the actuator stem and is a loose part with the stem nuts (1) backed off. For safety reasons, adjustments should only be made pneumatically.

These installation and plug stem adjustment procedures are available for mounting of the Models 87/88 Actuators on most of the reciprocating and hard seat valves series. In case of the valves with spring loaded internal auxiliary tight shutoff plug (41400 Series), or valves with PTFE Soft seat ring, refer to instruction Add. No 184399 E or to the Section "Models 87/88 Actuators Coupling" on the specific instructions of the valve.

10.1 Air to open (Model 88)

- A. Connect manual loading panel tubing to the lower diaphragm case.
- B. Apply required air pressure through the manual loading panel to completely retract the actuator stem (10).
- C. Install actuator on the valve body with drive nut.
- D. Position top and bottom stem connectors (2 and 4) and replace the two socket head cap screws (5). Turn as far as possible the plug stem into lower part of the stem connector (2 or 6).
- Note Size 6 actuator - Screw the plug stem into the actuator stem (10) thru the bottom stem connector (2). Depending on stem length, it may be required, to allow this step, to progressively lower the actuator towards the body, during screwing plug stem into actuator stem.*
- E. Release air pressure, then ensure that the actuator stem is fully extended.
- F. Using the stem lock nuts (1), unscrew the plug stem until the plug touches the seat.

Caution: DO NOT TURN the plug against the seat as damage can occur.

- G. Pneumatically or with the handwheel, stroke the actuator to raise the plug off the seat. Unscrew the plug stem one full turn and lock the stem in place with the lock nut(s) (1) against the stem connector (2 or 6).
- H. Line up the stroke scale (9) with the pointer (7) and check actuator for operation.

10.2 Air to close (Model 87)

- A. Install actuator on the valve body with drive nut.
- B. Position top and bottom stem connectors (2 and 4)

and replace the two socket head cap screws (5). Turn as far as possible the plug stem into lower part of the stem connector (2 or 6).

Note Size 6 actuator - Screw the plug stem into the actuator stem (10) thru the bottom stem connector (2). Depending on stem length, it may be required, to allow this step, to progressively lower the actuator towards the body, during screwing plug stem into actuator stem.

- C. Pneumatically or with the handwheel, stroke the actuator to the rated spring range or stroke (if using the handwheel).
- D. Using the stem lock nuts (1) unscrew the plug stem until the plug touches the seat.

Caution: DO NOT TURN the plug against the seat as damage can occur.

- E. Release the pressure in the actuator or back off the handwheel to raise the stem.
- F. Unscrew the stem 1/2 turn and lock the stem in place by tightening the stem nuts (1) against the stem connector (2 or 6).
- G. Line up the stroke scale (9) with the pointer (7) and check actuator for operation.

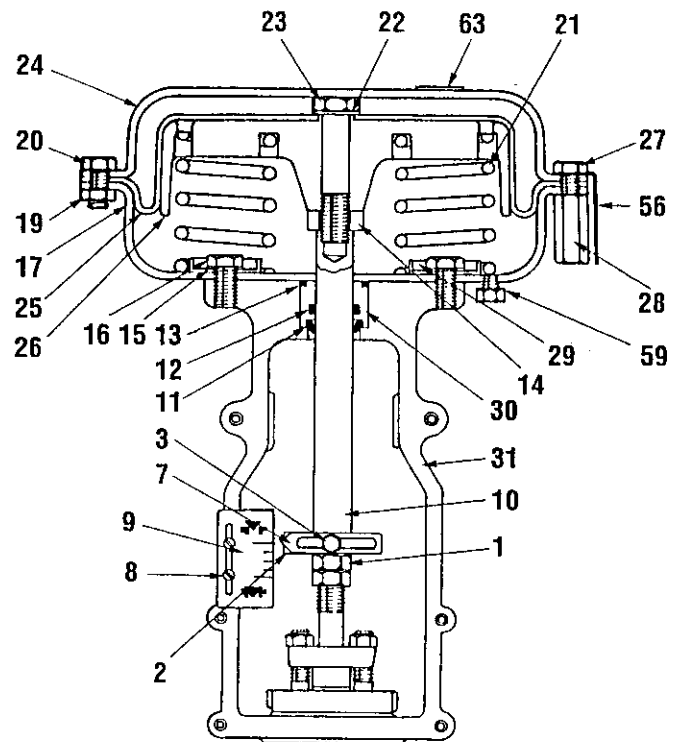


Figure 2
Size 6 Actuator Air to Close (Model 87)

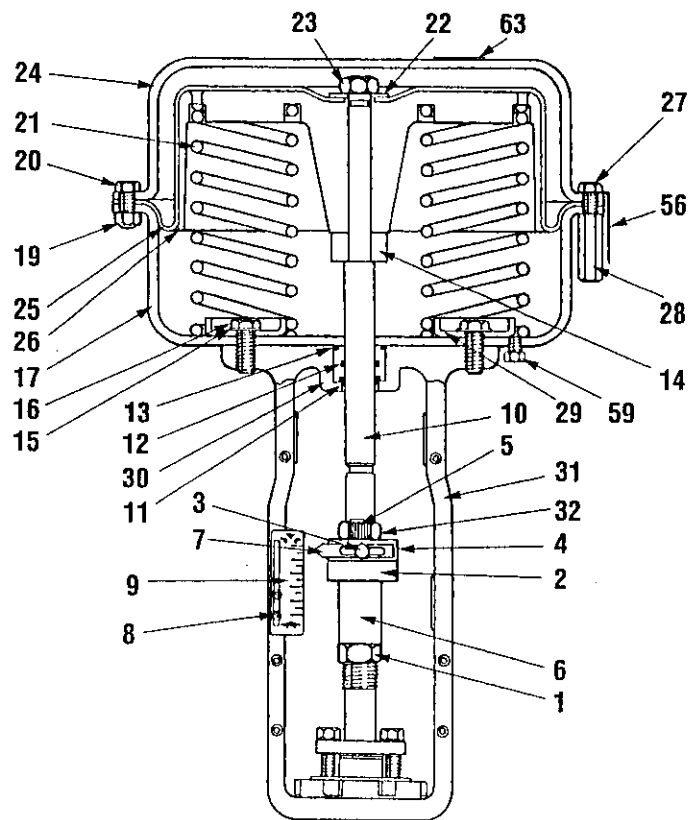


Figure 3
Size 16 Actuator Air to Close (Model 87)

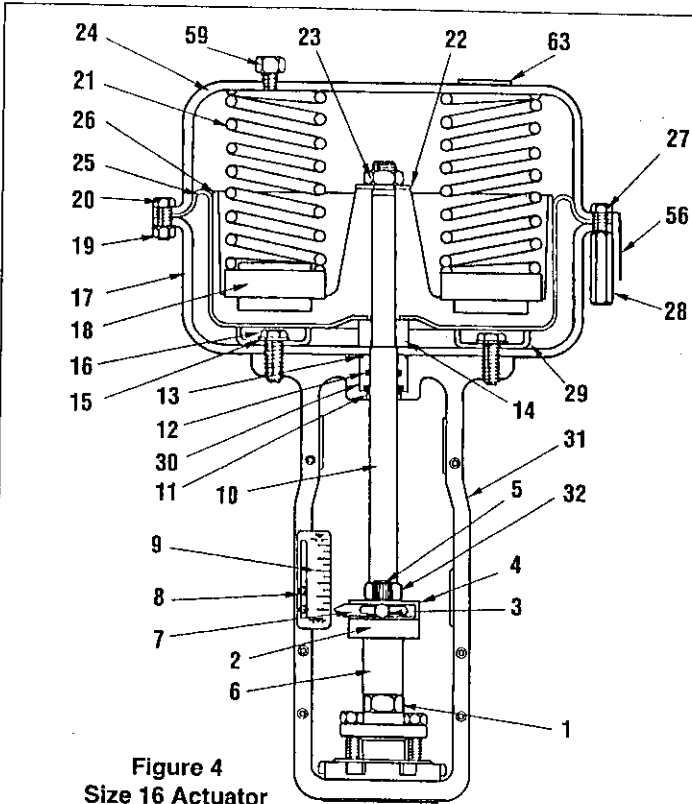


Figure 4
Size 16 Actuator
Air to Open (Model 88)

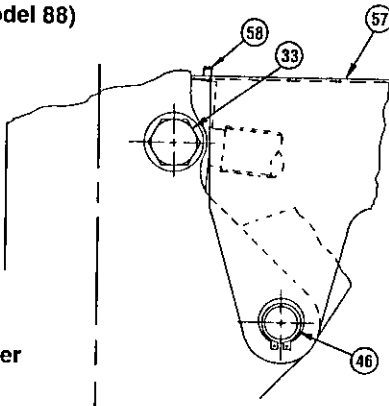


Figure 7
Handwheel Cover

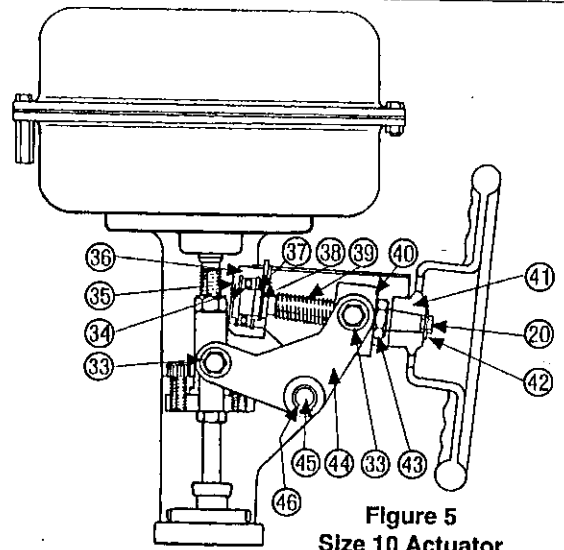


Figure 5
Size 10 Actuator
with optional Handwheel

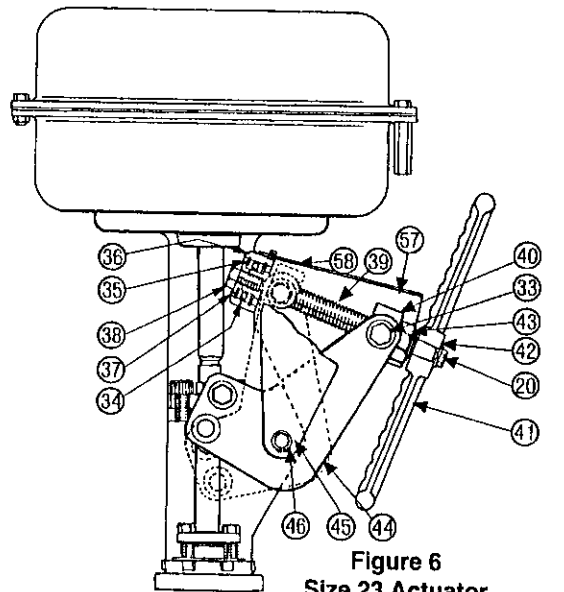


Figure 6
Size 23 Actuator
with optional Handwheel

Parts References

Ref. No	Description	Ref. No	Description	Ref. No	Description
1	Hex Nut	19	Hex Nut	▲37	End Flange
2	Stem Connector, bottom	20	Cap Screw, Hex head	▼38	Cap Screw, Hex head
3	Cap Screw, Hex head	21	Spring	39	Handwheel Stem
★ 4	Stem Connector, top	22	Washer	40	Traveling Nut
★ 5	Cap Screw, soc. head	■23	Nut, Jam	41	Handwheel
★ 6	Connector Insert	24	Upper Diaphragm Case	42	Washer, Flat
7	Pointer	●25	Diaphragm	43	Lock Nut
8	Screw, Pan head	26	Diaphragm Plate	44	Handwheel Lever Assembly
9	Scale - Travel	27	Cap Screw, Hex head	45	Lever Pin
10	Actuator Stem	28	Compression Nut	46	Retaining Ring
●11	Stem Wiper	29	Spring Guide	56	Warning Plate
●12	O-Ring	30	Stem Bushing	57	Handwheel Cover
●13	O-Ring	31	Yoke, machining	58	Groove Pin
14	Spacer	★32	Lock Nut	59	1/4" NPT Plug
●15	Seal Washer	33	Pivot Pin	61	Serial Plate (Not Shown)
16	Cap Screw, Hex head	34	Thrust Bearing	62	Drive Screw (Not Shown)
17	Lower Diaphragm Case	35	Retaining Ring	63	Caution Tag
★18	Spring Spacer	36	Handwheel Pivot		

● Recommended Spare Parts
★ Not provided for Size 6 Actuator
Sizes 6 & 10
■ Hex Head Cap Screw on Size 6 Actuator
● Not provided for 20 mm (.8 in.) travel
Underlined: Optional Handwheel Only

▲ Bearing Ring on Sizes 6 & 10
▼ Retaining Ring on


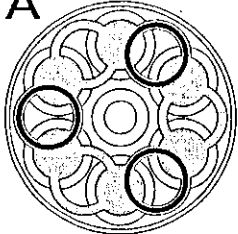
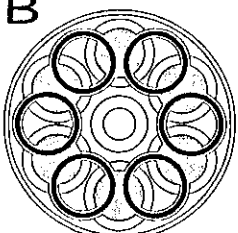

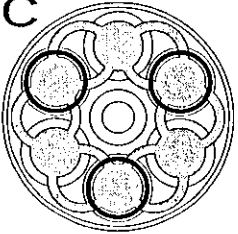
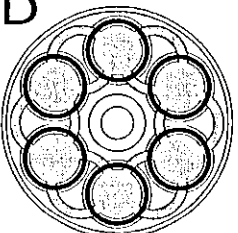

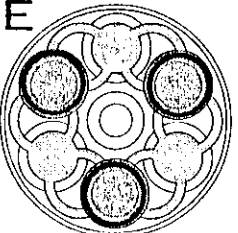
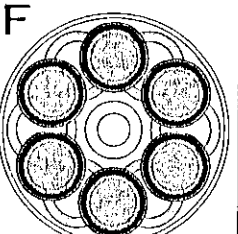
Actuator No	Travel & color code	Range (psi)	Qty	Springs Position	
6 (Dia. 292 mm)	0.8" (20mm) RED	3-15	3	A	<p>Springs placed in the bottom cavity </p> <p>A</p>  <p>B</p>  <p>Springs placed on the upper pedestals </p> <p>C</p>  <p>D</p>  <p>Springs placed on additional spacers </p> <p>E</p>  <p>F</p> 
		6-30	6	B	
		11-23	3	C	
		21-45	6	D	
10 (Dia. 368 mm)	0.8" (20mm) RED	3-15	3	A	
		6-30	6	B	
		11-23	3	C	
		21-45	6	D	
	1.5" 38mm) BLUE	3-15	3	A	
		6-30	6	B	
		11-23	3	E	
		21-45	6	F	
16 (Dia. 476 mm)	0.8" (20mm) RED	3-15	3	A	
		6-30	6	B	
		11-23	3	C	
		21-45	6	D	
	1.5" 38mm) BLUE	3-15	3	A	
		6-30	6	B	
		11-23	3	E	
		21-45	6	F	
	2.0" (51mm) GREEN	3-15	3	A	
		6-30	6	B	
		11-23	3	E	
		21-45	6	F	
2.5" (64mm) YELLOW	3-15	3	A		
	6-30	6	B		
	11-23	3	E		
	21-45	6	F		
23 (Dia. 550 mm)	0.8" (20mm) RED	3-15	3	A	
		6-30	6	B	
		11-23	3	C	
		21-45	6	D	
	1.5" 38mm) BLUE	3-15	3	A	
		6-30	6	B	
		11-23	3	E	
		21-45	6	F	
	2.0" (51mm) GREEN	3-15	3	A	
		6-30	6	B	
		11-23	3	E	
		21-45	6	F	
	2.5" (64mm) YELLOW	3-15	3	A	
		6-30	6	B	
		11-23	3	E	
		21-45	6	F	

TABLE 4
Arrangement of springs into diaphragm plate according to actuator characteristics

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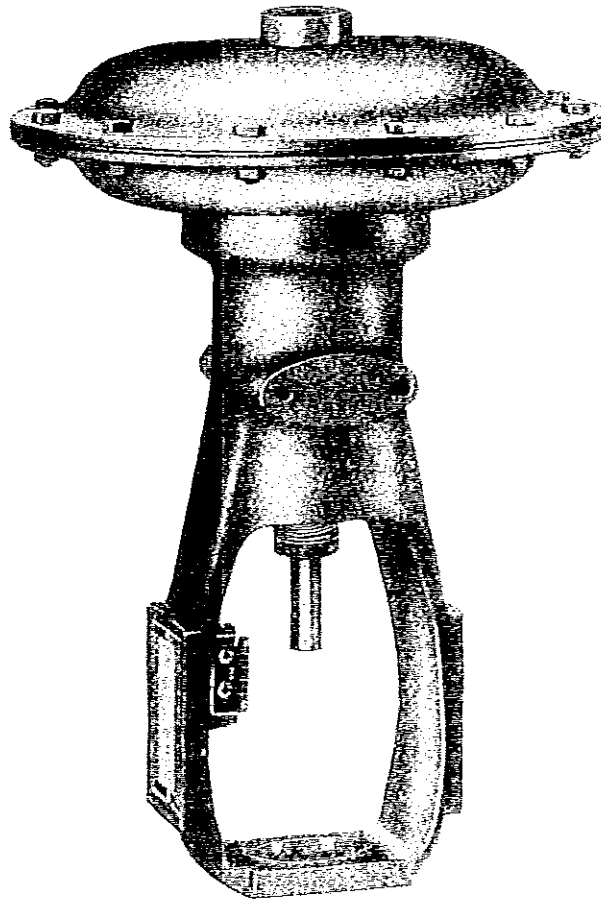
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MASONEILAN

Spring-Diaphragm Actuator Instructions

Masoneilan Spring-Diaphragm Actuator Instructions



description

The spring-diaphragm actuator is a simple, powerful mechanical device. There are two general types, "Air-to-Extend Stem" and "Air-to-Retract Stem". Actuators are designated by case size: Nos. 9, 11, 13, 15, 18 and 18L.

The nominal range of a spring-diaphragm actuator is the air pressure range in pounds per square inch (psi) for rated stroke under no load. Common ranges are 3-15 and 6-30 psi. The spring range and maximum allowable supply pressure are marked on the serial plate. For a 3-15 psi nominal range, the stem will start to stroke when the air pressure reaches 3 psi and will complete the stroke when the pressure reaches 15 psi (plus or minus 5%).

In the air-to-extend actuator, conformation of the molded diaphragm to the diaphragm plate serves as a flexible upper guide for the actuator stem (26). The lower guide is an oil impregnated bronze bushing (37) located in the spring adjustor (36). The air-to-retract actuator differs from the air-to-extend unit in that the spring (22), spring barrel (71) and spring adjustor (36) are located above the diaphragm plate

(40) and diaphragm (39) which are inverted. A gasket (19) at the joint of the diaphragm case and yoke and a packing box around the actuator stem prevents air leakage. The diaphragm acts as a flexible upper guide and the packing box assembly as the lower guide for the actuator stem.

Air connections are 1/4" NPT. Connections are located in the upper diaphragm case (air-to-extend actuators) or yoke (air-to-retract actuators).

Standard Actuator Size	Effective Diaphragm Area (sq. in.)	Maximum Stroke (in.)
9	45	3/4
11	71	1
13	105	1 1/2
15	145	2
18	200	2 1/2
18L	200	4

maintenance

Air-to-Extend Actuators (Type 37)

diaphragm replacement: Before disassembling the actuator, all spring compression should be relieved by turning the spring adjustor (36), to prevent the upper case popping up when the cap screws (45) are removed. This is especially important on actuators with a high initial spring setting. Remove cap screws (45), nuts (46) and upper diaphragm case (43). Remove nut (30) and washer (41) to release the diaphragm (39). If possible, the replacement diaphragm should be of the molded type supplied by Masonellan but in an emergency a diaphragm may be cut from flat sheet stock for up to and including No. 15 actuators. To allow sufficient stroke without restriction due to flatness of the diaphragm, the diaphragm bolt circle should be about 10% greater than that of the diaphragm case.

Replace washer (41), nut (30) and upper diaphragm case.

spring adjustment: An air supply, with a gauge and regulator, should be piped to the upper diaphragm case for this adjustment. Adjust spring compression so that the actuator stem (26) just begins to move when air pressure reaches minimum pressure of the range stamped on the serial plate. This movement is most easily detected by

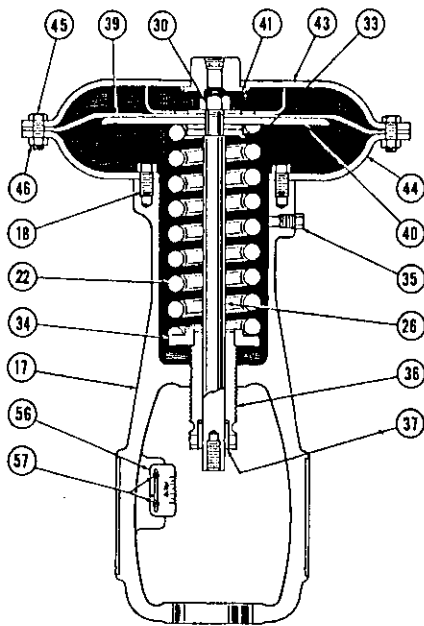
feeling the stem as air pressure is applied. **Note:** Adjust spring compression only when there is no air pressure on diaphragm.

Air-to-Retract Actuators (Type 38)

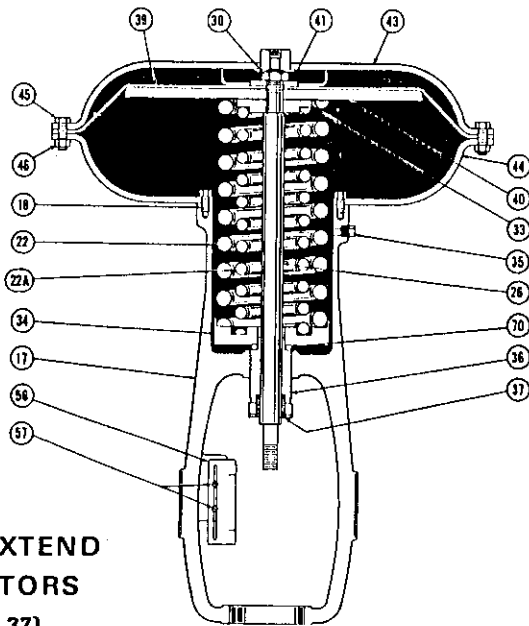
diaphragm replacement: Procedure is the same as for air-to-extend actuators except that the entire upper case assembly (including spring barrel (71), spring (22), spring seats (33 & 34), nut (30) and diaphragm plate (40)) must be removed to release the diaphragm. Install a new diaphragm and reassemble the above parts.

spring adjustment: Procedure is identical with that for air-to-extend actuators except that supply air is piped to the 1/4" port in the yoke.

packing box: The packing box is subject to low air pressure only and requires minimum maintenance. The packing rings have a square section and are in asbestos. The packing may be added to or completely replaced without disassembling either the actuator or the mechanism (or valve) to which it is attached. Be sure to tighten packing nut (20) lightly. Over-tightening will cause excessive friction resulting in sluggish performance.

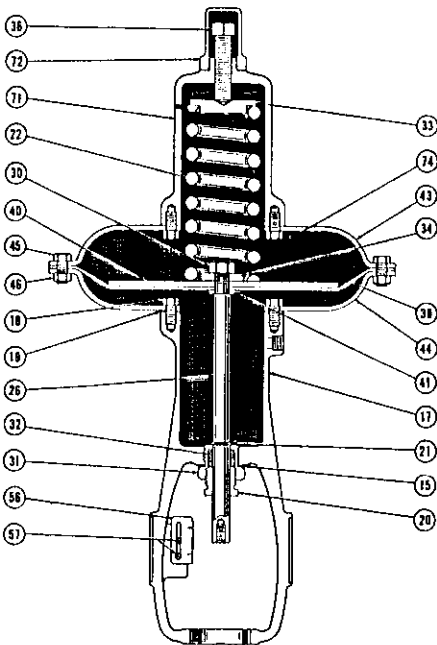


Case Nos. 9, 11, & 13

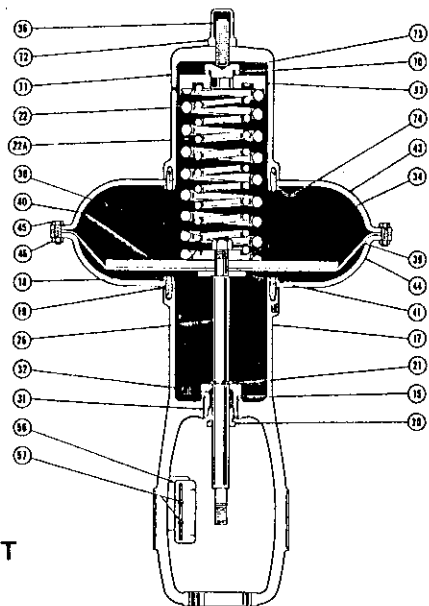


Case Nos. 15, 18 & 18L

**AIR-TO-EXTEND
ACTUATORS
(TYPE 37)**



Case Nos. 9, 11 & 13



Case Nos. 15, 18 & 18L

**AIR-TO-RETRACT
ACTUATORS
(TYPE 38)**

PARTS REFERENCE

Ref. No.	Part Name	Computer Abbrev.	Ref. No.	Part Name	Computer Abbrev.	Ref. No.	Part Name	Computer Abbrev.
* 15	Gasket (packing box)	GASKET	* 32	Packing	PACKING	45	Cap Screw (diaph. case)	CAP SCR
17	Yoke	YOKE	33	Spring Seat (upper)	USPR ST	46	Nut (diaph. case)	NUT
18	Cap Screw (L. case to yoke)	CAP SCR	34	Spring Seat (lower)	LSPR ST	56	Travel Indicator Scale	TI SCL
* 19	Gasket (L. case to yoke)	GASKET	35	Pipe Plug	PIP PLG	57	Machine Screw	MCN SCR
20	Packing Nut	PKG NUT	36	Spring Adjustor	SPR ADJ	70	Ball and Retainer	BAL & RTN
21	Snap Ring	SNP RNG	37	Bushing (spring adjustor)	BUSHING	71	Spring Barrel	SPR BRL
22	Actuator Spring	ACT SPR	* 39	Diaphragm	DIAPHRM	72	Spring Barrel Cap	SBL CAP
22A	Actuator Spring	ACT SPR	40	Diaphragm Plate	DPH PLT	73	Ball Bearing Race	BBG RCE
26	Actuator Stem	ACT STM	41	Diaphragm Washer	DPH WSH	74	Cap Screw (SBL to U D CSE)	CAP SCR
30	Nut (actuator stem)	NUT	43	Upper Diaphragm Case	U D CSE			
31	Packing Box	PKG BOX	44	Lower Diaphragm Case	L D CSE			

*Recommended spare parts



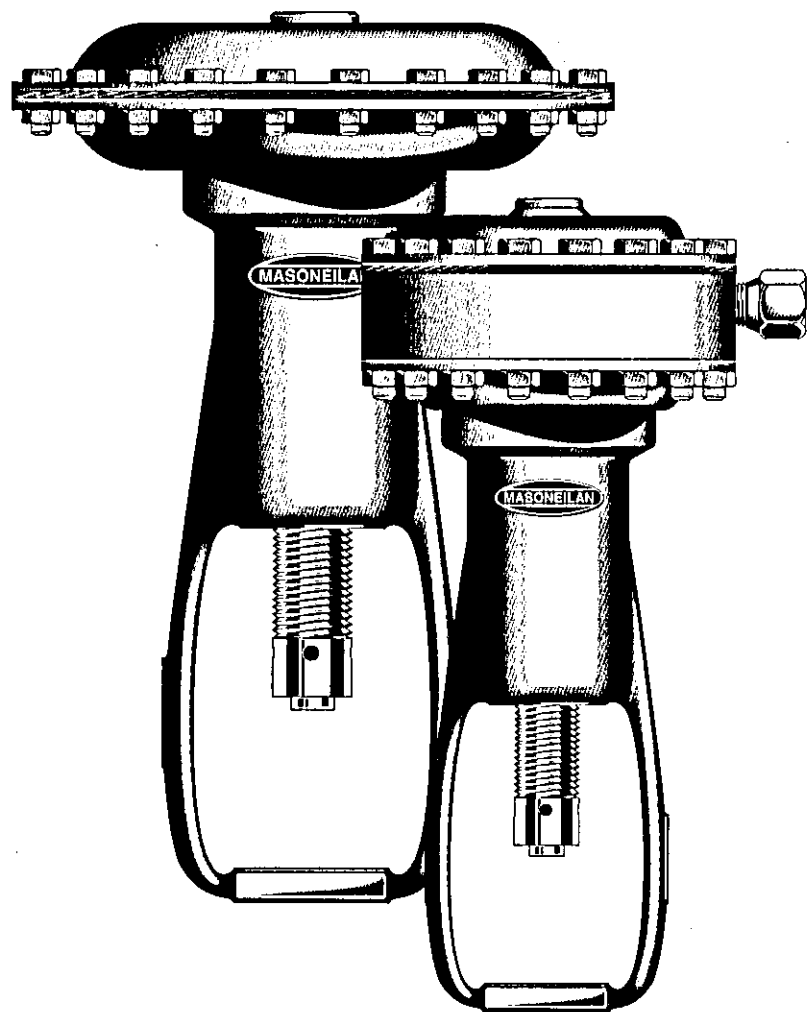
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10900 Series Actuators
For use with 500 Regulators Instructions

Instructions No 176420 E
Rev. B 08/97

10900 Series Actuators for use with 500 Regulators Instructions



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General

These adjustment and maintenance instructions apply to the 10900 Series Actuators used with the Masoneilan 500 Series Pressure Regulators. They include a parts reference list including recommended spare parts (see pages 3 & 4).

For installation, operation, adjustment and maintenance of the 500 Series Regulators body S/A refer to instructions Nos indicated by the following table.

Regulator Model No	Body S/A Instruction No
525; 525-50 526; 526-50	EY5200 E; EY4550 E
535H; 535H-50 536H; 536H-50	176418E
535V; 535V-50	176419E

Spare parts

When performing maintenance always use Masoneilan replacement parts. Parts are obtainable through your local Masoneilan Representative or Spare Parts Department. When ordering parts, always include Model and Serial Numbers shown on serial plate.

Description-Operation

The 10900 Actuator is a simple powerful mechanical device. It is Air-to-Extend Stem type. The nominal range of an actuator is the pressure range in pounds per square inch (psi) in which the pressure setting can be obtained by adjustment.

Conformation of the diaphragm (11) to the diaphragm plate (10) serves as a flexible upper guide for the actuator stem (6). Nylon reinforced neoprene diaphragms permit smooth, sensitive operation. The lower guide is an oil impregnated bronze bushing (3) located in the spring adjuster (2).

Note: On request, for special services, the nylon reinforced neoprene diaphragm may be provided with a PTFE coating.

The 10900 Series Actuators are designed for use with the 500 Series Regulators for reducing, back pressure and differential pressure applications.

Function	Regulator Model No	Actuator Type
REDUCING	525 535H 535V	Spring Diaphragm
BACK PRESSURE	526 536H	
DIFFERENTIAL REDUCING	525-50 535H-50 535V-50	Differential
DIFFERENTIAL BACK PRESSURE	526-50 536H-50	

After sales Department

Masoneilan has a highly skilled After Sales Department available for start-up, maintenance and repair of our regulators and components parts. Contact the nearest Masoneilan Sales Office or Representative or, directly the After Sales Department of Condé-sur-Noireau Plant.

Training

MASONEILAN regularly holds training seminars for technicians in its factory of Condé-sur-Noireau. In order to participate in one of these training seminars you should get in touch with our local Masoneilan Representative or our Training Department.

The following instructions should be thoroughly reviewed and understood prior to installing operating or performing maintenance on this equipment. Only qualified personnel to service this equipment.

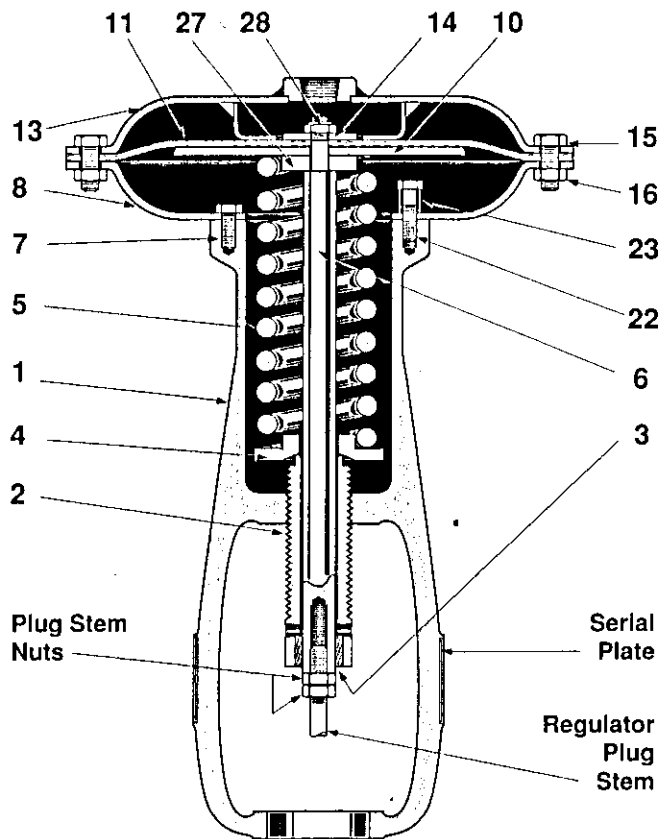
Non-compliance with safety rules and caution notes of this instruction may bring about malfunction of the device or damage it seriously. In addition, such negligence might expose personnel present on the field to grave hazards.

The opposite chart indicates the combinations available to provide the desired function. The 10900 Series Actuators are designated by the nominal range (psi). See the following chart.

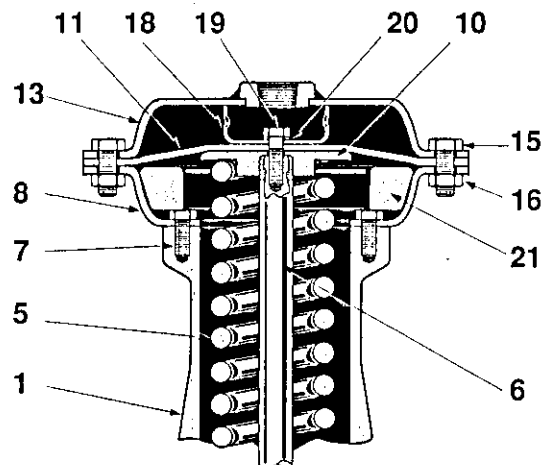
In Spring Diaphragm Actuators, three actuator cases are available: a case rated for 60 psi static pressure, a case rated for 250 psi static pressure and a case rated for 750 psi static pressure.

In Differential Pressure Actuators, two actuator cases are available: a low-pressure case rated for 250 psi static pressure, and a high-pressure case rated at 600, 1000 and 1500 psi static pressure.

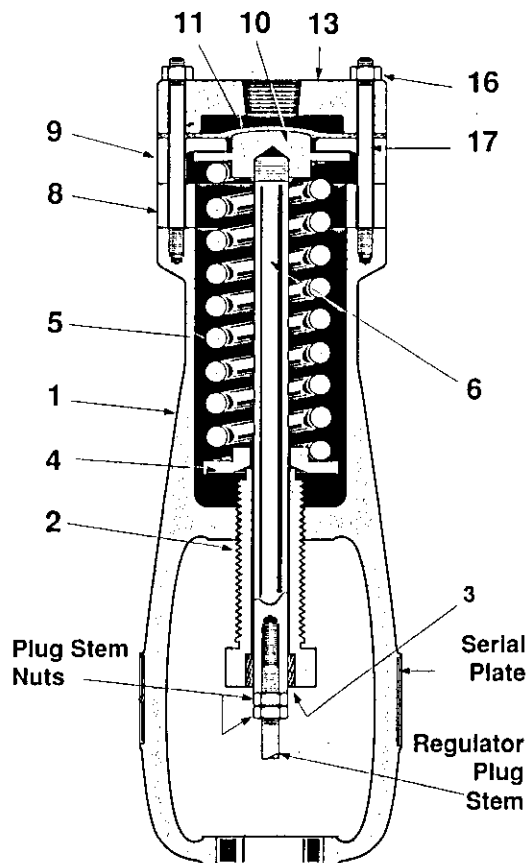
Actuator Type	Range (psi)	Max. Static Pressure (psi)	Case Size
Spring Diaphragm	0,5 - 2	60	11
	1,5 - 3 2 - 10 6 - 20 15 - 40		9
	30 - 75 60 - 125 80 - 250 150 - 750		250
	Low Pressure Case		
	3 - 12 10 - 35 30 - 75 60 - 125	250	5 4
	High Pressure Case		
Differential	3 - 15 30 - 85	600	5
	5 - 30 10 - 60		1000
	75 - 185 100 - 330	1500	3 1/2



Design for the 0,5-2 ; 1,5-3 ; 2-10 ; 6-20
and 15-40 psi ranges



Design for the 30-75, 60-125
and 80-250 psi ranges



Design for the 150-750 psi range

Figure 1 — Spring-Diaphragm Actuators for 500,
500H and 500V Models Regulators

PARTS REFERENCE

Ref.	Part Name	Ref.	Part Name	Ref.	Part Name
1	Yoke	② 9	Diaphragm Chamber	③ 18	Stop Cup
2	Spring Adjuster	10	Diaphragm Plate	③ 19	Diaphragm Screw
3	Bushing (Incl. Ref. 2)	11	Diaphragm ●	③ 20	Dynaseal Washer ●
4	Lower Spring Seat	13	Diaphragm Case (Upper)	④ 21	Reducing Ring
5	Actuator Spring	① 14	Diaphragm Washer	⑤ 22	Stop Screw
6	Actuator Stem	15	Cap Screw (Diaph.case)	⑤ 23	Stop Spacer
7	Cap Screw (L. case to yoke)	16	Nut (Diaph.case)	① 27	Upper Spring Washer
8	Diaphragm Case (Lower)	② 17	Stud (Diaph. case)	① 28	Locknut (Actuator stem)

● Recommended spare parts

① Only on 0,5-2 ; 1,5-3 ; 2-10 ; 6-20 and 15-40 psi ranges

② Only on 150-750 psi range

③ Only on 30-75; 60-125 and 80-250 psi ranges

④ Only on 60-125 and 80-250 psi ranges

⑤ Only on 0,5-2 ; 1,5-3 ; 2-10 ; 6-20 and 15-40 psi ranges actuators mounted on types 526 and 536H regulators

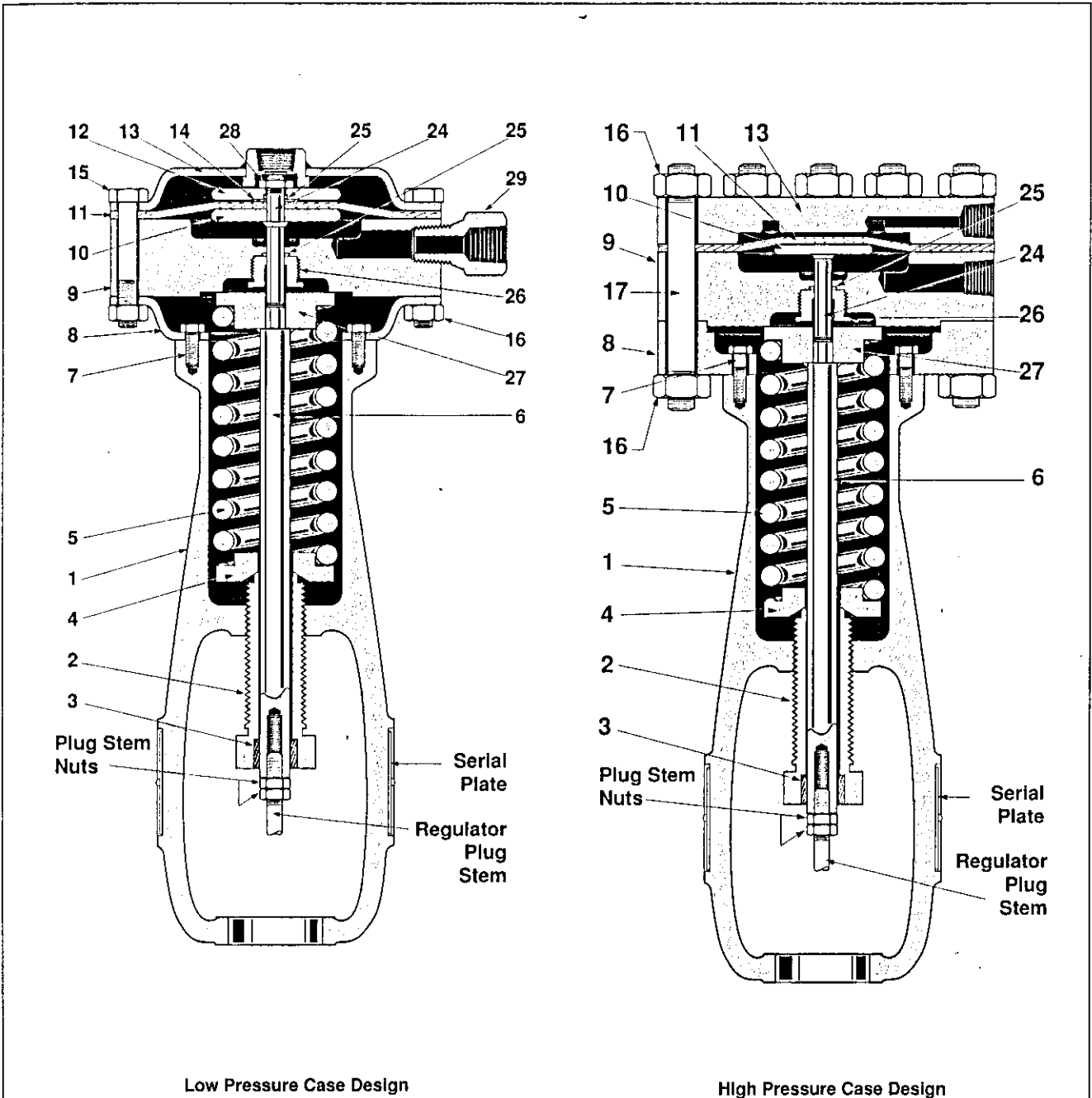


Figure 2 — Differential Pressure Actuators for 500-50, 500H-50 and 500V-50 Models Regulators

PARTS REFERENCE

Ref.	Part Name	Ref.	Part Name	Ref.	Part Name
1	Yoke	9	Diaphragm Chamber	② 17	Stud (Diaph. case)
2	Spring Adjuster	10	Diaphragm Plate (Incl. w. Ref. 24)	24	Plunger Sub-assembly
3	Bushing (Incl. Ref. 2)	11	Diaphragm ●	③ 25	O-Ring ●
4	Lower Spring Seat	① 12	Upper Diaphragm Plate	26	O-Ring Retainer
5	Actuator Spring	13	Diaphragm Case (Upper)	27	Upper Spring Seat (Incl. w. Ref. 6)
6	Actuator Stem	① 14	Diaphragm Washer	① 28	Locknut
7	Cap Screw (L. case to yoke)	① 15	Cap Screw (Diaph.case)	① 29	Connection Adapter
8	Diaphragm Case (Lower)	16	Nut (Diaph.case)		

● Recommended spare parts
 ① Only on Low Pressure Case Design
 ② Only on High Pressure Case Design

③ Qty: 2 on Low Pressure Case Design
 Qty: 1 on High Pressure Case Design

Installation

On steam service, the regulator should be installed with the actuator down so that the diaphragm will be protected by a condensate barrier. If installed otherwise, an adequate condensate barrier must be incorporated.

In the Spring Diaphragm Actuators, the 1/2" NPT pressure connection is located on the upper diaphragm case (13).

In the Differential Pressure Actuators, the 1/2" NPT high pressure connection is located on the upper diaphragm case (13) and the 1/2" NPT low pressure connection is located on the diaphragm chamber (9) or on the connection adapter (29).

Refer to Regulators Body S/A Instructions for installation according to the regulator function.

Adjustment

When pressure setting has been specified in order, the regulator is set accordingly at the factory for test. **Then, the spring compression is fully removed to avoid unnecessary stress to parts (diaphragm, spring) during the stocking.**

It is necessary to proceed with adjustment before servicing.

The regulator pressure range is engraved on the serial plate.

Proceed as follows :

- Open stop valve on the outlet side of the regulator and partially open stop valve on the inlet side, allowing pressure in the system to build up slowly.
- Open controlled pressure line valve(s) and check setting by means of the gauge(s). Set by means of the spring adjuster (2) of the actuator.

(To increase pressure setting (or pressure differential), turn adjusting screw clockwise to compress the spring. To decrease the setting, turn adjusting screw counterclockwise to relieve spring compression).

- Fully open stop valve on the inlet side of the regulator.

Maintenance

CAUTION: Regulator must be isolated and pressure vented before disassembly.

Replacing diaphragm

On spring diaphragm actuators (500 series Regulators), (Figure 1)

- Remove the controlled pressure line from the diaphragm case (13) and relieve all spring compression by unscrewing spring adjuster (2).
- Remove upper diaphragm case (13), [nuts (16) and screws (15)], [not screws (15) on 150-750 psi range].
- **a) On 0,5-2 ; 1,5-3 ; 2-10 ; 6-20 and 15-40 psi ranges:**
Remove locknut (28), diaphragm washer (14) and diaphragm (11).
- **b) On 30-75, 60-125 and 80-250 psi ranges:**
Remove diaphragm screw (19), seal washer (20), stop cup (18) and diaphragm (11).
- **c) On 150-750 psi range:**
Remove diaphragm (11).

Note: By means of a wrench applied on the plug stem nuts, hold the actuator stem during this operation.

- Install new diaphragm and reassemble by reversing of the above description order.
- Readjust the spring compression (see above).

On differential actuators (500-50 series Regulators), (Figure 2)

a. On low pressure case design:

- Remove the high and low pressure lines from the diaphragm case (13) and the diaphragm chamber (9).
- Relieve all spring compression by unscrewing spring adjuster (2).
- Remove nuts (16) and cap screws (15). Remove upper diaphragm case (13).
- Remove locknut (28), upper diaphragm plate (12), upper O-Ring (25), washer (14) and diaphragm (11).
- Install new diaphragm and reassemble by reversing of the above description order. Replace upper O-Ring (25) if necessary.
- Readjust the spring compression (see above).

b. On high pressure case design:

- Remove the high and low pressure lines from the diaphragm case (13) and the diaphragm chamber (9).
- Relieve all spring compression by unscrewing spring adjuster (2).
- Remove nuts (16), upper diaphragm case (13) and diaphragm (11).
- Install new diaphragm and reassemble by reversing of the above description order.
- Readjust the spring compression (see above).

Replacing O-ring(s) (25) (low and high pressure case)

On differential actuators, (Figure 2)

- Disassemble the actuator head as described on the paragraph : "Replacing diaphragm", (see page 5).
- Remove diaphragm chamber (9) with plunger S/A (24).

- With a wrench applied over O-Ring retainer (26), unscrew it out of-diaphragm chamber (9).
- Remove O-Ring (25), being careful not to damage plunger. Install new O-Ring, replace and tighten O-Ring retainer (26).
- Reassemble and readjust spring compression, (see page 5).

Caution: Uniformly tighten all diaphragm case nuts (16) when reassembling.

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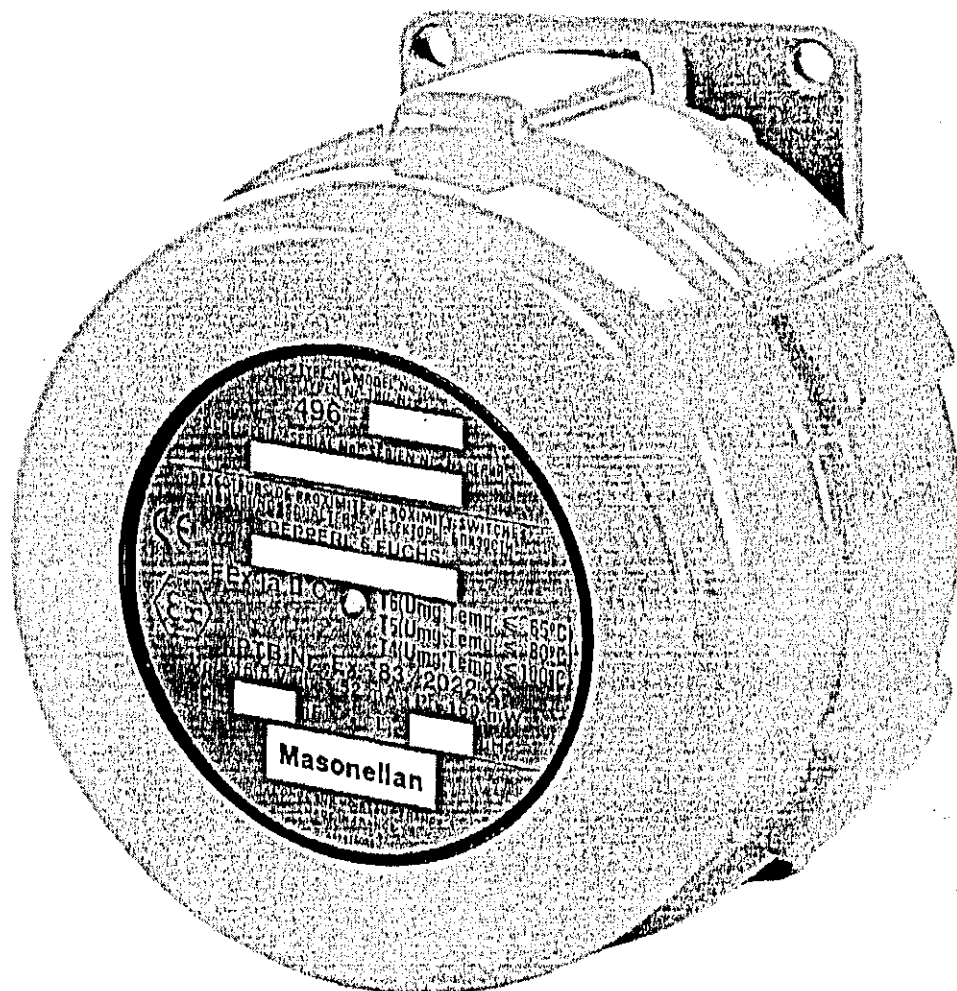
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Rev. B 08/97

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**Models 496-4 and 496-5
Rotary position detectors Instructions**

Masoneilan Models 496-4 and 496-5 Rotary position detectors Instructions



description and operation

Description (Figure 3)

In connection with a relay, the series 496 rotary position detectors are used for indicating one or two plug positions of a control valve (full opened or full closed).

They may be equipped with one or two proximity detectors, each of them being actuated by an arm adjustable by friction.

The housing and cover are of anodized aluminum, epoxy painted.

Series 496 position detectors may be mounted on the Camflex II rotary valves (35 002 Series) or Varimax (30 000 Series), Control Ball II valves (36 002 Series), butterfly valves as MiniTork II (37 002 Series) or HPBV (39002 Series) valves.

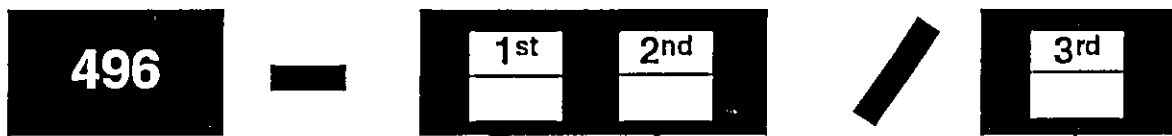
Also, they may be used on valves as the 11 000, 21 000 and 41 000 Series and all other linear motion valves. A parts list for the Series 496 detector appears in page 3.

Operation (Figure 3)

The detectors (34) are built around of an oscillator altered by the presence of a metallic part - arm (33) - in its detection field.

The internal change in resistance is used for controlling the relay.

NUMBERING SYSTEM OF THE 496 SERIE



Instrument Type
1. Mechanical switch with one single pole, double throw contact arrangement
2. Mechanical switch with two single poles, double throw contact arrangement
3. Potentiometric Position Transmitter
4. Electronic switch with one proximity detector
5. Electronic switch with two proximity detectors
6. Mechanical switch with one double pole, double throw contact arrangement
7. Mechanical switch with two double poles, double throw contact arrangement
8. Optoelectronic Position Transmitter

Protection
55. Weatherproof (E)
56. Weatherproof, oxygen environment (E)
57. Explosionproof and weatherproof (E)
58. Intrinsically safe and weatherproof (E)
These two digits are used only when European standards are concerned.
Otherwise the instrument is explosionproof and weatherproof (US)

E= European standards

Additional Switch* (if any)
1. Mechanical switch with one single pole, double throw contact arrangement
2. Mechanical switch with two single poles, double throw contact arrangement
4. Electronic switch with one proximity detector
5. Electronic switch with two proximity detectors
6. Mechanical switch with one double pole, double throw contact arrangement
7. Mechanical switch with two double poles, double throw contact arrangement

* This digit and its oblique bar is only used when the transmitter is provided with an auxiliary switch

Caution: Electrical protection of some of the above mentioned equipment combinations, can be not in accordance with all protection standards. Consult Masonellan.

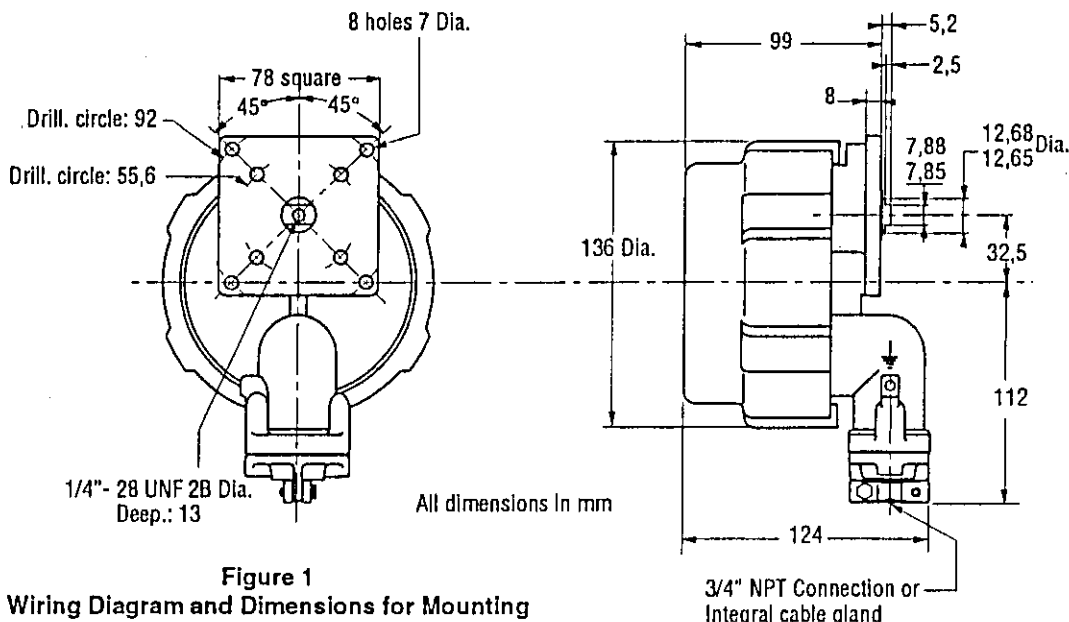


Figure 1

Wiring Diagram and Dimensions for Mounting

installation and adjustments

Installation

Electrical Protection

The detectors and other parts are protected by a housing presenting a tight degree up to IP65 following to standard CEI 144 and IP657 following to standard NFC20.010. This tight degree is ensured by two O-rings (7 & 10) located between body and cover and on the detector shaft.

Intrinsically safe circuit: Only the intrinsically safe bifilar line and models 496-4 (or 5) position detectors may be installed in hazardous area.

The detectors are in accordance with the following European standards (CENELEC):

EN 50014 & 50020

- EEx d II CT6 (ambient temperature $\leq 65^{\circ}\text{C}$)
- EEx d II CT5 (ambient temperature $\leq 80^{\circ}\text{C}$)
- EEx d II CT4 (ambient temperature $\leq 100^{\circ}\text{C}$)

The power relay (*No supplied by MASONELAN*) must be located outside the hazardous area. To define the line, refer to the Test laboratory report.

Electrical Connection-Wiring (Figures 1 & 2)

A cable entry is integrated at the bottom of the housing and includes a cable clamping device. Different leak-proof packings allow the adaptation of diameters of unarmed cables from 6 to 15 mm.

The cable entry is also available in $\frac{3}{4}$ " NPT threaded connection form. This can be designed to answer most of the customer requests.

The wiring is performed by means of a terminal strip (24) located into the housing. See diagram of the Figure 2.

The installation in hazardous locations should be according to the regulations in force concerning flameproof material.

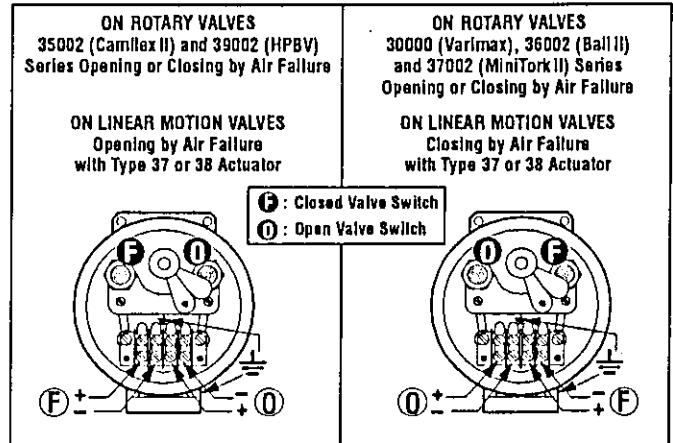


Figure 2 - Wiring Diagram

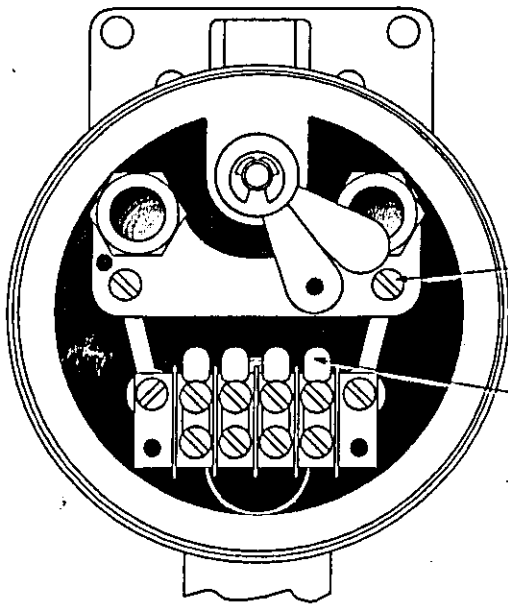
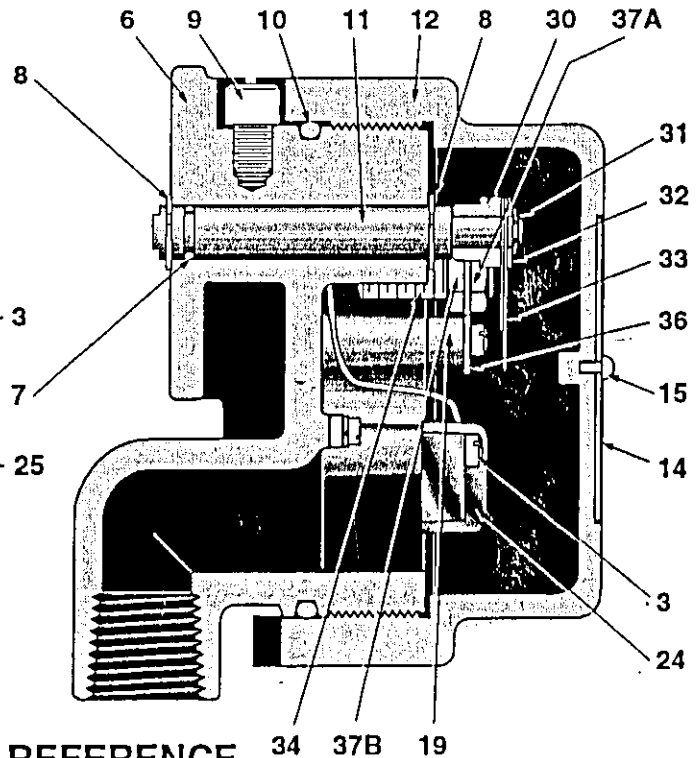


Figure 3
Cutaway Views of Types 496-4/5
Position Detectors



PARTS REFERENCE

Ref.	Part Name	Ref.	Part Name	Ref.	Part Name
3	Screw	12	Cover	31	Snap Ring
6	Body	14	Serial Plate	32	Washer
● 7	O-Ring	15	Drive Screw	33	Arm
8	Snap Ring	19	Spacer	34	Detector
9	Screw	24	Terminal Strip	* 35	Spacer (Not shown)
● 10	O-Ring	25	Terminal	36	Detector Bracket
11	Shaft	30	Spacer	37	Nut ((Fastening Detector)

- Recommended Spare Parts
- * Only on 496-4 Model

Coupling

The coupling of the detector shaft to the valve is made by means of a back lever and a motion linkage proper to each valve configuration. The back lever is fastened to the arm shaft (11) with a washer and a hex. head screw. Figures 7 to 10 show installation details on the various valves.

Adjustments

The series 496 detector is normally installed and adjusted on the control valve at the factory. To adjust the instrument in the field, proceed as follows:

CAUTION: During adjustment operations, take care not to modify the gap between the arms and detectors (by pushing or pulling the arm extremities); a change of the gap would result an alteration of switching points.

496-4 Model

1. Actuate the valve to the desired switching position. (full opened or full closed) and determine what will be the rotating sense of the shaft when the arm will leave the "switching" position.
2. According to the so defined rotating sense, the Figure 4 shows the positions of the detector on its bracket (right side or left) and arm when switching.

Slowly turn the arm towards the detector until obtaining switching. Switching occurs when arm covers approximately $\frac{1}{3}$ of the detector sensitive face.

496-5 Model

Before any valve operating, position the arms as shown on Figure 5 (a).

During the following adjustments, take care that the detector marked by a red spot be controlled by the arm having the same red spot.

First Switching Adjustment

The adjustment of the first switching is carried out at the beginning of the actuator stroke.

1. Determine what will be the rotating sense of the shaft when pressure will increase in actuator.

According to the so defined rotating sense, the Figure 5 (b, c) indicates the detector and the arm to assign for the first switching point.

2. Slowly turn both arms together towards the detector until switching of the corresponding relay.

Second Switching Adjustment

The adjustment of the second switching is carried out at the end of the actuator stroke.

3. With one hand, lock-up the first detector arm and with the other hand, bring the second arm towards the detector until switching of the corresponding relay.
4. Be sure that the first switching adjustment remains satisfactory.

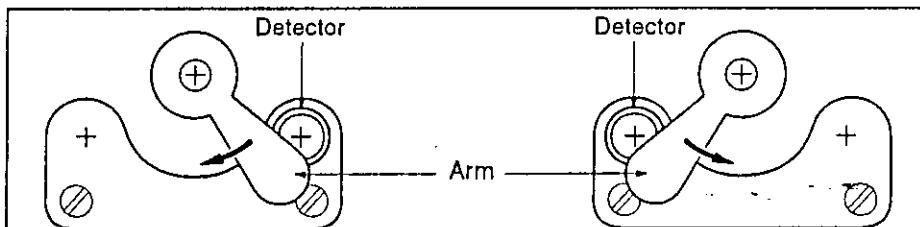


Figure 4—Position of the Arm on the 496-4 Model

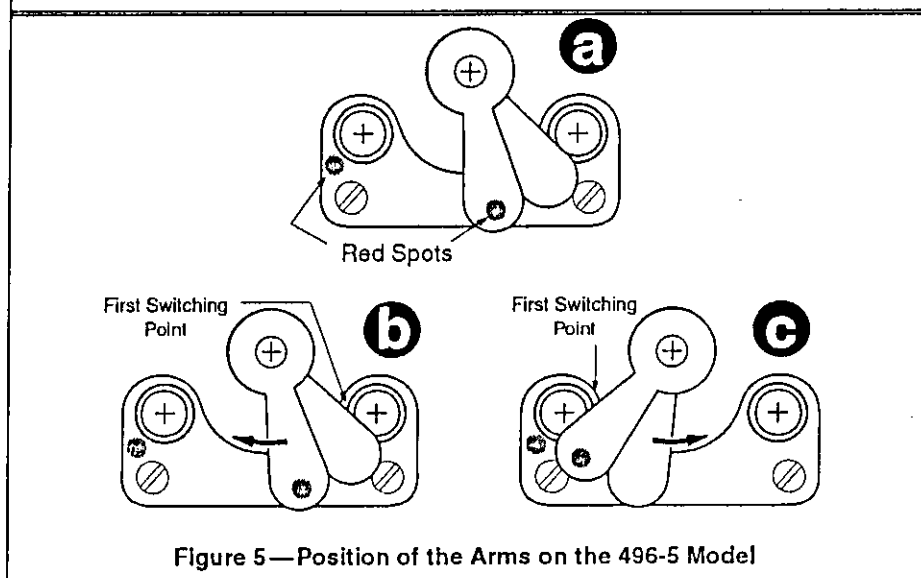


Figure 5—Position of the Arms on the 496-5 Model

Gap Adjustment

Gap between detector and arm is adjusted at the factory. If it would be necessary to carry out this adjustment, proceed as follows:

1. Loosen the detector mounting nut (37A) located in front of the bracket (36).
2. Unscrew the locknut (37B) by some turns.
3. Position the arm facing to the detector and push on the shaft end (11), at the mechanism side, so as to eliminate the longitudinal clearance.
4. Lock-up the detector in rotation and turn nut (37A) in holding it against the bracket (36). Adjust gap at .012" (0,3 mm): check it with a thickness-gauge.
5. Tighten the nut (37B)

Arm Shaft (11) Removal

In case of disassembling the shaft (11), remove the rear retaining ring (8).

Note: Do not intervene on the other retaining ring (8) (located in front); this one is positioned at the factory so as to keep the minimum longitudinal clearance at the shaft assembly).

When re-assembling, make sure that shaft (11) be sufficiently lubricated; if not, coat it with a "Molykote G[®]" grease, or equivalent.

Arms Removal (33)

If for some reason, the arms of a model 496-5 detector have been dismantled, reassemble as follows:

Successively install on the shaft (11): the spacer (30), the arm (33), the second arm (33) marked by a red spot, then the washer (32). Put the retaining ring (31) in place.

In the case of a model 496-4 detector, install on the shaft (11): the spacer (30), the arm (33), a spacer (35) and the washer (32). Put the retaining ring (31) in place.

Relay (No supplied by MASONEILAN)

The relay is supplied with alternating current. Its consist of a transformer, a rectifier, an amplifier and a two switching output relay.

The switches may be connected to audible alarms or signal lights for warning one or two predetermined plug positions of a control valve.

These switches may also be used to actuate solenoids, relays and other electrical devices.

The single relay (for model 496-4 detector) is provided with one control circuit. This one controls a single pole double throw switch, (Figure 6a).

The double relay (for model 496-5 detector) is provided with two independent control circuits. Each of them controls a single pole double throw switch, (Figure 6b).

Electrical rating : 4 A max.
250 V max.
500 W max.

See paragraph "Installation".

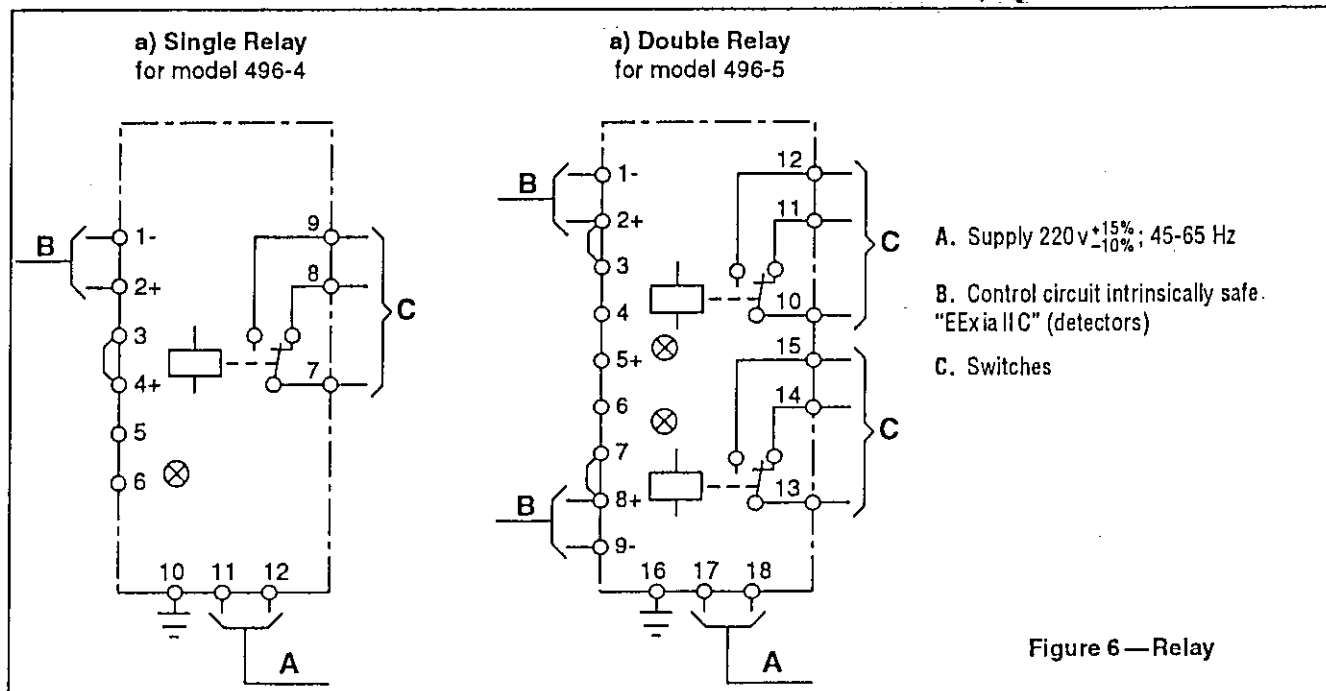


Figure 6—Relay

Mounting arrangements

On 35002 Series Camflex II Valves (Figure 7):

1. Remove shaft cover, or if equipped with a positioner, remove positioner and mounting plate.
2. Remove bottom cover (2).
3. Install mounting bracket (3) using two flat head screws (7).
4. Screw pin (12) to control lever (10).
5. Remove cap screw (11) from control lever (10) and slide control lever onto shaft, behind the main lever of the valve. Position control lever (10) in line with main lever. Replace and tighten cap screw (11).
6. Mount detector (1) on bracket (3) using the four cap screws (4) and the four hex. nuts (8).
7. For 3" (80mm) valve size and larger, slide slotted bottom cover (2) over the lever (10) and push in place.
8. Place slotted end of the back lever (9) over pin (12) of the control lever (10). Secure with washer (13) and clip (14).
9. Attach the back lever (9) to the detector shaft using lock washer (5) and cap screw (6).
10. Refer to pages 3 to 5 to proceed with wiring and adjusting detectors.

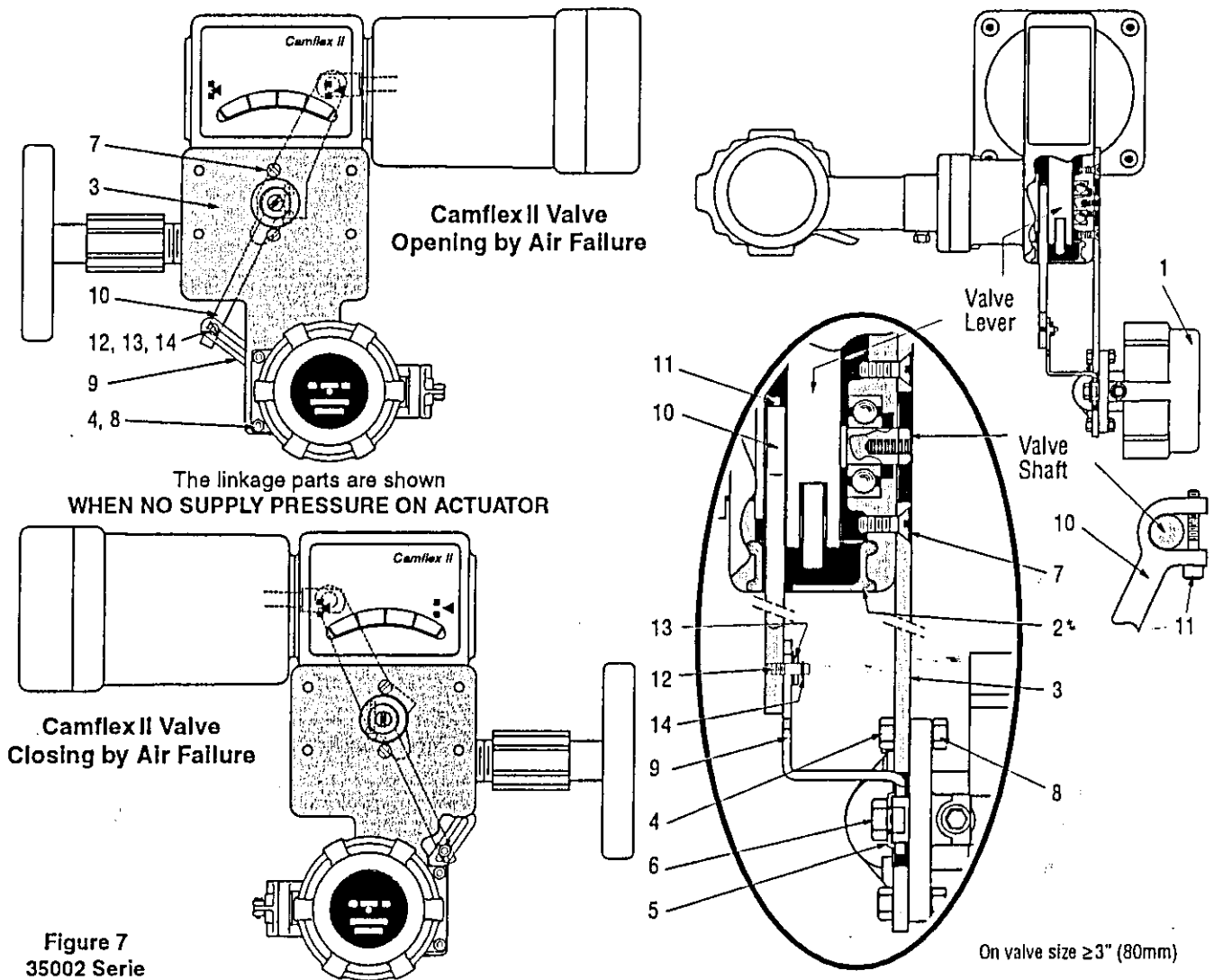


Figure 7
35002 Serie
Camflex II Valve

PARTS REFERENCE

Ref.	Part Name	Ref.	Part Name	Ref.	Part Name
1	496 Rotary Detector	6	Cap Screw	11	Cap Screw (Control lever)
2	Bottom Cover	7	Flat Head Screw	12	Lever Pin
3	Mounting Bracket	8	Hex. Nut	13	Washer
4	Cap Screw	9	Back Lever	14	Retaining Clip
5	Lock Washer	10	Control lever		

On 30000 Series Varimax Valves (Figure 8):

1. Remove shaft cover, or if equipped with a positioner, remove positioner and mounting plate.
2. Screw the index-screw (17), with its lock washer (18), into one of the two threaded holes of the control lever (10).

Note: The head of the index-screw (17) will be engaged in the slot located on the valve shaft end to ensure the proper position of the control lever (10). The proper hole to be used configuration can be easily identified referring to the below Figure 8 and presenting the lever in the shown position.

3. By means of the hex. head screw (19), fit the control lever (10) on the valve shaft end in the proper position relating to the valve operating way.

4. Install the mounting bracket (3) by means of the spacer (15) and the two flat head screws (7).
5. Mount detector (1) on bracket (3) using the four cap screws (4) and the four hex. nuts (8).
6. Attach the back lever (9) to the detector shaft using lock washer (5) and hex. head screw (6).
7. Connect the back lever (9) to the control lever (10) by means of link (20), two driving pins (12), four washers (13) and two retaining clips (14).
8. Refer to pages 3 to 5 to proceed with wiring and adjusting detectors.

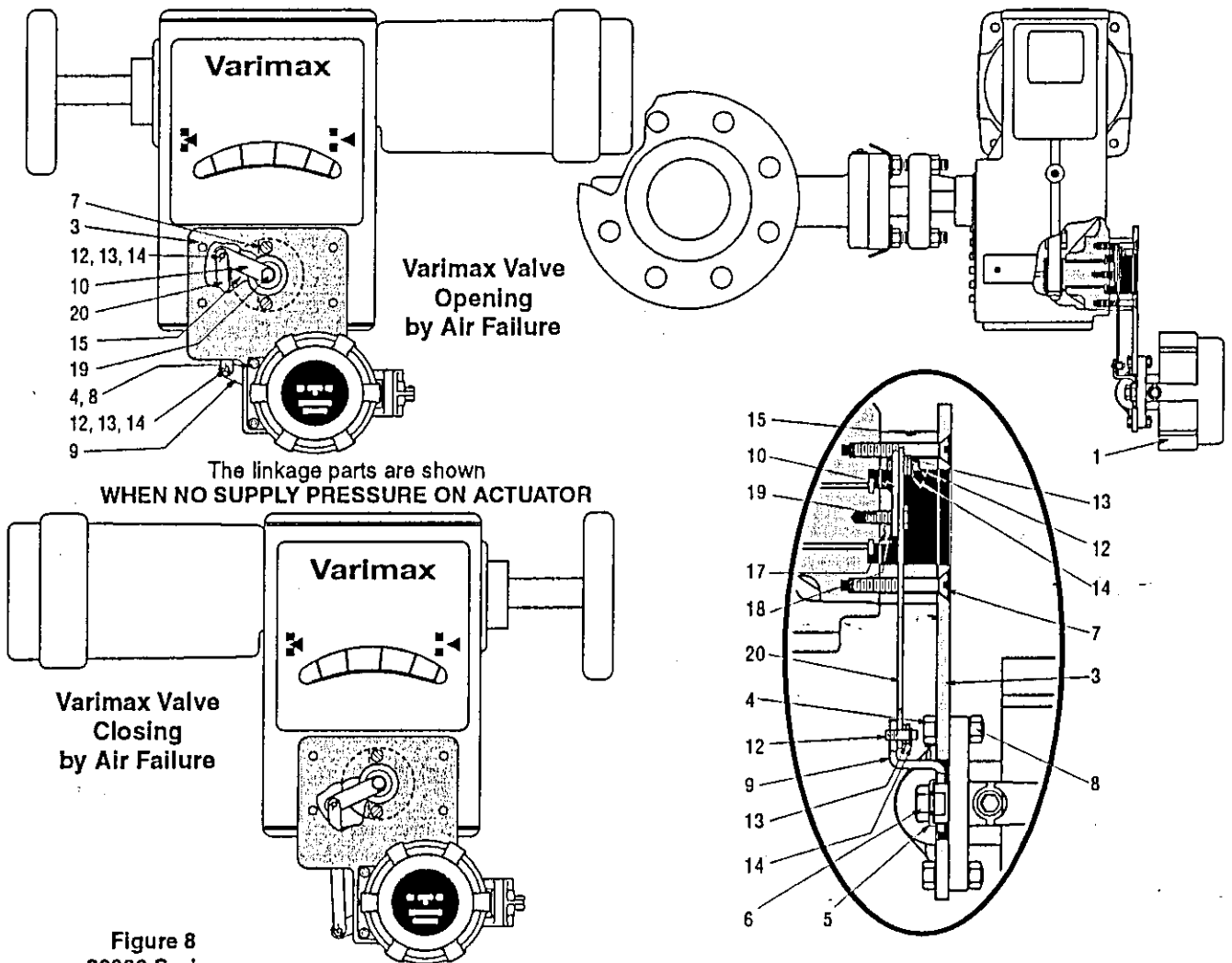


Figure 8
30000 Series
Varimax Valves

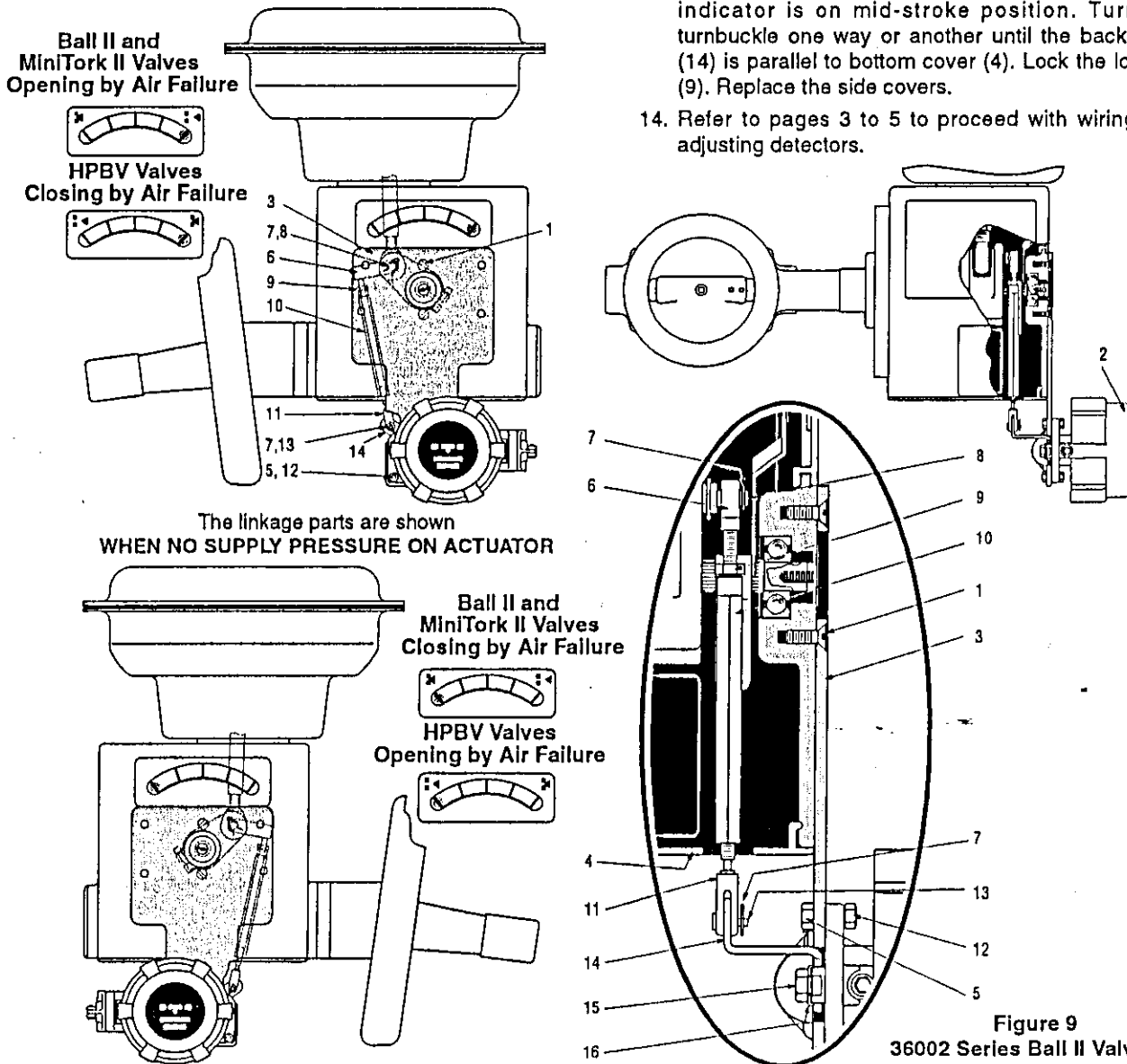
PARTS REFERENCE

Ref.	Part Name	Ref.	Part Name	Ref.	Part Name
1	496 Rotary Detector	8	Hex. Nut	15	Spacer (Mounting Bracket)
3	Mounting Bracket	9	Back Lever	17	Index-screw (Control lever)
4	Cap Screw	10	Control lever	18	Lock Washer
5	Lock Washer	12	Lever Pin	19	Hex. Head Screw
6	Hex. Head Screw	13	Washer	20	Link
7	Flat Head Screw	14	Retaining Clip		

On 36002 Series Ball II, 37002 Series MiniTork II and 39002 Series HPBV Valves (Figure 9):

1. Remove shaft cover, or if equipped with a positioner, remove positioner and mounting plate.
2. Remove plastic panels for access, bottom, front and sides.
3. Admit supply pressure on actuator until the actuator pivot pin (8) is in intermediate position, such that every load is removed from the pin.
4. Remove existing pivot pin and install special pin (8) with detector mounting pivot pin.
5. Assemble take off link (6), locknut (9) and turnbuckle (10), without tighten. Slide assembly over pivot pin (8) and push on retaining clip (7).

6. Install front cover.
7. Install mounting plate (3) using the two flat head screws (1).
8. Mount detector (2) to plate (3) using the four hex. head screws (5) and four nuts (12).
9. Assemble back lever (14) to the detector shaft using cap screw (15) and lock washer (16).
10. Replace the bottom cover (4) having proper holes.
11. Screw the clevis (11) on the turnbuckle (10). Rotate clevis to equalize the length of two engaged threaded ends.
12. Insert the clevis (11) through the proper hole of bottom cover (4) and connect to back lever (14) using clevis pin (13) and retaining clip (7).
13. Admit supply pressure on actuator until the travel indicator is on mid-stroke position. Turn the turnbuckle one way or another until the back lever (14) is parallel to bottom cover (4). Lock the locknut (9). Replace the side covers.
14. Refer to pages 3 to 5 to proceed with wiring and adjusting detectors.



PARTS REFERENCE

Ref.	Part Name	Ref.	Part Name	Ref.	Part Name
1	Flat Head Screw	7	Retaining Clip	13	Clevis Pin
2	496 Rotary Detector	8	Pivot Pin (Actuator)	14	Back Lever
3	Mounting Bracket	9	Locknut	15	Hex. Head Screw
4	Bottom Cover (Actuator)	10	Turnbuckle	16	Lock Washer
5	Hex. Head Screw	11	Clevis		
6	Take Off Link	12	Hex. Nut		

On No 37 and 38 Spring Diaphragm Actuators (Figure 10):

The 496 detector is rigidly mounted on the spring barrel of the diaphragm actuator by means of a bracket (7) fastened to the mounting pad with cap screws (8).

The back lever (9) is fastened to the end of the detector shaft with spring washer (15) and cap screw (17).

The turnbuckle (6) must be adjusted before adjusting the detectors. Apply air pressure to the actuator until the actuator stem has traveled exactly half the rated stroke. Loosen locknut (5) and turn the turnbuckle (6) until the back lever (9) is level. Tighten locknut (5), then proceed with wiring and adjusting detectors according to instructions on pages 3 to 5.

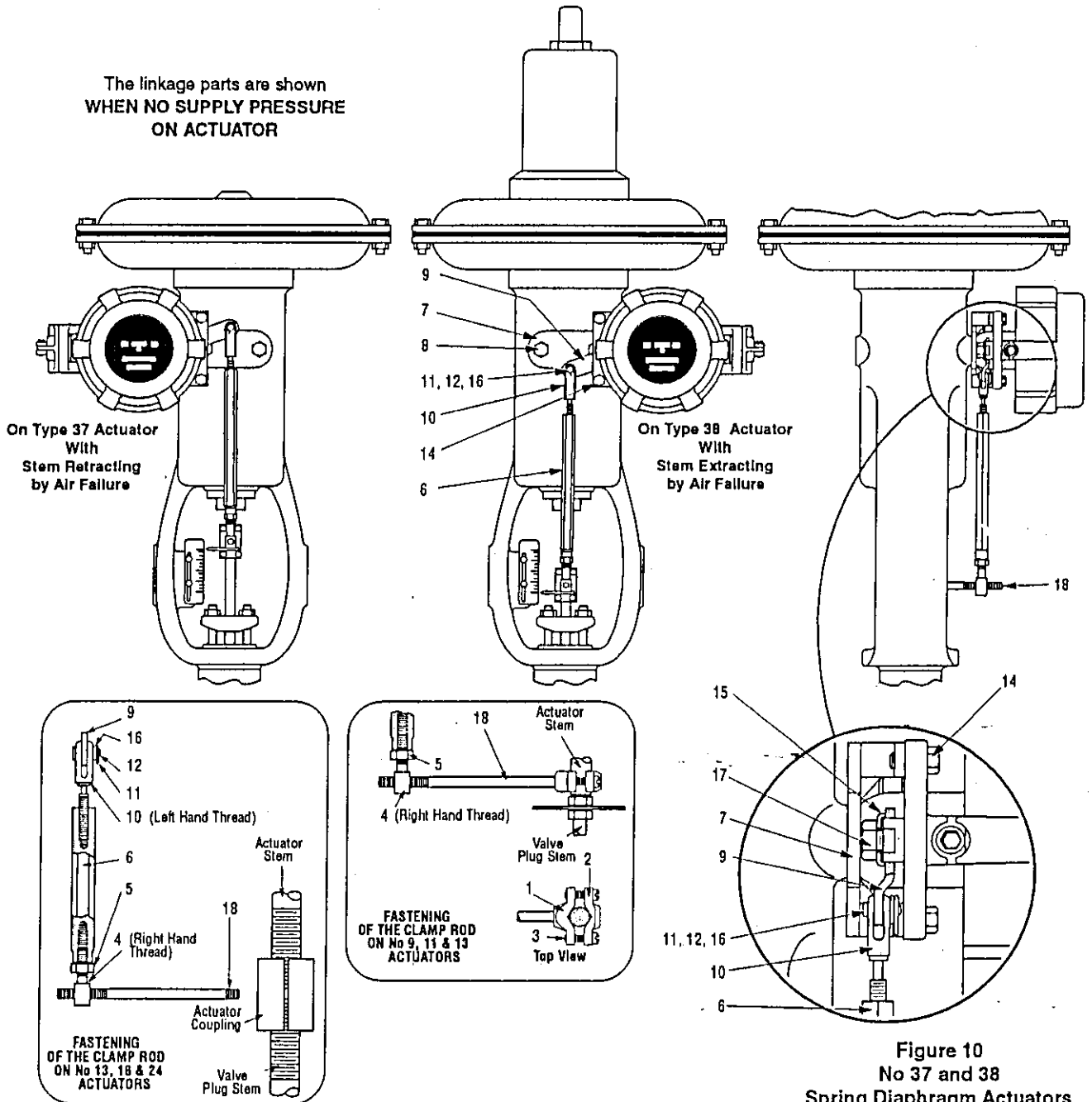


Figure 10
No 37 and 38
Spring Diaphragm Actuators

PARTS REFERENCE

Ref.	Part Name	Ref.	Part Name	Ref.	Part Name
1	Clamp	7	Mounting Bracket	14	Hex. Head Screw
2	Clamp	8	Hex. Head Screw	15	Lock Washer
3	Screw	9	Back Lever	16	Washer
4	Turnbuckle Screw	10	Clevis	17	Hex. Head Screw
5	Locknut	11	Retaining Clip	18	Clamp Rod
6	Turnbuckle	12	Clevis Pin		



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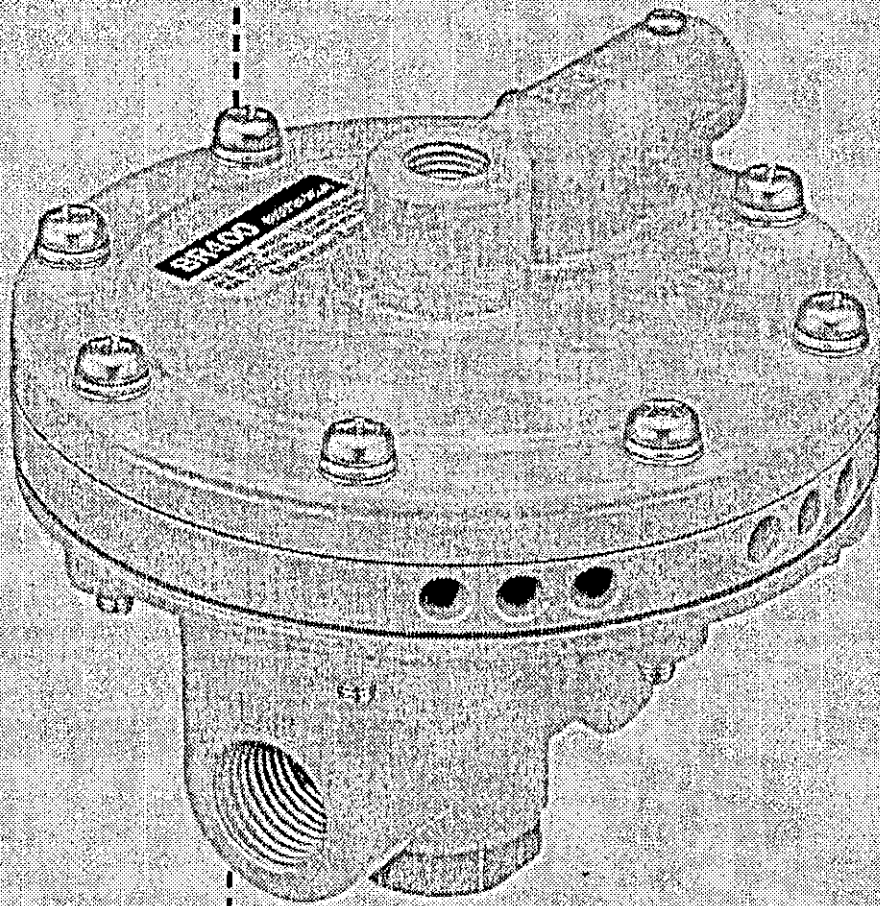
Model BR400 Booster Relay

MASONEILAN®

Model BR400 Booster Relay

ES0400

09/99



INSTRUCTION MANUAL

DRESSER VALVE
DIVISION

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Product Description

The Model BR400 is a high capacity volume booster for use on high-volume actuators to increase stroking speed. It is equally suitable for use on diaphragm or piston (single or double acting) actuators. The dynamic response can be altered by an adjustable bypass valve to obtain stable operation on a wide range of actuator sizes.

Features and Benefits

- Flow characteristics suitable for control valves
- Use of an aspirator structure provides excellent pressure regulation.
- Shorter stroking time with stable operation is achieved by the characteristics of the BR400 that produce a large air flow when the difference between the signal and output pressure is large and a decreasing flow volume as the pressure difference decreases. This characteristic together with proper adjustment of the bypass valve allows the BR400 to be used on all control valves utilizing booster relays.
- Secondary pressure partition plate (Seal Plate) to detect output pressure.
- Built-in bypass valve with lock screw for adjusting sensitivity of the system.
- Filter on both the supply pressure and signal pressure ports.
- Corrosion resistant finish and stainless assembly hardware to permit use in corrosive atmospheres.

Principle of Operation

Input pressure applied to the upper diaphragm produces a force which is opposed in a 1:1 ratio by the output pressure force acting on the lower diaphragm through the seal plate orifice. An increase in input pressure will depress the top diaphragm and open the pilot valve, admitting supply pressure to the output until the output pressure action on the lower diaphragm re-balances the forces. Conversely, a decrease in input pressure allows the exhaust valve to open until the output pressure falls to same value as the input. A stabilizing adjustable needle valve allows a controlled flow of input signal direct to output to obtain more stable control of small or slow input changes

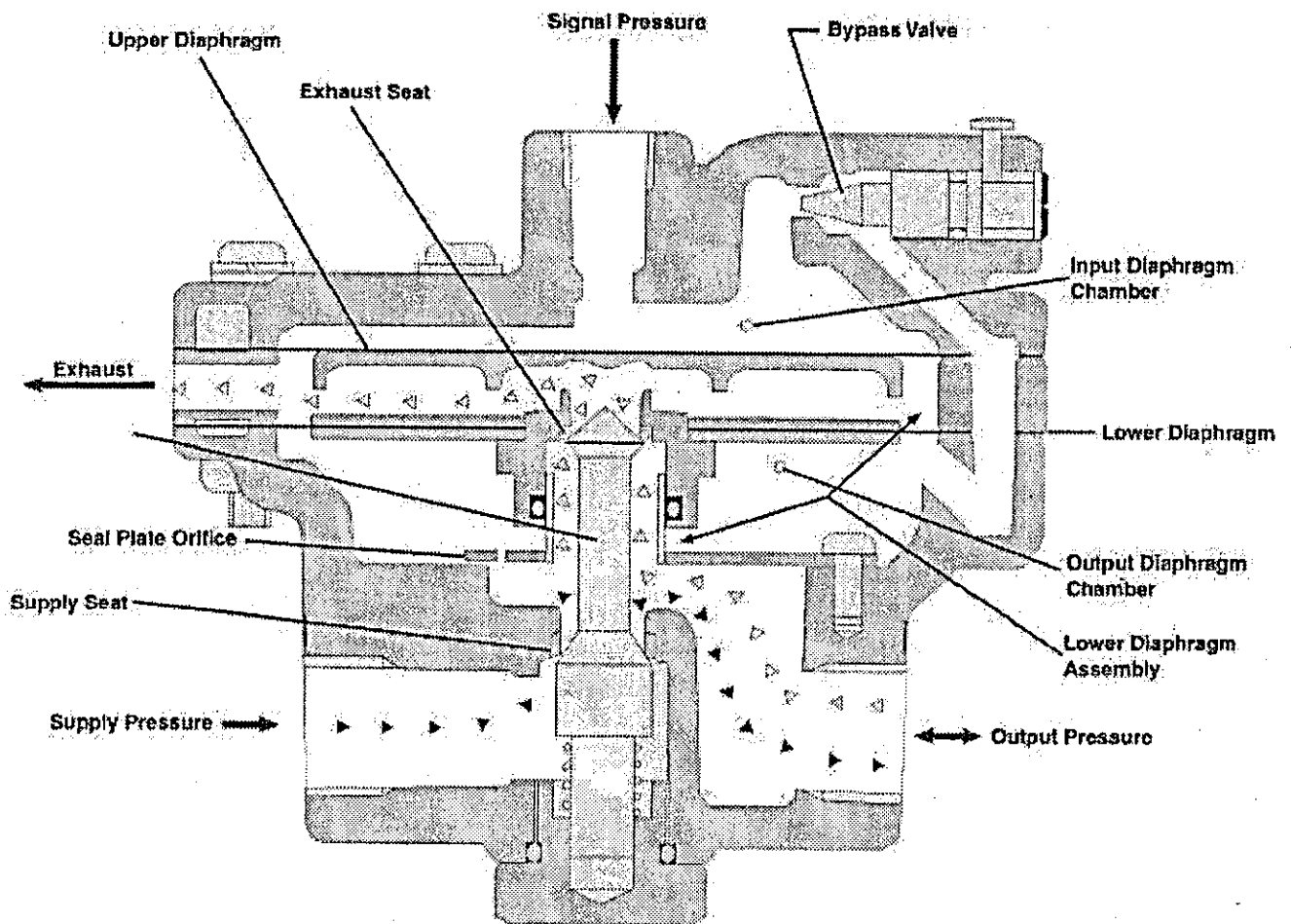


Figure 1 - Cut-away View of BR400 Booster Relay

Specifications:

Maximum Supply Pressure	150 psi (1.03 MPa, 10.3 bar)
Maximum Signal Pressure	150 ps1 (1.03 Mpa, 10.3 bar)
Operating Temperature Limits	-30° C to + 100° C (Optional -55° C to +100° C)
Input / Output Ratio	1:1
Accuracy of Input / Output Ratio	+ / - 2%
Approximate Weight	3 lbs. (1.4 kg)
Materials of Construction	See Figure 3 and Table 2
Maximum Cv (supply)	2.6 (See Figure 2)
Maximum Cv (exhaust)	2.4 (See Figure 2)
Deadband	See Figure 2

Table 1 - Specifications

Flow Characteristics

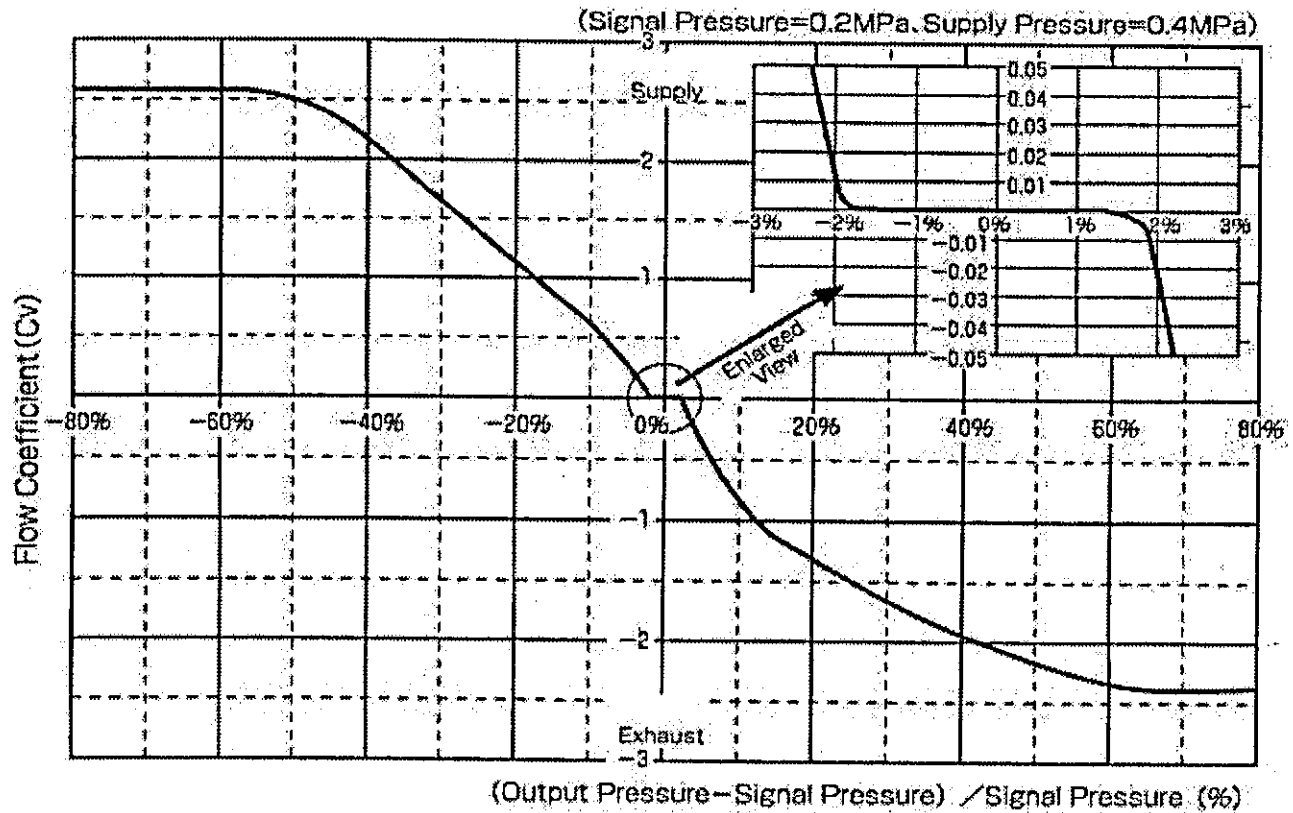


Figure 2 - Flow Characteristics

Pneumatic Supply

The Model BR400 Booster Relay requires a source of clean, dry, oil-free, instrument grade air to ANSI/ASA-57.3 1975 (R1981) or ISA-S7.3-1075 (R1981).

Dew Point	At least 18° F (10° C) below minimum anticipated ambient temperature.
Particulate Matter	Filtered to below 5 microns.
Oil Content:	Less than 1 ppm w/w or v/v.
Contaminants	Free of all corrosive contaminants and hazardous gasses, flammable or toxic.

Pneumatic Connections

The pneumatic connection locations are shown on Figure 1 and are also stamped on relay body. The supply and output connections are ½" NPT and the signal connection is ¼" NPT. The supply and output tubing should be a minimum of ½". Blow out all piping prior to connecting to booster. Use of a soft setting anaerobic hydraulic seal, such as Loctite Hydraulic Seal 542 is recommended on the male threads of all connections.



CAUTION

Do not use an excessive amount of hydraulic sealant as it will not set and may migrate into the pneumatic passages.



CAUTION

Do not use pipe thread sealant tape on pneumatic fittings, as it tends to shred small particles which can cause instrument malfunction.

Installation

The booster relay should be close coupled to the actuator. Use of a short ½" pipe nipple between the relay output and the actuator provides both the pneumatic connection and mounting means. The preferred orientation is with the exhaust openings pointing down; however horizontal mounting is acceptable.

Operation

Prior to applying supply pressure to the relay, open the bypass needle valve approximately one turn. After applying pressure, note response of actuator to open and close commands from the positioner. If excessive overshoot or hunting is seen, open needle valve until stable operation is obtained. If valve is sluggish, close needle valve until unstable operation occurs, then back off until stable operation is obtained.

Turning valve clockwise (closing) speeds response but can lead to instability. Turning valve counterclockwise aids stability but will slow down the actuator's response. Proper setting provides stable operation and acceptable response time.

Maintenance

The BR400 Booster Relay does not require any routine maintenance. If a contaminated air supply has been used, then there may be need to clean the filters or disassemble the relay to clean the supply and exhaust seats and valves.

Troubleshooting

If the output pressure does not respond to changes in the input pressure, check that supply pressure is at proper value and that signal and supply filters are not plugged with foreign matter. Check also that supply and exhaust valve seats are clean.

If output pressure is not stable or is slow to respond, check setting of bypass needle valve. See bypass valve setting procedure under "Operation".

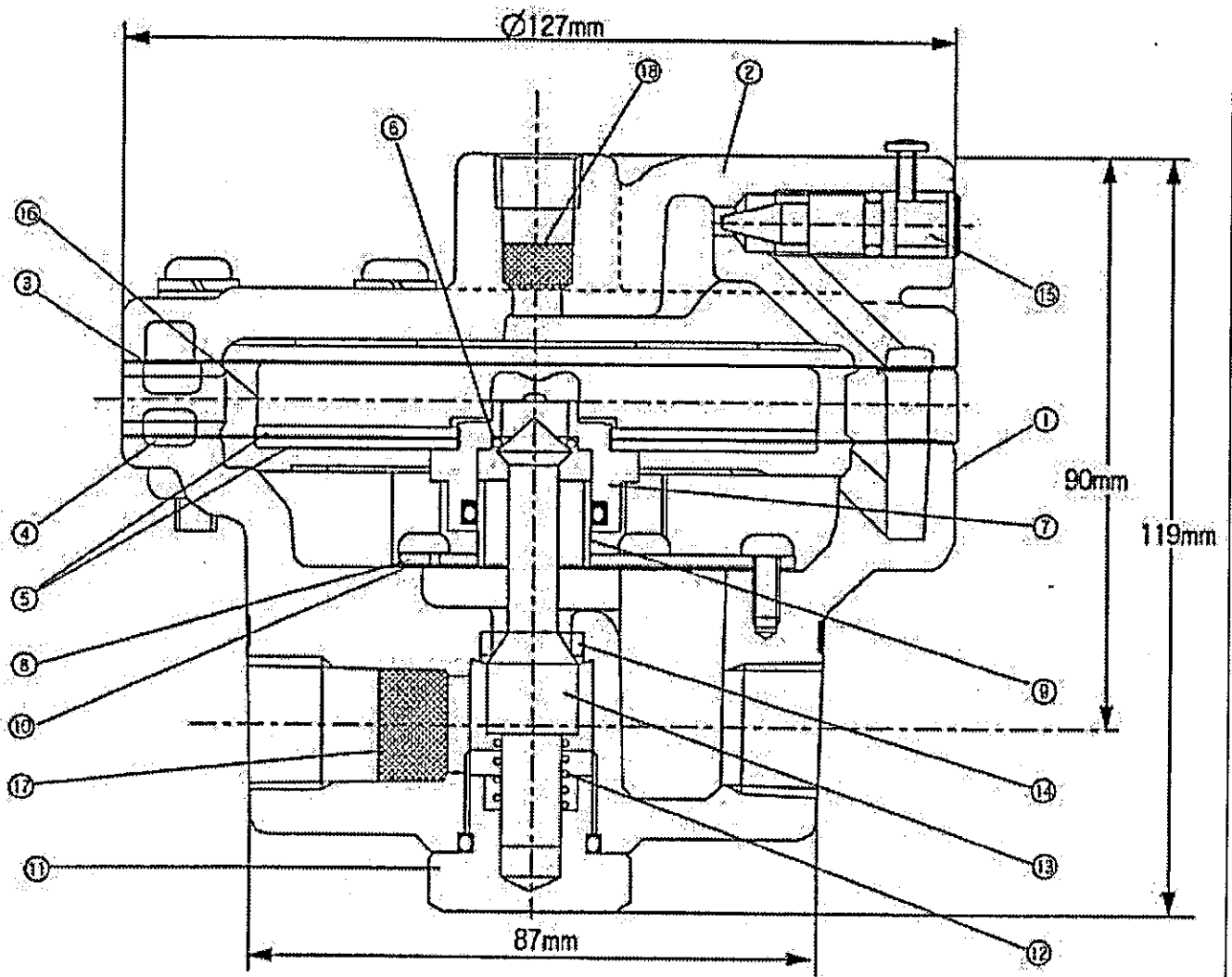


Figure 3 - Construction and Dimensions

Materials of Construction

No.	Part	Standard Material	No.	Part	Standard Material
1	Body	Aluminum Alloy Die Casting	10	Seal Plate Gasket	Inorganic Fiber/Oil Resistant Synthetic Rubber
2	Case	Aluminum Alloy Die Casting	11	Plug Cap	Copper Alloy
3	Upper Diaphragm	Chloroprene / Polyester	12	Coil Spring	Austenitic Stainless Steel
4	Lower Diaphragm	Chloroprene / Polyester	13	Plug	Austenitic Stainless Steel
5	Lower Diaphragm Plate	Aluminum Alloy Plate	14	Supply Seat	Acetal Copolymer
6	Exhaust "O"-Ring	Acetal Copolymer	15	Bypass Valve Plug	Austenitic Stainless Steel
7	Exhaust Seat	Copper Alloy	16	Piston	Glass Fiber Reinforced Thermoplastic Polyester
8	Seal Plate	Austenitic Stainless Steel	17	Supply Filter	Austenitic Stainless Steel
9	Exhaust Seal Guide	Copper Alloy	18	Signal Filter	Austenitic Stainless Steel

Table 2 - Materials of Construction

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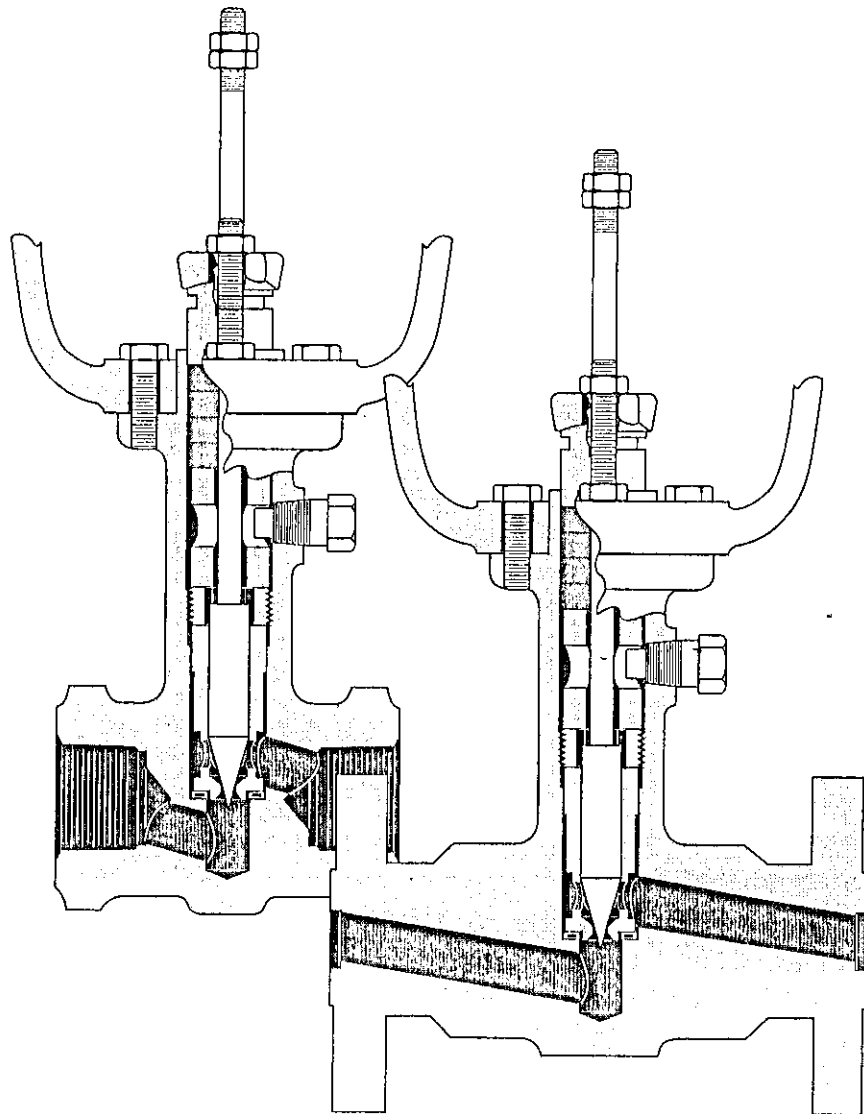
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12

**535 V Reducing and 535 V-50
Differential Pressure Regulators Instructions**

Instructions No 176419 E
Rev. A 01/91

Masoneilan 535 V Reducing and 535 V-50 Differential Pressure Regulators Instructions (Microflow Regulator)



Masoneilan
Valve & Controls 

General

These installation, operation, adjustment and maintenance instructions, apply to the Masoneilan Models 535 V Reducing and Models 535 V-50 Differential Pressure Regulators. They include a parts reference list including recommended spare parts (see page 5).

These two models are the "Microflow" range of the 500 Series Regulators.

Refer to Instructions No 176420 E for connecting, adjustment and maintenance of the 10900 Series Actuators equipping the 500 Series regulators.

The following instructions should be thoroughly reviewed and understood prior to installing operating or performing maintenance on this equipment. Only qualified personnel to service this equipment
Non-compliance with safety rules and caution notes of this instruction may bring about malfunction of the device or damage it seriously. In addition, such negligence might expose personnel present on the field to grave hazards.

Spare parts

When performing maintenance always use Masoneilan replacement parts. Parts are obtainable through your

local Masoneilan Representative or Spare Parts Department. When ordering parts, always include Model and Serial Numbers shown on serial plate.

After sales Department

Masoneilan has a highly skilled After Sales Department available for start-up, maintenance and repair of our regulators and components parts. Contact the nearest Masoneilan Sales Office or Representative or, directly the After Sales Department of Condé-sur-Noireau Plant.

Training

MASONEILAN regularly holds training seminars for technicians in its factory of Condé-sur-Noireau. In order to participate in one of these training seminars you should get in touch with our local Masoneilan Representative or our Training Department.

Care must be exercised when unpacking the regulator to prevent damage. Should any problems arise, contact Masoneilan After Sales Department. Be sure to include Serial and Model numbers in all correspondence.

Description-Operation

Nos 535 V Regulators

The 535 V Direct Operated Regulators are designed to maintain a uniform reduced pressure. Microflow bodies of regulators are offered in single seat type.

Operation

The adjustable spring is set for the desired controlled pressure. This spring holds the plug open. An increase in controlled pressure above the set point causes regulators to close.

Variations in the controlled pressure thus cause the necessary regulators movement to restore the controlled pressure to set point.

Nos 535 V-50 Regulators

Masoneilan 535 V-50 Series Differential Pressure Regulators are designed for maintaining one pressure in excess of another (reference) pressure by an adjustable amount. Microflow bodies of regulators are offered in single seat type.

Installation

Before installing, blow out line thoroughly to remove all foreign matter which might foul the regulator.

Place the regulator vertically in a horizontal run of pipe so that the controlled fluid will flow through the body in the direction indicated by the arrow on the body or the words "IN & OUT" marked on the connections. On steam service, the regulator should be installed with the

Operation

The adjustable spring of actuator is set for the desired differential pressure. This spring holds the regulator open. An increase in differential above the set point causes No 535 V-50 regulators to close.

Variations in the differential pressure thus cause the necessary regulator movement to restore the controlled pressure to set point.

Plug and seat ring combination (trim)

Eight plugs and five seat rings can be used in combination to obtain ten different plug and seat ring assemblies (See Figure 2).

Each plug design and the seat ring orifice diameter permit to identify parts in relation to Figure 2.

The four plugs corresponding to trim Nos 6 to 9 differ by the angle of the flat, machined on the point. The same seat ring (3e) and the same spacer (3f) are used in the four cases.

See Figure 2 to select the plug and seat ring combination to obtain the required C_v .

diaphragm chamber down so that the diaphragm will be protected by a water seal. If installed otherwise, an adequate water seal or seals must be provided.

A three valve by-pass around the regulators permits removing the regulator from the line without shutting off the flow.

See Figure 1 for typical installation diagrams.

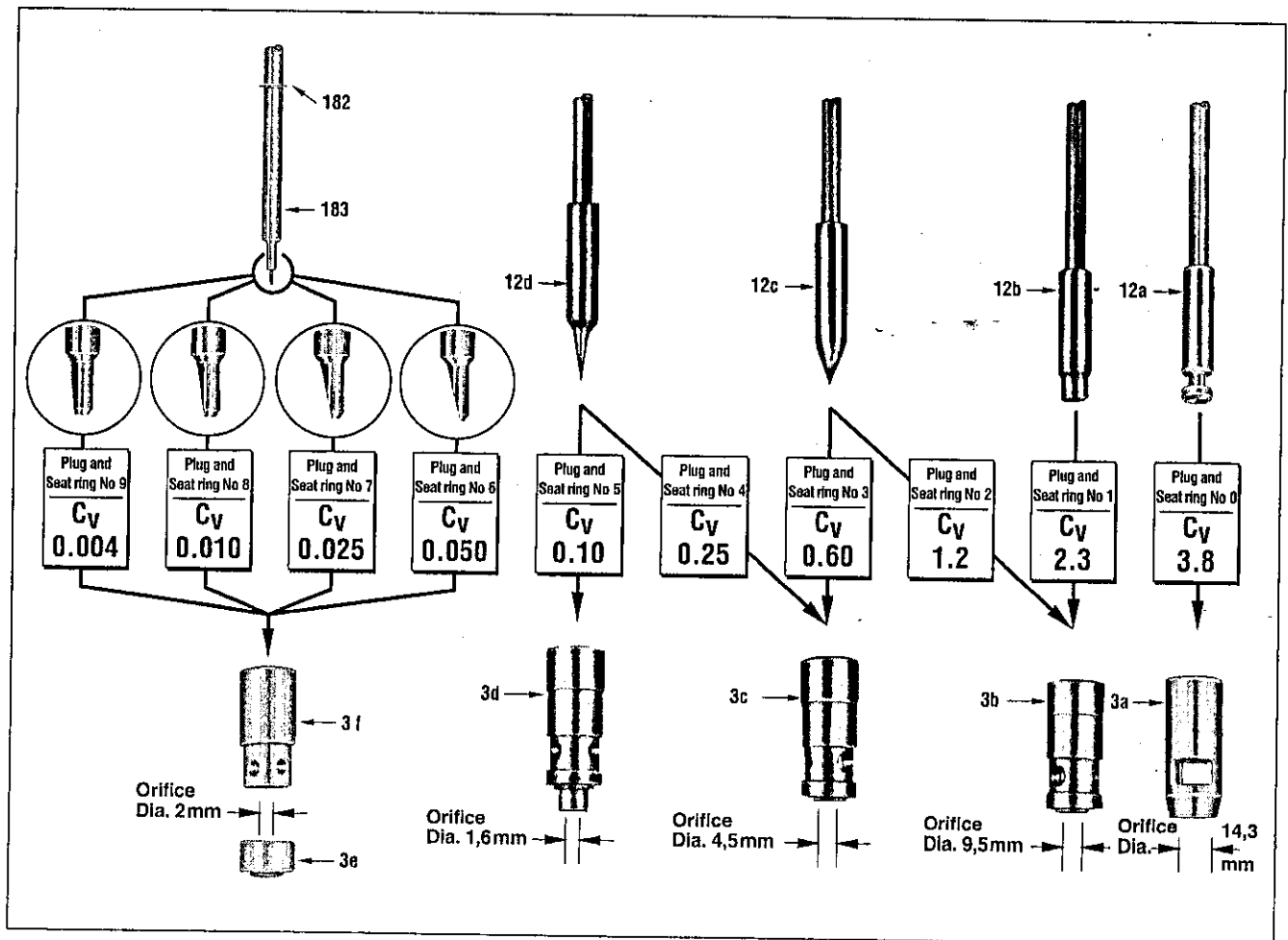
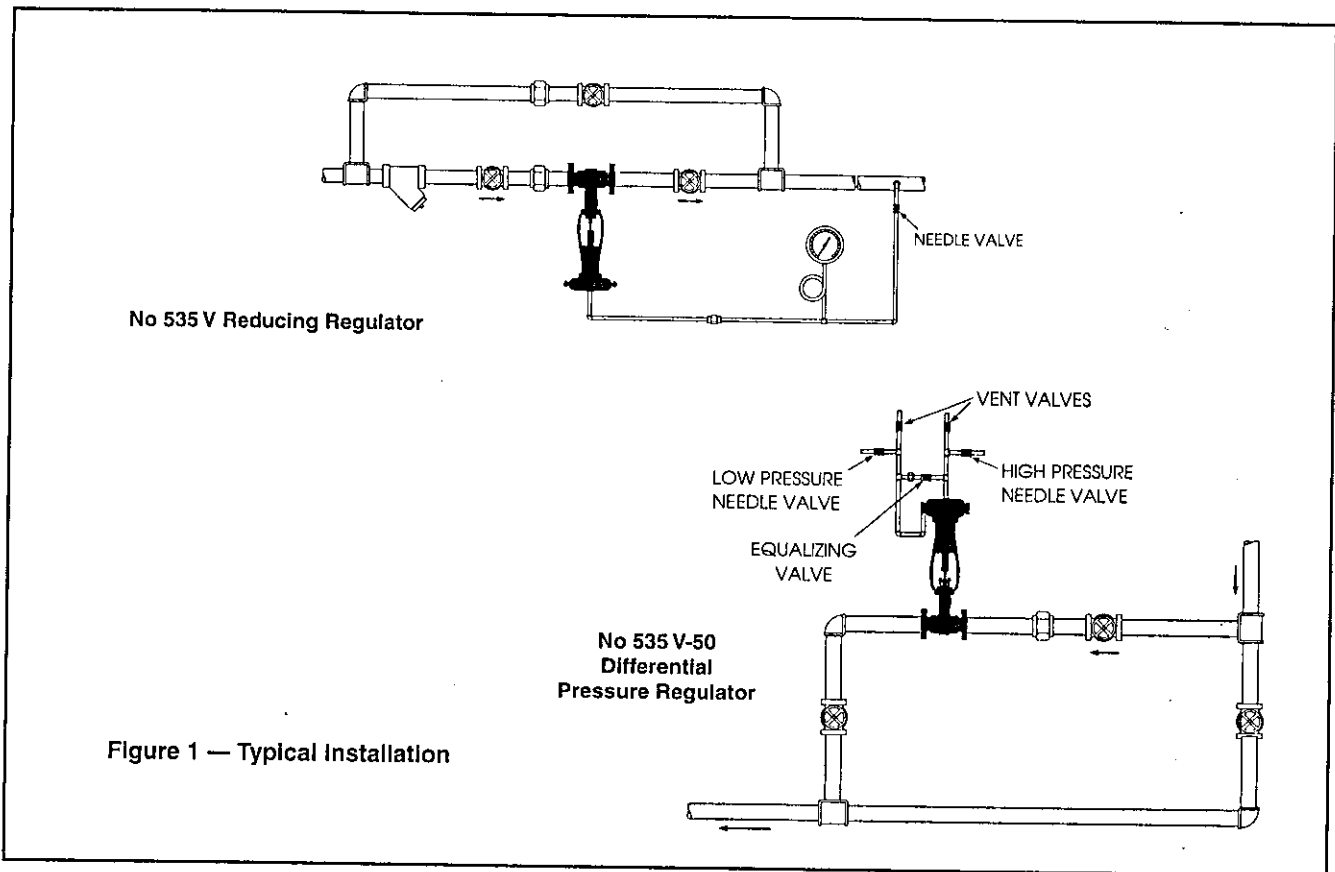


Figure 2 — Ten plug and seat ring assemblies (Trim).

On No 535 V Regulators

Pipe the controlled pressure from a convenient point in the line 6-10 feet (1,8 to 3m) from the regulator (or in the discharge line 6-10 feet from the pump on pump pressure applications.) to the 1/2" NPT connection in the diaphragm case.

Install a gauge and a needle valve in the controlled pressure line, to protect diaphragm case against any overpressure.

Needle valve permits shutting off the control line and also serves as an adjustable choke to prevent cycling of the regulator, which may result from the pulsation of a pump in the system.

On No 535 V-50 Regulators

Warning: Pressure must be increased on both sides of the diaphragm at the same time in order to avoid diaphragm failure.

Pipe the **higher** pressure fluid from a convenient point to the 1/2" NPT connection in the **upper** diaphragm case (i.e., to diaphragm chamber where pressure will oppose the spring). Pipe the lower pressure fluid to the diaphragm chamber.

Install a needle valve and gauge in each of these control lines, sufficiently near each other so that both valves can be reached simultaneously.

Needle valves permit shutting off both control lines and may be used as adjustable chokes to prevent cycling of the regulator as a result of pump pulsations. By adjusting both valves simultaneously, accidental overpressuring either side of the diaphragm can be avoided.

Caution: Tests have been performed at the factory to check correct operation of the regulator on its full nominal spring range. After that, the spring compression has been fully removed to avoid unnecessary stress of parts (diaphragm, spring) during storage.
THEREFORE IT IS NECESSARY TO PROCEED WITH ADJUSTMENT BEFORE SERVICING.

Maintenance

If there is excessive leakage through the regulator when it is shut off, the cause may be:

1. Foreign matter holding valve off seat: disassemble and clean.
2. Normal wear of seating surfaces: disassemble and replace plug and/or seat ring.
3. Seat ring gasket (2) damaging (*except with trim for Cv max. 3.8*): replace gasket.

CAUTION: Regulator must be isolated and pressure vented before disassembly.

Disassembly (Figure 3)

- Disconnect the control line(s) at the diaphragm case.
- Remove the two packing flange nuts (8b). Raise packing flange (10) up the plug stem and remove the two nuts (8a) as well as the two mounting screws (16).
- By means of two flat spanners, unlock the plug stem nuts (27) and unscrew them to the threaded end of the plug stem (12 or 183). Tighten nuts in this position.
- Fasten the actuator to a hoisting gear and **very slowly** pull out the actuator-plug S/A.
- With a flat spanner applied on the nuts (27), unscrew the plug stem from the actuator stem while pulling out vertically and slowly the actuator. Carry on until plug stem is fully unscrewed from actuator stem.

CAUTION: Carefully avoid that seating surface of the plug contacts the seat ring during the plug unscrewing.

- Separate actuator and packing flange (10) from the body S/A.

- Remove two nuts (27) and packing follower (9) from the plug stem.
- Using a packing hook, remove the largest number of packing rings (6) from packing box. Remove safety pin (11) and pull plug stem to remove packing spacer (5) and the remainder of packing rings.
- Using a 9/16" or 14 mm piece of hex stock and a wrench, unlock and pull out seat ring retainer (4).
- Pull out seat ring (3) and gasket (2) using a hook made from steel wire, diameter about 3mm. Carefully fettle the hook end.

Note: The seat ring with $Cv < 0.10$ consists of two parts: The seat ring proper (3e) and a spacer (3f). The small size of orifice of these parts does not allow for their removal by means of a hook. Therefore, it is necessary to remove the body from the pipe, turn it over and, if needed, to hit the bottom with a wooden mallet. Should the seat ring be jammed in its housing, it is possible to move it using a screwdriver inserted through the outlet orifice.

Regulator with Cv 3.8 does not feature any seat ring gasket (2).

Reassembly and Plug Stem Adjustment (Figures 3, 4, and 5)

Before reassembly, thoroughly clean the inside of the valve body and parts. Mating surfaces must be thoroughly cleaned. On reassembly, new seat ring gasket (2) and new packing (6) must be used.

- Place a new seat ring gasket (2) in the valve body (13) and install the seat ring (3) taking care to correctly center the gasket on the seat ring shoulder. Orient it in such a manner that one of its ports lines up with the body outlet orifice.

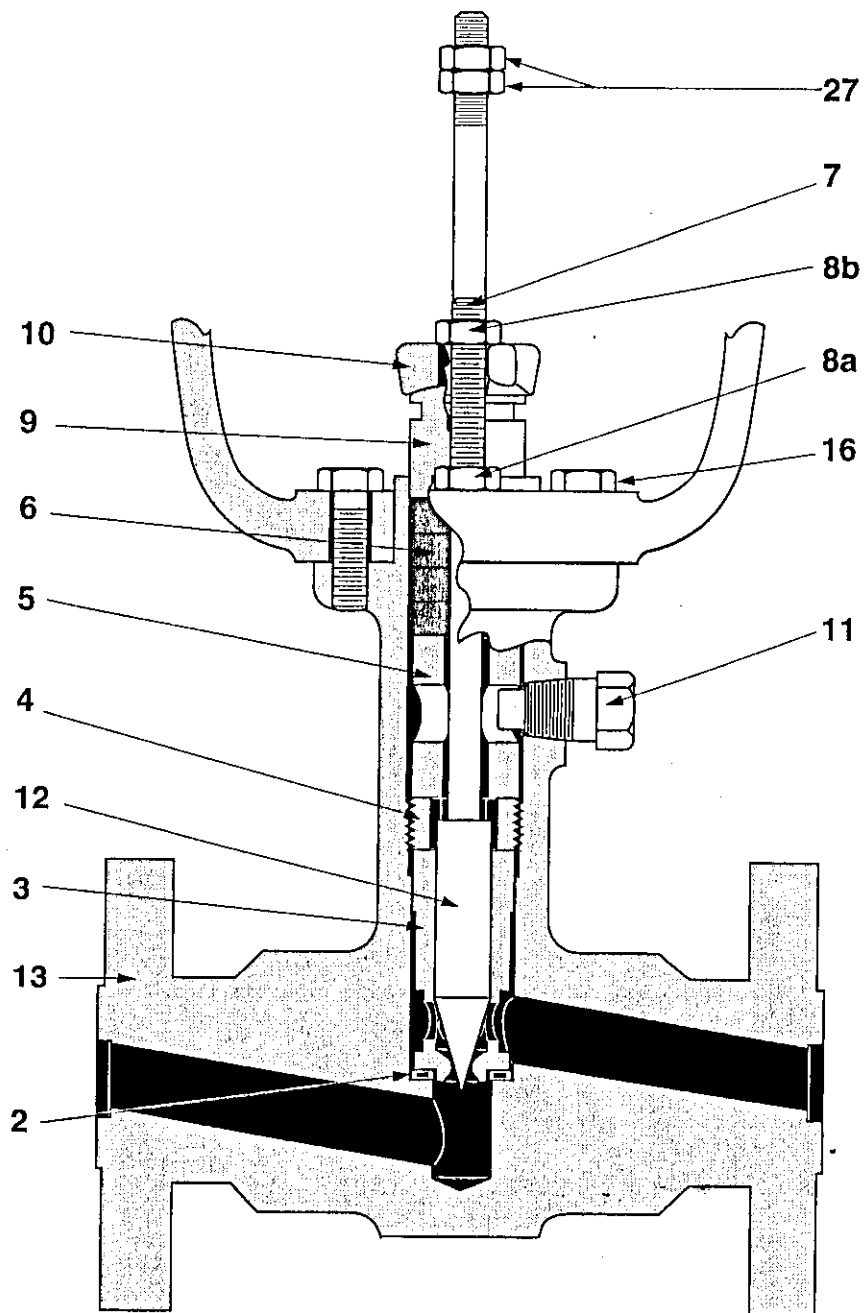


Figure 3
 Cross Section of Type
 535 V Regulator.
 (C_v 0.60 for example)

PARTS REFERENCE

Ref.	Part Name	Ref.	Part Name	Ref.	Part Name
● 2	Seat Ring Gasket +	7	Packing Flange Stud	13	Body
3	Seat Ring	8a	Mounting Nut	16	Mounting Screw
3e	Seat Ring (Only on $C_v < 0.10$ *)	8b	Packing Flange Nut	27	Plug Stem Nut
3f	Spacer (Only on $C_v < 0.10$ *)	9	Packing Follower	● 182	Retaining Ring (Only on $C_v < 0.10$ *)
4	Seat Ring Retainer	10	Packing Flange	183	Plug-Stem (Only on $C_v < 0.10$ *)
5	Packing Spacer	11	Safety Pin		
● 6	Packing	12	Plug-Stem		

● Recommended spare parts

* Complete sub-assembly includes : Plug-stem (183), Retaining ring (182), Seat ring (3e) and Spacer (3f). (See Figure 2)

+ Non-existent on C_v 3.8

Note: For a C_v smaller than 0.10, the seat ring (3e) shall first be positioned on the new gasket (2) taking the same precautions as shown above. Next, engage spacer (3f) and orient one of its ports towards the body outlet orifice.

Regulator with C_v 3.8 does not feature any seat ring gasket (2).

- Carefully apply Never Seez grease (or equivalent) to threads and bottom of retainer (4). With a 9/16" or 14 mm piece of hex stock and a wrench, torque the retainer to 59 ft-lbs (8 daN.m) if a graphite gasket st. st. reinforced, or to 40 ft-lbs (5,5 daN.m) if a glass filled PTFE gasket, (See Figure 4).

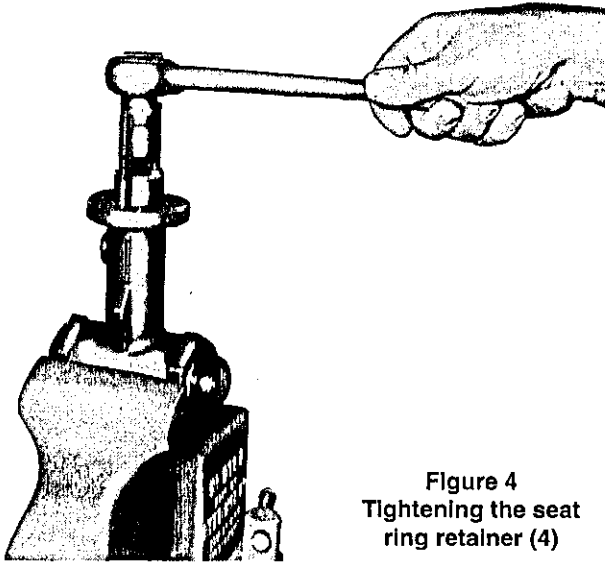


Figure 4
Tightening the seat ring retainer (4)

Note: On regulator with C_v 3.8 torque the retainer to 15 ft-lb (2 daN.m).

- Insert the plug-stem (12 or 183) into the seat ring (3). For a $C_v < 0.10$, ensure that there is no binding during the stroking of the plug. If binding occurs, loosen the retainer (4) and replace the seat ring (3e) in the correct position until the stem smoothly slides.
- Slide spacer (5) aligning the hole in the spacer with the safety pin (11) hole in the valve body.

Note: For a C_v smaller than 0.10 ensure that the retaining ring (182) is placed on the plug before engaging it in the spacer (3f). If the retaining ring is damaged, replace it.

- Wrap the safety pin (11) with two turns of PTFE tape (Teflon). Screw it into the bonnet five and a half to six turns from where threads engagement starts.

Note: To find start of threads engagement, proceed as follows:

- Screw safety pin about one turn,
- Pull safety pin outwards while unscrewing it.

- Install packing, positioning the skive cut of each packing ring 120° away from the cut of an adjacent ring. Slightly push down rings one after another using a tube 1/2" schedule 160 size. Install packing follower (9) on the plug stem.

- Hold actuator above body S/A. Before that actuator stem contacts the plug stem, screw two nuts (8a) on the two studs (7), slide packing flange (10) on the stem and the studs and screw the two nuts (27) to the threaded end of plug stem.

- While holding the plug in "Open" position, slowly pull down the actuator and screw the plug stem into the actuator stem.

Note: This operation will be facilitated turning the plug by means of a wrench applied on the nuts (27) tightened one against the other.

Carefully avoid that seating surface of the plug contacts the seat ring during the plug screwing.

Pulling down motion of the actuator and plug stem screwing must be simultaneously performed: carry on until the lower part of actuator yoke contacts the body flange (13).

- Screw and tighten the two screws (16). Tighten also the two nuts (8a). Finger tight the two packing flange nuts (8b).
- Unscrew the plug stem until the plug is seated.
- Screw one nut (27) against the lower part of the actuator stem while placing a 2,5 mm shim between nut and stem (see Figure 5).
- Tighten second nut (27) against the first in this position. Remove the shim and screw the plug stem into the actuator stem, until the nuts contact the actuator stem. Lock by means of a wrench applied on the nuts.
- Connect the controlled pressure line(s) to diaphragm case.
- Place back in service and tighten the nuts (8b) only as much as is necessary to stop any leakage.

Packing box

Adding Packings

To add a ring of packing, depressurize the regulator, back off packing flange nuts (8b) all the way, lift the packing flange and follower and insert one ring of packing. Tighten nuts (8b) finger tight plus one full turn.

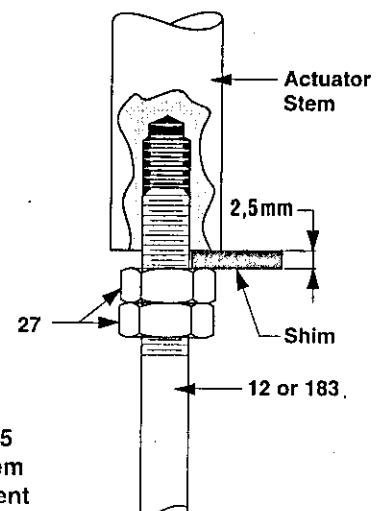


Figure 5
Plug-stem adjustment

Packing Quick Change Method

(For regulators Cv 0.6 to 3.8 only)

The fastest and simplest way to replace packing is to remove the entire actuator without disturbing actuator parts or calibration. However, this is not recommended for regulators with a small Cv ($C_v < 0.6$), due to the very fineness of their plug. In this event, disassemble the regulator to replace the packing (See under "Disassembly", page 4).

CAUTION: Regulator must be isolated and pressure vented before disassembly.

- Remove safety pin (11) from body. The safety pin engages the packing spacer (5). The function of safety pin and spacer is to prevent the plug from being pushed out if the actuator is removed while the regulator is still pressurized. The regulator internal parts cannot be removed unless the safety pin is removed first. Remove two packing flange nuts (8b) and two mounting nuts (8a). Remove also two mounting screws (16).
- Remove the actuator-plug assembly off the regulator.

- Clean the packing box and plug stem and carefully place new rings of packing around the stem. Position the skive cut of each packing ring 120° from that of the adjacent ring.
- Reassemble the actuator-plug assembly to the regulator body, taking care: (a) to align hole in spacer (5) with safety pin hole; (b) to replace two mounting nuts (8a) before nuts (8b); (c) to take extra care in guiding each ring into the packing box.
- Tighten two nuts (8a) and two screws (16) on the actuator yoke.
- Wrap the safety pin (11) with two turns of PTFE tape (Teflon). **Screw it into the bonnet five and a half to six turns from where threads engagement starts.**

Note: To find start of threads engagement, proceed as follows:

- a. Screw safety pin in about one turn,*
 - b. Pull safety pin outwards while unscrewing it.*
- Replace packing follower, packing flange and flange nuts (8b). Tighten nuts finger tight plus one full turn. Place back in service.

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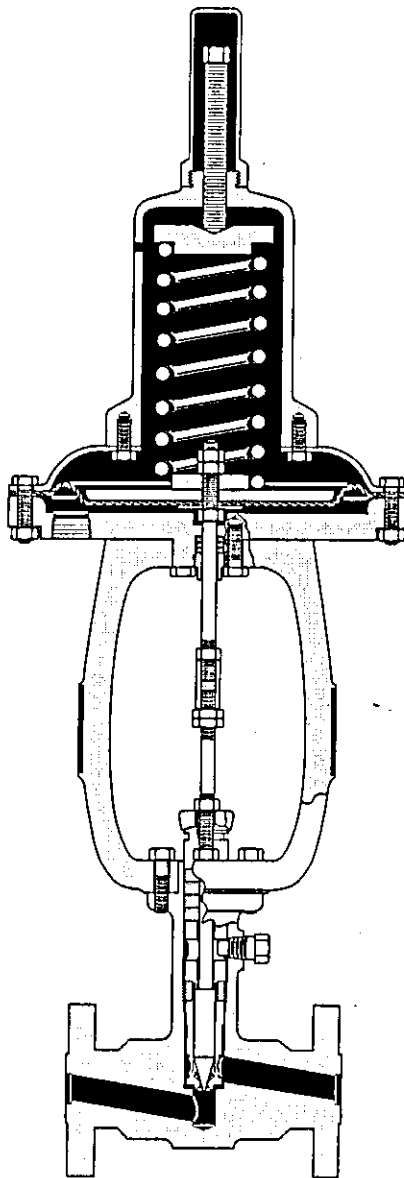
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13

**536V Back Pressure
Microflow Regulators Instructions**

Instructions No 182037 E
08/94

Masoneilan 536V Back Pressure Microflow Regulators Instructions



Masoneilan

DRESSER

General

These installation, operation, adjustment and maintenance instructions, apply to the Masoneilan Models 536V Back Pressure Regulators. They include a parts reference list including recommended spare parts (see page 11).

This model is the "Microflow" equivalent of the 526-536 Back Pressure Regulators.

The following instructions should be thoroughly reviewed and understood prior to installing operating or performing maintenance on this equipment. Only qualified personnel to service this equipment

Non-compliance with safety rules and caution notes of this instruction may bring about malfunction of the device or damage it seriously. In addition, such negligence might expose personnel present on the field to grave hazards.

Spare Parts

When performing maintenance always use Masoneilan replacement parts. Parts are obtainable through your local Masoneilan Representative or Spare Parts Department.

When ordering parts, always include Model and Serial Numbers shown on serial plate.

After Sales Department

Masoneilan has a highly skilled After Sales Department available for start-up, maintenance and repair of our regulators and components parts. Contact the nearest Masoneilan Sales Office or Representative or, directly the After Sales Department of Condé-sur-Noireau Plant.

Training

MASONEILAN regularly holds training seminars for technicians in its factory of Condé-sur-Noireau. In order to participate in one of these training seminars you should get in touch with our local Masoneilan Representative or our Training Department.

Care must be exercised when unpacking the regulator to prevent damage. Should any problems arise, contact Masoneilan After Sales Department. Be sure to include Serial and Model numbers in all correspondence.

Description-Operation

The 536V Direct Operated Regulators are designed to maintain a uniform upstream pressure. Microflow bodies of regulators are offered in single seat type.

The actuator of the 536V is a simple powerful mechanical device. It is Air-to-Retract Stem type. The nominal range of an actuator is the pressure range in pounds per square inch (psi) in which the pressure setting can be obtained by adjustment.

Conformation of the diaphragm to the diaphragm plate (40) or lower spring seat (34) serves as a flexible upper guide for the actuator stem (26). Nylon reinforced neoprene diaphragms permit smooth, sensitive operation. The packing box acts as a lower guide for the actuator stem.

Note: On request, for special services, the nylon reinforced neoprene diaphragm may be provided with a PTFE coating.

The actuators are designated by the nominal range (psi). See the following chart.

Range (psi)	Case Size
0,5 - 3	11
2 - 5	9
3 - 15	5
10 - 40	5
30 - 85	5
60 - 170	5

Operation

The adjustable spring is set for the required controlled pressure. This spring holds the plug closed. An increase in controlled pressure above the set point retracts actuator stem and causes regulators to open.

Variations in the controlled pressure thus cause the necessary regulators movement to restore the controlled pressure to set point.

Plug and seat ring combination (trim)

Eight plugs and five seat rings can be used in combination to obtain ten different plug and seat ring assemblies (See Figure 2).

Each plug design and the seat ring orifice diameter permit to identify parts in relation to figure 2.

The four plugs corresponding to trim Nos 6 to 9 differ by the angle of the flat, machined on the point. The same seat ring (3e) and the same spacer (3f) are used in the four cases.

See figure 2 to select the plug and seat ring combination to obtain the required C_v .

Installation

Before installing, blow out line thoroughly to remove all foreign matter which might foul the regulator.

Place the regulator vertically in a horizontal run of pipe so that the controlled fluid will flow through the body in the direction indicated by the arrow on the body or the words "IN & OUT" marked on the connections. On steam service, the regulator should be installed with the diaphragm chamber down so that the diaphragm will be protected by a water seal. If installed otherwise, an adequate water seal or seals must be provided.

A three valve by-pass around the regulators permits removing the regulator from the line without shutting off the flow.

See figure 1 for typical installation diagram.

Pipe the controlled pressure from a convenient upstream point in the line 6-10 feet (1,8 to 3 m) from the regulator to the 1/2" NPT connection in the diaphragm case.

Install a gauge and a needle valve in the controlled pressure line, to protect diaphragm case against any overpressure.

No 536V Back Pressure Regulator

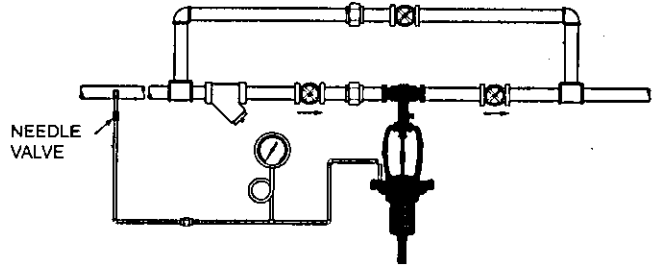


Figure 1 — Typical Installation

Needle valve permits shutting off the control line and also serves as an adjustable choke to prevent cycling of the regulator, which may result from the pulsation of a pump in the system.

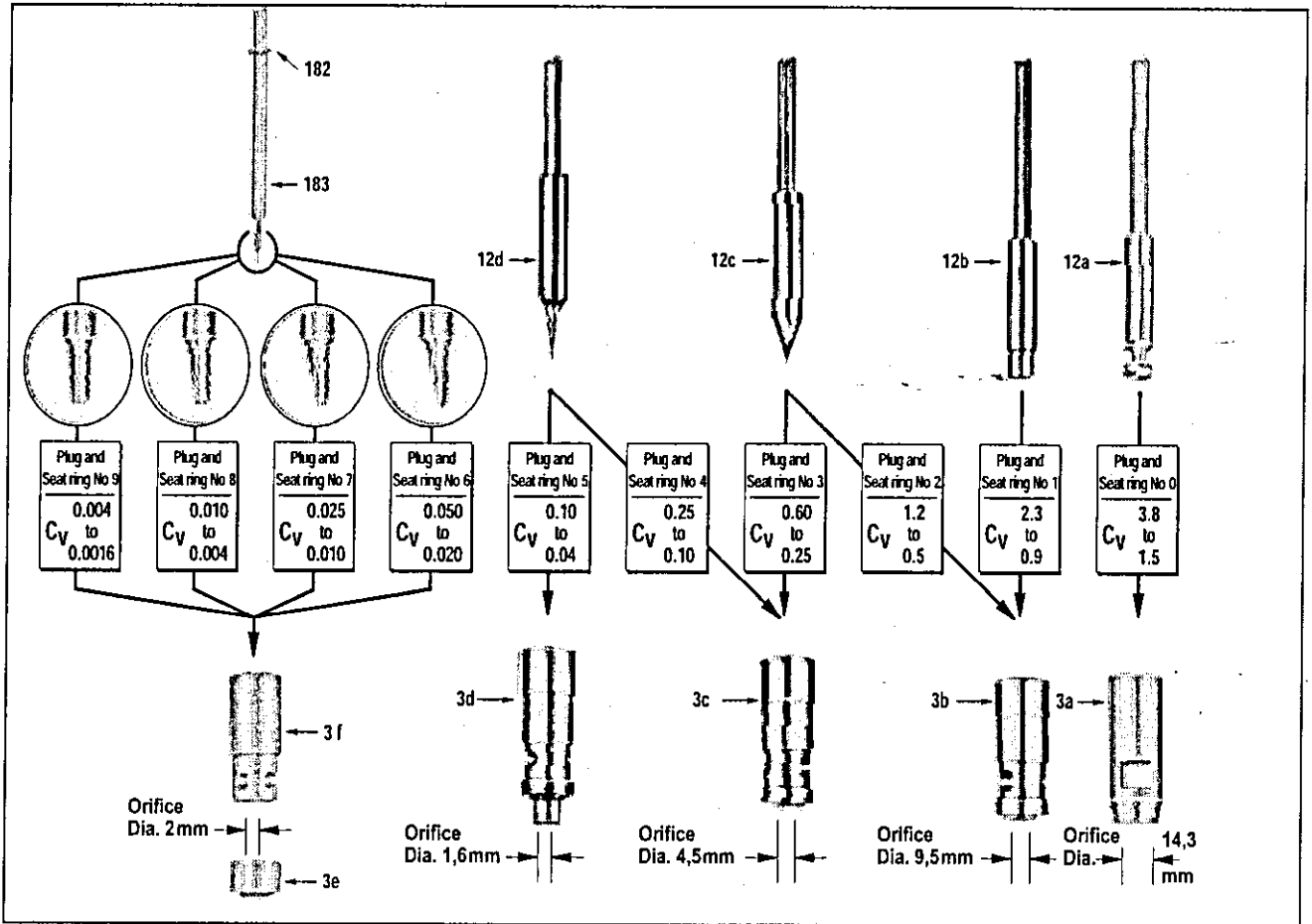


Figure 2 — Ten plug and seat ring assemblies (Trim).

Set Point Adjustment

Caution: Tests have been performed at the factory to check correct operation of the regulator on its full nominal spring range. After that, the spring compression has been fully removed to avoid unnecessary stress of parts (diaphragm, spring) during storage.
THEREFORE IT IS NECESSARY TO PROCEED WITH ADJUSTMENT BEFORE SERVICING.

The regulator pressure range is engraved on the serial plate.

To adjust spring compression (set point), proceed as follows:

- Open stop valve on the outlet side of the regulator and partially open stop valve on the inlet side, allowing pressure in the system to build up slowly.
- Open controlled pressure line valve and check setting by means of the gauge. Set by means of spring adjuster screw (36).

(To increase pressure setting, turn adjusting screw clockwise to compress the spring. To decrease the setting, turn adjusting screw counterclockwise to relieve spring compression).

- Fully open stop valve on the inlet side of the regulator.

Maintenance

If there is excessive leakage through the regulator when it is shut off, the cause may be:

1. Foreign matter holding valve off seat: disassemble and clean.
2. Normal wear of seating surfaces: disassemble and replace plug and/or seat ring.
3. Seat ring gasket (2) damaging (*except with trim for C_v max. 3.8*): replace gasket.

Part Replacement in Body S/A

CAUTION: Regulator must be isolated and pressure vented before disassembly.

Disassembly (Figures 3, 5, 6 & 7)

- a. Disconnect the control line at the diaphragm case and connect a temporary supply air line.
- b. Admit on the diaphragm sufficient pressure to open the plug about 1 mm.
- c. Remove the two packing flange nuts (8b). Raise packing flange (10) up the plug stem and remove the two nuts (8a) as well as the two mounting screws (16).
- d. By means of two 17 mm flat spanners, unlock the plug stem nuts (27) and unscrew them to the threaded end of the plug stem (12 or 183). Tighten nuts one against the other in this position.
- e. Fasten the actuator to a hoisting gear and very slowly pull out the actuator-plug S/A.
- f. With a flat spanner applied on the upper nut (27), unscrew the plug stem from the coupling (101) while pulling out actuator vertically and slowly. Carry on until plug stem is fully unscrewed from coupling.

CAUTION: Carefully avoid that seating surface of the plug contacts the seat ring during the plug unscrewing.

- g. Separate actuator and packing flange (10) from the body S/A. Shut off temporary supply on actuator.

- h. Remove two nuts (27) and packing follower (9) from the plug stem.
- i. Using a packing hook, remove the largest number of packing rings (6) from packing box. Remove safety pin (11) and pull plug stem to remove packing spacer (5) and the remainder of packing rings.
- j. Using a 9/16" or 14 mm piece of hex stock and a wrench, unlock and pull out seat ring retainer (4).
- k. Pull out seat ring (3) and gasket (2) using a hook made from steel wire, diameter about 3 mm. Carefully fettle the hook end.

Note: The seat ring with $C_v < 0.10$ consists of two parts: The seat ring proper (3e) and a spacer (3f). The small size of orifice of these parts does not allow for their removal by means of a hook. Therefore, it is necessary to remove the body from the pipe, turn it over and, if needed, to hit the bottom with a wooden mallet. Should the seat ring be jammed in its housing, it is possible to move it using a screwdriver inserted through the outlet orifice. Regulator with C_v 3.8 does not feature any seat ring gasket (2).

Reassembly and Plug Stem Adjustment (Figures 3, 5, 6 & 7)

Before reassembly, thoroughly clean the inside of the valve body and parts. Mating surfaces must be thoroughly cleaned. On reassembly, new seat ring gasket (2) and new packing (6) must be used.

- Place a new seat ring gasket (2) in the valve body (13) and install the seat ring (3) taking care to correctly center the gasket on the seat ring shoulder. Orient it in such a manner that one of its ports lines up with the body outlet orifice.

Note: For a C_v smaller than 0.10, the seat ring (3e) shall first be positioned on the new gasket (2) taking the same precautions as shown above. Next, engage spacer (3f) and orient one of its ports towards the body outlet orifice.

Regulator with C_v 3.8 does not feature any seat ring gasket (2).

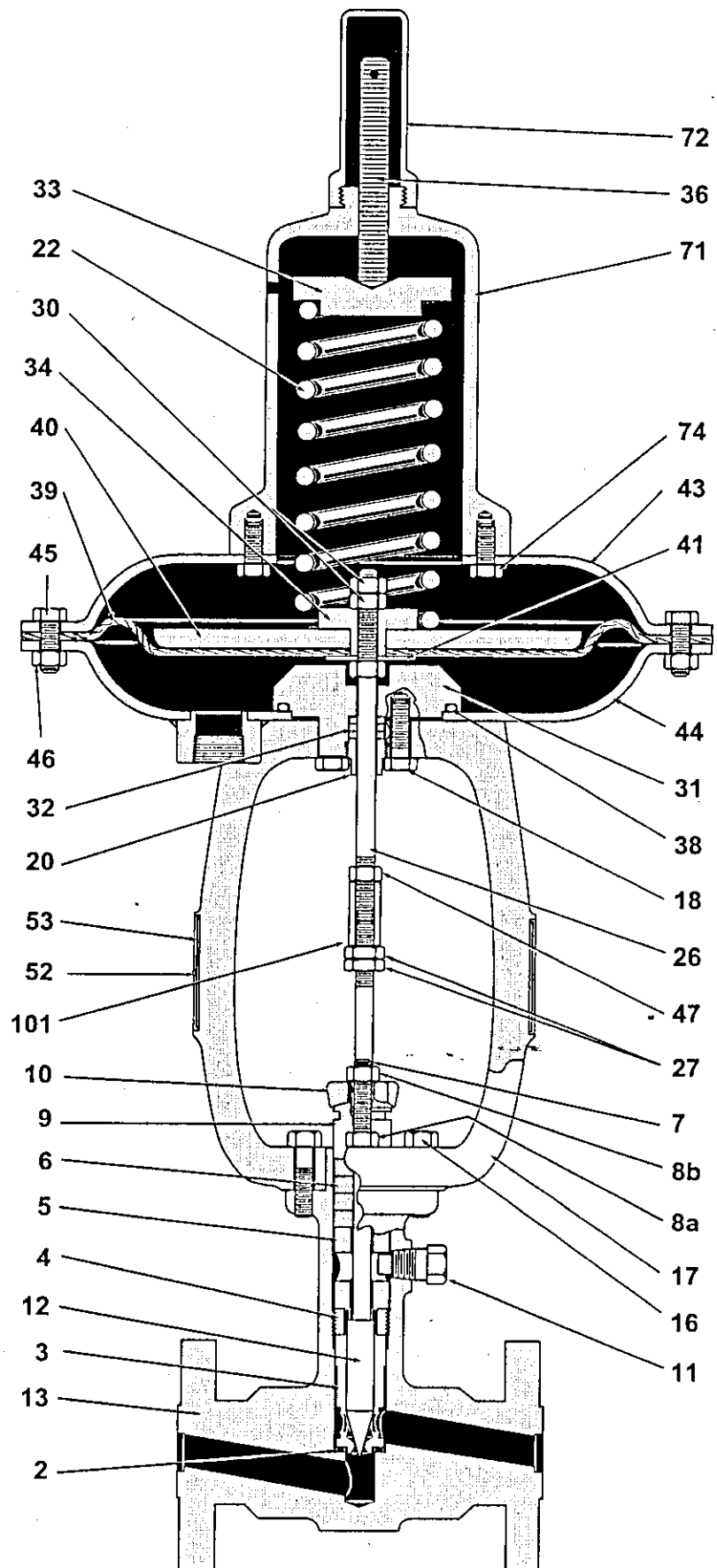


Figure 3
 Cross Section of Type 536V
 Regulator.
 Range 0,5-3 psi

See Parts References page 11

- Carefully apply Never Seez grease (or equivalent) to threads and bottom of retainer (4). With a 9/16" or 14 mm piece of hex stock and a wrench, torque the retainer to 59 ft-lbs (8 daN.m) if a graphite gasket st. st. reinforced, or to 40 ft-lbs (5,5 daN.m) if a glass filled PTFE gasket (See Figure 4).

Note: On regulator with C_v 3.8 torque the retainer to 15 ft-lb (2 daN.m).

- Insert the plug-stem (12 or 183) into the seat ring (3). For a C_v 0.10, ensure that there is no binding during the stroking of the plug. If binding occurs, loosen the retainer (4) and replace the seat ring (3e) in the correct position until the stem smoothly slides.

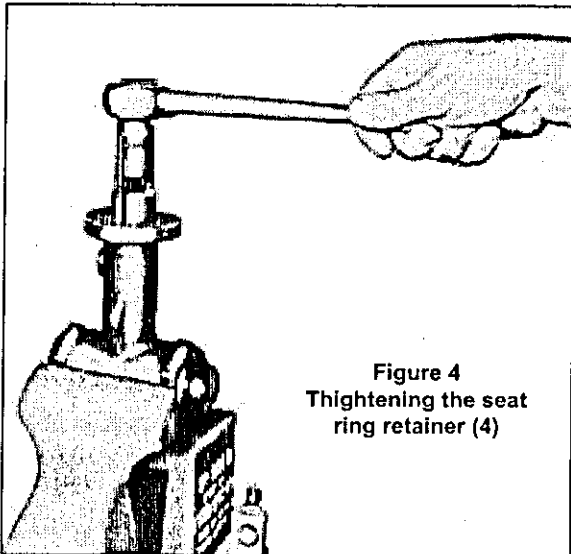


Figure 4
Tightening the seat ring retainer (4)

- Slide spacer (5) aligning the hole in the spacer with the safety pin (11) hole in the valve body.

Note: For a C_v smaller than 0.10 ensure that the retaining ring (182) is placed on the plug before engaging it in the spacer (3f). If the retaining ring is damaged, replace it.

- Wrap the safety pin (11) with two turns of PTFE tape (Teflon). Screw it into the bonnet five and a half to six turns from where threads engagement starts.

Note: To find start of threads engagement, proceed as follows:

- Screw safety pin about one turn,*
- Pull safety pin outwards while unscrewing it.*

- Install packing, positioning the skive cut of each packing ring 120° away from the cut of an adjacent ring. Slightly push down rings one after another using a tube 1/2" schedule 160 size. Install packing follower (9) on the plug stem.
- Insure that any pressure is admitted on diaphragm case. Hold actuator above body S/A. Before that coupling (101) contacts the plug stem, screw two nuts (8a) on the two studs (7), slide packing flange (10) on the plug stem and studs then screw the two nuts (27) to the threaded end of plug stem. Tighten nuts one against the other in this position
- While holding the plug in "Open" position (as far as possible), slowly pull down the actuator and screw the plug stem as long as possible into the coupling (101).

Note: This operation will be facilitated turning the plug by means of a wrench applied on the nuts (27) tightened one against the other.

Carefully avoid that seating surface of the plug contacts the seat ring during the plug screwing. Pulling down motion of the actuator and plug stem screwing must be simultaneously performed: carry on until the lower part of actuator yoke contacts the body flange (13).

- Place actuator in correct orientation in relation to regulator body S/A: the 1/2" NPT connection must be 90 degrees apart from controlled pressure line.
- Screw and tighten the two screws (16). Tighten also the two nuts (8a). Finger tight the two packing flange nuts (8b).
- Turn the nuts (27) to unscrew plug stem until the seating area of the plug just contacts the seat ring.
- Admit on actuator diaphragm a supply pressure higher than setting point value.
- Turn nuts (27) to unscrew plug stem by one turn and a half. Loosen the two nuts (27) and screw the upper nut against the coupling (101). During this step, the coupling must be held by means of a 14 mm flat spanner or pliers. Tighten second nut (27) against the first, using the two 17 mm flat spanners. Shut off air supply and disconnect temporary air line from the actuator.
- Connect the controlled pressure line to diaphragm case.
- Place back in service and tighten the nuts (8b) only as much as is necessary to stop any leakage.

Packing box

Adding Packings

To add a ring of packing, depressurize the regulator, back off packing flange nuts (8b) all the way, lift the packing flange and follower and insert one ring of packing. Tighten nuts (8b) finger tight plus one full turn.

Packing Quick Change Method (For regulators C_v 0.6 to 3.8 only)

The fastest and simplest way to replace packing is to remove the entire actuator without disturbing actuator parts or calibration. However, this is not recommended for regulators with a small C_v (C_v 0.6), due to the very fineness of their plug. In this event, disassemble the regulator to replace the packing (See under "Disassembly", page 4).

CAUTION: Regulator must be isolated and pressure vented before disassembly.

- Remove safety pin (11) from body. The safety pin engages the packing spacer (5). The function of safety pin and spacer is to prevent the plug from being pushed out if the actuator is removed while the regulator is still pressurized. The regulator internal parts cannot be removed unless the safety pin is removed first. Remove two packing flange nuts (8b) and two mounting nuts (8a). Remove also two mounting screws (16).
- Remove the actuator-plug assembly off the regulator.
- Clean the packing box and plug stem and carefully place new rings of packing around the stem. Position the skive cut of each packing ring 120° from that of the adjacent ring.

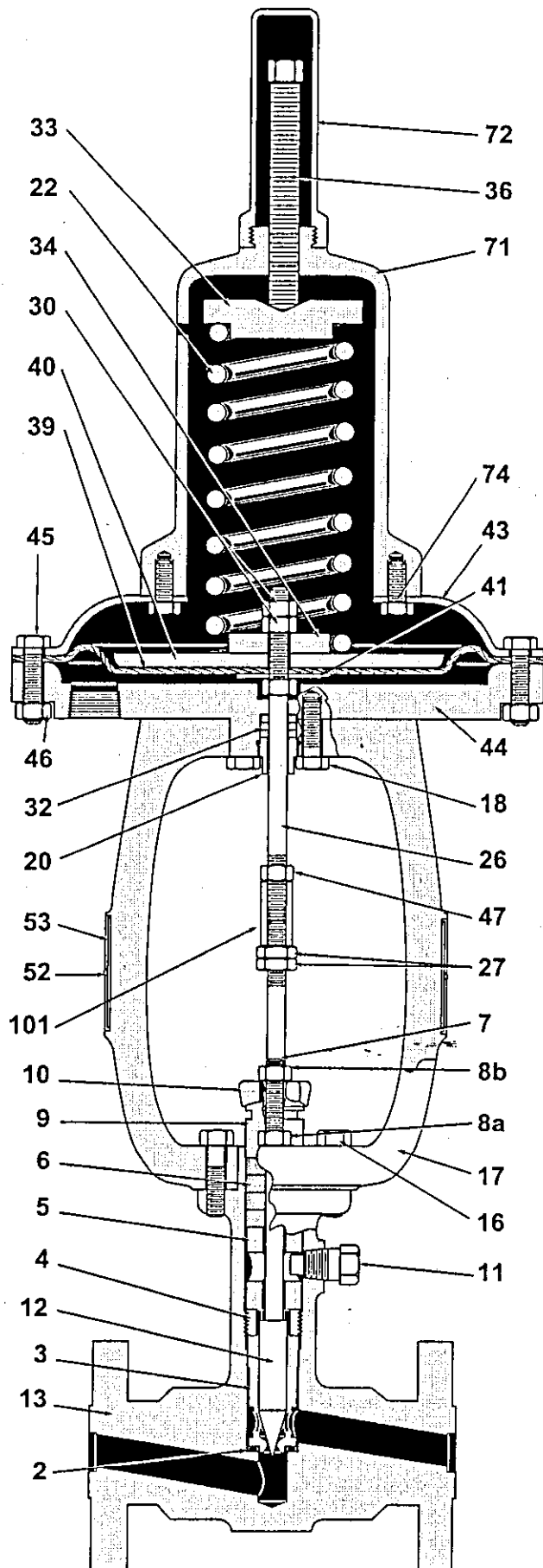


Figure 5
 Cross Section of Type 536 V
 Regulator.
 Range 2-5 psi

See Parts References page 11

- Reassemble the actuator-plug assembly to the regulator body, taking care: (a) to align hole in spacer (5) with safety pin hole; (b) to replace two mounting nuts (8a) before nuts (8b); (c) to take extra care in guiding each ring into the packing box.
- Tighten two nuts (8a) and two screws (16) on the actuator yoke.
- Wrap the safety pin (11) with two turns of PTFE tape (Teflon). Screw it into the bonnet five and a half to six turns from where threads engagement starts.

Note: To find start of threads engagement, proceed as follows:

- a. Screw safety pin in about one turn,
- b. Pull safety pin outwards while unscrewing it.

- Replace packing follower, packing flange and flange nuts (8b). Tighten nuts finger tight plus one full turn. Place back in service.

Replacing Diaphragm

CAUTION: Regulator must be isolated and pressure vented before disassembly.

- a. Disconnect the controlled pressure line from actuator case connection. Remove spring barrel cap (72). By means of a paint spot, make a mark on the spring adjuster screw (36) with regard to upper part of spring barrel (71); this is a reference of the service set point, in preparation to reassembly. Fully unscrew the spring adjuster screw (36) to remove (or release as far as) the spring compression.

Caution: In case of ranges 3-15; 10-40; 30-85 and 60-170 psi, the spring is always under light compression after fully unscrewing of spring adjuster (36). So, prior removal upper diaphragm case and spring barrel subassembly, the nuts (46) — located above diaphragm case in these configurations — must be evenly and progressively unscrewed until spring compression is fully relieved.

- b. Unscrew nuts (46) then remove cap screws (45) and upper diaphragm case (43) - spring barrel (71) - spring adjuster (36) subassembly, (as well as spring barrel spacer (102) in case of ranges 3-15; 10-40; 30-85 and 60-170 psi).
- c. Remove upper spring seat (33) and spring (22). In case of ranges 10-40; 30-85 and 60-170 psi, remove also the reducing ring (23).
- d. By means of two 1/2" or 13 mm flat spanners, unlock the upper stem nut (30).
- e. By means of a 17 mm flat spanner applied on upper plug stem nut (27), prevent the rotation of actuator stem (26) and unscrew the second nut (30).
- f. Remove lower spring seat (34). In case of ranges 0,5-3 and 2-5 psi, remove also the diaphragm plate (40).
- g. Remove the diaphragm (39). Clean thoroughly all parts in preparation for reassembly.

- h. Place new diaphragm and reassemble by reversing of the above description order. Adjust spring compression to set point, proceeding as indicated under "Set Point Adjustment". Place back in service.

Replacing O-ring (38)

(Only in case of 0,5-3 psi range)

- Perform steps a. to g. of the above chapter "Replacing Diaphragm". Remove diaphragm washer (41) and loosen the packing nut (20).
- By means of two 17 mm flat spanners, unlock the plug stem nuts (27) and unscrew them to the threaded end of the plug stem (12 or 183). Tighten nuts one against the other in this position.
- By means of a 14 mm flat spanner or pliers, hold the coupling (101) and, with a 17 mm flat spanner applied on the upper nut (27), unscrew the plug stem from the coupling. Do not unlock the coupling nut (47).
- Remove the four screws (18) and together raise the actuator packing box (31), packing box parts (32-20), O-ring (38) and actuator stem (26).
- Remove O-ring (38) from its box. Carefully clean all parts.
- Place a new O-ring, then place the packing box subassembly, using the four cap screws (18). Insure that orientation and centering of the lower diaphragm case (44) are correctly achieved.
- Screw the actuator stem and coupling (26-101) as far as possible on the plug stem. (*Do not overtighten*).
- Place diaphragm washer (41), diaphragm, diaphragm plate (40), lower spring seat (34) then, finger tight one of the two nuts (30) on the actuator stem end (26).
- By means of a 14 mm flat spanner or pliers, applied on the coupling (101), hold actuator stem (26) and firmly tight nut (30). With two 1/2" or 13 mm flat spanners tighten second nut (30) against the first.
- Place spring (22), its upper spring seat (33) and upper diaphragm case (43) - spring barrel (71) - spring adjuster (36) subassembly, with screws (45) and nuts (46). Tighten actuator packing nut (20).
- Turn spring adjuster screw (36) until the paint mark previously performed flushes with the upper part of the spring barrel.
- Connect a temporary supply air line on the lower diaphragm case connection (44).
- Admit on actuator diaphragm a supply pressure higher than setting point value.
- Turn nuts (27) to unscrew plug stem by one turn and a half. Unlock the two nuts (27) and screw the upper nut against the coupling (101). During this step, the coupling must be held by means of a 14 mm flat spanner or pliers. Tighten second nut (27) against the first, using the two 17 mm flat spanners. Shut off air supply and disconnect temporary air line from the actuator.
- Connect the controlled pressure line to diaphragm case. Adjust the set point, proceeding as indicated under "Set Point Adjustment". Place back in service.

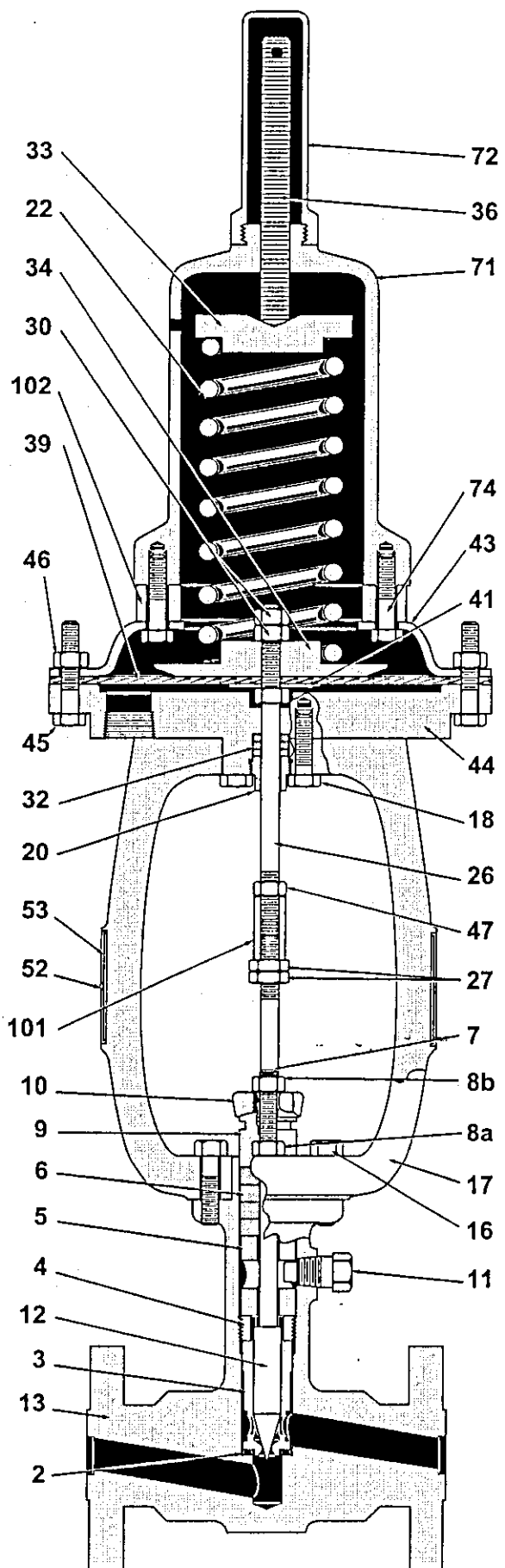


Figure 6
 Cross Section of Type 536 V
 Regulator.
 Range 3-15 psi

See Parts References page 11

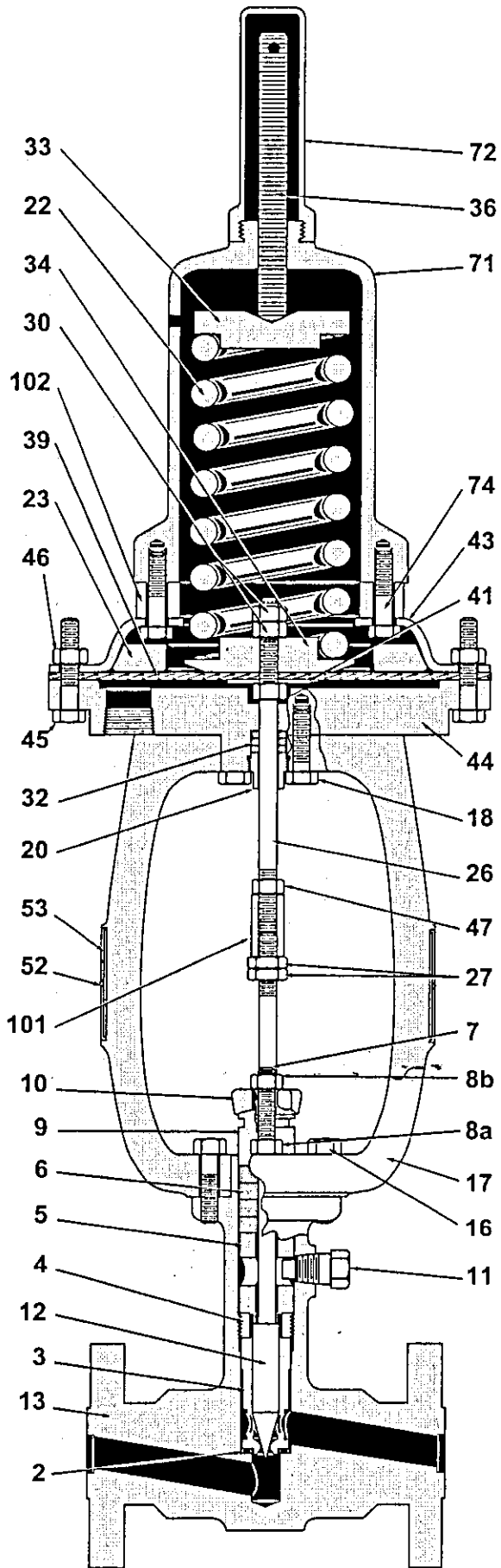


Figure 7
Cross Section of Type 536 V
Regulator.
 Range 10-40; 30-85 & 60-170 psi

See Parts References page 11

Maintenance of the actuator packing box

The actuator packing box requires minimum maintenance. The PTFE-Kevlar packing rings have a square section and a skive cut allowing easy replacement. The packing may be added to or completely replaced without disassembling either the actuator or regulator body S/A. Be sure to tighten packing nut (20) lightly. Overtightening will cause excessive friction resulting in sluggish performance.

PARTS REFERENCE

Ref.	Part Name	Ref.	Part Name	Ref.	Part Name
● 2	Seat Ring Gasket*	17	Yoke	41	Diaphragm Washer
3	Seat Ring	18	Cap Screw (L. diaph. case to yoke)	43	Diaphragm Case (Upper)
3e	Seat Ring (Only on C _v 0.10 *)	20	Packing Nut	44	Diaphragm Case (Lower)
3f	Spacer (Only on C _v 0.10 *)	22	Actuator Spring	45	Cap Screw (Diaph. case)
4	Seat Ring Retainer	① 23	Reducing Ring	46	Nut (Diaph. case)
5	Packing Spacer	26	Actuator Stem	47	Actuator Stem Nut (Coupling)
● 6	Packing	27	Plug Stem Nut	52	Drive Screw
7	Packing Flange Stud	30	Actuator Stem Nut	53	Serial Plate
8a	Mounting Nut	② 31	Actuator Packing Box	71	Spring Barrel
8b	Packing Flange Nut	● 32	Actuator Packing	72	Spring Barrel Cap
9	Packing Follower	33	Upper Spring Seat	74	Cap Screw (Spring Barrel)
10	Packing Flange	34	Lower Spring Seat	101	Coupling
11	Safety Pin	36	Spring Adjuster	④102	Spring Barrel Spacer
12	Plug and Stem	● 38	O-Ring ②	● 182	Retaining Ring (Only on C _v 0.10 *)
13	Body	● 39	Diaphragm	183	Plug-Stem (Only on C _v 0.10 *)
16	Mounting Screw	③ 40	Diaphragm Plate		

● Recommended spare parts

* Complete subassembly includes: Plug-stem (183), Retaining ring (182), Seat ring (3e) and Spacer (3f). (See figure 2)

+ Non-existent on C_v 3.8

① Only on range 10-40; 30-85 and 60-170 psi

② Only on range 0,5-3 psi

③ Only on range 0,5-3 and 2-5 psi

④ Only on range 3-15; 10-40; 30-85 and 60-170 psi



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77-6

Air Lock-up Valve Instructions

Masoneilan No 77-6 Air Lock-up Valve Instructions

Installation

Caution: Do not use for air pressures exceeding 250 psf.

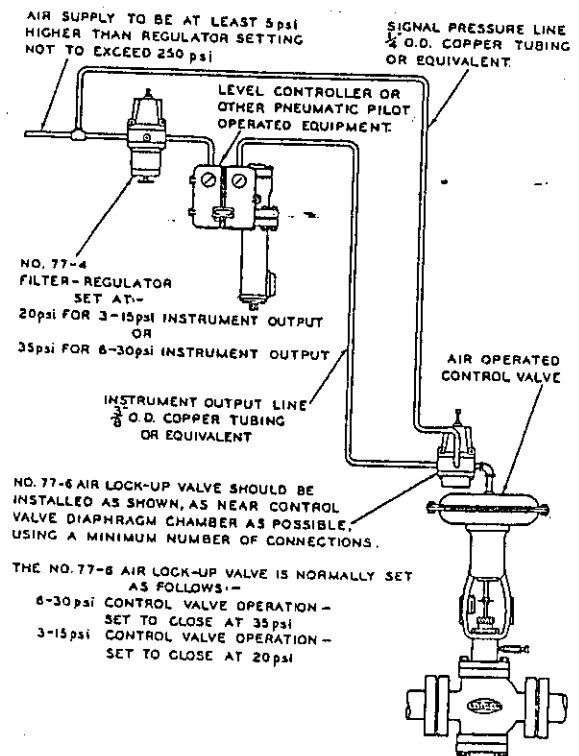
Prior to installing, clean all lines thoroughly to remove all dirt, scale or other foreign matter. Install lock-up valve in controller output line as near control valve diaphragm chamber as possible, holding number of connections to

a minimum, so that the air flows through the body in the direction indicated by the words INLET and OUTLET marked on the underside of valve body.

The signal pressure line should be connected upstream of the air supply regulator to provide effective response of the lock-up valve in event of air failure. Be sure all pipe connections are tight.

Adjustment

The lock-up valve is normally factory set (i.e., 20 psi for 3-15 psi operation or 35 psi for 6-30 psi operation) and should not require adjustment. If, however, it becomes necessary to adjust the setting an air supply, with a gauge and regulator, should be piped to the signal pressure connection after (1) relieving compression on range spring of lock-up valve and (2) connecting instrument output line to inlet connection of lock-up valve. Instrument output pressure need be sufficient only to determine open and closed position of lock-up valve. Turn air supply pressure on until pressure gauge indicates the desired set pressure, then turn adjusting screw down until no air pressure may be felt coming from the outlet of the lock-up valve. Valve will be fully closed at this point. Finally, tighten adjusting screw locknut and connect (1) the lock-up valve outlet connection to control valve diaphragm chamber and (2) the signal pressure line to the signal pressure connection of the lock-up valve. Turn on and set air supply to operating pressure.



Maintenance

Due to their design and intended application, maintenance difficulties are not expected to be encountered with these valves. If they fail to perform in satisfactory manner, it may be due to accumulation of dirt in one or more of the ports. If necessary to disassemble, proceed as follows after (1) shutting of supply pressure; (2) relieving spring compression by backing off the adjustment screw.

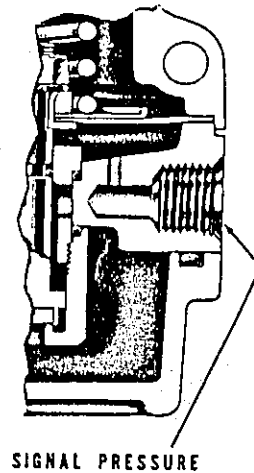
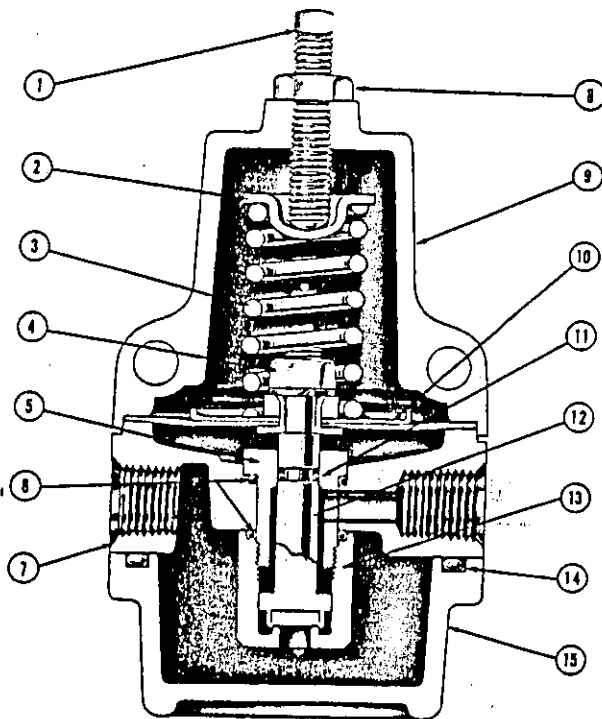
Remove the four body cap screws; body cap (15), body cap O-ring (14), range spring (3), upper spring button (2) and spring case (9) will come free from body (7).

To free diaphragm S/A (10) and inlet valve S/A (12) from body, place wrench on insert retainer (13) and unscrew from body insert (5). Remove body insert O-ring (6)

and slide diaphragm S/A, body insert and inlet valve S/A from body. Holding inlet valve from turning, unscrew inlet valve locknut (4) and remove diaphragm S/A from inlet valve. Turn inlet valve out of body insert.

Check all ports to be sure they are clear of dirt. Inspect diaphragm S/A for rupture or for damage around the edge. If necessary, install new diaphragm S/A. Check inlet valve for wear. If inlet valve is roughed-up or pitted, replace with new one.

To reassemble the lock-up valve, perform all operations in reverse order to that used in disassembly. *Note: O-ring on inlet valve stem should be lubricated before inlet valve is reassembled in body insert.*



PARTS REFERENCE

Ref.	Qty	Part Name	Ref.	Qty	Part Name
1	1	Adjusting Screw	9	1	Spring Case
2	1	Upper Spring Button	10	1	Diaphragm S/A
3	1	Range Spring	11	1	Inlet Valve O-Ring
4	1	Inlet Valve Locknut	12	1	Inlet Valve S/A
5	1	Body Insert	13	1	Insert Retainer
6	2	O-Rings	14	1	Body Cap O-Ring
7	1	Body	15	1	Body Cap
8	1	Locknut	16	4	Body Cap Screws



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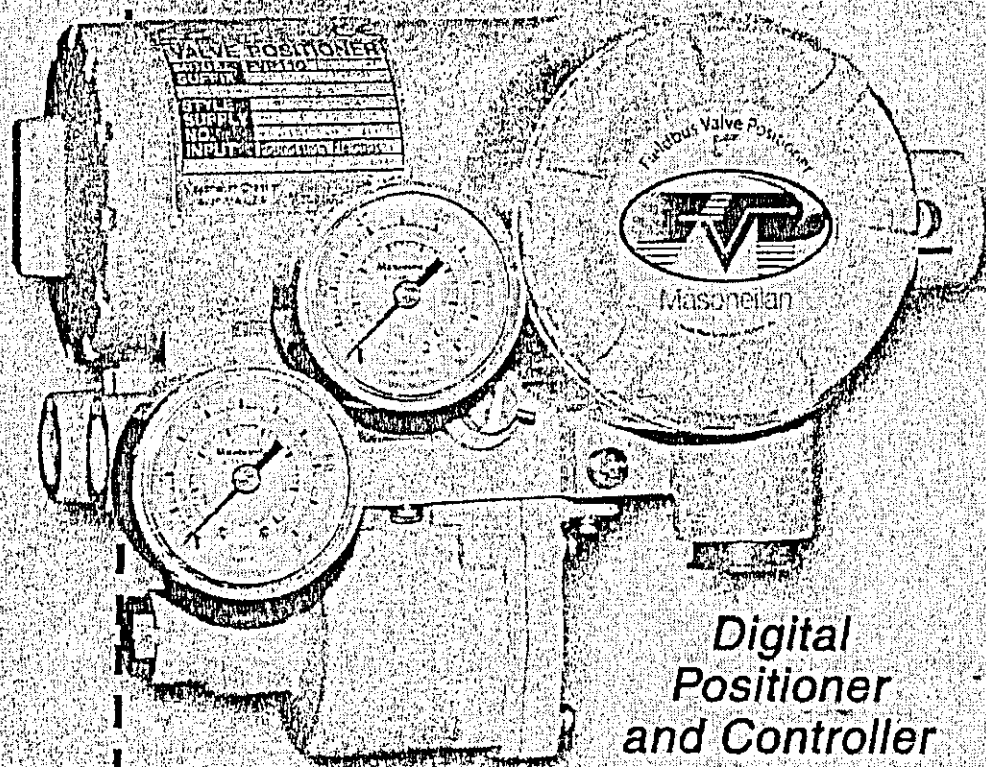
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FVP
FIELDBUS Valve Positioner

MASONEILAN FVP

FIELDBUS Valve Positioner

EW4000
11/01



*Digital
Positioner
and Controller*

INSTRUCTION MANUAL



DRESSER
Flow Control

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Customer Maintenance Parts List

Model FVP110 Advanced Valve Positioner CMPL 21B04C01-01E

INTRODUCTION

The FVP110 Advanced valve positioner is fully factory-tested according to the specifications indicated upon the order.

This Instruction Manual consists of two parts: 'Hardware' and 'Functions'. 'Hardware' part gives instructions on handling, wiring set-up and maintenance of FVP110, and 'Functions' part describe the software functions of FVP110.

In order for the FVP110 to be fully functional and to operate in an efficient manner, both parts in this instruction manual must be carefully read, so that users become familiar with the functions, operation, and handling of the FVP110.

■ Notes on the Instruction Manual

- This manual should be delivered to the end user.
- The information contained in this manual is subject to change without prior notice.
- The information contained in this manual, in whole or part, shall not be transcribed or copied without notice.
- In no case does this manual guarantee the merchantability of the transmitter or its adaptability to a specific client need.
- Should any doubt or error be found in this manual, submit inquiries to your local dealer.
- No special specifications are contained in this manual.
- Changes to specifications, structure, and components used may not lead to the revision of this manual unless such changes affect the function and performance of the transmitter.

■ Notes on Safety and Modifications

- Before handling the FVP110, it is absolutely imperative that users of this equipment read and observe the safety instructions mentioned in each section of the manual in order to ensure the protection and safety of operators, the FVP110 itself and the system containing the transmitter. We are not liable for any accidents arising out of handling that does not adhere to the guidelines established in the safety instructions.
- No maintenance should be performed on explosion-proof type temperature transmitters while the equipment is energized. If maintenance is required with the cover open, always first use a gas detector to check that no explosive gases are present.

- If the user attempts to repair or modify an explosion-proof type transmitter and is unable to restore it to its original condition, damage to the explosion-proof features result, leading to dangerous conditions. Contact your authorized Dresser Valve Division representative for repairs or modifications of an explosion-proof type transmitter.
- The FVP110 advanced valve positioner and this manual use the following safety related symbols and signals.

● Symbols used in this Instruction Manual

WARNING

Contains precautions to protect against the chance of explosion or electric shock which, if not observed, could lead to death or serious injury.

CAUTION

Contains precautions to protect against danger, which, if not observed, could lead to personal injury or damage to the instrument.

IMPORTANT

Contains precautions to be observed to protect against adverse conditions that may lead to damage to the instrument or a system failure.

NOTE

Contains precautions to be observed with regard to understanding operation and functions.

Some of the diagrams in this instruction manual are partially omitted, described in writing, or simplified for ease of explanation. The drawings contained in the instruction manual may have a position or characters (upper/lower case) that differ slightly from the what are actually seen to an extent that does not hinder the understanding of functions or monitoring of operation.

■ Warranty

- The warranty period of the instrument is written on the estimate sheet that is included with your purchase. Any trouble arising during the warranty period shall be repaired free of charge.
 - Inquiries with regard to problems with the instrument shall be accepted by the sales outlet or our local dealer representative.
 - Should the instrument be found to be defective, inform us of the model name and the serial number of the instrument together with a detailed description of nonconformance and a progress report. Outline drawings or related data will also be helpful for repair.
 - Whether or not the defective instrument is repaired free of charge depends on the result of our inspection.
- The following conditions shall not be eligible for charge-exempt repair.
- Problems caused by improper or insufficient maintenance on the part of the customer.
 - Trouble or damage caused by mishandling, misuse, or storage that exceeds the design or specification requirements.
 - Problems caused by improper installation location or by maintenance conducted in a non-conforming location.
 - Trouble or damage was caused by modification or repair that was handled by a party or parties other than our consigned agent.
 - Trouble or damage was caused by inappropriate relocation following delivery.
 - Trouble or damage was caused by fire, earthquake, wind or flood damage, lightning strikes or other acts of God that are not directly a result of problems with this instrument.

■ Trade Mark

- FOUNDATION Fieldbus is a trademark of the Fieldbus Foundation.
- Registered trademarks or trademarks appearing in this manual are not designated by a TM or ® symbol.
- Other company names and product names used in this manual are the registered trademarks or trademarks of their respective owners.

[HARDWARE]

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1. NOTES ON HANDLING

The FVP110 advanced valve positioner is fully factory-tested upon shipment. When the FVP110 is delivered, visually check that no damage occurred during the shipment.

1.1 Nameplate

The model name and configuration are indicated on the nameplate. Verify that the configuration indicated in the "Model and Suffix Code" in Chapter 7 is in compliance with the specifications written on the order sheet.

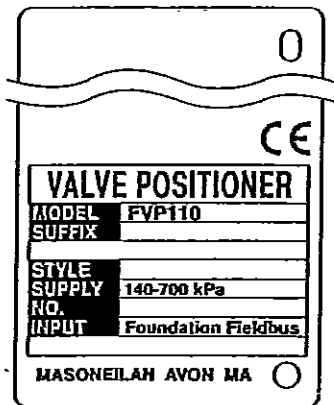


Figure 1.1 Nameplate

1.2 Transport

To prevent damage while in transit, leave the positioner in the original shipping container until it reaches the installation site.

1.3 Storage

When an extended storage period is expected, observe the following precautions:

- (1) If at all possible, store the positioner in factory-shipped condition, that is, in the original shipping container.
- (2) Choose a storage location that satisfies the following requirements.
 - A location that is not exposed to rain or water.
 - A location subject to a minimum of vibration or impact.

- The following temperature and humidity range is recommended. Ordinary temperature and humidity (25°C, 65%) are preferable.

Temperature: -40 to 85°C

Humidity: 5 to 100% RH (at 40°C)

- (3) The performance of the positioner may be impaired if stored in an area exposed to direct rain and water.

To avoid damage to the positioner, install it immediately after removal from the shipping container. Follow wiring instructions in this manual.

1.4 Choosing the Installation Location

Although the advanced valve positioner is designed to operate in a vigorous environment, to maintain stability and accuracy, the following is recommended:

(1) Ambient Temperature

It is preferable not to expose the instrument to extreme temperatures or temperature fluctuations. If the instrument is exposed to radiation heat a thermal protection system and appropriate ventilation is recommended.

(2) Environmental Requirements

Do not allow the positioner to be installed in a location that is exposed to corrosive atmospheric conditions. When using the positioner in a corrosive environment, ensure the location is well ventilated. The unit and its wiring should be protected from exposure to rainwater.

(3) Impact and Vibration

It is recommended that the positioner is installed in a location that is subject to a minimum amount of impact and vibration.

1.5 Use of a Transceiver

Although the positioner is designed to resist influence from high frequency noise, use of a transceiver in the vicinity of installation may cause problems. Installing the transmitter in an area free from high frequency noise (RFI) is recommended.

1.6 Insulation Resistance Test and Withstand Voltage Test

CAUTION

- (1) Overvoltage of the test voltage that is so small that it does not cause an dielectric breakdown may in fact deteriorate insulation and lower the safety performance; to prevent this it is recommended that the amount of testing be kept to a minimum.
- (2) The voltage for the insulation resistance test must be 500V DC or lower, and the voltage for the withstand voltage test must be 500V AC or lower. Failure to heed these guidelines may cause faulty operation.
- (3) Where a built-in arrester is provided (suffix code: /A), the voltage for the insulation resistance test must be 100V DC or lower, and the voltage for the withstand voltage test must be 100V AC or lower. Failure to heed these guidelines may cause faulty operation.

Follow the steps below to perform the test, the wiring of the communication line must be removed before initiating testing.

j Insulation resistance test procedure

1. Lay transition wiring between the + terminal and the - terminal.
2. Connect the insulation resistance meter (with the power turned OFF) between the transition wiring of Step 1 above and ground terminal. The polarity of the input terminals must be positive and that of the ground must be negative.
3. Turn the power of the insulation resistance meter ON and measure the insulation resistance. The duration of the applied voltage must be the period during which 100 M Ω or more is confirmed (or 20 M Ω if the unit is equipped with a built-in arrester).
4. Upon completion of the test, remove the insulation resistance meter, connect a 100 K Ω resistor between the transition wiring, and allow the electricity to discharge. Do not touch the terminal with your bare hands while the electricity is discharging for more than one second.

j Withstand voltage test procedure

Testing between the input terminals and the grounding terminal

1. Lay the transition wiring between the + terminal and the - terminal, and connect the withstand voltage tester (with the power turned OFF) between the transition wiring and the grounding terminal. Connect the grounding side of the withstand voltage tester to the grounding terminal.
2. After setting the current limit value of the withstand voltage tester to 10 mA, turn the power ON, and gradually increase the impressed voltage from 0 V to the specified value.
3. The voltage at the specified value must remain for a duration of one minute.
4. Upon completion of the test, carefully reduce the voltage so that no voltage surge occurs.

1.7 Notes for Safety

CAUTION

When air is supplied to a valve, do not touch the moving part(a stem of the valve), as it may suddenly move.

CAUTION

- While A/M selection switch is set to manual side (M), the pressure set in the regulator for air supply will be directly output to the actuator regardless of the control signal. Before changing the mode from auto to manual, check and confirm thoroughly that there will be no effect which may cause a danger in process or personal injury by changing the mode.
- Do not change the mode by using auto/manual switch during the operation. If the mode is changed from auto to manual or manual to auto, the valve stem will happen to move to the position which is different from the control signal (the input signal to the positioner), and thus dangerous.
- As soon as the manual operation is finished, make it sure to change the mode to auto by moving the A/M selection switch to Auto(A) side.

1.8 EMC Conformity Standards

For EMI(Emission) : EN 55011

For EMS(Immunity) : EN 50082-2

1.9 Installation of Explosion Protected Type Positioner



CAUTION

To preserve the safety of explosionproof equipment requires greater care during mounting, wiring, and piping. Safety requirements also place restrictions on maintenance and repair activities. Please read the following section very carefully.

1.9.1 FM Certification

a) Caution for FM Explosion Type

1.9.1 FM Certification

a) FM Explosionproof Type

Caution for FM Explosion type

Note1. Model FVP series Valve Positioner for use in hazardous (classified) locations:

Explosionproof for Class I, Division 1, Groups A, B, C, and D;
Dust-ignitionproof for Class II / III, Division 1, Groups E, F and G
Enclosure Rating: NEMA 4X
Temperature Code: T6
Ambient Temperature: -40 to 80 deg C

Note2. Wiring

All wiring shall comply with National Electrical Code ANSI/NFPA 70 and Local Electrical Codes

"FACTORY SEALED, CONDUIT SEAL NOT REQUIRED".

Note3. Operation

Note a warning label worded as follows.

Warning: OPEN CIRCUIT BEFORE REMOVING COVER.

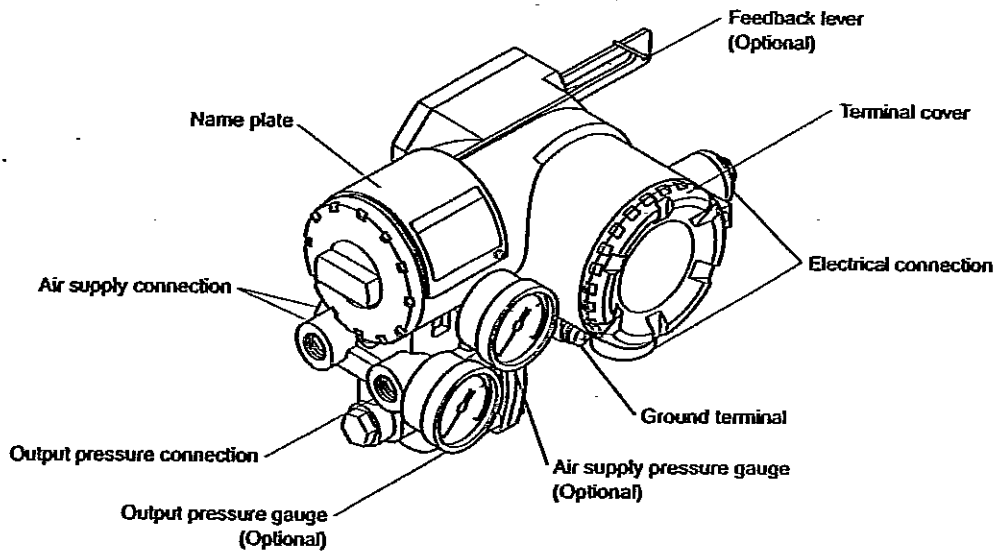
Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous locations.

Note4. Maintenance and Repair

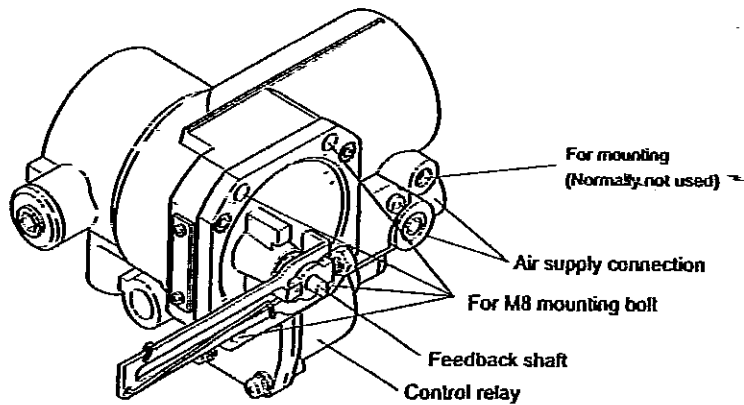
The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void the approval of Factory Mutual Research Corporation.

2. PART NAMES

2.1 Appearance and Part Names

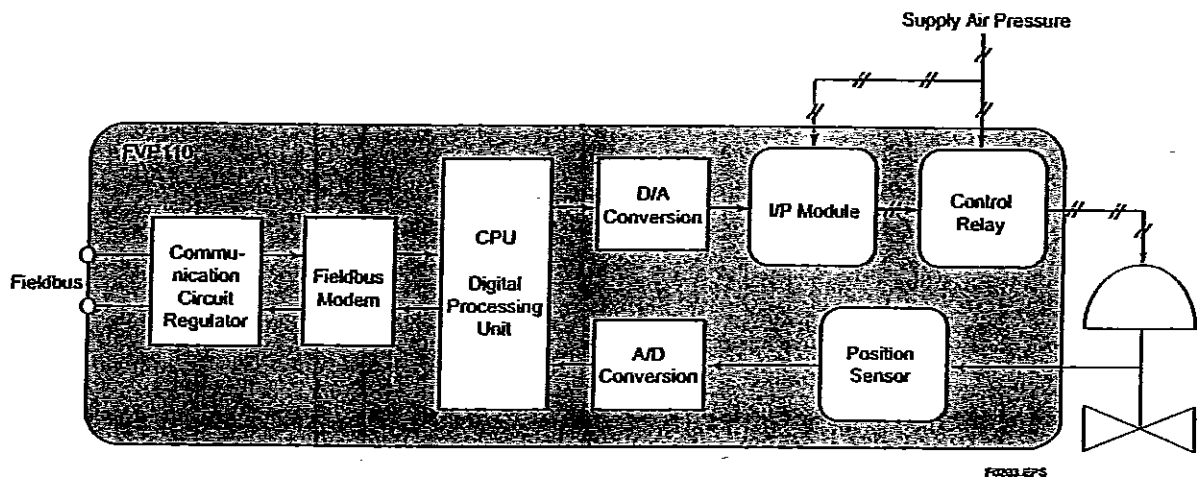


F0201E.EPS



F0202E.EPS

2.2 Block Diagram



3. INSTALLING FVP110 ON ACTUATOR

3.1 General

For installation of a FVP110, see Section 1.4, "Choosing the Installation Location." For the ambient, environmental conditions required for installation, see Chapter 7, "General Specifications."

WARNING

To avoid injury or the process being affected when installing or replacing a positioner on a control valve, ensure that:

- All inputs to the valve actuator and other accessories of the valve and actuator, including the air supply and electric signal, are cut off.
- The process has been shut down or the control valve is isolated from the process by using bypass valves or the like.
- No pressure remains in the valve actuator.

3.2 Installing FVP110 on Actuator

A FVP110 can be installed on a valve actuator with a mounting bracket. Prepare the bracket and clamp which are necessary to install the valve, according to the valve. In general, the installation method is determined by the combination of the control valve and positioner as well as by the valve manufacturer who performs the adjustment. For details, consult the control valve manufacturer.

Required Tools: To install a FVP110, you need to prepare:

- Nominal 13-mm open end or box end wrench for M8 bolts used to fix the mounting bracket to the positioner.
- Nominal 10-mm open end or box end wrench for M6 bolt used to fix the feedback lever to the shaft.

3.2.1 Installing FVP110 on Linear-motion Control Valve

The following shows the general installation procedure when assembling a FVP110 with a linear-motion control valve (e.g., a globe valve) combined with a diaphragm actuator or single-acting cylinder actuator. Note that the most suitable procedure may differ depending on the shapes of the bracket and valve actuator, and the structure of the mounting position.

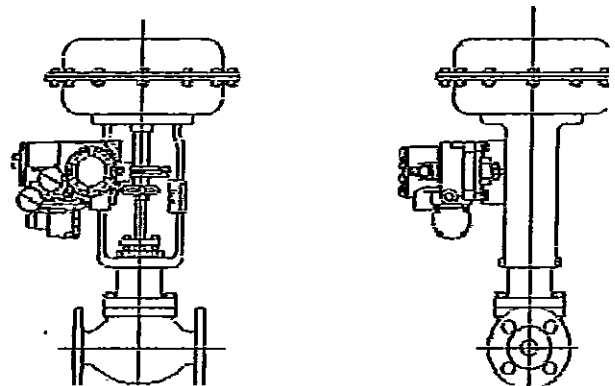


Figure 3.1 FVP Installed on Linear-motion Valve/Actuator

(1) Fixing Bracket to FVP110

Use the four M8 bolts that come with the FVP110 to tightly fix the mounting bracket to the FVP110. (See "Part Names" on page 2.1) The installation method is determined by the combination of the control valve and positioner as well as by the valve manufacturer who performs the adjustment. For details, consult the control valve manufacturer.

(2) Fixing the FVP110 to Actuator with Bracket

After fixing the bracket to the FVP110, attach it to the actuator with the specified bolts.

Depending on the shapes of the bracket and actuator, the working space at the rear of the FVP110 where the feedback shaft is positioned may be quite narrow, making installation work tricky. In such a case, the entire procedure may be made much easier by attaching the feedback lever to the feedback shaft as described in step (3), prior to carrying out step (2). Check the space behind the FVP110 beforehand.

3. INSTALLING FVP110 ON ACTUATOR

(3) Attaching Feedback Lever

The FVP110 with option code /LV comes with the two different feedback levers shown below. Check the specifications of the levers shown in Table 3.1 and Figure 3.2 and choose the lever most suitable for the control valve used.

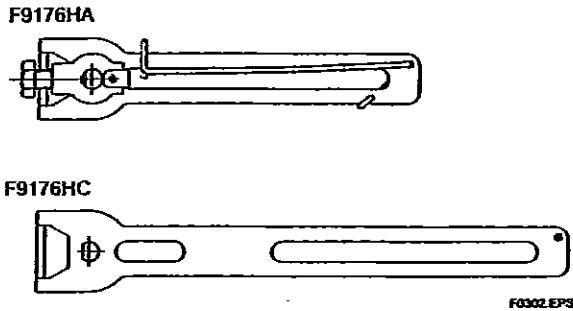


Figure 3.2 Feedback Levers

Table 3.1 Specifications of Levers

Lever Model	Stroke (X)	Pin-to-shaft Distance (L)	Allowable Range of Rotation Angle of Feedback Shaft(θ)
F9176HA	10 to 60mm	25 to 75mm	±10 to 25 degrees
F9176HB	30 to 100mm	75 to 115mm	

Note: When assembling a FVP110 with a linear-motion actuator, ensure that the rotation angle of the FVP110's feedback shaft does not exceed the allowable range (10 to 25 degrees shown above). Only if the range of the rotation angle is within this specification, it is guaranteed that the specified accuracy can be obtained by linearity correction (see the description for travel calibration in Section 5.3, "Carrying out Auto Tuning").

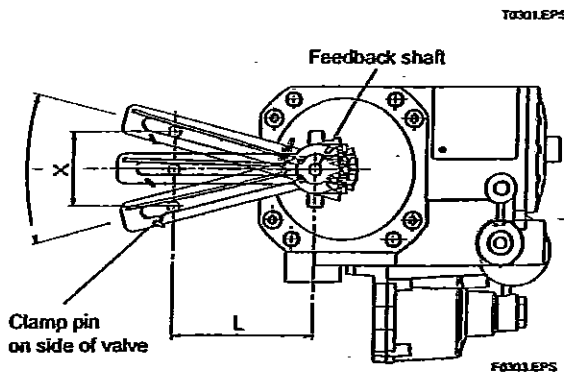


Figure 3.3 Stroke of Lever

The hardware for attaching the lever to the feedback shaft and the spring for fixing the clamp pin are attached to the F9176HA, the smaller feedback lever for generally used mid-capacity actuators. Thus, when using the F9176HC, the feedback lever for high-capacity actuators, detach and use the hardware and spring from the F9176HA. See Figure 3.4. To do so, first detach the spring <4>. Then, detach the clip <1>

and remove the hardware <2> and <3>. Attach <1> to <4> to the F9176HC feedback lever for high-capacity actuators in the reverse order.

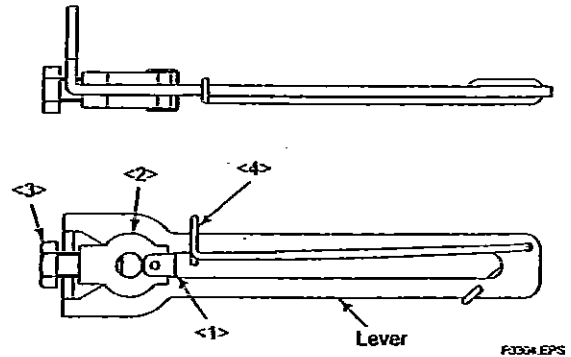


Figure 3.4 Disassembling a Lever Assembly

When determining which lever to use, follow the procedure below to make a linkage between the FVP110 positioner and control valve's stem via the clamp and lever. The adjustment of this linkage is a decisive factor for determining the characteristics of the control valve combined with the FVP110 positioner.

- (1) Insert the FVP110's feedback shaft into the small hole on the stopper side of the lever as shown in Figure 3.5.

CAUTION

It is extremely likely that attaching the lever in the wrong orientation will cause the feedback shaft to rotate at an angle exceeding its mechanical limits of ±55 degrees, resulting in the FVP110 being seriously damaged.

Next, fix the lock screw.

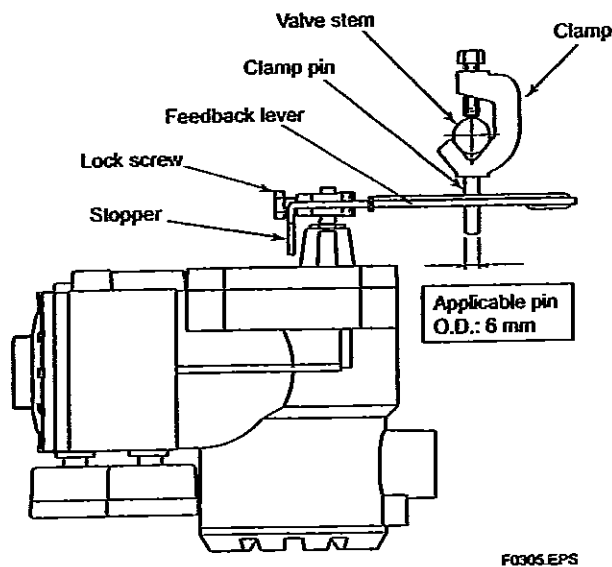


Figure 3.5 Attaching Lever and Clamp

- (2) Attach the clamp to the stem in reference with Figure 3.5. It is necessary to set the clamp of the FVP110 in a position that allows the feedback lever to be at an angle within ± 15 degrees from the horizontal level when the valve stem is at the 50% position (see Figure 3.6). Installing the FVP110 at a carefully determined position, where the feedback lever is at the horizontal level when the valve stem is at the 50% position, will make the consequent installation work easier.

Note that only if the FVP110 is installed at a position meeting the specification above, it is guaranteed that the specified accuracy can be obtained by linearity correction (see also Section 13.5, "Travel Calibration").

WARNING

Procedures (3) through (6) require supplying air to the actuator. Piping must be carried out by following the instructions shown in Chapter 4. "Wiring and Piping".

- (3) Using a flat-headed screwdriver, turn the A/M selector switch on the FVP110 clockwise to change the selector position to M (manual). Be sure to turn the switch until it stops (see also Section 3.2.3, "A/M Switching").

WARNING

Changing the A/M selector switch position to M (manual) causes air at the pressure setting of the pressure regulator for air supply to be supplied to the valve actuator regardless of the input signal. Therefore, prior to switching to manual mode, make sure that doing so will neither cause an injury nor affect the process.

- (4) Next, supply air to the valve actuator. Doing so causes the valve stem to move; be extremely careful about safety. Adjust the pressure regulator to set the stroke of the stem to 50%.

WARNING

Do not supply air at a pressure exceeding the maximum rated air supply pressure of the actuator or the FVP110 (700 kPa). Doing so may result in a high risk of damage to the equipment or lead to an accident.

- (5) Check that the feedback lever is at around the horizontal level. If its incline deviates from the horizontal level by 15 degrees or more, shut off the air supply for safety. Then, after confirming that the air has been completely exhausted out of the actuator, readjust the clamp position.
- (6) After the incline from the horizontal level has been adjusted to within ± 15 degrees, shut off the air supply and turn the A/M selector switch counterclockwise until it stops, to change the selector position to A (automatic). (See also Section 3.2.3, "A/M Switching").

3. INSTALLING FVP110 ON ACTUATOR

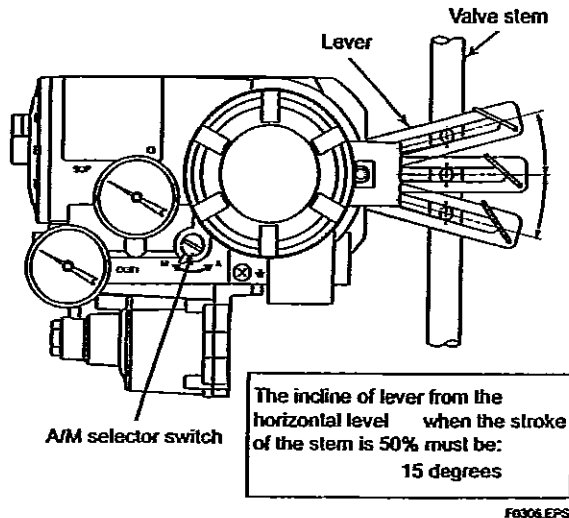


Figure 3.6 Checking Position at Which Clamp Should Be Fixed

3.2.2 Installing FVP110 on Rotary-motion Control Valve

The following shows the general installation procedure when assembling a FVP110 with a rotary-motion control valve combined with a diaphragm actuator or single-acting cylinder actuator. Note that the most suitable procedure may differ depending on the shapes of the bracket and valve actuator, and the structure of the actuator.

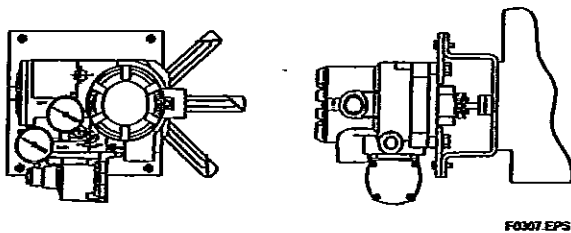


Figure 3.7 FVP Installed on Rotary-motion Valve/Actuator

(1) Allowable Range of Rotation Angle of Feedback Shaft

When combining a FVP110 with a rotary-motion actuator, ensure that the rotation of the feedback shaft by the position feedback meets the following specifications:

- Range of rotation angle of shaft:
Within ± 45 degrees from horizontal level
- Minimum span: 20 degrees
- Maximum span: 90 degrees
- Mechanically allowable rotation angle:
 ± 55 degrees

If any one or more of the specifications above are not met, the specified accuracy may not be guaranteed, resulting in the FVP110 positioner being damaged. An advance check is essential.

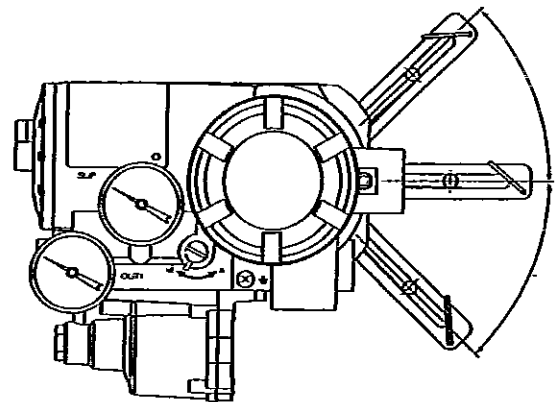


Figure 3.8 Allowable Range of Rotation Angle of Feedback Shaft When Assembling with Rotary-motion Actuator

(2) Fixing Bracket to FVP110

Use the four M8 bolts that come with the FVP110 to tightly fix the mounting bracket to the FVP110. (See "Part Names" on page 2.1) The installation method is determined by the combination of the control valve and positioner as well as by the valve manufacturer who performs the adjustment. For details, consult the control valve manufacturer.

(3) Attaching Feedback Lever

For a rotary-motion actuator, since it is often difficult to secure sufficient working space between the positioner and actuator, attach the feedback lever before fixing the FVP110 to the actuator. Make sure that the stopper is located on the side of the FVP110 as shown in Figure 3.9.

⚠ CAUTION

It is extremely likely that attaching the lever in the wrong orientation will cause the feedback shaft to rotate at an angle exceeding its mechanical limits of ± 55 degrees, resulting in the FVP110 being seriously damaged.

Next, fix the lock screw.

(4) Fixing the FVP110 to Actuator with Bracket

Insert the pin attached to the valve spindle, into the long hole of the feedback shaft of the FVP110 positioner.

Before fixing the bracket to the actuator, carefully position it so that the center of the rotation axis of the valve plug and that of the FVP110 positioner's feedback shaft are aligned both horizontally and vertically. After the alignment has been checked, tightly fix the bracket to the actuator with the specified bolts. Misalignment of these rotation axes decreases the level of accuracy.

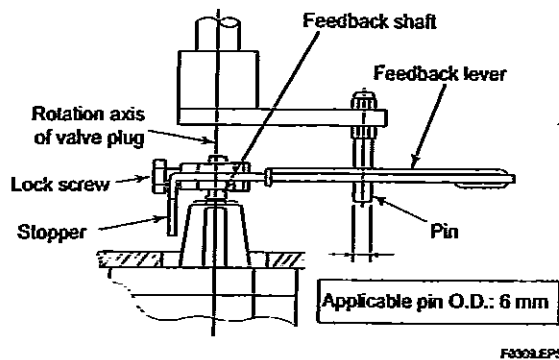


Figure 3.9 Inserting Pin into Hole of Feedback Lever

3.2.3 A/M Switching

To perform manual operation of the valve using the A/M (automatic/manual) mode switching mechanism of the FVP110, there needs to be a pressure regulator for the air supply. To perform manual operation, follow the procedure below.

- (1) Turn the A/M selector switch clockwise to change the switch position to M until it stops.
- (2) In manual mode, you can vary the pneumatic pressure output to the valve actuator by changing the regulator output pressure regardless of the input signal of the FVP110. For a FVP110 equipped with pressure gauges, you can read the output pressure to the actuator.
- (3) After you have finished manual operation, turn the A/M selector switch counterclockwise until the stopper pin touches the side of the FVP110's casing in order to ensure the switch position changes to A.

**WARNING**

- Changing the A/M selector switch position to M (manual) causes air at the pressure setting of the pressure regulator for air supply to be supplied to the valve actuator regardless of the input signal. Therefore, prior to switching to manual mode, make sure that doing so will neither cause an injury nor affect the process.
- Do not change the A/M selector switch position from M (manual) to A (automatic) or A (automatic) to M (manual) during operation. Doing so will cause the valve stem to temporarily move to a position different from the position determined by the level of the input signal to the positioner.
- If the pressure larger than the allowable range of pressure gauge is applied, the pressure gauge may possibly be damaged.

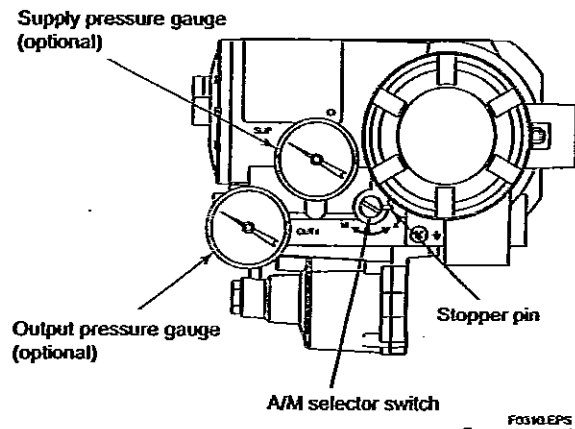


Figure 3.10 A/M Selector Switch

4. WIRING AND PIPING

4.1 General

This chapter describes the air piping and electric wiring connections.

WARNING

- Be sure to cut off all inputs to the valve actuator and other accessories of the valve and actuator, including the air supply and electric signal before making or modifying the piping and wiring connections.
- The process must be shut down or the control valve isolated from the process by using bypass valves or the like when making or modifying the piping and wiring connections.
- Always cap the unused wiring ports with blind plugs.

4.2 Piping

4.2.1 Air Supply

For stable operation of the FVP110 over a long term, a clean and dry supply of air needs to be maintained. Therefore, be careful about the following:

- (1) To prevent moisture, oil, and dust from being led into the FVP110 through pipes, give careful consideration to the choice of the air supply system and supply air suction point as well as installation of the air supply header and air supply piping.
- (2) The desired supply air must:
 - Be dry air whose dew point is at least 10°C lower than that of the ambient temperature.
 - Be free from solid particles as a result of being passed through a 5- μ m or finer filter.
 - Not contain oil at a concentration higher than 1 ppm in weight or volume.
 - Not be contaminated by a corrosive, explosive, flammable, or toxic gas.
 - Comply with ANSI/ISA-57.3 1975 (R1981) or ISA-S7.3-1975 (R1981).
- (3) The FVP110 requires an air supply of 140 to 700 kPa. Within this range, regulate the air supply pressure at a level within $\pm 10\%$ of the air supply pressure specified for the actuator, and at 10% of the actuator's spring range or higher.

WARNING

Do not supply air at a pressure exceeding the maximum rated air supply pressure of the actuator or the FVP110 (700 kPa). Doing so may result in a high risk of damage to the equipment or lead to an accident.

4.2.2 Pneumatic Piping

Connect the air supply pipe to the SUP port of the FVP110, and the output pressure pipe to the OUT1 port. Use O.D. 6-mm/I.D. 4-mm or O.D. 8-mm/I.D. 6-mm copper tubes for piping, and pneumatic pipe fittings for joints. After finishing the piping, check that there is no leakage from the joints.

Note that a FVP110 has two air supply ports (SUP): one at the rear and the other on the side. When delivered, the rear SUP port is capped with a blind plug. Thus, to use the rear SUP port, remove the blind plug and cap the side SUP port with it. At this time, be very careful that no foreign matter or dust caught in the sealing tape is allowed to enter inside the pipe.

Figure 4.1 shows the pneumatic piping ports. The port specification can be chosen when ordering the FVP110.

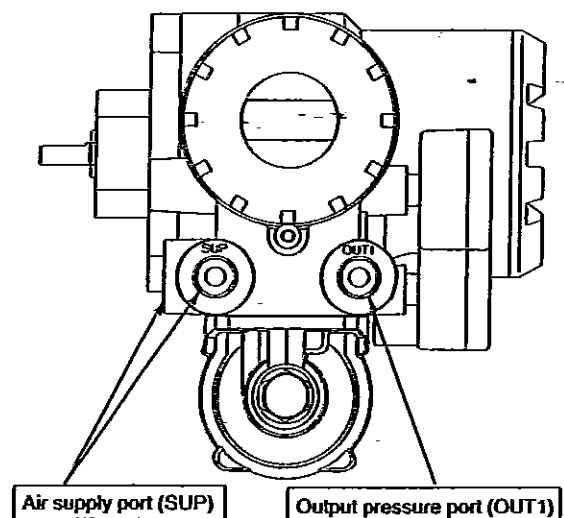


Figure 4.1 Pneumatic Piping Ports

⚠ CAUTION

- To obtain the maximum air processing flow rate of the FVP110, the inner diameter of the piping tube needs to be at least 6 mm. When the FVP110 is combined with a high-capacity actuator and a minimum response speed is required, use a tube whose inner diameter is 6 mm or larger.
- Do not use an unnecessarily long tube or piping as it will decrease the air flow rate, thus leading to a decrease in response speed.
- Perform sufficient flushing of the piping tubes and fittings before use to ensure that no foreign matter such as metal refuse may enter the piping.
- When performing the piping connection, be sufficiently careful that a piece of sealing tape or other solid or fluid sealing material does not enter the piping.

4.3 Wiring

4.3.1 Recommended Cables

For wiring for a FVP110, use a cable for H1 fieldbus segments specified by the Fieldbus FOUNDATION™. A shielded cable is recommended. For the details of cables required for H1 fieldbus segments, see "Fieldbus Technical Information"(TI 38K3A01-01).

Choose cables suitable for the respective ambient temperature ranges, especially when they are to be laid in a hot or cold place.

When laying cables in or through a place where the atmosphere may include a toxic gas or liquid, or oil or solvent, choose wires and cables made of materials that have sufficient durability.

4.3.2 Precautions on Wiring

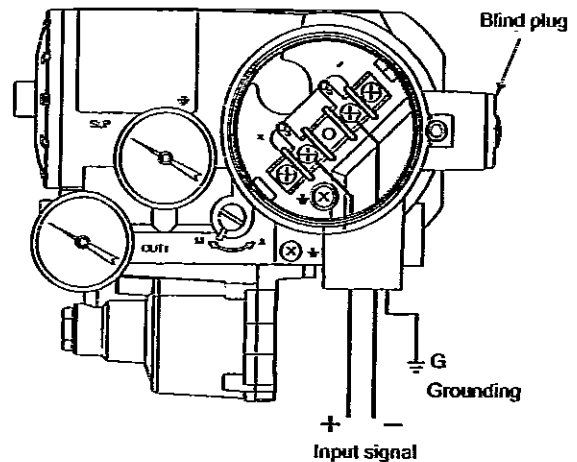


Figure 4.2 Wiring

- (1) Prevent the cables from being affected by noise induced from a high-capacity transformer or power supply to a motor.
- (2) As shown in Figure 4.2, remove the terminal box cover and dust proofing plug when performing a wiring connection. Be sure to securely seal the unused wiring port with a blind plug.
- (3) To make the cables watertight and to prevent them from being damaged, it is recommended to use a cable conduit and duct. Also for the same reasons, be sure to use a watertight adapter for the connection of the conduit to the port.
- (4) Ground the FVP110 to a pole with a grounding resistance of 100 Ω or less. There are two grounding terminals: one inside and another outside the terminal box. Use either terminal.

5. SETUP

CAUTION

During the setup especially when autotuning is being executed, the valve stem may happen to move suddenly to an unexpected direction. Before starting the setup, check and confirm that the process has been shut down or the control valve is isolated from the process. During the setup, keep away from the movable parts to avoid injury.

5.1 General

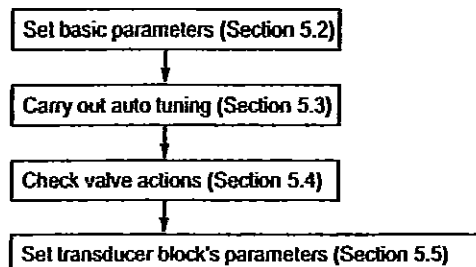
After mechanically attaching the FVP110 to an actuator and finishing the wiring and piping, connect the FVP110 to a fieldbus and make settings, such as carrying out auto tuning and setting the tight-shut option, using a parameter setting tool or the like.

IMPORTANT

For the operation of a parameter setting tool, read the manual of each tool. Also, read the Chapters 8 through 10 and 12 of this manual to become familiar with the configuration of the fieldbus instrument and the function of the transducer block before starting adjustment.

Check that the piping and wiring connections are all correct, and then supply the specified input voltage and air pressure. For the connection to the fieldbus, see the chapters 4.3 'Wiring' and 8.4 'System Configuration'.

Parameter settings for the actuator and valve are to be made in the parameters in the transducer block inside the FVP110 positioner. For details of each parameter, refer to the parameters list in Appendix I. Follow the procedure below.



F0501 EPS

Figure 5.1 Setup Procedure

5.2 Setting Basic Parameters

First, set the target mode's in the parameters `MODE_BLK` of the transducer block and AO function block to O/S (Out of Service). When either one or both of the transducer block and AO function block are in the O/S mode, the transducer block's parameters that determine the valve actions are write-locked.

(1) Selecting the Acting Direction of Valve

In the parameter `ACT_FAIL_ACTION`, set the value, 1 or 2, corresponding to the acting direction of the valve, whether the valve opens or closes due to an increase of the pneumatic pressure. The setting in `ACT_FAIL_ACTION` determines the relationship between the pneumatic input signal and 0-100% of the valve position, where the 0% position means complete closure.

- 1 = self-closing (air to open)
- 2 = self-opening (air to close)

IMPORTANT

For the transducer block, the 0% output always means complete closure of the valve. Set `ACT_FAIL_ACTION` correctly in accordance with the acting direction of the valve used. Nonetheless, the 0-100% of the transducer block's output can be logically reversed by setting `IO_OPTS` in the AO block to true.

Independently of the above setting, FVP110 always acts identical upon power off and cut-off of the air supply.

(2) Selecting the Actuator Type

For the parameter VALVE_TYPE, set the value, 1 or 2, in accordance with the actuator type.

1 = linear-motion actuator

2 = rotary-motion actuator

Choosing the linear-motion type automatically corrects a linearity error that is inherently caused between the linearly acting actuator and the rotating displacement sensor inside the FVP110 actuator.

5.3 Carrying out Auto Tuning**CAUTION**

This function strokes the valve over its full range. Do not execute while valve is controlling the process. Keep away from the movable parts to avoid injury.

After selecting the acting direction of the valve and the actuator type, carry out auto tuning. The auto tuning program automatically:

- Adjusts the zero-point and span.
- Adjusts the parameter settings for controlling the valve.

**IMPORTANT**

Auto Tuning in FVP110 sets the 0% point at the position where the valve is fully closed and 100% point at the position where the valve stem stops against the mechanical stopper (fully open). If it is necessary to adjust the zero point and span precisely to the rated stroke of the valve, carry out travel calibration which is described later in this chapter after the Auto Tuning.

To carry out auto tuning, write a value to the parameter AUTO_TUNE_EXEC according to the following procedure.

**CAUTION**

For the first time after installing the FVP110 on the actuator or anytime after detaching the FVP110 and installing it again on the actuator, be sure to perform step (1) below, or (2) and (3) to carry out all adjustments. Otherwise, the adjustments cannot be carried out correctly. From the next and any time thereafter, perform only step (2) or (3) independently.

- (1) To sequentially adjust the zero-point and span, and then control parameter settings for the first time after installing the FVP110 on a valve actuator, write:

4 (= travel calibration at stop point and control parameter tuning).

- (2) To leave the control parameter settings unchanged and only perform zero-point and span adjustments such as after detaching the FVP110 from the valve actuator and restoring it, write:

2 (= travel calibration at stop point).

- (3) To leave zero-point and span settings unchanged and only adjust control parameter settings, such as after the hysteresis of the valve actions has greatly changed, write:

3 (= control parameter tuning).

The time needed to complete the adjustments, which varies with the actuator size and the hysteresis of the actions, is roughly 4 minutes for a mid-capacity (capacity of around 3 liters) actuator.

If you want to abort auto tuning for some reason such as when you have started it while leaving the air supply shut off, write:

5 (= cancel execution).

The tuning result will be written to AUTO_TUNE_RESULT. The value of AUTO_TUNE_RESULT is 255 and is displayed as "In operation" while auto tuning is running, and will change to 1 which is displayed as "Succeeded" when auto tuning has finished successfully. In the event of a warning or error, a value other than those below will be displayed. For details, see the specifications for the transducer block.

1 = succeeded

2 = canceled

255 = in operation

The values of the hysteresis of valve actions and the air supply pressure measured during auto tuning are stored in parameters of the transducer block inside the FVP110. Note that pressure data such as air supply pressure data are available only for a FVP110 with an optional pressure sensor.

CAUTION

Ensure that the pressure of the air supply to the FVP110 positioner is regulated within the specified range. If it differs from the pressure during actual operation, or if it is unstable, optimum tuning results may not be obtained.

The following parameters are tuned by carrying out auto tuning:

SERVO_GAIN
(static loop gain of internal valve control loop)

SERVO_RESET (integral time)

SERVO_RATE (derivative time)

SERVO_RATE_GAIN (derivative gain)

SERVO_DEADBAND
(dead band of integral action)

SERVO_OFFSET (offset of integral action)

BOOST_ON_THRESHOLD
(threshold to switch on the boost action)

BOOST_OFF_THRESHOLD
(threshold to switch off the boost action)

BOOST_VALUE

SERVO_I_SLEEP_LMT
(timer setting for integral action)

SERVO_P_ALPHA
(multiplication coefficient for the square of proportional factor)

INTERNAL_GAIN
(total gain of I/P module, control relay and the valve)

Normally, control parameters need not be readjusted after auto tuning. (Should there be a problem, see Chapter 16, "Troubleshooting.")

If you want to carry out fine adjustments of the zero-point and span settings, perform the travel calibration as follows.

● Travel Calibration

If the full stroke of the valve is too large for the maximum required flow rate, you can change the span of the travel by carrying out a travel calibration.

- (1) First, vary the value of FINAL_VALUE.value (see caution) to move the stem and adjust the stem to the desired point that you want to set as the 100% position.
- (2) Next, write 3 to TRAVEL_CALIB_EXEC. This changes the span while leaving the zero point unchanged.

TRAVEL_CALIB_EXEC:

- 1 = off
- 2 = 0%-point calibration (no change to span)
- 3 = span calibration (no change to 0% point)
- 4 = 50%- point calibration (no change to either span or 0% point)

CAUTION

Only when the target mode's in both the AO and transducer blocks are O/S, can FINAL_VALUE.value be written.

The result of the travel calibration will be written to TRAVEL_CALIB_RESULT.

5.4 Checking Valve Actions

After carrying out auto tuning, check step responses by changing the value of the transducer block's final valve position setpoint, FINAL_VALUE.value. Also, check whether the valve acts correctly over the 0-100% position range.

CAUTION

Only when the target mode's in MODE_BLK parameters in both the AO and transducer blocks are O/S, can FINAL_VALUE.value be written.

5.5 Setting Parameters of Transducer Block

Set the following parameters as necessary. For the settings made as default when shipped, see the parameter lists in Appendix 1.

(1) Position-to-flow Rate Characteristic Type

The parameter POSITION_CHAR_TYPE defines the characteristics between the valve position and flow rate, and is set to linear by default. Write the appropriate value:

- 1 = linear
- 2 = equal percent (50:1)
- 3 = equal percent (30:1)
- 4 = quick open (reversal of equal % - 50:1)
- 255 = user-defined

Writing the value 255 allows you to define the desired characteristics by 10 line segments for evenly divided input levels. The coordinates (0,0) and (100,100) are fixed; set the values corresponding to OUT(Output of AO block) = 10%, 20%, 30%..., 80%, 90%. Note that a set value must be greater than the preceding set value; the output must increase as the input increases.

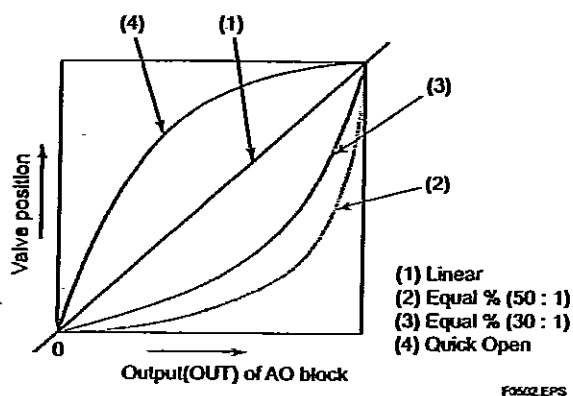


Figure 5.2 Position-to-flow Rate Characteristic Type

(2) Final-value Limits

Eu_100 and Eu_0 in the parameter FINAL_VALUE_RANGE define the upper and lower limits of FINAL_VALUE.value of the transducer block.

! CAUTION

Even if the range of FINAL_VALUE.value is limited by FINAL_VALUE_RANGE, the actual valve position is set to outside the FINAL_VALUE_RANGE setting when the tight-shut or full-open action described below is activated.

(3) Tight-shut and Full-open Actions

The tight-shut action is an action to decrease the output pressure to a level much lower than the 0% pressure level (or to increase it much higher than the 0% pressure level for an air-to-close valve) when FINAL_VALUE.value is less than FINAL_VALUE_CUTOFF_LO in order to ensure that the valve is tightly shut off. Conversely, the full-open action is an action to increase the output pressure to a level much higher than the 100% pressure level (or decrease it much lower than the 100% pressure level for an air-to-close valve) when FINAL_VALUE.value is larger than FINAL_VALUE_CUTOFF_HI in order to ensure that the valve is fully open.

A hysteresis of 1% is applied to the thresholds, FINAL_VALUE_CUTOFF_LO and FINAL_VALUE_CUTOFF_HI.

(4) Thresholds for Limit Switches

Just like hardware limit switches for a valve, on/off status signals can be generated when the valve position read-back signal FINAL_POSITION_VALUE.value reaches specified levels. These on/off statuses can be transferred to a DI function block.

Write the threshold for the upper limit switch to LIMSW_HI_LIM, and the threshold for the lower limit switch to LIMSW_LO_LIM.

A hysteresis of 1% is applied to the thresholds, LIMSW_HI_LIM and LIMSW_LO_LIM.

! CAUTION

To make a DI block-read the on/off statuses of a limit switch, set CHANNEL of the DI block to:

- 2, for reading the on/off status of the upper limit switch.
- 3, for reading the on/off status of the lower limit switch.

(5) Thresholds for Operation Result Integration Alarms

The FVP110 has a function to integrate the following operation result quantities individually:

- TOTAL_CYCLE_COUNT (incremented by 1 at each change in the direction of the action)
- TOTAL_TRAVEL (in % where full stroke = 100%)
- TOTAL_OPEN_TIME (in hours)

- TOTAL_CLOSE_TIME (in hours)
- TOTAL_NEAR_CLOSE_TIM (total at nearly closed time in hours)

When these values exceed the respective thresholds below, corresponding alarms are output. Set the thresholds as necessary.

- CYCLE_COUNT_LIM
- TRAVEL_LIM
- OPEN_TIME_LIM
- CLOSE_TIME_LIM
- NEAR_CLOSE_TIME_LIM

Also, set NEAR_CLOSE_THRESHOLD, which defines the threshold of the valve position for counting NEAR_CLOSE_TIME, as necessary.

For other alarms and self-diagnostic functions, see "12.6 Online Diagnostics".

6. MAINTENANCE

6.1 General

The modular structure of the FVP110 increases the ease of maintenance work. This chapter describes cleaning and part replacement procedures that should be done for maintenance of the FVP110.

The FVP110 is a precision instrument; read the following carefully when carrying out maintenance.

For calibrations, see Chapter 5.

6.2 Periodic Inspections

To maintain problem-free plant operation, periodic inspections are essential. At each periodic inspection, be especially careful when ensuring that:

- No external damage can be seen.
- No leakage from the FVP110 or the piping around it can be detected.
- No build up in the drain, or dust or oil adhering to the air supply line has occurred.

6.2.1 Cleaning the Fixed Nozzle

The fixed nozzle of the FVP110 is attached to the control relay's surface that engages the FVP110's main structure (see Figure 6.1). Detach the control relay from the main structure of FVP110 by following the instruction shown in 6.3.2. Thread a wire with a 0.25-mm diameter through the nozzle to clean it. After cleaning the nozzle, place the nozzle and O-ring at the original position and attach the control relay again.

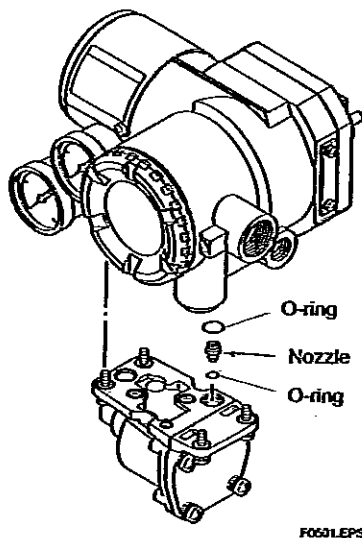


Figure 6.1 Cleaning the Nozzle



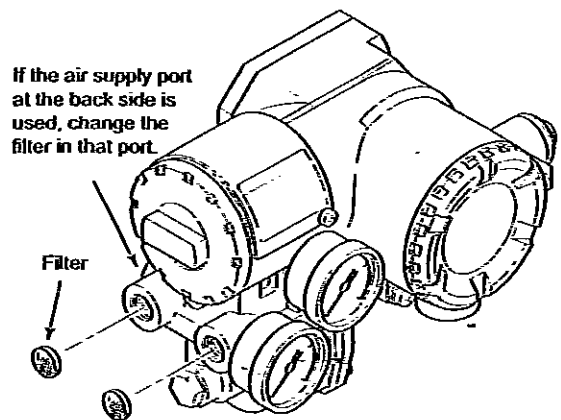
CAUTION

All the O-rings used for the sealing of pneumatic signal circuits are made of silicon rubber. The sealing capability is degraded if general silicon grease is applied. When applying grease to a sealing part, use a type of grease compatible with silicon rubber, such as fluoride grease and grease for silicon rubber.

6.3 Part Replacement

6.3.1 Replacing the Screen Filters

When the screen filters installed deep in the air supply port and output pneumatic signal port become clogged, replace them with new filters using a tool with pointed tips such as a set of tweezers.



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Figure 6.2 Replacing the Screen Filters

6.3.2 Replacing the Control Relay Assembly

- (1) Decrease the air supply pressure to zero.
- (2) Using a Philips screwdriver, unscrew the four mounting screws on the bottom face.
- (3) Pull the relay assembly downwards to detach it.
- (4) To mount a new relay assembly, remove the mounting screws and washers from the old assembly and use them to mount the new assembly in place by tightening them from below.

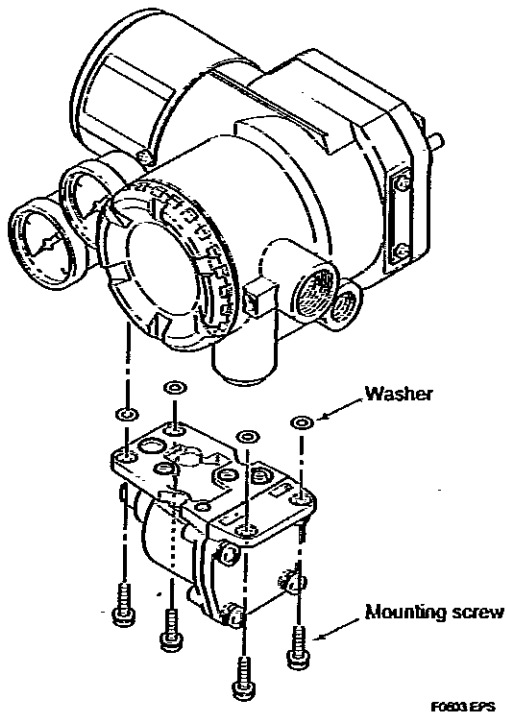


Figure 6.3 Replacing the Control Relay Assembly

6.3.3 Replacing the Internal Air Filter

An air filter is provided at the opening to the internal pneumatic circuits. Follow the procedure below to replace it.

- (1) Decrease the air supply pressure to zero.
- (2) Remove the relay assembly (in reference with Section 6.3.2).
- (3) Remove the pneumatic circuit holding plate and gasket.
- (4) Remove the air filter and O-ring.
- (5) Set the new filter in place.
- (6) Perform steps (3), then (2) to restore the FVP110 to its original state.

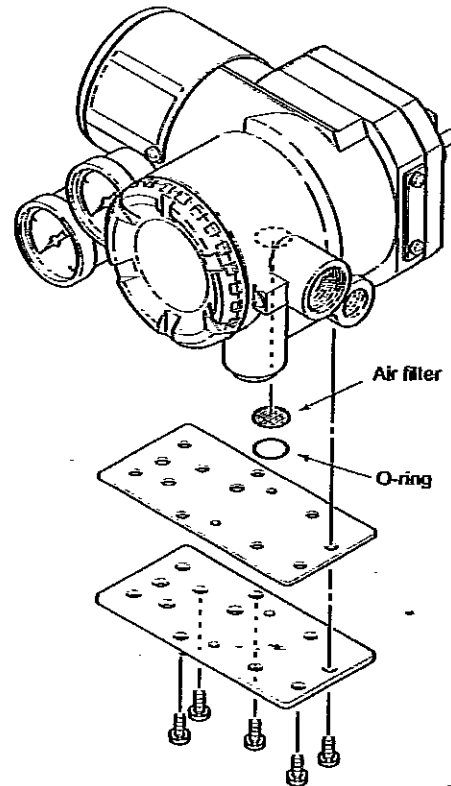


Figure 6.4 Replacing the Internal Air Filter

7. STANDARD SPECIFICATIONS

■ STANDARD SPECIFICATIONS

Applicable Control Valve:

Linear or Rotary Motion Control Valve
(Diaphragm Actuator and Single Acting Cylinder)
Note: Double Acting Actuator can be applicable
with using reversing relay.

Functions:

Function Blocks:

AO: One Analog Output
DI: Two Discrete Inputs
PID: One PID Control Function (Optional)

Pressure Sensor(optional)

Flow Characterization Feature:

Linear
Equal Percentage(50 : 1)
Equal Percentage(30 : 1)
Quick Opening
Customer Characterization (10 segments)

Auto Tuning Function

Valve Position Detecting Function

Continuous Diagnostics Function:

Total Travel
Number of Cycles
Time Open/Time Close/Time Near Close

Housing Materials:

Case: Aluminum die-cast
Paint: Polyurethane resin-baked finish
Color: Masoncilan Gray

Pressure Gauge Case:

Stainless steel

Communication:

Digital: FOUNDATION fieldbus

Conditions of Communication Line

Supply Voltage: 9 to 32V DC
Supply Current: 17 mA(max)

Normal Operating conditions:

Air Supply pressure: 20 to 100 psi (140 to 700 kPa)
Vibration Limit: 4 mm at 5 to 15 Hz;
2G at 15 to 2000 Hz
Shock limit: 10G

Manual Operation:

Available using Auto/Manual(A/M) transfer switch

Zero Adjustment Range:

-15 to 85% of span

Span Adjustment Range:

Within 300% of span

Valve-stem travel Range:

Linear Motion:
5 to 150 mm(0.2 to 6.0 inch)
(Rotation Range: ± 10 to ± 25 deg)

Rotary Motion:

2 to 90 deg

Air Consumption and Output Capacity:

	Diaphragm, Single Acting Cylinder
Air Supply Pressure	20 psi (140 kPa)
Maximum Air Consumption	0.178 SCFM (0.32 Nm ³ /h)
Maximum Output Capacity	4.1 SCFM (6.6 Nm ³ /h)

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Ambient temperature Limits:

-40 to 85°C(-40 to 185°F)

Ambient Humidity Limits:

5 to 95% RH at 40°C(104°F)

EMC Conformity

For EMI (Emission): EN55011
For EMS (Immunity): EN50082-2

Waterproof:

NEMA 4X: IP65

Explosion-Proof Construction:

Explosion-proof Construction: Dual compartment

7. STANDARD SPECIFICATIONS

Connections:

Air Connection: Rc 1/4 or 1/4 NPT female
 Electrical Connection: 1/2 NPT

Pressure Gauge Connection: 1/8 NPT female

Factory Mutual (FM) FM Explosionproof approval
 Explosionproof for Class I, Division 1, Groups
 A, B, C, and D:
 Dust-ignitionproof for Class II/III, Division 1,
 Groups E, F and G
**"FACTORY SEALED. CONDUIT SEAL NOT
 REQUIRED". FF1**
 Enclosure Rating: NEMA 4X
 Temperature Code: T6
 Ambient Temperature: -40 to 80 Deg. C
 Electrical Connection: 1/2NPT female *2

*2 Applicable for Electrical Connection Code 3

Mounting:

Front of Actuator with bracket.
 Direct Connection for rotary valve.

Weight:

2.3 kg (4.41 lb)

■ **PERFORMANCE SPECIFICATIONS**

Linearity:

±0.5% of Span (including linkages)

Hysteresis:

0.3% of Span

Ambient temperature Effect:

±0.08% of Span/°C

Position Effect:

±0.3% of Span/90 deg

Vibration Effect:

±2% of Span at 15 to 2000 Hz

■ **MODEL AND SUFFIX CODES**

Model	Suffix Codes	Description
FVP110	Valve positioner
Input Signal	-F	Digital communication (FOUNDATION Fieldbus protocol)
Applicable Control Valve	1	Single Acting Actuator
.....	A	Always A
Connections	3	Electrical Connection: 1/2 NPT, Pneumatic Connection; Rc 1/4 NPT
.....	N	Always N
Optional Codes	/□	Optional Specifications

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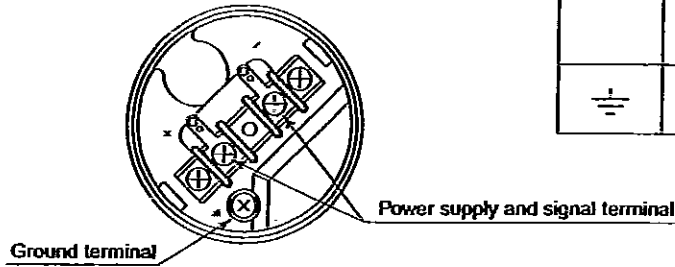
■ **OPTIONAL SPECIFICATIONS**

Item	Description	Code	
Lightning protection	Power supply 10.5 to 32V DC Allowable current Max. 6000 A(1x 40 μs), repeating 1000 A(1x 40 μs), 100 times	A	
Painting	Coating change Epoxy resin coating	X1	
	Color Change	Terminal Munsell notation code; N11.5 Black	P1
		Cover only Metallic silver	P7
PID Function Block	PID control function	LC1	
Output Monitor	Built-in pressure sensor for output	AP	
With Pressure Gauge	Scale and calibration unit: Pa	GP	
	Scale and calibration unit: kg/cm ²	GM	
	Scale and calibration unit: bar	GB	
	Scale and calibration unit: psi	GE	
Agency Approval	FM Explosionproof per above description	FF1	

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7. STANDARD SPECIFICATIONS

Terminal Configuration



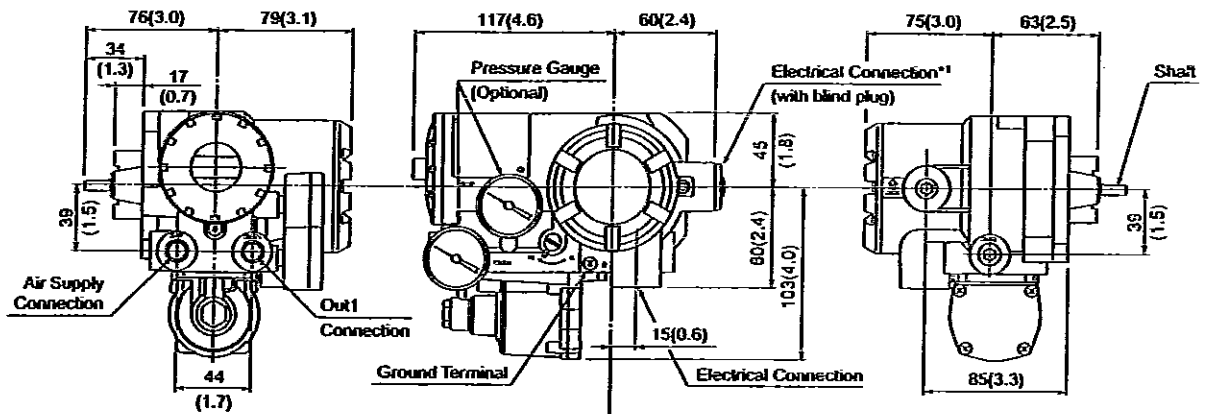
Terminal Wiring

	Power supply and signal terminal
	Ground terminal

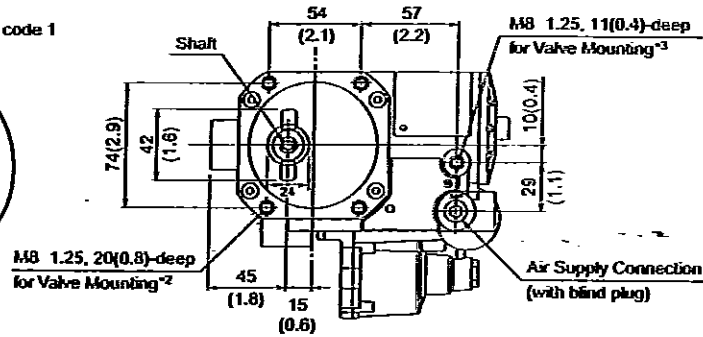
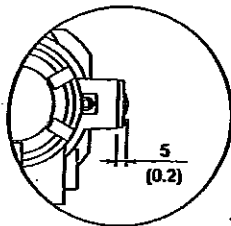
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■ DIMENSIONS

Unit: mm(approx. inch)



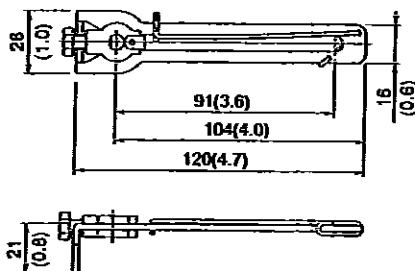
*1: Blind plug for Connections code 1



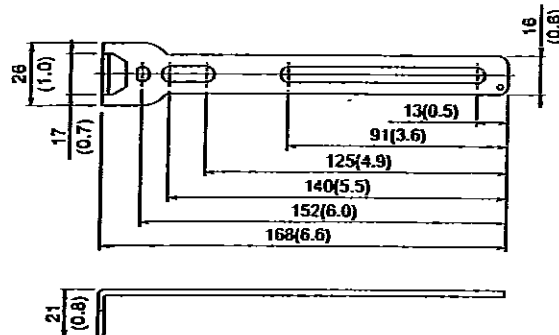
*2: Attached with 4 mounting bolts (M8, 25 mm) and spring washers (Applicable bracket thickness: 3 to 6 mm)

*3: Available when unable to mount securely with the 4 bolts in *2.

Lever 1 (Optional code /LV1)



Lever 2 (Optional code /LV1)



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8. ABOUT FIELDBUS

8.1 Outline

Fieldbus is a bi-directional digital communication protocol for field devices, which offers an advancement in implementation technologies for process control systems and is widely employed by numerous field devices.

FVP110 employs the specification standardized by The Fieldbus Foundation, and provides interoperability between Yokogawa devices and those produced by other manufacturers. Fieldbus comes with software consisting of AO function block, two DI function blocks and optional PID function block, providing the means to implement a flexible instrumentation system.

For information on other features, engineering, design, construction work, startup and maintenance of Fieldbus, refer to "Fieldbus Technical Information" (TI 38K3A01-01E).

8.2 Internal Structure of FVP110

The FVP110 contains two virtual field devices (VFD) that share the following functions.

8.2.1 System/network Management VFD

- Sets node addresses and Physical Device tags (PD Tag) necessary for communication.
- Controls the execution of function blocks.
- Manages operation parameters and communication resources (Virtual Communication Relationship: VCR).

8.2.2 Function Block VFD

- (1) Resource block
 - Manages the information common to each FB VFD in FVP110.
- (2) Transducer block
 - Located between Hardware I/O(actuator, sensor) and AO/DI function blocks, pass the control signal from AO function block to I/P module to control the valve position.
- (3) AO function block
 - Accepts a control signal from an upstream block and pass the signal to Transducer block.

- Accept a valve position signal from Transducer block and feedback it to an upstream block.

(4) DI function block

- Receives the discrete signal from Transducer block and output them.

(5) PID function block(optional)

- Offers PID control function.

8.3 Logical Structure of Each Block

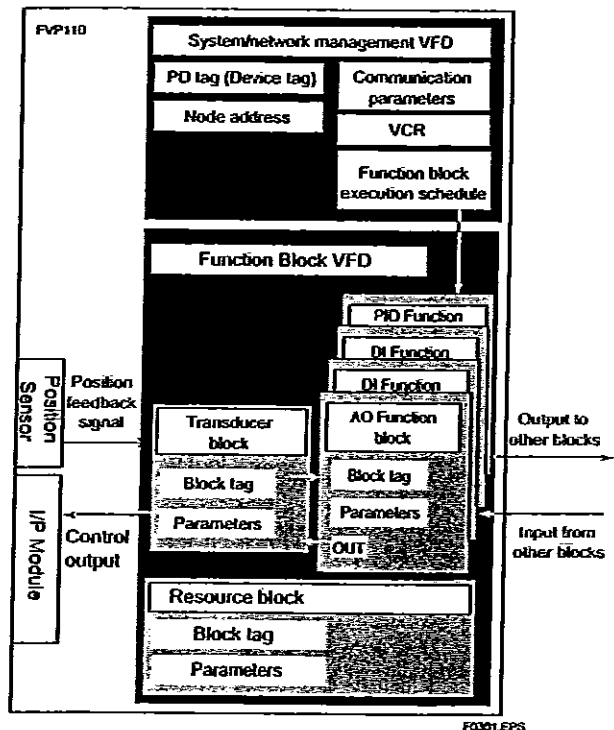


Figure 8.1 Logical Structure of Each Block

Setting of various parameters, node addresses, and PD Tags shown in Figure 8.1 is required before starting operation.

8.4 System Configuration

The following instruments are required for use with Fieldbus devices:

- **Power supply:**
Fieldbus requires a dedicated power supply. It is recommended that current capacity be well over the total value of the maximum current consumed by all devices (including the host). Conventional DC current cannot be used as is.
- **Terminator:**
Fieldbus requires two terminators. Refer to the supplier for details of terminators that are attached to the host.
- **Field devices:**
Connect the field devices necessary for instrumentation. FVP110 has passed the interoperability test conducted by The Fieldbus Foundation. In order to properly start Fieldbus, it is recommended that the devices used satisfy the requirements of the above test.
- **Host:**
Used for accessing field devices. A dedicated host (such as DCS) is used for an instrumentation line while dedicated communication tools are used for experimental purposes.
- **Cable:**
Used for connecting devices. Refer to "Fieldbus Technical Information" (TI 38K3A01-01E) for details of instrumentation cabling. Provide a cable sufficiently long to connect all devices. For field branch cabling, use terminal boards or a connection box as required. If the total length of the cable is in a range of 2 to 3 meters for laboratory or other experimental use, the following simplified cable (a twisted pair wire with a cross section of 0.9 mm² or more (AWG #xx) and cycle period of within 5 cm (2 inches) may be used. Termination processing depends on the type of device being deployed. For FVP110, use an M4 screw terminal claw. Some hosts require a connector.

Refer to Dresser Valve Division when making arrangements to purchase the recommended equipment.

The number of devices that can be connected to a single bus and the cable length vary depending on system design. When constructing systems, both the basic and overall design must be carefully considered to allow device performance to be fully exhibited.

8.4.1 Connection of Devices

Connect the devices as shown in Figure 9.1. Connect the terminators at both ends of the trunk, with a minimum length of the spur laid for connection.

The polarity of signal and power must be maintained.

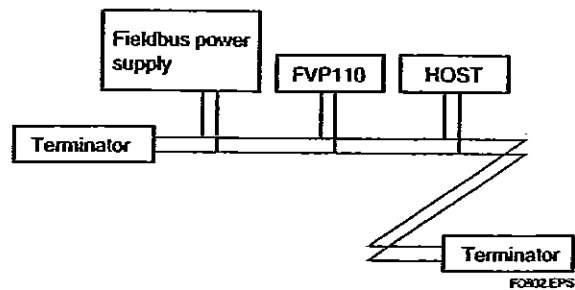


Figure 8.2 Cabling

Before using a Fieldbus configuration tool other than the existing host, confirm it does not affect the loop functionality in which all devices are already installed in operation. Disconnect the relevant control loop from the bus if necessary.

8.5 Integration of DD

- If the host supports DD (Device Description), the DD of the FVP110 needs to be installed. Check if host has the following directory under its default DD directory.

445644/0001

(445644 is the manufacturer number of Dresser Valve Division, and 0001 is the FVP110 device number, respectively.)

If this directory is not found, DD of FVP110 has not been included. Create the above directory and copy the DD file (0m0n.ffo,0m0n.sym) (m, n is a numeral) (to be supplied separately) into the directory.

Once the DD is installed in the directory, the name and attribute of all parameters of the FVP110 are displayed.

Off-line configuration is allowed by using the Capability file(CFF) which is also to be supplied separately.



IMPORTANT

For offline configuration, use the CFF which matches the specification of the instrument to be configured. For FVP110, there are two types of CFF file; one for standard type instruments and the other for the instruments with /LC1 option in which PID function block is available. Using unmatched CFF will cause an error upon down-loads, etc.

9. CONFIGURATION

This chapter contains information on how to adapt the function and performance of the FVP110 to suit specific applications. Because two or more devices are connected to Fieldbus, settings including the requirements of all devices need to be determined. Practically, the following steps must be taken.

(1) Network design

Determines the devices to be connected to Fieldbus and checks the capacity of the power supply.

(2) Network definition

Determines the tag and node addresses for all devices.

(3) Definition of combining function blocks

Determines the method for combination between each function block.

(4) Setting tags and addresses

Sets the PD Tag and node addresses one by one for each device.

(5) Communication setting

Sets the link between communication parameters and function blocks.

(6) Block setting

Sets the parameters for function blocks.

The following section describes each step of the procedure in the order given. Using a dedicated configuration tool allows the procedure to be significantly simplified. This section describes the procedure to be assigned for a host which has relatively simple functions. For operation of the host, refer to the instruction manual for each host. No details of the host are explained in the rest of this material.



IMPORTANT

Connecting a Fieldbus configuration tool to a loop with its existing host may cause communication data scrambles resulting in a functional disorder or a system failure.



IMPORTANT

Do not turn off the power immediately after setting. If the power is turned off within 40 seconds after setting is made, the modified parameters are not saved and the settings return to the original values.

9.1 Network Design

Select the devices to be connected to the Fieldbus network. (Refer to 8.4 'System Configuration' for selection of the devices.)

First, check the capacity of the power supply. The power supply capacity must be greater than the sum of the maximum current consumed by all devices to be connected to Fieldbus. The maximum current consumed (power supply voltage 9 V to 32 V) for FVP110 is 17 mA. The cable must have the spur in a minimum length with terminators installed at both ends of the trunk.

9.2 Network Definition

Before connection of devices with Fieldbus, define the Fieldbus network. Allocate PD Tag and node addresses to all devices (excluding such passive devices as terminators).

The PD Tag is the same as the conventional one used for the device. Up to 32 alphanumeric characters may be used for definition. Use a hyphen as a delimiter as required.

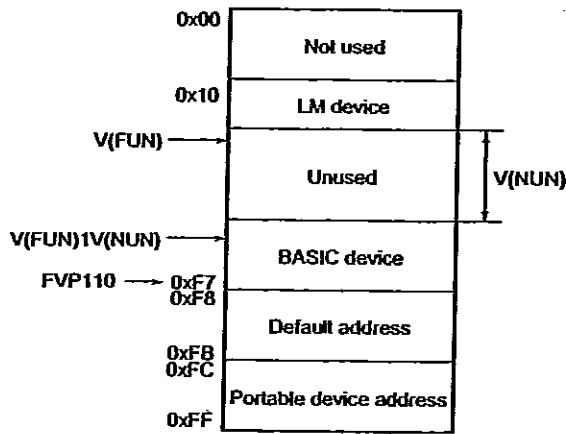
The node address is used to specify devices for communication purposes. Because data is too long for a PD Tag, the host uses the node address in place of the PD Tag for communication. A range of 16 to 247 (or hexadecimal 0x10 to 0xF7) can be set. Generally, the device (LM device) with bus control function (Link Master function) is allocated from a smaller address number (16) side, and other devices (BASIC device) without bus control function allocated from a larger address number (247) side respectively. Place FVP110 in the range of the BASIC device. Set the range of addresses to be used to the LM device. Set the following parameters.

Table 9.1 Parameters for Setting Address Range

Symbol	Parameters	Description
V (FUN)	First-Unpolled-Node	Indicates the address next to the address range used for the host or other LM device.
V (NUN)	Number-of-consecutive-Unpolled-Node	Unused address range

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The devices within the address range written as "Unused" in Figure 9.1 cannot be used on a Fieldbus. For other address ranges, the range is periodically checked to identify when a new device is mounted. Care must be taken not to allow the address range to become wider, which can lead to exhaustive consumption of Fieldbus communication performance.



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Figure 9.1 Available Range of Node Addresses

To ensure stable operation of Fieldbus, determine the operation parameters and set them to the LM devices. While the parameters in Table 9.2 are to be set, the worst-case value of all the devices to be connected to the same Fieldbus must be used. Refer to the specification of each device for details. Table 9.2 lists FVP110 specification values.

Table 9.2 Operation Parameter Values of the FVP110 to be Set to LM Devices

Symbol	Parameters	Description and Settings
V (ST)	Slot-Time	Indicates the time necessary for immediate reply of the device. Unit of time is in octets (256 μs). Set maximum specification for all devices. For FVP, set a value of 4 or greater.
V (MID)	Minimum-Inter-PDU-Delay	Minimum value of communication data intervals. Unit of time is in octets (256 μs). Set the maximum specification for all devices. For FVP, set a value of 4 or greater.
V (MRD)	Maximum-Reply-Delay	The worst case time elapsed until a reply is recorded. The unit is Slot-time; set the value so that V (MRD) 3V (ST) is the maximum value of the specification for all devices. For FVP, the setting must be a value of 12 or greater.

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9.3 Definition of Combining Function Blocks

The input/output parameters for function blocks are combined. Practically, setting is written to the FVP110 link object with reference to "Block setting" in Section 9.6 for details.

For the FVP110, in order to minimize the delay in data transfer between Transducer block and AO function block, transducer block are designed to be executed in conjunction with the execution of AO function block. Therefore, in order to activate Transducer block, it is necessary that AO function block is always defined in the schedule.

The combined blocks need to be executed synchronously with other blocks on the communications schedule. In this case, change the FVP110 schedule according to the following table. Enclosed values in the table are factory-settings. FVP110 schedule is set as shown in the following. Change it as necessary.

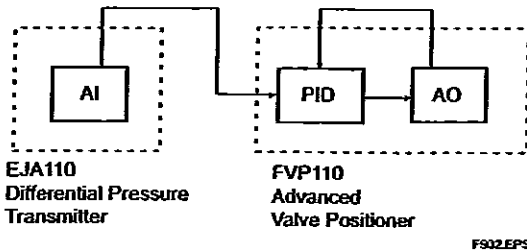
Table 9.3 Execution Schedule of the FVP110 Function Blocks

Index	Parameters	Setting (Enclosed is factory-setting)
269 (SM)	MACROCYCLE_DURATION	Cycle (MACROCYCLE) period of control or measurement. Unit is 1/32 ms. (32000 = 1 s)
276 (SM)	FB_START_ENTRY.1	AO block startup time. Elapsed time from the start of MACROCYCLE specified in 1/32 ms. (32000 = 1 s)

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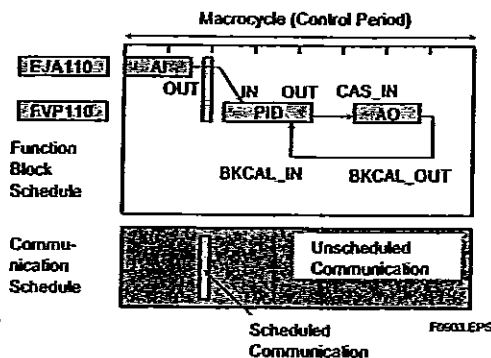
A maximum of 120 ms is taken for execution of AO block, a maximum of 70 ms for execution of each DI block, and a maximum of 150 ms is taken for execution of PID block. For scheduling of communications for combination with the next function block, the execution is so arranged as to start after a lapse of longer than the time above mentioned. In no case should two function blocks of the FVP110 be executed at the same time (execution time is overlapped).

Figure 9.3 shows an example of schedule based on the loop shown in Figure 9.2.



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Figure 9.2 Example of Loop Connecting Function Block of FVP110 with other instruments



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Figure 9.3 Function Block Schedule and Communication Schedule

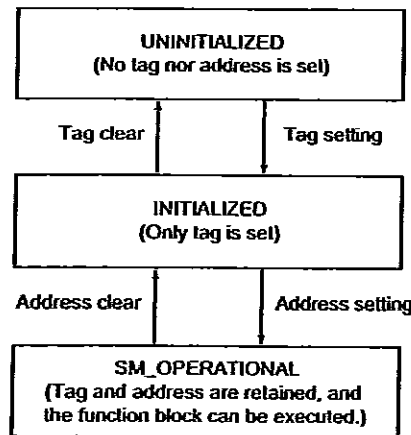
For the case where the control period (macrocycle) is set to 4 seconds or longer, set the following interval larger than 1% of the macrocycle.

- The interval between 'the end of block execution' and 'the start of releasing CD from LAS'.
- The interval between 'the end of a block execution' and 'the start of the next block execution'.

9.4 Setting of Tags and Addresses

This section describes the steps in the procedure to set PD Tags and node addresses in the FVP110. Connect FVP110 with other network devices and turn on the power of the host and the bus.

There are three states of Fieldbus devices as shown in Figure 9.4, and if the state is other than the lowest SM_OPERATIONAL state, no function block is executed. FVP110 must be transferred to this state when a tag or address is changed.



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Figure 9.4 Status Transition by Setting PD Tag and Node Address

FVP110 has a PD Tag (CV1001) and node address (247, or hexadecimal 0xF7) that are set upon shipment from the factory unless otherwise specified. If two FVP110s are connected at a time, one FVP110 will keep the address upon shipment while the other will have a default address (See Figure 9.2). To change only the node address, clear the address once and then set a new node address. To set the PD Tag, first clear the node address and clear the PD Tag, then set the PD Tag and node address again.

Devices whose node address was cleared will await the default address (randomly chosen from a range of 248 to 251, or from hexadecimal 0xF8 to 0xFB). At the same time, it is necessary to specify the device ID in order to correctly specify the device. The device ID of

the FVP110 is 5945430001xxxxxxxx. (The xxxxxxxx at the end of the above device ID is a total of 8 alphanumeric characters.)

9.5 Communication Setting

To set the communication function, it is necessary to change the database residing in SM-VFD.

9.5.1 VCR Setting

Set VCR (Virtual Communication Relationship), which specifies the called party for communication and resources. FVP110 has 19 VCRs whose application can be changed, except for the first VCR, which is used for management.

FVP110 has VCRs of four types:

Server(QUB) VCR

A Server responds to requests from a host. This communication needs data exchange. This type of communication is called QUB (Queued User-triggered Bidirectional) VCR.

Source (QUU) VCR

A Source multicasts alarms or trends to other devices. This type of communication is called QUU (Queued User-triggered Unidirectional) VCR.

Publisher (BNU) VCR

A Publisher multicasts AI block output to another function block(s). This type of communication is called BNU (Buffered Network-triggered Unidirectional) VCR.

Subscriber (BNU) VCR

A Subscriber receives the data from another function block(s). This type of communication is called BNU (Buffered Network-triggered Unidirectional) VCR.

A Server VCR is capable to respond to requests from a Client (QUB) VCR after the Client initiates connection to the Server successfully. A Source VCR transmits data without established connection. A Sink (QUU) VCR on another device can receive it if the Sink is configured so. A Publisher VCR transmits data when LAS requests so. An explicit connection is established from Subscriber (BNU) VCR(s) so that a Subscriber knows the format of published data.

Parameters must be changed together for each VCR because modification for each parameter may cause inconsistent operation.

9.5.2 Function Block Execution Control

According to the instructions given in Section 9.3, set the execution cycle of the function blocks and schedule of execution.

9.6 Block Setting

Set the parameter for function block VFD.

9.6.1 Link Object

Link object combines the data voluntarily sent by the function block with VCR. FVP110 has 15 link objects. A single link object specifies one combination. Each link object has the parameters listed in Table 9.4. Parameters must be changed together for each VCR because the modifications made to each parameter may cause inconsistent operation.

Table 9.4 Link Object Parameters

Sub-index	Parameters	Description
1	LocalIndex	Sets the index of function block parameters to be combined; set "0" for Trend and Alert.
2	VcrNumber	Sets the index of VCR to be combined. If set to "0", this link object is not used.
3	RemoteIndex	Sets the index of remote object associated with this link object.
4	ServiceOperation	Set one of the following. Set only one each for link object for Alert or Trend. 0: Undefined 1: Local 2: Publisher 6: Alert 7: Trend
5	StateCountLimit	Set the maximum number of consecutive state input values which may be received before the input status is set to BAD. Setting of "2" or larger value is recommended to avoid unnecessary mode transfer which is caused when subscriber failed to receive data correctly.

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15 link objects are not factory-set.

9.6.2 Trend Object

It is possible to set the parameter so that the function block automatically transmits Trend. FVP110 has seven Trend objects, five of them are for analog data, and two of them are for discrete data. A single Trend object specifies the trend of one parameter.

Each Trend object has the parameters listed in Table 9.5. The first four parameters are the items to be set.

Table 9.5 Parameters for Trend Objects

Sub-index	Parameters	Description
1	Block Index	Sets the leading index of the function block that takes a trend.
2	Parameter Relative Index	Sets the index of parameters taking a trend by a value relative to the beginning of the function block.
3	Sample Type	Specifies how trends are taken. Choose one of the following 2 types: 1: Sampled upon execution of a function block. 2: The average value is sampled.
4	Sample Interval	Specifies sampling intervals in units of 1/32 ms. Set the integer multiple of the function block execution cycle.
5	Last Update	The last sampling time.
6 to 21	List of Status	Status part of a sampled parameter.
21 to 37	List of Samples	Data part of a sampled parameter.

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Seven objects are not factory-set.

9.6.3 View Object

This is the object to form groups of parameters in a block. One of advantage brought by forming groups of parameters is the reduction of load for data transaction. FVP110 has six View objects for Transducer block and four View objects for each Resource block, AO block and DI1 and DI2 function block, and each View object has the parameters listed in Table 9.7 to 9.11.

Table 9.6 Purpose of Each View Object

	Description
VIEW_1	Set of dynamic parameters required by operator for plant operation. (PV, SV, OUT, Mode etc.)
VIEW_2	Set of static parameters which need to be shown to plant operator at once. (Range etc.)
VIEW_3	Set of all the dynamic parameters.
VIEW_4	Set of static parameters for configuration or maintenance.

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Table 9.7 View Object for Transducer Block

Relative index	Parameters	VIEW 1	VIEW 2	VIEW 3	VIEW 4 1st	VIEW 4 2nd	VIEW 4 3rd
1	ST_REV	2	2	2	2		
2	TAG_DESC						
3	STRATEGY				2		
4	ALERT_KEY				1		
5	MODE_BLK	4		4			
6	BLOCK_ERR	2		2			
7	UPDATE_EVT						
8	BLOCK_ALM						
9	TRANSDUCER_DIRECTORY						
10	TRANSDUCER_TYPE	2	2	2	2		
11	XD_ERROR	1		1			
12	CORRECTION_DIRECTORY						
13	FINAL_VALUE	5		5			
14	FINAL_VALUE_RANGE		11				
15	FINAL_VALUE_CUTOFF_HI				4		
16	FINAL_VALUE_CUTOFF_LO				4		
17	FINAL_POSITION_VALUE	5		5			
18	SERVO_GAIN				4		
19	SERVO_RESET				4		
20	SERVO_RATE				4		
21	ACT_FAIL_ACTION				1		
22	ACT_MAN_ID				4		
23	ACT_MODEL_NUM				32		
24	ACT_SN				32		
25	VALVE_MAN_ID					4	
26	VALVE_MODEL_NUM					32	
27	VALVE_SN					32	
28	VALVE_TYPE					1	
29	XD_CAL_LOC						32
30	XD_CAL_DATE						7
31	XD_CAL_WHO						32
32	ALARM_SUM			8			
33	POSITION_CHAR_TYPE		1				
34	POSITION_CHAR						
35	LIMSW_HI_LIM		4				
36	LIMSW_LO_LIM		4				
37	ELECT_TEMP			4			
38	TEMPERATURE_UNIT						
39	SUPPLY_PRESSURE		4				
40	SPRING_RANGE		11				
41	OUT_PRESSURE			4			
42	SERVO_OUTPUT_SIGNAL			4			
43	SERVO_RATE_GAIN						
44	SERVO_DEADBAND						
45	SERVO_OFFSET						
46	BOOST_ON_THRESHOLD						
47	BOOST_OFF_THRESHOLD						
48	BOOST_VALUE						

9. CONFIGURATION

Relative index	Parameters	VIEW 1	VIEW 2	VIEW 3	VIEW 4 1st	VIEW 4 2nd	VIEW 4 3rd
49	SERVO_I_SLEEP_LMT						
50	SERVO_P_ALPHA						
51	SERVO_RET_TO_DFLT						
52	MEAS_GAIN						
53	VALVE_TC						
54	VALVE_HYS						
55	VALVE_SLIP_WIDTH						
56	MEAS_PRESS_AIR						
57	MEAS_PRESS_SUPPLY						
58	MEAS_SPRING_RANGE						
59	CONTROL_DIR						
60	THETA_HI						
61	THETA_LO						
62	THETA_P						
63	TRAVEL_CALIB_EXEC						
64	TRAVEL_CALIB_RESULT						
65	OPEN_STOP_ADJ						
66	AUTO_TUNE_EXEC						
67	AUTO_TUNE_RESULT						
68	AUTO_TUNE_STATE						
69	SERVO_RET_TO_DEFAULT						
70	ADVAL_FW						
71	ADVAL_BW						
72	ADVAL_PRESS						
73	ADVAL_T						
74	TOTAL_CYCLE_COUNT						
75	CYCLE_DEADBAND						
76	CYCLE_COUNT_LIM						
77	TOTAL_TRAVEL						
78	TRAVEL_DEADBAND						
79	TRAVEL_LIM						
80	TOTAL_OPEN_TIME						
81	TOTAL_CLOSE_TIME						
82	OPEN_CLOSE_THRESHOLD						
83	OPEN_TIME_LIM						
84	CLOSE_TIME_LIM						
85	TOTAL_NEAR_CLOSE_TIM						
86	NEAR_CLOSE_THRESHOLD						
87	NEAR_CLOSE_TIME_LIM						
88	DEVIATION_LIM						
89	DEVIATION_TIME_TH						
90	RELEASE_FAILSAFE						
91	MODEL						
92	DEV_OPTIONS						
93	PRESS_SENS_INSTALLED						
94	ACTUATOR_TYPE						
95	RELAY_TYPE						
	Total (in bytes)	21	39	41	96	71	73

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Table 9.11 View Object for Resource Block

Relative index	Parameters	VIEW 1	VIEW 2	VIEW 3	VIEW 4
1	ST_REV	2	2	2	2
2	TAG_DESC				
3	STRATEGY				2
4	ALERT_KEY				1
5	MODE_BLK	4		4	
6	BLOCK_ERR	2		2	
7	RS_STATE	1		1	
8	TEST_RW				
9	DD_RESOURCE				
10	MANUFAC_ID				4
11	DEV_TYPE				2
12	DEV_REV				1
13	DD_REV				1
14	GRANT_DENY		2		
15	HARD_TYPES				2
16	RESTART				
17	FEATURES				2
18	FEATURE_SEL		2		
19	CYCLE_TYPE				2
20	CYCLE_SEL		2		
21	MIN_CYCLE_T				4
22	MEMORY_SIZE				2
23	NV_CYCLE_T		4		
24	FREE_SPACE		4		
25	FREE_TIME	4		4	
26	SHED_RCAS		4		
27	SHED_ROUT		4		
28	FAIL_SAFE	1		1	
29	SET_FSAFE				
30	CLR_FSAFE				
31	MAX_NOTIFY				1
32	LIM_NOTIFY		1		
33	CONFIRM_TIME		4		
34	WRITE_LOCK		1		
35	UPDATE_EVT				
36	BLOCK_ALM				
37	ALARM_SUM	8		8	
38	ACK_OPTION				2
39	WRITE_PRI				1
40	WRITE_ALM				
41	ITK_VER				2
42	SOFT_REV				
43	SOFT_DESC				
44	SIM_ENABLE_MSG				

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Relative index	Parameters	VIEW 1	VIEW 2	VIEW 3	VIEW 4
45	DEVICE_STATUS_1			4	2
46	DEVICE_STATUS_2			4	
47	DEVICE_STATUS_3			4	2
48	DEVICE_STATUS_4			4	1
49	DEVICE_STATUS_5			4	
50	DEVICE_STATUS_6			4	
51	DEVICE_STATUS_7			4	
52	DEVICE_STATUS_8			4	
	Total (in bytes)	22	30	54	31

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Table 9.12 Indexes of View for Each Block

	VIEW_1	VIEW_2	VIEW_3	VIEW_4
Resource Block	40100	40101	40102	40103
Transducer Block	40200	40201	40202	40203 through 40205
AO Function Block	40500	40501	40502	40503
DI1 Function Block	40600	40601	40602	40603
DI2 Function Block	40610	40611	40612	40613
PID Function Block	40800	40801	40802	40803

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9.6.4 Function Block Parameters

Function block parameters can be read from the host or can be set. For a list and details of the parameters of blocks held by the FVP110, refer to the chapter for each function block and the list of parameters in the latter part of this manual.

10. ACTIONS OF FVP110 DURING OPERATION

10.1 Block Modes

All function blocks have modes. All blocks have their mode, expressed by `MODE_BLK` parameter. It is a structure of four components; Target, Actual, Permitted and Normal. Target is the mode into which an operator wants to bring this block. This component is writable. Actual shows the actual mode of the block and is read-only. When necessary condition is satisfied, actual mode becomes same to target. There is a chance that actual mode says different from target by some reason. Permitted mode shows which mode is allowed in this Function Block. Normal mode is a memo for operator to record mode that an operator expects in normal conditions.

The table below shows the modes supported by each function block contained in a FVP110.

Table 10.1 Block Modes

Function Block	Modes
Resource	Auto, O/S
Transducer	Auto, O/S
AO	RCas, Cas, Auto, Man, (LO), (IMan), O/S
DI	Auto, Man, O/S
PID	ROut, RCas, Cas, Auto, Man, (LO), (IMan), O/S

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Modes marked with () in the above table cannot be specified as "target".

The following are outlines of each mode.

O/S mode

Means Out of Service mode, in which the block does not run, and its output and setpoint maintain their previous values.

IMan mode

Means Initialization Manual mode. Only the AO and PID blocks in the FVP110 support this mode. When one of these blocks detects a loss of a correct path to the downstream block (such as when the downstream block is in the O/S, Man, Auto or LO mode), it enters IMan mode. For example, when the data status of `BKCAL_IN` in a PID block is "bad" or "good: not invited", the PID block enters IMan mode.

LO mode

Means Local Override mode. If the PID block enters LO mode, the block output follows the tracking value (`TRK_VAL`). In AO block, the block enters LO mode when the block detects the fault status. In this case, the block holds the output or outputs the pre-configured value (`FSTATE_VALUE`) according to the setting of options.

Man mode

Means Manual mode. If the data status of a function block's input is bad or its target mode is Man, the block enters Man mode. In Man mode, the function block does not update its OUT value. If the target is also Man, it allows the user to write a desired value to it.

Auto mode

In Auto mode, the function block performs the specified calculations based on the setpoint and outputs the result, independently without interlocking with another function block. The user can write the setpoint of a function block in this mode if the target is Auto. If the target mode of a function block is Auto, or if both of the following conditions are met for a function block, the block enters Auto mode:

- The target mode is Cas or RCas.
- There is an error in communication with the upstream function block.

Cas mode

Means Cascade mode. In Cas mode, the function block performs the specified calculations based on the setpoint that is input from a different function block via the cascade input parameter and outputs the result.

ROut mode

Means Remote Output mode. In ROut mode, the output of the function block is set to the value of the remote output parameter that is written by a host computer or others. To prevent a sudden change in output, the block's calculations are initialized when a change in mode occurs.

RCas mode

Means Remote Cascade mode. In RCas mode, the function block performs the specified calculations based on the setpoint that is input from host computer or others via the remote cascade parameter, and outputs the result.

Table 10.2 Examples of Block Mode Combinations and Operation Statuses

Operation Statuses	AI	PID	AO	TB
Transducer Initial setup, valve setup (when carrying out auto tuning, travel calibration, etc.)	—	—	O/S	O/S
Modification of parameter settings in transducer block (modification of control parameter settings, etc.)	—	—	O/S	O/S
Constant valve position control	—	—	Auto	Auto
PID single-loop control	Auto	Auto	Cas	Auto
PID cascade-loop control	Auto	Primary PID: Auto Secondary PID: Cas	Cas	Auto

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Table 10.2 shows examples of block mode combinations in a FVPI10 (however, it does not show all patterns). When a block changes mode or the data status of a signal changes for some reason, the other blocks connected to that block identify the change by detecting the change in status of an input signal, and change their modes, too. For example, when the data status of BKCAL_IN in a PID block changes to bad, the PID block automatically change mode to IMfan to initialize the control of its downstream block.

The respective modes to which each block should enter upon occurrence of a communication error and at a restart, and the handling of signals in each mode may be defined in the block's option parameters such as IO_OPTS and STATUS_OPTS. For details, see the detailed descriptions of each function block.

10.2 Alarm Generation

When the FVP110 detects an abnormality in the device itself by the self-diagnostic function, a device alarm is issued from the resource or transducer block. An abnormality in a function block or in a process value is issued from the corresponding block as a block error or process alarm.

A FVP110 can report the following alarms and events.

Analog alerts: A type of alarm generated when a process value or a deviation value exceeds a specified limit in the following blocks:

PID block : HI, HI_HI, LO, LO_LO, DV_HI, DV_LO

Discrete alerts: A type of alarm generated when an abnormal status is detected. For the resource block, a discrete alert is generated as a block alarm or write-error alarm. For the DI block, a discrete alert is generated as a block alarm or DISC alarm. For the Transducer block, AO block and PID block, a discrete alert is only generated as a block alarm.

Update alerts: Generated whenever a change is made to the settings of the certain parameters.

Table 10.3 shows the elements composing an alert object.

Table 10.3 Alert Objects

Analog Alert	Subindex		Parameter Name	Description
	Discrete Alert	Update Alert		
1	1	1	Block Index	Leading Index to the block in which the alert has occurred
2	2	2	Alert Key	Copy of ALERT_KEY
3	3	3	Standard Type	Type of the alert that occurred
4	4	4	Mfr Type	The name of the alert defined in the device description (DD) file written by the device manufacturer.
5	5	5	Message Type	Cause of the alert
6	6	6	Priority	Priority level of the alert
7	7	7	Time Stamp	Time when the alert occurred first
8	8		Subcode	Subcode that indicates the cause of the alert
9	9		Value	Value of the related data
10	10		Relative Index	Relative Index to the related data
		8	Static Revision	Value of ST_REV in the block
11	11	9	Unit Index	Unit code of the related data

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10.3 Simulation Function

The FVP110 has a function to simulate input signals to its internal function blocks and makes the blocks to carry out the specified actions with the simulated input signals in order to allow for testing applications in the host computer or alarm handling processes. Each function block has a parameter to switch on/off the simulation function. To prevent this parameter setting from being modified during plant operation by mistake, a hardware switch labeled SIM.ENABLE is provided on the FVP110's amplifier assembly. Sliding this switch position to ON enables the simulation function to run. Remotely writing "REMOTE LOOP TEST SWITCH" to SIM_ENABLE_MSG also causes the same effect as turning ON the SIM.ENABLE switch; however, the value of SIM_ENABLE_MSG will be

10. ACTIONS OF FVP110 DURING OPERATION

lost when the power to the FVP110 is turned off. In short, simulation can be carried out if the hardware SIM.ENABLE switch is ON or if the value of SIM_ENABLE_MSG is "REMOTE LOOP TEST SWITCH".

When the simulation can be carried out, alarms generated from the resource blocks mask the other device alarms. Hence, simulation must be disabled immediately after it has finished.

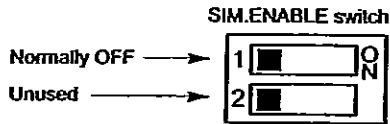


FIG101.EPS

Figure 10.1 SIM.ENABLE Switch

11. RESOURCE BLOCK

11.1 General

The resource block stores device hardware information related to all function blocks in the same device, such as the memory size, and controls the device hardware and internal function blocks. Regardless of the execution schedule of the function blocks, the resource block runs at a certain interval.

11.2 Alarm Processing

The resource block generates a block alarm in the following cases:

- An error represented by a bit in **BLOCK_ERROR**, shown in the table below, has occurred (identified as a Block alarm).
- A static parameter has been written (identified as an update event).
- The value of a write-locked parameter has been modified (identified as Write alarm).

Table 11.1 **BLOCK_ERROR** in Resource Block

Bit	Name of Error Represented	Cause
3	Simulate Active	SIMULATE is active.
5	Device Fail Safe Set	Fail safe function is set.
10	Lost Static Data	
11	Lost NV Data	
13	Device Needs Maintenance Now	Needs servicing urgently.
15	Out-of-Service	The target mode is O/S.

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12. TRANSDUCER BLOCK

12.1 General

The transducer block works as an interface between the hardware I/O (actuator, sensor) and internal function blocks. Most functions of the FVP110 as a valve positioner are packed in the transducer block. Major functions of the transducer blocks include:

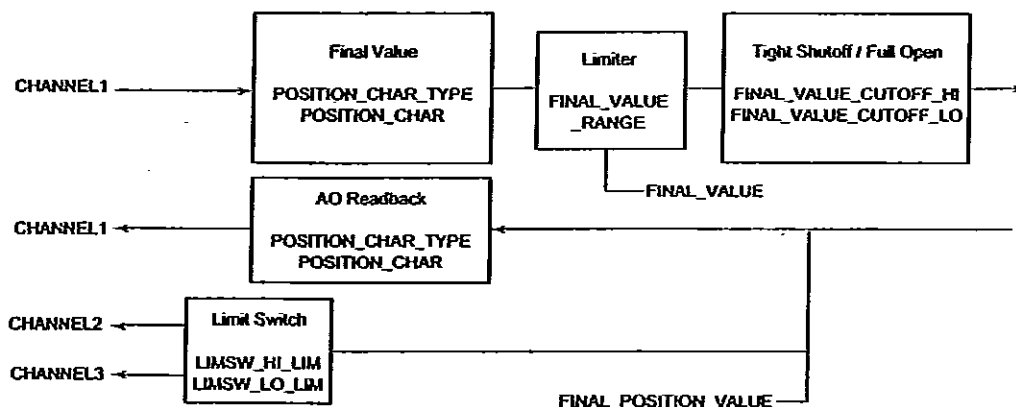
- Transmission and reception of setpoint and readback signals for valve position
- Setpoint high/low limiters
- Auto tuning
- Valve tight-shut and full-open actions
- Valve position-to-flow rate characteristics conversion
- Travel calibration
- Diagnostics of valve and positioner
- Valve position limit switches
- Pressure and temperature measurement (pressure measurement requires the optional sensor)
- Fail safe

The transducer block in a FVP110 is connected to an AO function block and two DI blocks via its channels as shown below.

Table 12.1 Correspondence between Channels and I/O Signals

Channel	Signal	Description
1	Analog input/output	Setpoint and readback signals
2	Discrete output	High limit switch status
3	Discrete output	Low limit switch status

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Figure 12.1 Function Diagram of Transducer Block

12.2 Forward Path

The following describes the signal input from the AO block to the transducer block and then passed to the device hardware side.

12.2.1 Input from AO Block

The OUT value of the AO block is input to the transducer block. This input action is halted when:

- The channel number of the AO block is not set as 1; or
- The AO block is in O/S mode.

Based on the input value from the AO block, transducer block:

- Performs the flow rate-to-valve position conversion;
- Limits the setpoint within a specified range; and
- Performs tight-shut or full-open action as necessary.

The input from the AO block is always a percentage value where the transducer block always regards 0% to be the shut-off position. Make the correct settings at initial setup according to the specifications of the valve (in reference with Chapter 5, "Setup").

12.2.2 Position-to-flow Rate Characteristic Conversion

The parameter POSITION_CHAR_TYPE defines the characteristics between the valve position and flow rate, and can be set to one the following:

- 1 = linear
- 2 = equal percent (50:1)
- 3 = equal percent (30:1)
- 4 = quick open (reversal of equal percent 50:1)
- 255 = user-defined

Writing the value 255 allows you to define the desired characteristics by 10 line segments for evenly divided input levels. The coordinates (0,0) and (100,100) are fixed; set the values corresponding to OUT(Output of AO block) = 10%, 20%, 30%..., 80%, 90%. Note that a set value must be greater than the preceding set value; the output must increase as the input increases.

This flow rate conversion is applied to the signal in the backward path as well.

12.2.3 FINAL_VALUE and Range

The parameter FINAL_VALUE contains the valve position setpoint for valve control, and its value is always a percent value where 0% is the shut-off position as is the case for the input signal. High and low limits for the value of FINAL_VALUE.value can be set in FINAL_VALUE_RANGE.

12.2.4 Tight-shut and Full-open Actions

The tight-shut action is an action to decrease the output pressure to a level much lower than the 0% pressure level for an air-to-open valve (or increase it to a level much higher than the 0% pressure level for an air-to-close valve) when FINAL_VALUE.value is less than FINAL_VALUE_CUTOFF_LO in order to ensure that the valve is tightly shut off. After the tight-shut action is activated, when FINAL_VALUE.value becomes greater than FINAL_VALUE_CUTOFF_LO by 1% or more, the tight-shut action will turn off.

Conversely, the full-open action is an action to increase the output pressure to a level much higher than the 100% pressure level for an air-to-open valve (or decrease it to a level much lower than the 100% pressure level for an air-to-close valve) when FINAL_VALUE.value is larger than FINAL_VALUE_CUTOFF_HI in order to ensure that the valve is fully open. After the full-open action is

activated, when FINAL_VALUE.value becomes less than FINAL_VALUE_CUTOFF_HI by 1% or more, the full-open action will turn off.

Although the actual output signal level is changed to a level outside the range during the period when the tight-shut or full-open action is on, the value of FINAL_VALUE.value remains as computed and is not affected by these actions.

12.3 Backward Path

The following describes the signal input from the device hardware to the transducer block and then passed to other function blocks.

12.3.1 FINAL_POSITION_VALUE

The parameter FINAL_POSITION_VALUE contains a percentage value of the valve position sent from the position sensor where 0% is the shut-off position as is the case for FINAL_VALUE.value. When one or more of the following conditions become true, the data status of FINAL_POSITION_VALUE becomes Bad, which is notified to the connected AO block and upstream function blocks:

- Bad - Out of service: The block is in the O/S mode.
- Bad - Sensor failure: The position sensor has failed.
- Bad - Device failure: The A/D converter has failed.
- Bad - Non specific: The deviation exceeds the limit.

12.3.2 Limit Switches

Limit switches monitor whether the valve position has reached a specified high or low limit position and send the high limit switch status to channel 2 and the low limit switch status to channel 3. The thresholds (settings) for the high and low limit switches should be set in LIMSW_HI_LIM and LIMSW_LO_LIM. The switch statuses sent to channels 2 and 3 mean:

0 = off (inactive)

1 = on (active)

Hysteresis of 1% is applied for both High and Low limit switch. While the limit switch of high side stays ON, it turns to OFF again only when the value of FINAL_POSITION_VALUE becomes smaller by 1% or less than the value of LIMSW_HI_LIM. Also, while limit switch of low side stays ON, it turns to OFF again only when the value of FINAL_POSITION_VALUE becomes greater by 1% or more than the value of LIMSW_LO_LIM.

12.4 Auto Tuning

CAUTION

This function strokes the valve over its full range. Do not execute while valve is controlling the process. Keep away from the movable parts to avoid injury.

Auto tuning checks the valve responses and automatically tunes control parameter settings. The actions to be performed can be chosen as shown in the table below (for how to carry out auto tuning, see Chapter 5, "Setup"). Before carrying out auto tuning, change the modes of the AO function block and transducer block to O/S.

Table 12.2 Types of Auto Tuning

value	Comment	Description
1	Off	-----
2	Travel calibration tuning at stop point	Travel calibration at the tight-shut and full-open positions
3	Control parameter tuning	Tuning of control parameters
4	Travel calibration at stop point & Control parameter tuning	Sequential execution of travel calibration and control parameter tuning
5	Cancel execution	Cancellation of auto tuning execution
6	Travel calibration at stop point without time out (for very large valve)	Zero-point and span calibration at the tight-shut and full-open positions without time out
7	Travel calibration with step by step (for very large valve)	Step-by-step travel calibration at the tight-shut and full-open positions
255	Self-check only	Execution of self-diagnostics only (without parameter tuning)

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IMPORTANT

Auto Tuning in FVP110 sets the 0 % point at the position where the valve is fully closed and 100% point at the position where the valve stem stops against the mechanical stopper(fully open). If it is necessary to adjust the zero point and span precisely to the rated stroke of the valve, carry out travel calibration which is described later in this chapter after the Auto Tuning.

The result of auto tuning, which is written to AUTO_TUNE_RESULT, may be an error or warning. An error invalidates the tuning and does not update the parameter settings.

Table 12.3 AUTO_TUNE_RESULT & TRAVEL_CALIB_RESULT

Value (*1)	Comment	Error/Warning (*2)	Description
1	Succeeded	-	Auto tuning/Travel calibration has succeeded.
2	Canceled	-	Auto tuning has been canceled.
21	Exhaust air pressure warning	W	The measured exhaust pressure exceeds ±60 Kpa.
22	Small supply air pressure warning	W	The measured supply air pressure is less than 100 kPa.
23	Large supply air pressure warning	W	The measured supply air pressure is greater than 800 kPa.
40	Offset drift warning	W	The offset falls outside the normal operation range.
42	Large Response speed warning	W	Waiting time for measuring time > 40 seconds
43	Large hysteresis warning	W	Hysteresis > 30%
44	Large slip width warning	W	Slip width > 5%
60	Small angle span warning	W	Rotation-angle span < 15 degrees
61	Large angle span warning	W	VALVE_TYPE is linear and the rotation-angle span exceeds 55 degrees; or VALVE_TYPE is rotary and the rotation-angle span exceeds 95 degrees.
62	50% angle warning	W	VALVE_TYPE is linear and the rotation angle at the 50% position exceeds ±20 degrees.
100	Small angle span error	W	Rotation-angle span < 5 degrees
101	Large angle span error	E	VALVE_TYPE is linear and the rotation-angle span exceeds 60 degrees; or VALVE_TYPE is rotary and the rotation-angle span exceeds 100 degrees.
102	50% angle error	E	VALVE_TYPE is linear and the rotation angle at the 50% position exceeds ±25 degrees.
103	Linear adjust error	E	FINAL_VALUE.value falls outside 50 ±10% at 50% position.
120	Offset measurement failed error	E	Offset measurement has failed.
121	Gain measurement failed error	E	Gain measurement has failed.
122	Response speed measurement failed error	E	Response speed measurement has failed.
123	Hysteresis measurement failed error	E	Hysteresis measurement has failed.
255	In operation	-	Auto tuning is being executed.

(*1) Number 103 is not shown for AUTO_TUNE_RESULT. Number 1 through 44 and 120 through 123 are not shown for TRAVEL_CALIB_RESULT.

(*2) E stands for "Error", and W stands for "Warning".

T1203.EPS

12.5 Travel Calibration



CAUTION

This function strokes the valve over its full range. Do not execute while valve is controlling the process. Keep away from the movable parts to avoid injury.

Calibrate the travel of the valve stem, i.e., the stroke of the valve, as follows. First, set the valve stem to the desired position by changing the value of `FINAL_VALUE`.value. Next, write the value from the following choices according to your purpose of calibration. At this time, the AO block and the transducer block need to be in the O/S mode.

- 1 = off
- 2 = 0% point calibration (calibrates only the 0% point and shifts the 100% point by the resulting amount of the change in 0% point while leaving the span unchanged).
- 3 = span calibration (calibrates only the 100 % point while leaving the 0% point unchanged).
- 4 = 50% point calibration (calibrates at the 50% point while leaving the 0% point and 100 % point unchanged).

The 50%-point calibration (in other words, linearity calibration) is intended to minimize the linearity error at the 50% point. Also, if the feedback lever is slightly deviates from a horizontal level due to careless installation of the FVP110 positioner, an error caused by this shift can be corrected by the 50%-point calibration. Note that carrying out auto tuning of Index 2 or 4 clears the 50% calibration result. If you want to carry out the 50%-point calibration, do it after other tuning has finished.

The result of Travel calibration, which is written to `TRAVEL_CALIB_RESULT` as shown in Table 12.3, may be an error or warning. An error invalidates the tuning and does not update the parameter settings.

12.6 Online Diagnostics

The FVP110 features functions to diagnose the FVP110 itself and valve actions during online. The following describes the self-diagnostics function related to the transducer block.

12.6.1 XD_ERROR

The transducer block performs self-diagnostics and writes the results to the parameter `XD_ERROR`. Table 12.4 shows the meanings of these results in `XD_ERROR`.

When the content of `XD_ERROR` or `BLOCK_ERROR` becomes a nonzero value, an alarm is output to the parameter `BLOCK_ALM`.

Table 12.4 XD_ERROR

value	Message	Description
100	Cycle count limit exceed	TOTAL_CYCLE_COUNT has reached CYCLE_COUNT_LIM.
101	Travel limit exceed	TOTAL_TRAVEL has reached TRAVEL_LIM.
102	Total open limit exceed	TOTAL_OPEN_TIME has reached OPEN_TIME_LIM.
103	Total close limit exceed	TOTAL_CLOSE_TIME has reached CLOSE_TIME_LIM.
104	Total near close limit exceed	TOTAL_NEAR_CLOSE_TIM has reached NEAR_CLOSE_TIME_LIM.
110	Temperature out of range	The measured temperature is out of range.
111	Pressure sensor out of range	The measured pressure is out of range.
112	Position sensor out of range	The measured valve position is out of range.
113	Deviation warning	The deviation between the setpoint and measured valve position has exceeded DEVIATION_LIM continuously for the period specified by DEVIATION_TIME_TH [1].
120	Temperature sensor failure	Temperature sensor failed
121	Pressure sensor failure	Pressure sensor failed
122	Operation point drift warning	Operation point drifts.
123	Deviation error	The deviation between the setpoint and measured valve position has exceeded DEVIATION_LIM continuously for the period specified by DEVIATION_TIME_TH [2].
124	Position sensor failure	Position sensor failed
125	A/D converter failure	A/D converter failed

T1204.EPS

12.6.2 Fail-safe Action

If the "A/D converter failure," "position sensor failure," or "deviation error" event occurs in the `XD_ERROR` described above, the transducer block activates the specified fail-safe action by cutting the current signal to I/P module to zero. In addition, in the event of "position sensor failure" or "deviation error," the fail-safe action will not be deactivated even when the cause of the failure/error is cleared. Writing "Clear non-latch" to the parameter `RELEASE_FAILSAFE` will finally deactivate the fail-safe action in this case. The fail-safe action activated in the event of "A/D converter failure" will be deactivated automatically when the cause of the failure is cleared.

12.6.3 Operation Result Integration

The FVP110 has a function to integrate the following operation result quantities individually. To reset an integrated quantity, write 0 to the corresponding parameter.

- **TOTAL_CYCLE_COUNT:**
Incremented by 1 at each change in the direction of the valve action and indicates the total number of times of changes in direction of valve actions.
- **TOTAL_TRAVEL:**
Total travel distance of the stem position shown as a percentage of the valve position span.
- **TOTAL_OPEN_TIME** and **TOTAL_CLOSE_TIME:**
TOTAL_CLOSE_TIME contains the integrated time periods (in hours) when the valve position is equal to or less than the thresholds previously set in **OPEN_CLOSE_THRESHOLD**.
TOTAL_OPEN_TIME is the integrated time periods (in hours) other than **TOTAL_CLOSE_TIME**.
- **TOTAL_NEAR_CLOSE_TIM:**
Total time period (in hours) when the valve position is within the threshold set in **NEAR_CLOSE_THRESHOLD**.

12.6.4 Recording of Revisions

When the user makes a change to the setting of a static parameter, the change is counted-up in the parameter **ST_REV** and update event is generated.

12.7 Control Parameters

The following control parameters in a FVP110 can be set up by auto tuning:

SERVO_GAIN
SERVO_RESET
SERVO_RATE
SERVO_RATE_GAIN
SERVO_DEADBAND
SERVO_OFFSET
BOOST_ON_THRESHOLD
BOOST_OFF_THRESHOLD
BOOST_VALUE

SERVO_I_SLEEP_LMT

SERVO_P_ALPHA

INTERNAL_GAIN

12.8 Temperature and Pressure Measurement

The FVP110 measures the surface temperature of the amplifier and sets it in the parameter **ELECT_TEMP** in the transducer block. The unit of temperature is defined by **TEMPERATURE_UNIT** and can be selected from:

1101 = °C

1102 = °F

A FVP110 with an optional pressure sensor can measure the output air pressure to the valve actuator and sets it in the parameter **OUTPUT_PRESSURE**. The unit of pressure is defined by Unit Code in **SPRING_RANGE** and can be selected from:

1133 = kPa

1137 = bar

1141 = psi

1145 = kgf/cm²

13. AO FUNCTION BLOCK

13.1 General

The AO function block receives the control signal from the transducer block and outputs it to the actuator. The major functions of the AO function block include:

- Scaling
- Setpoint limiters - for both the value and rate of change
- Simulation
- Valve position feedback
- Actions upon abnormality of upstream block
- Signal inversion

The AO function block performs bi-directional signal handling: transfer of the valve control signal to the transducer block (forward path) and feedback of the valve position signal from the transducer block to the upstream block (backward path).

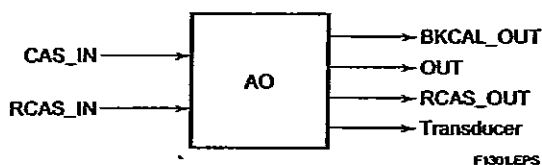


Figure 13.1 Inputs/Outputs of AO Function Block

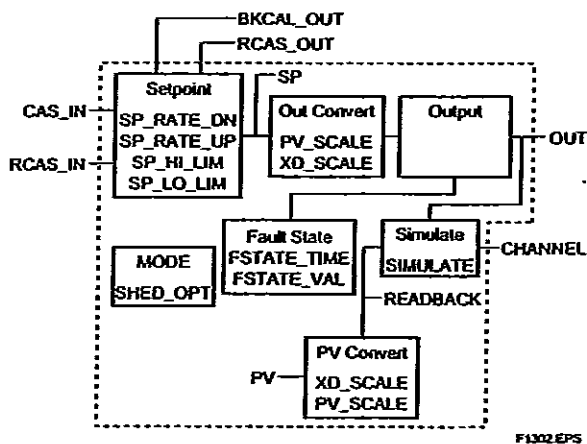


Figure 13.2 Function Diagram of AO Function Block

13.2 Modes

The target mode for the AO function block can be set from five block modes: RCas, Cas, Auto, Man, and O/S. Regardless of the target mode, the AO block automatically enters the IMan or LO mode when a specified condition is met (such as when another function block enters a specific status) depending on the parameter settings.

13.3 Forward Path

The following describes the signal input from the upstream block to the AO block and then passed to the transducer block. The upstream block is typically the PID controller block, and the control signal from the PID block is input as the source of computing the setpoint SP for the AO block.

The path for computing the SP differs depending on the mode. In Cas mode, CAS_IN is used for SP. In RCas mode, RCAS_IN is used for SP. If the value of CAS_IN or RCAS_IN, whichever is used, is greater than SP_HI_LIM (high limit) or less than SP_LO_LIM (low limit), the internal SP is set to the respective limits. Also, if the rate of change in the value of CAS_IN or RCAS_IN, whichever is used, is greater than SP_RATE_UP (rate-of-increase limit) in the increasing direction, or than SP_RATE_DN (rate-of-decrease limit) in the decreasing direction, the change in internal SP is limited by the corresponding rate-of-change limit setting.

In RCas, Cas or Auto mode, the SP value is used for the AO block's output OUT, whose value is then passed to the transducer block via channel I.

13.3.1 Fault state

When any of the following status keeps for the moment of time specified in FSTATE_TIME, the block goes to the fault state and the mode changes to LO mode.

1. Target mode is Cas, and the status of CAS_IN is 'Bad: No Comm'
2. Target mode is Cas, and the status of CAS_IN is 'Good: IFS'
3. Target mode is RCas, and the status of RCAS_IN is 'Good: IFS'

In LO mode, the block holds the output (OUT) or outputs FSTATE_VAL, according to the setting of IO_OPTS.

13.4 Backward Path

The valve position signal from the transducer block is written to the parameter READBACK in the AO block, then scaled based on XD_SCALE and PV_SCALE to be converted to the process variable PV. The value of PV is fed back to the PID block or an upper-level system as the valve position signal via the parameter BKCAL_OUT and RCAS_OUT.

If SIMULATE is set to 'Enable', the value of SIMULATE.Simulate_Value is always set in READBACK.

SIMULATE contains the following data:

- Simulate Status: Status to be set in simulation mode
- Simulate Value: Value to be set in simulation mode
- Transducer Status: Status of input from transducer
- Transducer Value: Value of input from transducer
- Enable/Disable: Whether to enable (2) or disable (1) simulation

13.5 IO_OPTS and STATUS_OPTS

IO_OPTS and STATUS_OPTS are parameters that stipulate options about block's signal processing and mode transitions. The settings of these options are made by setting or resetting the respective bits: on = true, off = false. Table 13.1 shows the options available in IO_OPTS of the AO block.

Table 13.1 IO_OPTS of AO Block

Bit	Meaning	Description
1	SP tracks PV if Man	Equalizes SP to PV when target is MAN mode.
3	SP tracks PV if LO	Equalizes SP to PV in LO mode.
4	SP tracks RCas or Cas if LO or Man (SP track retained target)	In LO mode, Equalizes SP to RCAS_IN if target mode is RCas and to CAS_IN if target mode is Cas.
5	Increase to close	Inverts the signal while it goes from SP through OUT.
6	Faultstate Type (Faultstate to value)	Uses a FSTATE_VALUE in LO mode.
7	Faultstate Type (Use Faultstate value on restart)	Uses a value preset for fault state also at a restart.
8	Target to Man	Sets the target mode to Man upon activation of the fault state.
9	PV for BKCAL_OUT	Sets the value of PV in BKCAL_OUT and RCAS_OUT.

T1301EPS

Only the Propagate Fault Backward option is available in STATUS_OPTS of the AO block.

Table 13.2 STATUS_OPTS of AO Block

Bit	Meaning	Description
4	Propagate Fault Backward	Stipulates the handling of the value, data status and related alarm of BKCAL_OUT and RCAS_OUT to be performed. If this option is true, then: - Set the quality and sub-status components of the status of BKCAL_OUT to Bad and sensor failure, respectively. - Do nothing special for the BKCAL_OUT value. If this option is false, then: - Set the quality and sub-status components of the status of BKCAL_OUT to Bad and non specific, respectively. - Generates a block alarm.

T1302EPS

13.6 Mode Shedding upon Computer Failure

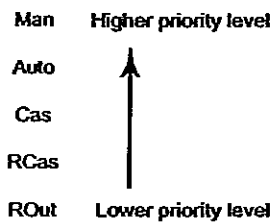
When the data status of RCAS_IN, which is the setting received from a computer or other upstream system as the setpoint, falls to Bad while the block in question is running in RCas (remote cascade) mode for the time specified in SHED_RCAS parameter in the resource block, mode shedding occurs in accordance with the setting in SHED_OPT. Table 13.3 shows the available selections for SHED_OPT setting for the AO block.

Table 13.3 SHED_OPT of AO Block

bit	Available Setting for SHED_OPT	Actions upon Computer Failure
1	Normal shed, normal return	Sets MODE_BLK.actual to Cas(*1), and leaves MODE_BLK.target unchanged.
2	Normal shed, no return	Sets both MODE_BLK.actual and MODE_BLK.target to Cas(*1).
3	Shed to Auto, normal return	Sets MODE_BLK.actual to Auto(*2), and leaves MODE_BLK.target unchanged.
4	Shed to Auto, no return	Sets both MODE_BLK.actual and MODE_BLK.target to Auto(*2).
5	Shed to Manual, normal return	Sets MODE_BLK.actual to Man, and leaves MODE_BLK.target unchanged.
6	Shed to Manual, no return	Sets both MODE_BLK.actual and MODE_BLK.target to Man.
7	Shed to retained target, Normal return	If Cas is set in MODE_BLK.target, - sets MODE_BLK.actual to Cas and - leaves MODE_BLK.target unchanged. If Cas is not set in MODE_BLK.target, - sets MODE_BLK.actual to Auto(*2) and - leaves MODE_BLK.target unchanged.
8	Shed to retained target, No return	If Cas is set in MODE_BLK.target, sets: - MODE_BLK.actual to Cas, and - MODE_BLK.target to Cas, too. If Cas is not set in MODE_BLK.target, sets: - MODE_BLK.actual to Auto(*2), and - MODE_BLK.target to Cas.

T1334.EPS

(*1) The modes to which the AO block can transfer are limited to those set in MODE_BLK.permitted, and the priority levels of modes are as shown below. In fact, if Normal shed, normal return is set for SHED_OPT, the detection of a computer failure causes MODE_BLK.actual to change to Cas, Auto, or Man, whichever is set in MODE_BLK.permitted and has the lowest priority level.



F1303.EPS

(*2) Only when Auto is set as permitted mode.

NOTE: If a control block is connected as a cascade primary block of the AO block, a mode transition of the AO block to Cas occurs in the following sequence due to initialization of the cascade connection: RCas → Auto → Cas.

13.7 Initialization at Start

To prevent a sudden change in output when the AO block carries out the specified actions for the first time after the power is turned on, it:

- 1) Equalizes SP to PV if the Faultstate Type option (bit no. 7) in IO_OPTS is false.
- 2) Equalizes OUT to READBACK.

If the Faultstate Type option (bit no. 7) in IO_OPTS is true, it restores FSTATE_VAL in SP.

13.8 Alarm Processing

When a condition shown in the table below is met, the AO block changes the bit statuses of BLOCK_ERROR accordingly and generates a block alarm.

Table 13.4 BLOCK_ERROR in AO Block

Bit	Name of Error Represented	Condition
3	Simulate Active	SIMULATE is active.
4	Local Override	Fault state is on, and Propagate Fault Backward is false.
7	Input Failure / process variable has BAD status	Propagate Fault Backward in STATUS_OPTS is false, and the sub-status component of the status of READBACK is sensor failure or device failure.
15	Out-of-Service	The target mode is OVS.

T1334.EPS

14. DI FUNCTION BLOCK

14.1 General

A FVP110 contains two DI function blocks, which individually transfer the valve-position high and low limit switch signals generated by the transducer block.

The major functions of a DI function block include:

- Signal inversion (I/O processing option)
- Simulation
- Filtering (time delay)
- Alarm generation

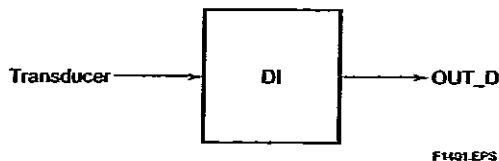


Figure 14.1 Inputs/Outputs of DI Function Block

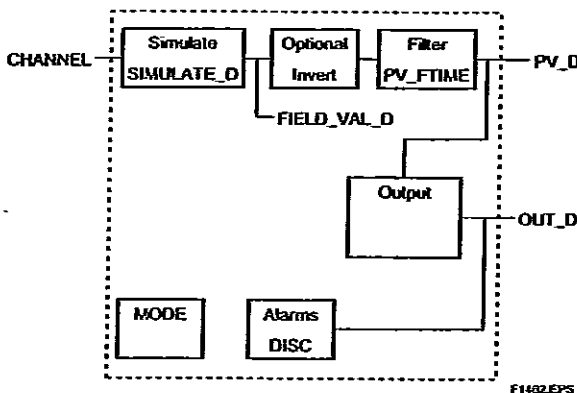


Figure 14.2 Function Diagram of DI Function Block

14.2 Modes

The target mode for a DI function block can be set from three block modes: O/S, Auto, and Man.

14.3 PV Value (PV_D)

A limit switch signal is transferred from the transducer block via a channel. Normally, the Transducer Value and Transducer Status values in *SIMULATE_D* are copied to *FIELD_VAL_D*, indicating the on/off status of the corresponding limit switch. If *SIMULATE_D* is set to 'Enable', the Simulate Value and Simulate Status values in *SIMULATE_D* are copied to *FIELD_VAL_D*.

SIMULATE_D contains the following data:

- Simulate Status: Status to be set in simulation mode
- Simulate Value: Value to be set in simulation mode
- Transducer Status: Status of input from transducer
- Transducer Value: Value of input from transducer
- Enable/Disable: Whether to enable (2) or disable (1) simulation

The value of *FIELD_VAL_D* is copied to the process value *PV_D*. At this time, if the Invert option (bit 0) is specified as true, the on/off status is inverted.

Table 14.1 *FIELD_VAL_D*

Value of <i>FIELD_VAL_D</i>	Value of <i>PV_D</i>	
	Invert = False	Invert = True
0	0 (off)	1
≥1	1 (on)	0

T1401.EPS

14.4 Filtering

Transfer of a change in the value of *FIELD_VAL_D* to the value of *PV_D* can be delayed for a desired time period set in the parameter *PV_FTIME* (in seconds).

14.5 Output

The value of the output *OUT_D* is generated based on the value of *PV_D*.

14.6 IO_OPTS and STATUS_OPTS

IO_OPTS and *STATUS_OPTS* are parameters that stipulate options about block's signal processing and mode transitions. The settings of these options are made by setting or resetting the respective bits: on = true, off = false. Table 14.2 shows the options available in *IO_OPTS* of a DI block.

Table 14.2 *IO_OPTS* of DI Block

Bit Position	Meaning	Description
0	Invert	Inverts the on/off status.

T1402.EPS

The table below shows the options available in *STATUS_OPTS* of the AO block.

Table 14.3 STATUS_OPTS of DI Block

Bit Position	Meaning	Description
3	Propagate Fault Forward	<p>Stipulates the handling of the value and data status of OUT_D when the quality component of the data status of SIMULATE_D fails to Bad and the sub-status component fails to device failure or sensor failure.</p> <p>If this option is true, then it:</p> <ul style="list-style-type: none"> - Does not generate a block alarm. - Sets the status and value of SIMULATE_D in OUT_D. <p>If this option is false, then it:</p> <ul style="list-style-type: none"> - Generates the "input failure" block alarm. - Set the quality and sub-status components of the status of OUT_D to Bad and non specific, respectively.
8	Uncertain if Man mode	Sets the status of OUT_D to uncertain when in Man mode.

T1404EPS

14.7 Alarm Processing

14.7.1 Block Alarms

When a condition shown in the table below is met in a DI block, the DI block changes the bit statuses of BLOCK_ERROR accordingly and generates a block alarm.

Table 14.4 BLOCK_ERROR in AO Block

Bit	Name of Error Represented	Condition
3	Simulate Active	SIMULATE_D is active.
7	Input Failure / process variable has BAD status	Propagate Fault Backward in STATUS_OPTS is false, and the sub-status component of the status of READBACK is sensor failure or device failure.
15	Out of Service	The target mode is O/S.

T1404EPS

14.7.2 Discrete Alarm

The parameter DISC_ALM is a discrete alarm of the parameter OUT_D.

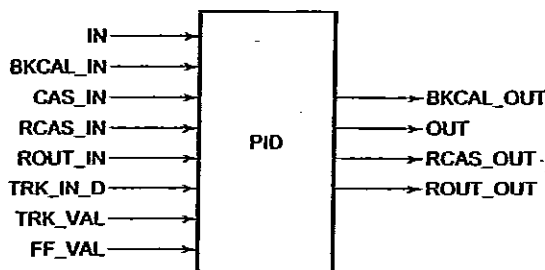
When the value of OUT_D agrees with the value of DISC_LIM, the alarm state of DISC_ALM is set to active and an alert is generated.

15. PID FUNCTION BLOCK

15.1 General

The PID function block receives an input signal, performs PID control computation, and outputs the control signal, like a single-loop controller. In practice, it performs PID computation based on the deviation between the setpoint set in the actual mode and the PV, and generates a value of its output OUT so as to decrease the deviation. The PID block works with other function blocks such as the AI and AO blocks connected to it. The major functions of the PID block include:

- Filtering
- Setpoint limiters - both for the value and rate of change
- Scaling of Process Variables(PV), setpoint(SP) and output (OUT)
- PID control computation
- Control action bypass
- Feed-forward
- External-output tracking
- Measured-value tracking
- Output limiters
- Mode shedding upon computer failure
- Alarm generation



F1501EPS

Figure 15.1 Inputs/Outputs of PID Function Block

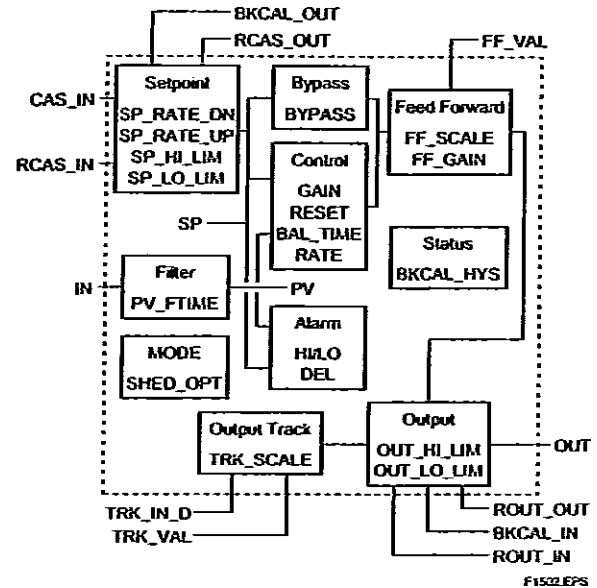


Figure 15.2 Function Diagram of PID Function Block

15.2 Modes

The target mode for the PID function block can be set from five block modes: ROut, RCas, Cas, Auto, Man, and O/S. Regardless of the target mode, the PID block automatically enters the IMan or LO mode when a specified condition is met (such as when another function block enters a specific status), depending on the parameter settings.

15.3 Input Processing

The input signal to IN is filtered through a lag filter whose time constant is set in PV_FTIME, and then set as the process variable (PV).

15.4 Setpoint (SP) Limiters

The path for computing the SP differs depending on the mode. In Cas mode, CAS_IN is used for SP. In RCas mode, RCAS_IN is used for SP. If the value of CAS_IN or RCAS_IN, whichever is used, is greater than SP_HI_LIM (high limit) or less than SP_LO_LIM (low limit), the internal SP is set to the respective limits. When the target mode is Auto or Man, and when SP-PV tracking is not specified at the same time, the rate of change in the setpoint is also limited (by the values of SP_RATE_UP and SP_RATE_DN).

15.5 PID Computation

For PID control, the PID block in a FVP110 employs the PV-proportional and PV-derivative type PID control algorithm (referred to as the I-PD control algorithm). This algorithm, whose basic form is expressed in the equation below, ensures control stability against sudden changes in the setpoint, such as when the user enters a new setpoint value. At the same time, the I-PD algorithm ensures excellent controllability by performing proportional, integral, and derivative control actions in response to changes of characteristics in the controlled process, changes in load, and occurrences of disturbances.

Where,

$$\Delta MV_n = K \left\{ \Delta PV_n + \frac{\Delta T}{T_i} (PV_n - SP_n) + \frac{T_d}{\Delta T} \Delta(\Delta PV_n) \right\}$$

ΔMV_n = change in control output

ΔPV_n = change in measured (controlled) value
= $PV_n - PV_{n-1}$

ΔT = control period
= period_of_execution in block header

K = proportional gain
= $GAIN$ (= 100/proportional band)

T_i = integral time = RESET

T_d = derivative time = RATE

The subscripts, n and n-1, represent the sampling time and thus PV_n and PV_{n-1} denote the PV value sampled most recently and the PV value sampled at the preceding control period respectively.

The table below shows the PID control parameters.

Table 15.1 PID Control Parameters

Parameter	Description	Valid Range
GAIN	Proportional gain	0.05 to 20
RESET	Integral time	0.1 to 10,000 (seconds)
RATE	Derivative time	0 to infinity

T1501EPS

15.6 Control Output

The final control output value, OUT, is computed based on the change in control output ΔMV_n , which is calculated at each control period in accordance with the aforementioned algorithm. The PID block in a FVP110 performs the velocity type output action for the control output. This means that the PID block determines the value of the new control output(OUT) by adding the change in control output calculated in

the current control period, ΔMV_n , to the current read-back value of the MV(OUT), MV_{RB} (BKCAL_IN). This action can be expressed as:

$$OUT = BKCAL_IN + \Delta MV_n$$

15.7 Direction of Control Action

The direction of the control action is determined by the Direct Acting setting in CONTROL_OPTS.

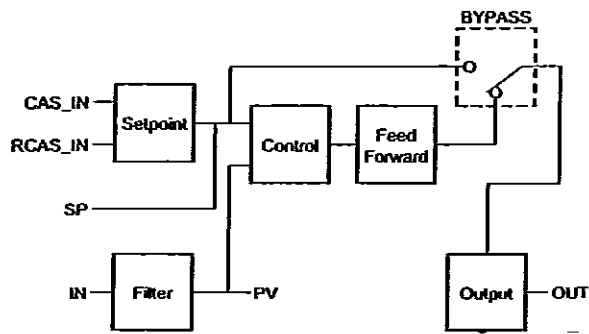
Table 15.2 Direction of Control Action

Value of Direct Acting	Resulting Action
True	The output increases when the input PV is greater than the setpoint SP.
False	The output decreases when the input PV is greater than the setpoint SP.

T152EPS

15.8 Control Action Bypass

The PID control computation can be bypassed so as to set the SP value in the control output OUT as shown below. Setting BYPASS to on bypasses the PID control computation.



F1503EPS

Figure 15.3 Control Action Bypass

15.9 Feed-forward

Feed-forward is an action to add a compensation input signal FF_VAL to the output of the PID control computation and is typically used for feed-forward control. In practice, the value of FF_VAL is scaled to the range of the OUT, multiplied by the value of FF_GAIN, and then added to the PID control computation result, as illustrated by Figure 15.4.

When the status of FF_VAL is Bad, the value of LUV(Lust usable value) is used instead of FF_VAL. If LUV contains no value, the feed-forward action is not carried out.

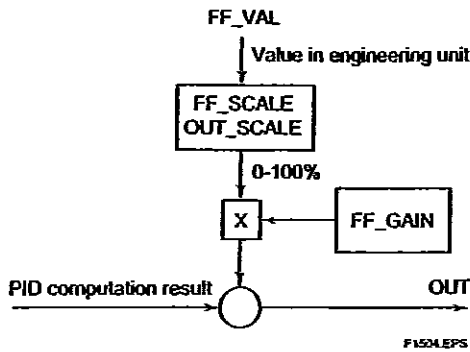


Figure 15.4 Feed-forward

15.10 External-output Tracking (LO)

External-output tracking is an action of outputting the value of the remote output TRK_VAL set from outside the PID block, as illustrated in the figure below. External tracking is performed when the block mode is LO.

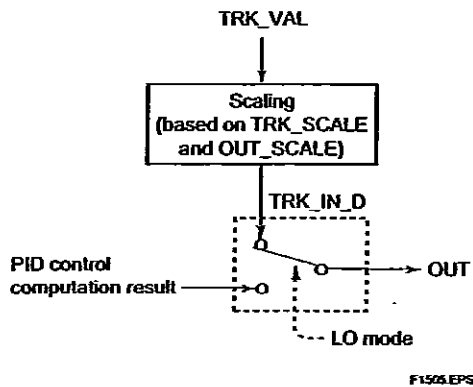


Figure 15.5 External-value Tracking

To change the block mode to LO:

- (1) Set Track Enable in CONTROL_OPTS (see Section 15.12) to true.
- (2) Set TRK_IN_D to true.

However, to change the block mode from Man to LO, Track in Manual must also be set as true in CONTROL_OPTS.

15.11 Measured-value Tracking

Measured-value tracking, also referred to as SP-PV tracking, is the action of equalizing the setpoint SP to the measured value PV when the block mode (MODE_BLK.actual) is Man in order to prevent a sudden change in control output from being caused by a mode change to Auto.

While a cascade primary control block is performing automatic control in Auto or Cas mode, when the mode of its secondary control block is changed from Cas to Auto, the cascade connection is opened and the control action of the primary block stops. The SP of the primary controller can also be equalized to its cascade input signal CAS_IN in this case.

The settings for measured-value tracking are made in the parameter CONTROL_OPTS, as shown in Table 15.3.

15.12 CONTROL_OPTS

CONTROL_OPTS is a parameter that stipulates control options as shown below.

Table 15.3 CONTROL_OPTS of PID Block

Bit	Options in CONTROL_OPTS	Description
0	Bypass Enable	Switch for activating the control action bypass
1	SP-PV Track in Man	Equalizes SP to PV when MODE_BLK.target is set to Man.
2	SP-PV Track in Rout	Equalizes SP to PV when MODE_BLK.target is set to ROut.
3	SP-PV Track in LO or IMan	Equalizes SP to PV when MODE_BLK.actual is set to LO or IMan.
4	SP Track retained Target	Equalizes SP to RCAS_IN or CAS_IN when MODE_BLK.target is either in IMan, LO, Man or ROut and MODE_BLK.actual is set to RCas or Cas.
5	Direct Acting	Set the PID block to be a direct acting controller.
7	Track Enable	While this option is set, if the value of TRK_IN_D becomes '0', the mode transfers to LO.
8	Track in Manual	Set this option when the mode should be transferred to LO even when MODE_BLK.target is set to Man. This option is invalid when Track Enable option is not set.
9	Use PV for BKCAL_OUT	Sets the value of PV in BKCAL_OUT and RCAS_OUT, instead of the value of SP.
12	Obey SP limits if Cas or RCas	Puts the setpoint high/low limits in force in the Cas or RCas mode.
13	No OUT limits in Manual	Disables the high/low limits for OUT in the Man mode.

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15.13 Initialization and Manual Fallback (IMan)

Initialization and manual fallback denotes a set of abnormality handling actions in which a PID block changes mode to IMan (initialization manual) and

suspends the control action. Initialization and manual fallback takes place only when the following condition is met:

- The quality component of BKCAL_IN.status (data status of BKCAL_IN) is Bad.
- OR -
- The quality component of BKCAL_IN.status is Good (c)
- AND -
- The sub-status component of BKCAL_IN.status is FSA, LO, NI, or IR.

15.14 Manual Fallback

Manual fallback denotes an abnormality handling action in which a PID block changes mode to Man (manual) and suspends the control action. The manual fallback action is enabled to take place if the Target to Manual if BAD IN option in STATUS_OPTS is set as true, and it takes place when the following condition is met:

- IN.status (data status of IN) is Bad except when the control action bypass is on.

15.14.1 STATUS_OPTS

The table below shows the options in STATUS_OPTS.

Table 15.4 STATUS_OPTS of PID Block

Bit	Options in STATUS_OPTS	Description
0	IFS if BAD IN	Sets the sub-status component of OUT.status to IFS if IN.status is Bad except when PID control bypass is on.
1	IFS if BAD CAS IN	Sets the sub-status component of OUT.status to IFS if CAS_IN.status is Bad.
2	Use Uncertain as Good	Does not regard IN as being in Bad status when IN.status is Uncertain (to prevent mode transitions from being affected when it is Uncertain).
5	Target to Manual if BAD IN	Automatically changes the value of MODE_BLK.target to Man when IN falls to Bad status.
9	Target to next permitted mode if BAD CAS IN	Automatically changes the value of MODE_BLK.target to Auto (or to Man if Auto is not set in Permitted) when CAS_IN falls to Bad status.

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15.15 Auto Fallback

Auto fallback denotes an action in which a PID block changes mode from Cas to Auto and continues automatic PID control with the user-set setpoint. To enable the auto fallback action to take place:

- The Target to next permitted mode if BAD CAS IN option must be preset to true in STATUS_OPTS.
 - AND -
 - Auto must be preset in MODE_BLK.permitted.
- If the above settings are made, auto fallback takes place automatically when the following condition is met:
- CAS_IN.status (data status of cascade setpoint) is Bad except when the control action bypass is on.

15.16 Mode Shedding upon Computer Failure

When (1) the data status of RCAS_IN, which is the setting received from a computer as the setpoint SP, falls to Bad while the PID block is running in the RCas (remote cascade) mode, or when (2) the data status of ROUT_IN, which is the setting received from a computer as the remote output signal, falls to Bad while the PID block is running in the ROut (remote output) mode; mode shedding occurs in accordance with the SHED_OPT setting.

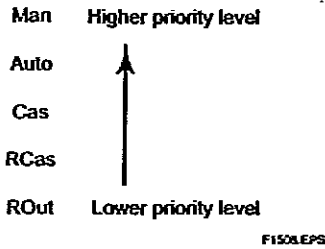
Table 16.5 SHED_OPT of PID Block

Available Setting for SHED_OPT	Actions upon Computer Failure
Normal shed, normal return	Sets MODE_BLK.actual to Cas(*1), and leaves MODE_BLK.target unchanged.
Normal shed, no return	Sets both MODE_BLK.actual and MODE_BLK.target to Cas(*1).
Shed to Auto, normal return	Sets MODE_BLK.actual to Auto(*2), and leaves MODE_BLK.target unchanged.
Shed to Auto, no return	Sets both MODE_BLK.actual and MODE_BLK.target to Auto(*2).
Shed to Manual, normal return	Sets MODE_BLK.actual to Man, and leaves MODE_BLK.target unchanged.
Shed to Manual, no return	Sets both MODE_BLK.actual and MODE_BLK.target to Man.
Shed to retained target, normal return	If Cas is set in MODE_BLK.target, - sets MODE_BLK.actual to Cas(*1) and - leaves MODE_BLK.target unchanged. If Cas is not set in MODE_BLK.target, - sets MODE_BLK.actual to Auto(*2) and - leaves MODE_BLK.target unchanged.
Shed to retained target, no return	If Cas is set in MODE_BLK.target, sets: - MODE_BLK.actual to Cas, and - MODE_BLK.target to Cas(*1), too. If Cas is not set in MODE_BLK.target, sets: - MODE_BLK.actual to Auto(*2), and - MODE_BLK.target to Cas.

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(*1)The modes to which the PID block can transfer are limited to those set in MODE_BLK.permitted, and the priority levels of modes are as shown below.

In fact, if Normal shed, normal return is set for SHED_OPT, detection of a computer failure causes MODE_BLK.actual to change to Cas, Auto, or Man, whichever is set in MODE_BLK.permitted and has the lowest priority level.



(*2) Only when Auto is set as permitted mode.

NOTE: If a control block is connected as a cascade primary block of the PID block in question, a mode transition of the PID block to Cas occurs in the following sequence due to initialization of the cascade connection: RCas or ROut → Auto → Cas.

Process Alarm	Cause of Occurrence	Parameter Containing Priority Level Setting
HI_HI_ALM	Occurs when the PV increases above the HI_HI_LIM value.	HI_HI_PRI
HI_ALM	Occurs when the PV increases above HI_LIM value.	HI_PRI
LO_ALM	Occurs when the PV decreases below the LO_LIM value.	LO_PRI
LO_LO_ALM	Occurs when the PV decreases below the LO_LO_LIM value.	LO_LO_LIM
DV_HI_ALM	Occurs when the value of [PV - SP] increases above the DV_HI_LIM value.	DV_HI_PRI
DV_LO_ALM	Occurs when the value of [PV - SP] decreases below the DV_LO_LIM value.	DV_LO_PRI

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15.17 Alarms

There are two kinds of alarms generated by a PID block: block and process alarms.

15.17.1 Block Alarm (BLOCK_ALM)

The block alarm BLOCK_ALM is generated upon occurrence of either of the following errors (values set in BLOCK_ERR) and notifies the content of BLOCK_ERR.

Value of BLOCK_ERR	Condition
Input Failure	IN.status of the PID block is either of the following: • Bad-Device Failure • Bad-Sensor Failure
Out of Service	MODE_BLK.target of the PID block is O/S.

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15.17.2 Process Alarms

There are six types of process alarms. Only one process alarm can be generated at a time, and the process alarm having the highest priority level from among those occurring at the same time is generated. The priority level is set for each process alarm type.

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16. TROUBLESHOOTING

16.1 What to Do First

When a problem occurs, check the following first.

Mounting of FVP110 Positioner

- Is the linkage to the valve actuator correctly set up?
- Is the feedback lever correctly attached?
- Is the span of rotation angle of the position sensor against the valve stroke more than the minimum requirement?
- Has auto tuning been performed after installation?

Air Piping

- Are the air pipes correctly connected? Is there no leak of air?
- Is the air supply pressure high enough to drive the valve?

- Is the A/M selector on the positioner set to A (automatic)?

Wiring

- Is the FVP110 positioner correctly connected to the fieldbus?
- Are the conductors incorrectly connected, in other words, is the plus side connected to minus, and vice-versa?
- Has the power to the fieldbus been turned on? Is the terminal-to-terminal voltage equal to or greater than 9 V?
- Is the terminator correctly installed?
- Is a host system connected to the fieldbus?

16.2 Troubleshooting Communications

Problem	Presumed Cause	Remedy	Ref. Section
Communication with the FVP110 cannot be performed.	Wiring is incorrect.	Correct wiring.	4.3, 8.4
	The power is off or the power supply voltage is less than 9 V.	Supply proper voltage.	4.3, Chapter 7
	The address detection range is not correctly set.	Correct address detection range.	9.4
Communication with the FVP110 is frequently cut off.	The fieldbus is experiencing a large amount of noise.	Using an oscilloscope or the like, check the waveform on the fieldbus.	—
The FVP110 can be detected, but neither function blocks nor transducer block can be seen.	The node address of the FVP110 is left as the default (0xF8-0xFB).	Change it to an operable address. See the descriptions for address settings.	9.4

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16.3 Troubleshooting Function Block Parameters

Problem	Presumed Cause	Remedy	Ref. Section
A value cannot be written to a parameter in the FVP110.	You have attempted to write a value outside the valid range.	Check the setting range of parameters.	Appendix 1
	The target mode does not allow write access.	Change the target mode. See the parameter lists.	Appendix 1
The actual mode of a function block cannot be equalized to the target mode.	O/S is set for the target mode of the resource block.	Change the target mode of the resource block to Auto.	Appendix 1, 10.1
	The I/O of the function block in question is not connected to another function block.	Using a configuration tool, set the virtual communication relationship (VCR) and link object.	Chapter 9
	Schedules that define when function blocks execute are not set correctly.	Set the schedules using a configuration tool.	Chapter 9
	The transducer block is in O/S mode.	Change the target mode of the transducer block to Auto.	Appendix 1, 10.1
A block's dynamic parameters do not update.	The block in question is in O/S mode.	Change the target mode as necessary.	Appendix 1, 10.1
	O/S is set for the target mode of the resource block.	Change the target mode of the resource block to Auto.	Appendix 1, 10.1

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16.4 Troubleshooting Valve Control

Problem	Presumed Cause	Remedy	Ref. Section
A change in setpoint causes no action of the valve.	Air piping is incorrect.	Correct piping.	4.2
	The instrument is in FAILSAFE state.	Write 'Clear non-latch' to RELEASE_FAILSAFE parameter.	12.6.2
	Air supply is not being fed.	Supply proper air pressure	4.2
	The valve has failed.	Apply a pneumatic pressure directly to the valve actuator and check whether there is valve action.	3.2.3
	The I/P module or control relay has failed, or there is breakage in the cable between the I/P module and control relay.	If the output pressure does not increase even though the SERVO_OUTPUT_SIGNAL value is at maximum, contact the nearest service station or representative office.	_____
The valve's full stroke is insufficient for the setpoint input.	The air supply pressure is not high enough to drive the valve actuator.	Check the air supply pressure rating for the valve actuator and supply air at the correct pressure, and write 4 or 2 to AUTO_TUNE_EXEC to redo autotuning.	4.2, 5.3
	The range of the setpoint is limited by software.	Check the values of SP_HI_LIM and SP_LO_LIM in the AO block and FINAL_VALUE_RANGE in the transducer block.	13.3, Appendix 1
The deviation between the setpoint and readback signal remains.	The tight-shut or full-open action is active.	Check the values of FINAL_VALUE_CUTOFF_HI and FINAL_VALUE_CUTOFF_LO.	12.2.4, Appendix 1
	The travel calibration has not been performed correctly.	Write 2 to AUTO_TUNE_EXEC to perform 0 & 100% point adjustment.	5.3
The valve oscillates cyclically (limit cycle).	The friction of grand packing is large.	1) Write 4 or 3 to AUTO_TUNE_EXEC to redo auto tuning. 2) Use the actuator of proper size.	5.3
	The dead band of integral action is too little.	Write 4 or 3 to AUTO_TUNE_EXEC to redo auto tuning. Or, increase the SERVO_DEADBAND setting until the valve stops oscillating.	5.3 12.7, Appendix 1
	There's air leak from the pipe of output pressure, or feedback lever is not correctly attached.	Check the piping and attachment of the lever, and write 4 or 3 to AUTO_TUNE_EXEC to redo autotuning.	Chapter 3, 5.3
Valve responses are too slow.	If only the responses that require air suction are slow, it means that the regulator's maximum capacity is large enough.	Replace the regulator.	_____
	The I/P module's nozzle has become blocked from dirt contained in the air supply or the like.	Check whether or not error 122 occurs in XD_ERROR in steady states. If it does occur, contact the nearest service station or representative office.	12.6.1
	The control relay's nozzle has become blocked from dirt contained in the air supply or the like.	Check whether or not error 122 occurs in XD_ERROR in steady states.	12.6.1
	The control gain is insufficient.	Write 4 or 3 to AUTO_TUNE_EXEC to redo auto tuning. Or, increase the SERVO_GAIN setting.	5.3, 12.7, Appendix 1
	There's air leak from the pipe of output pressure, or feedback lever is not correctly attached.	Check the piping and attachment of the lever, and write 4 or 3 to AUTO_TUNE_EXEC to redo autotuning.	Chapter 3, 5.3

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16.5 Troubleshooting Auto Tuning

Problem	Presumed Cause	Remedy	Ref. Section
Auto tuning requests are rejected.	Either or both of the A/O block and transducer block are not in O/S mode.	Change the target modes of the AO and transducer block to O/S.	Appendix 1
When auto tuning has finished, AUTO_TUNE_RESULT changes value to an index from 21 to 24.	There is something wrong with the air supply pressure or spring range.	Check whether the measured pressure reading nearly equals the actual pressure. See the descriptions for auto tuning.	5.3 12.4
When auto tuning has finished, AUTO_TUNE_RESULT changes value to index 40 or 120.	There is something wrong with the operation point of the I/P module. SERVO_OFFSET could not be measured.	If there is nothing wrong with the air supply pressure and piping, contact the nearest service station or representative office.	—
When auto tuning has finished, AUTO_TUNE_RESULT changes value to an index from 42 to 44, or from 120 to 122.	The measured time delay constant, hysteresis, and/or slip width of the valve is excessively large.	Check whether they meet the characteristics specified for the valve. See the descriptions for auto tuning.	5.3 12.4
When auto tuning has finished, AUTO_TUNE_RESULT changes value to an index from 60 to 62, or from 100 to 103.	The span of rotation angle is incorrect or the 50% position deviation from the horizontal level is too large.	Correct the installation and try auto tuning again.	Chapter 3, 5.3

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16.6 Troubleshooting Position, Pressure, and Temperature Sensors

Problem	Presumed Cause	Remedy	Ref. Section
The position sensor signal remains unchanged.	The feedback lever is not properly attached.	See the descriptions for positioner installation.	Chapter 3
	The position sensor has failed or there is breakage in the cable between the sensor and amplifier.	If ADVAL_BW does not change value when the shaft rotates, it may be necessary to replace the position sensor. Contact our nearest representative or service station.	—
The position sensor signal is unstable, or XD_ERROR indicates error 124.	The position sensor has failed or there is breakage in the cable between the sensor and amplifier.	It may be necessary to replace the position sensor. Contact the nearest representative or service station.	—
The pressure sensor signal is unstable, or XD_ERROR indicates error 121.	The pressure sensor has failed.	It may be necessary to replace the amplifier. Contact the nearest representative or service station.	—
The temperature sensor signal is unstable, or XD_ERROR indicates error 120.	The temperature sensor has failed.	It may be necessary to replace the amplifier. Contact the nearest representative or service station.	—

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Appendix 1. FUNCTION BLOCK PARAMETERS

NOTE: Throughout the following tables, the Write column shows the modes in which the respective parameters can be written. The legends of the entries are as follows:

- O/S: Can be written when the corresponding block is in O/S mode.
 Man: Can be written when the corresponding block is in Man mode.
 Auto: Can be written when the corresponding block is in Auto, Man, or O/S mode.
 —: Can be written in no mode of the corresponding block.
 Blank: Can be written in all modes of the corresponding block.

A1.1 Parameters of Resource Block

Relative Index	Index	Parameter Name	Default (factory setting)	Write	Description
0	1000	Block Header		Block Tag =O/S	Information about this block, including the block tag, DD revision, execution time
1	1001	ST_REV	0	—	Incremented when a change is made to the parameter settings for the resource block to indicate the revision level of the settings, and used to see whether or not there is a change in parameter settings.
2	1002	TAG_DESC	Null		Universal parameter storing the description of the tag
3	1003	STRATEGY	0		Universal parameter used by an upper-level system to classify the function blocks.
4	1004	ALERT_KEY	0		Universal parameter used as a key to identify the point from which an alert is issued; normally used by an upper-level system to select alerts to provide to a particular operator who covers a specific area of the plant.
5	1005	MODE_BLK	O/S	Auto	Universal parameter that indicates the block operation conditions and is composed of actual mode, target mode, permitted modes, and normal mode.
6	1006	BLOCK_ERR	—	—	Universal parameter indicating the hardware and software error statuses related to the block itself
7	1007	RS_STATE	—	—	Indicates the statuses of resource in the FVP110.
8	1008	TEST_RW	Null		Parameter used to test read and write access to the FVP110
9	1009	DD_RESOURCE	Null	—	Name of the device description (DD) containing the information of this resource block
10	1010	MANUFAC_ID	0x	—	Manufacturer ID; 445644 (= 0x) is assigned to Dresser Valve Division.
11	1011	DEV_TYPE	1	—	ID number of device; 1 is assigned to the FVP110.
12	1012	DEV_REV	2	—	Revision number of the FVP110
13	1013	DD_REV	1	—	Revision number of the device description (DD) applied to this FVP110
14	1014	GRANT_DENY	0		Option to control access from the host computer and local control panel to tuning and alarm parameters
15	1015	HARD_TYPES	Scalar input, Scalar output	—	Bit string indicating the hardware types Bit 0: Scalar input Bit 1: Scalar output Bit 2: Discrete input Bit 3: Discrete output
16	1016	RESTART	—		Restart the FVP110 in the selected way. 1: Running 2: Restart Resource 3: Restart with the default settings 4: Restart CPU

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Appendix 1. FUNCTION BLOCK PARAMETERS

Relative Index	Index	Parameter Name	Default (factory setting)	Write	Description [Setting range]
17	1017	FEATURES	-	-	Shows supportable optional features of the block.
18	1018	FEATURE_SEL		-	Parameter used to select the optional features of the resource block
19	1019	CYCLE_TYPE	Scheduled	-	Bit string indicating cycle types executable for the resources Bit 0: Scheduled; to be scheduled Bit 1: Event driven; to be driven by an event Bit 2: Manufacturer specified; executable by a manufacturer-specified unique function
20	1020	CYCLE_SEL	Scheduled		Bit string used to select the cycle type
21	1021	MIN_CYCLE_T	3200 (100ms)	-	Minimum execution cycle
22	1022	MEMORY_SIZE	0	-	Memory size allowed for use of function block configurations in the device; checked before a download, but not supported by the FVP110.
23	1023	NV_CYCLE_T	0	-	Cycle of saving the settings of non-volatile attribute parameters to the EEPROM. 0 is set with the FVP110, and saving is not cyclically done.
24	1024	FREE_SPACE	0	-	Shows the free space memory for configurations as a percent value. FVP110 shows zero which means the pre-configured resource.
25	1025	FREE_TIME	0	-	Shows the free time that can be used for computations by resources but not supported by the FVP110.
26	1026	SHED_RCAS	640000		Communication time-out setting for communications with the device from which the remote cascade setpoint is sent.
27	1027	SHED_ROUT	640000		Communication time-out setting for communications with the device from which the remote output setting is sent; not used in the FVP110, however.
28	1028	FAULT_STATE	1	-	Indicates the fault-state.
29	1029	SET_FSTATE	1		Sets the fault-state.
30	1030	CLR_FSTATE	1		Clears the fault-state.
31	1031	MAX_NOTIFY	3	-	Maximum number of alerts retained in the device (FVP110).
32	1032	LIM_NOTIFY	3		Maximum number of alerts to be held by the device (FVP110); used by the user to restrict the number of alert notifications to the host to prevent overflow of alert receptions in the host.
33	1033	CONFIRM_TIM	5000 (ms)		Defines the time to wait for confirmation for an alert.
34	1034	WRITE_LOCK	Unlocked		Prohibits write access from outside the device to the settings.
35	1035	UPDATE_EVT	-	-	Shows the contents of an update event upon occurrence.
36	1036	BLOCK_ALM	-	-	Shows the contents of an alarm event upon occurrence.
37	1037	ALARM_SUM	Enable		Shows the alarm summary for all blocks within the device (FVP110).
38	1038	ACK_OPTION	0		Defines the acknowledgment action of each alarm type. By setting a bit to 1, the corresponding alarm will behave as acknowledged immediately when it occurs without receipt of acknowledgment from the host.
39	1039	WRITE_PRI	0		Defines the priority level of WRITE_ALM as well as allows for notification to be disabled and makes acknowledgment unnecessary for WRITE_ALM.
40	1040	WRITE_ALM	-	-	Alarm generated when WRITE_LOCK is set to unlocked

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Appendix 1. FUNCTION BLOCK PARAMETERS

Relative Index	Index	Parameter Name	Default (factory setting)	Write	Description
41	1041	ITK_VER	4	-	Version number of the inter-operability test kit
42	1042	SOFT_REV	-	-	Revision number of software
43	1043	SOFT_DSC	-	-	Revision number of software for development purpose.
44	1044	SIM_ENABLE_MSG	Null	-	Used to determine whether to enable the simulation function to run. To enable, set "REMOTE LOOP TEST SWITCH".
45	1045	DEVICE_STATUS_1	0	-	Shows device statuses - mainly link object setting statuses.
46	1046	DEVICE_STATUS_2	0	-	Shows device statuses - mainly individual for each block status.
47	1047	DEVICE_STATUS_3	0	-	Shows device statuses - mainly the contents of XD_ERROR in each block.
48	1048	DEVICE_STATUS_4	0	-	Not used in the FVP110.
49	1049	DEVICE_STATUS_5	0	-	Not used in the FVP110.
50	1050	DEVICE_STATUS_6	0	-	Not used in the FVP110.
51	1051	DEVICE_STATUS_7	0	-	Not used in the FVP110.
52	1052	DEVICE_STATUS_8	0	-	Not used in the FVP110.

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A1.2 Parameters of Transducer Block

Parameters marked with (*1) are automatically set and changed by autotuning. Parameters marked with (*2) are automatically set and changed by Travel calibration.

Relative Index	Index	Parameter Name	Default (factory setting)	Write	Description [Setting range]
0	2000	Block Header		Block tag = O/S	Information about this block, including the block tag, DD revision, execution time
1	2001	ST_REV	0	-	Incremented when a change is made to the parameter settings for the transducer block to indicate the revision level of the settings, and used to see whether or not there is a change in parameter settings.
2	2002	TAG_DESC	Spaces		Universal parameter storing the description of the tag
3	2003	STRATEGY	0		Universal parameter used by an upper-level system to classify the function blocks.
4	2004	ALERT_KEY	0		Universal parameter used as a key to identify the point from which an alert is issued; normally used by an upper-level system to select alerts to provide to a particular operator who covers a specific area of the plant.
5	2005	MODE_BLK	O/S		Universal parameter that indicates the block operation conditions and is composed of the actual mode, target mode, permitted modes, and normal mode.
6	2006	BLOCK_ERR	-	-	Indicates the error statuses related to the block itself.
7	2007	UPDATE_EVT	-	-	Shows the contents of an update event upon occurrence.
8	2008	BLOCK_ALM	-	-	Universal parameter indicating the hardware and software error statuses related to the block itself
9	2009	TRANSDUCER_DIRECTORY	1, 10	-	Index to the text describing the transducer contained in the FVP110 positioner
10	2010	TRANSDUCER_TYPE	106	-	Transducer type
11	2011	XD_ERROR	0	-	Stores the error prioritized at the highest level from among the errors that are currently occurring in the transducer block.
12	2012	CORRECTION_DIRECTORY	1, 13	-	Stores the number of data collection and the index number to be started with.
13	2013	FINAL_VALUE	-	O/S	Stores the valve control level and status written by the AO block.
14	2014	FINAL_VALUE_RANGE	-10%, 110%	O/S	Defines the upper and lower range limits of FINAL_VALUE, and the unit code and decimal point position for value indication of FINAL_VALUE.
15	2015	FINAL_VALUE_CUTOFF_HI	110%	O/S	If the value of FINAL_VALUE is greater than the value set in this parameter, the FVP110 moves the valve to the full-open position.
16	2016	FINAL_VALUE_CUTOFF_LO	-10%	O/S	If the value of FINAL_VALUE is less than the value set in this parameter, the FVP110 moves the valve to the shut-off position.
17	2017	FINAL_POSITION_VALUE	-	-	Stores the position data read by the valve position sensor.
18	2018	SERVO_GAIN (*1)	120	O/S	Static control loop gain set by auto tuning [0.5 to 1300]
19	2019	SERVO_RESET (*1)	15 sec	O/S	Integral time set by auto tuning
20	2020	SERVO_RATE (*1)	0.22 sec	O/S	Derivative time set by auto tuning
21	2021	ACT_FAIL_ACTION	1	O/S	Specifies the actuator action direction in case of losing of air supply pressure: 1 = self-closing 2 = self-opening
22	2022	ACT_MAN_ID	0	-	ID of actuator manufacturer
23	2023	ACT_MODEL_NUM	Null	-	Model number of actuator
24	2024	ACT_SN	0	-	Serial number of actuator
25	2025	VALVE_MAN_ID	0	-	ID of valve manufacturer
26	2026	VALVE_MODEL_NUM	Null	-	Model number of valve

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Appendix 1. FUNCTION BLOCK PARAMETERS

Relative Index	Index	Parameter Name	Default (factory setting)	Write	Description [Setting range]
27	2027	VALVE_SN	0		Serial number of valve
28	2028	VALVE_TYPE	1	O/S	Valve type: 1 = linear-motion valve 2 = rotary-motion valve
29	2029	XD_CAL_LOC	Null		Shows and is used to record the location where the positioner was calibrated.
30	2030	XD_CAL_DATE	01/01/00		Shows and is used to record the date when the positioner was calibrated.
31	2031	XD_CAL_WHO	Null		Shows and is used to record the person who calibrated the positioner.
32	2032	ALARM_SUM			Shows the alarm summary (current alarm statuses, acknowledged/unacknowledged states, masking states) for the transducer block.
33	2033	POSITION_CHAR_TYPE	1	O/S	Defines the valve position-to-flow characteristics: 1 = linear 2 = equal % (50:1) 3 = equal % (30:1) 4 = quick open (inverse of 50:1 equal %) 255 = user-defined 10-segment function
34	2034	POSITION_CHAR	10,20,30,40,50,60,70,80,90	O/S	Defines the coordinates of the segment function when 255 is set for POSITION_CHAR_TYPE. [0 to 100, only simple decreasing can be allowed]
35	2035	LIMSW_HI_LIM	+110%		Setting of high limit switch
36	2036	LIMSW_LO_LIM	-10%		Setting of low limit switch
37	2037	ELECT_TEMP	-	-	Indicates the temperature on amplifier board
38	2038	TEMPERATURE_UNIT	1101(degC)	O/S	Defines the unit of temperature indication above: 1101 = degC 1102 = degF
39	2039	SUPPLY_PRESSURE	140kPa	O/S	Air supply pressure (irrespective of control)
40	2040	SPRING_RANGE	20kPa, 100kPa	O/S	Defines the pressure range and unit for valve operation (with no direct effect on control). The unit defined here also applies to OUT_PRESSURE. 1133 = kPa 1137 = bar 1141 = psi 1145 = kg/cm ²
41	2041	OUT_PRESSURE	-	-	Output pressure to valve actuator
42	2042	SERVO_OUTPUT_SIGNAL	-	-	Output current (%) to I/P module
43	2043	SERVO_RATE_GAIN (*1)	5	O/S	Derivative gain; a control parameter set by auto tuning [2 to 20]
44	2044	SERVO_DEADBAND (*1)	0.5%	O/S	Derivative action dead band; a control parameter set by auto tuning [0 to 50%]
45	2045	SERVO_OFFSET (*1)	50% of MV	O/S	Derivative action offset; a control parameter set by auto tuning [0 to 100 % of MV]
46	2046	BOOST_ON_THRESHOLD (*1)	1.9, 2.9%	O/S	Threshold for switching on boost action; a control parameter set by auto tuning [0, 0.1 to 10 %]
47	2047	BOOST_OFF_THRESHOLD (*1)	1.0, 1.0%	O/S	Threshold for switching off boost action; a control parameter set by auto tuning [0.1 to 10%]
48	2048	BOOST_VALUE (*1)	8, 10% of MV	O/S	Boost value; a control parameter set by auto tuning [0 to 50 % of MV]
49	2049	SERVO_I_SLEEP_LMT (*1)	0 sec	O/S	Integral-action sleep timer setting; a control parameter set by auto tuning [0 to 10 sec]

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Appendix 1. FUNCTION BLOCK PARAMETERS

Relative Index	Index	Parameter Name	Default (factory setting)	Write	Description [Setting range]
50	2050	SERVO_P_ALPHA (*1)	0 %	O/S	Multiplication coefficient for the square of proportional factor; a control parameter set by auto tuning [0 to 100%]
51	2051	INTERNAL_GAIN (*1)(*2)	5 rad./mA	O/S	Gain for internal computation ; a control parameter set by auto tuning [0.5 to 50 rad./mA]
52	2052	MEAS_GAIN	0 rad./mA	-	Measurement gain of I/P module, control relay and valve; a parameter set by auto tuning
53	2053	VALVE_TC	0 sec	-	Proportional factor of response speed of valve; a parameter set by auto tuning
54	2054	VALVE_HYS	0 %	-	Hysteresis of valve actions (%); a parameter set by auto tuning
55	2055	VALVE_SLIP_WIDTH	0 %	-	Slip width of valve actions (%); a parameter set by auto tuning
56	2056	MEAS_PRESS_AIR	0kPa	-	Air pressure (%); a parameter set by auto tuning (Valid when an optional pressure sensor is specified.)
57	2057	MEAS_PRESS_SUPPLY	0kPa	-	Air supply pressure (%); a parameter set by auto tuning (Valid when an optional pressure sensor is specified.)
58	2058	MEAS_SPRING_RANGE	0kPa	-	Spring range of valve; a parameter set by auto tuning (Valid when an optional pressure sensor is specified.)
59	2059	CONTROL_DIR	2	-	Defines the acting direction of the feedback loop: 1 = direct 2 = reverse
60	2060	THETA_HI(*1)(*2)	+ 0.2 rad.	-	Upper angle signal limit of position sensor (in radians)
61	2061	THETA_LO(*1)(*2)	-0.2 rad.	-	Lower angle signal limit of position sensor (in radians)
62	2062	THETA_P(*1)(*2)	0 rad.	-	Angle signal equal to 50 % from position sensor (in radians)
63	2063	TRAVEL_CALIB_EXEC	1	O/S	Switch for starting a travel calibration.
64	2064	TRAVEL_CALIB_RESULT	1	-	Indicates the result of a travel calibration.
65	2065	OPEN_STOP_ADJ	-	-	Not used for FVP110.
66	2066	AUTO_TUNE_EXEC	1	O/S	Switch for starting auto tuning.
67	2067	AUTO_TUNE_RESULT	1	-	Indicates the result of auto tuning.
68	2068	AUTO_TUNE_STATE	0	-	Indicates auto tuning sequence number.
69	2069	SERVO_RET_TO_DFLT	1	O/S	Writing 2 to this parameter resets all control parameters to the defaults: 1 = off 2 = set (to the defaults)
70	2070	ADVAL_FW	-	-	Digital value of valve control signal, setpoint equivalent to A/D value of valve position signal.
71	2071	ADVAL_BW	-	-	A/D value of valve position signal
72	2072	ADVAL_PRESS	-	-	A/D value of pressure from sensor
73	2073	ADVAL_T	-	-	A/D value of temperature from sensor
74	2074	TOTAL_CYCLE_COUNT	0	-	Total number of cycles. To reset the count, write 0.
75	2075	CYCLE_DEADBAND	0.25%	-	Dead band of cycle counting
76	2076	CYCLE_COUNT_LIM	2 ³² -1	-	High-limit alarm setting for TOTAL_CYCLE_COUNT. When TOTAL_CYCLE_COUNT has reached this setting, a block alarm is generated.

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Appendix 1. FUNCTION BLOCK PARAMETERS

Relative Index	Index	Parameter Name	Default (factory setting)	Write	Description
77	2077	TOTAL_TRAVEL	0	O/S	Total amount of travel. To reset the count, write 0.
78	2078	TRAVEL_DEADBAND	0.25%		Dead band of travel integration
79	2079	TRAVEL_LIM	2 ³² -1		High-limit alarm setting for TOTAL_TRAVEL. When TOTAL_TRAVEL has reached this setting, a block alarm is generated.
80	2080	TOTAL_OPEN_TIME	0 hour		Total time other than counted for TOTAL_CLOSE_TIME. To reset the count, write 0.
81	2081	TOTAL_CLOSE_TIME	0 hour		Total time where valve position is equal to or less than OPEN_CLOSE_THRESHOLD. To reset the count, write 0.
82	2082	OPEN_CLOSE_THRESHOLD	0.25%	-	Threshold value for TOTAL_OPEN_TIME and TOTAL_CLOSE_TIME.
83	2083	OPEN_TIME_LIM	2 ³² -1 hours		High-limit alarm setting for TOTAL_OPEN_TIME. When TOTAL_OPEN_TIME has reached this setting, a block alarm is generated.
84	2084	CLOSE_TIME_LIM	2 ³² -1 hours		High-limit alarm setting for TOTAL_CLOSE_TIME. When TOTAL_CLOSE_TIME has reached this setting, a block alarm is generated.
85	8085	TOTAL_NEAR_CLOSE_TIM	0		Total time period when the valve position is equal to or less than the value set in NEAR_CLOSE_THRESHOLD (judged as when the valve is nearly closed). To reset the count, write 0.
86	2086	NEAR_CLOSE_THRESHOLD	3.0 %		Threshold for judging that the valve is nearly closed
87	2087	NEAR_CLOSE_TIME_LIM	2 ³² -1 hours		High-limit alarm setting for TOTAL_NEAR_CLOSE_TIM. When TOTAL_NEAR_CLOSE_TIM has reached this setting, a block alarm is generated.
88	2088	DEVIATION_LIM	110%		Deviation high limit (%)
89	2089	DEVIATION_TIME_TH	10, -1 (off)		If the time period when the deviation is continuously equal to or greater than DEVIATION_LIM has reached the time set for the first value in this parameter, a block alarm is generated. If it has reached the time set for the second value, the instrument transfers to fault state. Negative value means "off".
90	2090	RELEASE_FAILSAFE	1	O/S	Used to release the block from the fail-safe state. When the value of this parameter is 3, writing 1 will release the block from the fail-safe state. 1 = clear, non-latch (normal state) 2 = active, latched (during fail-safe state) 3 = clear, latched (cause has been cleared but fail-safe action is still on).
91	2091	MODEL	As specified upon ordering	-	Model code
92	2092	DEV_OPTIONS	0x000D (or 0X0001 if PID option is specified)	-	Indicates whether any software options are provided.
93	2093	PRESS_SENS_INSTALLED	1	-	Indicates whether a pressure sensor is equipped: 1 = equipped 2 = not equipped
94	2094	ACTUATOR_TYPE	1	-	Actuator type 1 = single acting
95	2095	RELAY_TYPE	1		Control relay type: 1 = direct acting

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A1.3 Parameters of AO Block

Relative Index	Index	Parameter Name	Default (factory setting)	Write	Description
0	5000	BLOCK HEADER		Block tag = O/S	Information about this block, including the block tag, DD revision, execution time
1	5001	ST_REV	0	-	Incremented when a change is made to the parameter settings for the AO block to indicate the revision level of the settings, and used to see whether there is a change in parameter settings.
2	5002	TAG_DESC	Spaces		Universal parameter storing the description of the tag
3	5003	STRATEGY	0		Universal parameter used by an upper-level system to classify the function blocks.
4	5004	ALERT_KEY	0		Universal parameter used as a key to identify the point from which an alert is issued; normally used by an upper-level system to select alerts to provide to a particular operator who covers a specific area of the plant.
5	5005	MODE_BLK	O/S		Universal parameter that indicates the block operation conditions and is composed of actual mode, target mode, permitted modes, and normal mode.
6	5006	BLOCK_ERR	-	-	Indicates the error statuses related to the block itself.
7	5007	PV	-	-	Indicates the primary analog value (or the corresponding process value) used to execute the specified actions, and the status of that value.
8	5008	SP	-	Auto	Indicates the setpoint for the block.
9	5009	OUT	-	Man	Indicates the output value and its status.
10	5010	SIMULATE	disable		Used to simulate the output from the Transducer block; allows the user to set the value and status input from the specified channel.
11	5011	PV_SCALE	0-100%	O/S	High and low scale values when displaying the PV parameter and the parameters which have the same scaling as PV.
12	5012	XD_SCALE	0-100%	O/S	High and low scale values used with the value obtained from or sent to the transducer block for a specified channel.
13	5013	GRANT_DENY	0		Option to control access from the host computer and local control panel to tuning and alarm parameters
14	5014	IO_OPTS	0 x 000A	O/S	Settings for the I/O processing of the block
15	5015	STATUS_OPTS	0 x 0000	O/S	Defines block actions depending on block status conditions.
16	5016	READBACK	-	-	Readback signal of valve position from transducer block
17	5017	CAS_IN	-		Cascade input
18	5018	SP_RATE_DN	+INF		Rate-of-decrease limit for SP effective in AUTO, CAS, and RCAS modes. If this parameter is 0, no limit is applied to the rate of decrease.
19	5019	SP_RATE_UP	+INF		Rate-of-increase limit for SP effective in AUTO, CAS, and RCAS modes. If this parameter is 0, no limit is applied to the rate of increase.
20	5020	SP_HI_LIM	100		Upper limit for setpoint (SP)
21	5021	SP_LO_LIM	0		Lower limit for setpoint (SP)
22	5022	CHANNEL	1	O/S	Defines the channel number of the hardware channel connected to the transducer block. Always set to 1 for the AO block in a FVP110.
23	5023	FSTATE_TIME	0 second		Defines the time from when the fault state of the RCAS_IN or CAS_IN is detected to when the output should be set to the level preset in FSTATE_VAL (this action takes place only if Fault State to value is set as true in I/O_OPTS).

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Appendix 1. FUNCTION BLOCK PARAMETERS

Relative Index	Index	Parameter Name	Default (factory setting)	Write	Description
24	5024	FSTATE_VAL	0		Preset output level for fault state. See above.
25	5025	BKCAL_OUT	-	-	Value to be input to BKCAL_IN of the downstream block; used by the downstream block to prevent reset windup and perform bumpless transfer to closed-loop control.
26	5026	RCAS_IN	-		Remote cascade setpoint set by the host computer, etc.
27	5027	SHED_OPT	1		Defines the mode shedding action to be taken upon occurrence of time-out of communication in a mode using the remote setpoint.
28	5028	RCAS_OUT	-	--	Remote setpoint sent to a host computer, etc.
29	5029	UPDATE_EVT	-	-	Shows the contents of an update event upon occurrence.
30	5030	BLOCK_ALM	-	-	Shows the contents of a block alarm upon occurrence.

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A1.4 Parameters of DI Block

Relative Index	Index		Parameter Name	Default (factory setting)	Write	Description
	DI1	DI2				
0	6000	6100	BLOCK HEADER		Block tag = O/S	Information about this block, including the block tag, DD revision, execution time
1	6001	6101	ST_REV	0	–	Incremented when a change is made to the parameter settings for the DI block to indicate the revision level of the settings, and used to see whether there is a change in parameter settings.
2	6002	6102	TAG_DESC	Spaces		Universal parameter storing the description of the tag
3	6003	6103	STRATEGY	0		Universal parameter used by an upper-level system to classify the function blocks.
4	6004	6104	ALERT_KEY	0		Universal parameter used as a key to identify the point from which an alert is issued; normally used by an upper-level system to select alerts to provide to a particular operator who covers a specific area of the plant.
5	6005	6105	MODE_BLK	O/S		Universal parameter that indicates the block operation conditions and is composed of actual mode, target mode, permitted modes, and normal mode.
6	6006	6106	BLOCK_ERR	–	–	Indicates the error statuses related to the block itself.
7	6007	6107	PV_D	–	–	Indicates the primary discrete value (or the corresponding process value) used to execute the specified actions, and the status of that value.
8	6008	6108	OUT_D	–	Man	Indicates the output value and its status.
9	6009	6109	SIMULATE_D	disable	–	Used to determine whether to use the limit switch signal input from the transducer block or use the user-set value. When this parameter is set to disable, the block uses the actual input value and status.
10	6010	6110	XD_STATE	0		Index to the text describing the states of the discrete value obtained from the transducer, but not supported by FVP110.
11	6011	6111	OUT_STATE	0		Index to the text describing the states of a discrete output, but not supported by FVP110.
12	6012	6112	GRANT_DENY	0		Used to check whether various user operations can be put into effective. Before operations, in the GRANT parameter component, set the bits (to 1) corresponding to the intended operations. After the operations, check the DENY parameter component. If the corresponding bits are not set (to 1) in DENY, it proves that the corresponding operation has been put into effective.
13	6013	6113	IO_OPTS	0	O/S	Settings for the I/O processing of the block
14	6014	6114	STATUS_OPTS	0	O/S	Defines block actions depending on block status conditions.
15	6015	6115	CHANNEL	2 or 3	O/S	Defines the channel number of the hardware channel connected to the transducer block. Always set 2 for the DI1 block and 3 for DI2 in a FVP110.
16	6016	6116	PV_FTIME	0 second		Time constant of filter for PV_D.
17	6017	6117	FIELD_VAL_D	–	–	Status of limit switch signal obtained from the transducer block
18	6018	6118	UPDATE_EVT	–	–	Shows the contents of an update event upon occurrence.
19	6019	6119	BLOCK_ALM	–	–	Shows the contents of a block alarm upon occurrence.
20	6020	6120	ALARM_SUM	enable		Shows the alarm summary (current alarm statuses, acknowledged/unacknowledged states, masking states) for the DI block.
21	6021	6121	ACK_OPTION	unack		Defines the priority of WRITE_ALM as well as allows for notification to be disabled and makes acknowledgement unnecessary for WRITE_ALM.
22	6022	6122	DISC_PRI	0	–	Priority order of discrete alarm
23	6023	6123	DISC_LIM	1		Input status of generating a discrete alarm
24	6024	6124	DISC_ALM	–		Status of discrete alarm

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A1.5 Parameters of PID Block (Optional)

Relative Index	Index	Parameter Name	Default (factory setting)	Write	Description
0	8000	BLOCK HEADER		Block tag = O/S	Information about this block, including the block tag, DD revision, execution time
1	8001	ST_REV	0	–	Incremented when a change is made to the parameter settings for the PID block to indicate the revision level of the settings, and used to see whether there is a change in parameter settings.
2	8002	TAG_DESC	Spaces		Universal parameter storing the description of the tag
3	8003	STRATEGY	0		Universal parameter used by an upper-level system to classify the function blocks.
4	8004	ALERT_KEY	0		Universal parameter used as a key to identify the point from which an alert is issued; normally used by an upper-level system to select alerts to provide to a particular operator who covers a specific area of the plant.
5	8005	MODE_BLK	O/S		Universal parameter that indicates the block operation conditions and is composed of actual mode, target mode, permitted modes, and normal mode.
6	8006	BLOCK_ERR	--	–	Indicates the error statuses related to the block itself.
7	8007	PV	--	–	Indicates the primary analog value (or the corresponding process value) used to execute the specified actions, and the status of that value.
8	8008	SP	–	Auto	Setpoint of the block
9	8009	OUT	–	Man	Value and status of output
10	8010	PV_SCALE	0-100%	O/S	Upper and lower scale limit values used for scaling of the input (IN) value.
11	8011	OUT_SCALE	0-100%	O/S	Upper and lower scale limit values used for scaling of the control output (OUT) value to the values in the engineering unit
12	8012	GRANT_DENY	0		Option to control access from the host computer and local control panel to tuning and alarm parameters
13	8013	CONTROL_OPTS	0x0000	O/S	Defines block actions depending on block status conditions.
14	8014	STATUS_OPTS	0x0000	O/S	Defines options for control actions of block.
15	8015	IN	0		Controlled-value input
16	8016	PV_FTIME	0		Time constant (in seconds) of the first-order lag filter applied to IN
17	8017	BYPASS	1	Man	Determines whether to bypass control computation. 1 = off; do not bypass. 2 = on; bypass.
18	8018	CAS_IN	0		Cascade setpoint
19	8019	SP_RATE_DN	+INF		Rate-of-decrease limit for setpoint (SP)
20	8020	SP_RATE_UP	+INF		Rate-of-increase limit for setpoint (SP)
21	8021	SP_HI_LIM	100		Upper limit for setpoint (SP)
22	8022	SP_LO_LIM	0		Lower limit for setpoint (SP)
23	8023	GAIN	1		Proportional gain (= 100 / proportional band)
24	8024	RESET	10		Integration time (seconds)
25	8025	BAL_TIME	0		Unused
26	8026	RATE	0		Derivative time (seconds)
27	8027	BKCAL_IN	0		Readback of control output
28	8028	OUT_HI_LIM	100		Upper limit for control output (OUT)
29	8029	OUT_LO_LIM	0		Lower limit for control output (OUT)
30	8030	BKCAL_HYS	0		Hysteresis for release from a limit for OUT status
31	8031	BKCAL_OUT	–	–	Read-back value to be sent to the BKCAL_IN of the downstream block
32	8032	RCAS_IN	0		Remote setpoint set from the host computer.

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Appendix 1. FUNCTION BLOCK PARAMETERS

Relative Index	Index	Parameter Name	Default (factory setting)	Write	Description
33	8033	ROUT_IN	-		Remote control output value set from a computer, etc.
34	8034	SHED_OPT	1		Defines the mode shedding actions, namely, the changes to be made to MODE_BLK.target and MODE_BLK.actual when (1) the value of RCAS_IN.status becomes Bad if MODE_BLK.actual = RCAS, or when (2) the value of ROUT_IN.status becomes Bad if MODE_BLK.actual = ROUT.
35	8035	RCAS_OUT	-	-	Remote setpoint sent to a host computer, etc.
36	8036	ROUT_OUT	-	-	Remote control output value
37	8037	TRK_SCALE	0-100%	Man	Upper and lower scale limits used to convert the output tracking value (TRK_VAL) to non-dimensional.
38	8038	TRK_IN_D			Switch for output tracking
39	8039	TRK_VAL			Output tracking value. When MODE_BLK.actual = LO, the value scaled from the TRK_VAL value is set in OUT.
40	8010	FF_VAL			Feed-forward input value. The FF_VAL value is scaled to a value with the same scale as for OUT, multiplied by the FF_GAIN value, and then added to the output of the PID computation.
41	8041	FF_SCALE	0-100%	Man	Scale limits used for converting the FF_VAL value to a non-dimensional value
42	8042	FF_GAIN	0	Man	Gain for FF_VAL
43	8043	UPDATE_EVT	-	-	Shows the contents of an update event upon occurrence.
44	8044	BLOCK_ALM	-	-	Shows the contents of a block alarm upon occurrence.
45	8045	ALARM_SUM	Enable		Shows the alarm summary (current alarm statuses, acknowledged/unacknowledged states, masking states)
46	8046	ACK_OPTION	0		Selects whether or not the alarms related to the DI block are automatically self-acknowledged.
47	8047	ALARM_HYS	0.5%		Hysteresis for alarm detection and resetting to prevent each alarm from occurring and recovering repeatedly within a short time
48	8048	HI_HI_PRI	0		Priority order of HI_HI_ALM alarm
49	8049	HI_HI_LIM	+INF		Setting for HI_HI_ALM alarm
50	8050	HI_PRI	0		Priority order of HI_ALM alarm
51	8051	HI_LIM	+INF		Setting for HI_ALM alarm
52	8052	LO_LO_PRI	0		Priority order of LO_ALM alarm
53	8053	LO_LO_LIM	+INF		Setting for LO_ALM alarm
54	8054	LO_PRI	0		Priority order of LO_LO_ALM alarm
55	8055	LO_LIM	+INF		Setting for LO_LO_ALM alarm
56	8056	DV_HI_PRI	0		Priority order of DV_HI_ALM alarm
57	8057	DV_HI_LIM	+INF		Setting for DV_HI_ALM alarm
58	8058	DV_LO_PRI	0		Priority order of DV_LO_ALM alarm
59	8059	DV_LO_LIM	+INF		Setting for DV_LO_ALM alarm
60	8060	HI_HI_ALM	-	-	Alarm that is generated when the PV value has exceeded the HI_HI_LIM value and whose priority order* is defined in HI_HI_PRI. * Priority order: Only one alarm is generated at a time. When two or more alarms occur at the same time, the alarm having the highest priority order is generated. When the PV value has decreased below [HI_HI_LIM - ALM_HYS], HI_HI_ALM is reset.
61	87061	HI_ALM	-	-	As above
62	8062	LO_LO_ALM	-	-	As above. Reset when the PV value has increased above [LO_LO_LIM + ALM_HYS].
63	8063	LO_ALM	-	-	As above
64	8064	DV_HI_ALM	-	-	An alarm that is generated when the value of [PV - SP] has exceeded the DV_HI_LIM value. Other features are the same as HI_HI_ALM.
65	8065	DV_LO_ALM	-	-	Alarm that is generated when the value of [PV - SP] has decreased below the DV_LO_LIM value. Other features are the same as LO_LO_ALM.

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A1.6 IO_OPTS - Availability of Options for Each Block

Bit	Contents	DI	AO
0	Invert	X	
1	SP tracks PV if Man		X
2	Reserved		
3	SP tracks PV if LO		X
4	SP tracks RCas or Cas if LO or Man		X
5	Increase to close		X
6	Faultstate Type		X
7	Faultstate Type		X
8	Target to Man		X
9	PV for BKCaL_Out		X
10	Reserved		

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A1.7 STATUS_OPTS - Availability of Options for Each Block

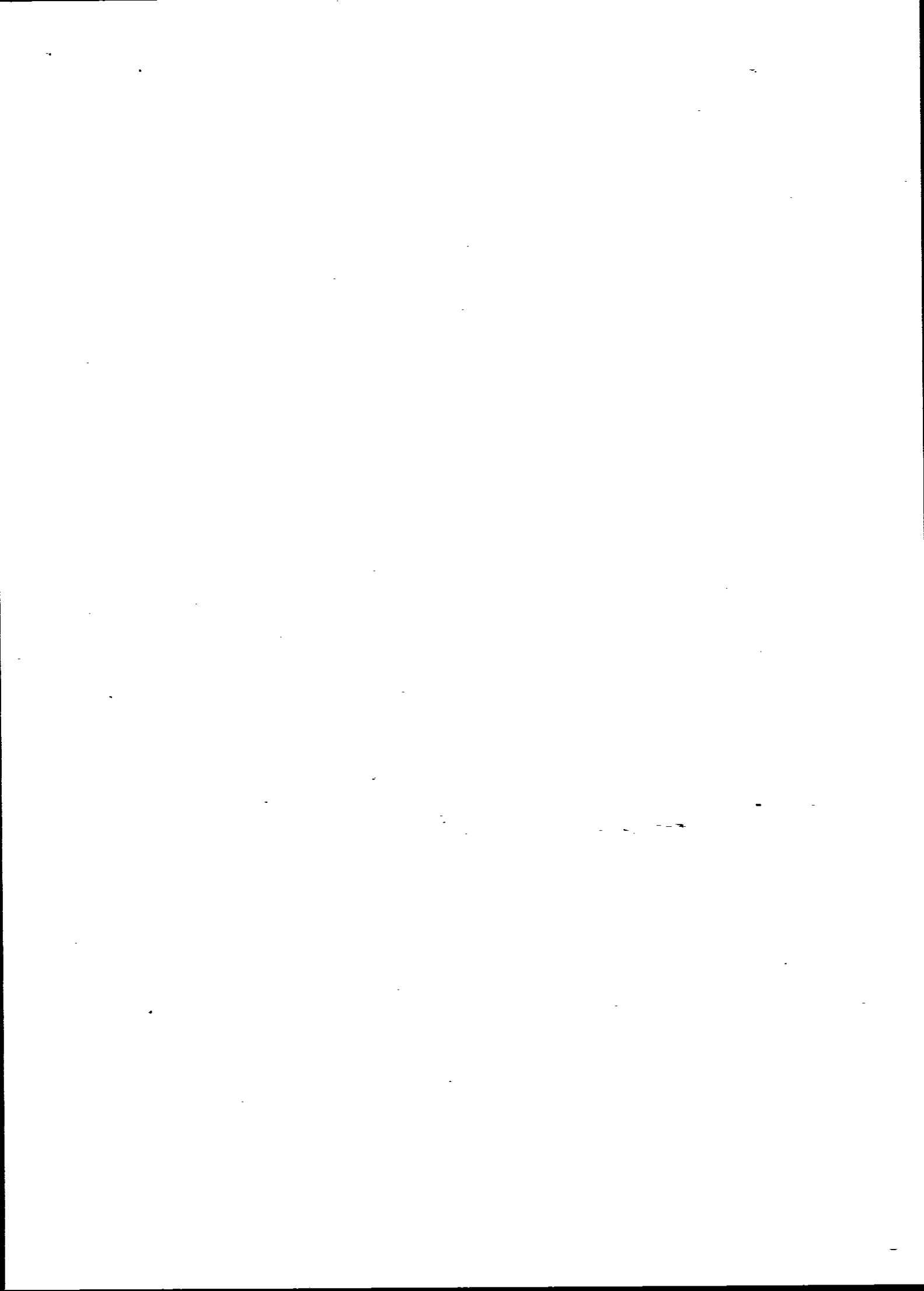
Bit	Contents	DI	AO	PID
0	IFS if BAD IN			X
1	IFS if BAD CAS_IN			X
2	Use Uncertain as Good			X
3	Propagate Fault Forward	X		
4	Propagate Fault Backward		X	
5	Target to Manual if BAD IN			X
6	Uncertain if Limited			
7	BAD if Limited			
8	Uncertain if Man mode	X		
9	Target to next permitted mode if Bad CAS_IN			X

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A1.8 CONTROL_OPTS - Availability of Options for Each Block

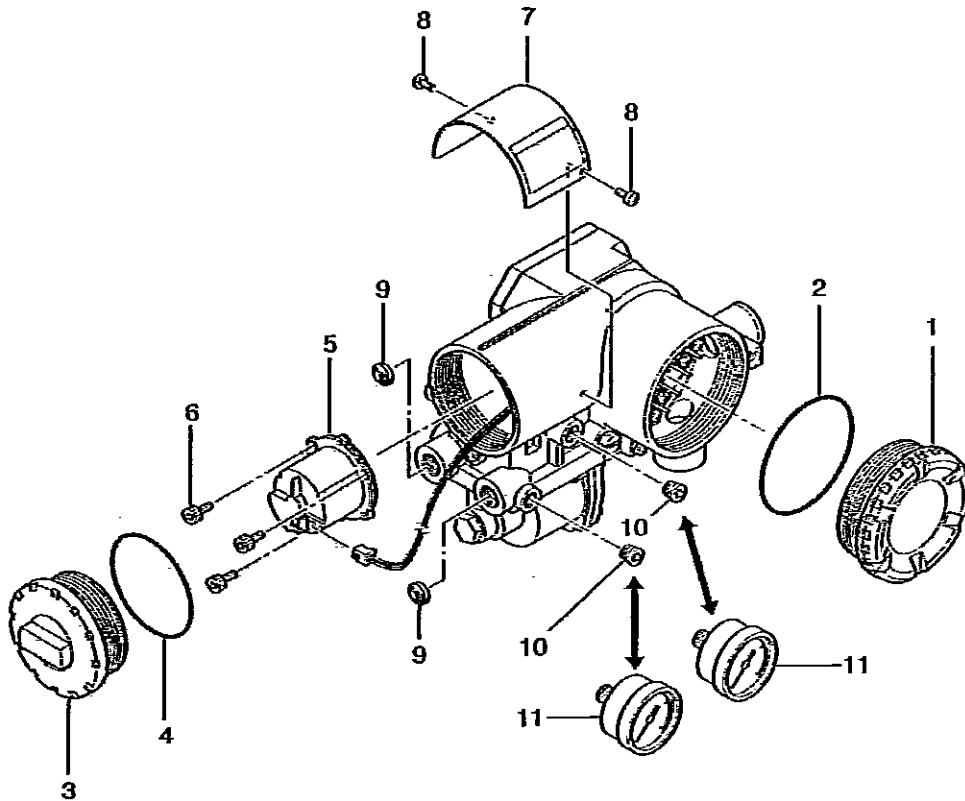
Bit	Contents	PID
0	Bypass Enable	X
1	SP-PV Track in Man	X
2	SP-PV Track in ROut	X
3	SP-PV Track in LO or IMan	X
4	SP Track retained target	X
5	Direct Acting	X
6	Reserved	
7	Track Enable	X
8	Track in Manual	X
9	Use PV for BKCAL_OUT	X
10	Act on IR	
11	Use BKCAL_OUT with IN_1	
12	Obey SP limits if Cas or RCas	X
13	No OUT limits in Manual	X
14	Reserved	
15	Reserved	

TA010A.EPS



Customer
Maintenance
Parts List

FVP110
Advanced Valve Positioner



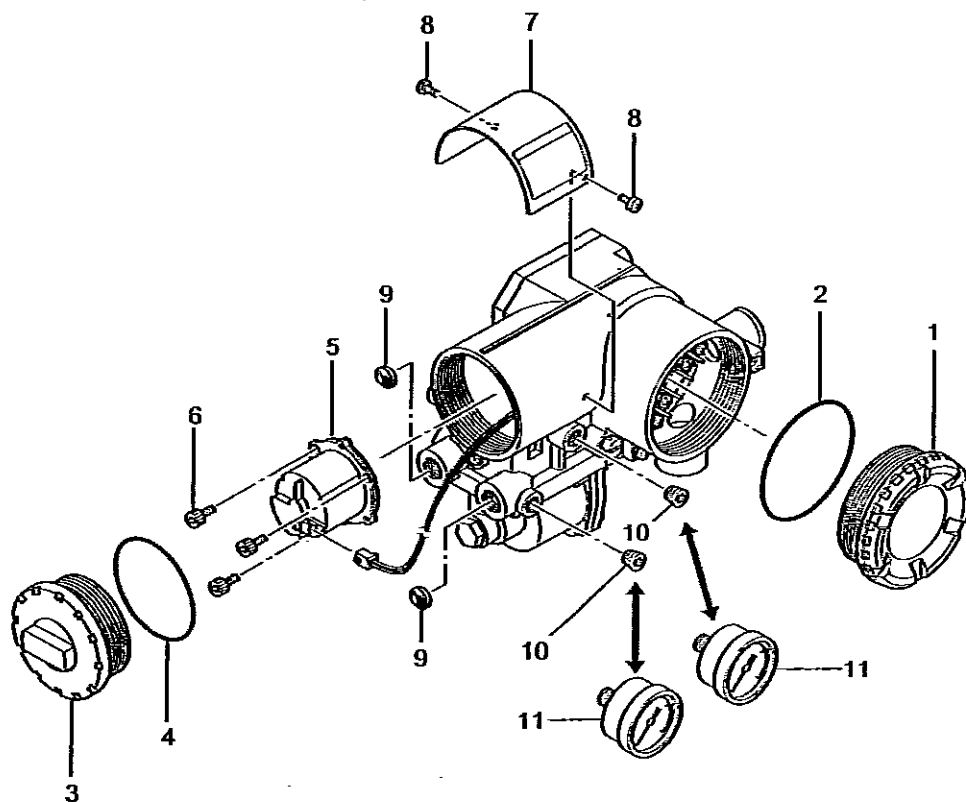
Item	Part No.	Qty	Description
1	F9341RA	1	Cover
2	F9341JP	1	O-Ring
3		1	IP Cover
4		1	O-Ring
5		1	IP Assembly
6		3	Bolt Hex. Socket
7		1	Name Plate
8	F9300AG	2	Screw
9	U0103FP	3	Screen
10	Bellow	2	Plug
	G9612EJ		For Connection code 1, 5, and 6
	G9612EL		For Connection code 3
11	See Table 1	2	Pressure Gauge

Table 1. Pressure Gauge Part Number (item 11).

Applicable Actuator code	Connection code	Optional code			
		/GP	/GM	/GB	/GE
1 (Single Acting Actuator)	1, 5, and 6	G9615ED	G9615AR	G9615EF	
	3				G9615EE

Customer Maintenance Parts List

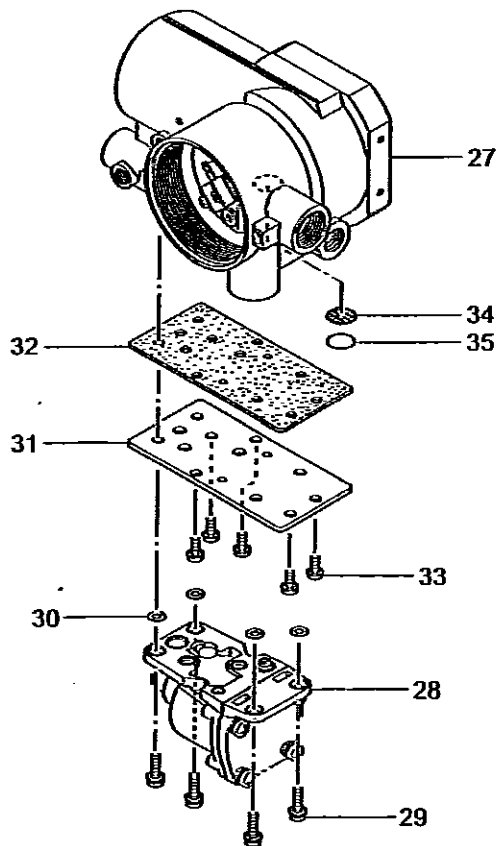
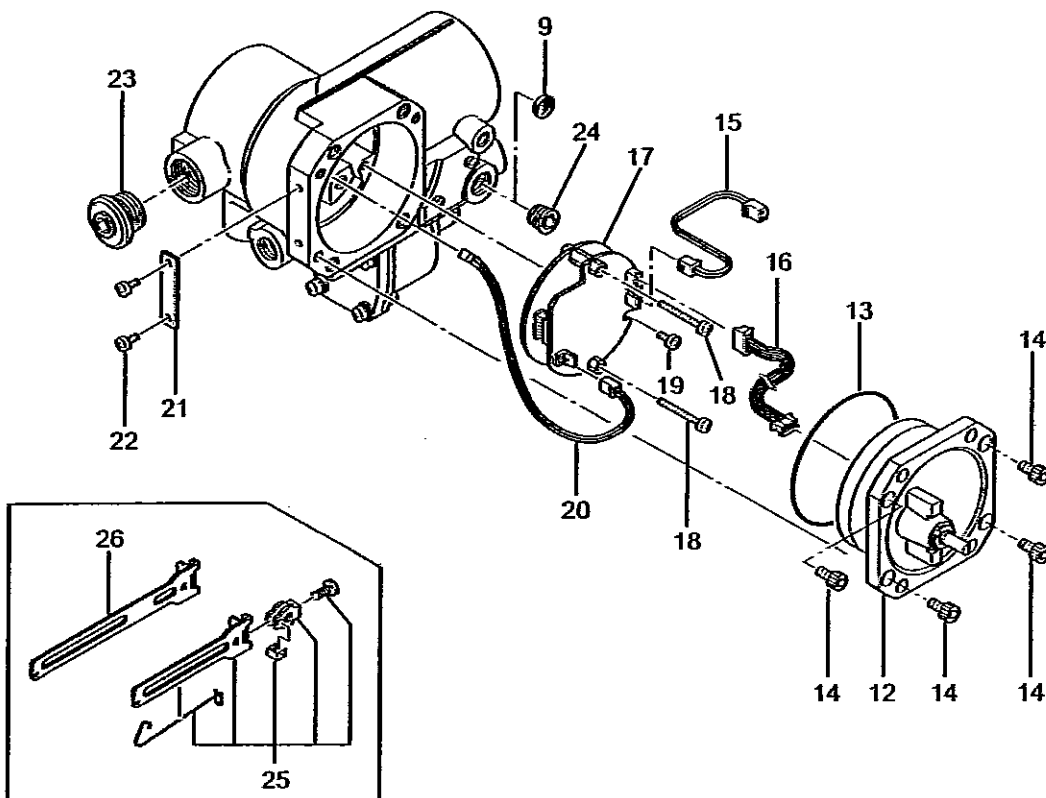
FVP110 Advanced Valve Positioner



Item	Part No.	Qty	Description
1	F9341RA	1	Cover
2	F9341JP	1	O-Ring
3	—	1	IP Cover
4	—	1	O-Ring
5	—	1	IP Assembly
6	—	3	Bolt Hex. Socket
7	—	1	Name Plate
8	F9300AG	2	Screw
9	U0103FP	3	Screen
10	Bellow	2	Plug
	G9612EJ		For Connection code 1, 5, and 6
	G9612EL		For Connection code 3
11	See Table 1	2	Pressure Gauge

Table 1. Pressure Gauge Part Number (item 11).

Applicable Actuator code	Connection code	Optional code			
		IGP	IGM	IGB	IGE
1 (Single Acting Actuator)	1, 5, and 6	G9615ED	G9615AR	G9615EF	—
	3	—	—	—	G9615EE



Item	Part No.	Qty	Description
12	—	1	Position Sensor Assembly
13	—	1	O-Ring
14	—	1	Bolt Hex. Socket
15	—	4	Connector Assembly
16	—	1	Connector Assembly
17	—	1	Amplifier Assembly
18	—	2	Screw Machine
19	—	1	Screw Machine
20	—	1	Connector Assembly
21	F9165DF	1	Tag Plate
22	F9300AG	2	Screw
23	Bellow G9330DP G9612EB F9340NW	1	Plug G 1/2 1/2 NPT Pg13.5
24	F9340NX Bellow G9612EK G9612EM	1	M20 Plug R 1/4 1/4 NPT
25	F9176HA	1	Lever Assembly
26	F9176HC	1	Lever
27	—	1	Case Assembly
28	F9177HA	1	Pilot Relay(Control Relay) Assembly
29	Y9414JY	4	Screw
30	F9177GZ	4	Washer
31	F9176GA	1	Plate
32	F9176GB	1	Gasket
33	G9307MQ	5	Screw M4x8
34	F9176GC	1	Filter
35	F9176JZ	1	O-Ring

REVISION RECORD

Title: Model FVP110 Advanced Valve Positioner
Manual No.: EW3003

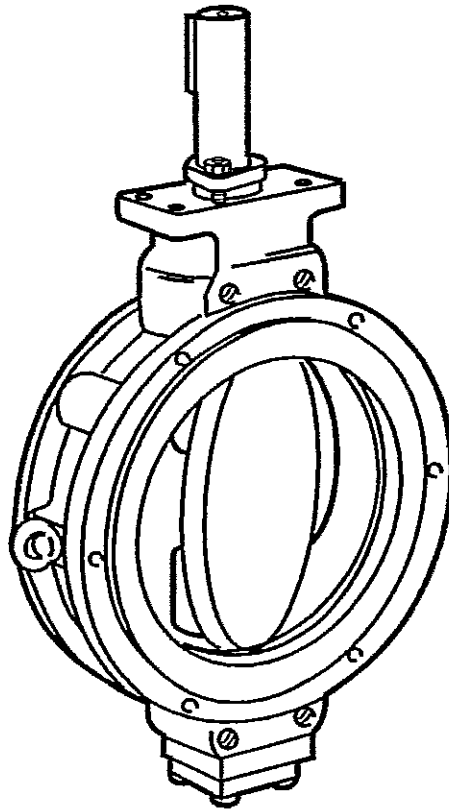
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EW3003

16

**NELDISC
Metal seated butterfly valves
Series L1 and L2**



NELDISC®
Metal seated
butterfly valves
Series L1 and L2

Installation, Maintenance and
Operating Instructions
2 L1 71 en
Issue 5/02

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READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.
If you require additional assistance, please contact the manufacturer or manufacturer's representative.
Addresses and phone numbers are printed on the back cover.

SAVE THESE INSTRUCTIONS!

Subject to change without notice.

All trademarks are property of their respective owners.

1 GENERAL

1.1 Scope of the manual

This installation, operation and maintenance manual provides essential information on L1 and L2 series Neldisc® butterfly valves. The actuators and instrumentation to be used with L1 and L2 series valves are also discussed briefly. Refer to the separate actuator and control equipment instruction manuals for further information.

NOTE:

Selection and use of the valve in a specific application requires close consideration of detailed aspects. Due to the nature of the product, this manual cannot cover all the individual situations that may occur when installing, using or servicing the valve.

If you are uncertain about the use of the valve or its suitability for your intended use, please contact Metso Automation for more information.

1.2 Valve description

Neldisc series L1 is a wafer type and series L2 a lug type metal seated butterfly valve.

The disc is elliptical and has a double eccentric mounting. When the valve is closed, the elliptical disc at the major axis displaces the seat ring outward, causing the seat ring to contact the disc at the minor axis. When the valve is opened, the contact is released and the seat ring returns to its original circular shape (see Fig. 1).

The disc is fitted to the shafts with pins and there are no holes through the disc.

Construction details of individual valves are included in the type code shown on the valve identification plate. To interpret the type code, please refer to Section 11.

The valve operates both in control and shut-off applications.

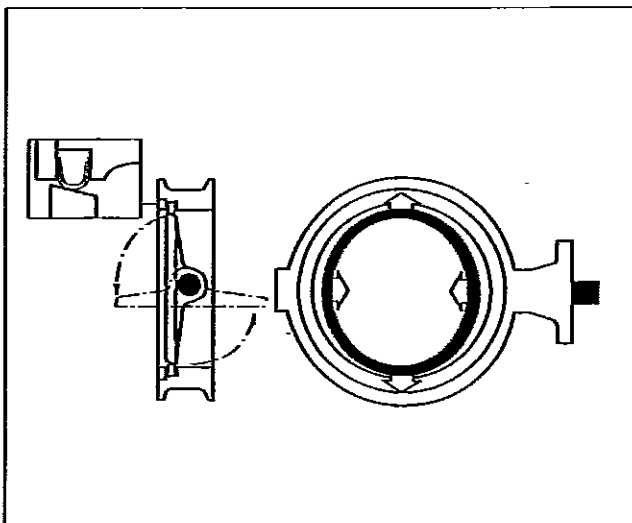


Fig. 1. Construction of a butterfly valve

1.3 Valve markings

Body markings are cast on the body. The valve also has an identification plate attached to it (see Fig. 2).

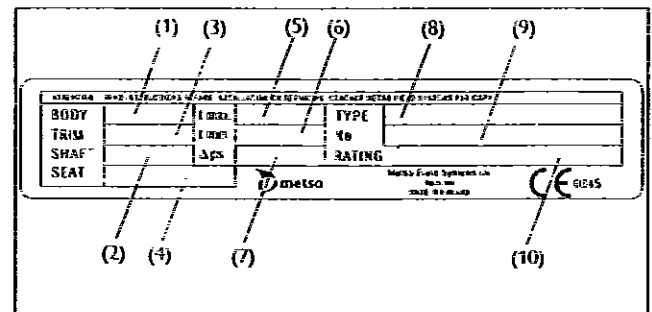


Fig. 2. Identification plate

Identification plate marking:

1. Body material
2. Shaft material
3. Trim material
4. Seat material
5. Maximum operating temperature
6. Minimum operating temperature
7. Maximum shut-off pressure differential
8. Type designation
9. Valve manufacturing parts list no.
10. Pressure class

1.4 Technical specifications

Type:	Full bore, metal seated butterfly valve	
Pressure class:		
Body:	L1C, L2C	ANSI 150/DIN PN 25
	L1D, L2D	ANSI 300/DIN PN40
Trim:	L1C, L2C	ANSI 150
	L1D, L2D	ANSI 300
Temperature range:	-200 °C .. +600 °C (for ambient temperatures > 600 °C, please contact the manufacturer)	
Flow direction:	Free	
Dimensions:	See p. 19-23	
Weights:	See p. 19-23	

1.5 Valve approvals

The valve meets the requirements of BS 6755, Part 2: 1987 and API 607, Third Edition, November 1985 on fire safety.

Valve with codes T or G are TA-Luft approved.

1.6 CE marking

The valve meets the requirements of the European Directive 97/23/EC relating to pressure equipment, and has been marked according to the Directive.

1.7 Recycling and disposal of a rejected valve

Most valve parts can be recycled if sorted according to material. Most parts have material marking. A material list is supplied with the valve. In addition, separate recycling and disposal instructions are available from the manufacturer. A valve can also be returned to the manufacturer for recycling and disposal against a fee.

1.8 Safety precautions

CAUTION:

Do not exceed the valve performance limitations!
Exceeding the limitations marked on the valve may cause damage and lead to uncontrolled pressure release.
Damage or personal injury may result.

CAUTION:

Do not dismantle the valve or remove it from the pipeline while the valve is pressurized!
Dismantling or removing a pressurized valve will result in uncontrolled pressure release. Always isolate the relevant part of the pipeline, release the pressure from the valve and remove the medium before dismantling the valve.
Be aware of the type of medium involved. Protect people and the environment from any harmful or poisonous substances. Make sure that no medium can enter the pipeline during valve maintenance.
Failure to do this may result in damage or personal injury.

CAUTION:

Beware of the discs cutting movement!
Keep hands, other parts of the body, tools and other objects out of the open flow port. Leave no foreign objects inside the pipeline.
When the valve is actuated, the disc functions as a cutting device. The position of the disc can also be changed when moving the valve.
Close and detach the actuator pressure supply pipeline for valve maintenance.
Failure to do this may result in damage or personal injury.

CAUTION:

Beware of noise emissions!
The valve may produce noise in the pipeline. The noise level depends on the application. It can be measured or calculated using Metso Automation Nelprof computer program. Observe the relevant work environment regulations on noise emission.

CAUTION:

Beware of a very cold or hot valve!
The valve body may be very cold or very hot during use. Protect yourself against cold injuries or burns.

CAUTION:

When handling the valve or the valve package, bear in mind its weight!
Never lift the valve or valve package by the actuator, positioner, limit switch or their piping.
Valve sizes DN 350 and over are equipped with a lifting eye bolt. Place the lifting ropes securely around the valve body (see Fig. 3).
Damage or personal injury may result from falling parts.

NOTE:

Do not turn the disc more than 90° as this could damage the seat. The valve is so constructed that the disc operates only between 0-90°.

2 TRANSPORTATION, RECEPTION AND STORAGE

Check the valve and the accompanying devices for any damage that may have occurred during transport.

Store the valve carefully before installation, preferably indoors in a dry place.

Do not take the valve to the intended location and do not remove the flow port protectors until the valve is installed.

The valve is delivered in the closed position. A valve equipped with a spring-return actuator is delivered in a position determined by the spring. During storage the valve must be lightly closed.

3 INSTALLATION

3.1 General

Remove the flow port protectors and check that the valve is undamaged and clean inside.

CAUTION:

When handling the valve or the valve package, bear in mind its weight!
Follow the lifting methods shown in Fig. 3.

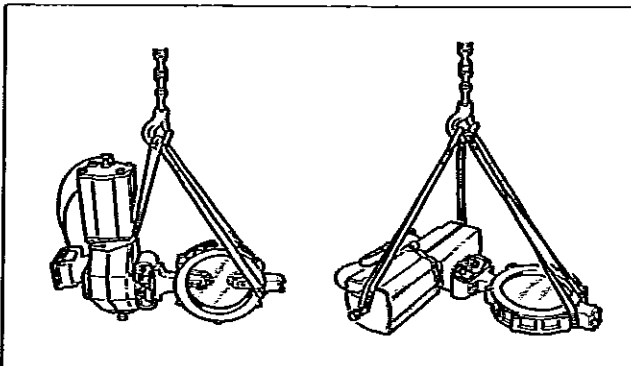


Fig. 3. Lifting of the valve

3.2 Mounting into the pipeline

Flush or blow the pipeline carefully before installing the valve. Foreign particles, such as sand or pieces of welding electrode, will damage the disc sealing surface and seat.

The valve may be installed in any position and offers tightness in both directions.

Install the valve in the pipeline so that the shaft is horizontal, if possible. However, we do not recommend installing the valve with the actuator on the underside because dirt in the pipeline may then enter the body cavity and damage the gland packing.

If the valve is equipped with a flow balancing trim (type code S-...), it must be on the downstream side of the valve body. The valve must be mounted so that the perforated plate will not collect any impurities in the pipeline (see Fig. 4).

Select flange gaskets according to the operating conditions.

Do not attempt to correct pipeline misalignment by means of flange bolting.

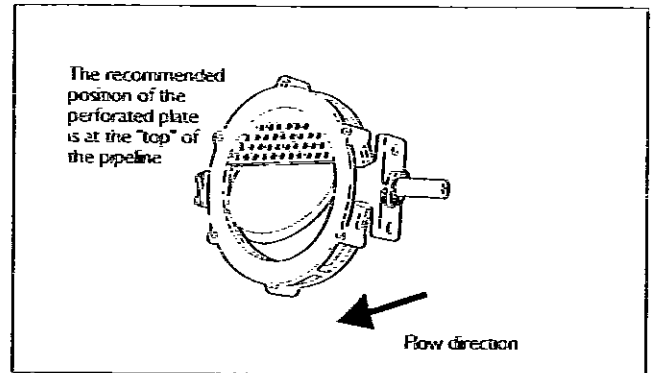


Fig. 4. Position of the flow balancing trim

It may be necessary to firmly support the pipeline to protect the valve from excess stress. Sufficient support will also reduce pipeline vibration and this ensures proper functioning of the positioner. Do not fasten supports to the flange bolting or to the actuator.

It is recommended that the length of any straight pipe preceding the control valve is at least $2 \times$ pipe diameter.

The flow causes a so-called dynamic torque against the valve disc which attempts to close the valve. In a pipe elbow the pressure on the outer edge is higher than on the inner edge.

When installing the butterfly valve immediately after a pipe elbow, the valve shaft must be directed toward the centre point of the pipe (see Fig. 5). This is especially important when the butterfly valve is used as a control valve.

The valve shaft of a butterfly valve mounted after the centrifugal pump must be perpendicular to the pump shaft (see Fig. 6).

When thus installed, the valve discs will be more evenly loaded and vibrations otherwise possible in the intermediate positions will be eliminated.

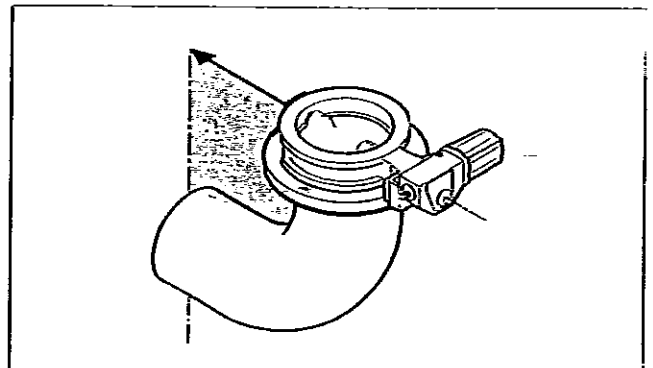


Fig. 5. Mounting after a pipe elbow

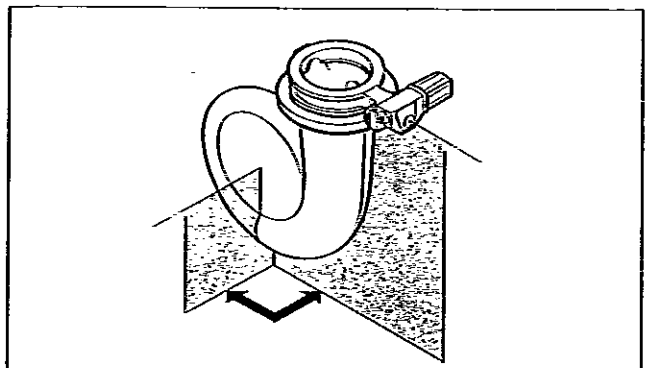


Fig. 6. Mounting after the centrifugal pump

When mounting the valve it must be in a closed position and be carefully centred between the pipe flanges so that the turning disc does not touch the pipe edge or flange gaskets.

In valves with certain nominal sizes some flange bolts do not pass the valve body. The valve body is thus equipped with grooves, holes or threads (see Section 3.2.1).

Ensure that the disc can turn to the open position after preliminary tightening of the flange bolts. The actuators of control valves are usually equipped with position stops which usually only allow the disc to open 80°.

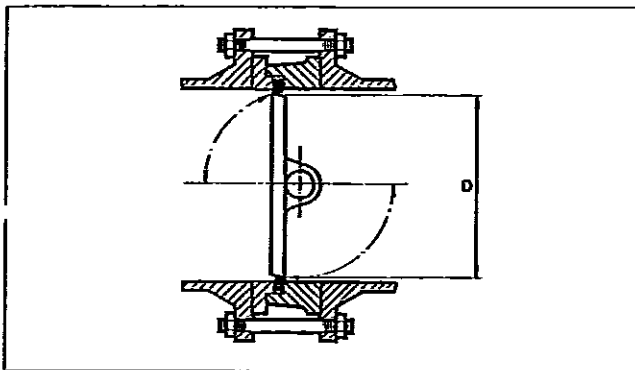


Fig. 7. Mounting dimensions

Table 1. Mounting dimensions (mm)

Valve size	D	
	L1CM	L1DM
03	68	68
04	89	89
05	115	115
06	142	136
08	190	188
10	242	227
12	288	281
14	327	317
16	374	352
18	422	400
20	464	443
24	565	536
28	665	
30	716	
32	762	
36	870	
40	960	

3.2.1 Mounting options

- X Flange bolts pass the neck of the body
- UH Unthreaded holes at the neck of the body
- SB Stud bolts at the neck of the body
- BH Stud bolts at the neck of the body and fraised holes on the body and flange ring
- FH Unthreaded holes at the neck of the body and fraised holes on the body and flange ring
- XF Flange bolts pass the neck of the body and fraise holes on the body and flange ring
- HM Fraised holes on the neck of the body for flange bolts
- Flange drilling not suitable

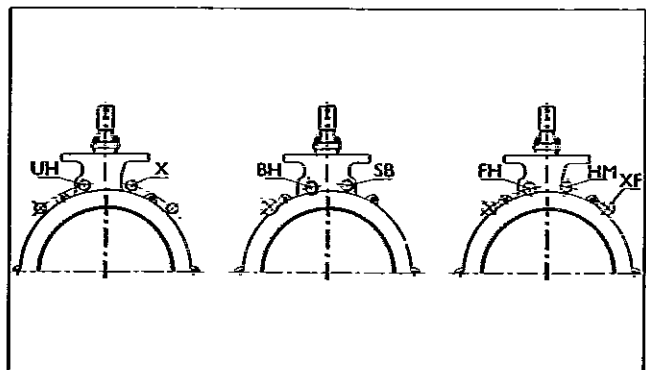


Fig. 8. Mounting options

Table 2. Mounting options

Valve type	ANSI 150	ANSI 300	PN 10	PN 16	PN 25	PN 40	Valve type	ANSI 300	PN 25	PN 40
L1C03	X	X	X	X	X	X	L1D03	X	X	X
L1C04	X	X	X	X	X	X	L1D04	X	X	X
L1C05	X	X	X	X	X	X	L1D05	X	X	X
L1C06	X	X	X	X	X	X	L1D06	X	XF	XF
L1C08	X	X	X	X	X	X	L1D08	UH	FH	FH
L1C10	X	—	X	X	X	—	L1D10	SB	FH	UH
L1C12	X	HM	X	X	HM	HM	L1D12	SB	BH	SB
L1C14	UH	—	UH	UH	UH	—	L1D14	SB	BH	SB
L1C16	UH	—	UH	UH	UH	—	L1D16	SB	BH	SB
L1C18	UH	—	SB	SB	SB	—	L1D18	SB	BH	SB
L1C20	SB	SB	SB	SB	SB	—	L1D20	SB	BH	SB
L1C24	SB	SB	SB	SB	SB	—	L1D24	SB	BH	SB
L1C28	SB	SB	SB	SB	SB	SB	L1D28	SB	BH	SB
L1C30	SB	SB	—	—	—	—	L1D30	SB	—	—
L1C32	SB	SB	SB	SB	SB	SB	L1D36	SB	—	BH
L1C36	SB	SB	SB	SB	SB	SB				
L1C40	SB	SB	SB	SB	SB	SB				
L1C40/42	SB*	SB*	—	—	—	—				

*) L1C40 can also be drilled acc. to MSS SP-44 42" drilling.

Table 3. Stud bolt dimensions (mm), mounting options SB, BH

Valve type	A	ANSI 150					ANSI 300					DIN PN 10					DIN PN 16					DIN PN 25					
		R	L	L ₁	L ₂	S	R	L	L ₁	L ₂	S	R	L	L ₁	L ₂	S	R	L	L ₁	L ₂	S	R	L	L ₁	L ₂	S	
L1C18												M24	125	107	85	16	M27	150	132	110	16	M33	180	122	100		
L1C20	167	1 1/8-8UN	140	114	93	24	1 1/4-8UN	150	132	111	16	M24	125	99	79	24	M30	140	114	93	24	M33	140	114	94		
L1C24	154	1 1/4-8UN	150	119	95	28	1 1/2-8UN	180	159	135	18	M27	150	119	95	28	M33	140	109	85	28	M36	170	139	115		
L1C28	229	1 1/4-8UN	170	130	97	32	1 5/8-8UN	220	180	145	32	M27	150	107	75	35	M33	160	117	85	35	M39	180	137	105		
L1C30	229	1 1/4-8UN	170	130	95	32	1 3/4-8UN	230	190	155	32																
L1C32	241	1 1/2-8UN	180	140	105	32	1 7/8-8UN	240	200	165	32	M30	180	137	102	35	M36	190	147	112	35	M45	190	147	112		
L1C36	241	1 1/2-8UN	180	145	110	32	2-8UN	240	200	165	32	M30	180	143	110	35	M36	190	153	120	35	M45	190	153	120		
L1C40	300	1 1/2-8UN	220	170	130	40	1 5/8-8UN	240	190	150	40	M33	190	140	100	40	M39	200	150	110	40	M52	210	160	120		
L1C40/42	300	1 1/2-8UN	220	170	130	40	1 5/8-8UN	240	190	150	40																

Valve type	A	ANSI 300					DIN PN 40					DIN PN 25															
		R	L	L ₁	L ₂	S	R	L	L ₁	L ₂	S	R	L	L ₁	L ₂	S											
L1D10	114	1-8UNC	150	122.5	121	24																					
L1D12	114	1 1/8-8UN	140	114	101	22	M30	140	114	101	22	M27	170	82	74	24											
L1D14	127	1 1/8-8UN	140	113	110	22	M33	140	105	103	30	M30	120	85	82	30											
L1D16	165	1 1/4-8UN	150	113	114	32	M36	170	125	126	40	M33	135	90	91	40											
L1D18	180	1 1/4-8UN	150	113	113	32	M36	170	129	129	36																
L1D20	200	1 1/4-8UN	150	104.5	106	38	M39	180	132.5	134	40	M33	140	92	112	40											
L1D24	240	1 1/2-8UN	180	125	125	45	M45	170	110	110	50	M36	160	100	100	50											
L1D28	250	1 1/2-8UN	180	135	135	42	M45	170	120	120	45	M39	160	110	110	42											
L1D30	300	1 3/4-8UN	200	145	145	45																					
L1D36	360	2-8UN	240	175	175	55	M52	200	135	135	55																

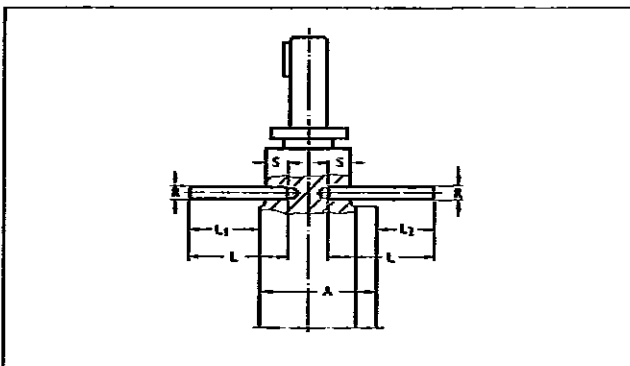


Fig. 9. Stud bolt mounting dimensions, mounting options SB, BH

3.3 Actuator

When installing the actuator on the valve, make sure that the valve package functions properly. See instructions for installing in Section 6.

Observe the space needed for removal of the actuator.

The upright position is recommended for the actuator cylinder.

The actuator must not touch the pipeline, because pipeline vibration may damage it or interfere with its operation.

In some cases, e.g. when a large-size actuator is used or when the pipeline vibrates heavily, supporting the actuator is recommended. Please contact Metso Automation for further information.

4 COMMISSIONING

Ensure that no dirt or foreign objects are left inside the valve or pipeline. Flush the pipeline carefully. Keep the valve 30-40° open during flushing.

When starting up the pump, ensure that the valve in the pipeline is closed or, at the very most, 20° open.

A waterhammer, which follows the start-up of high-capacity pumps, creates a torque peak in the disc. This can damage the pin connection between disc and shaft when the valve is 30-90° open.

The gland packing may leak after long storage. Tighten both nuts in the packing evenly until the leakage stops.

5 SERVICE

CAUTION:

Observe the safety precautions listed in Section 1.6 before starting work!

CAUTION:

For safety reasons the retaining plates **MUST** always be installed acc. to section 5.2.



5.1 General

Butterfly valves require no regular maintenance. However, check the packing regularly for tightness. If the valve should require maintenance for some reason, a few simple service measures are normally sufficient.

The numbers in parentheses refer to the parts list and the exploded view of the valve in Section 9.

NOTE:

If you send the valve to the manufacturer for repair, do not dismantle it. Clean the valve carefully, including the inside. For safety reasons, inform the manufacturer of the type of medium used in the valve.

NOTE:

Always use original spare parts to ensure that the valve functions as intended.

5.2 Removing the valve from the pipeline

CAUTION:

Do not dismantle the valve or remove it from the pipeline while the valve is pressurized!

It is generally most convenient to detach the actuator and its auxiliary devices (see Section 6), before removing the valve from the pipeline. If the valve package is small or difficult to access, it may be more practical to remove the entire package at the same time.

Ensure that the valve is not pressurized and the pipeline is empty. Ensure that the medium cannot flow into the section where servicing is to take place. The valve must be in a closed position when removing.

Support the valve carefully with a hoist. Place ropes carefully and unscrew the pipe flange bolts. Ensure that the ropes are positioned correctly (see Fig. 3). Lift valve correctly (see Fig. 3).

5.3 Replacing the gland packing

CAUTION:

Do not dismantle the valve or remove it from the pipeline while the valve is pressurized!

PTFE rings are used as a standard gland packing and graphite rings for high temperature constructions. Tightness is ensured by contact between the gland follower and the packing rings.

The gland packing (20) must be changed if leakage occurs even after the hex nuts (25) have been tightened.

The actuator need not be removed if the gland packing is made of PTFE. Remove the actuator if the gland packing is made of graphite.

- Make sure the valve is not pressurized.
- Unfasten the nuts (25) and remove the retaining plates (42) and the gland (9).
- Remove the five old packing rings (20). Do not damage the surfaces of the packing ring counterbore and shaft.
- Clean the gland packing and packing ring counterbore. Install five new gland packings one-by-one, pushing them into place with the gland.

The cutting points of the PTFE rings are mounted at a 90° angle between each ring.

Slip the graphite rings onto the shaft. Ensure that there are no burrs in the keyway groove which could damage the packing.

- Install the gland.
- Mount the retaining plates with the text UPSIDE on top (see Fig. 10).

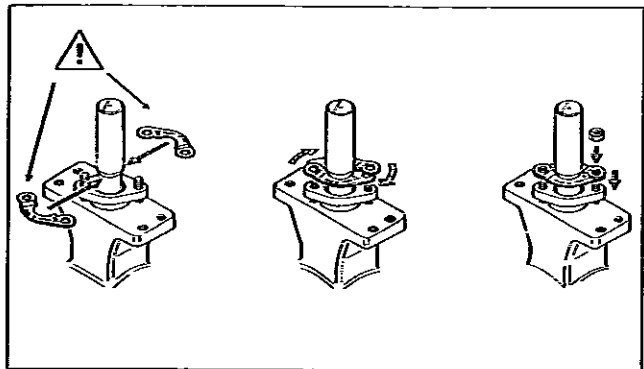


Fig. 10. Mounting the retaining plates

- Place the nuts on the studs and tighten the gland packings while the valve is not pressurized (see Table 4).
- Retighten if necessary.

Table 4. Gland packing nut tightening torques and margins

Shaft \varnothing	Thread	Torque, Nm	Min. tightening margin, mm
15-20	5/16 UNC	10	7
25-40	3/8 UNC	20	9
45-55	1/2 UNC	50	10
70-85	5/8 UNC	90	13
95-130	3/4 UNC	150	13
135-	7/8 UNC	240	24

5.4 Valve leakage

Valve leakage is not always caused by a damaged seat ring or disc. The reason can also be that the disc is not in the closed position.

- Check the position of the actuator relative to the valve. The screws may be loose or the bracket damaged.
- Check the adjustment in the closed position (see Section 6.4).

The marking line parallel to the disc on the valve shaft head shows roughly the closed position of the disc (see Fig. 12).

Pressure chocks can cause loosening of the pin connection between disc and shaft; consequently the shaft moves while the disc remains in place and this prevents full closing of the disc.

If the reason for the leakage does not become apparent after doing the above, the valve must be disassembled for replacing the parts.

5.5 Replacing the seat ring

CAUTION:

Do not dismantle the valve or remove it from the pipeline while the valve is pressurized!

- Ensure that the valve is not pressurized.
- Remove the valve from the pipeline. The valve must be in a closed position during removal. Follow the lifting methods shown in Section 3.
- Remove the clamp ring (2) by untightening the screws (27).
- Remove the old body seal (19) and the seat ring (4). Change the seat ring if it is damaged.
- Clean all the seating surfaces of the body and clamp ring. Check the surface of the seat ring.
- Check also the condition of the disc. A damaged disc must be changed (see Section 5.5).
- Check the condition of the pin connection. Repair it if necessary (see Section 5.5).

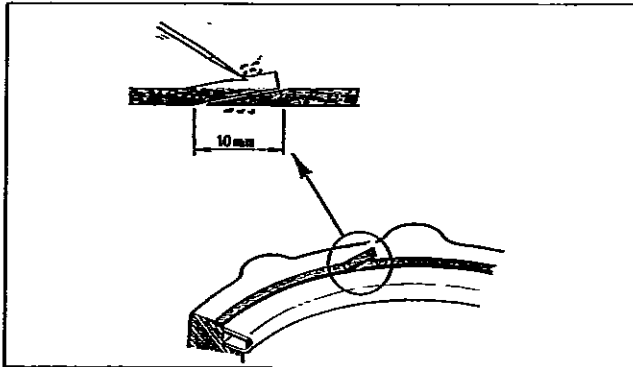


Fig. 11. Mounting the body seal

- Mount a new, self-adhesive body seal (19) into the body. The surface must be clean and free of grease. Handle the ends of the seal according to Fig. 11.
- Spray a thin layer of dry lubricating fluid, eg. Molykote 321R or equivalent, into the seat groove, surfaces of the clamp ring and seat ring.
- Centre the seat ring (4) carefully into its groove and turn the disc to maintain light contact with the seat.
- Mount the clamp ring and tighten the screws (27) lightly.
- Turn the disc slightly open and pull it back to set the seat into the proper position.
- Tighten the screws (27) evenly. An unevenly tightened flange may damage the seat ring. The screw heads must be below the flange surface.

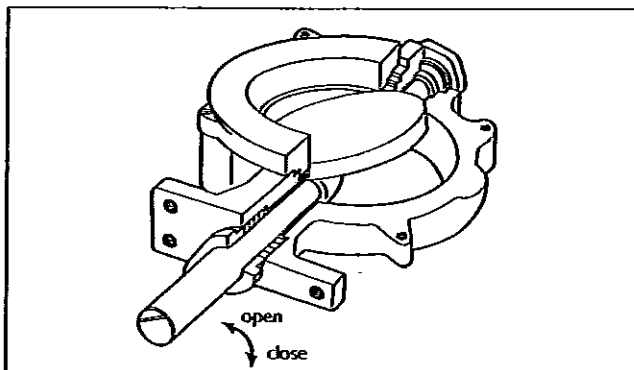


Fig. 12. The contact line between the disc and seat ring

- Check the position between the seat ring and the disc. The valve closes clockwise (see Fig. 12).
- Mount the actuator into the valve. Adjust the closed position limit and check the open position limit (see Section 6.4).

5.6 Replacing the disc, shafts and bearings

5.6.1 Disassembling the valve

The pin connection of the disc must be opened by drilling for changing the disc (3), shafts (11, 12) and bearings (15, 16).

- Remove the valve from the pipeline and the actuator from the valve.
- Remove the clamp ring (2) and seat ring (4) according to section 5.4.
- Set the valve horizontally on a sturdy surface so that the flat side of the disc lays against the surface, see fig. 13.

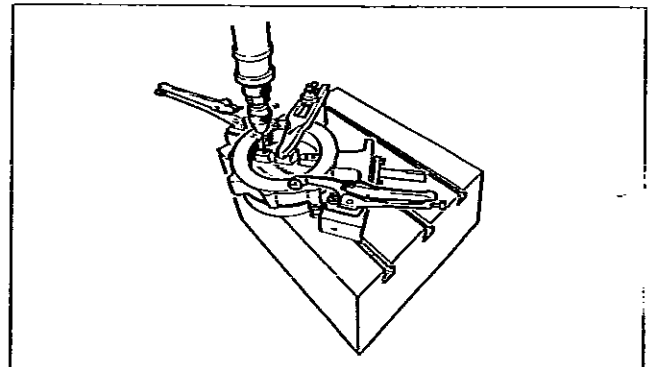


Fig. 13. Drilling the pins

- Drill the holes carefully to the centre of the pins (14). Choose a drill 0.2-0.5 mm smaller than the diameter of the pin.
- Drill the holes deep, but not enough to reach the disc.
- Pull the pins out.
- Dismantle the gland packing according to Section 5.2.
- Detach the screws (26) and the blind flange (10) and remove the gasket (18).
- Place rubber strips or other protection between the disc edge and the body and remove the shafts (see Fig. 14).
- Remove the bearings (15, 16).
- Clean and check all parts carefully.

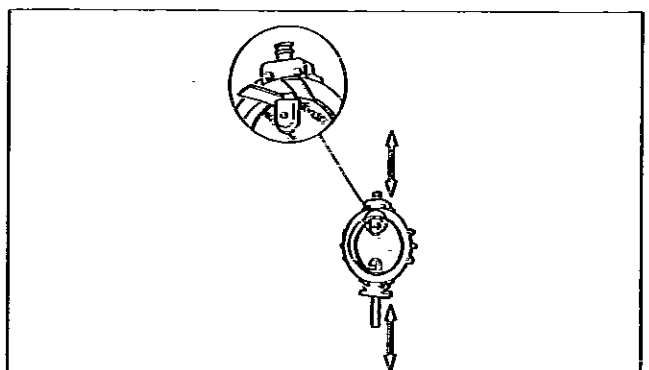


Fig. 14. Protecting the disc during disassembly and assembly

5.7 Assembling the valve

- Replace damaged parts with new ones.
- Set the disc and the shaft together beforehand. In case the pin holes have been damaged during removal of the old pins the holes can be drilled to a larger pin size. File off any burrs from the shafts.

The bearing material of the standard construction valves is PTFE-impregnated stainless steel net.

The bearings for the high temperature valves (H-construction) are cobalt alloy bushings which are mounted into the body together with the shafts.

- Mount the bearings into the body (see Fig. 15).

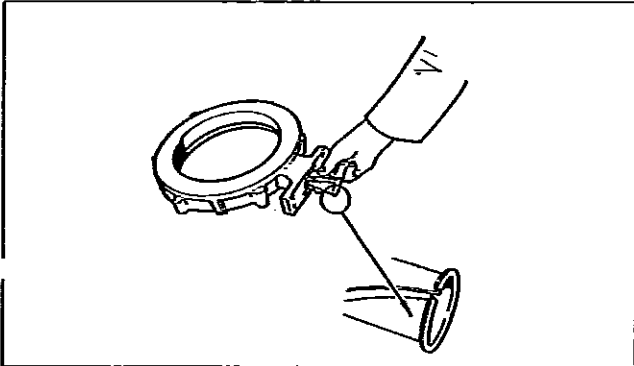


Fig. 15. Mounting the standard bearings

- H-construction:** Mount the bearing into the shaft. Spray a thin layer of dry lubricating fluid, e.g. Molykote 321R or equivalent, into the inside surface of the bushing and the shaft bearing groove. Press the bushing with a tightening ring into the shaft bearing groove and fit the shaft with the bearings carefully into the body through the tightening ring (see Fig. 16).

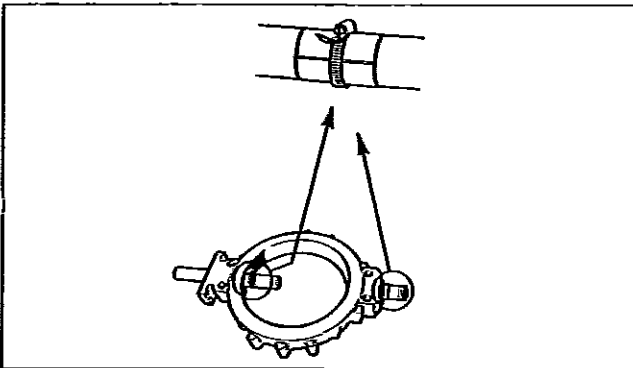


Fig. 16. Mounting the H-construction bearings

- Place the disc horizontally on a surface so that the flat side of the disc lays against the surface. Lift the body around the disc so that the shaft bores are aligned with the bores in the disc. Protect the disc (see Fig. 14).
- Press the shafts into the disc drillings. Align the pin holes. The shaft (11) position against the disc must be according to Fig. 12.

NOTE:

Use only pins supplied by the manufacturer!

NOTE:

The pins must be pressed with enough force to deform them so that the connection will be free from backlash.

- Support the disc well in a horizontal position during mounting of the pins. Push the new pins into the holes and press them in a press to final form (see Fig. 17). Use a smaller tool than the pin diameter. See Table 5 for force needed.

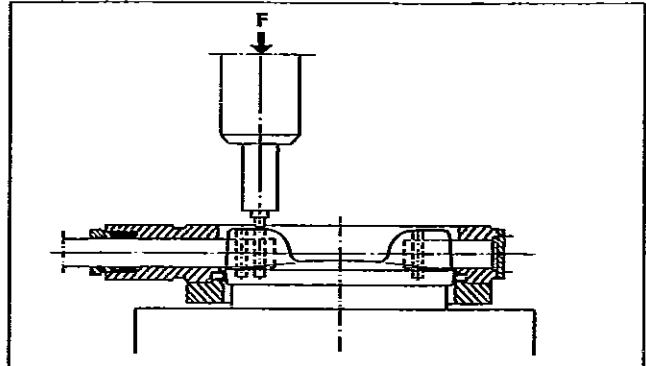


Fig. 17. Pressing the pins

Table 5. Pressing the pins, forces

Pin diameter, mm	Force, kN	Pin diameter, mm	Force, kN
5	45	20	500
6	60	25	780
8	80	30	1125
10	125	35	1500
12	180	40	2000
15	280	50	3150

- Install the gasket (18) and the blind flange (10). Screws of the blind flange must be tightened evenly. An unevenly tightened flange will damage the seat.
- Install the seat ring. See details in Section 5.4.
- Install the body seal (19) and the clamp ring (2). See details in Section 5.4.
- Install the gland packing (see Section 5.2).
- Check the contact line between the seat ring and the disc (see Fig. 12).

6 DETACHING AND MOUNTING THE ACTUATOR

6.1 General

CAUTION:

When handling the valve or the valve package, bear in mind its weight!

NOTE:

Do not turn the disc more than 90° as this could damage the seat. The valve is so constructed that the disc operates only between 0-90°.

6.2 Detaching the actuator

CAUTION:

The actuator cannot be removed from the valve when the pipeline is under pressure as a result of dynamic torque!

NOTE:

Before dismantling, carefully observe the position of the valve with respect to the actuator and positioner/limit switch so as to ensure that the package can be properly reassembled.

The actuator is factory-mounted on the valve and the stroke limit stop screws are adjusted in advance.

- Ensure that the pipeline is not pressurized.
- Disconnect the actuator from its power source; detach the air supply pipe and control signal cables or pipes from their connectors.
- Unscrew the bracket screws.
- Detach the actuator using a suitable extractor. The correct tool can be ordered from the manufacturer (see Fig. 18).
- Remove the bracket and coupling, if any.

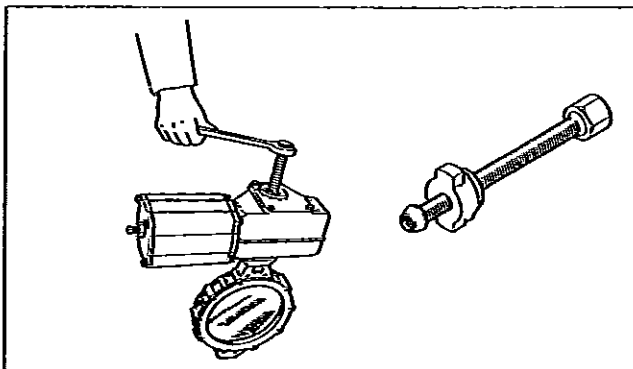


Fig. 18. Removing the actuator with an extractor

6.3 Mounting the actuator onto the valve

- Turn the valve to the closed position before mounting the actuator.
- Clean the shaft and the shaft bore and file off any burrs which could interfere with mounting. Protect the joint surfaces from corrosion, e.g. with Cortec VCI 369.

- If a bushing is required between the actuator shaft bore and the valve shaft, mount it first in the actuator shaft bore.
- The valve keyway is on the side opposite the flat side of the disc. The actuator shaft bore has two keyways set 90° apart.
- For double-acting cylinder actuator, BC, and spring-return cylinder actuator, BJ (spring-to-close), choose the keyway which establishes the piston in its upper position (at the top end of the cylinder) when the valve is closed.

In the spring-return cylinder actuator BJA (spring-to-open), choose the keyway which establishes the piston in its lower position when the valve is open.

In valves with manual operation the disc must be closed by turning the handwheel clockwise.

- Check visually that the actuator is correctly positioned relative to the valve. Tighten all the fastening screws as tightly as possible.
- Adjust the stop screws to the closed position (see Section 6.4).
- The opening angle in a control valve is usually limited by a bolt to 80°. The opening angle of a shut-off valve is 90°.
- When a shaft extension is required, the sizing of the shaft extension must be discussed with the valve manufacturer.

6.4 Stop screw adjustment

6.4.1 General

Close the metal seated butterfly valve by turning the disc with a torque against the seat. Choose the torque from Tables 7-10 for adjusting the stop screw to the closed position of the actuator. Try not to exceed the given values since excessive torque would strain the seat and the joint between the disc and the shaft. Always readjust the stop screw after changing the seat and after mounting the actuator.

6.4.2 Actuators other than tabulated

Close the valve as per the tabulated torque M_c and adjust the stops accordingly. Note the increased torque created by the actuator while the valve is closed.

NOTE:

Metso Automation accepts no responsibility for compatibility of actuators not installed by Metso Automation.

6.4.3 Changing the mounting position

CAUTION:

The actuator must not be removed from the valve in a pipeline under pressure as a result of dynamic torque!

Always remove the actuator from the valve shaft before mounting it into another key groove. Readjust the closed position limit as instructed.

If manually operated, the valve should close when the handwheel is turned clockwise. In a double-action cylinder, the piston must be in the upper position of the cylinder when the valve is closed. In this position the actuator creates maximum torque. Do not turn the disc more than 90° as this could damage the seat.

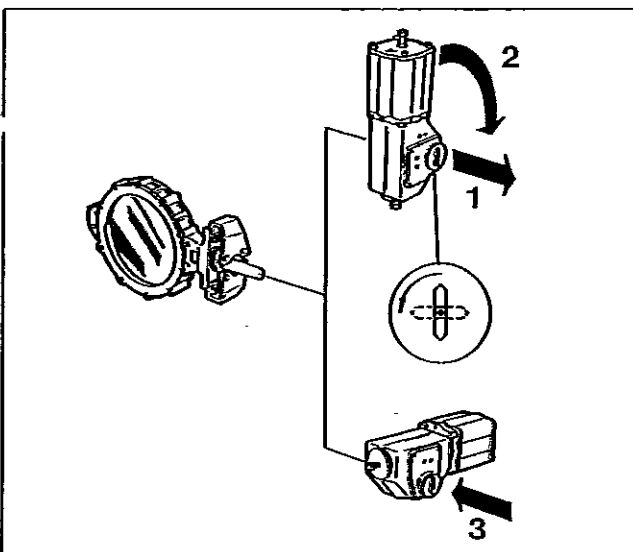


Fig. 19. Changing the mounting position

6.4.4 Double-acting cylinder actuator BC

- Apply the tabulated shut-off pressure P_c to the air connection at the cylinder base.
- With the stop screw removed, check through the air connection hole that the piston does not touch the cylinder end. If it does, loosen the bracket screws and turn the actuator clockwise to increase the adjusting margin.

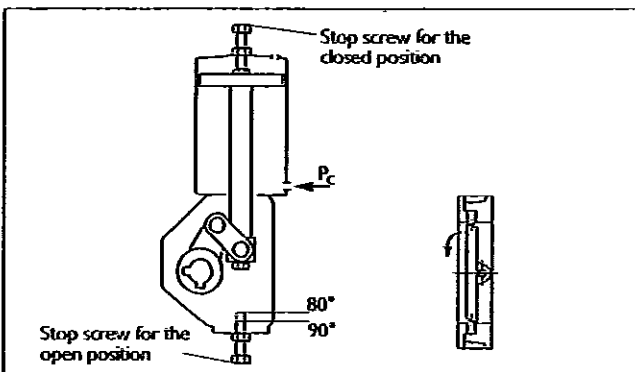


Fig. 20. Cylinder actuator, Series BC/B1C

- Turn the closed position stop screw until it touches the piston, then turn back 1/4 turn and lock up. Leakproof with Loctite 225 or other non-hardening sealant. The sealant must not flow inside the cylinder.
- An extra long screw is needed for opening angles < 80°.

6.4.5 Manual operator M

- Close the valve as per the tabulated primary torque M_1 (handwheel torque) given in Tables 7-10.
- Tighten the closed position stop screw until it touches the linkage, then turn back 1/4 turn and lock up with Loctite 225.

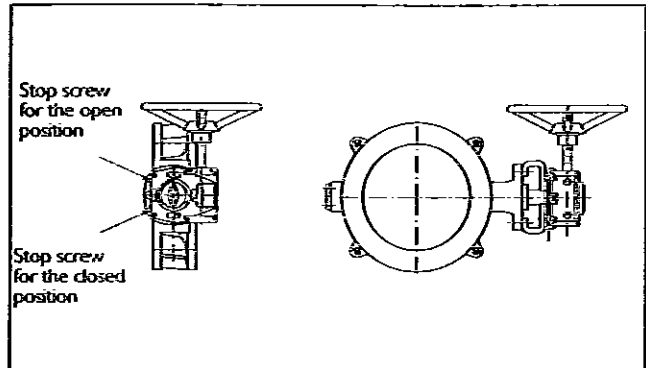


Fig. 22. Actuator, Series M

6.4.6 Hand lever RM

- Mount the hand lever on the valve, but do not fasten hex screws (A). Turn the lever using force F in Table 6.
- When closing torque is applied, turn the housing (B) cog of the closing limit to maintain contact with the lever arm. Fasten hex screws (A).

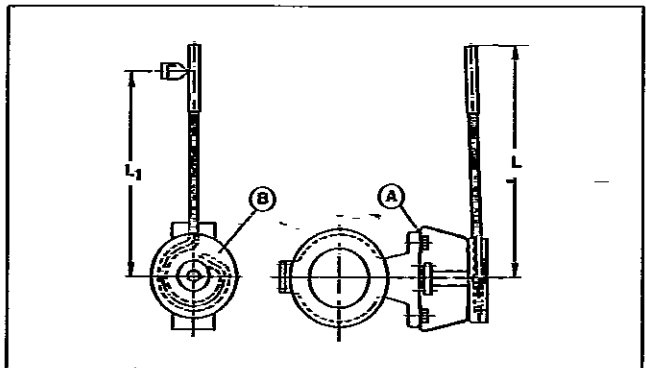


Fig. 21. Hand lever, Series RM

Table 6. Hand lever RM, adjustment values

Size	L		L1		Torque		F		
	DN	"	mm	"	mm	"	Nm	lbf ft	N
80	03	400	16	350	14	40	30	115	26
100	04	400	16	350	14	70	52	200	45
125	05	400	16	350	14	100	74	285	63
150	06	500	20	450	18	135	100	300	67

6.4.7 Electric operator

Instructions for adjustment are given in a separate leaflet code D304568, which is available from the manufacturer.

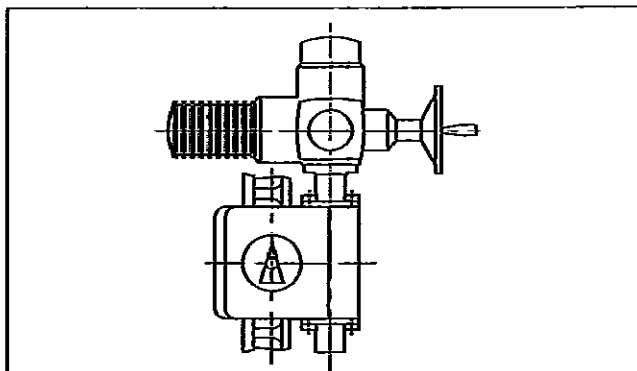


Fig. 23. Electric operator

6.4.8 Spring-return cylinder actuator B1J

Spring-to-close

- Before mounting the cylinder, screw in the closed position stop screw completely.
- The table overleaf indicates *) spring when the spring-created torque does not exceed the maximum permitted closing torque M_c . Otherwise, apply the tabulated pressure P_c into the air connection at the cylinder end against the spring force. **The stop screw cannot be removed when the cylinder is pressurized!** Open the stop screw until it does not touch the piston.
- Turn the closed position stop screw until it touches the piston, then turn back 1/4 turn and lock up. Leakproof with Loctite 225 or other non-hardening sealant. The sealant must not flow inside the cylinder.
- After adjusting, check the adjusting margin through the air connection hole. The piston must not touch the cylinder end. If necessary, increase the margin by loosening the bracket screws and turning the actuator clockwise.
- An extra long screw is needed for opening angles $< 80^\circ$.

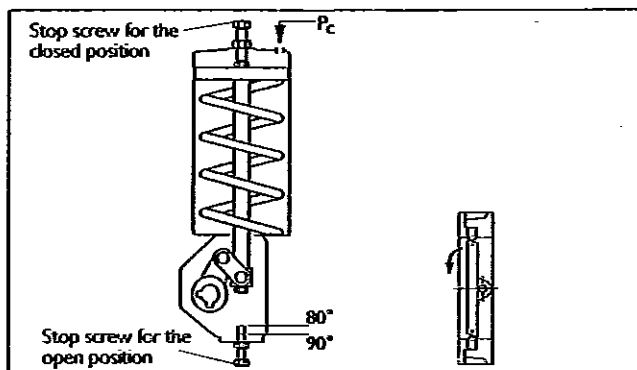


Fig. 25. Cylinder actuator, series B1

6.4.9 Spring-return cylinder actuator B1JA

Spring-to-open

- The actuator being unpressurized the valve is open. Unscrew the close limit stop screw (actuator housing). Apply tabulated shut-off pressure P_c to the air connection at the cylinder bottom end against the spring force to close the valve.
- Check through the stop screw hole that the piston rod does not touch the cylinder top end. If it does, loosen the bracket screws and turn the actuator clockwise to increase the adjusting margin.
- Turn the closed position stop screw until it touches the piston, then turn back 1/4 turn and lock up. Leakproof with Loctite 225 or other non-hardening sealant. The sealant must not flow inside the cylinder.
- An extra long screw is needed for opening angles $< 80^\circ$.

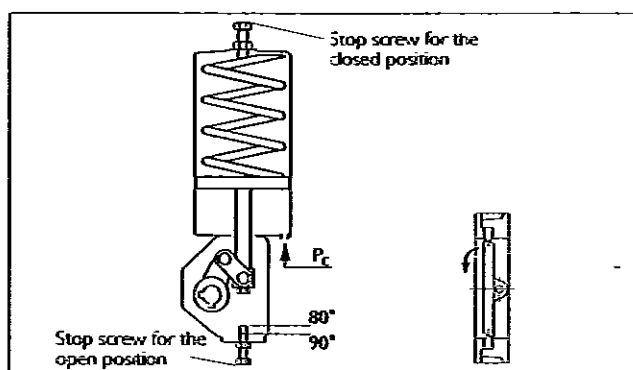


Fig. 24. Cylinder actuator, Series B1JA

7 TOOLS

No special tools are needed for servicing the valve. However, we recommend an extractor for removing the actuator from the valve. The tool can be ordered from the manufacturer.

8 ORDERING SPARE PARTS

When ordering spare parts, always include the following information:

- valve type designation (from the identification plate or documents),
- number of the parts list, part number, name of the part and quantity required, or
- number of this manual, part number, name of the part and quantity required.

Table 7. Series L1C, closing torques

Size	Closing torque M _c (Nm) / (lbf ft)	BC and BJ actuator	BC supply pressure P _c (bar) / (psi)	BJ spring-to- close P _c (bar) / (psi)	BJA spring-to- open P _c (bar) / (psi)	BJC spring-to- close P _c (bar) / (psi)	BJKA spring-to- open P _c (bar) / (psi)	Quadra-Power			Manual operator	Primary torque M ₁ Handwheel (Nm) / (lbf ft)
								actuator	spring-to- close P _c (bar) / (psi)	spring-to- open P _c (bar) / (psi)		
3	45 / 33	6	2.5 / 36	-	-	-	-	QP2C	0.6 / 9	3.6 / 52	AR11	4 / 3
		8	2.1 / 30	0.7 / 10	3.3 / 48	0.3 / 4	2.8 / 41	QP3C	1.1 / 16	3.2 / 46	M07	4 / 3
		10	1.6 / 23	1.1 / 16	2.8 / 41	0.7 / 10	2.2 / 32					
4	75 / 55	6	4.1 / 59	-	-	-	-	QP2C	-	4.3 / 62	AR11	6 / 4
		8	3.4 / 49	0.2 / 3	3.8 / 55	*) spring	3.3 / 48	QP3C	0.8 / 12	3.5 / 51	M07	7 / 5
		9	2.1 / 30	-	-	-	-	-				
		10	1.9 / 28	0.9 / 13	3.1 / 45	0.5 / 7	2.6 / 38					
		11	1.1 / 16	-	-	-	-	-				
5	110 / 80	6	6.0 / 87	-	-	-	-	QP3C	0.3 / 4	3.9 / 57	AR11	9 / 7
		8	5.0 / 72	*) spring	4.5 / 65	-	3.8 / 55	QP4C	1.0 / 14	3.3 / 48	M07	10 / 7
		9	3.0 / 43	-	-	-	-	-				
		10	2.4 / 35	0.6 / 9	3.4 / 49	0.2 / 3	2.9 / 42					
		11	1.5 / 22	-	-	-	-	-				
		12	1.3 / 19	1.1 / 16	3.0 / 43	0.7 / 10	2.2 / 32					
6	150 / 110	6	8.2 / 119	-	-	-	-	QP3C	-	4.3 / 62	AR11	12 / 9
		9	4.1 / 59	-	-	-	-	QP4C	0.8 / 12	3.5 / 51	M07	14 / 10
		10	3.3 / 48	0.2 / 3	3.8 / 55	*) spring	3.2 / 46					
		11	2.1 / 30	-	-	-	-					
		12	1.6 / 23	0.9 / 13	3.1 / 45	0.5 / 7	2.6 / 38					
8	300 / 220	10	6.5 / 94	*) spring	5.0 / 72	-	4.4 / 64	QP4C	-	4.3 / 62	AR11	24 / 18
		11	4.2 / 61	-	-	-	-	QP5C	0.8 / 12	3.5 / 51	M10	27 / 20
		12	3.3 / 48	0.2 / 3	3.8 / 55	*) spring	3.2 / 46					
		13	2.1 / 30	-	-	-	-					
		16	1.6 / 23	0.9 / 13	3.1 / 45	0.5 / 7	2.6 / 38					
10	500 / 370	12	5.5 / 80	*) spring	4.6 / 67	-	4.0 / 58	QP5C	0.1 / 1	4.1 / 59	AR11	40 / 30
		13	3.5 / 51	-	-	-	-				M12	44 / 32
		16	2.8 / 41	0.5 / 7	3.6 / 52	*) spring	3.0 / 43					
		17	1.8 / 26	-	-	-	-					
12	825 / 610	13	5.8 / 84	-	-	-	-				AR21	50 / 37
		16	4.5 / 65	*) spring	4.2 / 61	-	3.6 / 52				M14	51 / 38
		17	3.0 / 43	-	-	-	-					
		20	2.3 / 33	0.6 / 9	3.4 / 49	0.2 / 3	2.8 / 41					
14	1160 / 860	16	6.4 / 93	*) spring	4.9 / 71	-	4.3 / 62				AR21	70 / 52
		17	4.2 / 61	-	-	-	-				M14	72 / 53
		20	3.3 / 48	0.3 / 4	3.7 / 54	*) spring	3.1 / 45					
		25	1.7 / 25	0.9 / 13	3.1 / 45	0.5 / 7	2.6 / 38					
16	1650 / 1220	16	9.5 / 138	-	5.9 / 86	-	5.2 / 75				AR31	70 / 52
		17	6.0 / 87	-	-	-	-				(AR21)	95 / 70
		20	4.7 / 68	*) spring	4.2 / 61	-	3.6 / 52				M15	80 / 59
		25	2.4 / 35	0.6 / 9	3.4 / 49	0.2 / 3	2.8 / 41					
18	2200 / 1620	20	6.3 / 91	*) spring	4.8 / 70	-	4.2 / 61				AR31	95 / 70
		25	3.2 / 46	0.4 / 6	3.7 / 54	*) spring	3.1 / 45				M15	107 / 79
		32	1.6 / 23	0.9 / 13	3.1 / 45	0.5 / 7	2.5 / 36				M16	83 / 61
20	2700 / 1990	25	3.9 / 57	0.1 / 1	3.9 / 57	*) spring	3.3 / 48				AR41	110 / 80
		32	1.9 / 28	0.8 / 12	3.2 / 46	0.4 / 6	2.7 / 39				M16	102 / 75
24	4400 / 3240	25	6.4 / 93	*) spring	4.8 / 70	-	4.2 / 61				AR41	190 / 140
		32	3.2 / 46	0.4 / 6	3.7 / 54	*) spring	3.1 / 45				M16	166 / 122
		40	1.5 / 22	-	-	-	-					
28	6500 / 4790	32	4.7 / 68	*) spring	4.2 / 61	-	3.6 / 52				Limitorque	Torkmatic
		322	-	0.6 / 9	-	0.2 / 3	-				T325/SGA	75 / 55
		40	2.3 / 33	-	-	-	-				WTR60/SGA	75 / 55
		50	1.2 / 17	-	-	-	-					
30	8000 / 5900	32	5.8 / 84	-	4.6 / 67	-	4.0 / 58				Limitorque	Torkmatic
		322	-	0.5 / 7	-	*) spring	-				T325/SGA	90 / 65
		40	2.8 / 41	-	-	-	-				T425/SGA	95 / 70
32	9400 / 6930	50	1.4 / 20	-	-	-	-				WTR130/SGA	65 / 48
		322	-	0.3 / 4	-	*) spring	-				Limitorque	Torkmatic
		40	3.3 / 48	-	-	-	-				T325/SGA	100 / 75
36	12600 / 9290	50	1.7 / 25	-	-	-	-				T425/SGA	110 / 80
		322	-	*) spring	-	-	-				WTR130/SGA	75 / 55
		40	4.4 / 64	-	-	-	-				Limitorque	Torkmatic
40	16400 / 12090	50	2.3 / 33	-	-	-	-				T425/SGA	150 / 110
		322	-	-	-	-	-				WTR130/SGA	100 / 75
		50	5.7 / 83	-	-	-	-				Limitorque	Torkmatic
48	25600 / 18880	50	2.9 / 42	-	-	-	-				T425/SGA	190 / 140
		502	1.3 / 19	-	-	-	-				WTR130/SGA	130 / 95
		50	4.8 / 70	-	-	-	-				Limitorque	Torkmatic
56	40000 / 29500	50	2.0 / 29	-	-	-	-				T450/SGA	200 / 150
		502	7.6 / 110	-	-	-	-				Limitorque	Torkmatic
		502	3.1 / 45	-	-	-	-				T500/SGA	210 / 155

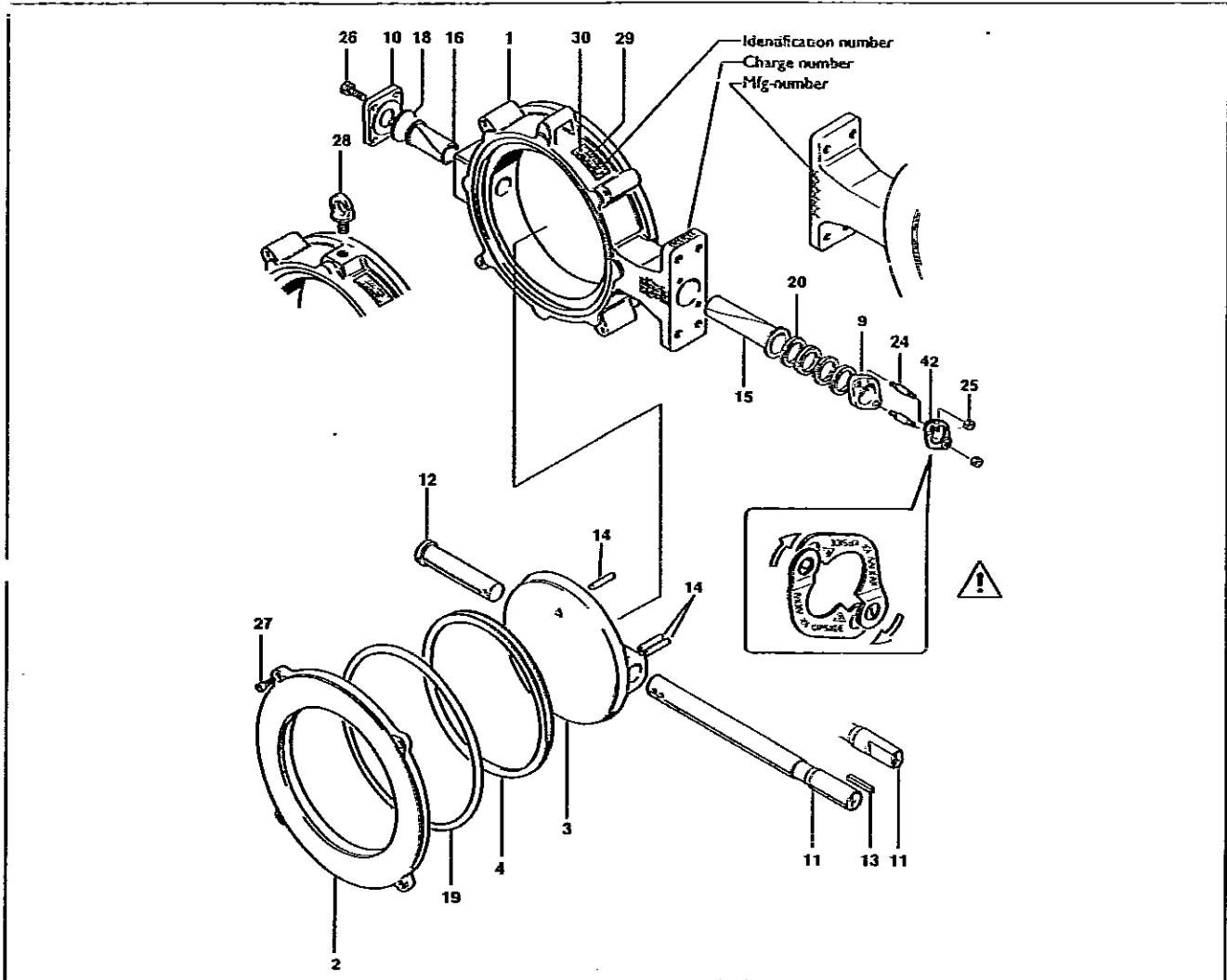
*) Spring torque not adequate to achieve tightness according to ISO 5208 Rate D, BS 6755 Part 1 Rate D, ANSI/FCI 70.2 Class V, IEC 534-4 or MSS-SP72 / 1970

Table 8. Series L1D, closing torques

Size	Closing torque M _c (Nm) / (lbf ft)	BC and BJ actuator	BC supply pressure P _c (bar) / (psi)	BJ spring-to- close P _c (bar) / (psi)	BJA spring-to- open P _c (bar) / (psi)	BJK spring-to- close P _c (bar) / (psi)	BJKA spring-to- open P _c (bar) / (psi)	Quadra- Power actuator	Quadra-Power spring-to- close P _c (bar) / (psi)	Quadra-Power spring-to- open P _c (bar) / (psi)	Manual operator	Primary torque M ₁ (Nm) / (lbf ft)
3	45 / 33	6	2.5 / 36	-	-	-	-	QP2C	0.6 / 9	3.6	AR 11	4 / 3
		8	2.1 / 30	0.7 / 10	3.3 / 48	0.3 / 4	2.8 / 41	QP3C	1.1 / 16	3.2	M07	4 / 3
		10	1.6 / 23	1.1 / 16	2.8 / 41	0.7 / 10	2.2 / 32					
4	75 / 55	6	4.1 / 59	-	-	-	-	QP2C	-	4.3	AR 11	6 / 4
		8	3.4 / 49	0.2 / 3	3.8 / 55	*) spring	3.3 / 48	QP3C	0.8 / 12	3.5	M07	7 / 5
		9	2.1 / 30	-	-	-	-					
		10	1.9 / 28	0.9 / 13	3.1 / 45	0.5 / 7	2.6 / 38					
		11	1.1 / 16	-	-	-	-					
5	110 / 80	6	6.0 / 87	-	-	-	-	QP3C	0.3 / 4	3.9	AR 11	9 / 7
		8	5.0 / 72	*) spring	4.5 / 65	-	3.8 / 55	QP4C	1.0 / 14	3.3	M07	10 / 7
		9	3.0 / 43	-	-	-	-					
		10	2.4 / 35	0.6 / 9	3.4 / 49	0.2 / 3	2.9 / 42					
		11	1.5 / 22	-	-	-	-					
6	230 / 170	10	5.0 / 72	*) spring	4.4 / 64	-	3.8 / 55	QP4C	0.3 / 4	3.9	AR 11	20 / 15
		11	3.2 / 46	-	-	-	-	QP5C	1.0 / 14	3.3	M10	21 / 15
		12	2.5 / 36	0.5 / 7	3.5 / 51	0.1 / 1	2.9 / 42					
		13	1.6 / 23	-	-	-	-					
		16	1.3 / 19	0.9 / 13	3.0 / 43	0.6 / 9	2.3 / 33					
8	460 / 340	11	6.4 / 93	-	-	-	-	QP5C	0.3 / 4	3.9	AR 11	37 / 27
		12	5.0 / 72	*) spring	4.4 / 64	-	3.8 / 55				M14	28 / 21
		13	3.2 / 46	-	-	-	-					
		16	2.5 / 36	0.5 / 7	3.5 / 51	0.1 / 1	2.9 / 42					
		17	1.7 / 25	-	-	-	-					
10	800 / 590	13	5.6 / 81	-	-	-	-				AR 21	50 / 37
		16	4.4 / 64	*) spring	4.2 / 61	-	3.6 / 52				M14	49 / 36-
		17	2.9 / 42	-	-	-	-					
		20	2.3 / 33	0.7 / 10	3.3 / 48	0.3 / 4	2.8 / 41					
12	1250 / 920	17	4.6 / 67	-	-	-	-				AR 21	75 / 55
		20	3.6 / 52	0.2 / 3	3.8 / 55	*) spring	3.2 / 46				M15	61 / 45
		25	1.8 / 26	0.8 / 12	3.2 / 46	0.4 / 6	2.6 / 38					
14	1750 / 1290	17	6.4 / 93	-	-	-	-				AR 31	75 / 55
		20	5.0 / 72	*) spring	4.3 / 62	-	3.7 / 54				M15	85 / 63
		25	2.6 / 38	0.6 / 9	3.4 / 49	0.2 / 3	2.9 / 42					
		32	1.3 / 19	1.0 / 14	2.9 / 42	0.6 / 9	2.3 / 33					
16	2500 / 1840	25	3.6 / 52	0.2 / 3	3.8 / 55	*) spring	3.2 / 46				AR 31/AR 41	110 / 80
		32	1.8 / 26	0.8 / 12	3.2 / 46	0.4 / 6	2.6 / 38				M16	94 / 69
18	3400 / 2510	25	4.9 / 71	*) spring	4.3 / 62	-	3.7 / 54				AR 41	145 / 110
		32	2.4 / 35	0.6 / 9	3.4 / 49	0.2 / 3	2.8 / 41				M16	128 / 94
		40	1.2 / 17	-	-	-	-					
20	4100 / 3020	32	3.0 / 43	0.4 / 6	3.6 / 52	*) spring	3.0 / 43				AR 41	175 / 130
		40	1.4 / 20	-	-	-	-				M16	155 / 114
		322	-	0.9 / 13	3.0 / 43	0.5 / 7	2.4 / 35					
24	6700 / 4940	32	4.8 / 70	*) spring	4.3 / 62	-	3.6 / 52				Limitorque	Torkmatic
		40	2.3 / 33	0.6 / 9	-	0.2 / 3	-				WTR60/SGA (AR 41)	75 / 55 280 / 210
28	9800 / 7230	322	-	0.2 / 3	-	*) spring	-				Limitorque	Torkmatic
		40	3.4 / 49	-	-	-	-				T325/SGA	110 / 80
		50	1.8 / 26	-	-	-	-				WTR60/SGA	110 / 80
30	12000 / 8850	322	-	*) spring	-	-	-				Limitorque	Torkmatic
		40	4.2 / 61	-	-	-	-				T425/SGA	150 / 110
		50	2.2 / 32	-	-	-	-				WTR130/SGA	95 / 70
32	14000 / 10320	40	4.9 / 71	-	-	-	-				Limitorque	Torkmatic
		50	2.5 / 36	-	-	-	-				T425/SGA	170 / 125
36	19000 / 14010	50	3.4 / 49	-	-	-	-				Limitorque	Torkmatic
		502	1.5 / 22	-	-	-	-				WTR130/SGA	150 / 110
40	25000 / 18440	50	4.5 / 65	-	-	-	-				Limitorque	Torkmatic
		502	2.0 / 29	-	-	-	-				T450/SGA	130 / 95

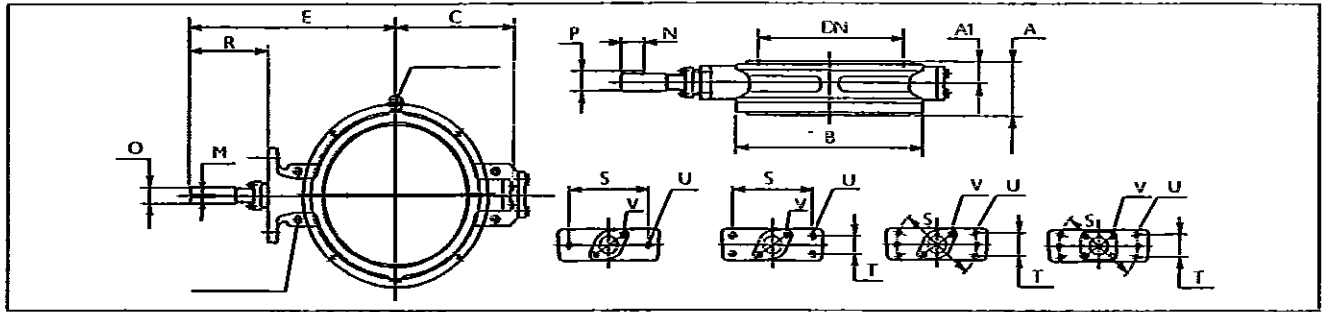
*) Spring torque not adequate to achieve tightness according to ISO 5208 Rate D, BS 6755 Part 1 Rate D, ANSI/FCI 70.2 Class V, IEC 534-4 or MSS-SP72 / 1970.

9 EXPLODED VIEW AND PARTS LIST



Item	Qty	Description	Recommended spare parts
1	1	Body	
2	1	Clamp ring	
3	1	Disc	
4	1	Seat ring	x
9	1	Gland	
10	1	Blind flange	
11	1	Drive shaft	
12	1	Shaft	
13	1	Key	
14	3	Pin	
15	1	Bearing	
16	1	Bearing	
18	1	Gasket	x
19	1	Body seal	x
20	5	Gland packing	x
24	2	Stud	
25	2	Hexagon nut	
26		Hexagon screw	
27		Hexagon socket screw	
28	1	Lifting eye bolt (DN 600-)	
29	1	Identification plate	
42	2	Retaining plate	

10 DIMENSIONS AND WEIGHTS



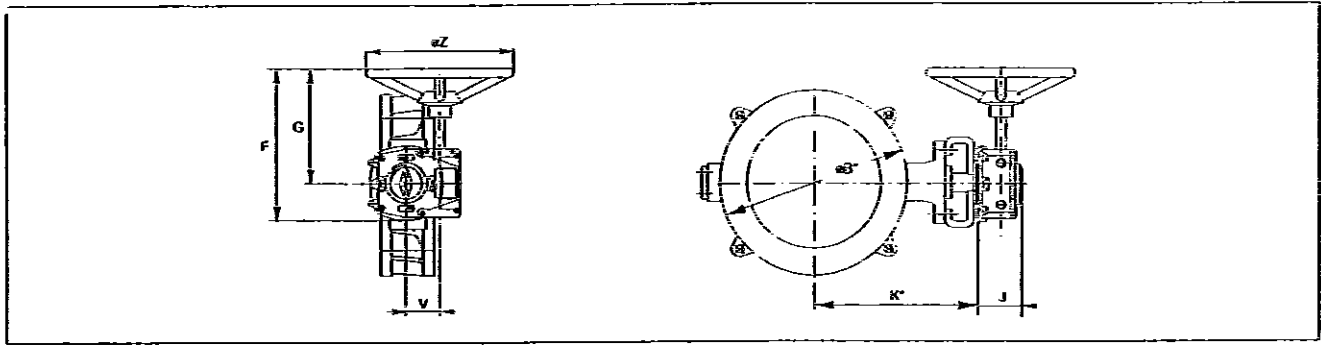
L1C/ANSI 150

Size		Dimensions, mm								U	V	Dimensions, mm					Weight
in	DN	A	A1	B	C	E	S	T	UNC	UNC	O	R	M	P	N	kg	
03	80	49	19	132	80	180	70	-	3/8	5/16	15	70	4,76	17	25	4	
04	100	56	22	160	100	210	90	-	1/2	5/16	20	80	4,76	22,2	35	6	
05	125	64	22	190	115	225	90	-	1/2	5/16	20	80	4,76	22,2	35	9	
06	150	70	29	216	130	290	110	32	1/2	5/16	20	110	4,76	22,2	35	15	
08	200	71	28	272	160	320	110	32	1/2	3/8	25	110	6,35	27,8	46	20	
10	250	76	31	327	210	360	130	32	1/2	3/8	30	140	6,35	32,9	51	30	
12	300	83	33	375	275	420	130	32	1/2	3/8	35	140	9,52	39,1	58	45	
14	350	92	38	435	290	460	160	40	5/8	3/8	40	165	9,52	44,2	68	70	
16	400	102	41	485	330	500	160	40	5/8	1/2	45	165	12,7	50,4	80	95	
18	450	114	46	537	370	560	160	55	3/4	1/2	50	180	12,7	55,5	90	130	
20	500	127	53	590	415	600	160	55	3/4	1/2	55	180	12,7	60,6	90	160	
24	600	154	65	690	505	745	230	90	1	5/8	70	250	19,05	78,2	119	280	
28	700	229	96	805	545	810	230	90	1	5/8	85	250	22,23	94,7	146	400	
30	750	229	96	870	585	835	230	90	1	5/8	85	250	22,23	94,7	145	470	
32	800	241	101	910	600	960	330	120	1 1/4	3/4	95	330	22,23	104,8	156	550	
36	900	241	105	1010	660	995	330	120	1 1/4	3/4	105	330	25,4	116,2	180	710	
40	1000	300	130	1120	715	1090	330	120	1 1/4	3/4	120	330	31,75	133,8	205	950	

L1D/ANSI 300

Size		Dimensions, mm								U	V	Dimensions, mm					Weight
in	DN	A	A1	B	C	E	S	T	UNC	UNC	O	R	M	P	N	kg	
03	80	49	19	132	80	180	70	-	3/8	5/16	15	70	4,76	17	25	4	
04	100	56	22	160	100	210	90	-	1/2	5/16	20	80	4,76	22,2	35	6	
05	125	64	22	190	115	225	90	-	1/2	5/16	20	80	4,76	22,2	35	9	
06	150	76	31,5	245	150	280	110	32	1/2	3/8	25	110	6,35	27,8	46	20	
08	200	89	38	303	205	350	130	32	1/2	3/8	35	140	9,52	39,1	58	40	
10	250	114	56	352	265	435	160	40	5/8	1/2	45	165	12,7	50,4	80	70	
12	300	114	53	415	305	490	160	55	3/4	1/2	50	180	12,7	55,5	90	90	
14	350	127	62	470	335	515	160	55	3/4	1/2	55	180	12,7	60,6	90	125	
16	400	156	83	530	385	635	230	90	1	5/8	70	250	19,05	78,2	119	200	
18	450	180	90	565	410	655	230	90	1	5/8	70	250	19,05	78,2	119	245	
20	500	200	100	625	465	705	230	90	1	5/8	85	250	22,23	94,7	146	305	
24	600	240	120	743	525	860	330	120	1 1/4	3/4	95	330	22,23	104,8	156	540	
28	700	250	125	848	615	935	330	120	1 1/4	3/4	120	330	31,75	133,8	205	830	
30	750	300	150	942	655	970	360	135	1 1/4	7/8	135	330	31,75	149,0	225	1250	
36	900	360	180	1100	730	1060	360	135	1 1/4	1	165	330	38,10	181,0	280	2000	

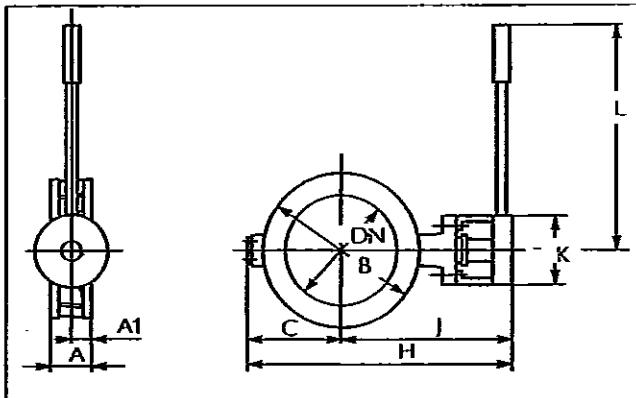
L1C + M



L1C + M

Type	F	G	J	V	øZ	kg
M07	196	152	58	39	125	3
M10	297	239	67	52	200	5
M12	357	282	81	67	250	10
M14	435	345	94	90	457	18
M15	532	406	106	123	457	31
M16	642	466	127	154	610	45

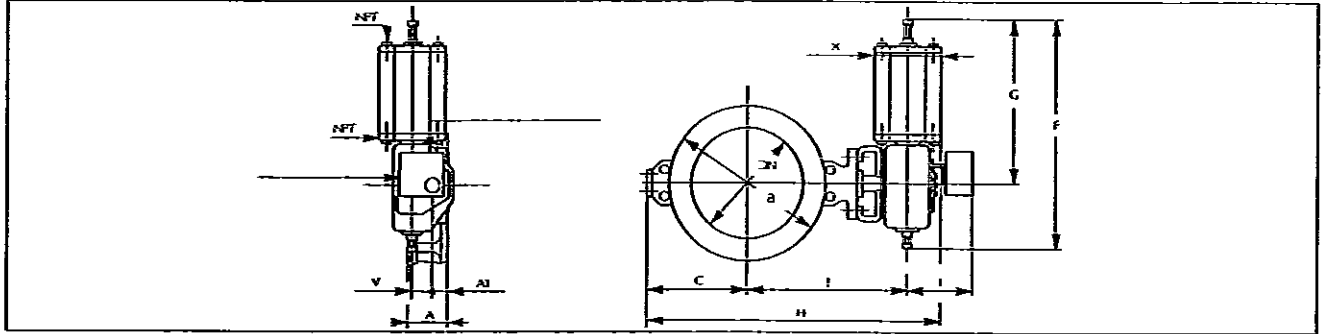
L1C + RM



L1C + RM

Type valve and actuator	DN	A	A ₁	B	C	H	J	K	L	kg
L1C 03 - RM415	80	49	19	132	80	260	180	100	400	5
L1C 04 - RM420	100	56	22	160	100	310	210	100	400	8
L1C 05 - RM420	125	64	22	190	115	340	225	100	400	11
L1C 06 - RM520	150	70	29	216	130	420	290	130	500	19

L1C + BC/B1C (DN 80...450)



Type valve and actuator	Dimensions, mm												NPT	Weight kg	*H
	DN	A	A ₁	B	C	F	G	H	X	I	J	V			
L1C 03 - BC6	80	49	19	132	80	400	260	375	90	225	213	36	1/4	9	375
L1C 03 - BC9	80	49	19	132	80	455	315	370	110	225	214	43	1/4	15	370
L1C 04 - BC6	100	56	22	160	100	400	260	415	90	225	233	36	1/4	11	415
L1C 04 - BC9	100	56	22	160	100	455	315	410	110	225	234	43	1/4	17	410
L1C 04 - BC11	100	56	22	160	100	540	375	420	135	230	240	51	3/8	22	420
L1C 05 - BC6	125	64	22	190	115	400	260	445	90	225	248	36	1/4	14	445
L1C 05 - BC9	125	64	22	190	115	455	315	440	110	225	249	43	1/4	20	440
L1C 05 - BC11	125	64	22	190	115	540	375	450	135	230	255	51	3/8	25	450
L1C 06 - BC9	150	70	29	216	130	455	315	505	110	225	299	43	1/4	26	505
L1C 06 - BC11	150	70	29	216	130	540	375	515	135	230	305	51	3/8	34	515
L1C 06 - BC13	150	70	29	216	130	635	445	560	175	245	331	65	3/8	48	565
L1C 08 - BC11	200	71	28	272	160	540	375	575	135	230	335	51	3/8	38	575
L1C 08 - BC13	200	71	28	272	160	635	445	620	175	245	361	65	3/8	53	625
L1C 08 - BC17	200	71	28	272	160	770	545	650	215	260	376	78	1/2	76	655
L1C 10 - BC11	250	76	31	327	210	540	375	665	135	230	375	51	3/8	51	665
L1C 10 - BC13	250	76	31	327	210	635	445	690	175	245	381	65	3/8	66	695
L1C 10 - BC17	250	76	31	327	210	770	545	720	215	260	396	78	1/2	89	725
L1C 12 - BC13	300	83	33	375	275	635	445	815	175	245	441	65	3/8	81	820
L1C 12 - BC17	300	83	33	375	275	770	545	845	215	260	456	78	1/2	105	850
L1C 12 - BC20	300	83	33	375	275	840	575	875	215	275	475	97	1/2	125	890
L1C 14 - BC17	350	92	38	435	290	770	545	875	215	260	471	78	1/2	145	880
L1C 14 - BC20	350	92	38	435	290	840	575	905	215	275	490	97	1/2	185	920
L1C 14 - BC25	350	92	38	435	290	1040	710	985	265	310	533	121	1/2	210	1015
L1C 16 - BC17	400	102	41	485	330	770	545	955	215	260	511	78	1/2	150	960
L1C 16 - BC20	400	102	41	485	330	840	575	985	215	275	530	97	1/2	175	1000
L1C 16 - BC25	400	102	41	485	330	1040	710	1065	265	310	573	121	1/2	235	1095
L1C 18 - BC20	450	114	46	537	370	840	575	1090	215	275	595	97	1/2	210	1105
L1C 18 - BC25	450	114	46	537	370	1040	710	1150	265	310	618	121	1/2	275	1180
L1C 18 - BC32	450	114	46	537	370	1330	910	1235	395	350	665	153	3/4	390	1265

* = Dimension H for BCM

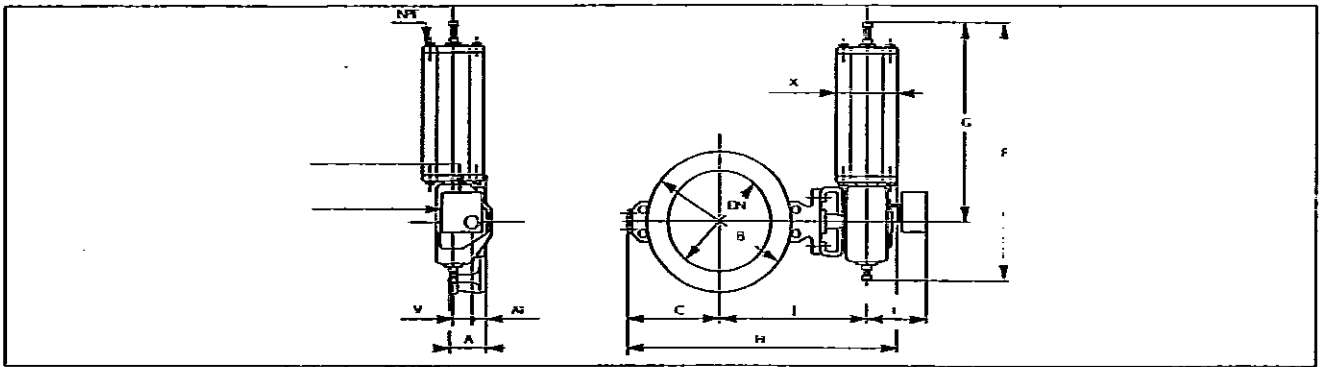
L1C + BC/B1C (DN 500 ...1000)

Type valve and actuator	Dimensions, mm												NPT	Weight kg	*H
	DN	A	A ₁	B	C	F	G	H	X	I	J	V			
L1C 20 - BC25	500	127	53	590	415	1040	710	1235	265	310	658	121	1/2	305	1265
L1C 20 - BC32	500	127	53	590	415	1330	910	1320	395	350	705	153	3/4	420	1350
L1C 24 - BC25	600	154	65	690	505	1040	710	1410	265	310	743	121	1/2	425	1440
L1C 24 - BC32	600	154	65	690	505	1330	910	1485	395	350	780	153	3/4	540	1515
L1C 24 - BC40	600	154	65	690	505	1660	1150	1610	505	365	850	194	3/4	755	1655
L1C 28 - BC32	700	229	96	805	545	1330	910	1590	395	350	845	153	3/4	650	1620
L1C 28 - BC40	700	229	96	805	545	1660	1150	1715	505	365	915	194	3/4	875	1760
L1C 28 - BC50	700	229	96	805	545	1970	1350	1815	610	415	965	242	1	1260	-
L1C 30 - BC32	750	229	96	870	585	1330	910	1655	395	350	870	153	3/4	740	1685
L1C 30 - BC40	750	229	96	870	585	1660	1150	1780	505	365	940	194	3/4	955	1825
L1C 30 - BC50	750	229	96	870	585	1970	1350	1880	610	415	990	242	1	1330	-
L1C 32 - BC32	800	241	101	910	600	1330	910	1725	395	350	925	153	3/4	820	1755
L1C 32 - BC40	800	241	101	910	600	1660	1150	1865	505	365	1010	194	3/4	1035	1910
L1C 32 - BC50	800	241	101	910	600	1970	1350	1965	610	415	1060	242	1	1410	-
L1C 36 - BC40	900	241	105	1010	660	1660	1150	1960	505	365	1045	194	3/4	1185	1205
L1C 36 - BC50	900	241	105	1010	660	1970	1350	2060	610	415	1095	242	1	1580	-
L1C 40 - BC40	1000	300	130	1120	715	1660	1150	2110	505	365	1140	194	3/4	1455	2155
L1C 40 - BC50	1000	300	130	1120	715	1970	1350	2210	610	415	1190	242	1	1830	-

L1D + BC/B1C

Type valve and actuator	Dimensions, mm												NPT	Weight kg	*H
	DN	A	A ₁	B	C	F	G	H	X	I	J	V			
L1D 03 - BC6	80	49	19	132	80	400	260	375	90	225	213	36	1/4	9	375
L1D 03 - BC9	80	49	19	132	80	455	315	370	110	225	214	43	1/4	15	370
L1D 04 - BC6	100	56	22	160	100	400	260	415	90	225	234	36	1/4	11	415
L1D 04 - BC9	100	56	22	160	100	455	315	410	110	225	234	43	1/4	17	410
L1D 04 - BC11	100	56	22	160	100	540	375	420	135	230	240	51	3/8	23	420
L1D 05 - BC6	125	64	22	190	115	400	260	445	90	225	248	36	1/4	14	445
L1D 05 - BC9	125	64	22	190	115	455	315	440	110	225	249	43	1/4	20	440
L1D 05 - BC11	125	64	22	190	115	540	375	450	135	230	255	51	3/8	26	450
L1D 06 - BC11	150	76	32	245	150	540	375	525	135	230	295	51	3/8	39	525
L1D 06 - BC13	150	76	32	245	150	635	445	570	175	245	321	65	3/8	54	575
L1D 06 - BC17	150	76	32	245	150	770	545	600	215	260	336	78	1/2	77	605
L1D 08 - BC13	200	89	38	303	205	635	445	675	175	245	371	65	3/8	74	680
L1D 08 - BC17	200	89	38	303	205	770	545	705	215	260	386	78	1/2	97	710
L1D 08 - BC20	200	89	38	303	205	840	575	735	215	275	405	97	1/2	115	750
L1D 10 - BC17	250	114	56	352	265	770	545	825	215	260	446	78	1/2	130	830
L1D 10 - BC20	250	114	56	352	265	840	575	855	215	275	465	97	1/2	145	870
L1D 10 - BC25	250	114	56	352	265	1040	710	935	265	310	508	121	1/2	205	965
L1D 12 - BC20	300	114	53	415	305	840	575	955	215	275	525	97	1/2	170	970
L1D 12 - BC25	300	114	53	415	305	1040	710	1015	265	310	548	121	1/2	230	1045
L1D 14 - BC20	350	127	62	470	335	840	575	1010	215	275	550	97	1/2	200	1025
L1D 14 - BC25	350	127	62	470	335	1040	710	1070	265	310	573	121	1/2	265	1100
L1D 16 - BC25	400	165	83	530	385	1040	710	1180	265	310	633	121	1/2	340	1210
L1D 16 - BC32	400	165	83	530	385	1330	910	1255	395	350	670	153	3/4	465	1285
L1D 18 - BC25	450	180	90	565	410	1040	710	1225	265	310	653	121	1/2	385	1255
L1D 18 - BC32	450	180	90	565	410	1330	910	1300	395	350	690	153	3/4	510	1330
L1D 20 - BC32	500	200	100	625	465	1330	910	1405	395	350	740	153	3/4	570	1435
L1D 20 - BC40	500	200	100	625	465	1660	1150	1530	505	365	810	194	3/4	775	1575
L1D 24 - BC32	600	240	120	743	525	1330	910	1550	395	350	825	153	3/4	810	1580
L1D 24 - BC40	600	240	120	743	525	1660	1150	1690	505	365	910	194	3/4	1015	1735

* = Dimension H for BCM



L1C + BJ/B1J

Type valve and actuator	Dimensions, mm												NPT	Weight kg
	DN	A	A ₁	B	C	F	G	H	X	I	J	V		
L1C 03 - B _J 8	80	49	19	132	80	560	420	370	135	200	213	43	3/8	20
L1C 04 - B _J 8	100	56	22	160	100	560	420	415	135	200	238	43	3/8	23
L1C 04 - B _J 10	100	56	22	160	100	650	490	435	175	205	245	51	3/8	33
L1C 05 - B _J 8	125	64	22	190	115	560	420	445	135	200	253	43	3/8	26
L1C 05 - B _J 10	125	64	22	190	115	650	490	465	175	205	260	51	3/8	36
L1C 06 - B _J 10	150	70	29	216	130	650	490	525	175	205	305	51	3/8	42
L1C 06 - B _J 12	150	70	29	216	130	800	620	570	215	215	331	65	1/2	68
L1C 08 - B _J 10	200	71	28	272	160	650	490	585	175	205	335	51	3/8	47
L1C 08 - B _J 12	200	71	28	272	160	800	620	630	215	215	361	65	1/2	73
L1C 08 - B _J 16	200	71	28	272	160	990	760	670	265	235	376	78	1/2	115
L1C 10 - B _J 12	250	76	31	327	210	800	620	690	215	215	371	65	1/2	85
L1C 10 - B _J 16	250	76	31	327	210	990	760	730	265	235	386	78	1/2	125
L1C 12 - B _J 16	300	83	33	375	275	990	760	865	265	235	446	78	1/2	140
L1C 12 - B _J 20	300	83	33	375	275	1200	935	950	395	250	475	97	3/4	210
L1C 14 - B _J 16	350	92	38	435	290	990	760	895	265	235	471	78	1/2	165
L1C 14 - B _J 20	350	92	38	435	290	1200	935	990	395	250	500	97	3/4	235
L1C 14 - B _J 25	350	92	38	435	290	1530	1200	1080	505	290	533	121	3/4	390
L1C 16 - B _J 20	400	102	41	485	330	1200	935	1070	395	250	540	97	3/4	260
L1C 16 - B _J 25	400	102	41	485	330	1530	1200	1160	505	290	573	121	3/4	420
L1C 18 - B _J 20	450	114	46	537	370	1200	935	1155	395	250	585	97	3/4	295
L1C 18 - B _J 25	450	114	46	537	370	1530	1200	1245	505	290	618	121	3/4	450
L1C 18 - B _J 32	450	114	46	537	370	1830	1410	1305	540	330	665	153	1	840
L1C 20 - B _J 25	500	127	53	590	415	1530	1200	1330	505	290	658	121	3/4	480
L1C 20 - B _J 32	500	127	53	590	415	1830	1410	1390	540	330	705	153	1	870
L1C 24 - B _J 25	600	154	65	690	505	1530	1200	1505	505	290	743	121	3/4	600
L1C 24 - B _J 32	600	154	65	690	505	1830	1410	1555	540	330	780	153	1	990
L1C 28 - B _J 32	700	229	96	805	545	1830	1410	1660	540	330	845	153	1	1120
L1C 30 - B _J 32	750	229	96	870	585	1830	1410	1725	540	330	870	153	1	1190
L1C32 - B _J 32	800	241	101	910	600	1830	1410	1795	540	330	925	153	1	1270

L1D + B_J/B1J

Type valve and actuator	Dimensions, mm												NPT	Weight kg
	DN	A	A ₁	B	C	F	G	H	X	I	J	V		
L1D 03 - B _J 8	80	49	19	132	80	560	420	370	135	200	213	43	3/8	20
L1D 04 - B _J 8	100	56	22	160	100	560	420	415	135	200	238	43	3/8	23
L1D 04 - B _J 10	100	56	22	160	100	650	490	435	175	205	245	51	3/8	33
L1D 05 - B _J 8	125	64	22	190	115	560	420	445	135	200	253	43	3/8	26
L1D 05 - B _J 10	125	64	22	190	115	650	490	455	175	205	260	51	3/8	36
L1D 06 - B _J 10	150	76	32	245	150	650	490	535	175	205	295	51	3/8	47
L1D 06 - B _J 12	150	76	32	245	150	800	620	580	215	215	321	65	1/2	73
L1D 08 - B _J 12	200	89	38	303	205	800	620	675	215	215	361	65	1/2	93
L1D 08 - B _J 16	200	89	38	303	205	990	760	715	265	235	376	78	1/2	135
L1D 10 - B _J 16	250	114	56	352	265	990	760	845	265	235	446	78	1/2	165
L1D 10 - B _J 20	250	114	56	352	265	1200	935	940	395	250	475	97	1/2	235
L1D 12 - B _J 20	300	114	53	415	305	1200	935	1020	395	250	515	97	3/4	255
L1D 12 - B _J 25	300	114	53	415	305	1530	1200	1105	505	290	548	121	3/4	410
L1D 14 - B _J 20	350	127	62	470	335	1200	935	1075	395	250	540	97	3/4	290
L1D 14 - B _J 25	350	127	62	470	335	1530	1200	1160	505	290	573	121	3/4	445
L1D 16 - B _J 25	400	165	83	530	385	1530	1200	1270	505	290	633	121	3/4	520
L1D 16 - B _J 32	400	165	83	530	385	1830	1410	1325	540	330	670	153	1	915
L1D 18 - B _J 32	450	180	90	565	410	1830	1410	1370	540	330	690	153	1	960
L1D 20 - B _J 32	500	200	100	625	465	1830	1410	1475	540	330	740	153	1	1020
L1D 24 - B _J 32	600	240	120	743	525	1830	1410	1620	540	330	825	153	1	1260

11 TYPE CODE

BUTTERFLY VALVE, Series L1, L2, ANSI version

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
	L1	C	M	A	16	A	A	J	A	F	/	01

1.	S-DISC CONSTRUCTION
S-	Flow balancing trim on downstream side of body flow port

2.	PRODUCT SERIES
L1	Water type, full bore
L2	Lug type, full bore

3.	PRESSURE RATING
C	ANSI Class 150
D	ANSI Class 300

4.	SEAT DESIGN
M	Metal seat
N	Non-rigid

5.	CONSTRUCTION
A	Standard
C	Cryogenic
H	High temperature
Y	Special

6.	SIZE
	3"-40"

7.	BODY MATERIAL
A	ASTM A351 gr. CF8M
C	ASTM A351 gr. CG8M
D	ASTM A216 gr. WCB
Y	Special

8.	DISC MATERIAL
A	ASTM A351 gr. CF8M
C	ASTM A351 gr. CG8M
P	ASTM A216 gr. WCB
Y	Special

9.	SHAFT AND PIN MATERIAL
C	17-4PH
J	SIS 2324
Y	Special

10.	SEAT MATERIAL
A	Incoloy 825
B	SS Avesta 248 SV
Y	Special

11.	NON-STANDARD CONSTRUCTION
F	Gland packing graphite
T	Live loaded PTFE gland packing
G	Live loaded graphite gland packing
Y	Special

12.	FLANGE FACING
-	Stock Finish, without sign
01	Smooth Finish

13.	FLANGE DRILLING
-	According to valve pressure rating, standard without sign

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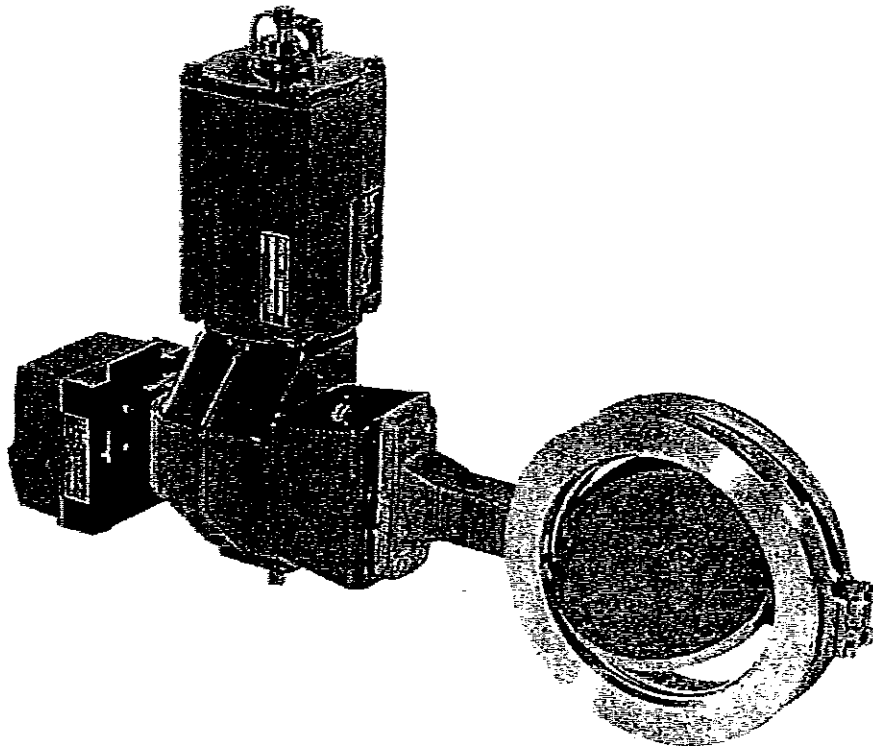
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**METAL SEATED
NELDISC BUTTERFLY VALVES
Series LW, LG, DIN rated**



**METAL SEATED
NELDISC® BUTTERFLY VALVES**
Series LW, LG, DIN rated

Installation, Maintenance and
Operating Instructions
2 LW 70 en
Issue 5/02

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READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.
If you require additional assistance, please contact the manufacturer or manufacturer's representative.
Addresses and phone numbers are printed on the back cover.

SAVE THESE INSTRUCTIONS!

Subject to change without notice.

All trademarks are property of their respective owners.

1 GENERAL

1.1 Scope of the manual

This installation, operation and maintenance manual provides essential information on series LW and LG Neldisc® butterfly valves. The actuators and instrumentation to be used with series LW and LG valves are also discussed briefly. Refer to the separate actuator and control equipment instruction manuals for further information.

NOTE:

Selection and use of the valve in a specific application requires close consideration of detailed aspects. Due to the nature of the product, this manual cannot cover all the individual situations that may occur when installing, using or servicing the valve. If you are uncertain about the use of the valve or its suitability for your intended use, please contact Metso Automation for more information.

1.2 Valve description

Neldisc series LW are wafer type and series LG are lug type metal seated butterfly valves.

The disc is elliptical and has a double eccentric mounting. When the valve is closed, the elliptical disc at the major axis displaces the seat ring outward, causing the seat ring to contact the disc at the minor axis. When the valve is opened, the contact is released and the seat ring returns to its original circular shape (see Fig. 1).

The disc is fitted to the shafts with pins and there are no holes through the disc.

Construction details of individual valves are included in the type code shown on the valve identification plate. To interpret the type code, please refer to Section 11.

The valve operates both in control and shut-off applications.

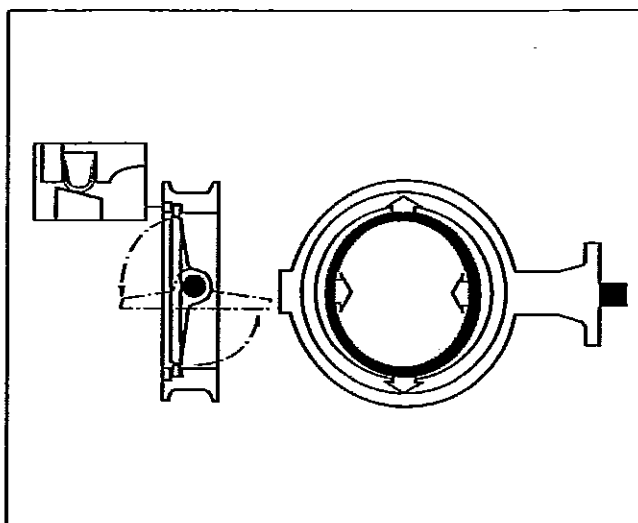


Fig. 1. Construction of a butterfly valve

1.3 Valve markings

Body markings are cast on the body. The valve also has an identification plate attached to it (see Fig. 2).

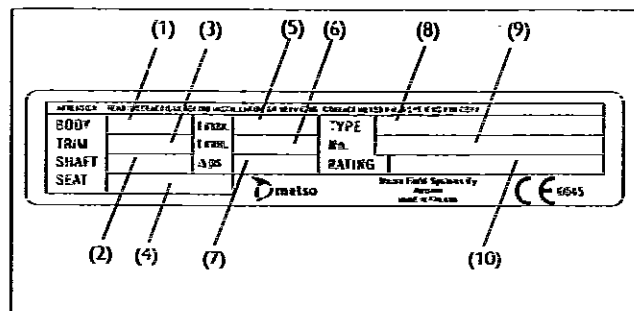


Fig. 2. Identification plate

Identification plate marking:

1. Body material
2. Shaft material
3. Trim material
4. Seat material
5. Maximum operating temperature
6. Minimum operating temperature
7. Maximum shut-off pressure differential
8. Type designation
9. Valve manufacturing parts list no.
10. Pressure class

1.4 Technical specifications

Type:	High performance butterfly valve metal seated LW: wafer type LG: lug type
Pressure class	
Body:	LW6L, LW7L, LG6L, LG7L: PN 25, ISO PN 20 LW8M, LG8M: PN 40, ISO PN 50
Trim:	LW6L, LW7L, LG6L, LG7L: Sizes DN 80-150: PN 25 Sizes DN 200-350: ISO PN 20 LW8M, LG8M: PN 40, ISO PN 50
Temperature range:	-200 °C - +600 °C (over 600 °C, please contact the manufacturer)
Zeroleak	-200 °C - +320 °C
Flow direction:	Free
Dimensions:	See p. 19-27
Weights:	See p. 19-27

1.5 Valve approvals

Baumuster/Bauteilprüfung
(TRB 801 Nr. 45 and VdTUV-Merkblatt 1065).

TA-Luft, chapter 3.1.8.4

Fire test to BS 6755 and API 607.

1.6 CE marking

The valve meets the requirements of the European Directive 97/23/EC relating to pressure equipment, and has been marked according to the Directive.

1.7 Recycling and disposal of a rejected valve

Most valve parts can be recycled if sorted according to material. Most parts have material marking. A material list is supplied with the valve. In addition, separate recycling and disposal instructions are available from the manufacturer. A valve can also be returned to the manufacturer for recycling and disposal against a fee.

1.8 Safety precautions

CAUTION:

Do not exceed the valve performance limitations!
Exceeding the limitations marked on the valve may cause damage and lead to uncontrolled pressure release.
Damage or personal injury may result.

CAUTION:

Do not dismantle the valve or remove it from the pipeline while the valve is pressurized!
Dismantling or removing a pressurized valve will result in uncontrolled pressure release. Always isolate the relevant part of the pipeline, release the pressure from the valve and remove the medium before dismantling the valve.
Be aware of the type of medium involved. Protect people and the environment from any harmful or poisonous substances. Make sure that no medium can enter the pipeline during valve maintenance.
Failure to do this may result in damage or personal injury.

CAUTION:

Beware of the discs cutting movement!
Keep hands, other parts of the body, tools and other objects out of the open flow port. Leave no foreign objects inside the pipeline.
When the valve is actuated, the disc functions as a cutting device. The position of the disc can also be changed when moving the valve.
Close and detach the actuator pressure supply pipeline for valve maintenance.
Failure to do this may result in damage or personal injury.

CAUTION:

Beware of noise emissions!
The valve may produce noise in the pipeline. The noise level depends on the application. It can be measured or calculated using Metso Automation's computer software. Observe the relevant work environment regulations on noise emission.

CAUTION:

Beware of a very cold or hot valve!
The valve body may be very cold or very hot during use. Protect yourself against cold injuries or burns.

CAUTION:

When handling the valve or the valve package, bear in mind its weight!
Never lift the valve or valve package by the actuator, positioner, limit switch or their piping.
Place the lifting ropes securely around the valve body (see Fig. 3).
Damage or personal injury may result from falling parts.

NOTE:

Do not turn the disc more than 90° as this could damage the seat. The valve is so constructed that the disc operates only between 0-90°.

2 TRANSPORTATION, RECEPTION AND STORAGE

Check the valve and the accompanying devices for any damage that may have occurred during transport.

Store the valve carefully before installation, preferably indoors in a dry place.

Do not take the valve to the intended location and do not remove the flow port protectors until the valve is installed.

The valve is delivered in the closed position. A valve equipped with a spring-return actuator is delivered in a position determined by the spring. During storage the valve must be lightly closed.

3 INSTALLATION

3.1 General

Remove the flow port protectors and check that the valve is undamaged and clean inside.

CAUTION:

When handling the valve or the valve package, bear in mind its weight!

Follow the lifting methods shown in Fig. 3.

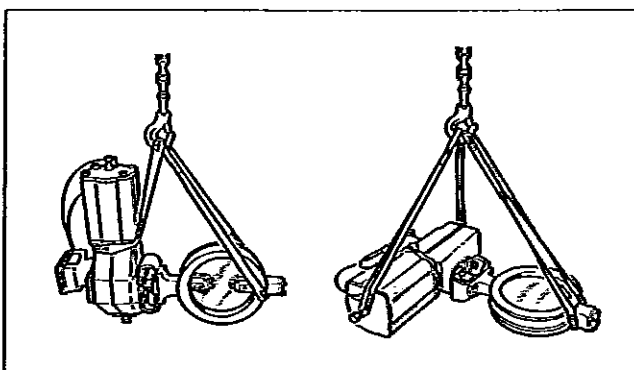


Fig. 3. Lifting of the valve

3.2 Mounting into the pipeline

Flush or blow the pipeline carefully before installing the valve. Foreign particles, such as sand or pieces of welding electrode, will damage the disc sealing surface and seat.

The valve may be installed in any position and offers tightness in both directions.

Install the valve in the pipeline so that the shaft is horizontal if possible. However, we do not recommend installing the valve with the actuator on the underside because dirt in the pipeline may then enter the body cavity and damage the gland packing.

If the valve is equipped with a flow balancing trim (type code S-...), it must be on the down stream side of the valve body. The valve must be mounted so that the perforated plate will not collect any impurities in the pipeline (see Fig. 4).

Select flange gaskets according to the operating conditions.

Do not attempt to correct pipeline misalignment by means of flange bolting.

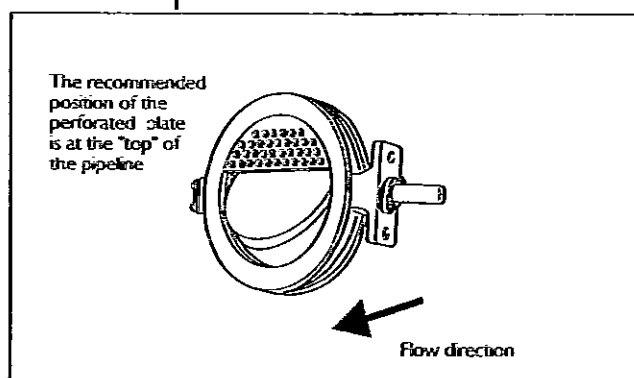


Fig. 4. Position of the flow balancing trim

It may be necessary to firmly support the pipeline to protect the valve from excess stress. Sufficient support will also reduce pipeline vibration and this ensures proper functioning of the positioner. Do not fasten supports to the flange bolting or to the actuator.

It is recommended that the length of any straight pipe preceding the control valve is at least $2 \times$ pipe diameter.

The flow causes a so-called dynamic torque against the valve disc which attempts to close the valve. In a pipe elbow the pressure on the outer edge is higher than on the inner edge.

When installing the butterfly valve immediately after a pipe elbow, the valve shaft must be directed toward the centre point of the pipe (see Fig. 5). This is especially important when the butterfly valve is used as a control valve.

The valve shaft of a butterfly valve mounted after the centrifugal pump must be perpendicular to the pump shaft (see Fig. 6).

When thus installed, the valve discs will be more evenly loaded and vibrations otherwise possible in the intermediate positions will be eliminated.

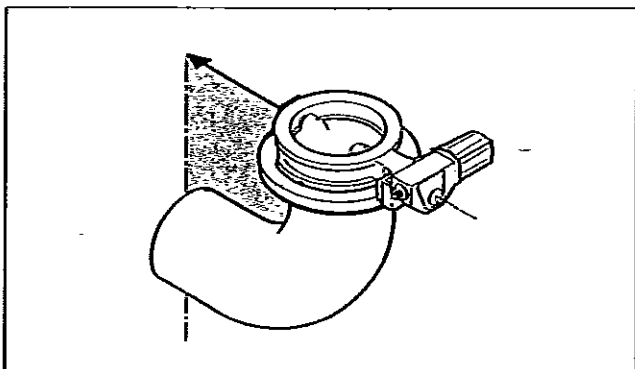


Fig. 5. Mounting after a pipe elbow

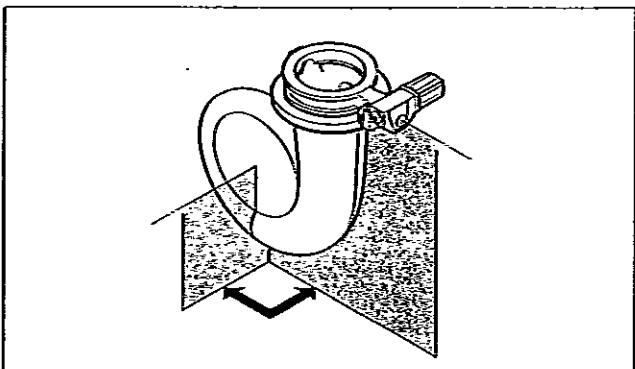


Fig. 6. Mounting after the centrifugal pump

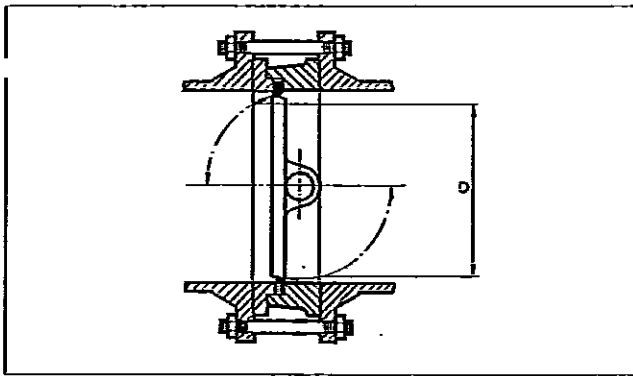


Fig. 7. Minimum pipe inside dimensions

Table 1. Minimum pipe inside dimensions (mm)

Valve size	D	
	LW6L, LW7L, LG6L, LG7L	LW8M, LG8M
80	69	69
100	90	90
125	112	112
150	144	143
200	193	190
250	243	241
300	290	287
350	329	321
400	374	315

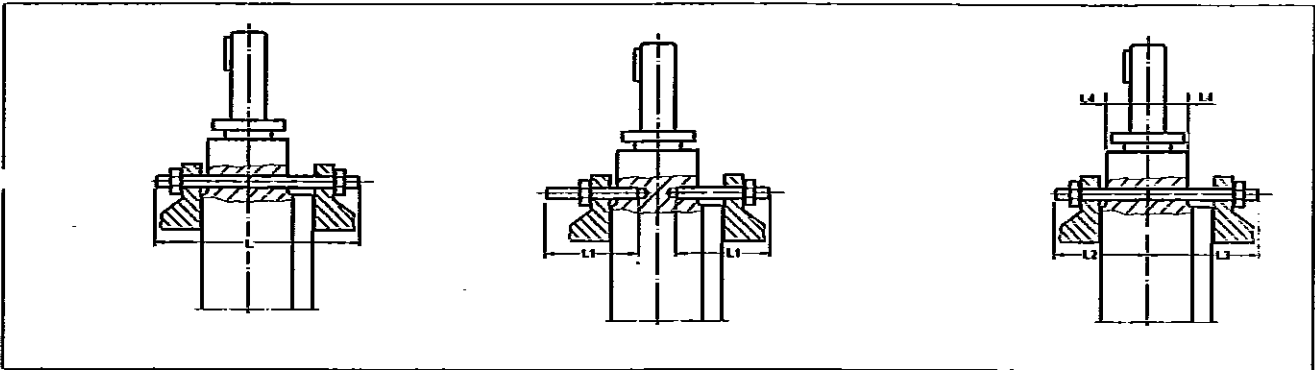


Fig. 8. Stud bolt length

Table 2. Stud bolt dimensions (mm)

LW6L DN	DIN PN10 FLANGE			DIN PN16 FLANGE			DIN PN25 FLANGE			ISO PN20 FLANGE		
	Thread	L	Qty	Thread	L	Qty	Thread	L	Qty	Thread	L	Qty
80	M16	130	8	M16	130	8	M16	140	8	M16	140	4
100	M16	140	8	M16	140	8	M20	160	8	M16	150	8
125	M16	150	8	M16	150	8	M24	170	8	M20	160	8
150	M20	160	8	M20	160	8	M24	180	8	M20	160	8
200	M20	170	8	M20	170	12	M24	190	12	M20	170	8
250	M20	180	12	M24	180	12	M27	200	12	M24	200	12
300	M20	190	12	M24	200	12	M27	220	16	M24	210	12
350	M20	190	16	M24	200	16	M30	230	16	M27	220	12
400	M24	220	16	M27	240	16	M33	270	16	M27	250	16

LW7L DN	DIN PN10 FLANGE			DIN PN16 FLANGE			DIN PN25 FLANGE			ISO PN20 FLANGE		
	Thread	L	Qty	Thread	L	Qty	Thread	L	Qty	Thread	L	Qty
80	M16	130	8	M16	130	8	M16	140	8	M16	140	4
100	M16	140	8	M16	140	8	M20	160	8	M16	150	8
125	M16	150	8	M16	150	8	M24	180	8	M20	170	8
150	M20	170	8	M20	170	8	M24	190	8	M20	180	8
200	M20	180	8	M20	180	12	M24	200	12	M20	180	8
250	M20	190	12	M24	190	12	M27	210	12	M24	200	12
300	M20	200	12	M24	210	12	M27	230	16	M24	210	12
350	M20	200	16	M24	210	16	M30	240	16	M27	230	12
400	M24	220	16	M27	240	16	M33	270	16	M27	250	16

LW8M DN	DIN PN 25 FLANGE					DIN PN 40 FLANGE					ISO PN 50 FLANGE				
	Thread	L	Qty	L1	Qty	Thread	L	Qty	L1	Qty	Thread	L	Qty	L1	Qty
80	M16	160	8			M16	160	8			M20	180	8		
100	M20	170	8	Stud bolts pass the body in the neck area (length L)		M20	170	8	Stud bolts pass the body in the neck area (length L)		M20	180	8	Stud bolts pass the body in the neck area (length L)	
150	M24	200	8			M24	200	8			M20	200	12		
200	M24	210	12			M27	230	12			M24	240	12		
250	M27	250	12			M30	270	12			M27	280	14		
300	M27	250	12	120	8	M30	270	12	140	8	M30	300	12	150	8
350	M30	280	12	120	8	M33	300	12	150	8	M30	320	16	150	8
400	M33	300	12	140	8	M36	330	12	160	8	M33	340	16	160	8

Table 2. Continued

LG6L DN	DIN PN10 FLANGE					DIN PN16 FLANGE					DIN PN25 FLANGE				ISO PN20 FLANGE				L4		
	Thread	L2	Qty	L3	Qty	Thread	L2	Qty	L3	Qty	Thread	L2	Qty	L3	Qty	Thread	L2	Qty		L3	Qty
80	M16	60	8	70	8	M16	60	8	70	8	M16	65	8	75	8	M16	65	4	75	4	16
100	M16	65	8	75	8	M16	65	8	75	8	M20	75	8	85	8	M16	70	8	80	8	19
125	M16	70	8	80	8	M16	70	8	80	8	M24	80	8	90	8	M20	75	8	85	8	20
150	M20	75	8	85	8	M20	75	8	85	8	M24	85	8	95	8	M20	75	8	85	8	20
200	M20	80	8	90	8	M20	80	12	90	12	M24	90	12	100	12	M20	80	8	90	8	23
250	M20	85	12	95	12	M24	85	12	95	12	M27	95	12	105	12	M24	95	12	105	12	26
300	M20	90	12	100	12	M24	95	12	105	12	M27	105	16	115	16	M24	100	12	11	12	30
350	M20	90	16	100	16	M24	95	16	105	16	M30	11	16	120	16	M27	105	12	115	12	35
400	M24	100	16	120	16	M27	110	16	130	16	M33	125	16	145	16	M27	115	16	135	16	38

LG7L DN	DIN PN10 FLANGE					DIN PN16 FLANGE					DIN PN25 FLANGE				ISO PN20 FLANGE				L4		
	Thread	L2	Qty	L3	Qty	Thread	L2	Qty	L3	Qty	Thread	L2	Qty	L3	Qty	Thread	L2	Qty		L3	Qty
80	M16	60	8	70	8	M16	60	8	70	8	M16	65	8	75	8	M16	65	4	75	4	16
100	M16	65	8	75	8	M16	65	8	75	8	M20	75	8	85	8	M16	70	8	80	8	19
125	M16	65	8	85	8	M16	65	8	85	8	M24	80	8	100	8	M20	75	8	95	8	20
150	M20	75	8	95	8	M20	75	8	95	8	M24	85	8	105	8	M20	80	8	100	8	20
200	M20	80	8	100	8	M20	80	12	100	12	M24	90	12	110	12	M20	80	8	100	8	23
250	M20	85	12	105	12	M24	85	12	105	12	M27	95	12	115	12	M24	90	12	110	12	26
300	M20	90	12	110	12	M24	95	12	115	12	M27	105	16	125	16	M24	95	12	115	12	30
350	M20	90	16	110	16	M24	95	16	115	16	M30	110	16	130	16	M27	105	12	125	12	35
400	M24	100	16	120	16	M27	110	16	130	16	M33	125	16	145	16	M27	115	16	135	16	38

LG8M DN	DIN PN25 FLANGE					DIN PN40 FLANGE					ISO PN50 FLANGE					L4
	Thread	L2	Qty	L3	Qty	Thread	L2	Qty	L3	Qty	Thread	L2	Qty	L3	Qty	
80	M16	65	8	95	8	M16	65	8	95	8	M20	75	8	105	8	16
100	M20	70	8	100	8	M20	70	8	100	8	M20	75	8	105	8	19
150	M24	85	8	115	8	M24	85	8	115	8	M20	85	12	115	12	25
200	M24	90	12	120	12	M27	100	12	130	12	M24	105	12	135	12	34
250	M27	110	12	140	12	M30	120	12	150	12	M27	125	16	155	16	42
300	M27	110	16	140	16	M30	120	16	150	16	M30	135	16	165	16	45
350	M30	125	16	155	16	M33	135	16	165	16	M30	145	20	175	20	50
400	M33	135	16	165	16	M36	150	16	180	16	M33	155	20	185	20	55

When mounting the valve it must be in a closed position and be carefully centred between the pipe flanges so that the turning disc does not touch the pipe edge or flange gaskets.

In valves with certain nominal sizes some flange bolts do not pass the valve body. The valve body is thus equipped with holes (see Section 3.2.1).

Ensure that the disc can turn to the open position after preliminary tightening of the flange bolts. The actuators of control valves are usually equipped with position stops which usually only allow the disc to open 80°.

Length of stud bolts in Table 2 are based on:

- gasket thickness of 1.5 mm
- heavy nuts with washers
- flange thickness of weldneck flanges per DIN or ISO

3.3 Actuator

When installing the actuator on the valve, make sure that the valve package functions properly. See instructions for installing in Section 6.

Observe the space needed for removal of the actuator.

The upright position is recommended for the actuator cylinder.

The actuator must not touch the pipeline, because pipeline vibration may damage it or interfere with its operation.

In some cases, e.g. when a large-size actuator is used or when the pipeline vibrates heavily, supporting the actuator is recommended. Please contact Metso Automation for further information.

4 COMMISSIONING

Ensure that no dirt or foreign objects are left inside the valve or pipeline. Flush the pipeline carefully. Keep the valve 30-40° open during flushing.

When starting up the pump, ensure that the valve in the pipeline is closed or, at the very most, 20° open.

A waterhammer, which follows the start-up of high-capacity pumps, creates a torque peak in the disc. This can damage the pin connection between disc and shaft when the valve is 30-90° open.

The packing construction is live loaded. So tightening the packing screws during service is not necessary.

5 SERVICE

CAUTION:

Observe the safety precautions listed in Section 1.6 before starting work!

CAUTION:

For safety reasons the retaining plates **MUST** always be installed according to Section 5.2



5.1 General

Butterfly valves require no regular maintenance. If the valve should require maintenance for some reason, a few simple service measures are normally sufficient.

The numbers in parentheses refer to the parts list and the exploded view of the valve in Section 9.

NOTE:

If you send the valve to the manufacturer for repair, do not dismantle it. Clean the valve carefully, including the inside. For safety reasons, inform the manufacturer of the type of medium used in the valve.

NOTE:

Always use original spare parts to ensure that the valve functions as intended.

5.1.1 Removing the valve from the pipeline

CAUTION:

Do not dismantle the valve or remove it from the pipeline while the valve is pressurized!

It is generally most convenient to detach the actuator and its auxiliary devices (see Section 6), before removing the valve from the pipeline. If the valve package is small or difficult to access, it may be more practical to remove the entire package at the same time.

Ensure that the valve is not pressurized and the pipeline is empty. Ensure that the medium cannot flow into the section where servicing is to take place. The valve must be in a closed position when removing.

Support the valve carefully with a hoist. Place ropes carefully and unscrew the pipe flange bolts. Ensure that the ropes are positioned correctly. Lift valve correctly (see Fig. 3).

5.2 Replacing the gland packing

CAUTION:

Do not dismantle the valve or remove it from the pipeline while the valve is pressurized!

PTFE V-rings are used as a standard gland packing and graphite rings for high temperature constructions. The packing construction is live loaded as standard. So tightening the packing screws during service is not necessary.

The gland packing (20) must be changed if leakage occurs even after the hex nuts (25) have been tightened.

- Make sure the valve is not pressurized.
- Unfasten the nuts (25) and remove the TA-Luft kits (44), the retaining plates (42) and the gland (9).
- Remove old packing rings (20). Do not damage the surfaces of the packing ring counterbore and shaft. It is not necessary to change anti-extrusion ring (22).
- Clean the gland packing and packing ring counterbore. Install new set of packings (V-ring or graphite). Slip the graphite rings onto the shaft. Ensure that there are no burrs in the keyway groove which could damage the packing.
- Install the gland.
- Mount the retaining plates with the text UPSIDE on top (see Fig. 9).

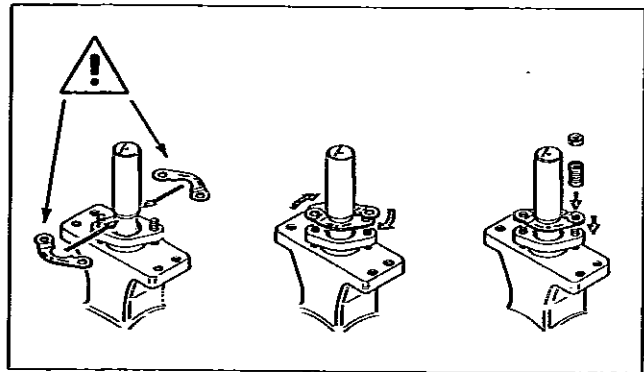


Fig. 9. Mounting the retaining plate

Table 3. Gland packing nut tightening torques

PTFE V-ring

LW6L, LG6L, LW7L, LG7L	LW8M, LG8M	Shaft diameter	Thread	Torque
DN	DN	mm		Nm
80	80	15	M8	3.5
100, 125, 150	100	20	M8	4.3
200	150	25	M10	9.3
250	-	30	M10	10.8
300	200	35	M10	12.2
350	-	40	M10	13.7
400	250	45	M14	32
	300	50	M14	38
	350/400	55	M14	46

Graphite packing

LW6L, LG6L, LW7L, LG7L	LW8M, LG8M	Shaft diameter	Thread	Torque
DN	DN	mm		Nm
80	80	15	M8	7.4
100, 125, 150	100	20	M8	9.3
200	150	25	M10	13.3
250	-	30	M10	15.4
300	200	35	M10	17.5
350	-	40	M10	19.6
400	250	45	M14	44
	300	50	M14	52
	350/400	55	M14	59

- Mount the TA-Luft kits.
- Place the nuts on the studs and tighten the gland packings while the valve is not pressurized. Use recommended torques, which are values of lubricated nuts (see Table 3).

5.3 Valve leakage

Valve leakage is not always caused by a damaged seat ring or disc. The reason can also be that the disc is not in the closed position.

- Check the position of the actuator relative to the valve. The screws may be loose or the bracket damaged.
- Check the adjustment in the closed position (see Section 6.4).

Table 4. Clamp ring screw torque

Screw size	Torque, Nm
M6	9
M8	16
M10	25
M12	37
M14	50
M16	70

The marking line parallel to the disc on the valve shaft head shows roughly the closed position of the disc (see Fig. 10).

Pressure chocks can cause loosening of the pin connection between disc and shaft; consequently the shaft moves while the disc remains in place and this prevents full closing of the disc.

If the reason for the leakage does not become apparent after doing the above, the valve must be disassembled for replacing the parts.

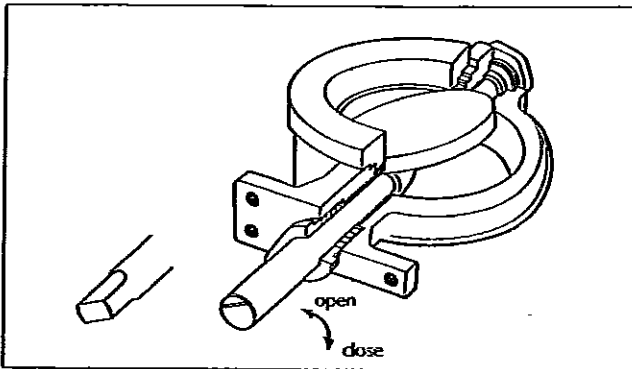


Fig. 10. Open and closed positions of the valve

5.4 Replacing the seat ring

CAUTION:

Do not dismantle the valve or remove it from the pipeline while the valve is pressurized!

- Ensure that the valve is not pressurized.
- Remove the valve from the pipeline. The valve must be in a closed position during removal. Follow the lifting methods shown in Section 3.
- Remove the clamp ring (2) by untightening the screws (27).
- Remove the old body seal (19) and the seat ring (4). Change the seat ring if it is damaged.
- Clean all the surfaces of the seats and check the surface of the seat ring.

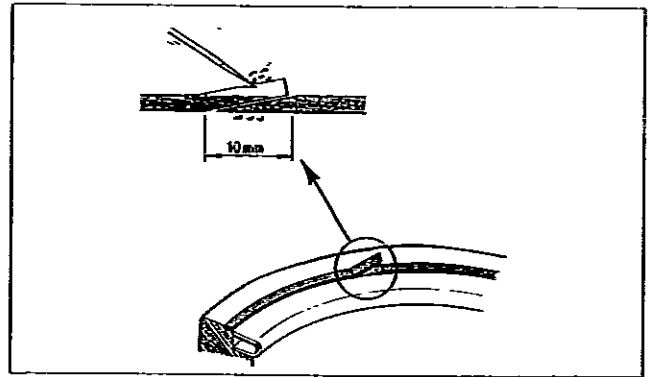


Fig. 11. Mounting the body seal

- Check also the condition of the disc. A damaged disc must be changed (see Section 5.5).
- Check the condition of the pin connection. Repair it if necessary (see Section 5.5).
- Mount a new, self-adhesive body seal (19) into the body. The surface must be clean and free of grease. Handle the ends of the seal according to Fig. 11.
- Spray a thin layer of dry lubricating fluid, e.g. Molykote 321R or equivalent, into the seat groove, surfaces of the clamp ring and seat ring.
- Centre the seat ring (4) carefully into its groove and turn the disc to maintain light contact with the seat.
- Mount the clamp ring and tighten the screws (27) lightly.
- Turn the disc slightly open and pull it back to set the seat into the proper position.
- Tighten the screws (27) crosswise and evenly. Recommended torque values for screws are listed in Table 4. An unevenly tightened flange may damage the seat ring. The screw heads must be below the flange surface in lug type valves.
- Check the position between the seat ring and the disc. The valve closes clockwise (see Fig. 10).
- Mount the actuator into the valve. Adjust the closed position limit and check the open position limit (see Section 6.4).

5.5 Replacing the disc, shafts and bearings

5.5.1 Disassembling the valve

The pin connection of the disc must be opened by drilling for changing the disc (3), shafts (11, 12) and bearings (15, 16).

- Remove the valve from the pipeline and the actuator from the valve.
- Remove the clamp ring (2) and seat ring (4) according to section 5.4.
- Set the valve horizontally on a sturdy surface so that the flat side of the disc lays against the surface (see Fig. 12).
- Drill the holes carefully to the centre of the pins (14). Choose a drill 0.2-0.5 mm smaller than the diameter of the pin.
- Drill the holes deep, but not enough to reach the disc.
- Pull the pins out.
- Dismantle the gland packing including anti-extrusion ring (22) and sheet ring (21) according to Section 5.2.
- Detach the screws (26) and the blind flange (10) and remove the gasket (18).
- Place rubber strips or other protection between the disc edge and the body and remove the shafts (see Fig. 13).

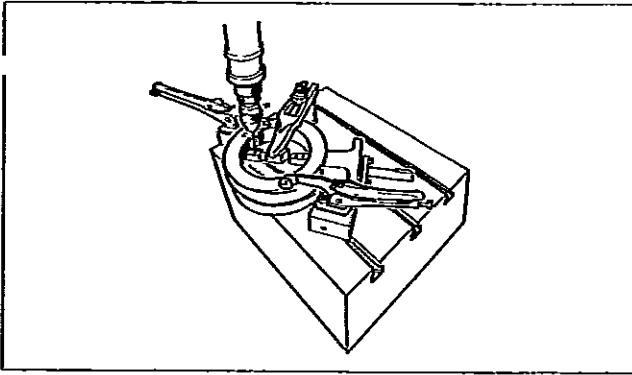


Fig. 12. Drilling the pins

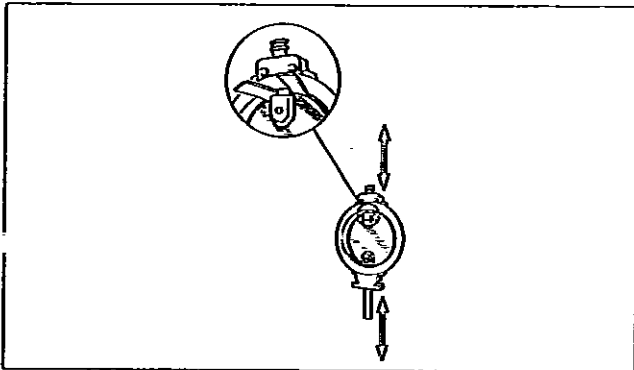


Fig. 13. Protecting the disc during disassembly and assembly

- Remove the bearings (15, 16).
- Clean and check all parts carefully.

5.6 Assembling the valve

- Replace damaged parts with new ones.
- Set the disc and the shaft together beforehand. In case the pin holes have been damaged during removal of the old pins the holes can be drilled to a larger pin size. File off any burrs from the shafts.

The bearing material of the standard construction valves is PTFE-impregnated stainless steel net.

The bearings for the high temperature valves (N and H-constructions) are cobalt alloy bushings which are mounted into the body together with the shafts.

- Mount the bearings into the body (see Fig. 14).
- High temperature-construction:** Mount the bearing into the shaft. Spray a thin layer of dry lubricating fluid, e.g. Molykote 321R or equivalent, into the inside surface of the bushing and the shaft bearing groove. Press the

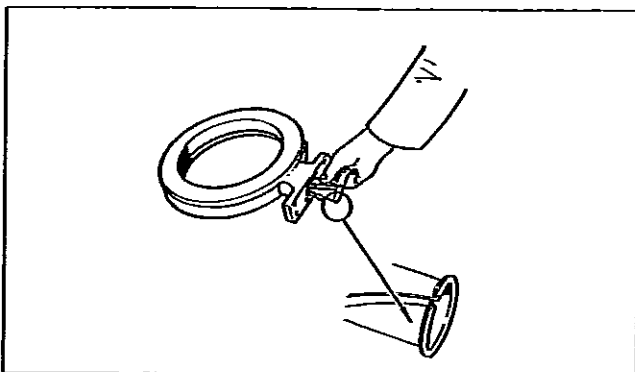


Fig. 14. Mounting the standard bearings

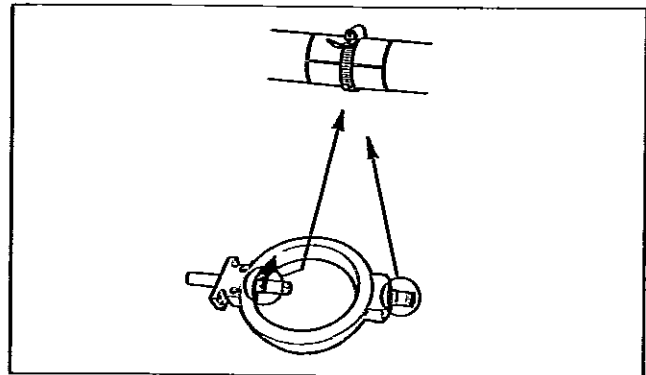


Fig. 15. Mounting the metal bearings

bushing with a tightening ring into the shaft bearing groove and fit the shaft with the bearings carefully into the body through the tightening ring (see Fig. 15).

- Place the disc horizontally on a surface so that the flat side of the disc lays against the surface. Lift the body around the disc so that the shaft bores are aligned with the bores in the disc. Protect the disc (see Fig. 13).
- Press the shafts into the disc drillings. Align the pin holes. The shaft (11) position against the disc must be according to Fig. 10.

NOTE:
Use only pins supplied by the manufacturer!

NOTE:
The pins must be pressed with enough force to deform them so that the connection will be free from backlash.

- Support the disc well in a horizontal position during mounting of the pins. Push the new pins into the holes and press them in a press to final form (see Fig. 16). Use a smaller tool than the pin diameter. See table 5 for forces.

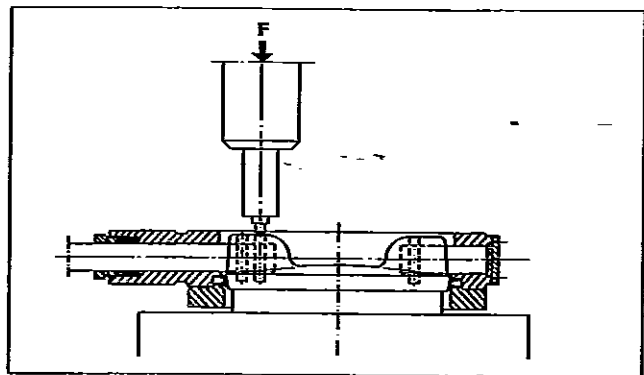


Fig. 16. Pressing the pins

Table 5. Pressing the pins, forces

Pin diameter, mm	Force, kN	Pin diameter, mm	Force, kN
5	45	10	125
6	60	12	180
8	80	15	280

- Install the gasket (18) and the blind flange (10). Screws of the blind flange must be tightened evenly. An unevenly tightened flange will damage the seat.
- Install the seat ring. See details in Section 5.4.
- Install the body seal (19) and the clamp ring (2). See details in Section 5.4.
- Install the gland packing (see Section 5.2).
- Check the contact line between the seat ring and the disc (see Fig. 10).

6 DETACHING AND INSTALLING THE ACTUATOR

6.1 General

CAUTION:

When handling the valve or the valve package, bear in mind its weight!

NOTE:

Do not turn the disc more than 90° as this could damage the seat. The valve is so constructed that the disc operates only between 0-90°.

CAUTION:

The actuator cannot be removed from the valve when the pipeline is under pressure as a result of dynamic torque!

NOTE:

Before dismantling, carefully observe the position of the valve with respect to the actuator and positioner/limit switch so as to ensure that the package can be properly reassembled.

The actuator is factory-mounted on the valve and the stroke limit stop screws are adjusted in advance. As a result of the dynamic torque the actuator can not be removed from the valve when the pipeline is under pressure.

6.2 Detaching the B1 series actuators

- Disconnect the actuator from its power source; detach the air supply pipe and control signal cables or pipes from their connectors.
- Unscrew the bracket screws.
- Detach the actuator using a suitable extractor. The correct tool can be ordered from the manufacturer (see Fig. 17).
- Remove the bracket and coupling, if any.

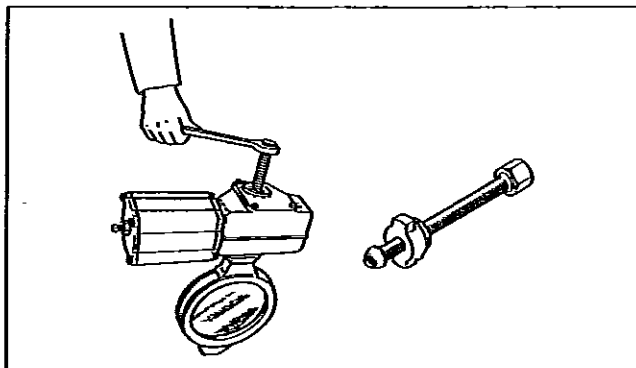


Fig. 17. Removing the B1 series actuator with an extractor

6.3 Detaching the EC and EJ actuators

- Detach the positioner, or any other accessory, from the actuator, and detach the coupling plate from the drive shaft.
- Loosen the bushing by turning the tightening screw counter-clockwise. The tightening screw also acts as an extractor.
- Detach the actuator finally from the valve after the screws that attach the actuator to the valve have been removed.
- Observe the respective positions between the actuator and valve and also between the key and keyway before removal. Attaching the actuator back is then easier.

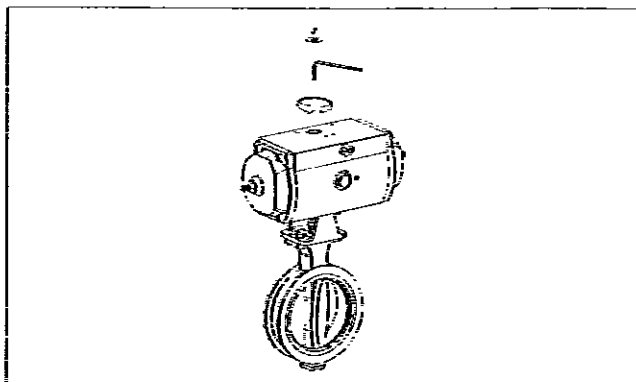


Fig. 18. Detaching the EC/EJ actuator

6.4 Installing the B1 series actuator

- Turn the valve to the closed position before mounting the actuator.
 - Clean the shaft and the shaft bore and file off any burrs which could interfere with mounting. Protect the joint surfaces from corrosion, e.g. with Cortec VCI 369.
 - If a bushing is required between the actuator shaft bore and the valve shaft, mount it first in the actuator shaft bore.
 - The valve keyway is on the side opposite the flat side of the disc. The actuator shaft bore has two keyways set 90° apart.
 - For double-acting cylinder actuator, B1C, and spring-return cylinder actuator, B1J (spring-to-close), choose the keyway which establishes the piston in its upper position (at the top end of the cylinder) when the valve is closed.
- In the spring-return cylinder actuator B1JA (spring-to-open), choose the keyway which establishes the piston in its lower position when the valve is open.
- Check visually that the actuator is correctly positioned relative to the valve. Tighten all the fastening screws as tightly as possible.
 - Adjust the stop screws to the closed position (see Section 6.4).
 - The opening angle in a control valve is usually limited by a bolt to 80°. The opening angle of a shut-off valve is 90°.
 - When a shaft extension is required, the sizing of the shaft extension must be discussed with the valve manufacturer.

6.5 Installing EC and EJ actuators

The actuator is attached to a bracket via an ISO 5211 standard mounting interface. The actuator is adapted to the valve shaft with a separate bushing. The bushing (II + III) is a two-piece cone-shaped bushing, which is tightened firmly with a tightening screw (I) around the valve shaft.

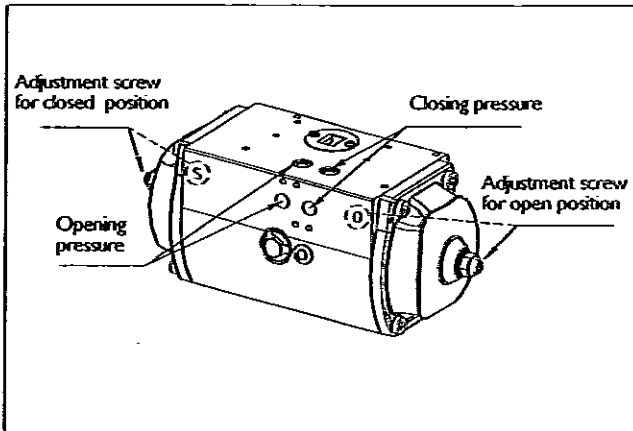


Fig. 19. Actuator connections

- Mount the bushing and the tightening screw from the mounting interface side of the actuator, according to Fig. 21. Insert cylindrical pins (III) in the bushing slots, these must be directed into the corresponding slots in the actuator during tightening. Before the installation of the bushing and the tightening screw, remove impurities such as old threadlocking material from the threads of the tightening screw, and apply Loctite 243 or similar threadlock carefully to the threads, as shown in Fig. 21. Turn the tightening screw from inside the actuator shaft using a suitable hex key, Fig. 21.
- Prior to installation, the correct shaft position of the valve has to be checked. In the key-type bushing there are four keyways, two of which are intended for valves with DIN key and two for valve shafts with ANSI key (for example M1 and M2 valves). The DIN keyway is located in the middle of the half bushing, and the ANSI keyway is located in the split between the bushing halves. Fig. 20 shows the keyway position when the actuator is in a closed position.
- The open or closed positions of the actuator can be identified either by using compressed air, see Fig. 19, or by checking the position of the pointer at the end of the drive shaft. The actuator is closed if the pointer on the coupling plate is transverse to the direction of the actuator's main shaft.
- In the bushing having blade head connection checking the right position is more simple. Use the pointer in the end of the drive shaft to see the correct position
- Mount the actuator to the valve bracket with four screws. The tightening screw of the bushing should be loosened before mounting, to allow the shaft to fit easily into the actuator.
- The actuator construction allows axial movement of the drive shaft. Check, before the screw is tightened, that the drive shaft is in the upper position of its axial movement, which is its normal position (the mounting position shown in Fig. 22). Checking is important, as the actuator shaft drops down slightly when the screw is tightened. The drive shaft axial movement can be

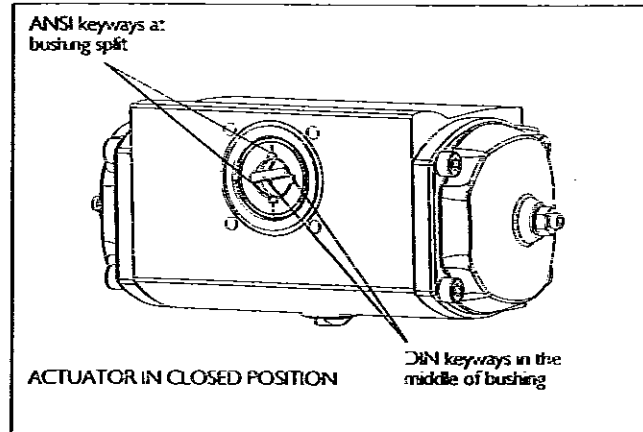


Fig. 20. Keyway positions on the actuator

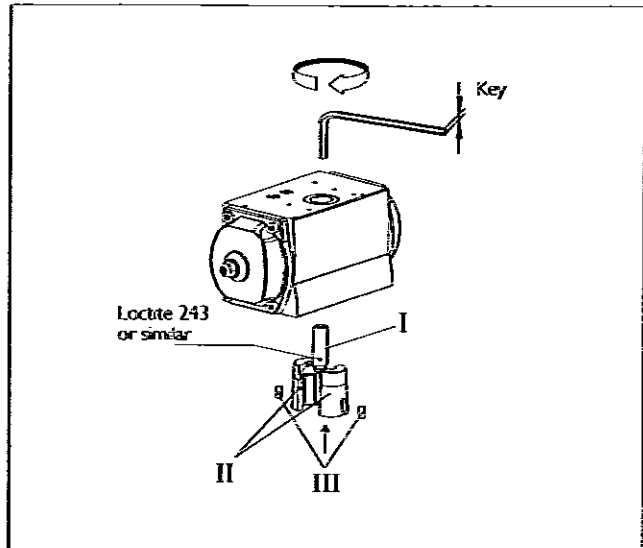


Fig. 21. Cone bushing installation

observed and measured before attachment to a valve. The actuator drive shaft is in the upper position when its upper surface conforms to Table 6 (see Fig. 22).

- The drive shaft will automatically find its correct position when the tightening screw is tightened, if the installation tool is used (see Figure 22). The installation tool is attached instead of the coupling plate using M4 screws with the drive shaft in upper position (before the valve is installed). Tighten the screws in such a way that the tool is tightened against the upper surface of the housing.
 - Install the actuator on the valve and attach the attachment screws normally. Finally, tighten the tightening screw according to Table 6. The required torque is also marked on a plate close to the drive shaft on the actuator housing. The installation tool is removed, and the coupling plate is reattached.
- The valve may malfunction if the tightening of the connection has been carried out improperly.**
- Finally, the extreme positions of the valve are adjusted with the stop screws at the ends of the actuator. The location of the screws for adjusting the Close and Open positions of the valve are marked with letters on the ends of the actuator housing (see Figure 19).

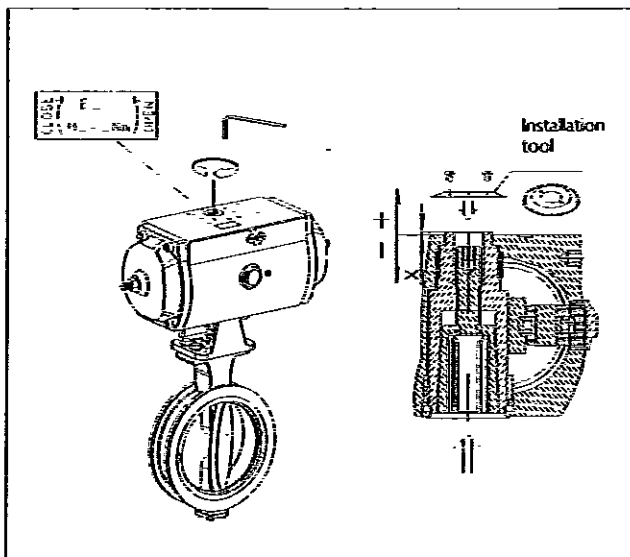


Fig. 22. Tightening of the cone bushing

Table 6. Mounting faces, tightening screws and drive shaft clearances

Size	Mounting	Thread	Key	Nm	-X upper pos. (mm)	-X lower pos. (mm)
EC/EJ05	F05	M12	6	25	4.0	1
EC/EJ07	F07	M16	8	50	1.5	-2
EC/EJ10	F10	M20	10	100	2.5	-2
EC/EJ12	F12	M24	14	200	3.5	-2
EC/EJ14	F14	M36	19	700	4.5	-2

6.6 Detaching and installing other actuator types

See actuator's manual for details.

6.7 Stop screw adjustment

6.7.1 General

Close the metal seated butterfly valve by turning the disc with a torque against the seat. Choose the torque from Tables 7 and 8 for adjusting the stop screw to the closed position of the actuator. Try not to exceed the given values since excessive torque would strain the seat and the joint between the disc and the shaft. Always readjust the stop screw after changing the seat and after mounting the actuator.

6.7.2 Actuators other than tabulated

Close the valve as per the tabulated torque M_c and adjust the stops accordingly. Note the increased torque created by the actuator while the valve is closed.

NOTE:

Metso Automation accepts no responsibility for compatibility of actuators not installed by Metso Automation.

6.7.3 Changing the mounting position

CAUTION:

The actuator must not be removed from the valve in a pipeline under pressure as result of dynamic torque!

Always remove the actuator from the valve shaft before mounting it into another key groove. Readjust the closed position limit as instructed.

If manually operated, the valve should close when the handwheel is turned clockwise. In a double-action cylinder, the piston must be in the upper position of the cylinder when the valve is closed. In this position the actuator creates maximum torque. Do not turn the disc more than 90° as this could damage the seat.

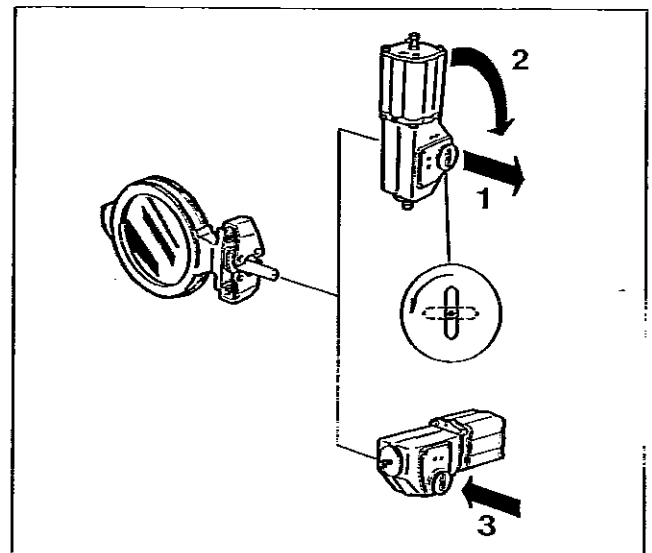


Fig. 23. Changing the mounting position

6.7.4 Double-acting cylinder actuator B1C

- Apply the tabulated shut-off pressure P_c to the air connection at the cylinder base.
- With the stop screw removed, check through the air connection hole that the piston does not touch the cylinder end. If it does, loosen the bracket screws and turn the actuator clockwise to increase the adjusting margin.
- Turn the closed position stop screw until it touches the piston, then turn back 1/4 turn and lock up. Leakproof with Loctite 225 or other non-hardening sealant. The sealant must not flow inside the cylinder.
- An extra long screw is needed for opening angles < 80°.

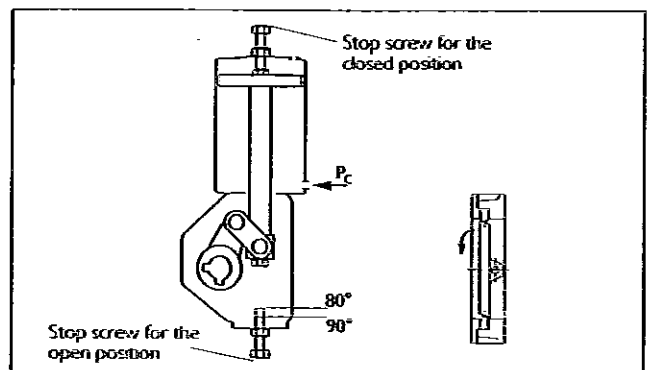


Fig. 24. Cylinder actuator, series B1C

6.7.5 Double-acting diaphragm actuator EC

Follow instructions given in Section 6.7.4. See also Fig. 19.

6.7.6 Spring-return cylinder actuator B1J

Spring-to-close

- Before mounting the cylinder, screw in the closed position stop screw completely.
- The table overleaf indicates *) *spring* when the spring-created torque does not exceed the maximum permitted closing torque M_c . Otherwise, apply the tabulated pressure P_c into the air connection at the cylinder end against the spring force. The stop screw must not be removed when the cylinder is pressurized! Open the stop screw until it does not touch the piston.
- Turn the closed position stop screw until it touches the piston, then turn back 1/4 turn and lock up. Leakproof with Loctite 225 or other non-hardening sealant. The sealant must not flow inside the cylinder.
- After adjusting, check the adjusting margin through the air connection hole. The piston must not touch the cylinder end. If necessary, increase the margin by loosening the bracket screws and turning the actuator clockwise.
- An extra long screw is needed for opening angles $< 80^\circ$.

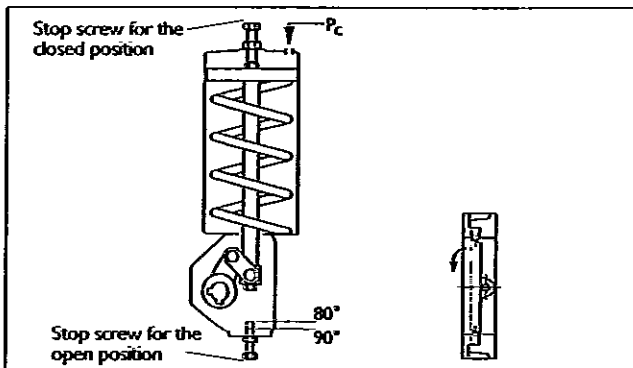


Fig. 25. Cylinder actuator, series B1J

6.7.7 Spring-return cylinder actuator B1JA

"Spring to open"

- The actuator being unpressurized the valve is open. UnscREW the close limit stop screw (actuator housing). Apply tabulated shut-off pressure P_c to the air connection at the cylinder bottom end against the spring force to close the valve.
- Check through the stop screw hole that the piston rod does not touch the cylinder top end. If it does, loosen the bracket screws and turn the actuator clockwise to increase the adjusting margin.
- Turn the closed position stop screw until it touches the piston, then turn back 1/4 turn and lock up. Leakproof with Loctite 225 or other non-hardening sealant. The sealant must not flow inside the cylinder.
- An extra long screw is needed for opening angles $< 80^\circ$

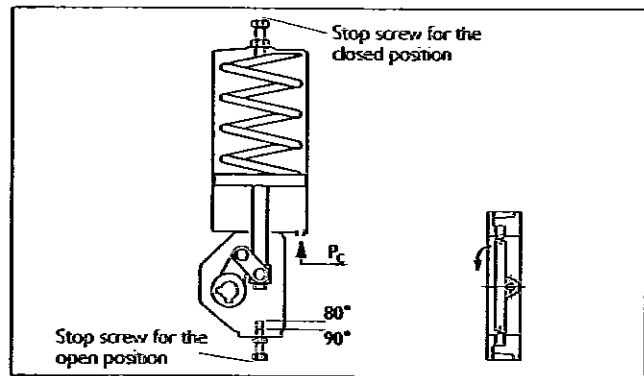


Fig. 26. Cylinder actuator, series B1JA

6.7.8 Spring-return diaphragm actuator EJ

Spring-to-close"

Follow instructions given in Section 6.7.6. See also Fig. 19.

Spring-to-open"

Follow instructions given in Section 6.7.7. See also Fig. 19.

6.7.9 M-series operator

- Close the valve as per the tabulated primary torque M_1 (handwheel torque) given in Tables 8 and 9.
- Tighten the closed position stop screw until it touches the linkage, then turn back 1/4 turn and lock up with Loctite 225.

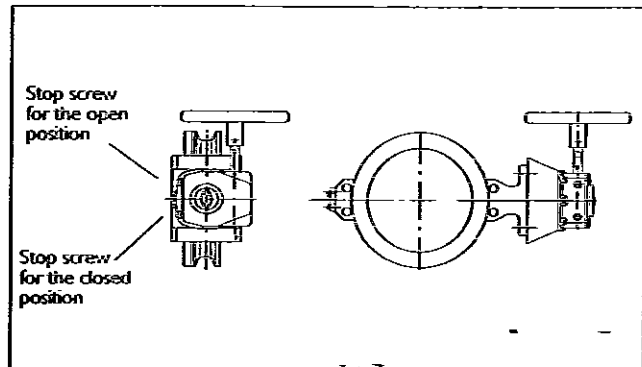


Fig. 27. Actuator, series M

6.7.10 Hand lever RH

- Mount the hand lever on the valve, but do not fasten hex screws (A). Turn the lever using force F in Table 6.
- When closing torque is applied, turn the housing (B) cog of the dosing limit to contact with the lever arm. Fasten hex screws (A).

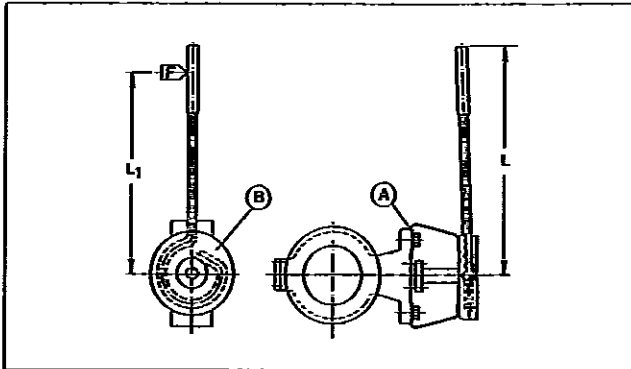


Fig. 29. Hand lever, series RH

Table 7. Hand lever RH, adjustment values

Size DN	L mm	L1 mm	Torque		F	
			Nm	lbf ft	N	lbf
80	400	350	40	30	115	26
100	400	350	70	52	200	45
125	400	350	100	74	285	63
150	500	450	135	100	300	67

6.7.11 Electric operator

Instructions for adjustment are given in a separate leaflet, code D304568, which is available from the manufacturer.

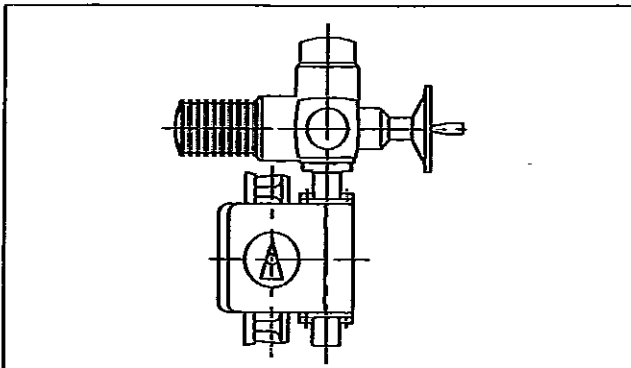


Fig. 28. Electric operator

7 TOOLS

No special tools are needed for servicing the valve. However, we recommend an extractor for removing the actuator from the valve. The tool can be ordered from the manufacturer.

8 ORDERING SPARE PARTS

When ordering spare parts, always include the following information:

- valve type designation (from the identification plate or documents),
- number of the parts list, part number, name of the part and quantity required, or
- number of this manual, part number, name of the part and quantity required.

Table 8. Series LW6L, LW7L, LG6L and LG7L, closing torques

DN SIZE	M _c (Nm) (lbf/ft)	BC and B _j size	BC pc (bar) (psi)	B _j pc (bar) (psi)	B _{JA} pc (bar) (psi)	B _{JK} pc (bar) (psi)	B _{JKA} pc (bar) (psi)	B _{JV} pc (bar) (psi)	B _{V/A} pc (bar) (psi)	EC and E _j size	EC pc (bar) (psi)	E _j pc (bar) (psi)	E _{JA} pc (bar) (psi)	Q _P actuator	Spring-to-clos _a (bar) (psi)	Spring-to-open (bar) (psi)	Manual operator	Input torque M ₁ (Nm) (lbf/ft)				
80 3"	45-33	6	2.5-36							5				QP2C	0.6-9	3.6-52	AR11	4-3				
		8	2.1-30	0.7	10	3.3-48	0.3	4	2.8-41	1.1	16	4	58	7	3.4-49	0.1	1	4.2-61	M7	4-3		
		10	1.6-23	1.1	16	2.8-41	0.7	10	2.2-32	1.6	23	3.4	49	10								
100 4"	75-55	6	4.1-59							5				QP2C		4.3-62	AR11	6-4				
		8	3.4-49	0.2	3	3.8-55	*)spring	3.3	48	0.6	9	4.6	68	7								
		9	2.1-30								10	2.3	33	0.7	10	3.7	54					
125 5"	110-80	6	6-87							14				QP3C	0.3	4	3.9	57	AR11	9-7		
		8	5-72	*)spring	4.5	65	3.8		5.5	77	7				QP4C	1	14	3.3	48	M7	10-7	
		9	3-43								10	3.4	49	0.1	1	4.2	61					
150 6"	150-110	6	8.2-119							14				QP3C		4.3	62	AR11	12-9			
		8	2.4-35	0.6	9	3.4	49	0.2	3	2.9	42	1.1	16	4	58	12	1.4	20	1.1	16	3.3	48
		11	1.5-22								14											
200 8"	300-220	10	6.5-94	*)spring	5	72		4.4	64	*)spring	5.6	81	5		QP4C		4.3	62	AR11	14-10		
		11	4.2-61								7				QP5C	0.8	12	3.5	51	M10	27-20	
		12	3.3-48	0.2	3	3.8	55	*)spring	3.2	46	0.8	12	4.3	62	10							
250 10"	500-370	10	1.6-23	0.9	13	3.1	45	0.5	7	2.6	38	1.3	19	3.8	55	*)spring	4.5	65				
		12	5.5-80	*)spring	4.6	67		4	58	*)spring	5.5	80	7		QP5C	0.1	1	4.1	59	AR11	40-30	
		13	3.5-51								10											
300 12"	825-610	16	2.8-41	0.5	7	3.6	52	0	3	4.3	1	14	4.3	62	12							
		17	1.8-26								14	2.6	38	0.5	7	3.7	54					
		13	5.8-84								7											
350 14"	1160-860	16	6.4-93	*)spring	4.9	71		4.3	62	*)spring	5.7	83	14	4.3	62	*)spring	4.6	67				
		17	4.2-61																			
		20	2.3-33	0.6	9	3.4	49	0.2	3	2.8	41	1.1	16	3.9	57	14	4.3	62	*)spring	4.6	67	
400 16"	1650-1220	16	9.5-138							14												
		17	6-87																			
		20	4.7-68	*)spring	4.2	61		3.6	52	0.3	4	4.7	68									
		25	2.4-35	0.6	9	3.4	49	0.2	3	2.8	41	1.1	16	3.9	57							

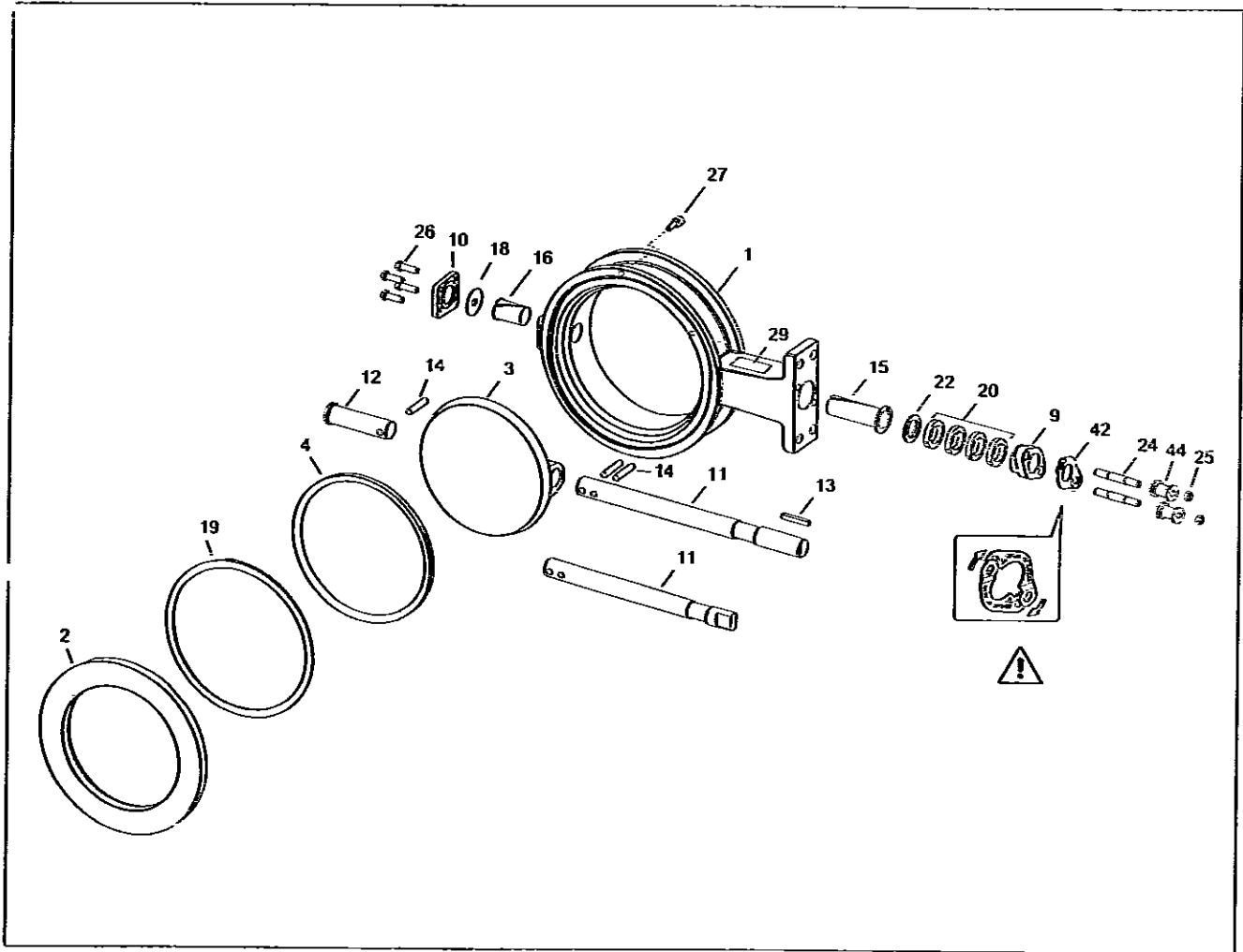
*) spring = spring torque not adequate to reach tightness according to ISO 5208 Rate D, BS 6755 Part 1 Rate D, ANSI/FCI 70.2 Class V, IEC 534-4 or MSS-SP72/1970

Table 9. Series LW8M and LG8M closing torques

DN SIZE	Mc (Nm) (lbf ft)	BC and BJ Size	BC pc (bar) (psi)	BJ pc (bar) (psi)	BJA pc (bar) (psi)	BJK pc (bar) (psi)	BJKA pc (bar) (psi)	BJV pc (bar) (psi)	BJVA pc (bar) (psi)	EC and EJ size	EC pc (bar) (psi)	EJ pc (bar) (psi)	EJA pc (bar) (psi)	QP actuator	Spring-to- close (bar) (psi)	Spring-to- open (bar) (psi)	Manual operator	Input torque M1 (Nm) (lbf ft)
80 3"	45	6	2.5	3.6	4.8	6.4	8.0	9.6	11.2	5	3.4	4.9	6.1	QP2C	0.6	9	AR11	4
	3	8	2.1	3.0	4.0	5.3	6.4	7.7	8.9	7	3.4	4.9	6.1	QP3C	1.1	16	M7	4
100 4"	75	10	1.6	2.3	3.1	4.1	5.4	6.7	8.0	10	2.3	3.3	4.2	QP2C	0.6	9	AR11	6
	55	6	4.1	5.9	7.8	10.1	12.4	14.7	17.0	5	3.4	4.9	6.1	QP3C	1.1	16	M7	4
	8	3.4	4.9	6.4	8.3	10.7	13.1	15.5	17.9	7	3.4	4.9	6.1	QP3C	1.1	16	M7	4
	9	2.1	3.0	4.0	5.3	6.4	7.7	8.9	10.1	10	2.3	3.3	4.2	QP3C	1.1	16	M7	4
125 5"	110	11	1.1	1.6	2.1	2.8	3.6	4.4	5.2	14	2.3	3.3	4.2	QP3C	1.1	16	M7	4
	80	6	6	8.7	11.6	15.5	19.4	23.3	27.2	5	3.4	4.9	6.1	QP3C	1.1	16	M7	4
	8	5	7.2	9.6	12.0	15.5	19.4	23.3	27.2	7	3.4	4.9	6.1	QP4C	1.4	20	M7	10
	9	3	4.3	5.7	7.1	9.1	11.2	13.3	15.4	10	3.4	4.9	6.1	QP4C	1.4	20	M7	10
150 6"	230	10	5	7.2	9.6	12.0	15.5	19.4	23.3	14	2.3	3.3	4.2	QP3C	1.1	16	M7	4
	170	12	1.3	1.9	2.5	3.3	4.1	5.0	5.9	10	2.3	3.3	4.2	QP3C	1.1	16	M7	4
	10	3.2	4.6	6.0	7.4	8.8	10.2	11.6	13.0	5	3.4	4.9	6.1	QP3C	1.1	16	M7	4
	11	3.2	4.6	6.0	7.4	8.8	10.2	11.6	13.0	7	3.4	4.9	6.1	QP3C	1.1	16	M7	4
200 8"	460	11	6.4	9.3	12.2	15.1	18.0	20.9	23.8	14	2.3	3.3	4.2	QP3C	1.1	16	M7	4
	340	12	5	7.2	9.6	12.0	15.5	19.4	23.3	5	3.4	4.9	6.1	QP3C	1.1	16	M7	4
	12	5	7.2	9.6	12.0	15.5	19.4	23.3	23.3	7	3.4	4.9	6.1	QP3C	1.1	16	M7	4
	13	3.2	4.6	6.0	7.4	8.8	10.2	11.6	13.0	10	2.3	3.3	4.2	QP3C	1.1	16	M7	4
250 10"	800	13	5.6	8.1	10.7	13.3	16.0	18.7	21.4	14	2.3	3.3	4.2	QP3C	1.1	16	M7	4
	590	16	4.4	6.4	8.4	10.4	12.4	14.4	16.4	7	3.4	4.9	6.1	QP3C	1.1	16	M7	4
	16	4.4	6.4	8.4	10.4	12.4	14.4	16.4	18.4	10	2.3	3.3	4.2	QP3C	1.1	16	M7	4
	17	2.9	4.2	5.5	7.1	8.7	10.3	11.9	13.5	12	2.3	3.3	4.2	QP3C	1.1	16	M7	4
300 12"	1250	20	2.3	3.3	4.3	5.3	6.3	7.3	8.3	14	2.3	3.3	4.2	QP3C	1.1	16	M7	4
	920	17	4.6	6.7	8.8	10.9	13.0	15.1	17.2	7	3.4	4.9	6.1	QP3C	1.1	16	M7	4
	20	3.6	5.2	6.8	8.4	10.0	11.6	13.2	14.8	10	2.3	3.3	4.2	QP3C	1.1	16	M7	4
	25	1.8	2.6	3.4	4.2	5.0	5.8	6.6	7.4	7	3.4	4.9	6.1	QP3C	1.1	16	M7	4
350 14"	1750	17	6.4	9.3	12.2	15.1	18.0	20.9	23.8	14	2.3	3.3	4.2	QP3C	1.1	16	M7	4
	1290	20	5	7.2	9.6	12.0	15.5	19.4	23.3	7	3.4	4.9	6.1	QP3C	1.1	16	M7	4
	20	5	7.2	9.6	12.0	15.5	19.4	23.3	23.3	10	2.3	3.3	4.2	QP3C	1.1	16	M7	4
	25	2.6	3.8	5.0	6.2	7.4	8.6	9.8	11.0	12	2.3	3.3	4.2	QP3C	1.1	16	M7	4

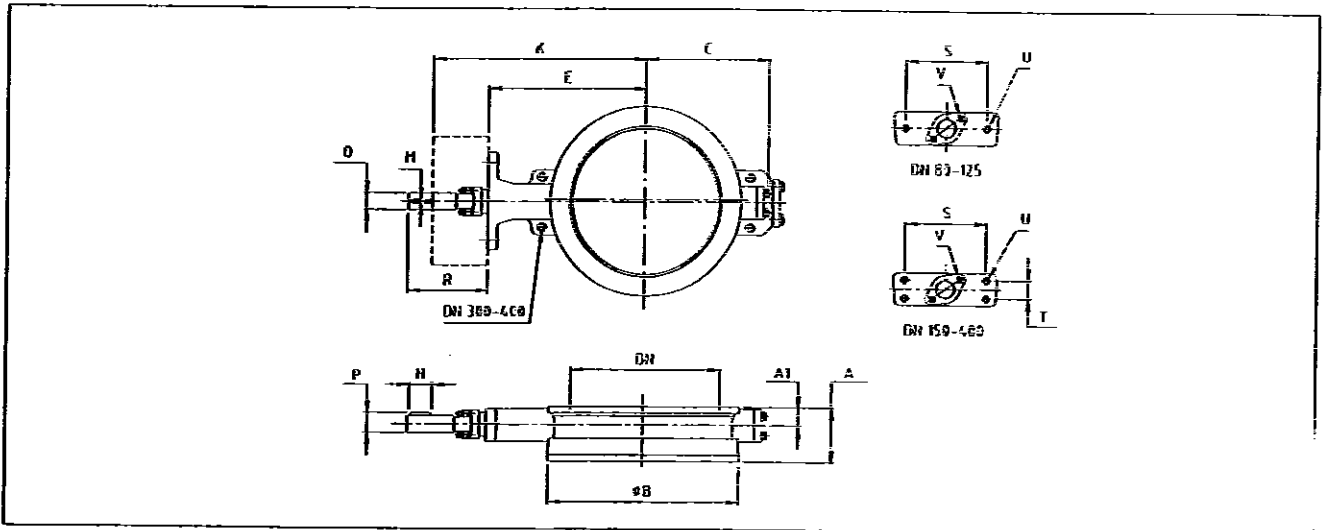
*) spring = spring torque not adequate to reach tightness according to ISO 5208 Rate D, BS 6755 Part 1 Rate D, ANSI/FCI 70.2 Class V, IEC 534-4 or MSS-SP72/1970

9 EXPLODED VIEW AND PARTS LIST



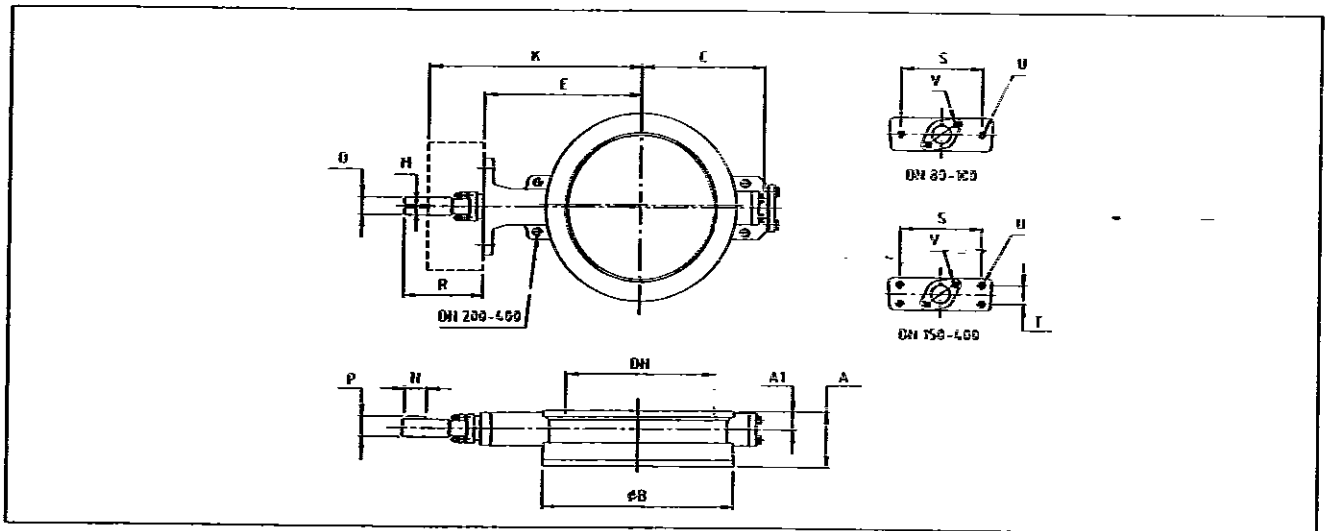
Item	Qty	Description	Recommended spare parts
1	1	Body	
2	1	Clamp ring	
3	1	Disc	
4	1	Seat ring	
9	1	Gland	x
10	1	Blind flange	
11	1	Drive shaft	
12	1	Shaft	
13	1	Key	
14	3	Pin	
15	1	Bearing	
16	1	Bearing	
18	1	Gasket	x
19	1	Body seal	x
20	1 set	Gland packing	x
21	1	Sheet ring	
22	1	Anti-extrusion ring	
24	2	Stud	
25	2	Hexagon nut	
26		Hexagon screw	
27		Hexagon socket screw	
29	1	Identification plate	
42	2	Retaining plate	
44	2	TA-Luft kit	

10 DIMENSIONS AND WEIGHTS



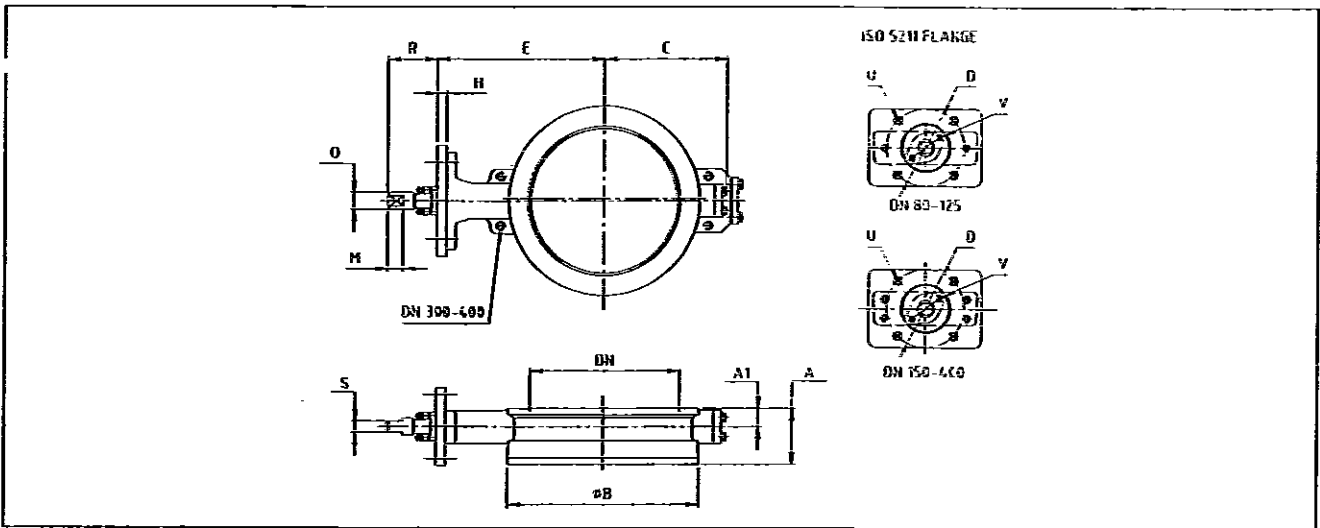
LW6LB, LW7LB, key connection

DN	Dimensions, mm										U Thread	V Thread	Dimensions, mm					Weight kg
	A1	LW6LB A (K1)	LW7LB A (K2)	B	C	E	K	S	T	O			R	M	N	P		
80	18	46	49	128	80	168	248	70	-	M10	M8	15	105	4.76	25	17.0	4	
100	20	52	56	158	100	182	272	90	-	M12	M8	20	125	4.76	35	22.2	6	
125	22	56	64	190	135	205	295	90	-	M12	M8	20	125	4.76	35	22.2	9	
150	23	56	70	212	150	227	317	110	32	M12	M8	20	125	4.76	35	22.2	15	
200	24	60	71	268	160	257	347	110	32	M12	M10	25	135	6.35	46	27.8	20	
250	29	68	76	320	210	290	400	130	32	M12	M10	30	160	6.35	51	32.9	30	
300	32	78	83	378	275	320	430	130	32	M12	M10	35	160	9.52	58	39.1	45	
350	36	92	92	438	290	355	475	160	40	M16	M10	40	188	9.52	68	44.2	70	
400	44	102	102	485	320	405	525	160	40	M16	M12	45	200	12.7	80	50.4	95	



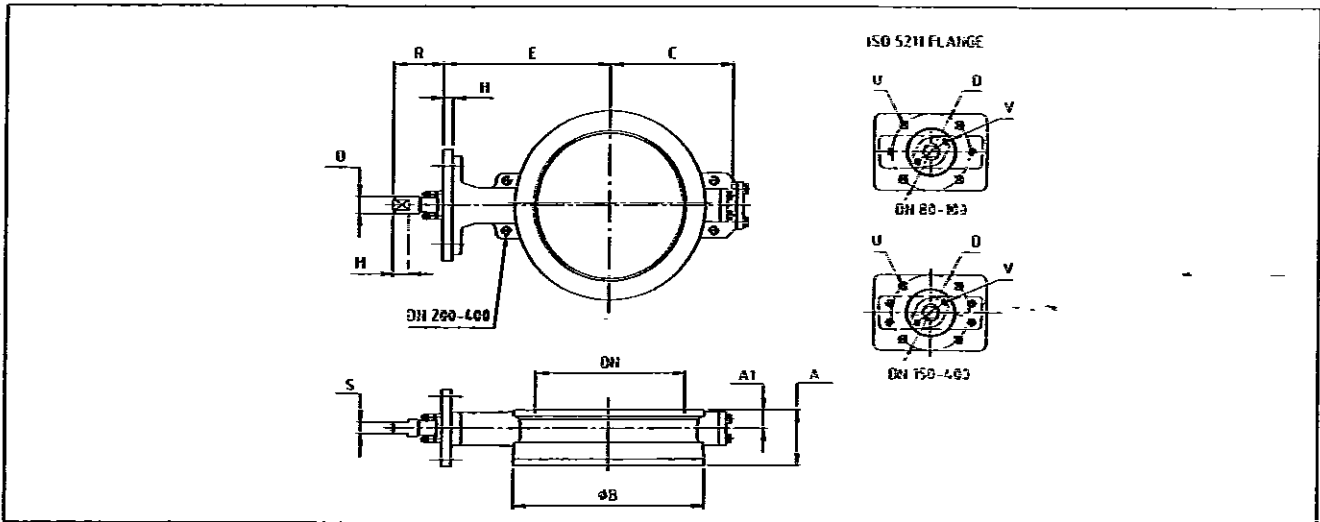
LW8MB, key connection

DN	Dimensions, mm										U Thread	V Thread	Dimensions, mm					Weight kg
	A1	A (K3)	B	C	E	K	S	T	O	R			M	N	P			
80	18	64	128	80	168	248	70	-	M10	M8	15	105	4.76	25	17.0	4		
100	20	64	158	100	182	272	90	-	M12	M8	20	125	4.76	35	22.2	6		
150	27	76	218	145	232	322	110	32	M12	M10	25	135	6.35	46	27.8	20		
200	34	89	276	205	274	364	130	32	M12	M10	35	146	9.52	58	39.1	38		
250	41	114	335	260	320	440	160	40	M16	M14	45	200	12.7	80	50.4	60		
300	46	114	395	300	360	500	160	55	M20	M14	55	230	12.7	90	55.5	85		
350	57	127	450	330	400	540	160	55	M20	M14	55	230	12.7	90	60.6	135		
400	66	140	505	370	440	580	160	55	M20	M14	55	230	12.7	90	60.6	125		



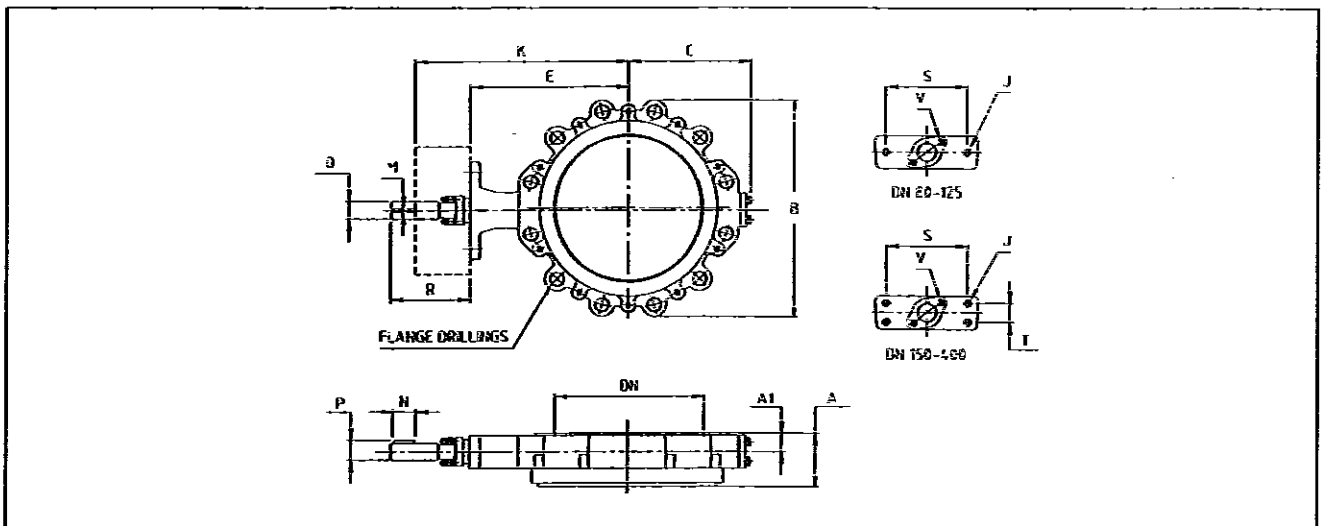
LW6LE, LW7LE, blade connection

DN	Dimensions, mm									U Thread	V Thread	Dimensions, mm				Weight kg
	A1	LW6LE A (K1)	LW7LE A (K2)	B	C	E	H	ISO 5211 Flange	D			O	R	M	S	
80	18	46	49	128	80	188	20	F10	102	M10	M8	14	55	11	11	4
100	20	52	56	158	100	202	20	F10	102	M10	M8	18	55	14	14	6
125	22	56	64	190	135	225	20	F10	102	M10	M8	18	55	14	14	9
150	23	56	70	212	150	247	20	F10	102	M10	M8	18	55	14	14	15
200	24	60	71	268	160	277	20	F12	125	M12	M10	22	70	17	17	20
250	29	68	76	320	210	310	20	F14	140	M16	M10	26	75	19	19	30
300	32	78	83	378	275	340	20	F14	140	M16	M10	33	80	24	24	45
350	36	92	92	438	290	385	30	F16	165	M20	M10	38	75	27	27	70
400	44	102	102	485	320	435	30	F16	165	M20	M12	42	90	30	30	95



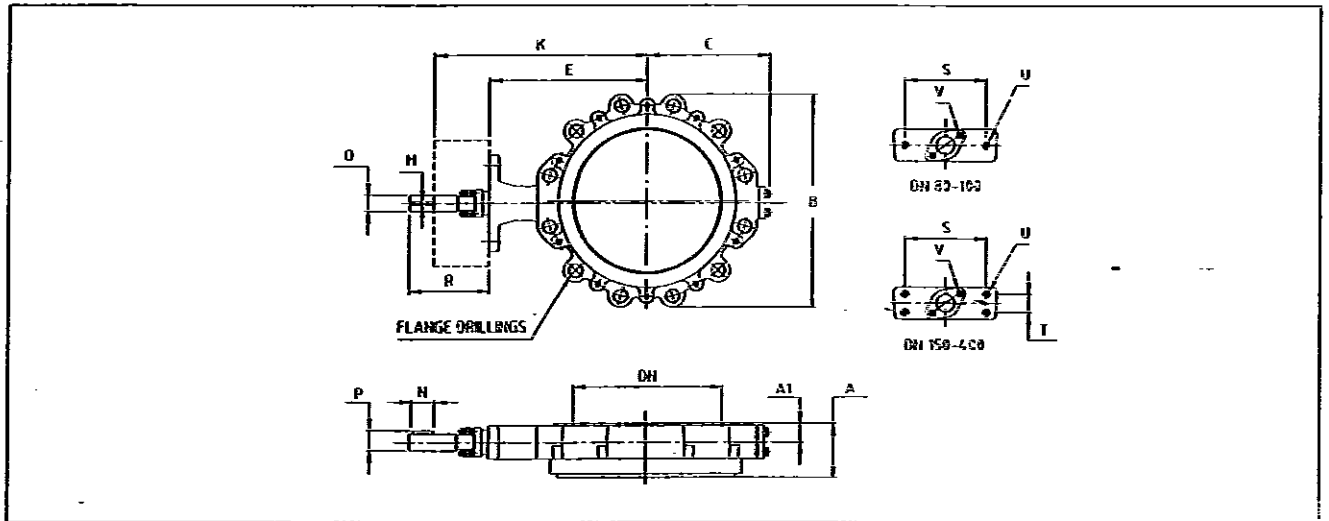
LW8ME, blade connection

DN	Dimensions, mm								U Thread	V Thread	Dimensions, mm				Weight kg
	A1	A (K3)	B	C	E	H	ISO 5211 Flange	D			O	R	M	S	
80	18	64	128	80	188	20	F10	102	M10	M8	14	55	11	11	4
100	20	64	158	100	202	20	F10	102	M10	M8	18	55	14	14	6
150	27	76	218	145	252	20	F12	125	M12	M10	22	70	17	17	20
200	34	89	278	205	294	20	F14	140	M16	M10	33	80	24	24	38
250	41	114	335	260	350	30	F16	165	M20	M14	42	90	30	30	60
300	46	114	395	300	390	30	F16	165	M20	M14	48	97	36	36	85
350	57	127	450	330	430	30	F16	165	M20	M14	53	125	41	41	105
400	66	140	505	370	470	30	F16	165	M20	M14	53	125	41	41	125



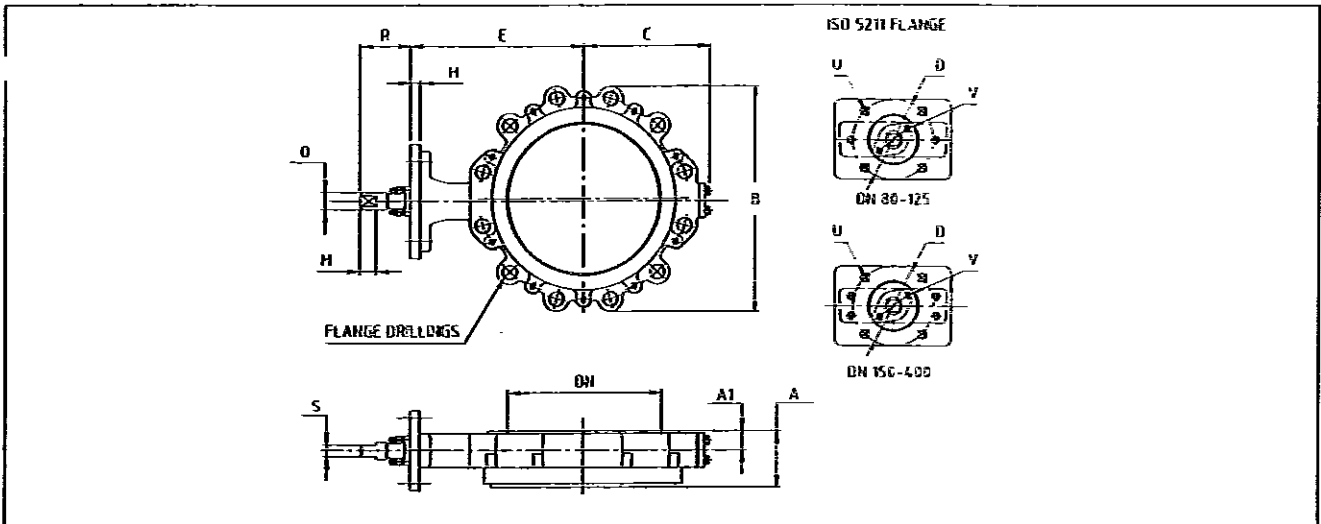
LG6LB, LG7LB, key connection

DN	Dimensions, mm										Flange drillings								Dimensions, mm					Wt. kg	
	A1	LG6LB A (K1)	LG7LB A (K2)	B	C	E	K	S	T	U	V	PN 10		PN 16		PN 25		ISOPN20		O	R	M	N		P
										Thr.	Thr.	Thr.	Qty	Thr.	Qty	Thr.	Qty	Thr.	Qty						
80	17	46	49	205	120	168	248	70	-	M10	M8	M16	8	M16	8	M16	8	M16	4	15	105	4.76	25	17.9	9
100	21	52	56	235	135	182	272	90	-	M12	M8	M16	8	M16	8	M20	8	M16	8	20	125	4.76	35	22.2	14
125	22	56	64	270	145	205	295	90	-	M12	M8	M16	8	M16	8	M24	8	M20	8	20	125	4.76	35	22.2	20
150	22	56	70	300	160	227	317	110	32	M12	M8	M20	8	M20	8	M24	8	M20	8	20	125	4.76	35	22.2	24
200	25	60	71	360	185	257	347	110	32	M12	M10	M20	8	M20	12	M24	12	M20	8	25	135	6.35	46	27.8	34
250	28	68	76	425	220	290	400	130	32	M12	M10	M20	12	M24	12	M27	12	M24	12	30	160	6.35	51	32.9	43
300	32	78	83	485	275	320	430	130	32	M12	M10	M20	12	M24	12	M27	16	M24	12	35	160	9.52	58	39.1	75
350	36	92	92	555	310	355	475	160	40	M16	M10	M20	16	M24	16	M30	16	M27	12	40	188	9.52	68	44.2	95
400	41	102	102	610	340	405	525	160	40	M16	M12	M24	16	M27	16	M33	16	M27	16	45	200	12.7	80	50.4	150



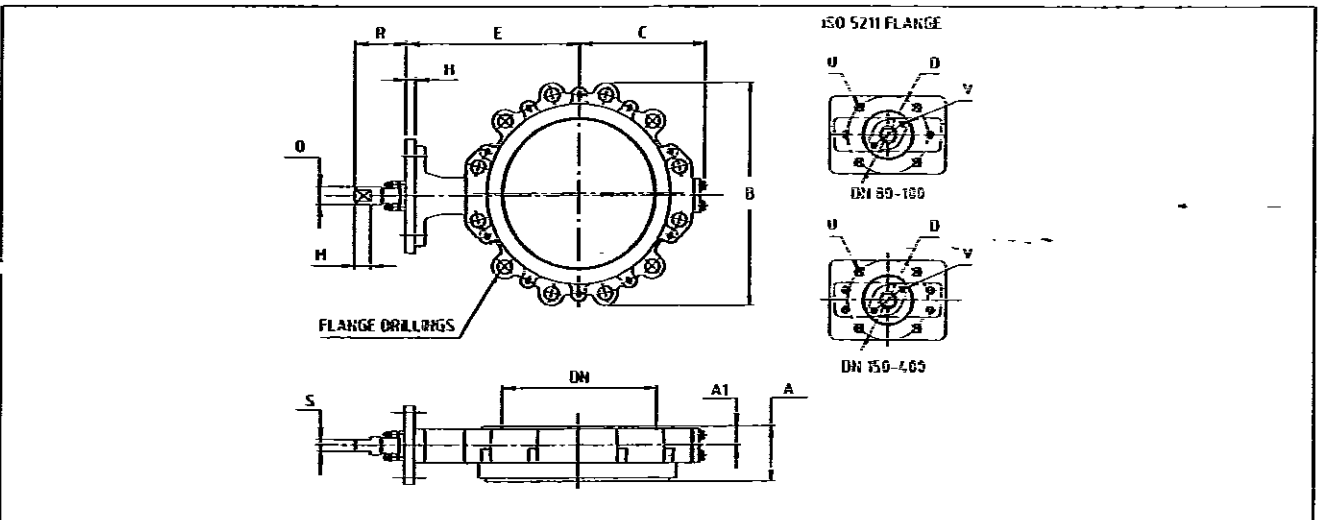
LG8MB, key connection

DN	Dimensions, mm										Flange drillings						Dimensions, mm					Weight kg
	A1	LG8MB A (K3)	B	C	E	K	S	T	U	V	PN 25		PN 40		ISO PN50		O	R	M	N	P	
									Thread	Thread	Thread	Qty	Thread	Qty	Thread	Qty						
80	17	64	205	120	168	248	70	-	M10	M8	M16	8	M16	8	M20	8	15	105	4.76	25	17.0	9
100	21	64	235	135	182	272	90	-	M12	M8	M20	8	M20	8	M20	8	20	125	4.76	35	22.2	14
150	24	76	290	160	232	322	110	32	M12	M10	M24	8	M24	8	M20	12	25	135	6.35	46	27.8	25
200	34	89	365	205	274	364	130	32	M12	M10	M24	12	M27	12	M24	12	35	146	9.52	58	39.1	48
250	41	114	435	260	320	440	160	40	M16	M14	M27	12	M30	12	M27	16	45	200	12.7	80	50.4	90
300	46	114	500	300	360	500	160	55	M20	M14	M27	16	M30	16	M30	16	50	230	12.7	90	55.5	150
350	57	127	565	330	400	540	160	55	M20	M14	M30	16	M33	16	M30	20	55	230	12.7	90	60.6	200
400	62	149	649	370	440	580	160	55	M20	M14	M33	16	M36	16	M33	20	55	230	12.7	90	60.6	290



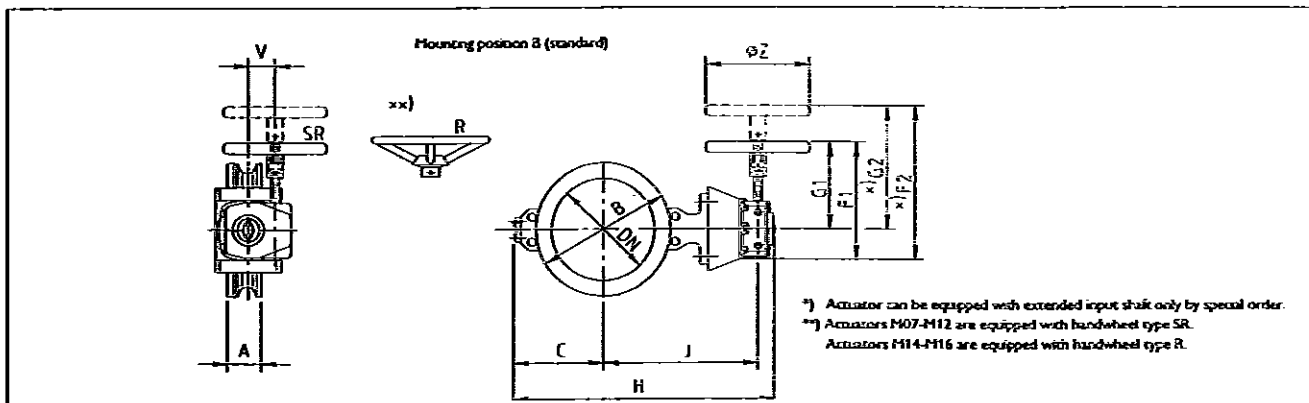
LG6LE, LG7LE, blade connection

DN	Dimensions, mm																			Wt. kg				
	A1	LG6LE	LG7LE	B	C	E	H	Flange ISO 5211	D	U Thr.	V Thr.	Flange drillings									Dimensions, mm			
		A (K1)	A (K2)									PN 10		PN 16		PN 25		ISO PN 20			O	R	M	S
Thr.	Qty	Thr.	Qty	Thr.	Qty	Thr.	Qty	Thr.	Qty	Thr.	Qty	Thr.	Qty	Thr.	Qty	Thr.	Qty							
80	17	46	49	205	125	188	20	F10	102	M10	M8	M16	8	M16	8	M16	8	M16	4	14	55	11	11	9
100	21	52	56	235	135	202	20	F10	102	M10	M8	M16	8	M16	8	M20	8	M16	8	18	55	14	14	14
125	22	56	64	270	145	225	20	F10	102	M10	M8	M16	8	M16	8	M24	8	M20	8	18	55	14	14	20
150	22	56	70	300	160	247	20	F10	102	M10	M8	M20	8	M20	8	M24	8	M20	8	18	55	14	14	24
200	25	60	71	360	185	277	20	F12	125	M12	M10	M20	8	M20	12	M24	12	M20	8	22	70	17	17	34
250	28	68	76	425	220	310	20	F14	140	M16	M10	M20	12	M24	12	M27	12	M24	12	26	75	19	19	43
300	32	78	83	485	275	340	20	F14	140	M16	M10	M20	12	M24	12	M27	16	M24	12	33	80	24	24	75
350	36	92	92	555	310	385	30	F16	165	M20	M10	M20	16	M24	16	M30	16	M27	12	38	75	27	27	95
400	41	102	102	610	340	435	30	F16	165	M20	M12	M24	16	M27	16	M33	16	M27	16	42	90	30	30	150



LG8ME, blade connection

DN	Dimensions, mm																			Wt. kg			
	A1	LG8ME	B	C	E	H	ISO 5211 Flange	D	U Thread	V Thread	Flange drillings								Dimensions, mm				
		A (K3)									PN 25		PN 40		ISO PN 50		O	R	M		S		
Thr.	Qty	Thr.	Qty	Thr.	Qty	Thr.	Qty	Thr.	Qty	Thr.	Qty	Thr.	Qty	Thr.	Qty	Thr.	Qty						
80	17	64	205	120	188	20	F10	102	M10	M8	M16	8	M16	8	M20	8	14	55	11	11	9		
100	21	64	235	135	202	20	F10	102	M10	M8	M20	8	M20	8	M20	8	18	55	14	14	14		
150	24	76	250	160	252	20	F12	125	M12	M10	M24	8	M24	8	M20	12	22	70	17	17	25		
200	34	89	365	205	294	20	F14	140	M16	M10	M24	12	M27	12	M24	12	33	80	24	24	48		
250	41	114	435	260	350	30	F16	165	M20	M14	M27	12	M30	12	M27	16	42	90	30	30	90		
300	46	114	500	300	390	30	F16	165	M20	M14	M27	16	M30	16	M30	16	48	97	36	36	150		
350	57	127	565	330	430	30	F16	165	M20	M14	M30	16	M33	16	M30	20	53	125	41	41	200		
400	62	140	649	370	470	30	F16	165	M20	M14	M33	16	M36	16	M33	20	53	125	41	41	250		

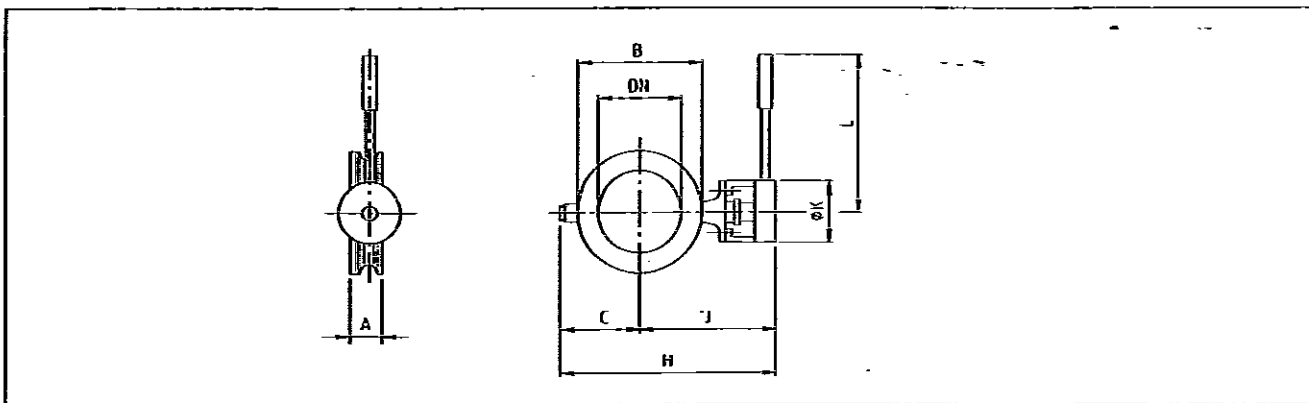


LW6L, LW7L + M-series

Valve	DN	Operator ISO 5211A	L 6 (K1)	L 7 (K2)	LW			LG			Dimensions, mm							LW L-M kg	LG L-M kg
					B	C	H	B	C	H	F1	G1	F2 (*)	G2 (*)	J	V	Z		
LW6_ LW7_ / LG6_ LG7_	80	M07/F07	49	49	128	80	390	205	120	430	196	152	-	-	275	39	125	8	13
	100	M07/F07	52	56	158	100	435	235	135	470	196	152	-	-	299	39	125	10	18
	125	M07/F07	56	64	190	135	495	270	145	505	196	152	-	-	322	39	125	13	24
	150	M07/F07	56	70	212	150	530	300	160	540	196	152	-	-	344	39	125	19	28
	200	M10F10 or M10EF10	60	71	268	160	580	360	185	605	227	169	297	239	387	52	200	26	40
	250	M12F12 or M12EF12	68	76	320	210	695	425	220	705	285	210	357	282	440	67	250	42	55
	300	M14F14 or M14EF14	78	83	378	275	805	485	275	805	378	279	435	354	480	90	457	65	95
	350	M14F16 or M14EF16	92	92	438	290	865	555	310	885	378	279	435	354	525	90	457	95	120
400	M16F16 or M16EF16	102	102	485	320	970	610	340	990	549	391	642	466	575	154	610	140	195	

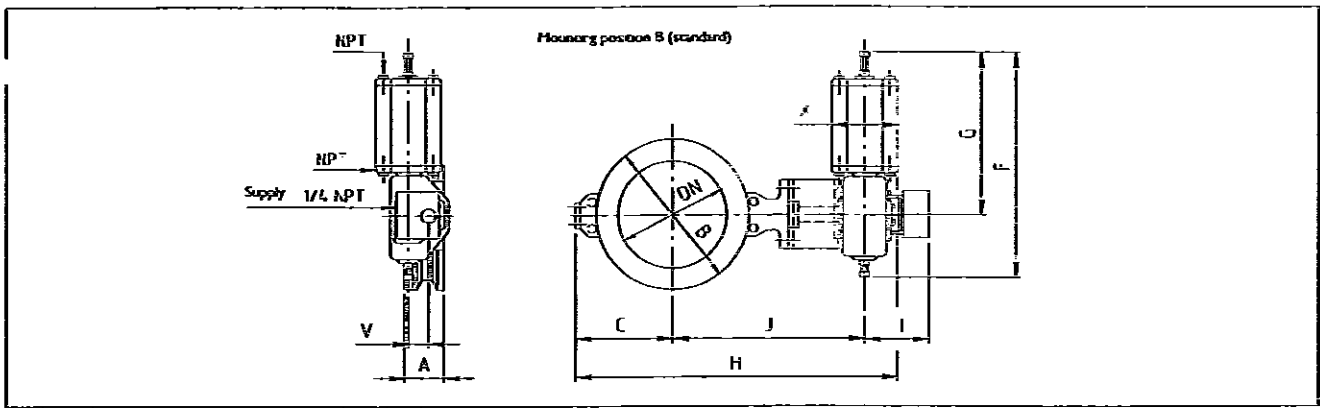
LW8M + M-series

Valve	DN	Operator ISO 5211	L 8 (K3)		LW8			LG8			Dimensions, mm							LW8 -M kg	LG8 -M kg
			A	B	C	H	B	C	H	F1	G1	F2 (*)	G2 (*)	J	V	Z			
LW8 / LG8	80	M07/F07	64	128	80	390	205	120	430	196	152	-	-	275	39	125	8	13	
	100	M07/F07	64	158	100	435	235	135	470	196	152	-	-	299	39	125	10	18	
	150	M10F10 or M10EF10	76	218	145	540	290	160	555	227	169	297	239	327	52	200	26	31	
	200	M14F14 or M14EF14	87	278	205	670	365	205	670	378	279	435	354	414	90	457	58	68	
	250	M14F16 or M14EF16	114	335	260	800	435	260	800	378	279	435	354	490	90	457	80	110	
	300	M15F16 or M15EF16	114	395	300	910	500	300	910	457	331	532	406	550	123	457	120	185	
	350	M15F16 or M15EF16	127	450	330	980	565	330	980	457	331	532	406	590	123	457	140	235	
	400	M15F16 or M15EF16	140	505	370	1060	650	370	1060	457	331	532	406	630	123	457	160	325	



LW6L, LW7L + RH

Valve	DN	Handlever	L 6 (K1)	L 7 (K2)	LW			LG			Dimensions in mm				LW L-RH kg	LG L-RH kg
			A	A	B	C	H	B	C	H	J	K	L			
LW6_ LW7_ / LG6_ LG7_	80	RH415	49	49	128	80	355	205	120	395	275	100	400	5	10	
	100	RH420	52	56	158	100	410	235	135	445	310	100	400	7	15	
	125	RH420	56	64	190	135	495	270	145	505	330	100	400	11	22	
	150	RH520	56	70	212	150	530	300	160	540	370	130	500	17	26	

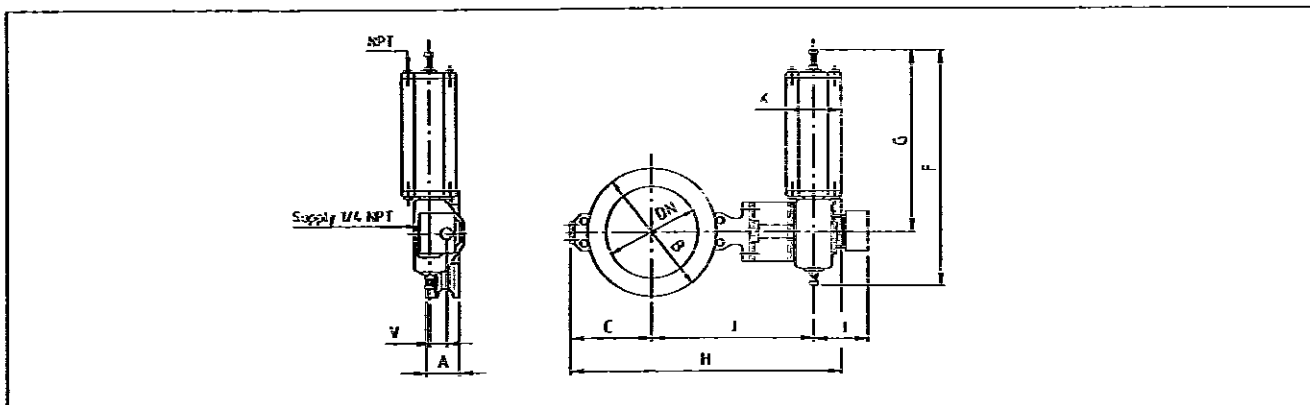


LW6L, LW7L + B1C

Valve	DN	Actuator	L		LW			LG			Dimensions, mm						NPT	LW L-B1C kg	LG L-B1C kg
			L 6(K1) A	L 7(K2) A	B	C	H	B	C	H	F	G	I	J	V	X			
LW6_ LW7_ / LG6_ LG7_	80	B1C9	49	49	128	80	445	205	120	485	450	315	220	307	43	110	1/4	20	25
	100	B1C9	52	56	158	100	490	235	135	525	450	315	220	331	43	110	1/4	22	30
	100	B1C11	52	56	158	100	510	235	135	545	535	375	225	337	51	135	3/8	28	36
	125	B1C9	56	64	190	135	550	270	145	560	450	315	220	351	43	110	1/4	25	38
	125	B1C11	56	64	190	135	570	270	145	580	535	375	225	36C	51	135	3/8	31	44
	150	B1C9	56	70	212	150	585	300	160	595	450	315	220	37E	43	110	1/4	34	43
	150	B1C11	56	70	212	150	605	300	160	615	535	375	225	382	51	135	3/8	40	49
	150	B1C13	65	70	212	150	640	300	160	645	650	640	445	24C	398	175	3/8	55	64
	200	B1C11	60	71	268	160	645	360	185	670	535	375	225	412	51	135	3/8	45	59
	200	B1C13	60	71	268	160	680	360	185	705	640	445	240	428	65	175	3/8	60	74
	200	B1C17	60	71	268	160	715	360	185	740	785	555	255	443	78	215	1/2	83	97
	250	B1C13	68	76	320	210	785	425	220	795	640	445	240	481	65	175	3/8	71	84
	250	B1C17	68	76	320	210	820	425	220	830	785	555	255	496	78	215	1/2	94	107
	300	B1C13	78	83	378	275	880	485	275	880	640	445	240	511	65	175	3/8	86	116
	300	B1C17	78	83	378	275	915	485	275	915	785	555	255	526	78	215	1/2	110	140
	300	B1C20	78	83	378	275	935	485	275	935	880	590	270	545	97	215	1/2	128	158
	350	B1C17	92	92	438	290	975	555	310	995	785	555	255	571	78	215	1/2	135	160
	350	B1C20	92	92	438	290	995	555	310	1015	880	590	270	590	97	215	1/2	145	180
	350	B1C25	92	92	438	290	1040	555	310	1060	1075	725	310	613	121	265	1/2	215	240
	400	B1C20	102	102	485	320	1075	610	340	1095	880	590	270	640	97	215	1/2	180	235
400	B1C25	102	102	485	320	1120	610	340	1140	1075	725	310	663	121	265	1/2	240	295	

LW8M + B1C

Valve	DN	Actuator	A	LW			LG			Dimensions, mm						NPT	LW8M-B1C kg	LG8M-B1C kg
				B	C	H	B	C	H	F	G	I	J	V	X			
LW8M/ LG8	80	B1C9	64	128	80	445	205	120	485	450	315	220	307	43	110	1/4	21	26
	100	B1C9	64	158	100	490	235	135	525	450	315	220	331	43	110	1/4	23	31
	100	B1C11	64	158	100	510	235	135	545	535	375	225	337	51	135	3/8	29	37
	150	B1C9	76	218	145	605	290	160	620	450	315	220	387	43	110	1/4	36	41
	150	B1C11	76	218	145	640	290	160	655	535	375	225	403	51	135	3/8	42	47
	150	B1C13	76	218	145	675	290	160	690	640	445	240	418	65	175	3/8	58	63
	200	B1C11	89	278	205	745	365	205	745	535	375	225	445	51	135	3/8	60	70
	200	B1C13	89	278	205	780	365	205	780	640	445	240	460	65	175	3/8	76	86
	200	B1C17	89	278	205	795	365	205	795	785	555	255	479	78	215	1/2	100	110
	250	B1C17	114	335	260	910	435	260	910	785	555	255	536	78	215	1/2	120	150
	250	B1C20	114	335	260	930	435	260	930	880	590	270	555	97	215	1/2	140	170
	250	B1C25	114	335	260	975	435	260	975	1075	725	310	578	121	265	1/2	200	230
	300	B1C20	114	395	300	1030	500	300	1030	880	590	270	615	97	215	1/2	230	165
	300	B1C25	114	395	300	1075	500	300	1075	1075	725	310	638	121	265	1/2	225	290
	350	B1C20	127	450	330	1100	565	330	1100	880	590	270	655	97	215	1/2	185	280
	350	B1C25	127	450	330	1145	565	330	1145	1075	725	310	678	121	265	1/2	245	340
400	B1C20	140	505	370	1180	649	370	1180	880	590	270	695	97	215	1/2	205	370	
400	B1C25	140	505	370	1225	649	370	1225	1075	725	310	718	121	265	1/2	265	430	

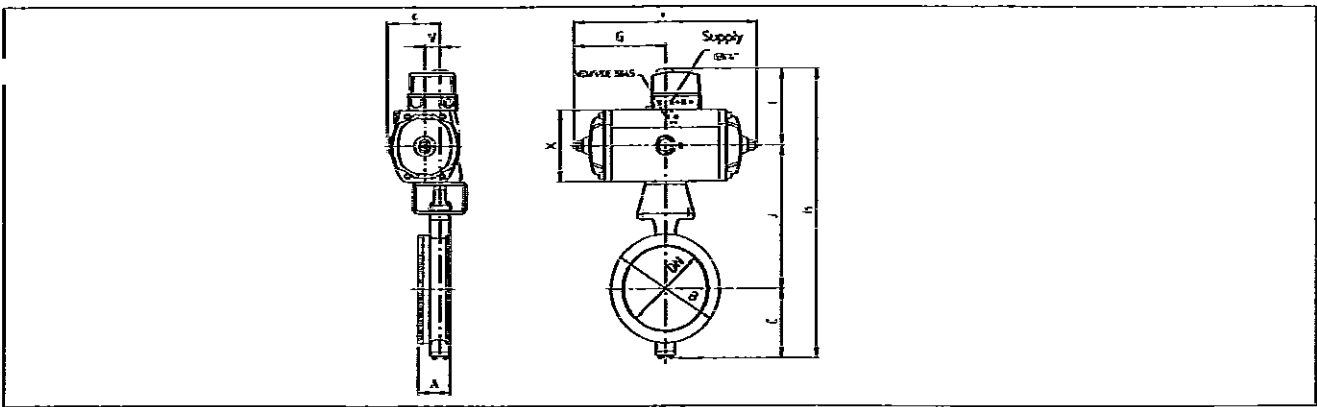


LW6L, LW7L + B1J

Valve	DN	Actuator	L_6(K1)	L_7(K2)	LW			LG			Dimensions, mm						NPT	LW8M-B1J kg	LG8M-B1J kg
			A	A	B	C	H	B	C	H	F	G	I	J	V	X			
LW6_ LW7_ / LG6_ LG7_	80	B1J8	49	49	128	80	460	205	120	500	555	420	220	307	43	135	3/8	27	32
	100	B1J8	52	56	158	100	505	235	135	540	555	420	220	331	43	135	3/8	29	37
	100	B1J10	52	56	158	100	530	235	135	565	640	480	225	337	51	175	3/8	42	50
	125	B1J8	56	64	190	135	560	270	145	570	555	420	220	351	43	135	3/8	32	45
	125	B1J10	56	64	190	135	585	270	145	595	640	480	225	360	51	175	3/8	45	58
	150	B1J8	56	70	212	150	600	300	160	610	555	420	220	376	43	135	3/8	41	50
	150	B1J10	56	70	212	150	625	300	160	635	640	480	225	382	51	175	3/8	54	63
	150	B1J12	56	70	212	150	660	300	160	670	815	620	240	398	65	215	1/2	81	90
	200	B1J10	60	71	268	160	665	360	185	690	640	480	225	412	51	175	3/8	59	73
	200	B1J12	60	71	268	160	700	360	185	725	815	620	240	428	65	215	1/2	86	100
	200	B1J16	60	71	268	160	740	360	185	765	990	760	255	443	78	265	1/2	143	129
	250	B1J12	68	76	320	210	805	425	220	815	815	620	240	481	65	215	1/2	97	110
	250	B1J16	68	78	320	210	845	425	220	855	990	760	255	496	78	265	1/2	140	153
	300	B1J12	78	83	378	275	900	485	275	900	815	620	240	511	65	215	1/2	112	142
	300	B1J16	78	83	378	275	940	485	275	940	990	760	255	526	78	265	1/2	156	186
	300	B1J20	78	83	378	275	1025	485	275	1025	1230	940	270	545	97	395	3/4	230	260
350	B1J16	92	92	438	290	1000	555	310	1020	990	760	255	571	78	265	1/2	180	205	
350	B1J20	92	92	438	290	1085	555	310	1105	1230	940	270	590	97	395	3/4	245	280	
350	B1J25	92	92	438	290	1160	555	310	1180	1490	1140	310	613	121	505	3/4	435	460	
400	B1J20	102	102	485	320	1165	610	340	1185	1230	940	270	640	97	395	3/4	280	335	
400	B1J25	102	102	485	320	1240	610	340	1260	1490	1140	310	663	121	505	3/4	460	515	

LW8M + B1J

Valve	DN	Actuator	A	LW			LG			Dimensions, mm						NPT	LW8M-B1J kg	LG8M-B1J kg
				B	C	H	B	C	H	F	G	I	J	V	X			
LW8M/ LG8	80	B1J8	64	128	80	460	205	120	500	555	420	220	307	43	135	3/8	28	33
	100	B1J8	64	158	100	505	235	135	540	555	420	220	331	43	135	3/8	30	38
	100	B1J10	64	158	100	530	235	135	565	640	480	225	337	51	175	3/8	43	41
	150	B1J10	76	218	145	625	290	160	640	640	480	225	387	51	175	3/8	56	61
	150	B1J12	76	218	145	660	290	160	675	815	620	240	403	65	215	1/2	83	88
	150	B1J16	76	218	145	700	290	160	715	990	760	255	418	78	265	1/2	128	133
	200	B1J12	89	278	205	765	365	205	765	815	620	240	445	65	215	1/2	100	110
	200	B1J16	89	278	205	805	365	205	805	990	760	255	460	78	265	1/2	145	155
	200	B1J20	89	278	205	890	365	205	890	1230	940	270	479	97	395	3/4	220	230
	250	B1J16	114	335	260	935	435	260	935	990	760	255	536	78	265	1/2	165	195
	250	B1J20	114	335	260	1020	435	260	1020	1230	940	270	555	97	395	3/4	240	270
	250	B1J25	114	335	260	1095	435	260	1095	1490	1140	310	578	121	505	3/4	440	470
	300	B1J20	114	395	300	1120	500	300	1120	1230	940	270	615	97	395	3/4	300	330
	300	B1J25	114	395	300	1195	500	300	1195	1490	1140	310	638	121	505	3/4	445	510
	350	B1J20	127	450	330	1190	565	330	1190	1230	940	270	655	97	395	3/4	285	380
	350	B1J25	127	450	330	1265	565	330	1265	1490	1140	310	678	121	505	3/4	465	560
400	B1J20	140	505	370	1265	649	370	1265	1230	940	270	695	97	395	3/4	305	470	
400	B1J25	140	505	370	1340	649	370	1340	1490	1140	310	718	121	505	3/4	485	650	

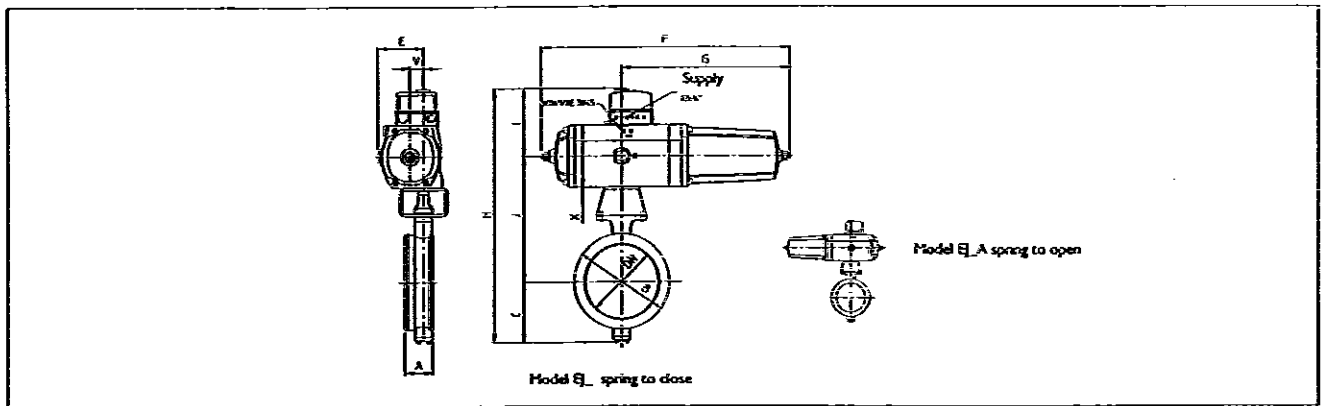


LW6L, LW7L + EC

Valve	DN	Actuator	L_6(K1)	L_7(K2)	LW			LG			Dimensions, mm						VDI/VDI	LW8M-EC	LG8M-EC	
			A	A	B	C	H	B	C	H	E	F	G	I	J	V				X
LW6_ LW7_ LG6_ LG7_	80	EC07	49	49	128	80	560	205	120	600	81	300	150	172	307	24	117	G1/4	14	19
	100	EC10	52	56	158	100	640	235	135	675	112	405	203	191	350	32	155	G1/4	24	32
	125	EC10	56	64	190	135	700	270	145	710	112	405	203	191	373	32	155	G1/4	27	38
	125	EC12	56	64	190	135	745	270	145	755	145	495	248	214	395	42	200	G1/4	44	55
	150	EC10	56	70	212	150	735	300	160	745	112	405	203	191	395	32	155	G1/4	33	43
	150	EC12	56	70	212	150	780	300	160	790	145	495	248	214	417	42	200	G1/4	50	60
	200	EC12	60	71	268	160	820	360	185	845	145	495	248	214	447	42	200	G1/4	55	70
	200	EC14	60	71	268	160	880	360	185	905	196	675	338	243	477	56	259	G1/4	95	110
	250	EC14	68	76	320	210	985	425	220	995	196	675	338	243	530	56	259	G1/4	105	120
	300	EC14	78	83	378	275	1080	485	275	1080	196	675	338	243	560	56	259	G1/4	120	150

LW8M + EC

Valve	DN	Actuator	A	LW			LG			Dimensions, mm						VDI/VDI	LW8M-EC	LG8M-EC	
				B	C	H	B	C	H	E	F	G	I	J	V				X
LW8M/ LG8M	80	EC07	64	128	80	560	205	120	600	81	300	150	172	307	24	117	G1/4	14	19
	100	EC10	64	158	100	640	235	135	675	112	405	203	191	350	32	155	G1/4	24	32
	150	EC12	76	218	145	780	290	160	795	145	495	248	214	422	42	200	G1/4	55	60
	200	EC12	89	278	205	885	365	205	885	145	495	248	214	464	42	200	G1/4	75	85
	200	EC14	89	278	205	945	365	205	945	196	675	338	243	494	56	259	G1/4	115	125
	250	EC14	114	335	260	1075	435	260	1075	196	675	338	243	570	56	259	G1/4	135	165



LW6L, LW7L + EJ

Valve	DN	Actuator	L_6(K1)	L_7(K2)	LW_			LG_			Dimensions, mm								VDI/VDE 3845	LW8M-EJ kg	LG8M-EJ kg
			A	A	B	C	H	B	C	H	E	F	G	I	J	V	X				
LW6_ LW7_ LG6_ LG7_	80	EJ07	49	49	128	80	560	205	120	600	81	443	293	172	307	24	117	G1/4	18	23	
	100	EJ10	52	56	158	100	640	235	135	675	112	606	403	191	350	32	155	G1/4	30	38	
	125	EJ10	56	64	190	135	700	270	145	710	112	606	403	191	373	32	155	G1/4	33	44	
	125	EJ12	56	64	190	135	745	270	145	755	145	770	522	214	395	42	200	G1/4	63	74	
	150	EJ12	56	70	212	150	780	300	160	790	145	770	522	214	417	42	200	G1/4	70	80	
	200	EJ14	60	71	268	160	880	360	185	905	196	1030	692	243	477	56	259	G1/4	132	145	
250	EJ14	68	76	320	210	985	425	220	995	196	1030	692	243	530	56	259	G1/4	142	155		

LW8M + EJ

Valve	DN	Actuator	A	LW_			LG_			Dimensions, mm								VDI/VDE 3845	LW8M-EJ kg	LG8M-EJ kg
				B	C	H	B	C	H	E	F	G	I	J	V	X				
LW8M/ LG8M	80	EJ07	64	128	80	560	205	120	600	81	443	293	172	307	24	117	G1/4	18	23	
	100	EJ10	64	158	100	640	235	135	675	112	606	403	191	350	32	155	G1/4	30	38	
	150	EJ12	76	218	145	780	290	160	795	145	770	522	214	422	42	200	G1/4	75	80	
	200	EJ14	89	278	205	945	365	205	945	196	1030	692	243	494	56	259	G1/4	175	185	

11 TYPE CODE

NELDISC® BUTTERFLY VALVE
 Series LW and LG, DIN rated

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	
	LW	6	L	B	A	200	P	A	B	A	T	/	03	K

1. sign	S-DISC CONSTRUCTION
S-	Flow balancing trim on down stream side of body flow port

2.	PRODUCT SERIES / DESIGN
LW	Wafer type, full bore, metal sealed butterfly valve
LG	Lug type, full bore, metal sealed butterfly valve

3.	FACE - TO - FACE
6	EN 558-part 1, table 5 / basic series 20 (DIN 3202-K1), body DN PN 25
7	EN 558-part 1, table 5 / basic series 25 (DIN 3202-K2), body DN PN 25
8	EN 558-part 1, table 5 / basic series 16 (DIN 3202-K3), body ISO PN 50
Y	Special

4.	PRESSURE RATING
L	DN PN 25, sizes DN 80 - DN 150 full rated to DN PN 25
M	DN PN 40 full rated (ISO PN 50 full rated)

5.	VALVE- ACTUATOR CONNECTION
B	Drive shaft with key way / bracket Nemes standard
E	Drive shaft with blade / ISO 5211 / NAMUR connection

6.	CONSTRUCTION
A	STANDARD - bearings AISI 316 + PTFE - body and blind flange gaskets graphite - five loaded TA-Luft packing
C	CRYOGENIC - extended bonnet and drive shaft - otherwise as construction A
H	EXTENDED SERVICE (max. +400 C) - shaft bearing surfaces nitrided - bearings cobalt based alloy - body and blind flange gaskets graphite - five loaded TA-Luft packing
H	HIGH TEMP - shaft bearing surfaces Ceal coated - bearings cobalt based alloy - body and blind flange gaskets graphite - five loaded TA-Luft packing
Y	Special

7.	SIZE
	080, 100, 125 (PN 25 body only), 150, 200, 250, 300, 350, 400

MATERIALS					
8. sign	BODY	9. sign	DISC	10. sign	SHAFTS & PINS
A	CF8M / 1.4403	A	F316 / CF8M	B	1.4418
P	WCB / 1.0319			C	Gc 630 (17-4PH)
				J	SS 329 (SIS 2324)

NON-STANDARD					
8. sign	BODY	9. sign	DISC	10. sign	SHAFT & PINS
B	1.4581	G	1.4581	H	XM-19 (316LSS)
F	LCC	K	F35CFM+ cobalt based alloy	H	Nimonic 80A
H	WC6	B	SS 410 or CA6NM		
S	C5	K	1.4408 / CF8M		
Y = Special					

11. sign	STANDARD SEAT	11. sign	NON-STANDARD SEAT
A	Incoloy 825, hard chrome plated	H	Nimonic 80A, hard chrome plated
C	Incoloy 825, polymer impregnated hard chrome	K	W No. 2-4681, UNS R31233 (ULTIMET)

12.	DESIGN OPTIONS
T	PTFE V-ring packing
G	Graphite packing; Fire safe construction
Y	Special

13.	FLANGE FACING (with DIN flange drillings)
-	DN 2526 Form C (Ra 10-15), standard, without sign
03	DN 2526 Form D (Ra 10)
04	DN 2526 Form E (Ra 4)
07	DN 2512 Form H (groove) (Ra 10)
Y	Special

13.	FLANGE FACING (with ASME flange drillings)
-	ASME B16.5, raised face, smooth finish (Ra 3.2 - 6.3), standard, without sign
20	Raised face, stock finish (Ra 10 - 12.5)
05	Ring Joint
Y	Special

13.	FLANGE DRILLING
-	According to valve pressure rating, standard, without sign
C	ASME 150 (available with DN PN 25 rated valves only)
D	ASME 300 (available with DN PN 40 rated valves only)
J	DN PN 10 (available with DN PN 25 rated valves only)
K	DN PN 16 (available with DN PN 25 rated valves only)
L	DN PN 25 (available with DN PN 25 rated valves only)
M	DN PN 40 (available with DN PN 40 rated valves only)
X	ISO PN 20 (available with DN PN 25 rated valves only)
Z	ISO PN 50 (available with DN PN 40 rated valves only)
Y	Special

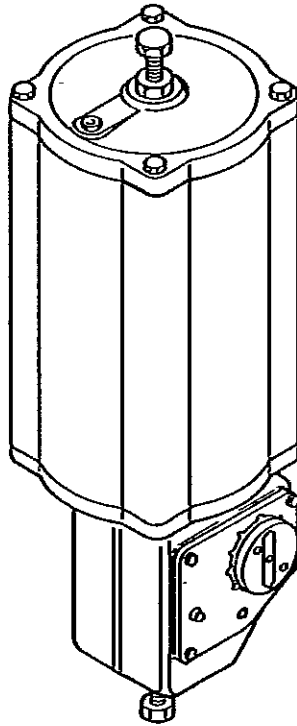
Gland packing shall be specified with 12th sign

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www.metsoautomation.com



18

**PNEUMATIC
CYLINDER ACTUATORS
Series BJ and B1J**



PNEUMATIC CYLINDER ACTUATORS

Series BJ and B1J

Installation, Maintenance and
Operating Instructions
6 BJ 71 en
Issue 5/02

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READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the actuator. If you require additional assistance, please contact the manufacturer or manufacturer's representative. Addresses and phone numbers are printed on the back cover.

SAVE THESE INSTRUCTIONS!

Subject to change without notice

All trademarks are property of their respective owners.

1 GENERAL

1.1 Scope of the manual

These instructions provide essential information for the use of Metso Automation BJ and B1J series actuators. For more details about valves, positioners and accessories, refer to the separate installation, operating and maintenance instructions of the particular unit.

1.2 Structure and operation

The BJ and B1J series actuators are pneumatic cylinder actuators designed for control and shut-off service.

The linkage has PTFE, PE-HD and Glacier DU bearings. The robust cast-iron housing efficiently protects the mechanism from ambient dust and moisture.

The spring provides the required safety function; the valve either opens or closes if the air supply is interrupted.

The mounting face dimensions of the BJ actuator comply with the manufacturer's internal standard and those of the B1J with the ISO 5211 standard.

In the BJ type, the spring is located on the piston rod side. The secondary shaft of the actuator, operated by the spring, rotates clockwise as seen from the pointer cover side. The piston then moves towards the end of the cylinder. The BJ type is normally applied for the spring-to-close operation, as it normally closes in the clockwise direction. The two keyways in the secondary shaft are positioned at an angle of 90° to each other, making it possible to change the position of the actuator in relation to the valve, see Fig. 1.

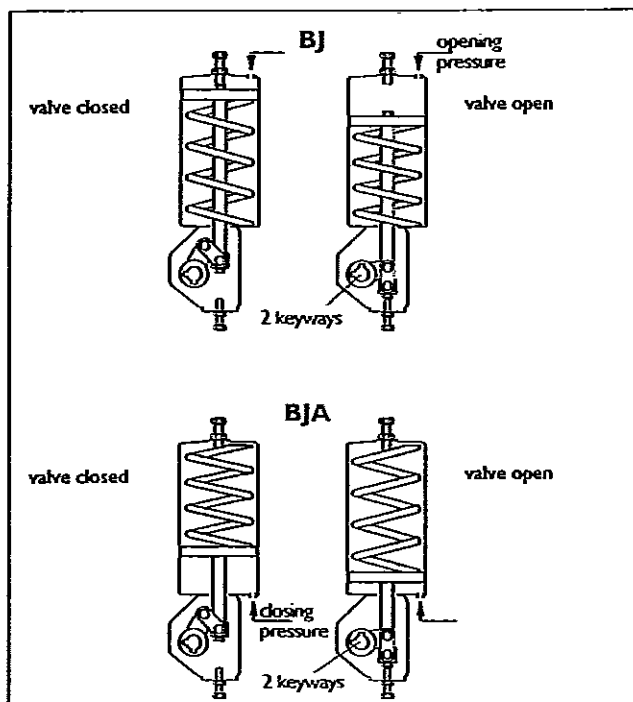


Fig. 1. Operating principle of the actuator

In the BJA type, the spring is located in the cylinder end side. The secondary shaft, operated by the spring, rotates counter-clockwise as seen from the pointer cover side. The piston moves away from the cylinder end. The BJA type is used for the spring-to-open function, see Fig. 1.

The size of the spring actuator is selected according to the torque given by the spring. It is, however, important to check that there is sufficient supply pressure to give the required torque in the opposite direction.

Screws are located in the upper end of the cylinder and in the lower end of the housing to regulate the length of the piston stroke and also the rotation angle of the actuator shaft.

1.3 Actuator markings

The actuator is provided with an identification plate, see Fig. 2. Identification plate markings are:

1. Type
2. PO number
3. Manufacturing date
4. Checked by
5. Max. supply pressure

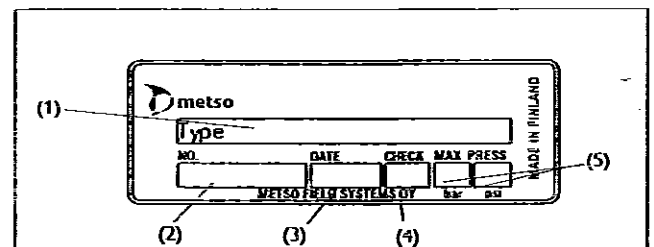


Fig. 2. Identification plate markings

1.4 Specifications

Ambient temperature:	
Standard design	-20° - + 70°C
Low temperature design	-40° - + 70°C
High temperature design:	-20° - +120°C
Maximum supply pressure:	8.5 bar/850 kPa
Stroke volume, dm ³ (liters):	
BJ 8	0,9
BJ 10	1,8
BJ 12	3,6
BJ 16	6,7
BJ 20	13
BJ 25	27
BJ 32	53
BJ 322	106

Nominal torque at maximum supply pressure, Nm:

Bj 8	70
Bj 10	150
Bj 12	300
Bj 16	600
Bj 20	1200
Bj 25	2400
Bj 32	4800
Bj 322	9600

NB. The torque changes according to supply pressure.

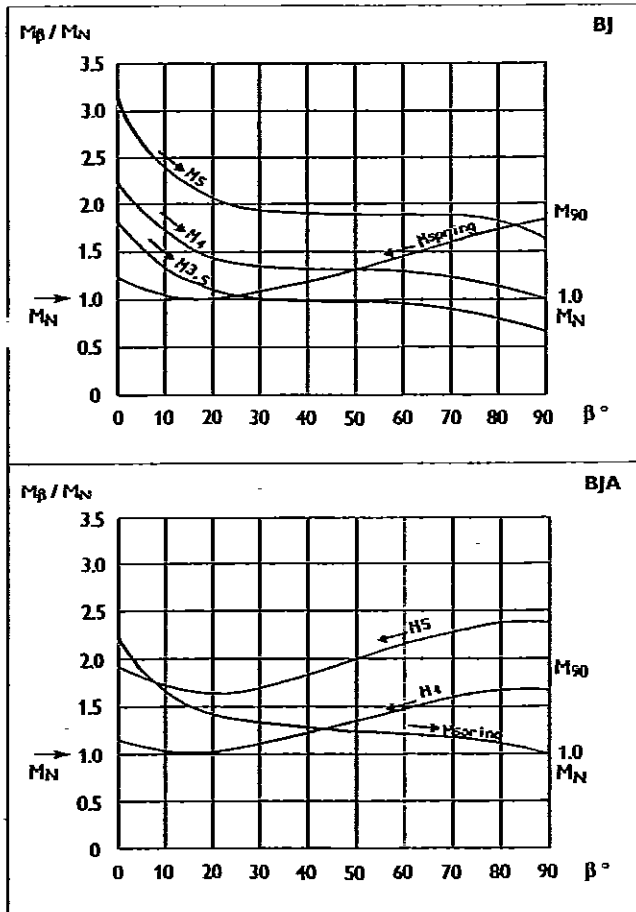


Fig. 3. Output torque as a function of turning angle

1.5 Recycling and disposal of a rejected actuator

Most actuator parts can be recycled if sorted according to material. Most parts have material marking. A material list is supplied with the actuator. In addition, separate recycling and disposal instructions are available from the manufacturer. An actuator can also be returned to the manufacturer for recycling and disposal against a fee.

1.6 Safety precautions

CAUTION:

Don't exceed the permitted values!

Exceeding the permitted pressure value marked on the actuator may cause damage and lead to uncontrolled pressure release in the worst case. Damage to the equipment and personal injury may result.

CAUTION:

Don't dismantle a pressurized actuator!

Dismantling a pressurized actuator leads to uncontrolled pressure release. Shut off the supply pressure and release pressure from the cylinder before dismantling the actuator. Otherwise, personal injury and damage to equipment may result.

CAUTION:

Follow the instructions given on the actuator warning plates!

CAUTION:

Before opening the cylinder fastening screws, release spring tension directed on actuator warning plate and in these instructions!

CAUTION:

Don't operate the actuator manually by turning from the lever arm!

CAUTION:

Don't dismantle the spring package!

The spring package within the cylinder is preloaded. The lock-welded fastening screw of the piston must never be opened or the spring package dismantled. The piston, piston rod, spring and spring plate of the BJ actuator are always delivered as a pre-assembled package.

CAUTION:

Don't use the lever in the torsion arm for manual operation when the actuator is pressurized!

Shut off the supply pressure and release pressure from the cylinder before using the hand lever. Note also the dynamic torque caused by the pipe flow.

Otherwise, personal injury and damage to equipment may result.

CAUTION:

Take the weight of the actuator or valve combination into account when handling it!

Do not lift the valve combination from the actuator, positioner or limit switch or their piping.

Lift the actuator as directed in section 2.

Lifting ropes for a valve combination should be fastened around it. Weights are listed in the table on page 18.

Dropping may result in personal injury or damage to equipment.

2 TRANSPORTATION, RECEPTION AND STORAGE

Make sure that the actuator and associated equipment have not been damaged during transportation. Store the actuator carefully before installation, preferably indoors in a dry place. Do not take it to the installation site or remove the protective caps of ports for piping until just before installation.

Lift the actuator as shown in Fig. 4: in a horizontal position from the stop screws, in a vertical position from an eye bolt screwed in the place of a stop screw. Do not use the lug for lifting dual-cylinder actuators. Refer to page 18 for weights.

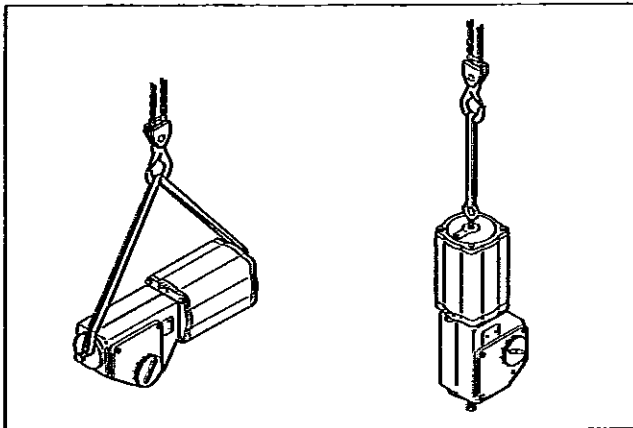


Fig. 4. Lifting the actuator

3 MOUNTING AND DEMOUNTING

3.1 Actuator gas supply

Dry compressed air or natural gas can be used in actuators in open-close operation, no oil spraying is needed. Clean, dry and oil-free instrument air must be used for cylinder actuators with a positioner. The air supply connections are presented in the dimensional drawings on page 18. The maximum supply pressure is 8.5 bar.

3.2 Mounting the actuator on the valve

CAUTION:

Take the weight of the actuator or valve combination into account when handling it!

CAUTION:

Beware of the cutting movement of the valve!

Install the actuator so that the shaft of the valve or any other device to be actuated goes into the shaft bore of the actuator. If the bore is larger than the shaft diameter, use a collar in between. The actuator shaft bore has two keyways at an angle of 90°. These allow the installation position of the actuator to be changed in relation to the valve. Metso Automation valves have a bevel at the end of their shafts to facilitate installation.

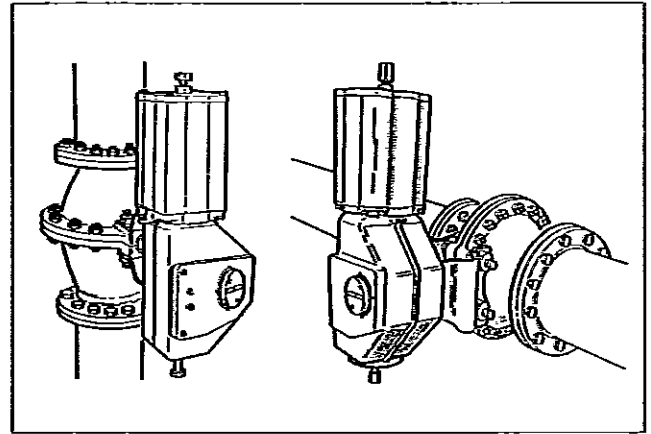


Fig. 5. Ways to install the actuator

The installation position can be selected freely, but Metso Automation recommends installation with the cylinder upright. The actuator is thus best protected against damage due to supply air impurities or water.

When the installation position of the actuator is altered, the arrow indicating the operating direction must be turned to correspond with the actual operation of the valve.

When necessary, lubricate the actuator bore and collar with Cortec VCI 369 or an equivalent anti-corrosive agent to prevent it from jamming due to rust.

The actuator must not be allowed to come in contact with the pipework, because the vibrations may damage it or cause unsatisfactory operation.

In some cases, e.g. when using large actuators or with extensive pipework vibrations, the actuator should be supported. Consult Metso Automation for instructions.

If the actuator is used with devices other than Metso Automation valves, any additional parts attached to the actuator must be properly protected.

3.3 Operating directions

A sticker on the actuator cylinder indicates the spring action direction.

NOTE:

Separate instructions are available for adjusting the close limit of metal-seated butterfly valves. Refer to the installation, operating and maintenance instructions of the valve.

3.3.1 B_J actuator - spring-to-close direction

Install the actuator on the valve with the piston in the upper end of the cylinder and the valve in the closed position, see Fig. 6. The cylinder must be depressurized and the air ports open. Adjust the closed-position setting using the stop screw (26) at the end of the cylinder. Seal the screw thread with a non-hardening sealant, such as Loctite 225 or the equivalent. The open-position setting is adjusted with the stop screw (27) at the bottom of the housing while the actuator is pressurized and the piston is in the lower position.

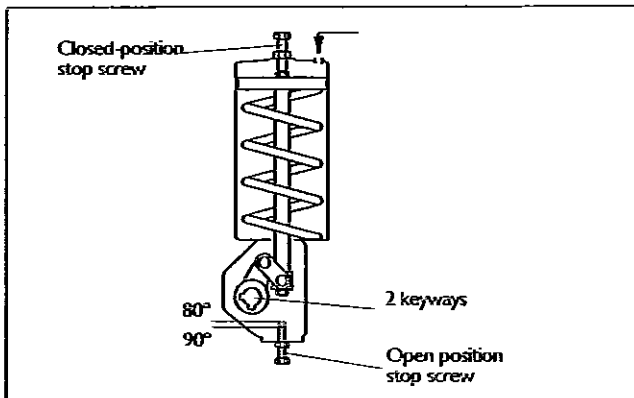


Fig. 6. B_J actuator

3.3.2 B_JA actuator - spring-to-open direction

Install the actuator on the valve with the piston in the lower end of the cylinder and the valve in the open position, see fig 7. The cylinder must be unpressurized and the air ports open. Adjust the open-position setting using the stop screw (27) at the end of the cylinder. The close-position setting is adjusted with the stop screw (26) at the end of the cylinder while the actuator is pressurized and the piston is in the upper position.

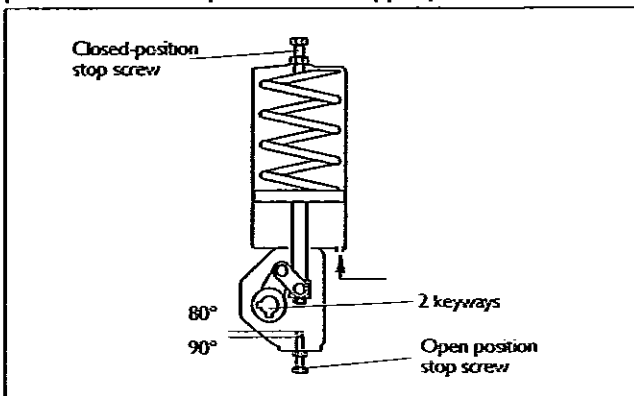


Fig. 7. B_JA actuator

3.4 Demounting the actuator from the valve

CAUTION:

Take the weight of the actuator or valve combination into account when handling it!

CAUTION:

Beware of the cutting movement of the valve!

The actuator must be depressurized and the supply air pipes disconnected. Unscrew the actuator-side screws of the bracket and pull the actuator off the valve shaft. This is best done using a specific extractor, see fig 8 and section 6 'Tools'.

Note the mutual positioning of the valve and the actuator to ensure correct functioning after reassembly.

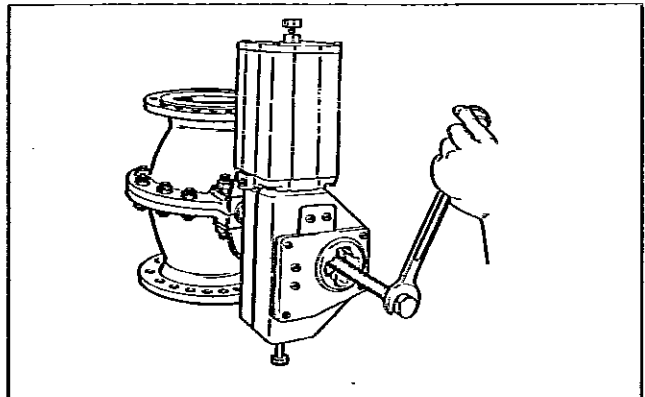


Fig. 8. Removing the actuator with an extractor

4 MAINTENANCE

4.1 General

CAUTION:

Note the precautions in section 1.5 before beginning work!

Under normal conditions, the actuators do not need regular maintenance. Maintenance procedures that the end user can do himself when necessary are described below.

Unless stated otherwise, the part numbers given refer to the exploded view and parts list in section 8.

In especially harsh corrosive conditions the linkage system inside the housing must be lubricated every six months. Use Cortec VCI 369 anti-corrosive agent or the equivalent. The housing may also be half filled with semi-fluid water-resistant grease (e.g. Mobilux EP2) while the piston rod is in the lower position.

If you remove the stop screw, adjust the limits after lubrication or grease filling !

4.2 Maintenance of the BJ actuator

CAUTION:

Don't dismantle a pressurized actuator!

CAUTION:

To release spring tension, the stop screw at the end of the cylinder must be removed before the cylinder fastening screws are opened!

CAUTION:

Don't dismantle the spring package!

The spring package within the cylinder is preloaded. Never open the lock-welded fastening screw of the piston or dismantle the spring package. The piston, piston rod, spring and spring plate of the BJ actuator are always delivered as a pre-assembled package.

The cylinder has a warning plate (43). When servicing the unit, check that the plate is in place and legible. See Fig. 9. Also check that the cylinder has the arrow sticker indicating the spring operating direction.

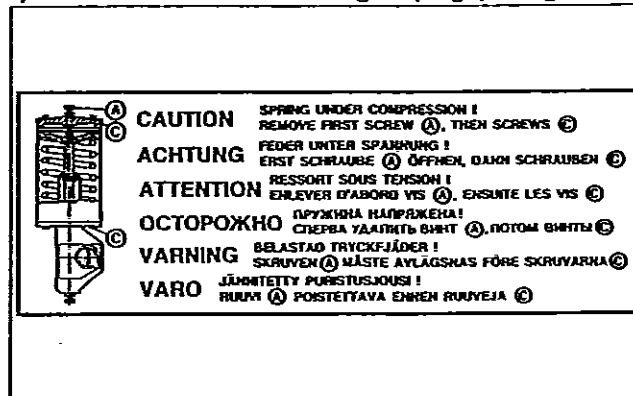


Fig. 9. Warning plate of the BJ actuator

4.2.1 Replacment of piston seals

We recommend that all seals and soft bearings be replaced when the actuator has been dismantled for servicing.

- Detach the actuator.
- Check that the cylinder has been depressurized, and the piston is at the outermost end of the cylinder.
- Remove the cylinder end side stop screw (26).
- Remove cylinder end (44).
- Remove housing cover (2).
- Unscrew the bearing screw (29) and the cylinder fastening screws (31) from the cylinder base (6) side, see Fig. 10. If the piston turns, do not prevent the turning with the piston fastening nut; send the entire actuator to the manufacturer to be repaired. It is very dangerous if the lock welding of the piston fastening nut is broken!
- Remove the cylinder with the piston - do not dismantle the spring package!
- Remove the O-rings.
- Slide the piston out of the cylinder.
- Remove old seals and O-rings (24, 18).
- Remove piston rod seal (16) and bearing (22). Clean the seal space.

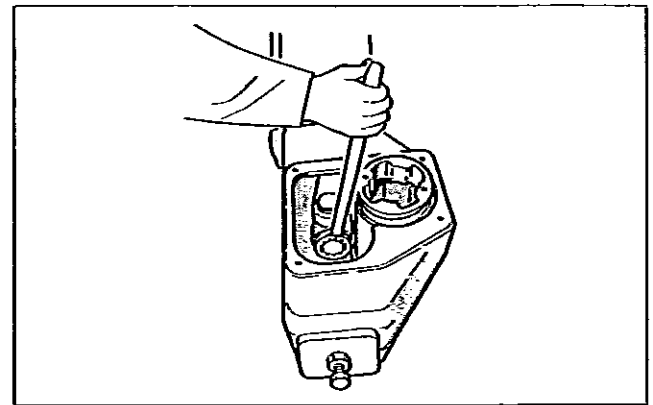


Fig. 10. Opening the fastening screw of the actuator bearing unit

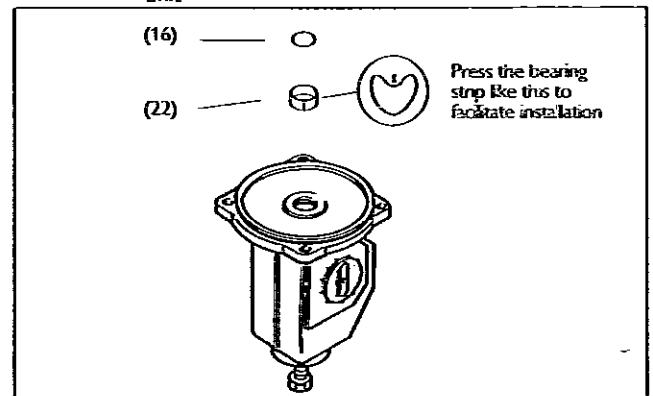


Fig. 11. Mounting the piston rod bearing and seal

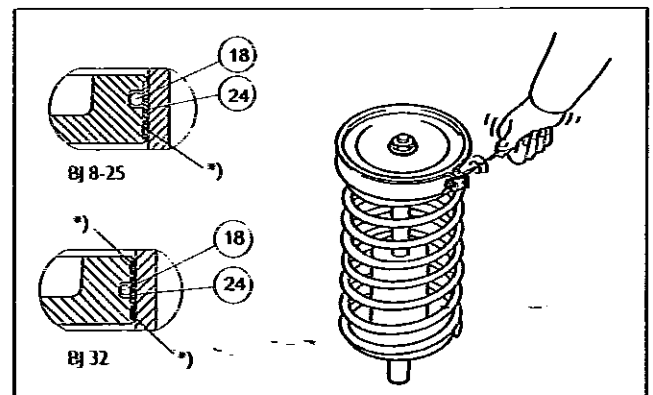


Fig. 12. Tightening piston seals with a tie ring

- Lubricate seal space and new O-ring with Unisilikon L250L or Molykote III. Install new bearing and O-ring, see fig 11.
- Clean piston seal groove and apply a thin coat of Cortec VCI 369.
- Install the O-ring (18) located under the piston seals.
- Place piston seals (24) around the piston so that the ends of the strips are located at opposite sides. Tighten the strips with a tie ring as in Fig. 12. Strips indicated with an asterisk can be cut 1.5 to 3 mm shorter to facilitate assembly.

NOTE:

The inside surface of the cylinder must be free of any grease!

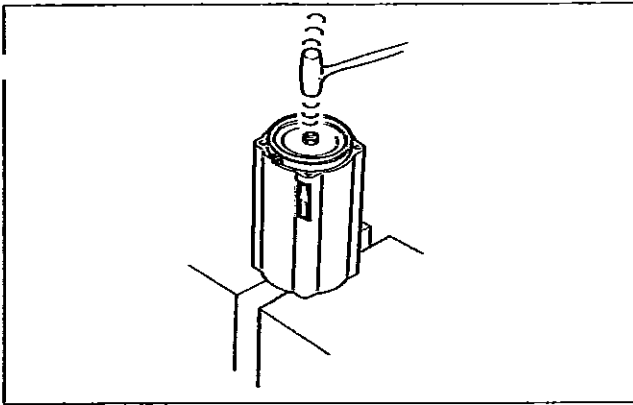


Fig. 13. Placing the piston in the cylinder

- Hammer or press the piston into the cylinder through the tie ring. Note the indicator arrow direction. See Fig. 13.
- Install new O-rings (19). Replace cylinder end and install cylinder with piston. Note the location of the air supply port: it must correspond to the exhaust air port in the cylinder base. Tighten screws (31); the torque is given in table 1.

Table 1. Tightening torques for screws

Torque, Nm					
Item	28	29	30	31	35
Actuator					
Bj 8	90	35	8	18	150
Bj 10	90	90	8	40	180
Bj 12	180	180	12	80	200
Bj 16	300	300	12	80	250
Bj 20	700	700	20	80	400
Bj 25	1100	1100	30	200	800
Bj 32	2000	2000	70	250	1500

- Apply bearing unit screw (29) thread with a sealant, e.g. Loctite 225, and tighten the screw as in table 1.
- Fasten the housing cover temporarily so that the secondary shaft bearings function but the linkage can still be seen, see Fig. 14.

CAUTION:

Keep your fingers, tools or other items out of the housing while operating the actuator with the cover open!

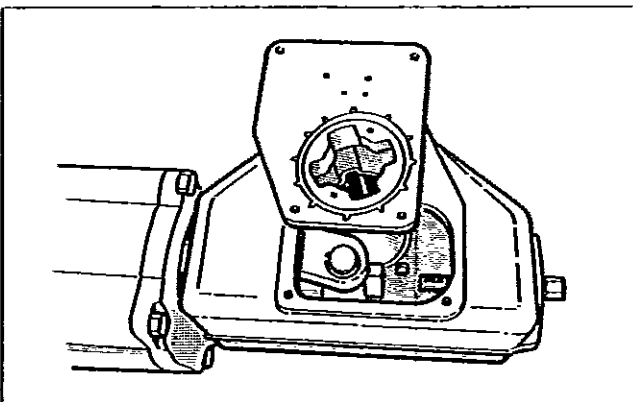


Fig. 14. Mounting the cover on the housing

- Check the attachment of the end and the base before temporarily connecting the compressed air supply to the actuator with a shut-off valve.
- Operate the actuator to check cylinder function and the condition of linkage bearings. Close the air supply and depressurize the cylinder.
- Lubricate the linkage throughout with Cortec VCI 369 anti-corrosive agent.
- Apply sealant, e.g. Loctite 573, to the interface between housing and cover and fasten the cover. See table 1 for torque.
- Install the actuator on the valve and adjust the stop screws.

To remove the cylinder base, you will need a special tool for opening the lock nut, see section 6 'Tools'.

4.2.2 Replacement of linkage bearings and O-rings

- Detach actuator from valve.
- Check that the cylinder has been depressurized, and the piston is at the outermost end.
- Remove cylinder end side stop screw (26).
- Remove housing cover (2).
- Open bearing unit (5) fastening screw (29). See Fig. 10.
- Turn lever arm (3) to detach the bearing unit from the piston rod (10). Lift the entire linkage out of the housing. See Fig. 15.
- Remove lock rings (36) and support rings (37). See Fig. 16.
- Remove connection arms (4) and check the condition of the bearings (20, 21).

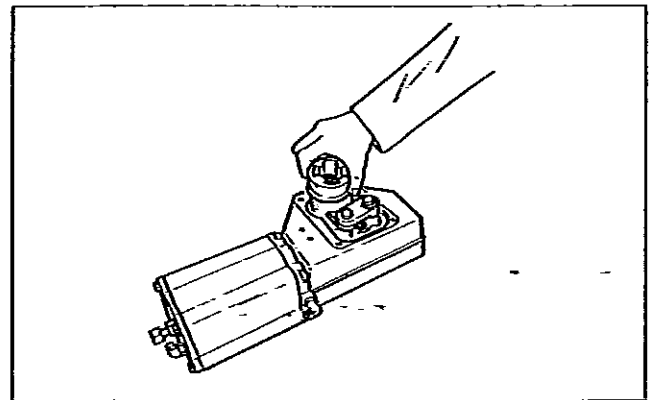


Fig. 15. Removing the linkage from the housing

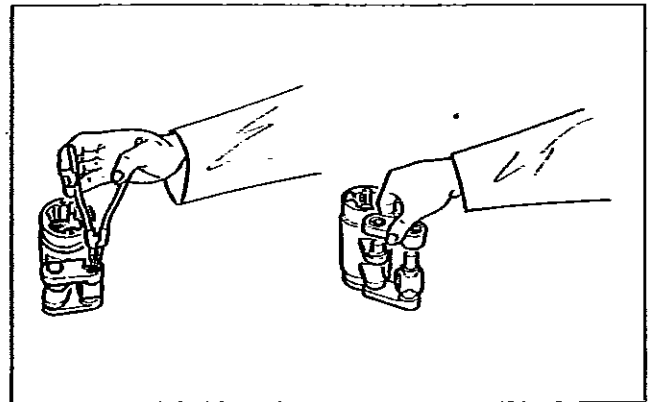


Fig. 16. Dismantling the linkage

The connection arm (4) bearings (20, 21) of the BJ8-25 actuator are fastened with a press-on fit, and therefore the entire connection arm must be replaced instead of changing the bearings. In the BJ32 actuator, the bearings can be removed.

- Remove lever arm bearings (23) and O-rings (17).
- Clean the linkage parts and apply Cortec VCI 369 to bearing and seal surfaces.
- Install new lever arm bearings and O-rings.
- Assemble the linkage and install in the housing; the correct position is shown in Fig. 15.
- Apply sealant, e.g. Loctite 225, to the bearing unit screw (29) thread and tighten the screw as in table 1.
- Lubricate the linkage throughout with Cortec VCI 369 anti-corrosive agent.
- Apply sealant, e.g. Loctite 573, to the interface between housing and cover and fasten the cover. See table 1 for torque.
- Operate the actuator to check that it is moving properly.
- Install the actuator on the valve and adjust the stop screws.

In a corrosive environment with high ambient humidity the linkage must be lubricated with Cortec VCI 369 every six months or the housing filled with grease. See section 4.1.

4.3 Maintenance of the BJA actuator

CAUTION:
Don't dismantle a pressurized actuator!

CAUTION:
To release spring tension, always remove the stop screw at the bottom of the housing before opening the cylinder fastening screws !

The cylinder has a warning plate (43), see fig 17. When servicing the unit, check that the plate is in place and legible. Also check that the cylinder has the arrow sticker indicating the spring operating direction.

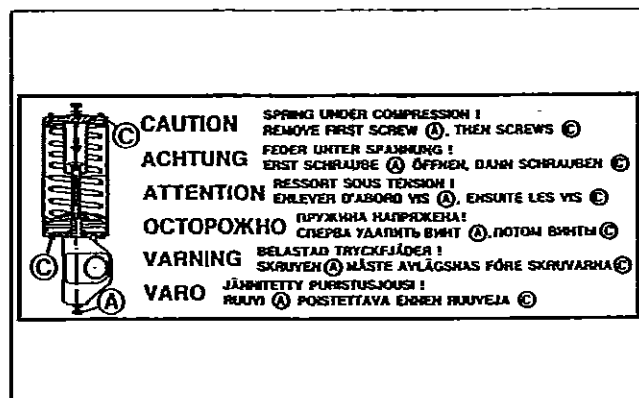


Fig. 17. BJA actuator warning plate

CAUTION:
Don't dismantle the spring package!
The spring pack within the cylinder is preloaded. Never open the lock-welded fastening screw or the piston or dismantle the spring package. The piston, piston rod, spring and spring plate of the BJA actuator are always delivered as a pre-assembled package.

4.3.1 Replacement of piston seals

We recommended that all seals and soft bearings be replaced when the actuator has been dismantled for servicing.

- Detach the actuator from the valve.
- Check that the cylinder has been depressurized, and the piston is at the cylinder base end.
- Remove the cylinder base side stop screw (27).
- Remove cylinder fastening screws (31) from the cylinder base (6) side. Lift the cylinder off together with the end.
- Remove housing cover (2).
- Turn the linkage enough to expose the bearing unit fastening screw (29). Open the screw.
- Remove the piston with the spring package - **do not dismantle the spring package!**
- Remove old seals and the O-ring (24, 18).
- Remove piston rod seal (16) and bearing (22). Clean the seal space.
- Lubricate seal space and new O-ring with Unisilikon L250L or Molykote ill. Install new bearing and O-ring, see fig 11.
- Clean piston seal groove and apply a thin coat of Cortec VCI 369.
- Install the O-ring (18) located under the piston seals.
- Place piston seals (24) around the piston so that the ends of the strips are at opposite sides. Tighten the strips with a tie ring as in Fig. 18. Strips indicated with an asterisk can be cut 1.5 to 3 mm shorter to facilitate assembly.

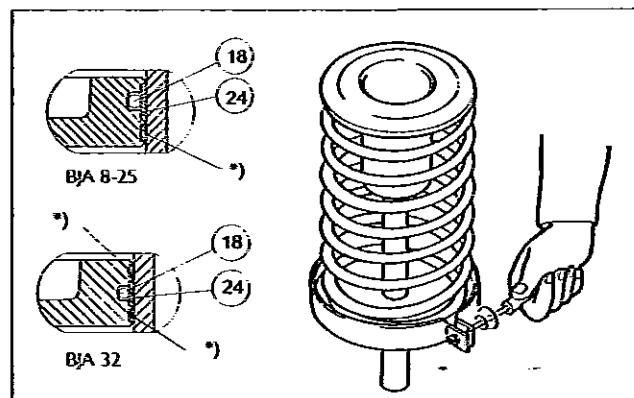


Fig. 18. Tightening piston seals with the tie ring

NOTE:
The inside surface of the cylinder must be free of any grease!

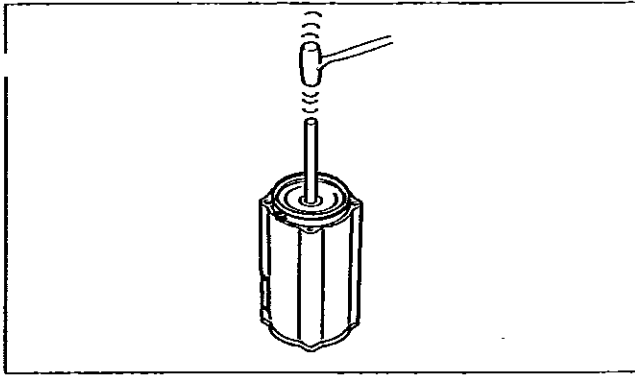


Fig. 19. Placing the piston in the cylinder

- Hammer or press the piston into the cylinder through the tie ring. Note the indicator arrow direction. See Fig. 19.
- Install new cylinder base O-rings (19). Replace cylinder with piston.
- Apply sealant, e.g. Loctite 225, to the bearing unit screw (29) thread and tighten the screw as in table 1 before mounting onto cylinder base.
- Fasten the housing cover temporarily so that the secondary shaft bearings function but the linkage can be seen.

CAUTION:

Keep your fingers, tools or other items out of the housing while operating the actuator with the cover open!

- Check the attachment of the end and the base before temporarily connecting the compressed air supply to the actuator with a shut-off valve.
- Operate the actuator to check cylinder function and the condition of bearings. Close the air supply and depressurize the cylinder.
- Lubricate the linkage throughout with Cortec VCI 369 anti-corrosive agent.
- Apply sealant, e.g. Loctite 573, to the interface between housing and cover and fasten the cover. See table 1 for torque.

To remove the cylinder base, you will need a special tool for opening the lock nut, see section 6 'Tools'. When reinstalling, secure the nut with Loctite 225.

- Install the actuator on the valve and adjust the stop screws.

4.3.2 Replacement of linkage bearings and O-rings

CAUTION:

For reasons of safety, follow the work procedure given below exactly.

- Detach actuator from valve.
- Check that the cylinder has been depressurized, and the piston is at the cylinder base end.
- Remove cylinder base stop screw (27).
- Remove housing cover (2).
- Open cylinder fastening screws (31) from the base side.
- Lift cylinder and piston until the bearing unit fastening screw (29) can be opened.

- Open fastening screw. See Fig. 10.
- Turn lever arm (3) to detach the bearing unit (5) from the piston rod. Lift the entire linkage out of the housing. See Fig. 15.
- Remove lock rings (36) and support rings (37). See Fig. 16.
- Remove connection arms (4) and check the condition of the bearings (20, 21).

The connection arm (4) bearings (20, 21) of the BJ8-25 actuator are fastened with a press-on fit, and so the entire connection arm must be replaced instead of changing the bearings. In the BJ32 actuator, the bearings can be removed.

- Remove lever arm bearings (23) and O-rings (17).
- Clean linkage parts and apply Cortec VCI 369 to bearing and seal surfaces.
- Install new lever arm bearings and O-rings.
- Assemble the linkage and install in the housing.
- Apply sealant, e.g. Loctite 225, to bearing unit screw (29) thread and tighten the screw as in table 1.
- Install new cylinder base O-ring (19). Install the cylinder.
- Apply Cortec VCI 369 anti-corrosive agent to the linkage throughout.
- Apply sealant, e.g. Loctite 573t, to the interface between housing and cover, and fasten the cover.
- Operate the actuator to check that it is moving properly.
- Install the actuator on the valve and adjust the stop screws.

In a corrosive environment with high ambient humidity the linkage must be lubricated with Cortec VCI 369 about every six months, or the housing filled with grease. See section 4.1.

4.4 Changing the BJ actuator into a BJA actuator

The BJ actuator can be changed into a BJA actuator by replacing the spring package and turning the cylinder the other way around.

4.4.1 Removing the cylinder

Remove the cylinder as in section 4.2.1.

4.4.2 Changing the spring package

Replace the spring package of the BJ actuator with a BJA spring package ordered from the manufacturer. The cylinder must be turned 180°. See Fig. 20.

NOTE:

The warning plate of the cylinder must also be changed to correspond with the BJA actuator!

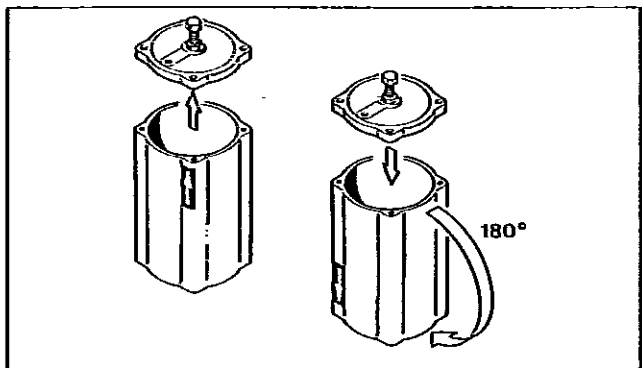


Fig. 20. Turning the cylinder

4.4.3 Assembling the actuator

Assemble the actuator as in section 4.3.1.

4.5 BJR and BJAR actuators

4.5.1 BJR actuator

The BJR actuator is otherwise like the BJ except that it can be operated manually to bring the piston to the lower position against the spring in case there is no air supply. The BJ actuator can be changed into a BJR by replacing the cylinder end (44) accordingly and adding parts (50 to 56).

4.5.1.1 Maintenance

CAUTION:

To release spring tension, always remove the threaded spindle and spindle nut at the cylinder end before opening the cylinder fastening screws!

The cylinder has a warning plate (43), see fig 21. When servicing the unit, check that the plate is in place and legible. Also check that the cylinder has the arrow sticker indicating the spring operating direction.

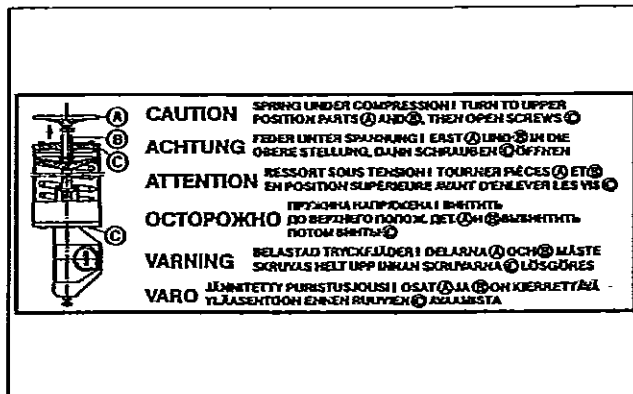


Fig. 21. BJR actuator warning plate

If air escapes between the spindle (50) and spindle nut (51), check the O-ring (54) and replace it if necessary. Also check the condition of the cylindrical rollers (56). See Fig. 22. Other maintenance as described for the BJ actuator in section 4.2.

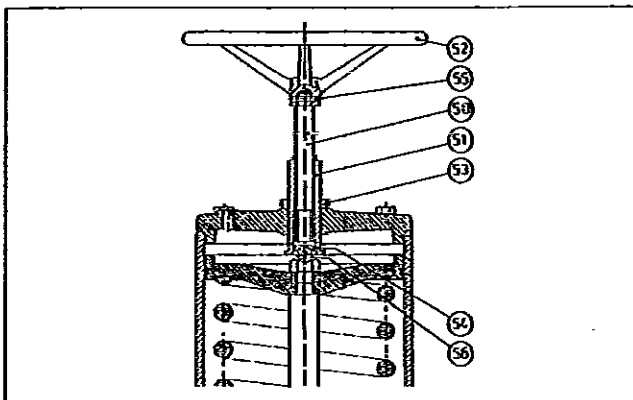


Fig. 22. BJR actuator

Parts list for Fig. 22:

Part	Quantity	Name
50	1	Spindle
51	1	Spindle nut
52	1	Hand wheel
53	1	Lock nut
54	1	O-ring
55	1	Spring pin
56	1	Cylindrical roller

4.5.1.2 Valve close and open position adjustment

In the BJR actuator, unlike in the BJ, the upper valve position limit is adjusted with the spindle nut (51) secured with the lock nut (53). During adjusting, the spindle (50) must be in the extreme outer position.

4.5.2 BJAR actuator

The BJAR actuator is otherwise like the BJA, except that it can be operated manually to bring the piston to the upper position against the spring in case there is no air supply. The BJA actuator can be changed into a BJAR by replacing the housing (1) and adding parts (50 to 56), see Fig. 24.

To make the change, the actuator must be dismantled, see section 4.3.2. A special tool is needed to unscrew and fasten the lock nut (35) fastening the cylinder base to the housing. See chapter 6 'Tools'.

4.5.2.1 Maintenance

CAUTION:

To release spring tension, always remove the threaded spindle and spindle nut at the cylinder end before opening the cylinder fastening screws!

The cylinder has a warning plate (43). When servicing the unit, check that the plate is in place and legible, see Fig. 23. Also check that the cylinder has the arrow sticker indicating the spring operating direction.

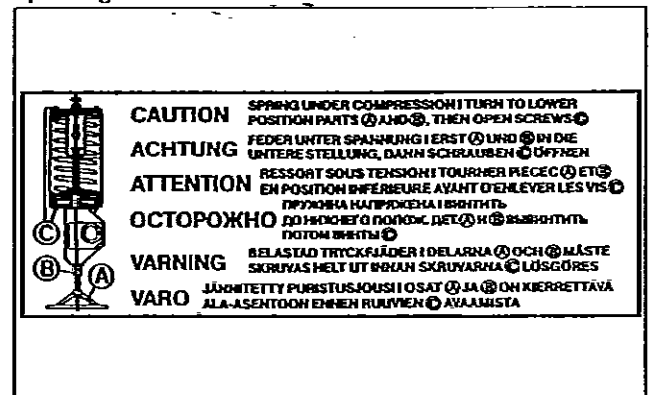


Fig. 23. BJAR actuator warning plate

If stiffness or noise occurs when the actuator is operated with the handwheel, check the condition of the bearings (56), see Fig. 24. Other maintenance as described for the BJA actuator in section 4.3.

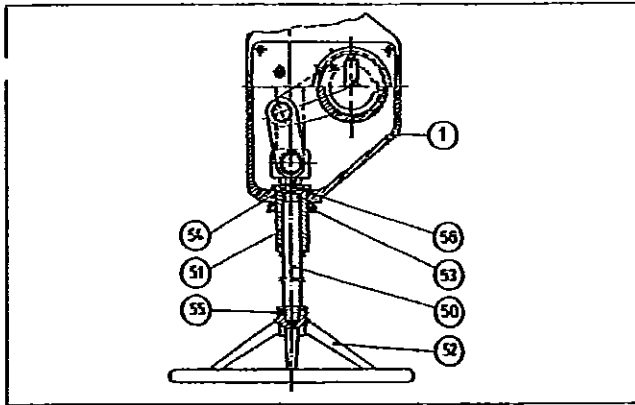


Fig. 24. BJAR actuator

Parts list for Fig. 24:

Part	Quantity	Name
1	1	Housing
50	1	Spindle
51	1	Spindle nut
52	1	Hand wheel
53	1	Lock nut
54	1	O-ring
55	1	Spring pin
56	1	Cylindrical roller

4.5.2.2 Valve close and open position adjustment

In the BJAR actuator, unlike in the BJA, the lower valve position limit is adjusted with the spindle nut (51) secured with the lock nut (53). During adjusting, the spindle (50) must be in the extreme outer position.

4.6 BJV and BJK actuators

The actuators are otherwise like the BJ, except the BJV has a more powerful spring yielding a 1.3 times higher torque, but also requiring a higher supply pressure (5 bar/500 kPa). The BJK has a lighter spring yielding a 0.7 times lower torque and reducing the supply pressure requirement. See section 10 'Type designation'.

4.6.1 Maintenance

See section 4.2 'Maintenance of the BJ actuator'.

4.7 BJVA and BJKA actuators

The actuators are otherwise like the BJA, except the BJVA has a more powerful spring yielding a higher torque, but also requiring a higher supply pressure. The BJKA has a lighter spring yielding a lower torque and reducing the supply pressure requirement. See chapter 10 'Type designation'.

4.7.1 Maintenance

See section 4.3 'Maintenance of the BJA actuator'.

4.8 BJ 322 and BJA 322 actuators

In principle, the structure of the BJ 322 and BJA 322 actuators is similar to that of the BJ or BJA actuators, respectively. To obtain a high operating torque, these devices are, however, equipped with two cylinders connected via a linkage to the secondary shaft. See section 10 'Type designation'.

4.8.1 Maintenance

See section 4.2 or 4.3 respectively.

5 MALFUNCTIONS

Table 2 lists malfunctions that might occur after prolonged use.

6 TOOLS

For maintenance of the actuator, you will need a few special tools in addition to the usual ones. The following can be ordered from the manufacturer:

- For actuator removal:
 - Extractor
- For piston seal installation:
 - Tie ring
- For cylinder base removal:
 - Lock nut key

7 ORDERING SPARE PARTS

NOTE:

Use only original spare parts. This ensures proper functioning of the actuator.

When ordering spare parts, always give the following information:

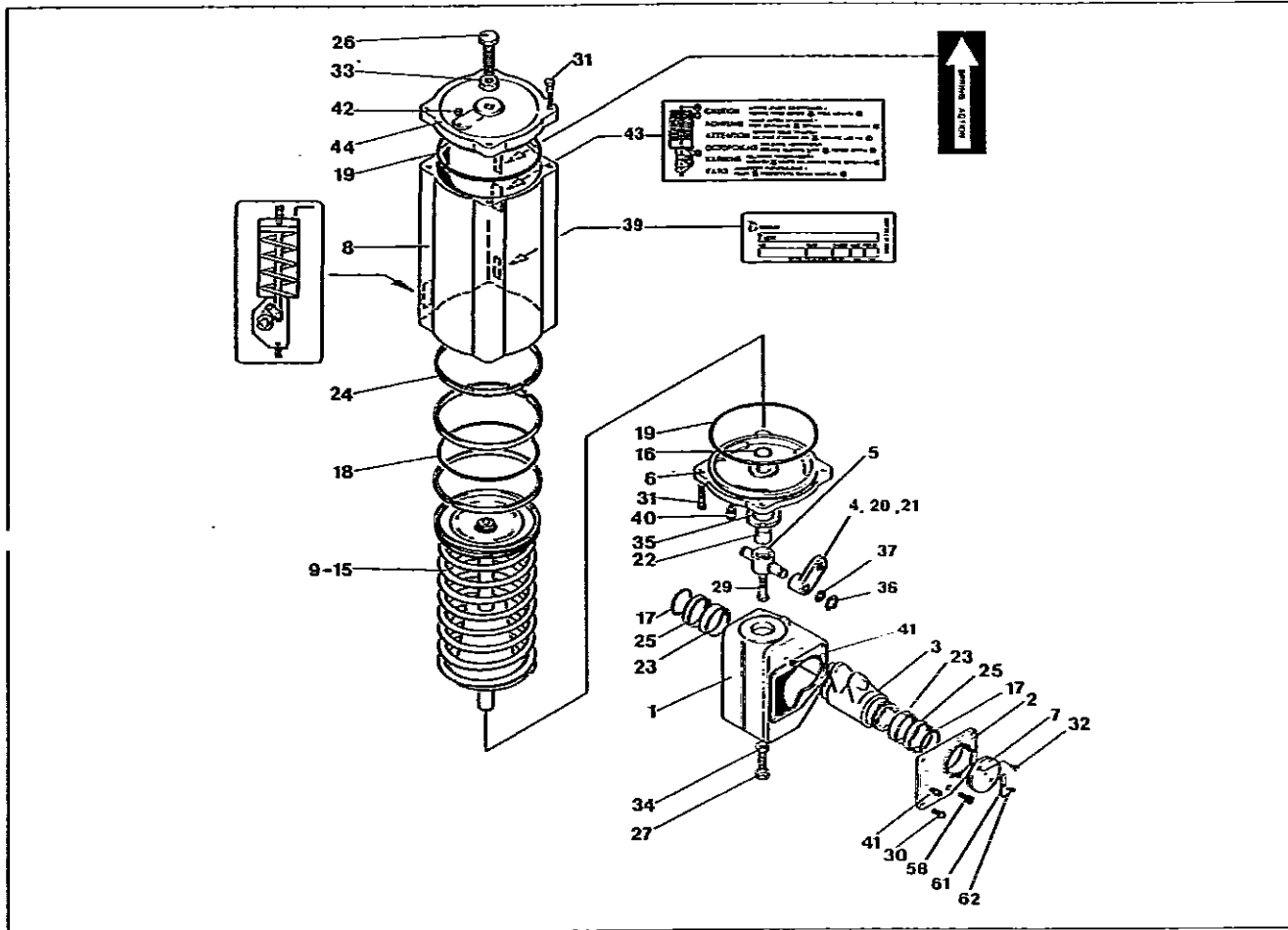
- Type marking indicated on the identification plate and in the relevant documents
- number of parts list, part number and quantity, or
- the number of these instructions, part number, name and quantity
- serial number if the type designation contains the letter Y.

Table 2. Possible malfunctions

Symptom	Possible fault	Action
Irregular or slow operation	Low supply pressure	Make sure that supply pressure complies with minimum torque required by valve. Check that supply air pipes are large enough.
	Positioner fault	Check positioner operation.
	Valve fault	Check that valve functions properly without actuator.
	Incorrect actuator rating	Contact manufacturer to check rating.
	Leak in piston or piston rod seal	Replace seals. See sect. 4.2.1 or 4.3.1, depending on actuator type.
	Cylinder damaged by impurities	Note installation position recommendation. Replace cylinder if damaged.
	Worn-out actuator bearings	Check bearings as in sections 4.2.2 or 4.3.2, depending on actuator type. Replace bearings when necessary. If operating density is high, bearings and piston seals must be replaced regularly. max. 500,000 operations.
	Linkage corroded in harsh, humid conditions	Clean linkage and replace bearings. When necessary lubricate housing or fill with grease regularly as in section 4.1. If water occurs in housing, an outlet hole (Ø 5 mm) can be bored in lower part of housing.
	Bearing unit fastening screw loose	Tighten screw. Seal e.g. with Loctite 225.
Backlash in joint between actuator and valve	Replace parts as necessary.	

8 EXPLODED VIEW AND PARTS LISTS

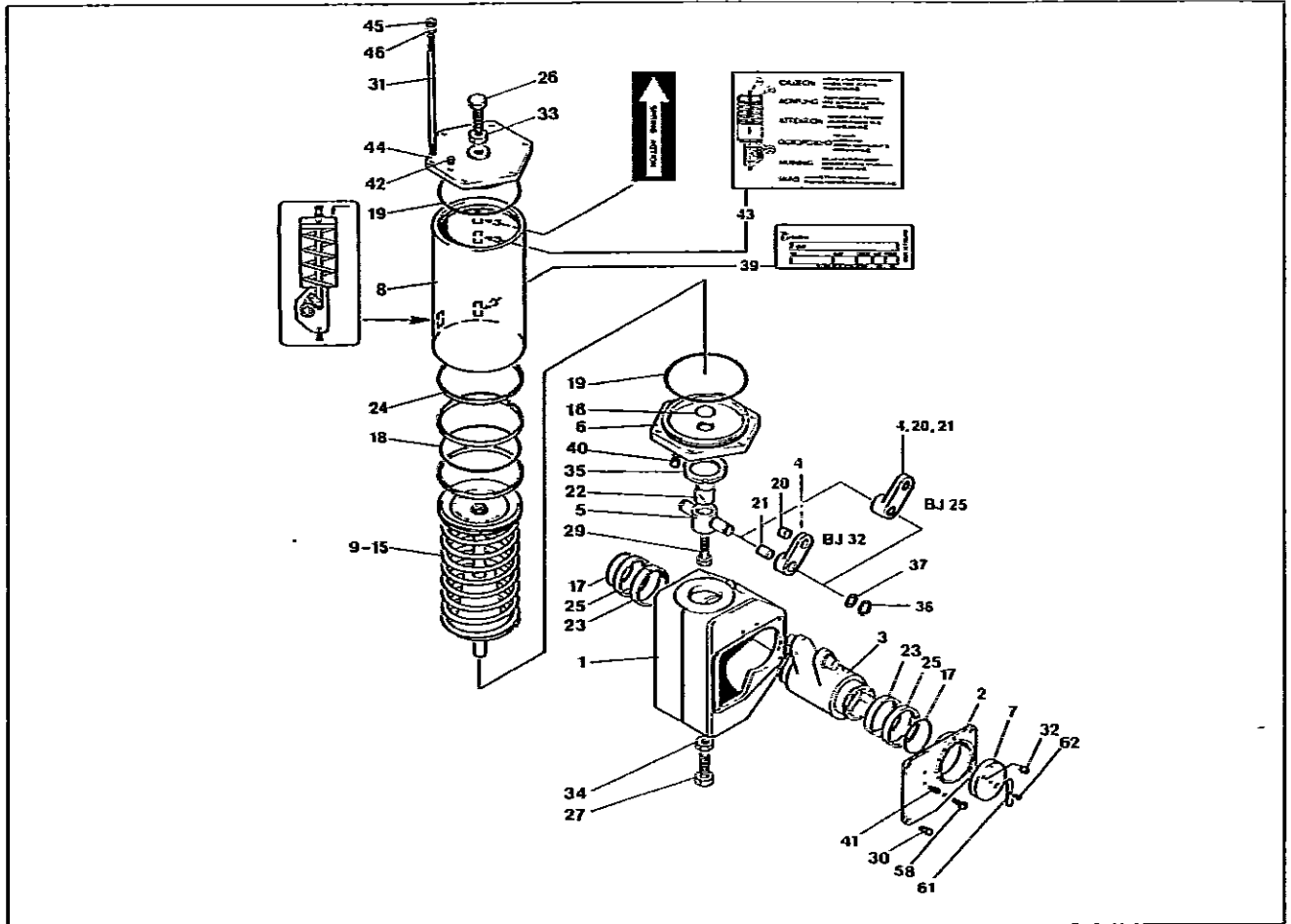
8.1 Actuators BJ/B1J 8-20



Item	Qty	Description	Recommended spare	Item	Qty	Description
1	1	Housing		25	2	Bushing
2	1	Cover		26	1	Stop screw
3	1	Lever arm		27	1	Stop screw
4	2	Connection arm and bearings		29	1	Screw
5	1	Bearing unit		30	4	Screw
6	1	Cylinder base		31	8, 12	Screw
7	1	Pointer cover		32	2	Screw
8	1	Cylinder		33	1	Nut
9*)	1	Piston		34	1	Nut
10*)	1	Piston rod		35	1	Lock nut
11*)	1	Spring		36	2	Lock ring
12*)	1	Spring plate		37	2	Support ring
13*)	1	Ring		39	1	ID plate
14*)	2	Lock ring		40	1	Filter
15*)	1	Hexagon nut		41	4	Plug
16	1	O-ring	x	42	1	Plug
17	2	O-ring	x	43	1	Warning plate
18	1	O-ring	x	44	1	Cylinder end
19	1	O-ring	x	58	1	Pressure outlet valve
20 **)	2	Bearing	x	61	1	Direction arrow
21 **)	2	Bearing	x	62	1	Screw
22	1	Bearing	x			
23	2	Bearing	x			
24	3	Piston seal	x			

*) Delivered as a set
 **) Parts 4, 20 and 21 delivered as a set

8.2 Actuators BJ/B1J 25-32

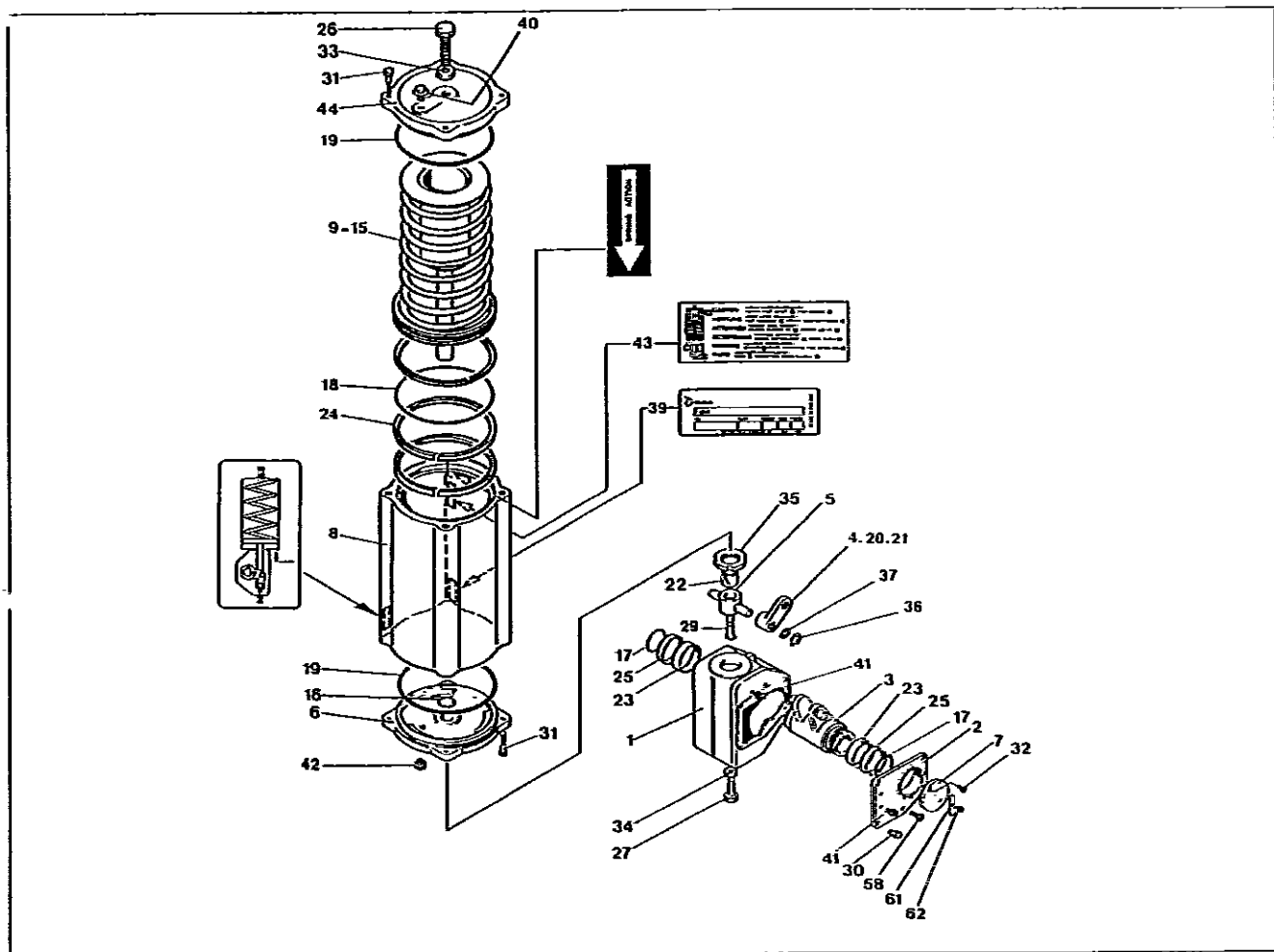


Item	Qty	Description	Recommended spare	Item	Qty	Description
1	1	Housing		26	1	Stop screw
2	1	Cover		27	1	Stop screw
3	1	Lever arm		29	1	Screw
4	2	Connection arm and bearings		30	4	Screw
5	1	Bearing unit		31	6	Stud
6	1	Cylinder base		32	2	Screw
7	1	Pointer cover		33	1	Nut
8	1	Cylinder		34	1	Nut
9*)	1	Piston		35	1	Lock nut
10*)	1	Piston rod		36	2	Lock ring
11*)	1	Spring		37	2	Support ring
12*)	1	Spring plate		39	1	ID plate
13*)	1	Ring		40	1	Filter
14*)	2	Lock ring		41	4	Plug
15*)	1	Hexagon nut		42	1	Plug
16	1	O-ring	x	43	1	Warning plate
17	2	O-ring	x	44	1	Cylinder end
18	1	O-ring	x	45	6	Nut
19	1	O-ring	x	46	6	Washer
20 **)	2	Bearing	x	58	1	Pressure outlet valve
21 **)	2	Bearing	x	61	1	Direction arrow
22	1, 2	Bearing	x	62	1	Screw
23	2	Bearing	x			
24	3, 4	Piston seal	x			
25	2	Bushing	x			

*) Delivered as a set

**) Pars 4, 20 and 21 delivered as a set, actuator size 25

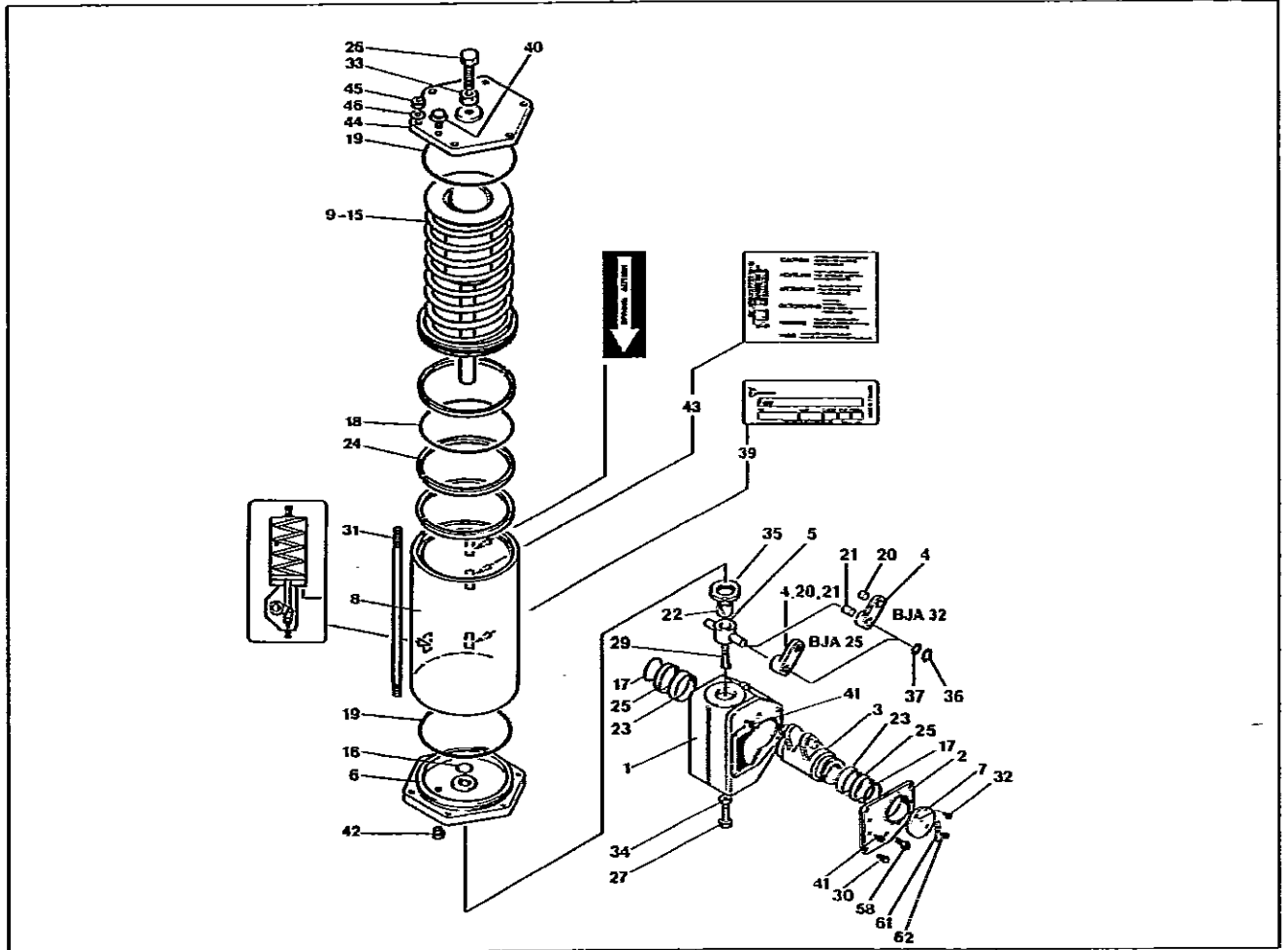
8.3 Actuators BJA/B1JA 8-20



Item	Qty	Description	Recommended spare	Item	Qty	Description
1	1	Housing		25	2	Bushing
2	1	Cover		26	1	Stop screw
3	1	Lever arm		27	1	Stop screw
4	2	Connection arm and bearings		29	1	Screw
5	1	Bearing unit		30	4	Screw
6	1	Cylinder base		31	8, 12	Screw
7	1	Pointer cover		32	2	Screw
8	1	Cylinder		33	1	Nut
9*)	1	Piston		34	1	Nut
10*)	1	Piston rod		35	1	Lock nut
11*)	1	Spring		36	2	Lock ring
12*)	1	Spring plate		37	2	Support ring
13*)	1	Clamping tube		39	1	ID plate
15*)	1	Hexagon nut		40	1	Filter
16	1	O-ring	x	41	4	Plug
17	2	O-ring	x	42	1	Plug
18	1	O-ring	x	43	1	Warning plate
19	1	O-ring	x	44	1	Cylinder end
20 **)	2	Bearing	x	58	1	Pressure outlet valve
21 **)	2	Bearing	x	61	1	Direction arrow
22	1	Bearing	x	62	1	Screw
23	2	Bearing	x			
24	3	Piston seal	x			

*) Delivered as a set
 **) Parts 4, 20 and 21 delivered as a set

8.4 Actuator BJA/B1JA 25-32



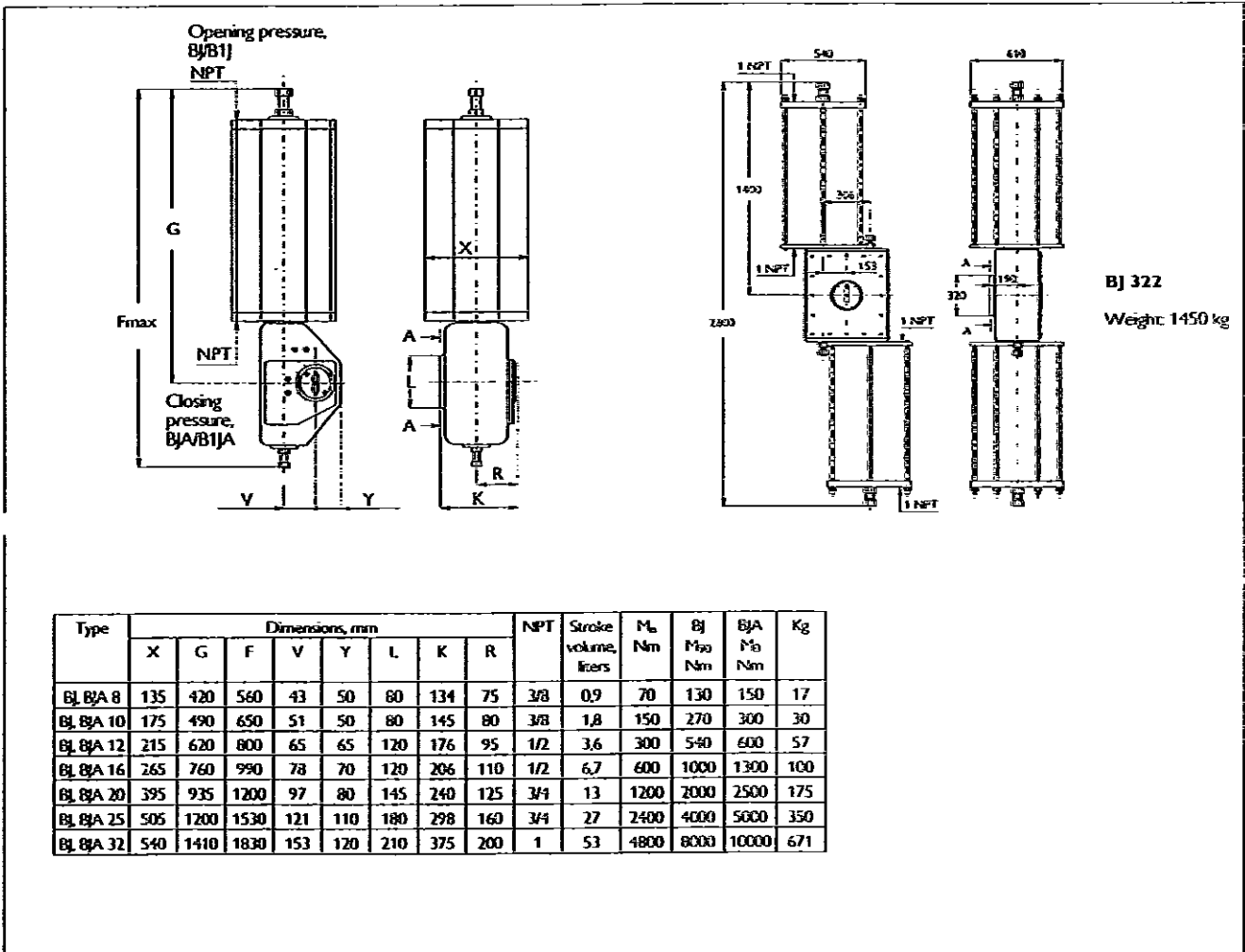
Item	Qty	Description	Recommended spare	Item	Qty	Description
1	1	Housing		26	1	Stop screw
2	1	Cover		27	1	Stop screw
3	1	Lever arm		29	1	Screw
4	2	Connection arm and bearings		30	4	Screw
5	1	Bearing unit		31	6	Stud
6	1	Cylinder base		32	2	Screw
7	1	Pointer cover		33	1	Nut
8	1	Cylinder		34	1	Nut
9*)	1	Piston		35	1	Lock nut
10*)	1	Piston rod		36	2	Lock ring
11*)	1	Spring		37	2	Support ring
12*)	1	Spring plate		39	1	ID plate
13*)	1	Clamping tube		40	1	Filter
15*)	1	Hexagon nut		41	4	Plug
16	1	O-ring	x	42	1	Plug
17	2	O-ring	x	43	1	Warning plate
18	1	O-ring	x	44	1	Cylinder end
19	1	O-ring	x	45	6	Nut
20 **)	2	Bearing	x	46	6	Washer
21 **)	2	Bearing	x	58	1	Pressure outlet valve
22	1, 2	Bearing	x	61	1	Direction arrow
23	2	Bearing	x	62	1	Screw
24	3, 4	Piston seal	x			
25	2	Bushing				

*) Delivered as a set

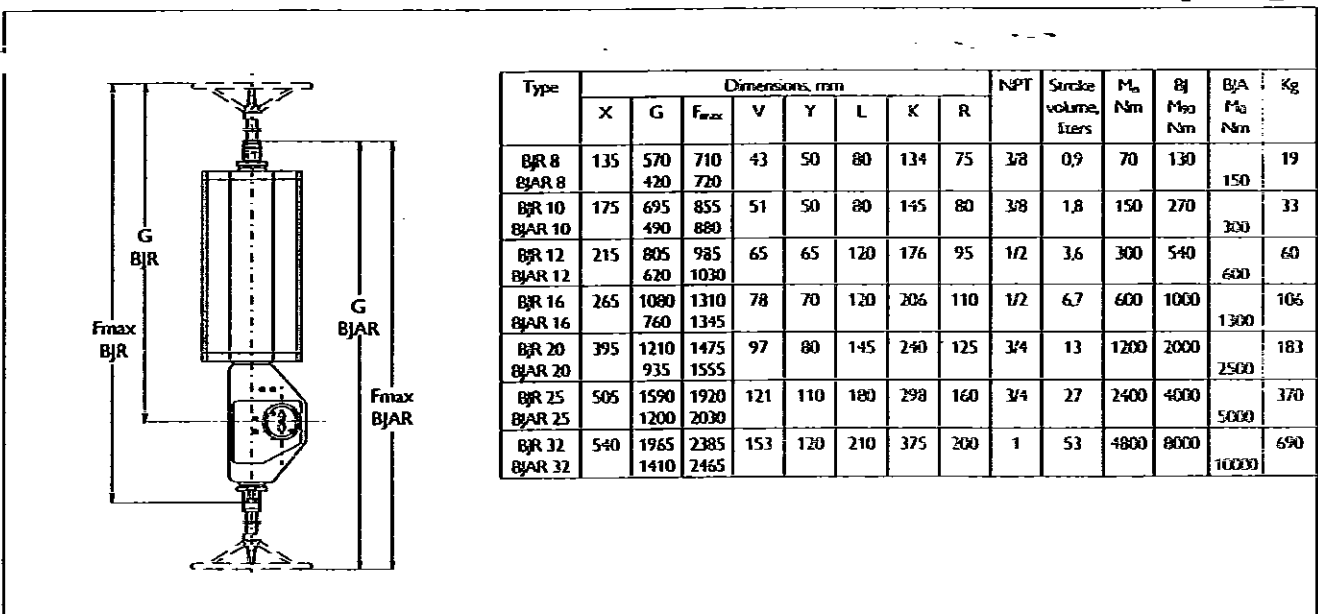
**) Parts 4, 20 and 21 delivered as a set, actuator size 25

9 DIMENSIONS AND WEIGHTS

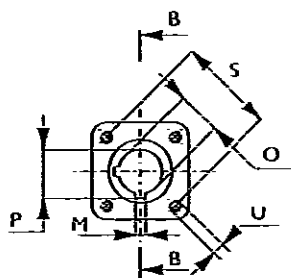
9.1 Actuators BJ/B1J, BJA/B1JA



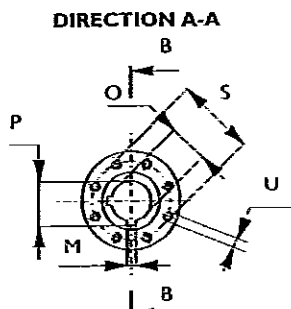
9.2 Actuator BJR/B1JR



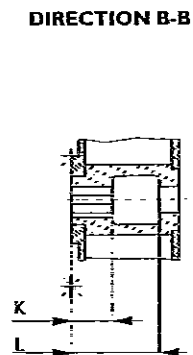
9.3 Mounting face dimensions



BJ 8...32; B1J 8...25



BJ 322; B1J 32, 322



Actuator	BJ, B1J*					BJ			B1J			
	BJ	O (+H)	M	P	K (keyway)	L	S	U (UNC)	N	S	U	N
8	15	4.76	17.0	50	90	80	1/2-13	4	70	M8	4	F07
	20	4.76	22.3									
	25	6.35	27.3									
	35	9.52	39.3									
10	20	4.76	22.3	60	105	80	1/2-13	4	102	M10	4	F10
	25	6.35	27.9									
	35	9.52	39.3									
	40	9.52	44.4									
12	25	6.35	27.9	75	130	120	5/8-11	4	125	M12	4	F12
	35	9.52	39.3									
	40	9.52	44.4									
	55	12.7	60.8									
16	35	9.52	39.3	80	120	120	5/8-11	4	140	M16	4	F14
	40	9.52	44.4									
	45	12.7	50.6									
	55	12.7	60.8									
Actuator	BJ, B1J*					BJ			B1J*			

BJ	O (+H)	M	P	K (keyway)	L	S	U (UNC)	N	S	U	N	Mounting face
20	55	12.7	60.8	105	195	145	3/4-10	4	140	M16	4	F14
	70	19.0	78.3	140	235	180	1-8	4	165	M16	4	F16
25	85	22.22	94.8	155	280	210	1 1/4-7	4	254	M16	8	F25
	95	22.22	105.5									
	105	25.4	116.3									
322	95	22.22	105.0	180	320	260	1 1/4-7	8	298	M20	8	F30
	105	25.4	116.3									
	120	31.75	133.9									

*) B1J = ISO 5211 mounting face

10 TYPE CODING

Pneumatic spring-return cylinder actuator, BJB1J

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
B	J	K	A	R	S	Y	U	20/55	H	E	Z
1. sign	Product group										
B	Cylinder actuator with attachment dimensions acc. to Metso Automation standard										
BJ	Cylinder actuator with attachment dimensions acc. to ISO 5211										
2. sign	Series										
J	Pneumatic, spring-return										
3. sign	Spring option										
-	Standard construction without sign										
K	Light spring (0,7 x nominal torque)										
V	Strong spring (1,3 x nominal torque)										
4. sign	Function code										
-	Spring-to-close operation without sign										
A	Spring-to-open operation										
5. sign	Construction										
-	Standard construction without sign										
R	Secondary hand-wheel for manual operation (sizes 8-16)										
RR	Secondary hand-wheel with wormgear (sizes 20 - 32)										
H	Manual hydraulic override										
6. sign	Cylinder and housing materials										
-	Aluminium cylinder and GG-20 housing, standard without sign										
S	Steel cylinder and GG-20 housing										
B	Aluminium cylinder and GGG-40 housing										
X	Steel cylinder and GGG-40 housing										
7. sign	Special construction										
-	Standard construction without sign										
Q	Mechanical locking device for piston movement limit on housing end. Locking with long screw to close position										
W	Mechanical locking device for piston movement limit on cylinder end. Locking with long screw to open position										
QW	Mechanical locking device for piston movement limit on housing and cylinder ends. Locking with long screws to close as well as to open position										
PP	Actuator equipped with automatic latching device for open position in series BJ and BJJ and for closed position in series BJA and BJA allowing about 20 degrees' motion.										
T	Actuator equipped with manual latching device. Actuator can be locked to open position allowing about 20 degrees motion.										
Y	Special construction										
8. sign	VDI / VDE 3845										
U	Attachment dimensions according to VDI/VDE 3845										
9. sign	Actuator size										
	E.g. 20/50 = actuator size / shaft bore diameter										
10. sign	Materials of seals and bearings										
-	Standard construction without sign (-20...+70 °C) O-rings: Nitrile rubber. Bearings and piston seals: PE-HD										
H	High temperatures (-20...+120 °C). Dynamic O-rings: fluorocarbon rubber. Bearings and piston seals: PTFE + C25										
C	Low temperatures (-40...+70 °C). Dynamic O-rings: Epichlorohydrin rubber. Bearings and piston seals: PTFE + C25										
11. sign	Screw material										
-	Steel, zinc coated and passivated. Standard, without sign										
E	Stainless steel										
12. sign	Non-standard operation range										
X	Valve closed position is limited to a given angle. E.g. X=30 (never fully closed).										
Z	Valve open position is limited to a given angle. E.g. Z=70 (never fully open).										

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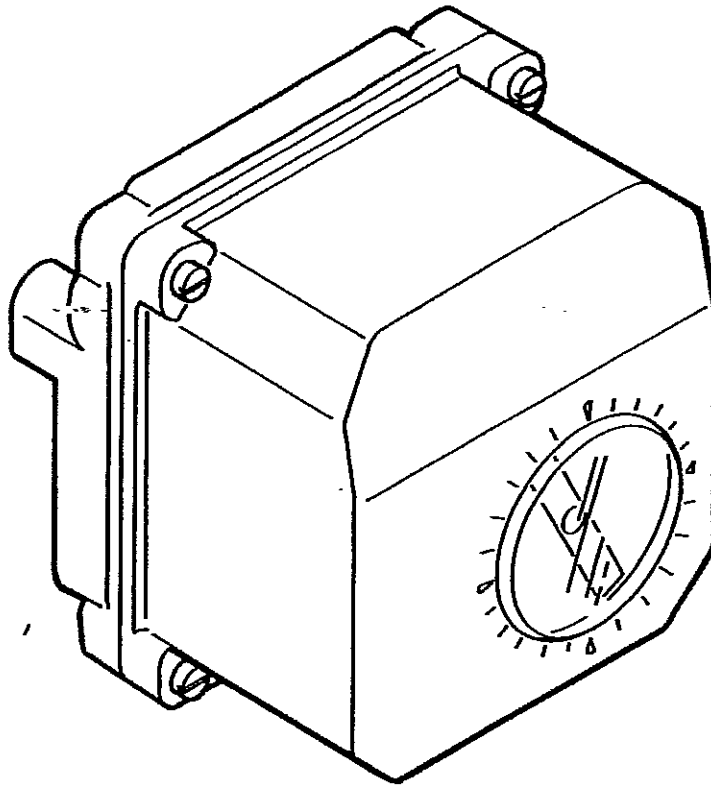
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LIMIT SWITCHES
Series NI700



LIMIT SWITCHES

Series NI700

Installation, Maintenance and
Operating Instructions
7 NI 72 en
Issue 5/02

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READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the limit switch. If you require additional assistance, please contact the manufacturer or manufacturer's representative. Addresses and phone numbers are printed on the back cover.

SAVE THESE INSTRUCTIONS!

Subject to change without notice.

All trademarks are property of their respective owners

1 INTRODUCTION

1.1 General description

The NI700 limit switch provided with inductive proximity switches is used for indication of the electrical position of valves and other devices.

The cam discs activating the proximity switches are mounted on the shaft.

The switching points of the proximity switches (1 or 2 pcs.) can be chosen freely.

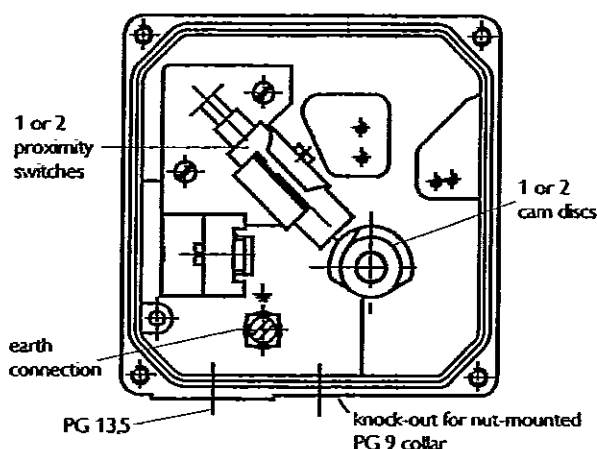


Fig. 1. Limit switch layout

1.2 Markings

The limit switch is provided with an identification plate sticker, see Fig. 2. Identification plate markings from top to bottom are:

- Complete type designation
- Type of switch
- Electrical values
- Enclosure class
- Temperature range
- Conduit entry (-L, -I or -NJ)
- Serial number

A separate plate in older versions shows the conduit entry (-L, -I or -NJ).

The type designation is described in chapter 11.

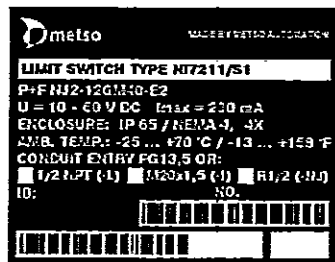


Fig. 2. Identification plate (NI7211)

1.3 Specifications

Proximity switch:	Inductive, diameter 8-14 mm / 0.31-0.55 in
	Sensing range 2 mm / 0.08 in
	Protection class IP67
	P+F NJ2-12GK-N

P+F NJ2-12GM40-E2	11
P+F NJ2-12GM40-E	21
OMRON E2E-X3D1-N	54
ifm IFC2002-ARKG/UP	56
Other switch types on special order	

Electrical values:	According to switch type
Switch accuracy:	< 1°
Number of switches:	1 or 2
Approvals NI7201/X	EEx ia IIC T6
Protection class of housing:	IP65 (DIN 40050, IEC 529) / NEMA 4 and 4X
Conduit entry:	PG 13.5 and knockout for additional entry PG9 NPT 1/2 inch = -L ISO M20x1.5 = -I R 1/2 = -NJ
Ambient temperature:	According to switch type or -25 - +65 °C / -13 - +149 °F for NI7201/X
Weight:	Approx. 0.6 kg / 1.1 lbs
Materials:	
Body:	aluminium alloy, epoxy coated
Cover:	polycarbonate
Internal parts:	stainless steel and plastic
Sealing:	nitrile and neopren rubber

1.4 Recycling and disposal of a rejected limit switch

Most limit switch parts can be recycled if sorted according to material. Most parts have material marking. A material list is supplied with the limit switch. In addition, separate recycling and disposal instructions are available from the manufacturer. A limit switch can also be returned to the manufacturer for recycling and disposal against a fee.

1.5 Safety precautions

CAUTION:

Do not exceed the limit switch performance limitations!

Exceeding the limitations marked on the limit switch may cause damage to the limit switch, actuator and valve.

Damage or personal injury may result.

CAUTION:

Observe caution with the live parts of the limit switch!

The limit switches are fed with a voltage that, depending on the system, can be lethal.

Do not touch any uncovered parts of the wires. Always detach the wires before dismantling the limit switch.

2 INSTALLATION ON A METSO AUTOMATION ACTUATOR

When the limit switch is ordered together with the valve, installation and adjustment are performed at the factory according to circuit diagrams in Chapter 10 or the customer's specifications.

When the limit switch is ordered separately, the installation parts belonging to the particular entity must also be ordered.

Ordering example: (B1CU)-Z-NI7211/S1 or (B1J12)-Z-NI7211/S2 or (B1J12-NP724/S2)-Z-NI7211/S2

The limit switch is equipped with both VDI/VDE 3845 (S1) mounting face and Metso Automation (S2) mounting face. Both mounting faces require different shafts. S1: H coupling; S2: C coupling.

The limit switch can be mounted on the actuator. If also the positioner is needed, use positioner/limit switch combination (e.g. NP1724/S1/7201).

If limit switch NI700/S1 is mounted on an existing actuator B_6-20 with bracket 4216200, make sure that the shaft and draught piece can rotate freely. Remove material from the bracket according to Fig. 3, if needed.

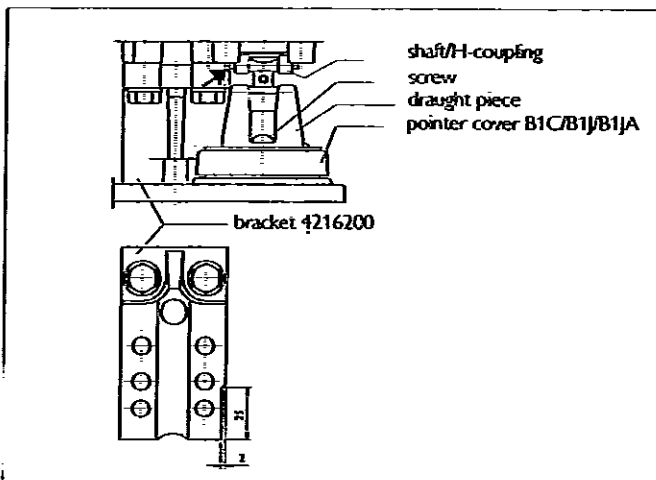


Fig. 3. Installing NI700/S1 limit switch on B series actuator (older version).

2.1 Installing limit switch NI700/S1 on Metso Automation actuators with VDI/VDE 3845 mounting face

2.1.1 Installation steps

1. The actuator piston must be in the up position (in spring-return actuators as determined by the spring).
2. Install the pointer (only B_U) parallel with the valve closure member and fasten the draught piece (2) with a screw (29) to the pointer cover (B_U) or to the coupling (QP), as shown in Fig. 4. Secure the draught piece fastening screw with a sealant (e.g. Loctite) and tighten it properly.
3. Fasten the mounting bracket (1) to the limit switch.
4. Fasten the mounting bracket (1) to the actuator. The mechanical coupling (223) of the limit switch must be positioned in the draught piece (2) as shown in Fig. 4.

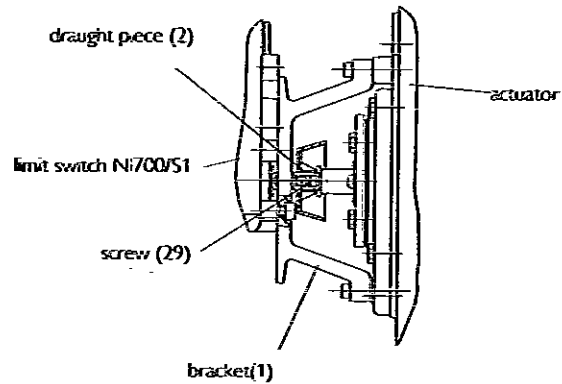


Fig. 4. installing S1

2.2 Installing limit switch NI700/S2 on Metso Automation B series actuators

2.2.1 Installation steps

1. The actuator piston must be in the up position (in spring-return actuators as determined by the spring).
2. Install the pointer parallel with the valve closure member and fasten the spline driver (2) to the pointer cover with the coupling strap positioned as shown in Fig. 5. Secure the spline driver fastening screw with a sealant (e.g. Loctite) and tighten it properly.
3. Fasten the mounting bracket (1) to the limit switch. Note the washers (3)!
4. Fasten the mounting bracket (1) on the actuator. The mechanical coupling (223) of the limit switch must be positioned in the spline driver (2) as shown in Fig. 5.

Observe the difference in installing the switch on the B1C and B1J actuators as compared with the case of the B1JA actuator.

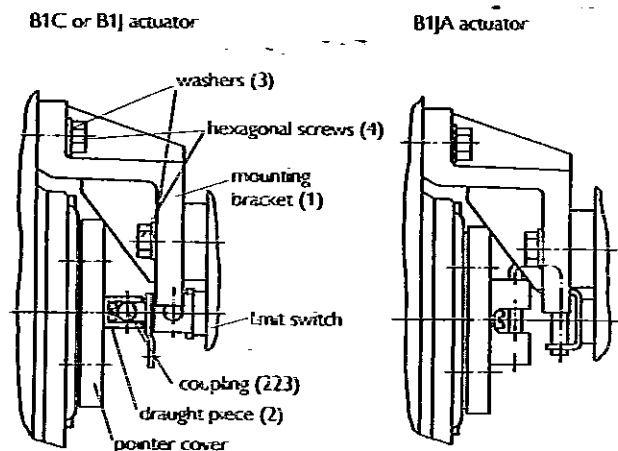


Fig. 5. Installing on a Metso Automation actuator

2.3 Installing the limit switch (S2) and positioner NP700/NE700/S2

Installation of a separate limit switch with a positioner is possible if both the limit switch and the positioner have S2 shaft.
Eg. NP724/S2-Z-NI7201/S2

2.3.1 Actuators B1C/B1J/B1JA6-20

1. The actuator piston must be in the up position (in spring-return actuators as determined by the spring).
2. Install the pointer parallel with the valve closure member and fasten the spline driver (2) to the pointer cover with the coupling strap positioned as shown in Fig. 5. Secure the spline driver fastening screw with a sealant (e.g. Loctite) and tighten it properly.
3. Fasten the bracket (5) to positioner NP700/NE700 with screw (7) and washer (6), see Section 9.5.
4. Fasten limit switch NI700 to the bracket (5), see Section 9.2.
5. Fasten the rod (10) with screws and bushings (12+11). Turn the bushing (11) onto the screw (12) so that the spacing inside the bushing is placed against the head of the screw, see Fig. 6. Apply the outer sphere of the bushing with Molykote BR2 vaseline (or the equivalent).

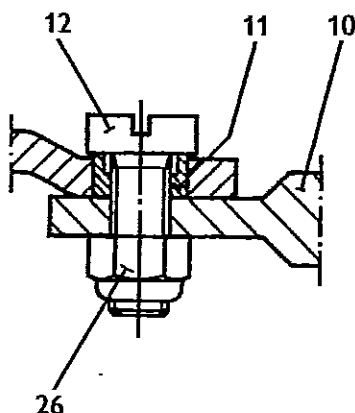


Fig. 6. Installing the rod (10)

6. Tighten the lock nuts (26).
7. Fasten the assembly to the actuator. The mechanical coupling of the positioner must be placed into the spline driver (2) as shown in Fig. 5.
8. Complete the piping of the positioner according to its installation, operating and maintenance instructions.

For installation instructions of the positioner/limit switch combinations see positioners' manuals (7 NP 72 / 7 NE 72).

2.3.2 Actuators B1C/B1J/B1JA25-502

1. The actuator piston must be in the up position (in spring-return actuators as determined by the spring).
2. Install the pointer parallel with the valve closure member and fasten the spline driver (2) to the pointer cover with the coupling strap positioned as shown in Fig. 5. Secure the spline driver mounting screw with a sealant (e.g. Loctite) and tighten it properly.

3. Fasten positioner NP700/NE700 and limit switch NI700 to the mounting bracket (1), see Section 9.6.
4. Fasten the rod (10) with screws and bushings (12+11). Turn the bushing (11) onto the screw (12) so that the spacing inside the bushing is placed against the head of the screw, see Fig. 4. Apply the outer sphere of the bushing with Molykote BR2 vaseline (or the equivalent).
5. Tighten the lock nuts (26).
6. Fasten the assembly to the actuator. The mechanical coupling of the positioner must be placed into the spline driver (2) as shown in Fig. 3.
7. Complete the piping of the positioner according to its installation, operating and maintenance instructions.

2.4 Installation on other actuators

1. Operate the actuator so that the valve closes. Also turn the limit switch shaft to activate the closed limit proximity switch (the lower one).
2. Fasten the coupling (2) between the limit switch and the actuator to the actuator (or to limit switch shaft).
3. Fasten the mounting bracket (1) to the limit switch.
4. Fasten the mounting bracket (1) with the limit switch to the actuator so that the mechanical coupling (223) of the limit switch (or the shaft end) is inserted in the slot of the coupling (2). Observe what was said about the position of the limit switch shaft in step 1 above!

2.5 Installing the limit switch NI700/700 on the positioner

The bottom of the limit switch acts also as the cover for the positioner. See drawings in chapter 9. It is possible to mount a limit switch on an existing positioner, however, the shaft and locking wheel of the positioner must be changed. It is recommended to order a pre-assembled combination.

The positioner should be adjusted before the mounting of the limit switch.

1. Operate the actuator until the valve is in the closed or open position.
2. Note the position of the actuator and valve when mounting the limit switch on the actuator. Make sure that the shaft (215) is in the right position: the lower switch is activated at the closed limit and the upper switch at the open limit.
3. Place the limit switch on the positioner so that the shafts are correctly engaged.
4. Fasten the screws (258).
5. Check the adjustment of the limit switch. See chapter 4 for details.

Remove the limit switch before the adjustment of the positioner. Loosen the screws (258). Note the position of the shaft relative to the positioner when removing the limit switch. Check the adjustment of the limit switch always after remounting.

3 ELECTRICAL CONNECTIONS

Before connecting the power, make sure that the electric specification and the wiring meet the installation conditions. Also observe the function of the proximity switch (make or break when the active face is covered. See also the information on the identification plate.

4 ADJUSTMENT

The pointer (210) need not be removed for adjustment.

When the limit switch is ordered together with the valve and the actuator, the proximity switches are adjusted at the factory.

The limits are adjusted by changing the position of the cam discs (221) on the shaft. Depending on the type, the proximity switch is activated when the active face is either covered or free.

With the actuator in the open or closed position, turn the cam disc to adjust the point where the switch is activated 5°-6° before limit. Use the LED indicator or a separate measuring instrument as an aid.

After re-installation of the actuator, first adjust its mechanical limits according to the valve, then the possible positioner according to separate instructions, and finally the limit switch.

Adjustment completed, turn the pointer (210) to make the yellow line parallel with the valve closure member.

5 CIRCUITRY

The internal circuitry of the limit switch is shown in the circuit diagrams of Chapter 10.

The connection diagrams are also supplied with the limit switch.

6 MAINTENANCE

Regular maintenance of the limit switch is not necessary.

7 OPTIONS

7.1 NI700/X, intrinsically safe construction

Limit switch has DEMKO EEx ia IIC T6 or EEx ib IIC T6 approval depending on switch certification.

8 ORDERING SPARE PARTS

NOTE:

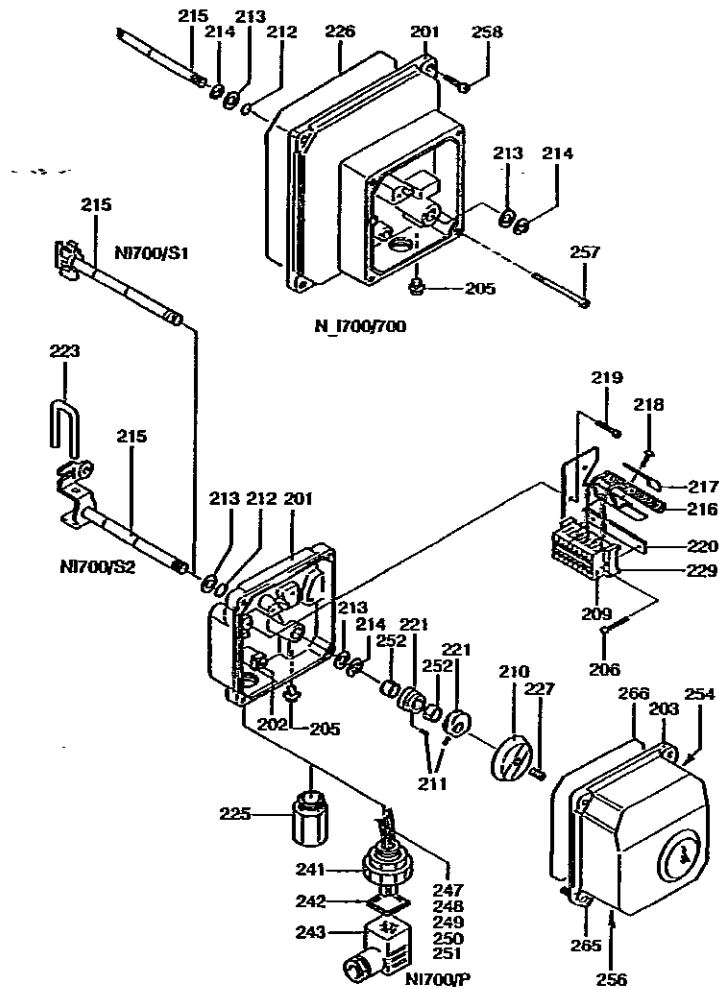
Always use original spare parts to make sure that the limit switch functions as intended.

When ordering spare parts, always include the following information:

- limit switch type designation (from the name plate or switch documents)
- number of the parts list (or number of this manual), part number, name of the part and number of pieces required

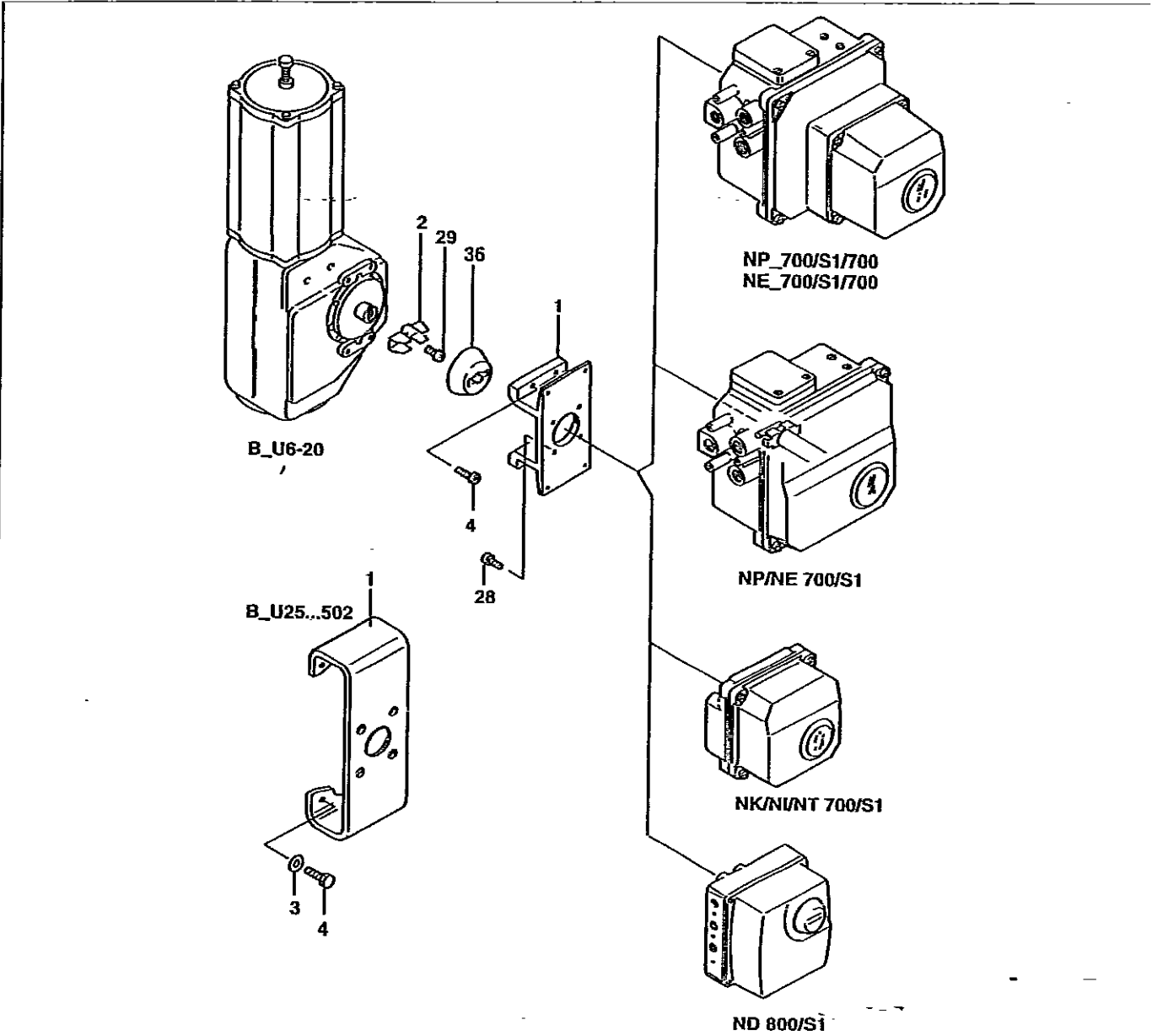
9 DRAWINGS AND PARTS LISTS

9.1 NI700, exploded view and parts list



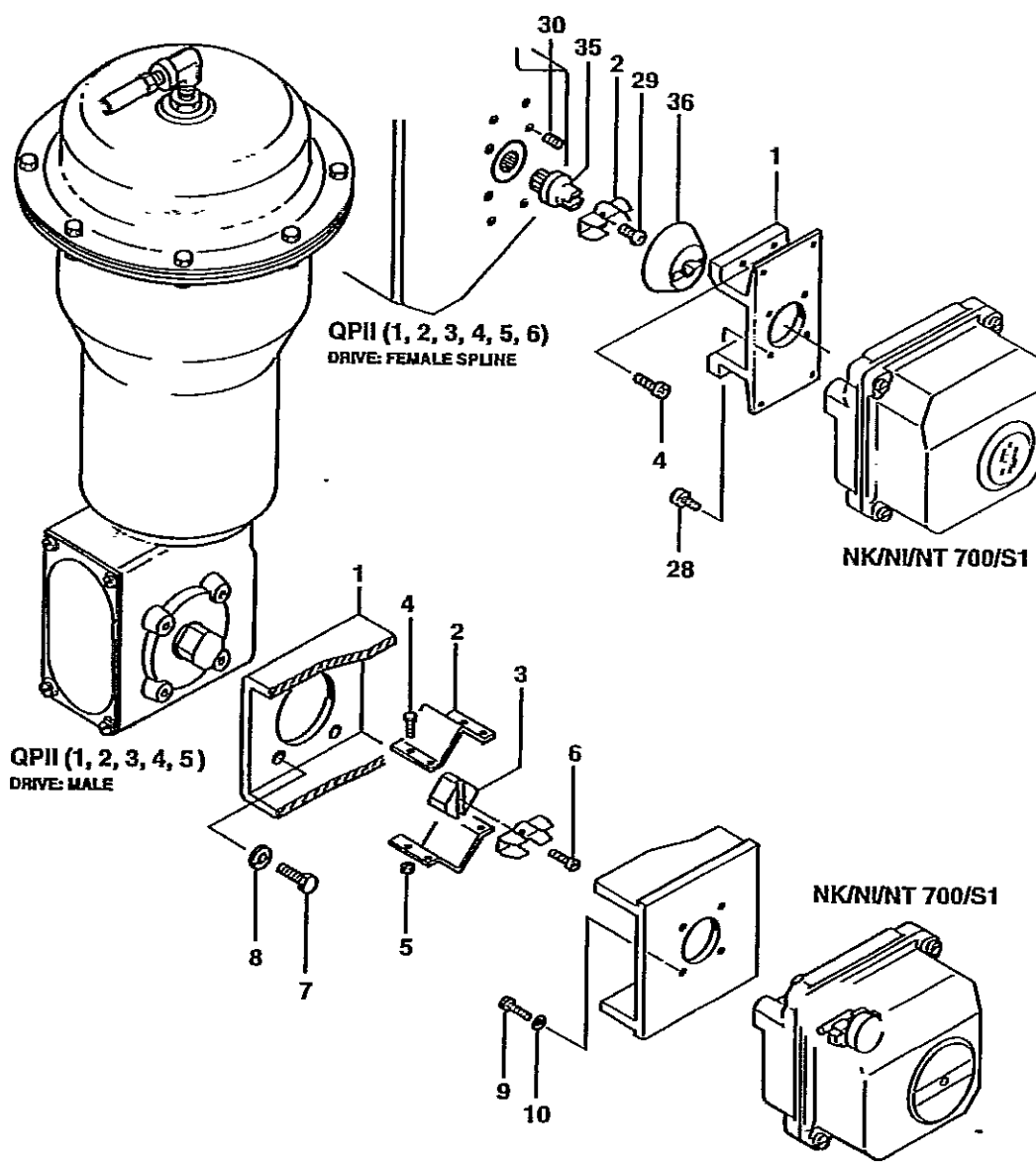
Item	Qty	Description	Recommended spare	Item	Qty	Description	Recommended spare
201	1	Housing		226	1	Seal	
202	1	Earth connection		227	1	Grub screw	
203	1	Cover, assy		229	2	End stop	
205	1	Equi potential bonding		241	1	Appliance connector	
206	2	Screw		242	1	Gasket	
209	8	Terminal		243	1	Appliance socket	
210	1	Pointer		247	1	Wire	
211	2 (1)	Screw		248	1	Wire	
212	1	O-ring	X	249	1	Wire	
213	2	Washer		250	1	Wire	
214	1 (2)	Lock ring	X	251	1	Wire	
215	1	Shaft, assy		252	2 (1)	Bushing	
216	2 (1)	Inductive proximity sensor		254	1	ID plate	
217	1	Washer		256	1	Additional plate	
218	1	Screw		257	1	Screw	
219	2	Screw		258	3	Screw	
220	1	Fastening plate		265	4 (3)	Screw	
221	2 (1)	Cam disc		266	1	Seal	X
223	1	Coupling		268	1	Support (with one switch only)	
225	1	Adapter					

9.2 Mounting parts for B1C6-502 and B1J8-322 actuators (S1)



Item	Qty	Description
1	1	Mounting bracket
2	1	Draught piece
3	4	Washer
4	4	Screw
28	1	Screw
29	2	Screw
36	1	Coupling jacket

9.3 Mounting parts for QUADRA-POWR® actuators (S1)



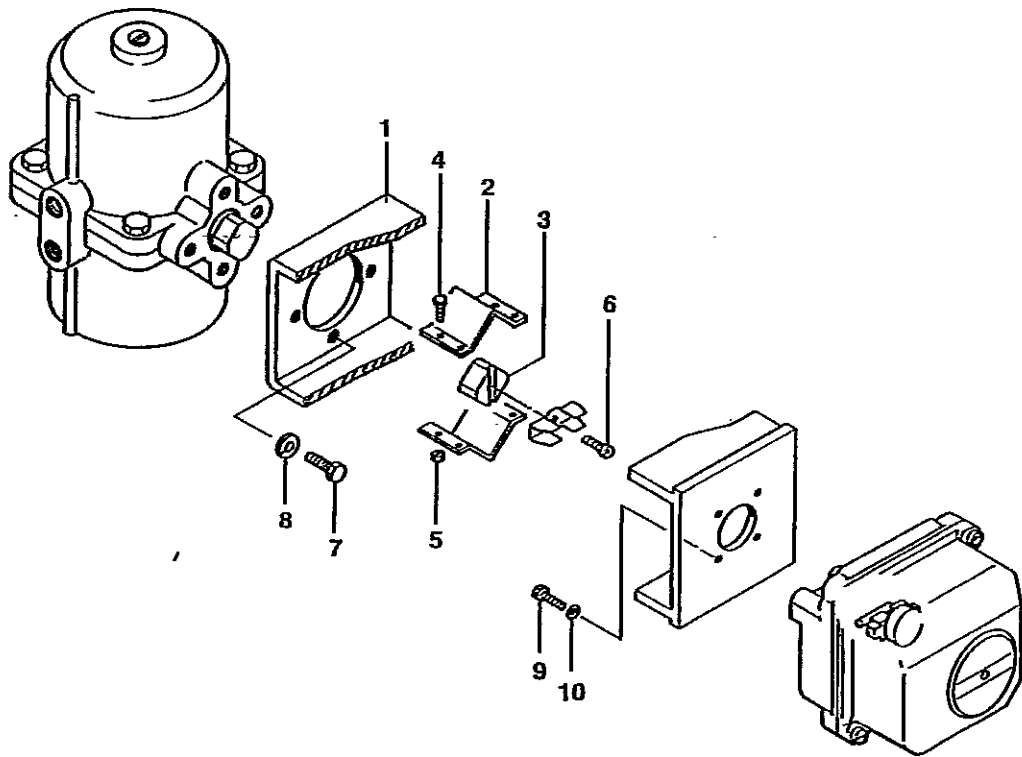
Drive: male

Item	Qty	Description
1	1	Mounting bracket
2	2	Coupling half
3	1	Adapter
4	4	Screw
5	4	Hex nut
6	1	Screw
7	4	Screw
8	4	Washer
9	4	Screw
10	4	Washer

Drive: female spline

Item	Qty	Description
1	1	Mounting bracket
2	1	Ear
4	4	Screw
28	4	Screw
29	1	Screw
30	(4)	Screw
35	1	Coupling
36	1	Coupling jacket

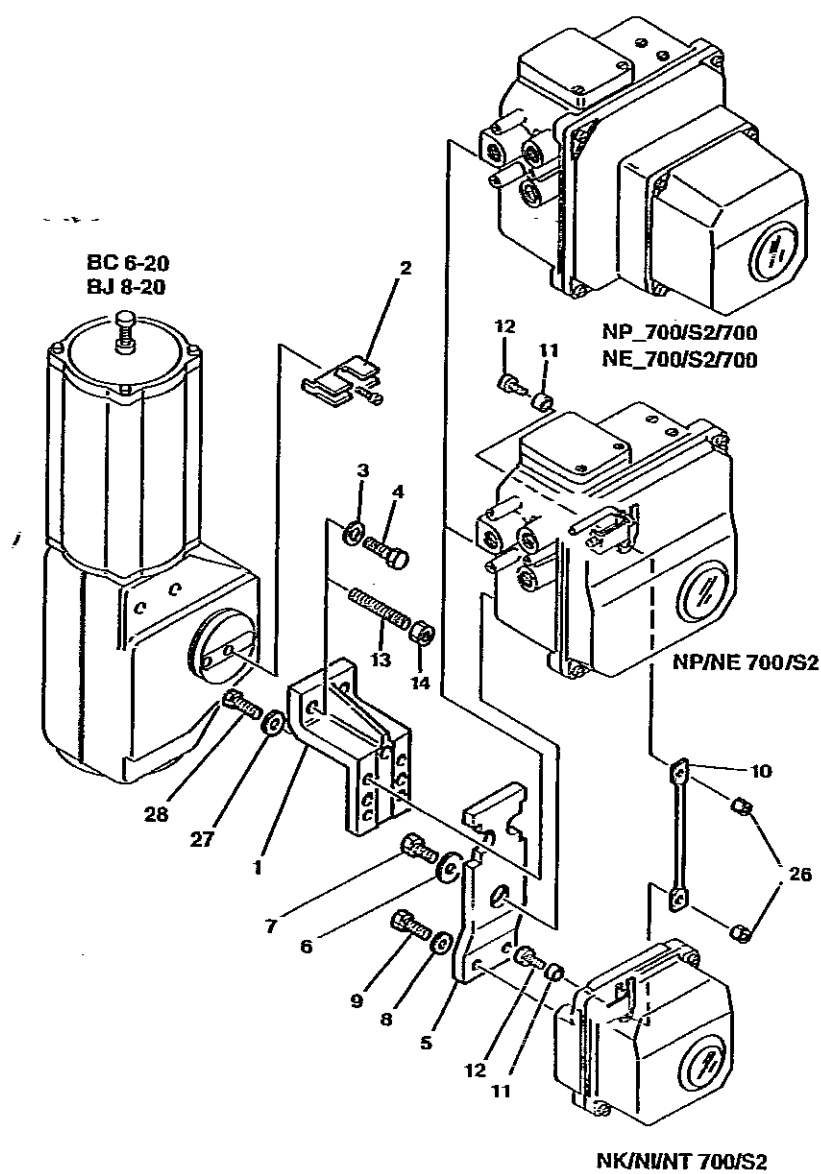
9.4 Mounting parts for SP actuators (S1)



NK/N/NT 700/S1

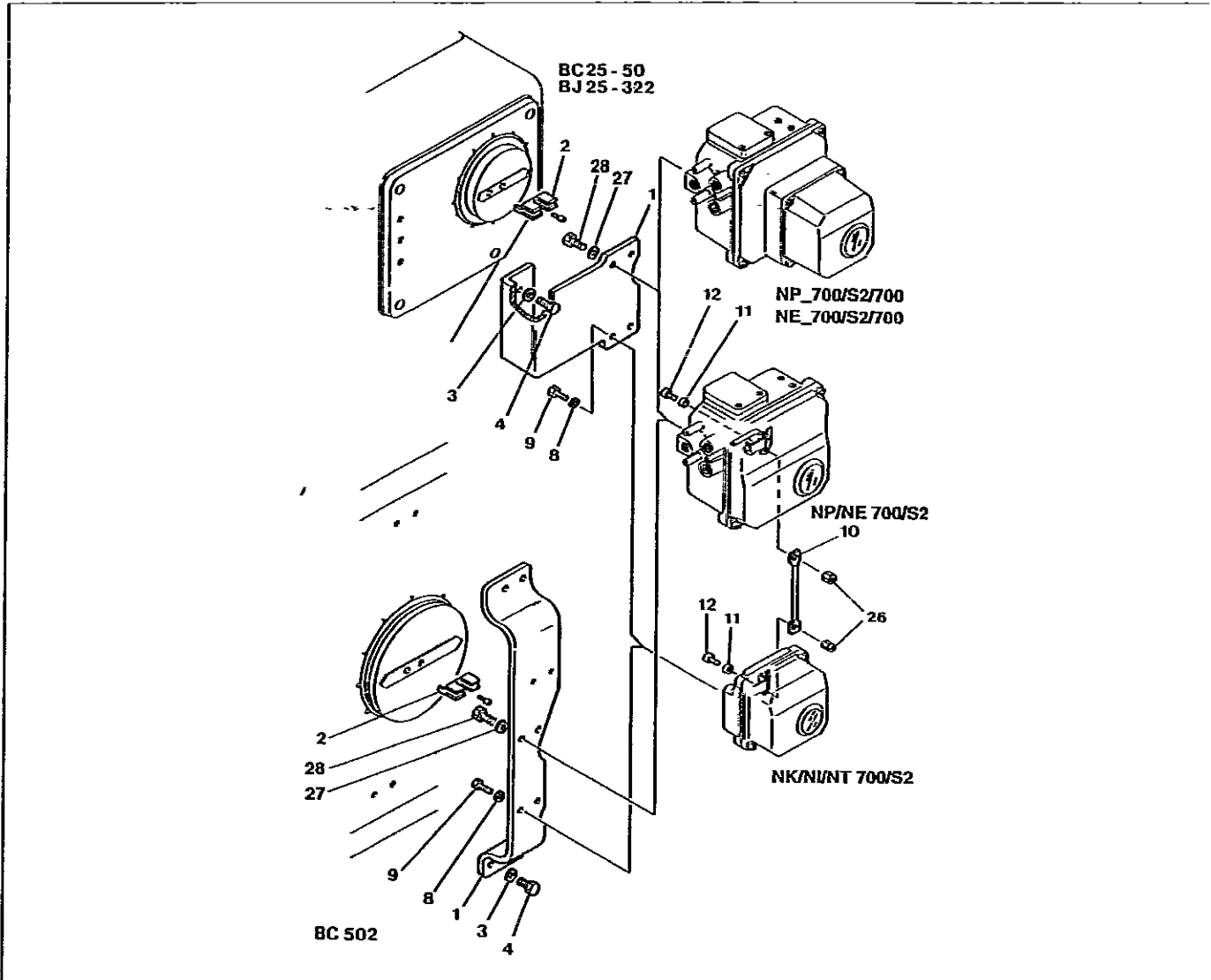
Item	Qty	Description
1	1	Mounting bracket
2	2	Coupling half
3	1	Adapter
4	4	Screw
5	4	Hex nut
6	1	Screw
7	4	Screw
8	4	Washer
9	4	Screw
10	4	Washer

9.5 Mounting parts for B1C6-20 and B1J8-20 actuators (S2)



Item	Qty	Description
1	1	Mounting bracket
2	1	Draught piece
3	2	Washer
4	2	Screw
5	1	Bracket
6	1	Washer
7	1	Screw
8	2	Washer
10	1	Rod
11	2	Bushing
12	2	Screw
13	2	Stud (B1C6 only)
14	2	Hexagon nut (B1C6 only)
26	2	Locking nut
27	2	Washer
28	2	Screw

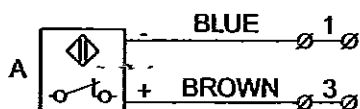
9.6 Mounting parts for B1C25-502 and B1J25-322 actuators (S2)



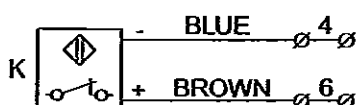
Item	Qty	Description
1	1	Mounting bracket
2	1	Draught piece
3	2 (4)	Washer
4	2 (4)	Screw
8	2	Washer
9	2	Screw
10	1	Rod
11	2	Bushing
12	2	Screw
26	2	Locking nut
27	2	Washer
28	2	Screw

10 CONNECTION DIAGRAMS

10.1 Limit switch NI700/X



A = OPEN
K = CLOSED



FACTORY ADJUSTMENT:

Active faces of proximity switches are covered when actuator is in intermediate position.

Active face A (upper switch) becomes free at open limit of travel and face K (lower switch) at closed limit.

Function can be inverted on site by re-adjusting the cam discs.

PROXIMITY SWITCH

Intrinsically safe:

EEx ia IIC T6 or EEx ib IIC T6.

According to Cenelec EN 50014 and EN 50020

Sensing range 2 - 4 mm / 0.08 - 0.16 in, depending on switch type

Rated voltage 8 V DC ($R_i \sim 1 \text{ k}\Omega$)

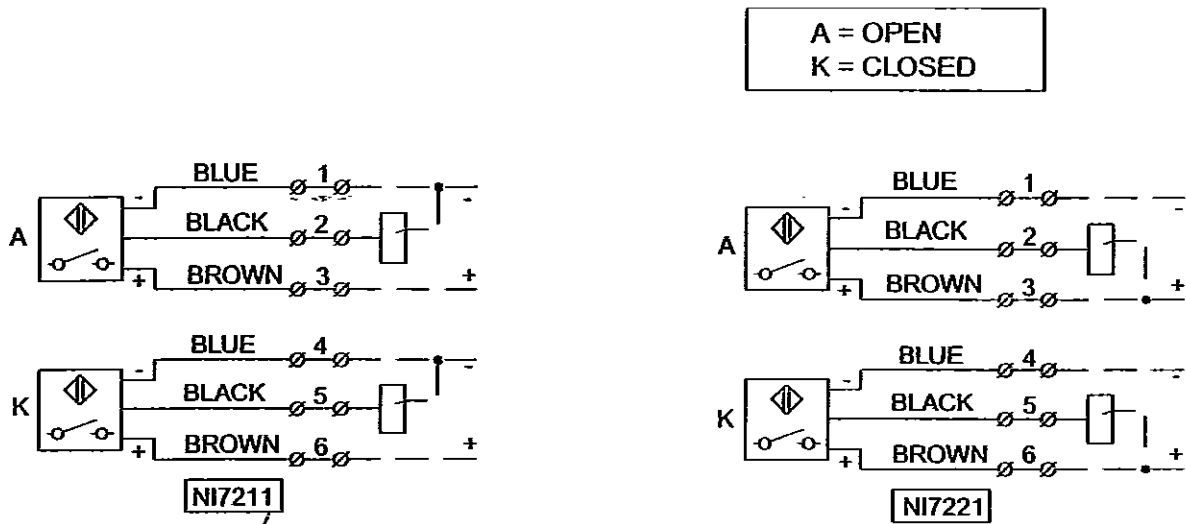
Current consumption

active face free, $\geq 3 \text{ mA}$

active face covered, $\leq 1 \text{ mA}$

	Type of proximity switch	Electrical values				Ex-classification	Certificate
		U _{max} (V)	I _{max} (mA)	L _i (μ H)	C _i (nF)		
01	P+F NJ2-12GK-N	16	52	50	45	EEx ia IIC T6	PTB Nr. Ex-95.D.2086 X
02	P+F NJ2-12GK-SN	16	52	150	50	EEx ia IIC T6	PTB Nr. Ex-96.D.2023 X
03	P+F NJ2-11-N-G	16	52	50	30	EEx ia IIC T6	PTB Nr. Ex-95.D.2086 X
04	P+F NJ2-11-SN-G	16	52	150	50	EEx ia IIC T6	PTB Nr. Ex-96.D.2023 X
05	P+F NJ2-11-N-G-910	16	52	50	30	EEx ia IIC T6	PTB Nr. Ex-95.D.2086 X
06	TELEMECANIQUE XSP-NO2122	12	100	1 mH	283	EEx ia IIC T6	LCIE No.82.6081 X
07	P+F NJ2-12GM-N	16	52	50	45	EEx ia IIC T6	PTB Nr. Ex-95.D.2086 X
08	P+F NCN4-12GM35-NO	16	52	100	95	EEx ia IIC T6	PTB Nr. Ex-95.D.2086 X
09	P+F NC32-12GM35-NO	16	52	100	90	EEx ia IIC T6	PTB Nr. Ex-95.D.2086 X
41	P+F NJ4-12GK-SN	16	52	150	70	EEx ia IIC T6	PTB Nr. Ex-96.D.2023 X

10.2 Limit switches NI7211 and NI7221



FACTORY ADJUSTMENT:

Active faces of proximity switches are free when actuator is in intermediate position.

Active face A (upper switch) becomes covered at open limit of travel and face K (lower switch) at closed limit.

Function can be inverted on site by re-adjusting the cam discs.

PROXIMITY SWITCH

Pepperl+Fuchs NJ2-12GM40-E2, PNP (11)

Pepperl+Fuchs NJ2-12GM40-E, NPN (21)

Sensing range 2 mm / 0.08 in

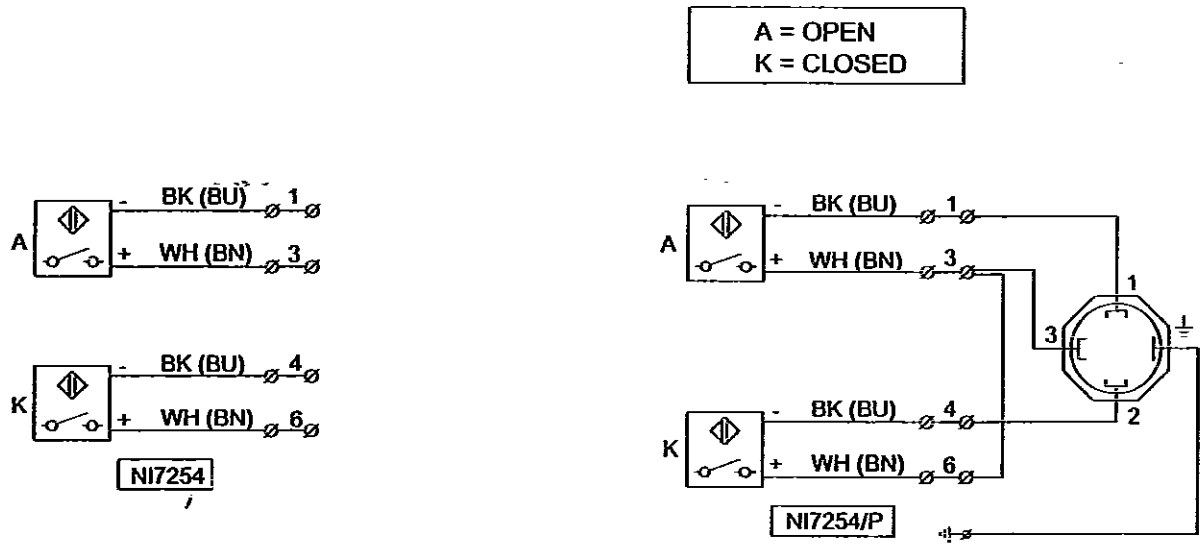
Rated voltage $U = 10 - 60$ V DC

Output current ≤ 200 mA
 active face covered, LED on

Quiescent current ≤ 15 mA
 active face free

Ambient temperature $-25 - +70$ °C / $-13 - +158$ °F

10.3 Limit switch NI7254



FACTORY ADJUSTMENT:

Active faces of proximity switches are free when actuator is in intermediate position.

Active face A (upper switch) becomes covered at open limit of travel and face K (lower switch) at closed limit.

Function can be inverted on site by re-adjusting the cam discs.

PROXIMITY SWITCH

OMRON E2E-X3D1-N (E2E-X3D1-G)

Sensing range 3 mm / 0.12 in

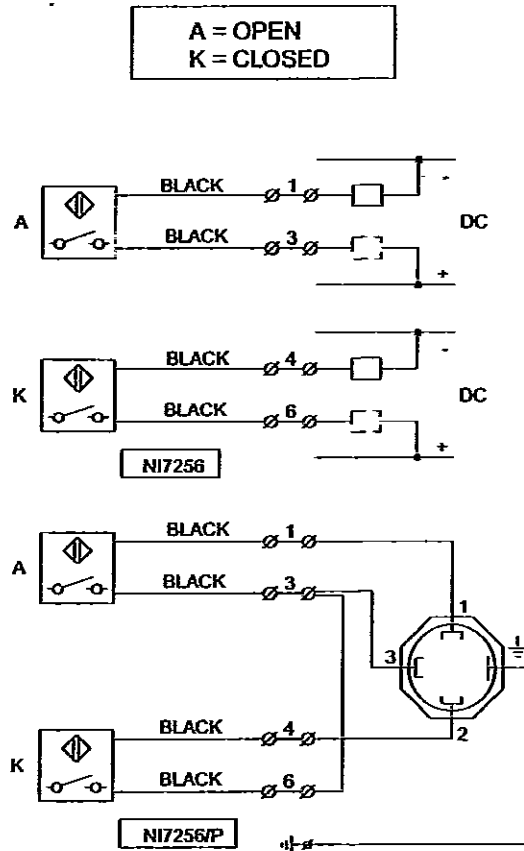
Rated voltage $U = 12 - 24 \text{ V DC}$

Output current 3 - 100 mA
active face covered, LED on

Quiescent current $\leq 0.8 \text{ mA}$
active face free

Ambient temperature $-25 - +70 \text{ }^\circ\text{C} / -13 - +158 \text{ }^\circ\text{F}$

10.4 Limit switch NI7256



FACTORY ADJUSTMENT:

Active faces of proximity switches are free when actuator is in intermediate position.

Active face A (upper switch) becomes covered at open limit of travel and face K (lower switch) at closed limit.

Function can be inverted on site by re-adjusting the cam discs.

Connection: load can be connected to + or -.

PROXIMITY SWITCH

Ifm electronic IFC2002-ARKG/UP

Sensing range 2 mm / 0.08 in

Rated voltage $U = 10 - 36 \text{ V DC}$

Output current $\leq 150 \text{ mA}$
active face covered, LED on

Quiescent current $\leq 0.6 \text{ mA}$
active face free

Ambient temperature $-25 - +80 \text{ }^\circ\text{C} / -13 - +176 \text{ }^\circ\text{F}$

11 TYPE CODE

LIMIT SWITCH, Series NI700

1.	2.	3.	4.	5.	6.	—	L
NI	7	1	11	A	/	S1	L

1. sign	PRODUCT GROUP
NI	Limit switch with inductive proximity switches

2. sign	SERIES CODE
---------	-------------

3. sign	QTY OF SWITCHES
1	1 pc
2	2 pcs

4. sign	SWITCH TYPE
01	P+F; NJ2-12GK-N DC; >3 mA; <1 mA; Intrinsically safe acc. to EEx ia IIC T6, 2-wire type. Temperature range -25 - +65 °C / -13 - +149 °F.
11	P+F; NJ2-12GM40-E2 DC; 200 mA; quiescent current <15 mA; PNP, 3-wire type. Temperature range -25 - +70 °C / -13 - +158 °F.
21	P+F; NJ2-12GM40-E DC; 200 mA; quiescent current <15 mA; NPN, 3-wire type. Temperature range -25 - +70 °C / -13 - +158 °F.
54	OMRON E2E-X3D1-N DC; 100 mA; quiescent current <0,8 mA, 2-wire type. Temperature range -25 - +70 °C / -13 - +158 °F.
56	IFM ELECTRONIC IFC2002-ARKG/UP DC; 150 mA; quiescent current <0.6 mA; 2-wire type. Temperature range -25 - +80 °C / -13 - +176 °F.

5. sign	ACTION (with 1 switch only)
A	Switch for open limit
K	Switch for closed limit

6. sign	OPTIONS
-	Standard, IP 65 enclosure, PG 13.5 conduit entry, without sign. Temperature range according to switch type.
X	Intrinsically safe construction, DEMKO EEx ia IIC T6 (or EEx ib IIC T6) certification (EN 50014, EN 50020). Temperature range -25 - +65 °C / -13 - +149 °F.
S1	Limit switch with attachment face according to standard VDI/VDE 3845. Not applicable to globe valve actuators.
S2	Limit switch with attachment face according to Meso Automation
P	Connection plug acc. to DIN 43650A and ISO 4400, with 2-wire types only.
Y	Special

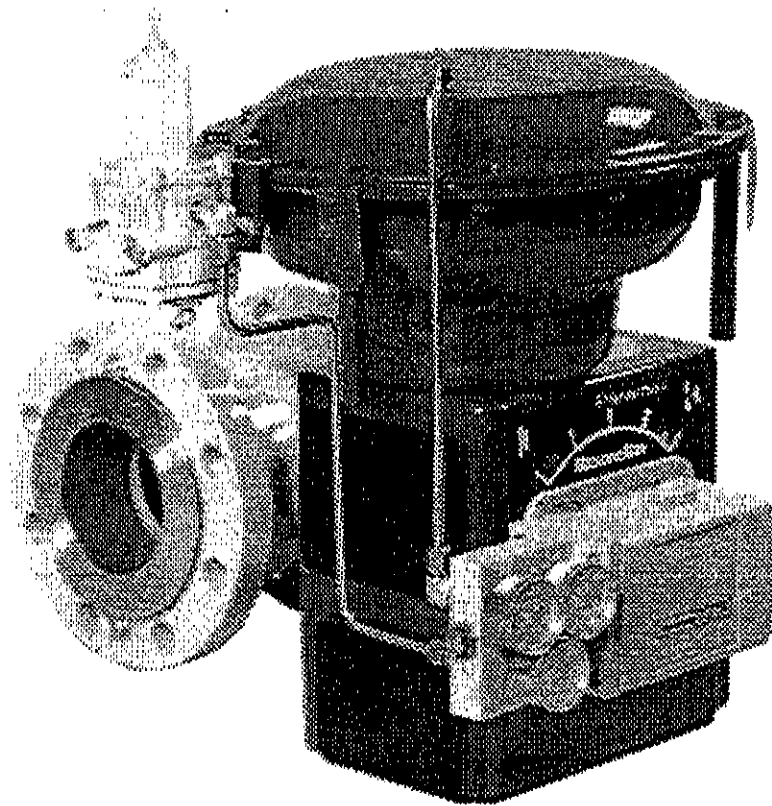
— □	EXTERNAL CONNECTION PARTS
L	PG13.5 / 1/2 NPT conduit entry. Will be specified in the option sticker.
I	PG13.5 / M20x1.5 conduit entry. Will be specified in the option sticker.
NJ	PG13.5 / R1/2 (PF1/2) conduit entry. Will be specified in the option sticker.

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**Paramax™ Series 36004
Control Ball Valve Instructions**

Instruction No. EM6004
Rev. 10/98

Paramax™ Series 36004 Control Ball Valve Instructions



Masoneilan

Valve & Controls

DRESSER

CAUTION: The instructions on the following pages should be thoroughly reviewed and understood prior to installing, operating, or performing maintenance on this equipment. Throughout the text, safety and/or caution notes will appear and must be strictly adhered to; otherwise, serious injury or equipment malfunction could result.

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Helpful Hints

1. Have spare parts on hand before starting.
2. Read the instructions carefully.
3. Study the figures carefully and identify each part.
4. Use the right tools for the job.
5. Be careful not to score the shaft, ball and guiding surfaces.
6. Insure all lubricants, gaskets and packing are compatible with the service.
7. Don't overtighten nuts or bolts.
8. Clean valve parts thoroughly before reassembly.
9. Work safely.

1.0 INTRODUCTION

These installation and maintenance instructions apply to the Series 36004 Paramax valve body and actuator subassemblies. Refer to Parts Supplement FM6004 for parts list. These instructions apply to all sizes and ratings of the 36004 Paramax.

1.1 Parts

When performing maintenance and repair work, always use genuine Masoneilan replacement parts. Parts should be ordered from the local Masoneilan representative. Always provide serial number and model number when ordering spare parts.

1.2 Service

Masoneilan's highly skilled Service Representatives are available for start-up, maintenance and repair of our valves and instruments. Contact your local Masoneilan representative.

1.3 Training

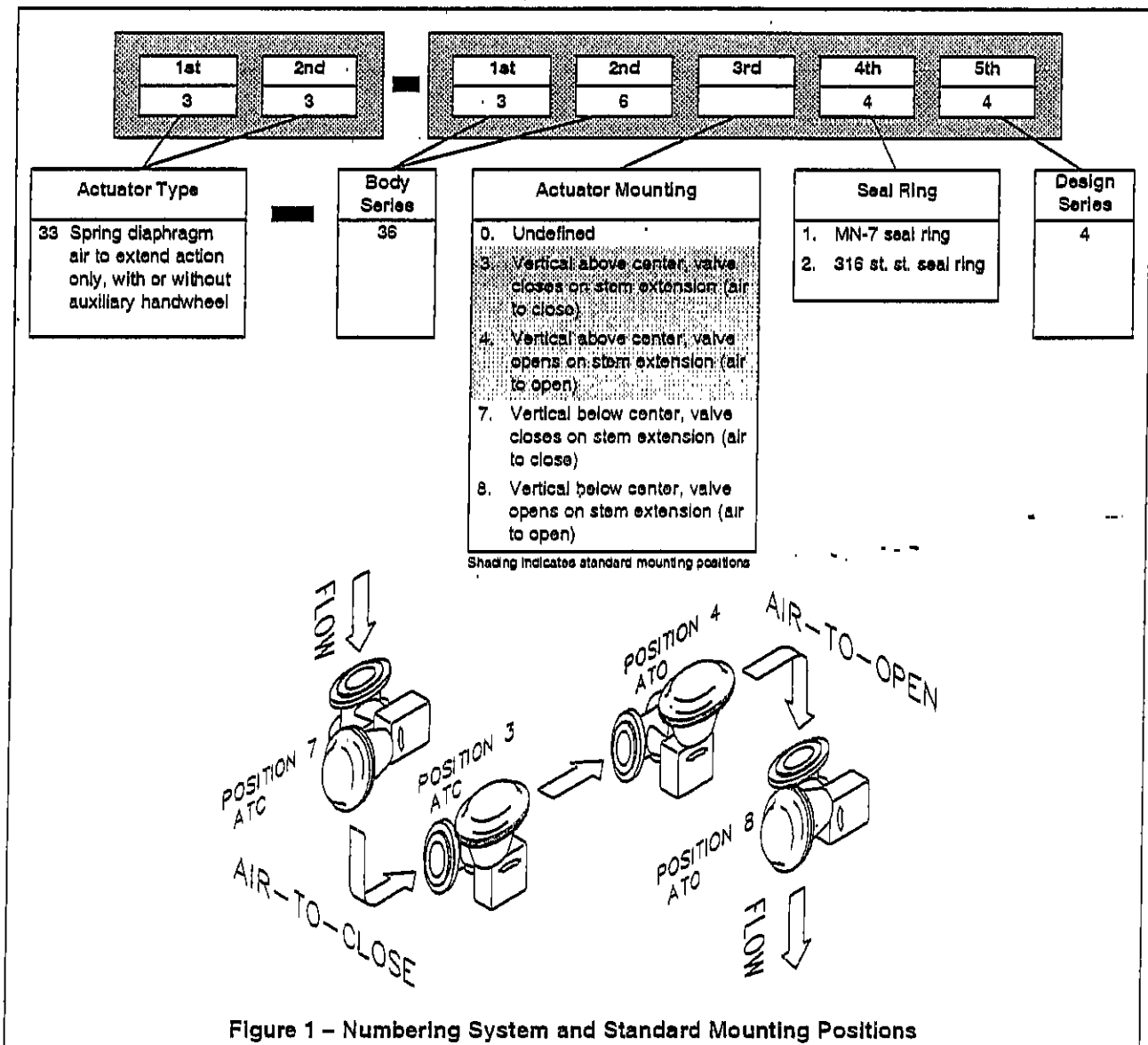
Contact your local Masoneilan representative for information.

2.0 INSTALLATION

2.1 General

2.1.1 Unpack valve carefully to avoid damage to valve, accessories, or tubing.

2.1.2 Record all valve and accessory serial plate data for future reference. Always provide serial and model numbers when ordering spare parts.



2.2 Pipeline Mounting

CAUTION: Do not remove button head screw (9) and washer (10) during installation. The function of these parts is to hold the retainer (3) and seal ring (8) in place and should be removed only when the valve is to be disassembled for maintenance (Figure 2).

A. Before installing the valve in the line, clean pipe and valve of all foreign materials such as welding chips, scale, oil, grease or dirt. Gasket surfaces must be thoroughly cleaned to ensure leak free joints.

B. Install valve in a horizontal or vertical line with the flow tending to push the seal ring (8) against the ball (2) as indicated by the flow arrow cast into the body. It is recommended that if adjacent walls and piping permit, the valve be oriented such that the ball opens upward. This is especially important when handling slurries. See Figure 1 for actuator mounting positions and for flow direction and Table 5 for line flange bolting lengths.

NOTE: Flange bolt lengths are non-standard on inlet and standard on outlet side.

C. Tighten bolting evenly and in crisscross fashion so that the retainer (3) held in place by the line flange will bear evenly against the seal ring (8).

D. The linkage of the 36004 Paramax valve has been properly adjusted at the factory and requires no further adjustment.

E. Where insulation of the valve body is required, do not insulate the valve bonnet. See Figure 16.

2.3 Air Piping

2.3.1 Air piping must be adequately sized to provide the regulated supply pressure specified on the nameplate. See Figure 7. As a general guideline, use 1/4" O.D. tubing or equivalent for all air lines. If supply air line exceeds 25 feet in length, use 3/8" O.D. tubing.

2.3.2 The actuator is furnished with a 1/4" NPT instrument air port on the upper case.

CAUTION: Do not exceed loading pressure specified on the valve nameplate, and under no circumstances exceed 35 psi (240 KPa).

2.4 Changing Actuator Position

CAUTION: Before proceeding with changing actuator position, air action or valve maintenance, isolate valve, vent process pressure and shut off air supply and signal air lines or electrical lines to unit. It is recommended that the valve be removed from the pipeline prior to maintenance work. Keep hands and tools away from the segmental ball, particularly when disconnecting the actuator stem from shaft arm as ball may rotate freely to its lowest position.

For each valve action (air to open/air to close) the actuator may be positioned to either side of the pipe. Actuator position is usually determined by adjacent piping, obstacles of various types or air piping arrangements. To reposition the actuator and/or bracket follow the disassembly and reassembly instructions below. Note: actuator positioning should be performed prior to installing the valve in the pipeline. To change actuator position and/or valve action refer to Figure 1 for desired position.

A. Remove valve from process line after closing isolating valves and disconnecting all pneumatic tubing and electrical wiring.

B. If valve is equipped with a handwheel (Figure 7) disengage handwheel and remove retaining clips (63), clevis pin (66) and pivot pins (72); remove entire handwheel assembly from bracket (62).

C. Remove pivot pin retaining clips (40), pivot pin (39) and spacer rings (69). Remove actuator hex nuts (75) and washers (76). Remove actuator. Note: spacer rings apply only on handwheel option.

D. Remove shaft cover (42) and screw (43). Loosen lever cap screw (34). Remove packing flange stud nuts (24), bracket mounting stud nuts (24) and washers (18). Loosen ball plug indicator arm (35).

E. If necessary, scribe a witness line on the lever (32) in relation to the slot on the end of the shaft (5).

Note: Standard lever has arrows stamped into it for alignment. For handwheel lever use slot for alignment.

F. Slide bracket (31) away from body until it clears bracket and packing flange studs (26 and 25), allowing lever (32) lever arm (64) and indicator arm (35) to be removed from shaft. Total removal of the bracket is not required.

CAUTION: Before proceeding determine valve action (air to open/air to close), refer to the appropriate figure (Figure 13 to open, Figure 14 to close). To obtain proper alignment, the lever must be oriented on the shaft so that the slot in the end of the shaft and arrows or indicator lines are aligned as shown; with the ball in the closed position, the distance between the top of the bracket and the top of the pivot pin must be as shown.

G. Slide lever (32) and lever arm (64) back onto shaft in desired position. Slide indicator arm (35) back onto shaft. Align bracket and slide back onto bracket mounting studs (26) and packing flange studs (25). Replace bracket mounting stud nuts (24) and washers (18). Slide packing flange (23) back onto packing flange studs (25) and replace packing flange stud nuts (24).

H. Remount actuator onto bracket and replace actuator mounting hex nuts (75) and washers (76). Position lever (32) and lever arm (64) so that rod end bearing (94) lines up in lever (32). Tighten lever cap screws (34).

I. Rotate ball plug (2) to closed position. If actuator action is air to open loosen rod end bearing locknut (93) and adjust position of rod end bearing (94) so that holes in lever (32) and rod end bearing (94) line up. Insert pivot pin (39) and replace spacer rings (69) and retaining rings (40).

CAUTION: When stroking valve keep hands and equipment clear of ball plug and seal ring to avoid injury or damage to personnel and equipment.

J. If action is air to close place ball plug (2) in closed position and pneumatically stroke actuator fully.

CAUTION: Do not exceed maximum air supply pressure. Keep hands clear of actuator stem and linkage.

Loosen rod end bearing locknut (93) and adjust rod end bearing (94) so that holes in lever (32) and rod end bearing (94) line up. Insert pivot pin (39) and spacers (69) and replace retaining rings (40).

K. For both air to open and air to close action, stroke valve fully to ensure proper closure of ball plug and operation of valve. It may be necessary to readjust rod end bearing slightly by loosening locknut and rotating stem.

L. Replace handwheel assembly in bracket (62), clevis pin (66) and retaining clips (63).

M. Replace shaft cover (42) and screw (43).

N. Set and lock indicator arm (35) to indicate plug position.

2.5 Changing Valve Action

NOTE: If the valve action is to be changed it should be done before the valve is installed in the line. This allows a positive visual check to ensure that the ball plug is fully closed when the actuator is in the proper position.

A. If the valve is equipped with a handwheel disengage the handwheel and remove retaining clips (63), clevis pin (66), and pivot pins (39). Remove cap screws (70), washers (71) and handwheel bracket (62).

B. If necessary, scribe a witness mark on the lever (32) in relation to the slot on the end of the shaft (5).

NOTE: Standard lever has arrows stamped into it for alignment. For handwheel lever use slot for alignment.

C. Remove pivot pin retaining clips (40), pivot pin (39) and spacer rings (69). Remove shaft cover (42) and screw (43). Remove actuator hex nuts (75) and washers (76). Remove actuator. Note: spacer rings apply only on handwheel option.

D. Loosen lever cap screw (34). Remove packing flange stud nuts (24), bracket mounting stud nuts (24) and washers (18). Loosen ball plug indicator arm (35).

E. Slide bracket (31) away from body until it clears bracket and packing flange mounting studs. Remove lever (32), lever arm (64) and indicator arm (35) from shaft.

CAUTION: Before proceeding determine valve action (air to open/air to close), refer to the appropriate figure (Figure 13 to open, Figure 14 to close). To obtain proper alignment, the lever must be oriented on the shaft so that the slot in the end of the shaft and arrows or indicator lines are aligned as shown; with the ball in the closed position, the distance between the top of the bracket and the top of the pivot pin must be as shown.

F. Flip lever (32) and lever arm (64) and replace on shaft 90° away from original position. Replace indicator arm (35). Slide bracket back onto bracket mounting studs (26), replace washers (18) and nuts (24) and tighten. Slide packing flange (23) back over packing flange studs (25) and replace packing flange stud nuts (24) and tighten.

G. Replace actuator on bracket in correct mounting position for air action. Replace actuator stud nuts (75) and washers (76). Position lever (32) and lever arm (64) so that rod end bearing (94) lines up in lever (32). Tighten lever cap screw (33).

H. Place ball plug (2) in closed position. If actuator action is air to open, loosen rod end bearing nut (93) and adjust position of rod end bearing (94) so that holes in lever (32) and rod end bearing (94) line up. Insert pivot pin (39) and replace retaining rings (40) and spacer rings (69).

I. If action is air to close, place ball plug (2) in closed position and pneumatically stroke actuator fully.

CAUTION: Do not exceed maximum air supply pressure.

Repeat step H.

J. For both air to open and air to close action, stroke valve fully to ensure proper closure of ball plug and operation of valve. Tighten rod end bearing locknut (93).

CAUTION: When stroking valve keep hands and equipment clear of ball plug and seal ring to avoid injury or damage to personnel or equipment.

K. Replace handwheel bracket (62), cap screws (70) and lockwashers (71) on opposite side of actuator bracket from where originally found. Insert handwheel assembly in bracket and replace clevis pin (66), retaining rings (63), lever arm bearing (65) and pivot pins (72). Replace shaft cover (42) and screw (43).

L. Set and lock indicator (35) to indicate plug position.

3.0 MAINTENANCE

3.1 Bracket Subassembly

3.1.1 Disassembly

CAUTION: When disconnecting actuator rod end bearing from shaft arm, the ball is likely to rotate toward the bottom of the valve body. Keep hands and tools away from the ball.

A. Remove screw (43) and shaft cover (42) or positioner if so equipped.

B. Remove retaining clips (40), pivot pin (39) and spacer rings (69).

Note: spacer rings apply only on handwheel option.

C. Remove actuator mounting nuts (75) and washers (76) and remove actuator from bracket (31).

D. If valve has handwheel, remove retainer clips (63), clevis pin (66), pivot pins (72). Remove handwheel assembly from bracket.

E. Loosen capscrew (33) and indicator arm (35). Remove packing flange stud nuts (24) and bracket mounting stud nuts (26) and washers (18).

F. Scribe a witness mark on the lever (32) indicating relative position to the slot in the end of the shaft (5).

G. Slide bracket (31) off studs and shaft, removing indicator arm (35), lever (32), lever arm (64) and packing flange (23).

H. Remove bearing (47) from bracket. Examine all parts for wear and/or damage. Replace if necessary.

3.1.2 Reassembly

NOTE: If the valve is equipped with a handwheel the lever consists of two separate arms which are a MATCHED PAIR and are not interchangeable with any other pair. The sequence of assembly is to place one lever over the shaft then the lever arm (64) insert pin (68), and then the second lever arm onto the shaft then slide the shaft into the bracket and bearing.

A. Replace ball bearing (47) in the bracket (31).

B. Place ball plug (2) in closed position. Slide bracket (31) partially over shaft. Ensure all packing box parts are in place and then slide packing flange (23) onto shaft. Slide lever (32) onto shaft on its former position. Slide handwheel lever arm (64) and second lever (32) onto shaft if valve has handwheel. Replace indicator arm (35). Slide bracket fully onto mounting studs (26); ensure shaft (5) is properly located in bearing (47). Replace lockwasher (18) and bracket mounting stud nuts (24) and tighten. Replace packing flange stud nuts (24).

C. Pull shaft out to bottom against bearing. Replace actuator and install washers (76) and nuts (75). Slide lever (32) on shaft so that it is lined up with rod end bearing (94). Tighten lever locking screw (33).

D. If valve action is air to open place ball plug (2) in closed position. Loosen rod end bearing locknut (93) and adjust rod end bearing until holes in lever (32) and rod end bearing (94) line up. Install pivot pin (39), spacers (69) (handwheel only) and retainer rings (40). If valve action is air to close, place ball plug (2) in closed position and pneumatically stroke actuator fully.

CAUTION: Do not exceed maximum air supply pressure specified on the valve nameplate, and under no circumstances exceed 35 psi (240 KPa).

E. For both air to open and air to close action, stroke valve fully to ensure proper closure of ball plug and operation of valve. Tighten rod end bearing locknut (93).

CAUTION: When stroking valve keep hands and equipment clear of ball plug and seal ring to avoid injury or damage to personnel or equipment. Do not exceed 35 psi.

F. Replace shaft cover (42) and screw (43) (or positioner if so equipped).

G. Replace handwheel assembly in bracket (62) and replace clevis pin (66), retaining clips (63), and pivot pins (72).

H. Set and lock indicator arm (35) to indicate plug position.

1. Check that handwheel operates valve through full range of travel. There is a 1/2" adjustment available at the end of the handwheel extension. Retract handwheel, remove end cap (51) and cap screw (55B). Rearrange stop (55A) and/or spacer (55C) to obtain desired extension.

3.2 Body Subassembly

3.2.1 Packing

NOTE: The packing follower should be held firmly, but not too tightly against the packing. Overtightening of the packing causes excessive friction and may affect valve operation. The packing in a new Paramax™ valve has not been tightened prior to shipment. It is recommended that further adjustments be made when the valve is put into service. If necessary to add packing, proceed as follows:

CAUTION: Valve must be isolated and process pressure vented before performing packing box maintenance.

3.2.1.1 Disassembly

A. Loosen and remove packing flange nuts (24) and slide packing flange (23) and packing follower (20) toward shaft lever (32).

NOTE: The lever (32) may be disconnected from the actuator stem and pushed up against the shaft bearing (47) (refer to section 3.1), if necessary for clearance.

B. Using a packing hook, remove the top pieces of packing rings.

3.2.1.2 Reassembly

A. Install new packing ring(s), making sure the skive cut in adjacent packing rings is offset 120° apart.

B. Replace packing follower (20) packing box flange (23) and packing nuts (24).

C. Evenly tighten packing nuts (24).

CAUTION: DO NOT overtighten packing nuts.

D. Place valve into service and tighten packing nuts (24) only as much as necessary to stop any leakage.

3.2.2 Seal Ring

3.2.2.1 Disassembly

NOTE: Seal ring removal, inspection and reinstallation must be done with the valve removed from the pipeline.

A. Remove screws (9) and washers (10).

NOTE: The flexible metal seal assembly consists of a seal ring (8), gasket (7), and backup ring (6). The soft seal assembly consists of an MN-7 seal ring (8).

B. Mark flexible metal seal ring (8) so that, if reinstalled, the same side will be in contact with the ball (MN7 seal ring is reversible). Remove retainer and seal assembly. If difficulty is encountered in removing seal assembly, rotate the ball to open position and pull out the seal ring.

C. Remove gasket (4) residue from body and retainer taking care not to damage seal surfaces.

3.2.2.2 Reassembly

A. Move ball to the closed position.

B. Replace seal assembly, gasket (4) and retainer (3). For the flexible metal seal assembly, take care that bevelled edges of flexible metal seal (8) and backup ring (6) are facing the ball.

C. Replace set screws (9) and washers (10) and tighten.

3.2.3 Ball Plug

3.2.3.1 Ball Plug Disassembly

A. Remove bracket (see section 3.2).

B. Remove screws (9) and washers (10). Slide the retainer (3) out of the valve body. Remove seal assembly (refer to Para. 3.2.2.1 Seal Ring - Disassembly).

C. Remove safety pin (27). Remove the shaft (5) from the valve body. The packing (19), packing adaptor (28) and packing follower (20) will slide out with the shaft. If the shaft will not move, thread nuts (24) on the packing studs, then place the packing flange (23) on top of the nuts. Slide the lever (32) onto the shaft (5) up against the packing flange (23) and tighten screw (34). By unscrewing the packing nuts (24) evenly, ample force is developed to move the shaft (5). Once shaft has been started, it should be possible to remove the shaft completely. If not, a suitable size bolt screwed into the tapped hole on the shaft end can be used as a shaft "puller."

D. Remove nuts (13), end flange (14), pin shaft (11) and gasket (15). If the pin shaft will not move, push it out with a rod inserted through the bonnet end of the valve.

E. Remove the ball (2) and separate the lower bushing (16) from it. Remove the upper bushing (17) and spacer tube (30) (8" and 10" sizes only). If it sticks, the upper bushing (17) can be pushed out with a rod of suitable size inserted into the pin shaft end of the body.

F. Remove packing (19), packing adapter (28), packing follower (20), and ring (29) from the shaft (5).

G. Examine all parts for damage due to erosion, corrosion, or wear. Replace the seal ring if damaged, worn or distorted. Replace all defective parts and all packing and gaskets. Clean the

valve parts thoroughly before reassembly. Remove gasket (4) and (15) residue from body and retainer taking care not to score sealing areas.

3.2.3.2 Ball Plug Reassembly

A. Replace lower bushing (16) in the ball and position ball in the body. Replace gasket (15).

B. Lubricate pin shaft (11) and insert through body and into the ball. Secure with end flange (14) and end flange nuts (13). Tighten nuts alternately to assure tight seal against the gasket. (Recommended lubricant SAF-T-EZE Anti-Seize or equal.)

C. Replace ring (29), spacer tube (30) (8" and 10" only), and upper bushing (17) on the shaft (5). Install shaft in the body and engage the ball such that when the ball is in the closed position, the machined slot in the shaft end is vertical (perpendicular to the body axis). Coat shaft below ring groove, spacer tube and bushing with lubricant (SAF-T-EZE Anti-Seize or equal).

D. Install packing adaptor (28), bevel side out over the shaft (5) and into the valve bonnet so that the hole through the side of the adaptor is aligned with the tapped hole through the bonnet for the safety pin (27).

E. Apply pipe sealant to the safety pin, install into bonnet and tighten.

CAUTION: Safety pin must engage hole in packing adaptor. Test by manually pulling on shaft to verify pin engagement.

F. Install packing (19) so that skive out of each piece of packing is offset approximately 120° from that of adjacent piece.

G. Install packing follower (22) over shaft and into bonnet with bevel side out. Install packing box flange (23) and nuts (24).

H. Rotate the ball to the closed position and follow (1.) for MN-7 seal ring or (2.) for metal seal ring:

(1.) MN-7 Seal Ring

- Install MN-7 seal ring (8).
- Install gasket (body/retainer) (4) and retainer (3).

(2.) Metal Seal Ring

- Install metal seal ring (8) with bevel edge facing ball.
- Install backup ring (6) with bevel edge facing the ball.
- Install gasket (7).

- Install gasket (body/retainer) (4) and retainer (3).

CAUTION: Do not assemble seal ring and retainer with ball in the open position, as establishing contact between seal ring and ball after assembly will damage the seal ring.

I. Replace screws (9), and washers (10) and tighten.

J. Install mounting bracket (31) and lever (32). Follow instruction 3.1.2 Bracket Reassembly.

K. Evenly tighten packing flange nuts (24) against packing flange (23) before placing valve into service.

CAUTION: DO NOT overtighten packing flange nuts.

L. After valve has been in service, retighten packing flange nuts evenly until any leaks are stopped.

3.3 Actuator Subassembly

3.3.1 Disassembly

CAUTION: The upper diaphragm case (84) is under spring tension. A warning tag (97) is attached to each of the three (3) long capscrews (95). The tension nuts (96) attached to capscrews (95) must be evenly removed last. The following procedure must be followed to avoid injury.

A. Isolate the valve, vent process pressure and shut off all electrical, signal air and supply air lines to the valve.

B. If equipped with a handwheel, it must be rotated to the disengaged position.

C. Remove air supply piping to upper diaphragm case (84).

D. Remove side covers (46).

E. Remove retaining clips (40) and remove pivot pin (39) and spacers (69) (handwheel only) to free rod end bearing (94).

F. Loosen and remove all short capscrews (86) and hex nuts (87). Mark upper case (84) and lower case (91) so that they can be reassembled with the same orientation of air inlet and mounting bolts.

G. Loosen each tension nut (96) approximately three full turns.

CAUTION: The upper diaphragm case (84) should separate from the lower case (91) as the tension nuts are loosened the three turns. If it does not, before proceeding, separate the upper diaphragm case (84) by tapping it around the circumference or inserting a screwdriver between the upper (84) and lower case (91). If the cases still do not separate, check that the actuator stem is not hung up inside the bracket. **DO NOT PROCEED WITH DISASSEMBLY UNLESS THE CASES CAN SEPARATE FREELY.**

H. Continue loosening the tension nuts (96) evenly approximately three turns each time ensuring that the upper diaphragm case (84) and diaphragm (85) continue to separate.

NOTE: Continue Step H until the tension nuts (96) can be easily removed by hand indicating the upper diaphragm case (84) is not under spring tension.

I. Remove tension bolts (95) and upper diaphragm case (84).

J. Remove diaphragm (85) and diaphragm plate subassembly from the actuator.

K. Remove retaining clip (40). Remove clevis pivot pin (79). Inspect for damage and/or wear in clevis (78), lever (32), clevis pins (79, 39) and rod end bearings (94). Replace if necessary.

L. Clean all mating/sealing surfaces which will come in contact with the diaphragm (85).

3.3.2 Reassembly

A. Connect rod end bearing (94) to diaphragm plate clevis (78) by installing clevis pin (79) and retaining clips (40). Ensure that the stem (77) is installed such that the wrench flats are at the end furthest from the diaphragm plate (88).

B. Ensure spring (90) and spring guide (98) are properly aligned in lower case (91) and install the diaphragm plate and stem subassembly. Replace diaphragm (85).

C. Align marks for correct orientation of upper case (84) and lower case (91). Replace upper diaphragm case (84) and install long capscrews (95), warning plate (97) and tension nuts (96).

NOTE: These bolts must be equally spaced at 120° intervals.

D. Take up tension nuts (96) evenly and sufficiently to allow installation of short capscrews (83) and hex nuts (87).

E. Tighten tension nuts (96) and then tighten all hex nuts (87) using a criss-cross tightening pattern.

NOTE: Nuts should be tightened only enough to seal the diaphragm between the upper and lower case. Do not overtighten.

F. Connect rod end bearing (94) to lever (32) by installing pivot pin (39), spacers (69) (handwheel only), and retaining clips (40).

G. Replace side covers (46) and reconnect signal and supply lines.

H. Place back in service and, if so equipped, rotate handwheel to desired position.

3.4 Handwheel Subassembly

3.4.1 Disassembly

CAUTION: Turn handwheel to disengage position before proceeding with handwheel maintenance.

A. Remove retaining clips (63) and push out pin (66). Make sure bushing (65) remains in the arm (64).

B. Remove the pivot pins (72) and remove handwheel subassembly.

C. Remove handwheel shaft subassembly (55) retaining ring (59) and unscrew nut (58). Remove needle bearing and race (60). Clean and check needle bearing and race for signs of wear. Replace if necessary.

D. Remove handwheel pivot (56) and thrust washer (61). Check washer and replace if necessary. Check O-ring (57) and replace if necessary.

E. Clean ACME threads on handwheel (54) and shaft S/A (55) and grease with Molykote G.

3.4.2 Reassembly (Figure 7)

A. Install thrust washer (61) and O-ring (57). Apply silicone lubricant sparingly to O-ring.

B. Slide handwheel pivot (56) onto the handwheel subassembly. Lubricate and install bearing race, needle bearing and outer race.

C. Install nut (58) bevel side toward bearing race and screw down tight. **DO NOT OVERTIGHTEN.** Replace retaining ring (59). Correct assembly should have the nut (58) touching the retaining ring (47).

CAUTION: Do not rotate handwheel prior to replacing pivot pins (72) into the handwheel mounting bracket (62).

D. Install assembly into handwheel mounting bracket (62) and replace pivot pins (72).

E. Connect handwheel shaft S/A (55) to handwheel (54) and to the lever arm with pin (66) and replace clip (63).

3.5 Diaphragm Replacement

CAUTION: Spring diaphragm actuators contain large forces due to their preloaded powerful springs. Failure to carefully follow this procedure can result in personal injury!

3.5.1 Disassembly

- A. Relieve actuator pressure and disconnect air supply. Do not remove pivot pin (39).
- B. Verify that all three tension bolts (95) and nuts (96) are in place and secure.
- C. Remove nuts (87) and capscrews (86) following a criss-cross pattern.
- D. Verify actuator stem (77) and rod end (94) are securely connected to lever (32) through pivot pin (39) and that retaining clips (40) are in place.
- E. Loosen tension nuts (96) evenly in sequence. Do not exceed three turns of any one nut (96) before proceeding to the next one. Do not vary the sequence.

CAUTION: Failure to evenly unload tension nuts may result in personal injury!

- F. Continue loosening tension nuts (96) until further loosening of the tension nuts (96) is no longer accompanied by an increase in separation of the upper diaphragm case (84) from the lower case (91). At this point the tension nuts (96), bolts (95) and warning plates (97) can be removed.
- G. Remove the upper diaphragm case (84) and diaphragm (85).

CAUTION: The diaphragm plate (88) remains under spring load.

3.5.2 Reassembly

- A. Ensure that sealing surfaces of diaphragm cases (84) and (91) are clean and free of any dirt or debris. Check that there are no foreign objects that may interfere with travel or damage diaphragm.
- B. Install diaphragm (85) on diaphragm plate (88). Align bolt holes with holes in lower case (91).
- C. Install three tension bolts (95) with warning plates (97) into upper case (84). Ensure bolts are equally spaced at 120° to each other.
- D. Mount upper case (84) onto diaphragm plate (88) such that the tension bolts pass through holes in diaphragm (85) and lower case (91).
- E. Install tension nuts (96) finger tight onto tension bolts (95).
- F. Tighten each tension nut (96) three turns before proceeding to the next to ensure actuator spring (90) is evenly loaded. Continue until the diaphragm is firmly sandwiched between the flanges of the upper and lower diaphragm cases. Torque tighten tension bolts to 50 in. lbs.
- G. Install cap screws (86) and nuts (87). Torque tighten to 50 in. lbs. in a criss-cross pattern. As this will tend to unload the tension bolts (96) repeat torque tightening of tension bolts and cap screws (86) to 50 in. lbs. in a criss-cross pattern until joint is evenly loaded to specified torque values.
- H. Reconnect air supply.
- I. Stroke actuator to confirm operation.

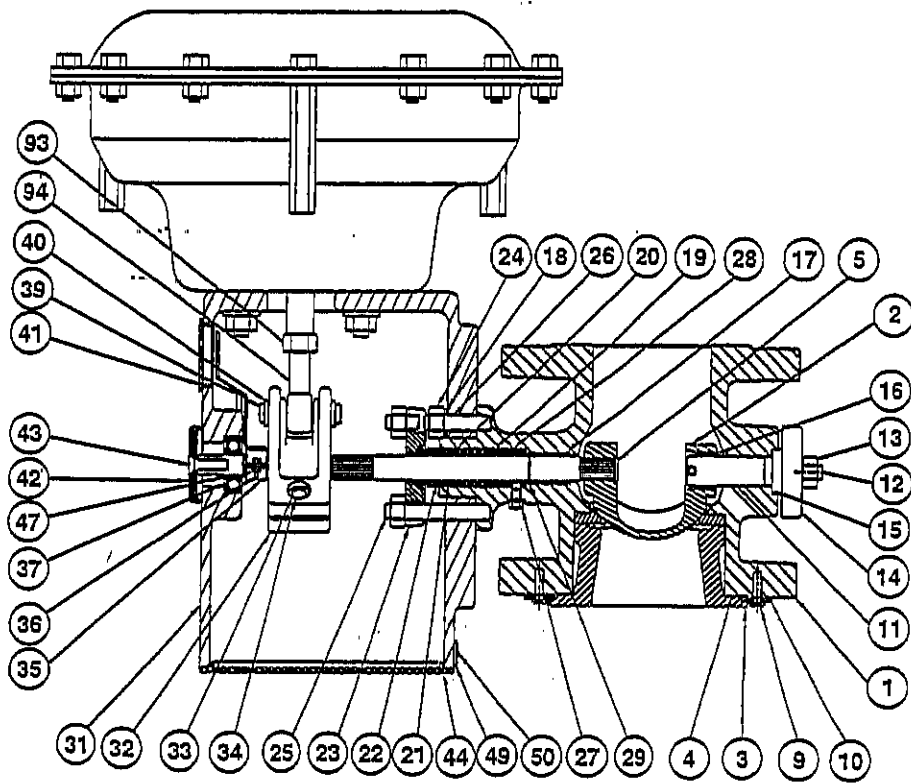


Figure 2 - General Assembly

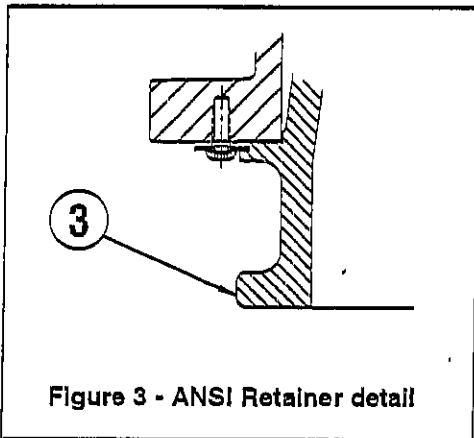


Figure 3 - ANSI Retainer detail

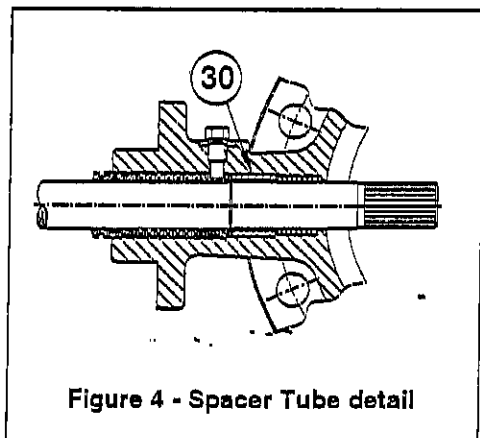


Figure 4 - Spacer Tube detail

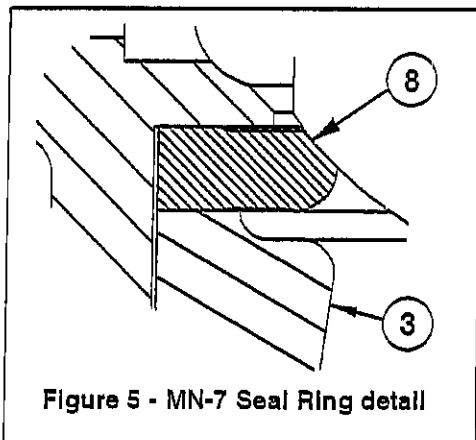


Figure 5 - MN-7 Seal Ring detail

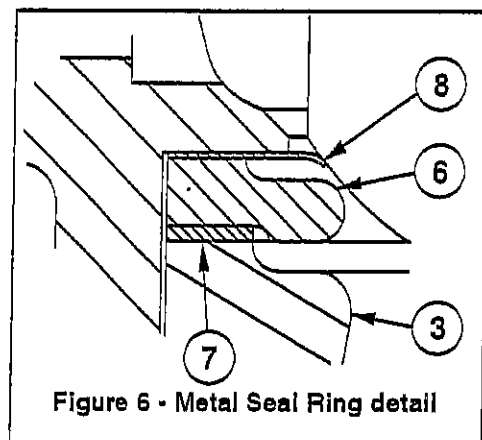


Figure 6 - Metal Seal Ring detail

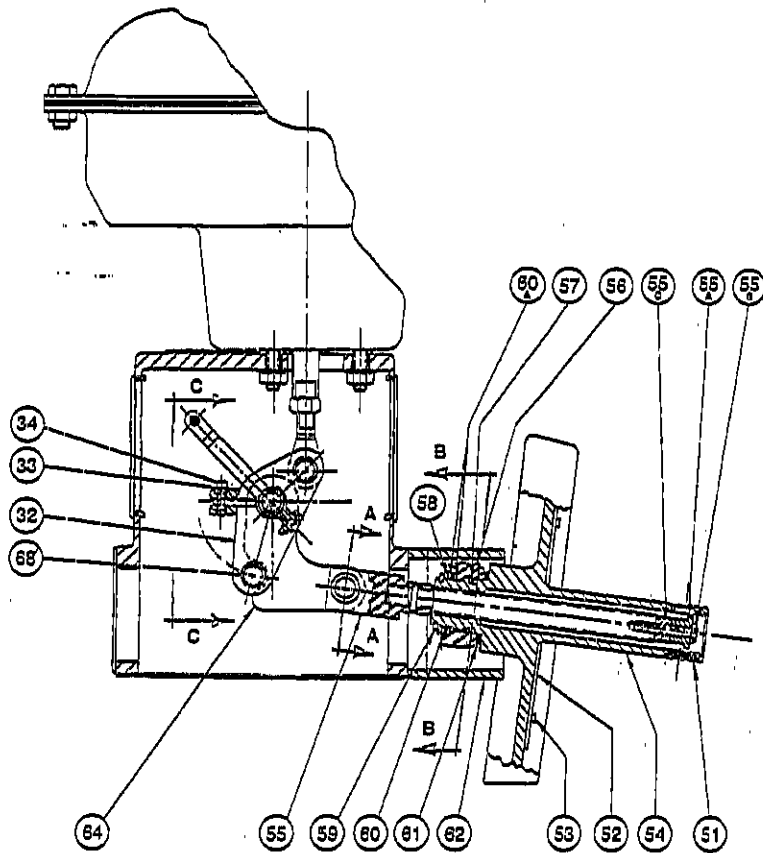


Figure 7 - Handwheel General Assembly

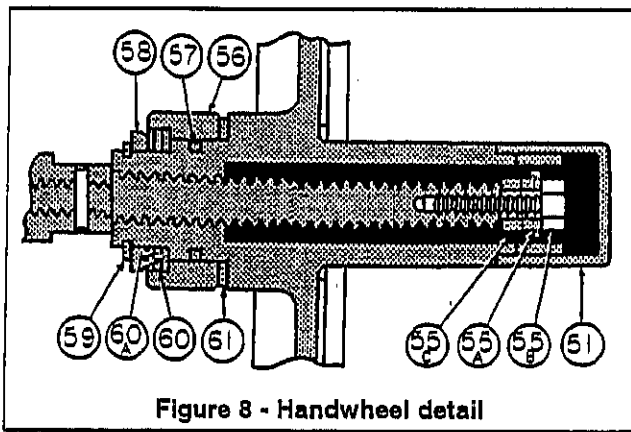


Figure 8 - Handwheel detail

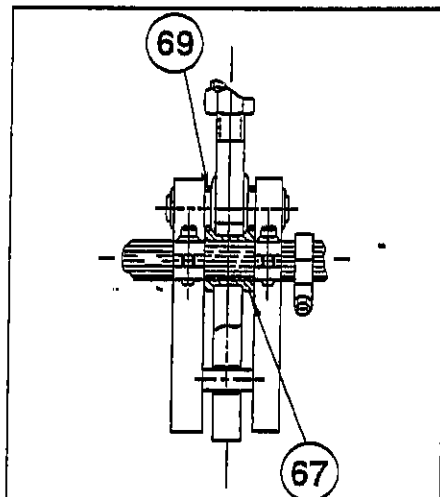


Figure 10 - Handwheel Lever detail

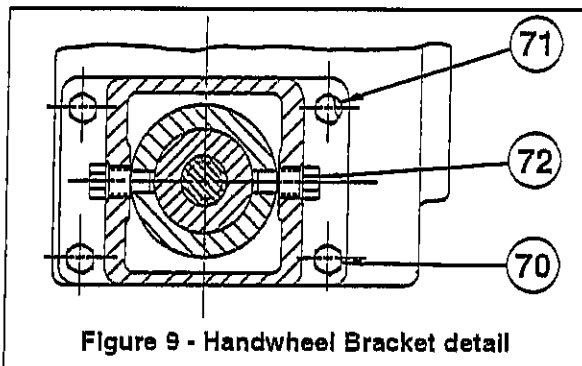


Figure 9 - Handwheel Bracket detail

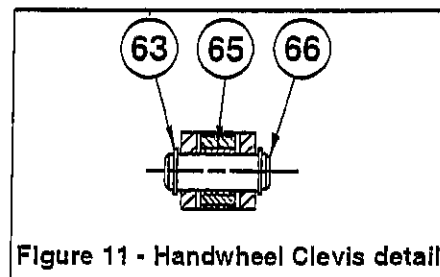
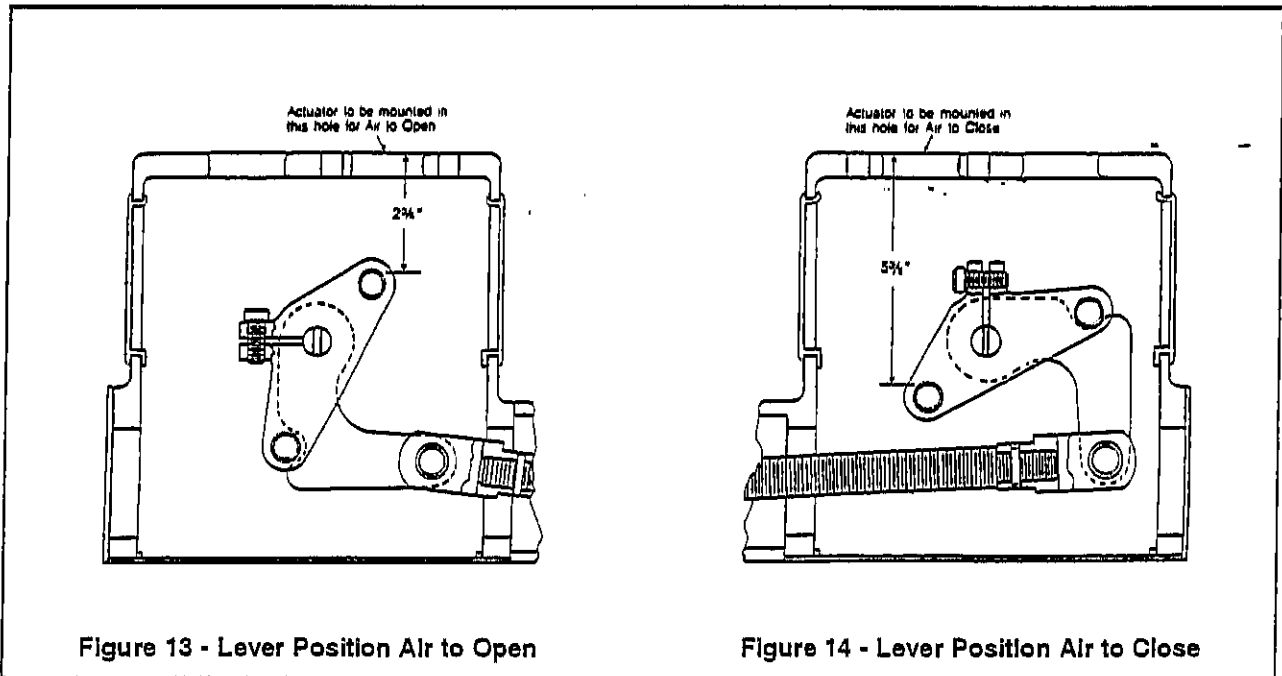
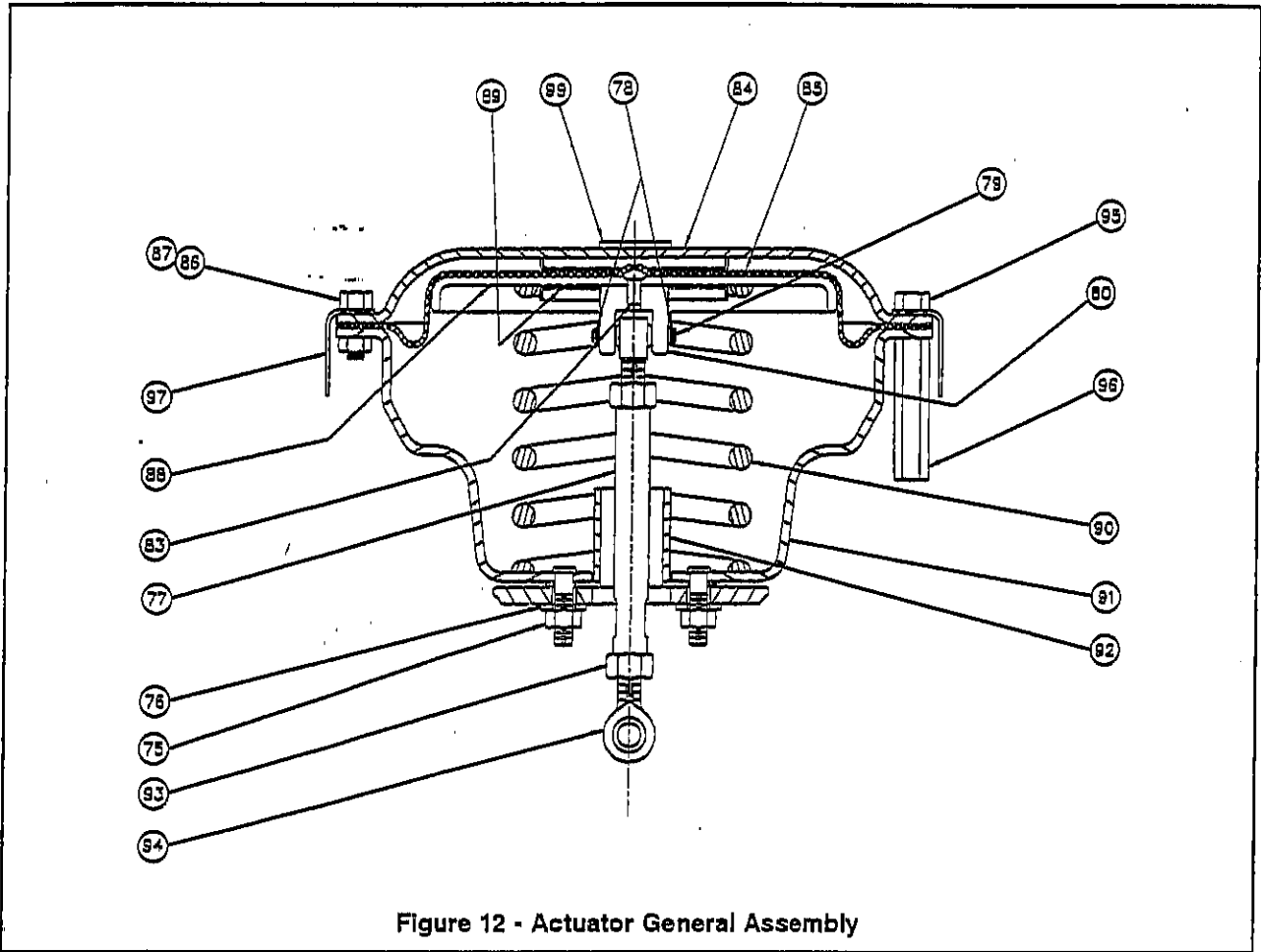


Figure 11 - Handwheel Clevis detail



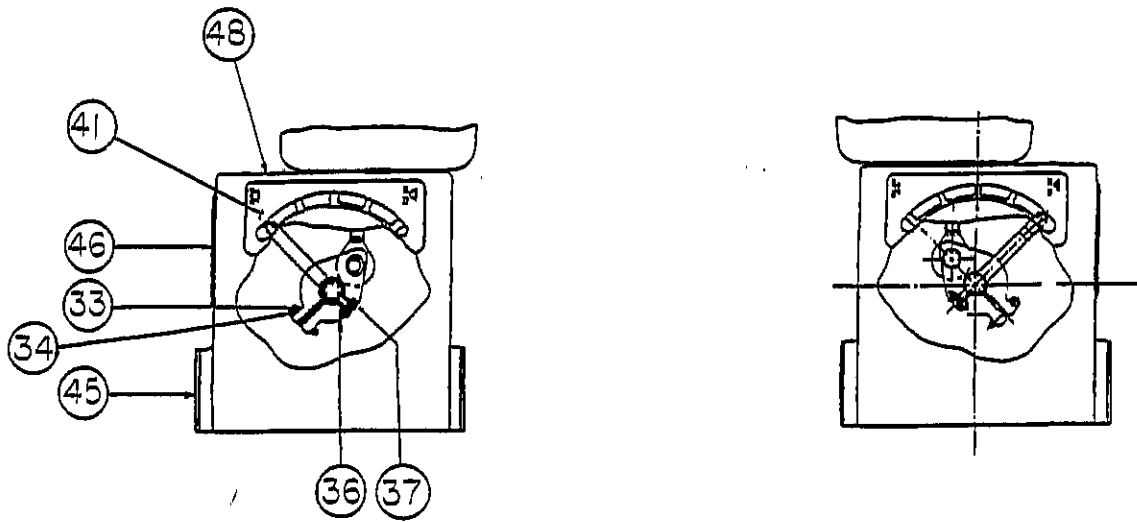


Figure 15 - Position Indicator detail

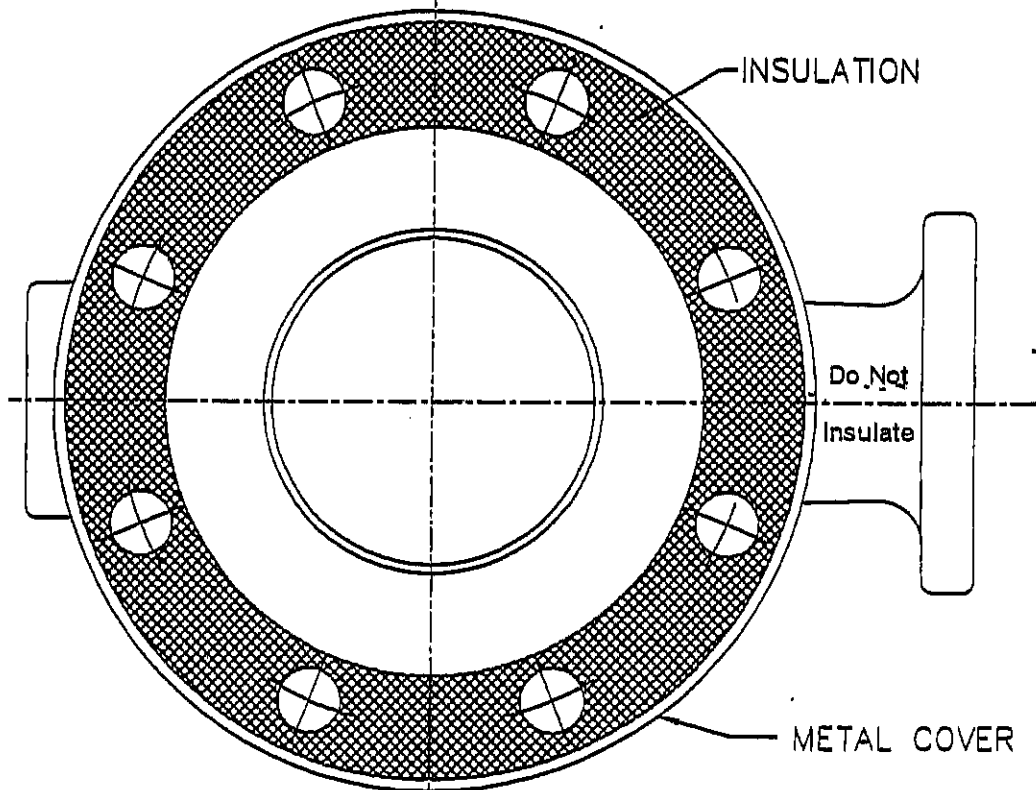


Figure 16 - Insulation detail

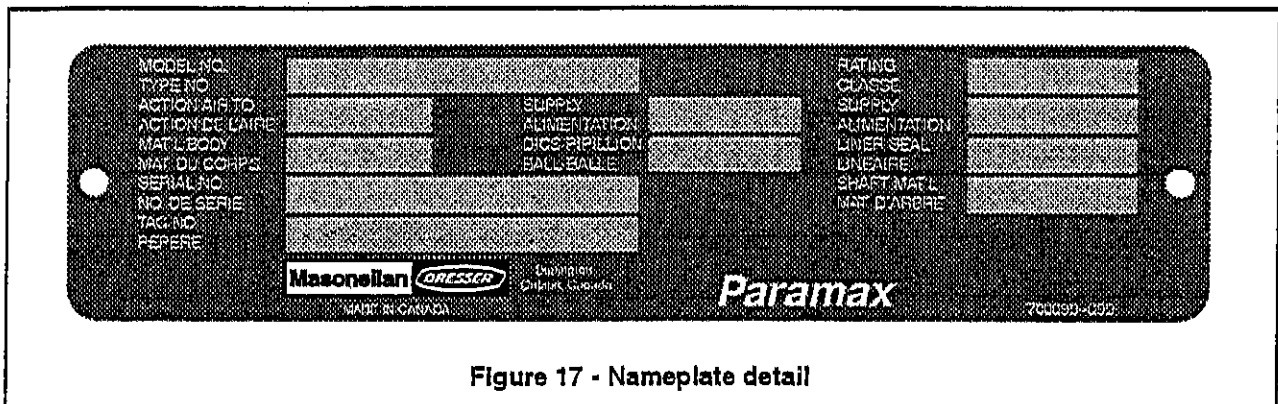


Figure 17 - Nameplate detail

TABLE 1 - Body Parts List

Ref. No.	Description
1	Body Flanged
2	Ball Plug
3	Retainer (ISA S75.04)
	Retainer (ANSI B16.10)
4	Gasket (Retainer/Body)
5	Shaft (Std. C.S. Body)
	Shaft (Std. S.S. Body)
6	Backup Ring (Metal Seal)
7	Gasket (Metal Seal)
8	Seal Ring
9	Slot Button HD Screw
10	Flat Washer
11	Pin Shaft (Std. C.S. Body)
	Pin Shaft (Std. S.S. Body)
12	Stud End Flange
13	Nut End Flange
14	End Flange
15	Gasket (Pin Shaft)
16	Lower Bushing
17	Upper Bushing
18	Lockwasher
19	Packing
20	Packing Follower
21	O-Ring
22	O-Ring
23	Packing Box Flange
24	Nut
25	Stud Packing Flange
26	Stud Bonnet
27	Safety Pin
28	Packing Adapter
29	Shaft Ring
30	Spacer Tube

TABLE 2 - Bracket and Linkage Parts List

Ref. No.	Description
31	Yoke
32	Lever
33	Cap Screw
34	Lockwasher
35	Indicator Arm
36	Machine Screw
37	Hex Nut
38	Indicator Dot
39	Pivot Pin
40	Retaining Clip
41	Front Cover S/A
42	Shaft Cover
43	Machine Screw
44	Bottom Cover
45	Boss Cover
46	Side Cover
47	Bearing
48	Hole Cover - - -
49	Serial Plate
50	Drive Screw

TABLE 3 - Handwheel Parts List

Ref. No.	Description
32	Lever Set
33	Lockwasher
34	Cap Screw
51	End Cap
52	Plate
53	Screw
54	Handwheel
55	Handwheel Shaft S/A
55A	Handwheel Stop
55B	Cap Screw
55C	Spacer (not shown)
56	Handwheel Pivot
57	O-ring
58	Locknut
59	Retaining Ring
60	Needle Bearing
60A	Bearing Race
61	Trust Washer
62	Handwheel Bracket
63	Retaining Clip
64	Lever Arm
65	Lever Arm Bearing
66	Clevis Pin
67	Guide
68	Lever Arm Pin
69	Spacer
70	Cap Screw
71	Lockwasher
72	Pivot Pin

TABLE 4 - Actuator Parts List

Ref. No.	Description
75	Hex Nut
76	Lockwasher
77	Stem
78	Clip
79	Clevis Pin
80	Clevis
83	Button Head Cap Screw
84	Upper Diaphragm Case
85	Diaphragm
86	Cap Screw
87	Nut
88	Diaphragm Plate
89	Spring Guide
90	Spring
91	Lower Diaphragm Case
92	Stop
93	Nut
94	Rod End Bearing
95	Tension Bolt
96	Tension Nut
97	Warning Plate

TABLE 5 - Line Bolting (Inlet Side)

Size	ANSI Pressure Rating	ISA S75.04 Face-to-Face	ANSI B16.10 Short Pattern Face-to-Face
2"	150#	3 3/4"	5 1/2"
	300#	4"	---
3"	150#	4"	5 1/4"
	300#	4 3/4"	---
4"	150#	4 1/2"	5 1/4"
	300#	5"	---
6"	150#	4 1/2"	6"
	300#	5 1/4"	---
8"	150#	4 3/4"	6 3/4"
	300#	6"	---
10"	150#	5 1/4"	6 1/2"
	300#	7"	---
12"	150#	5 1/2"	6"
	300#	7 1/2"	---

Masoneilan

Valve & Controls 

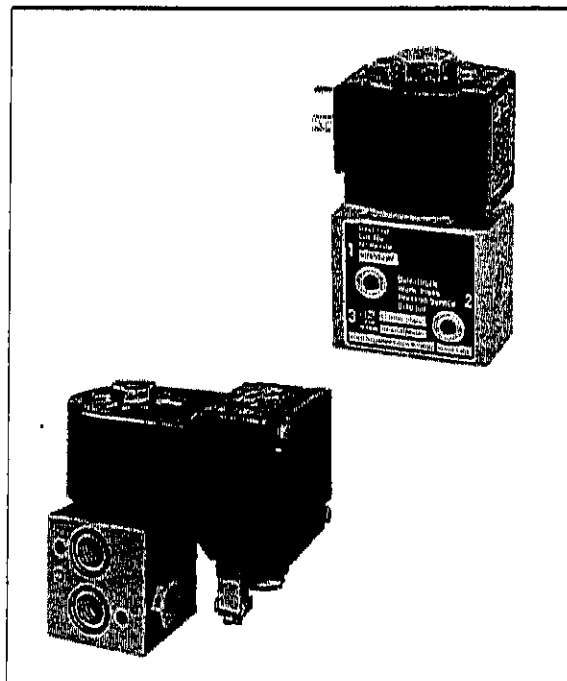
Facilities: Brazil, Canada, France, Germany, Italy, Japan, Mexico, Netherlands, Singapore, Spain, United Kingdom, United States

21

NORGREN HERION

3/2 Directional Control Valves
Direct solenoid operated poppet valves
Internal thread G1/4, 1/4-18 NPT or
flanged with NAMUR interface

- Suitable for instrumental air, neutral gaseous and liquid fluids and aggressive gaseous and liquid fluids
- Suitable for outdoor installation if equipped with corresponding solenoid
- AC solenoids with integrated rectifier (40 to 60 Hz)


Technical Data
Medium:

Neutral gaseous liquids or aggressive fluids

Operation:

Solenoid operated

Flow Direction:

Optional

Port Size:

G1/4, 1/4 NPT

Operating Pressure:

0 to 10 bar

Operating Temperature:

-25°C to +80°C (NBR)

-10°C to +120°C (FKM) – water up to +95°C

Fluid Temperature:

+60°C

Switching Cycles:

100/min

Mounting:

Optional, preferably vertical

Materials:

Body – stainless steel, brass, hard anodized aluminium

Seat seal – FKM (Viton), NBR (Perbunan), Silicon

Inner parts – stainless steel, brass

Ordering Information

3/2 Directional control valve, stainless steel, with seat seal Viton, port size G 1/4, solenoid 24 V DC, with hard anodized casing

Type: 2401127.3972.024.00
Options
Namur Interface

Add-on manual override for commissioning and maintenance

Many mounting possibilities

Valve/solenoid combinations to protection class

IP65 and explosion proof with DVGW

approval on request

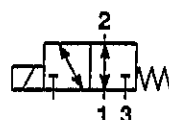
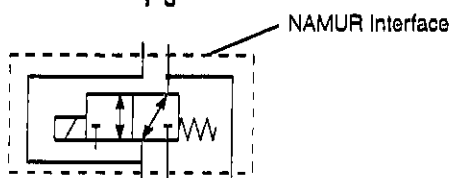
TÜV approval

Solenoids in protection class EEx d IIC T5/T6

Solenoids with CSA-/FM approval

Connectors

See data sheet 7503364


 Switching function:
 Pressure port
 at 1, 2 or 3


NAMUR Interface



General Information

Brass valves

Type *	Port size	Operating pressure ¹⁾ (bar)	kv-value (Cv(US) = kv x 1,2)	Seat seal	Dimensional drawing	Weight w/o solenoid (kg)	Variants
2401103	G 1/4	0 to 10	0,340	NBR	M01	0,65	
2401149	G 1/4	0 to 10	0,340	NBR	M01	0,65	DVGW approval solenoids Group A
2401138	1/4 NPT	0 to 10	0,340	NBR	M01	0,65	
2401126	G 1/4	0 to 10	0,340	FKM	M01	0,65	
2401107	G 1/4	0 to 10	0,340	NBR	M01	0,70	Manual override without detent
2401148	1/4 NPT	0 to 10	0,340	NBR	M01	0,70	Manual override without detent
2401119	G 1/4	0 to 10	0,340	NBR	M01	0,70	Manual override with detent
2401140	1/4 NPT	0 to 10	0,340	NBR	M01	0,70	Semi-automatic actuation
2401153	G 1/4	0 to 10	0,340	Silicon	M01	0,65	For ambient temp. down to -40 °C
2401106	1/4 NPT	0 to 10	0,340	Silicon	M01	0,65	For ambient temp. down to -40 °C
2401154	G 1/4	0 to 10	0,340	Silicon	M01	0,70	Semi-automatic actuation, for amb. temp. down to -40 °C

Solenoids Group A and B, see page 4.

Group B solenoids not suitable for valves made before 26/98.

Aluminium valves NAMUR interface

Type *	Port size	Operating pressure ¹⁾ (bar)	kv-value (Cv(US) = kv x 1,2)	Seat seal	Dimensional drawing	Weight w/o solenoid (kg)	Variants
2401190	G 1/4 NAMUR	0 to 10	0,340	NBR	M02	0,55	DVGW approval solenoids Group A
2401116	G 1/4 NAMUR	0 to 10	0,340	NBR	M02	0,55	Internal parts free of nonferrous metals DVGW approval, solenoids Group A
2401133	G 1/4 NAMUR	0 to 10	0,340	Silikon	M02	0,55	For ambient temp down to -40 °C
2401191	G 1/4 NAMUR	0 to 10	0,340	NBR	M02	0,55	DVGW approval solenoids Group B
025254	1/4 NPT NAMUR	0 to 10	0,340	NBR	M02	0,55	
2401109	G 1/4 NAMUR	0 to 10	0,340	NBR	M03	0,55	Port P integrated into flange interface

Solenoids Group A and B, see page 4.

Group B solenoids not suitable for valves made before 26/98.

* When ordering, please indicate solenoid, voltage and current type (frequency).

¹⁾ For gaseous or liquid fluids up to 40 mm²/s



Stainless steel valves

Type	Port size	Operating pressure ¹⁾ (bar)	Kv-value (Cv(US) = Kv x 1.2)	Seat seal	Dimensional drawing	Weight w/o solenoid (kg)	Variants
2401188	G 1/4	0 to 10	0,340	NBR	M01	0,65	Core tube and plunger 1.4104
2401112	1/4 NPT	0 to 10	0,340	NBR	M01	0,65	Core tube and plunger 1.4104

Solenoids Group A and B, see page 4

Stainless steel valves

Type	Port size	Operating pressure ¹⁾ (bar)	Kv-value (Cv(US) = Kv x 1.2)	Seat seal	Dimensional drawing	Weight w/o solenoid (kg)	Variants
2401127	G 1/4	0 to 10	0,340	FKM	M01	0,65	
2401147	1/4 NPT	0 to 10	0,340	FKM	M01	0,65	
2401155	G 1/4	0 to 10	0,340	Silicon	M01	0,65	For ambient temp. down to -40 °C, DVGW approval
2401168	1/4 NPT	0 to 10	0,340	Silicon	M01	0,65	For ambient temp. down to -40 °C, DVGW approval
2401145	G 1/4	0 to 10	0,340	FKM	M01	0,70	Semi-automatic actuation

Solenoids Group A, see page 4

Stainless steel valves NAMUR interface

Type	Port size	Operating pressure ¹⁾ (bar)	Kv-value (Cv(US) = Kv x 1.2)	Seat seal	Dimensional drawing	Weight w/o solenoid (kg)	Variants
2401196	G 1/4 NAMUR	0 to 10	0,340	NBR	M02	1,0	Core tube and plunger 1.4104
2401142	G 1/4 NAMUR	0 to 10	0,340	Silicon	M02	1,0	Core tube and plunger 1.4104, for ambient temp. down to -40 °C





Solenoids Group A, see page 4

* When ordering, please indicate solenoid, voltage and current type (frequency).




¹⁾ For gaseous or liquid fluids up to 40 mm²/s



Solenoids Group A

Type	Power consumption		Current		Tolerance (%)		Protection class	Temperatures		Dimensional drawing	Circuit diagram No.	Weight (kg)
	24V DC (W)	230V AC (VA)	24V DC (mA)	230V AC (mA)	pull-in current	at 100% duty cycle		Ambience (°C)	Fluid (°C)			
 0800 0801	16,9	-	703	-	10	25	IP00 w/o connector IP65 with connector ²⁾	+60	+80	M06	SB01	0,33
	-	18	-	185	10	25		+60	+80			
 3803 3804	-	18	-	185	10	25	IP00 w/o connector IP65 with connector ²⁾	+60	+80	M07	SB06	0,34
	-	18	-	185	10	25		+60	+80			
 3980 ¹⁾ 3981 ¹⁾ 3970 ¹⁾ 3971 ¹⁾ 3972 ¹⁾⁴⁾	12	-	502	-	10	25	EEx me II T5 EEx me II T6	+80 +45	+60 +45	M08	SB04	0,85
	-	14	-	61	10	25		EEx me II T5 EEx me II T6	+60 +45			
	7,6	-	315	-	10	20	EEx me II T4 EEx me II T6	+70 +50	+70 +50	M08	SB04	0,85
	-	9,0	-	39	10	20		EEx me II T4 EEx me II T6	+70 +50			
	7,6	-	315	-	10	20	EEx me II T4 EEx me II T6	+70 +50	+70 +50	M08	SB04	0,85
-	9,0	-	39	10	20	EEx me II T4 EEx me II T6		+70 +50	+70 +50			
 3826 3827	13,6	-	566	-	10	25	NEMA 4, 4X, 6, 6P, 7, 9	+60		M09	SB01	0,4
	-	15,7	-	68	10	25		NEMA 4, 4X, 6, 6P, 7, 9	+60			

Solenoids Group B

Type	Power consumption		Current		Tolerance (%)		Protection class	Temperatures		Dimensional drawing	Circuit diagram No.	Weight (kg)
	24V DC (W)	230V AC (VA)	24V DC (mA)	230V AC (mA)	pull-in current	at 100% duty cycle		Ambience (°C)	Fluid (°C)			
 0827 ²⁾ 0813 ²⁾	6,8	-	282	-	7	10	IP00 w/o connector IP65 with connector ²⁾	+60	+60	M07	SB01	0,33
	-	-	-	-	-	-		+60	+60			
 3960 ¹⁾ 3981 ¹⁾ 3962 ¹⁾⁴⁾	3,9	-	161	-	10	10	EEx me II T5 EEx me II T6	+80 +60	+80 +60	M08	SB04	0,85
	-	4,9	-	21	10	10		EEx me II T5 EEx me II T6	+80 +60			
	3,9	-	161	-	10	10	EEx me II T5 EEx me II T6	+80 +60	+80 +60	M08	SB04	0,85
-	-	-	-	-	-	EEx me II T5 EEx me II T6		+80 +60	+80 +60			
 3824 3825	8,9	-	370	-	10	10	NEMA 4, 4X, 6, 6P, 7, 9	+60		M09	SB01	0,4
	-	9,5	-	41	10	10		NEMA 4, 4X, 6, 6P, 7, 9	+60			

- 1) This solenoid is fitted with a fuse depending on current.
- 2) With DVGW approved units, minus tolerances are 5% less.
- 3) This solenoid does not have DVGW approval.
- 4) This solenoid is provided with a hard anodized surface as protection against corrosion. It is available only for 24 V DC.
- 5) DIN 43650 Form A



Brass valves with solenoids in protection class EEx d

Type *	Port size	Operating pressure ¹⁾ (bar)	kv-value (Cv(US) = kv x 1,2)	Seat seal	Dimensional drawing	Weight w/o solenoid (kg)	Variants
2401189.361X	G 1/4	0 to 10	0,340	NBR	M04	0,65	
2401195.361X	1/4 NPT	0 to 10	0,340	NBR	M04	0,65	
2401118.361X	G 1/4	0 to 10	0,340	Silicon	M04	0,65	For ambient temp. down to -40 °C
2401104.361X	1/4 NPT	0 to 10	0,340	Silicon	M04	0,65	For ambient temp. down to -40 °C

Stainless steel valves with solenoids in protection class EEx d

Type *	Port size	Operating pressure ¹⁾ (bar)	kv-value (Cv(US) = kv x 1,2)	Seat seal	Dimensional drawing	Weight w/o solenoid (kg)	Variants
2401193.361X	G 1/4	0 to 10	0,340	FKM	M04	0,75	
2401194.361X	1/4 NPT	0 to 10	0,340	FKM	M04	0,75	
2401130.361X	G 1/4	0 to 10	0,340	FKM	M04	0,80	Manual override with detent
2401122.361X	1/4 NPT	0 to 10	0,340	FKM	M04	0,80	Manual override without detent
2401113.361X	1/4 NPT	0 to 10	0,340	FKM	M04	0,80	Semi-automatic actuation

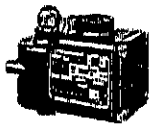
Aluminium valves (NAMUR interface) with solenoids in protection class EEx d

Type *	Port size	Operating pressure ¹⁾ (bar)	kv-value (Cv(US) = kv x 1,2)	Seat seal	Dimensional drawing	Weight w/o solenoid (kg)	Variants
2401197.361X	G 1/4 NAMUR	0 to 10	0,340	NBR	M05	0,65	
2401134.361X	G 1/4 NAMUR	0 to 10	0,340	NBR	M05	0,65	DVGW approval

* When ordering, please indicate solenoid, voltage and current type (frequency).

¹⁾ For gaseous or liquid fluids up to 40 mm²/s

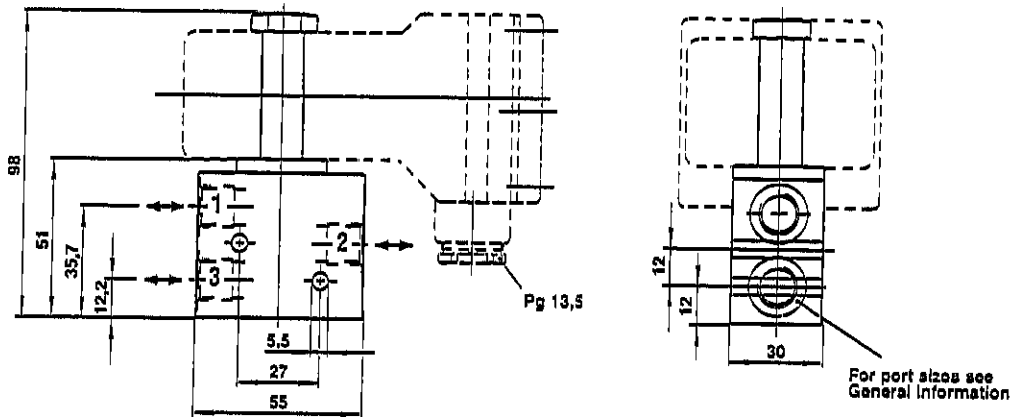
Solenoids in protection class EEx d

	Type	Power consumption		Current		Tolerance (%)		Protection class	Temperatures		Dimensional drawing	Circuit diagram No.	Weight (kg)
		24V DC (W)	230V AC (VA)	24V DC (mA)	230V AC (mA)	pull-in current at 100% duty cycle	at 100% duty cycle		Ambience (°C)	Fluid (°C)			
	3616	14,3	-	598	-	10	20	EEx d IIC T5 EEx d IIC T6	+60 +40	+60 +40	-	S802	0,8
	3617	-	16,1	-	70	10	20	EEx d IIC T5 EEx d IIC T6	+60 +40	+60 +40	-	S806	0,8

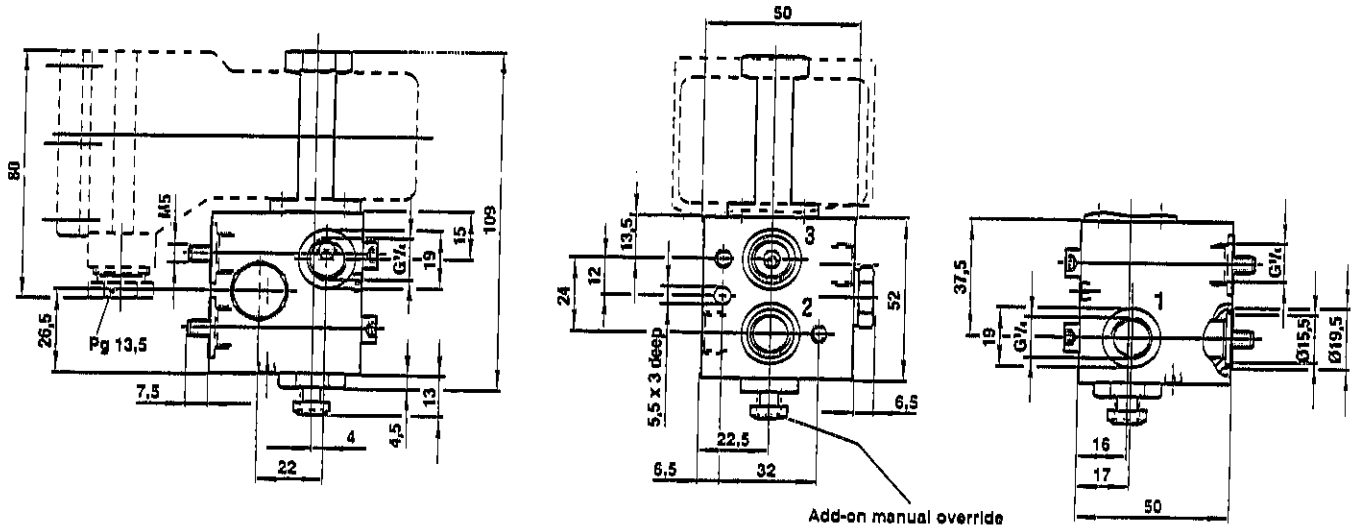


General dimensions valves

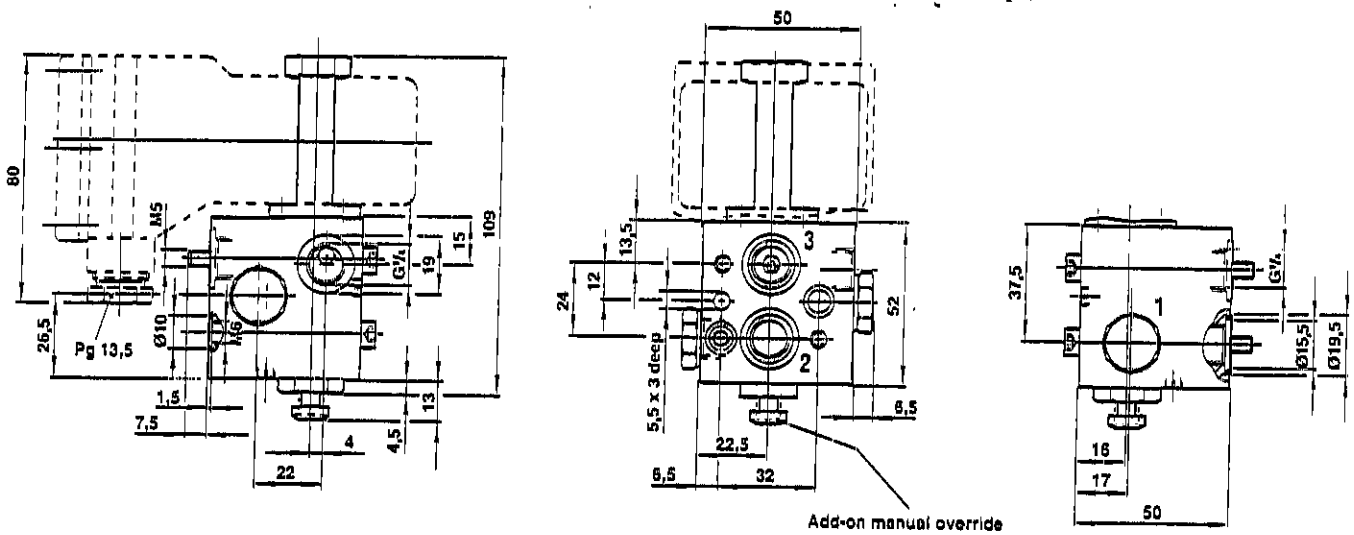
M01



M02

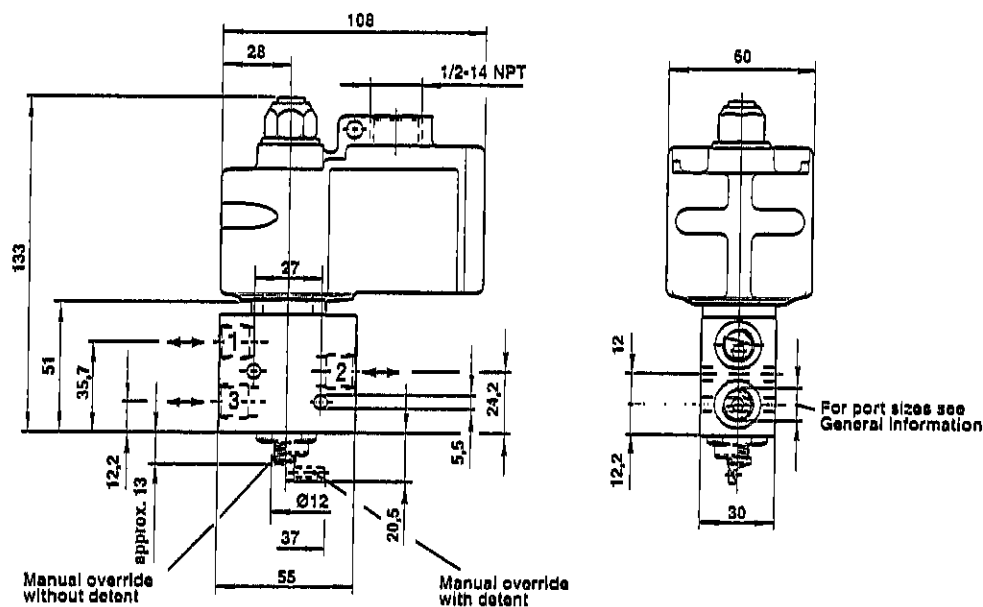


M03

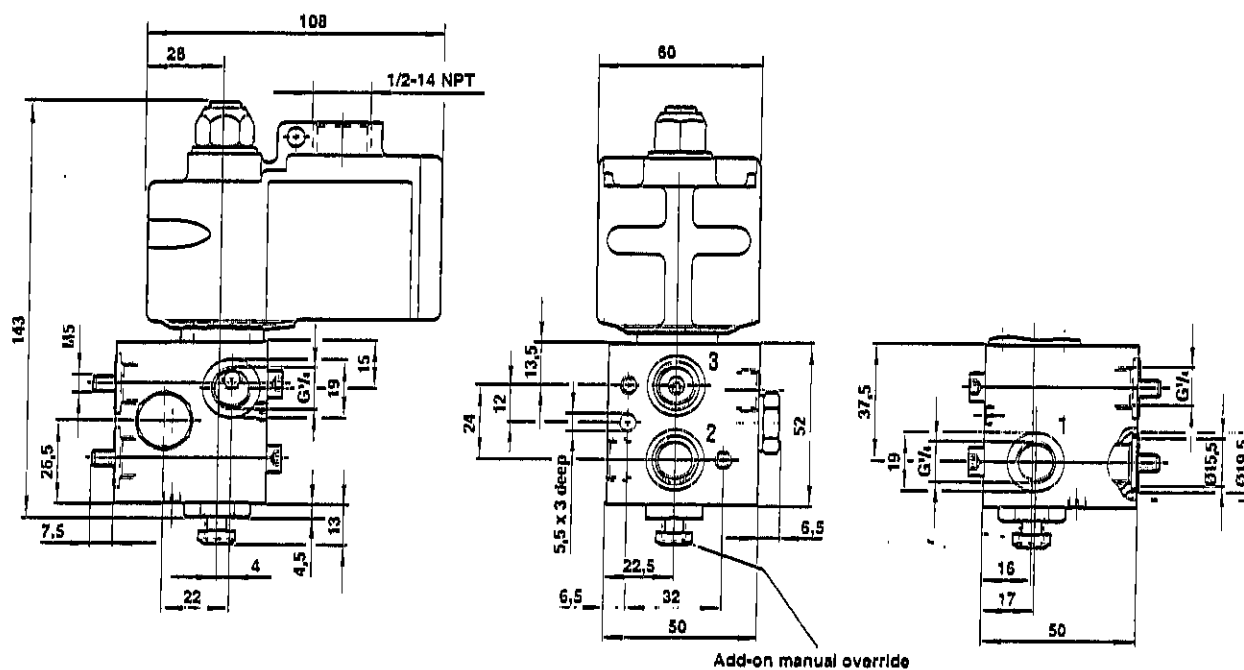




M04



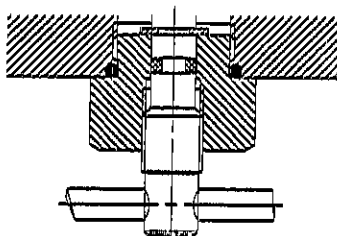
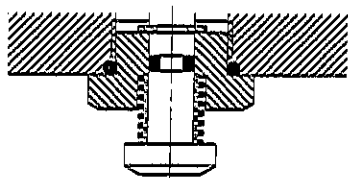
M05



Add-on manual overrides
without detent
Type: 0600205

with detent
Type: 0601765

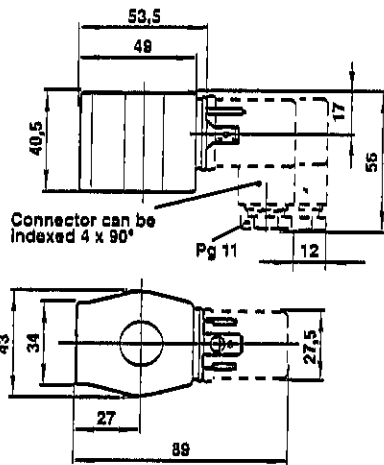
Threaded plug
Type: 0602764



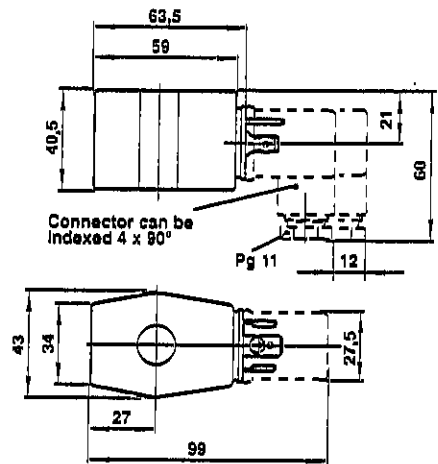


General dimensions solenoids

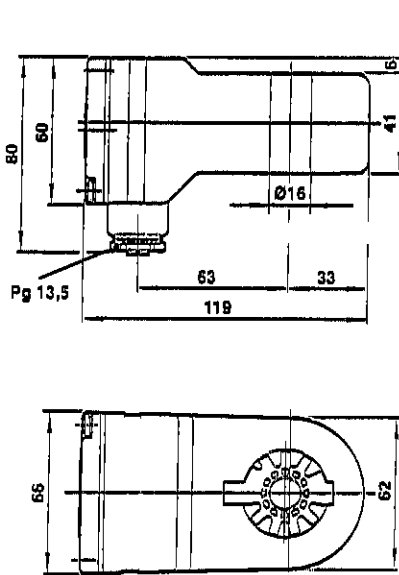
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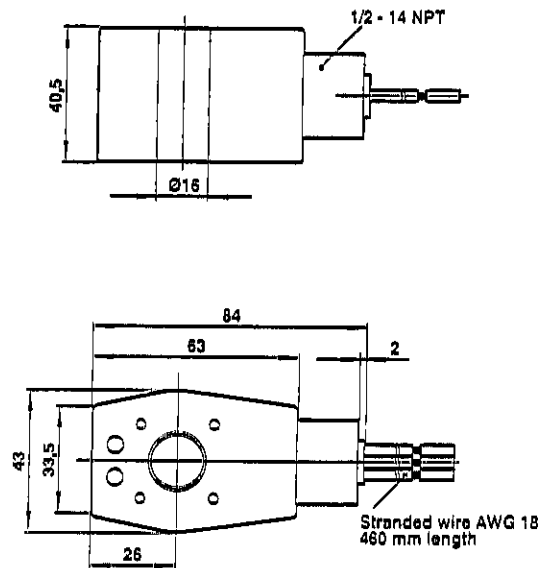
M07



M08

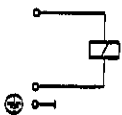


M09

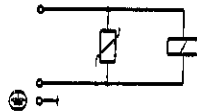


Circuit diagrams

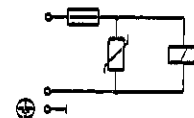
SB01



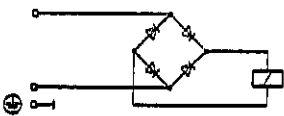
SB02



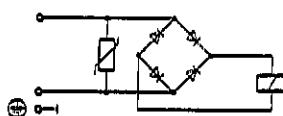
SB04



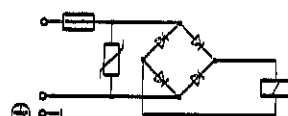
SB05



SB06

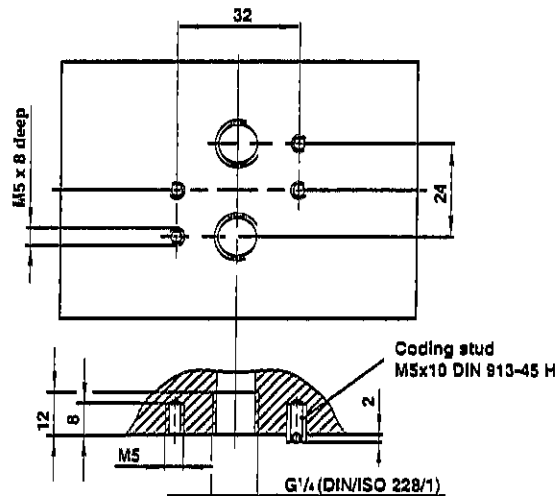


SB07





NAMUR interface



Mounting parts

Designation	Type	Application	Weight (Kg)	See data sheet
Flange plate	0559057	Direct attachment to pneumatic linear actuators with NAMUR ribbing and for wall mounting, depending on the tubing position	0,50	7502242
Yoke	0540593	In conjunction with a flange plate for attachment to pneumatic linear actuators with NAMUR pillar (round)	0,10	
Adaptor plate	0603216	Direct attachment to older design pneumatic pivot drives, with interface for valve Type 2401180	0,25	

Warning

These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under 'Technical Data'.

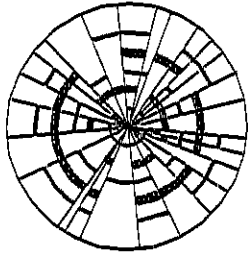
Before using these products with fluids other than those specified, for non-industrial applications, life-support systems, or other applications not within published specifications, consult NORGREN.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes. The system designer is warned to consider the failure modes of

all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure. System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products where applicable.

**ACTUATOR TYPE L 300 SR(f) / 76
SPRING RETURN (Fail Close)**



Contrôles Actionneurs

MOUNTING AND MAINTENANCE

MANUAL FOR ACTUATOR

TYPE L 300 SR(f) / 76

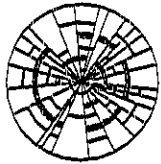
SPRING RETURN (Fail Close)

serial number n° A 182 - 1

Contrôles Actionneurs S.A

64, rue Berthie Albrecht - 94400 Vitry sur Seine - France

Tél : 01.55.53.12.49 - Fax : 01.46.80.17.11

 Contrôles Actionneurs	MOUNTING AND MAINTENANCE MANUAL		NO MAIN L300SR(f)/76
	MOUNTING AND MAINTENANCE MANUAL FOR LINEAR SPRING RETURN ACTUATOR TYPE L 300 SR(f) / 76 SERIAL NUMBER A 182 - 1		Date : 9/02/03 Rev : 0 Page : 1 / 6
Written by : E. TAUPIN	Vérifié by :	Approved by :	

The purpose of this manual is to describe the different operations to be carried out to mount the linear actuator type L300 SR(f) / 76 (spring return fail close) on to the valve, and to detail maintenance operations.

Reference drawing : assembly dwg n° A 182 Cou / L 300 SR(f) / 76
base one dwg n° A 162 En / L 300 SR(f) / 76

Bill of material : BOM L 300 SR(f) / 127 - n° A182-1

I Introduction

Prior any operations, verify the following points :

- Actuator pattern (number of holes, piercing diameter, ...) versus mounting bracket top work.
- Dimensions of the coupling versus dimensions of the valve stem and actuator piston rod.
- Verify that the valve and the actuator are in the same position.
(In this case, the actuator being fail close by spring, the close position seems to be the most adequate position).

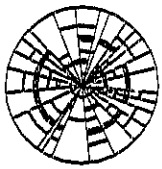
II Mounting

Actuator must be off pressure and off electrical power.

The actuator is fail close (by spring). The actuator stem rep 1-70 is extended to the maximum.

"Open" stop screws

No "Open" stop screw on this acuator



Contrôles
Actionneurs

MOUNTING AND MAINTENANCE MANUAL

NO MAIN L300SR(f)/76

MOUNTING AND MAINTENANCE MANUAL
FOR LINEAR SPRING RETURN ACTUATOR
TYPE L 300 SR(f) / 76
SERIAL NUMBER A 182 - 1

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"Close" stop screws

No "Close" stop screws on this actuator

Mounting

- Place the actuator, the most vertical possible, above the valve. Then approach it slowly
- Continue the approach until the bottom face of the actuator get in contact with the mounting bracket top flange. (During this operation make sure that both valve and actuator stems are not interfering)
- Made up the "mounting screws", tight but not blocked
- Position the coupling nut onto the valve stem and the actuator rod. At that stage, a slight adjustment of the "piston rod" maybe necessary to achieve the correct position.
Apply a very low pressure to achieve this position
- Cycle the assembly 3 or 4 times to allow the best positioning of the actuator versus the valve.
- Then block the "mounting screws".

III Set up

The mounting operations being completed, set up the air pressure to the minimum value of the contract.

Set up of the "close" stop screws

Not applicable for this actuator

Set up of the "open" stop screw

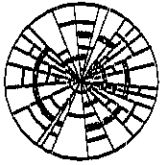
Not applicable for this actuator

IV Maintenance

TS actuators have been developed and engineered to reduce maintenance operations to the minimum. The main maintenance operation concerns the pneumatic cylinder seals.

Spring cartridge does not require any maintenance in term of seal.

Prior to start any maintenance operation, ensure that the adequate seal kit is available.



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MOUNTING AND MAINTENANCE MANUAL

NO MAIN L300SR(D)/76

MOUNTING AND MAINTENANCE MANUAL
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TYPE L 300 SR(†) / 76
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Verify its content versus the informations shown by the bill of material. Control visually all the parts.

A special attention will be applied to the seal check.

Actuator will be mandatory off air and off power.

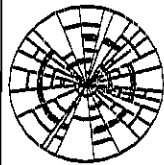
Diassembly

Spring cartridge

- Using an impact key, break out the 2 compression tie bar rep 3-65. This operation must be achieved carefully. Approximate length 150 mm.
- Remove the compression tie bars and their friction washers rep 6-370.
- Remove the spring cartridge outer flange rep 3-30, the cylinder rep 3-20 and the spring rep 3-50
- Take away the compression flange rep 3-40.
- Break out the 2 Hexa socket screws rep 6-350 and remove the spring cartridge inner flange rep 3-10.

Pneumatic cylinder

- Break out the screw rep 6-210 and remove the blinders A rep 2-60 et B rep 2-70 from the outer flange rep 2-50.
- Extract the "jonc" rep 2-40 from its groove by turning the outer flange. This operation can be made easier by blocking one end of the "jonc" using a screwdriver located into the half circular groove of the cylinder (receiving the blinder A).
- Pull out the outer flange rep 2-50. Take away the "O" ring seal rep 5-250 from its groove.
- Take away from the outer flange, the bearing rep 3-90.
- Pull out the actuator stem rep 1-70 . During any operation on the stem, a special care is required to prevent it from scratches and other damages



Contrôles
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MOUNTING AND MAINTENANCE MANUAL

NO MAIN L300SR(1)/76

MOUNTING AND MAINTENANCE MANUAL
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TYPE L 300 SR(f) / 76
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- Remove the circlips rep 6-290, the retaining ring rep 2-120 and the split ring rep 2-110.
- Pull out the piston and remove the "O" ring seal rep 5-240.
- Take away the piston seal rep 5-210 and the bearing rep 5-220.

- Dissamble the cylinder and the inner flange rep 2-20 as done for the outer flange / cylinder.

- From the inner flange, remove the internal circlips rep 6-295 and the bearing rep 1-90 and the UN seal rep 5-230.

Reassembly

Prior to any reassembly operations, clean and inspect the parts carefully. Any minor damages such burrs, scratches, ... have to be removed by honing.

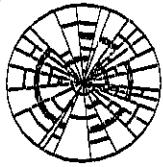
Pneumatic cylinder

- Grease and introduce the new UN seal rep 5-230 and the bearing rep 1-90 into the inner flange and put back in position the internal circlips rep 6-295.
- Introduce the inner flange rep 2-20 equipped with its new "O" ring seal rep 5-250, into the cylinder rep 2-10.
- A slight adjustment may be needed in heigh, to enable the introduction of the new "jonc".
- Complete the "jonc" rep 2-40 introduction by pushing it and rotating the flange simultaneously.
- Place both blinders B and A in their groove and secure them by the screw rep 6-210.

For the following operations, we advise to build the actuator in the upright position.

- Grease and position the new piston/piston rod "O" ring seal rep 5-240 onto the piston rod.
- Put back in place the lower split ring rep 2-110, its clips rep 6-290 and the retaining ring rep 2-120.
- Place the piston rep 2-30 onto the rod, in contact with the split ring.
- Assemble the upper split ring, its retaining ring and its clips.
- Locate the new piston seal rep 5-210 and the bearing ring rep 5-220.

- Grease generously the cylinder, the piston seal and the bearing ring.
- Position very carefully the piston rod rep 1-70 through the UN seal rep 5-230 and the bearing rep 1-90 into the inner flange.



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MOUNTING AND MAINTENANCE MANUAL

NO MAIN L300SR(f)/76

MOUNTING AND MAINTENANCE MANUAL
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- Introduce the piston into the cylinder. During this operation make sure that the piston seal and the bearing ring remain properly positionned.
- After greasing, position the new bearing rep 3-90 into the outer flange rep 2-50 groove
- Locate the spring cartridge inner flange rep 3-10 onto the bearing.
- Secure this sub assembly by the 2 CHC M16 screws.
- Lift this subassembly using slings located on the compression flange rep 3-80 and position it on to the actuator rod rep 1-70.
- Introduce the outer flange rep 2-50 into the cylinder rep 2-10.
- A slight adjustment may be needed in heigh, to enable the introduction of the new "jonc".
- Complete the "jonc" rep 2-40 introduction by pushing it and rotating the flange simultaneously.
- Place both blinders B and A in their groove and secure them by the screw rep 6-210.

Note : at that stage, we advise to perform the leakage test to verify the proper mounting.
see the relevant paragraph page 6.

Spring cartrigde reassembly

Leakage test being positive, the spring cartridge reassembly will be carried out as follows :

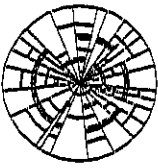
- Position the inter flange rep 3-40 on the piston rod.
- Grease and position the spring rep 3-50 and the cylinder rep 3-20.
- Place the outer flange rep 3-30 on the top of the spring.
- Grease generously the 2 compression tie bars rep 3-65 and start the made up operations.
(Screw the 2 tie bars in a almost simultaneous way).
- Achieve the spring compression (approximately 150 mm).

V Testing and set up

Stop screws

N/A

Testing

 <p>Contrôles Actionneurs</p>	MOUNTING AND MAINTENANCE MANUAL	NO MAIN L300SR(f)/76
	<p>MOUNTING AND MAINTENANCE MANUAL FOR LINEAR SPRING RETURN ACTUATOR TYPE L 300 SR(f) / 76 SERIAL NUMBER A 182 - 1</p>	<p>Date : 9/02/03 Rev : 0 Page : 6 / 6</p>

Seal test

Apply air pressure (3 or 4 bar (g)) in the lower side of the pneumatic cylinder.
Using a foaming solution check the following seals :

- Inner flange/ cylinder ("O" ring seal rep 5-250)
- Inner flange / piston rod (UN rod seal rep 5-230)

pourring generously the foaming solution on the checked areas.

- Piston / cylinder (piston seal rep 5-210)
- Piston / piston rod ("O" ring seal rep 5-240)

by having solution spread on the breathing port of the outer flange.

Disconnect pressure.

Note : leakage shall not exceed 10 N.l / mm.

Functioning test

This test shall be performed after complete reassembly.

Set up the air pressure to the minimum value of the contract (4.1 bar(g)) and apply it in the lower side of the pneumatic cylinder.

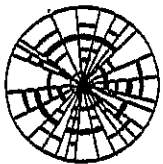
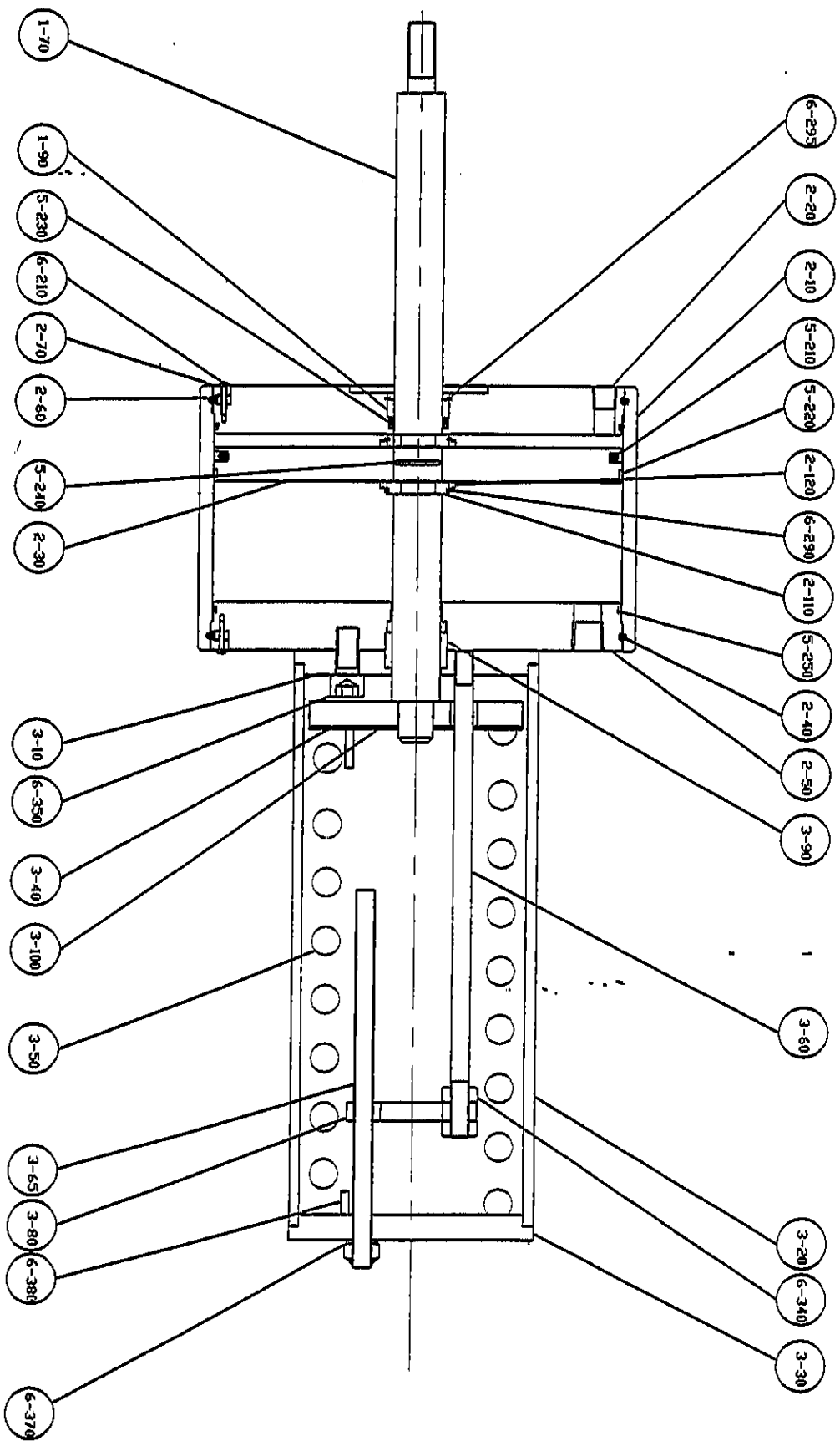
The piston must translate in a gentle and uniform manner. This can be controled by watching the actuator rod penetrating the inner flange of the actuator.

Stop pressure. The actuator rod shall extend from the pneumatic cylinder in the same conditions than previously. (Speed may be greater in this case).

VI Results

If both tests are proved satisfactory the actuator is deemed as OK and the actuator can be reassembled onto the valve.

In case of difficulties encountered during these operations, contact Contrôles Actionneur.



Contrôles
Actionneurs

64, rue Barthélemy Albrecht
94400 Vitry sur Seine - France
Té : 01.55.55.12.49 - Fax : 01.46.60.17.11

Rev.	Date	Modifications	Dess :	Verif :	Approb.
0	2/03	Issue	EI		

ASSEMBLY DRAWING
L 300 SRC(F) / 76
JOB A 182

Plan: A182 Cou L300SRC(F)/76 P1 V1 Rev : 0

AIR FILTER REGULATOR TYPE FR 10

SAMI INSTRUMENTS s.r.l.

Via Botte, 8 - 35011 Reschigliano di Campodarsego (PD) - Italy
Tel: ++39.049.920.1939 (6 linee r.a.) - Fax ++39.049.921.7549
e-mail: sami_instruments@tin.it

AIR FILTER REGULATOR TYPE FR 10

AIR FILTER REGULATOR INSTRUCTIONS

GENERALS

OPERATION

DISASSEMBLY AND MAINTENANCE

INSTALLATION

PART LIST

FR 10 AIR FILTER REGULATOR

GENERALS

The FR 10 air regulator is a combined automatic reducing relief and high capacity filter suited for granting constant air supply for pneumatic instruments as well as for air filtration in order to eliminate solid and liquid impurities prejudicial to the good operation of connected equipment.

The unit acts as a proportional action pressure regulator with high sensitivity and delivers a practically constant air pressure outlet, notwithstanding wide variations of required air flow rate.

The die-cast aluminium alloy body is also suited for use in corrosive atmospheres; the condensate cylinder is of considerable capacity, provided with a drain cock for easy cleaning by vertical as well as level installation.

Filter can easily be removed for cleaning and quickly replaced.

OPERATION

The filter regulator main parts are shown on fig. 2

The outlet pressure value is determined by the initial compression of the spring (5) by means of the setting screw (1).

The outlet pressure, acting on the diaphragm (11), compresses the spring and sets the opening amplitude of plug (17).

As the outlet pressure decreases owing to higher air drawn, the force of the spring tends to displace the diaphragm downwards and then the air flow through the plug seat is sufficient in respect of required quantity.

The new balance condition is held until the next variation of air draw, diaphragm (11) moves upwards.

Plug (17) following the diaphragm displacement, reduces the air flow through its seat, until a new balance condition is established.

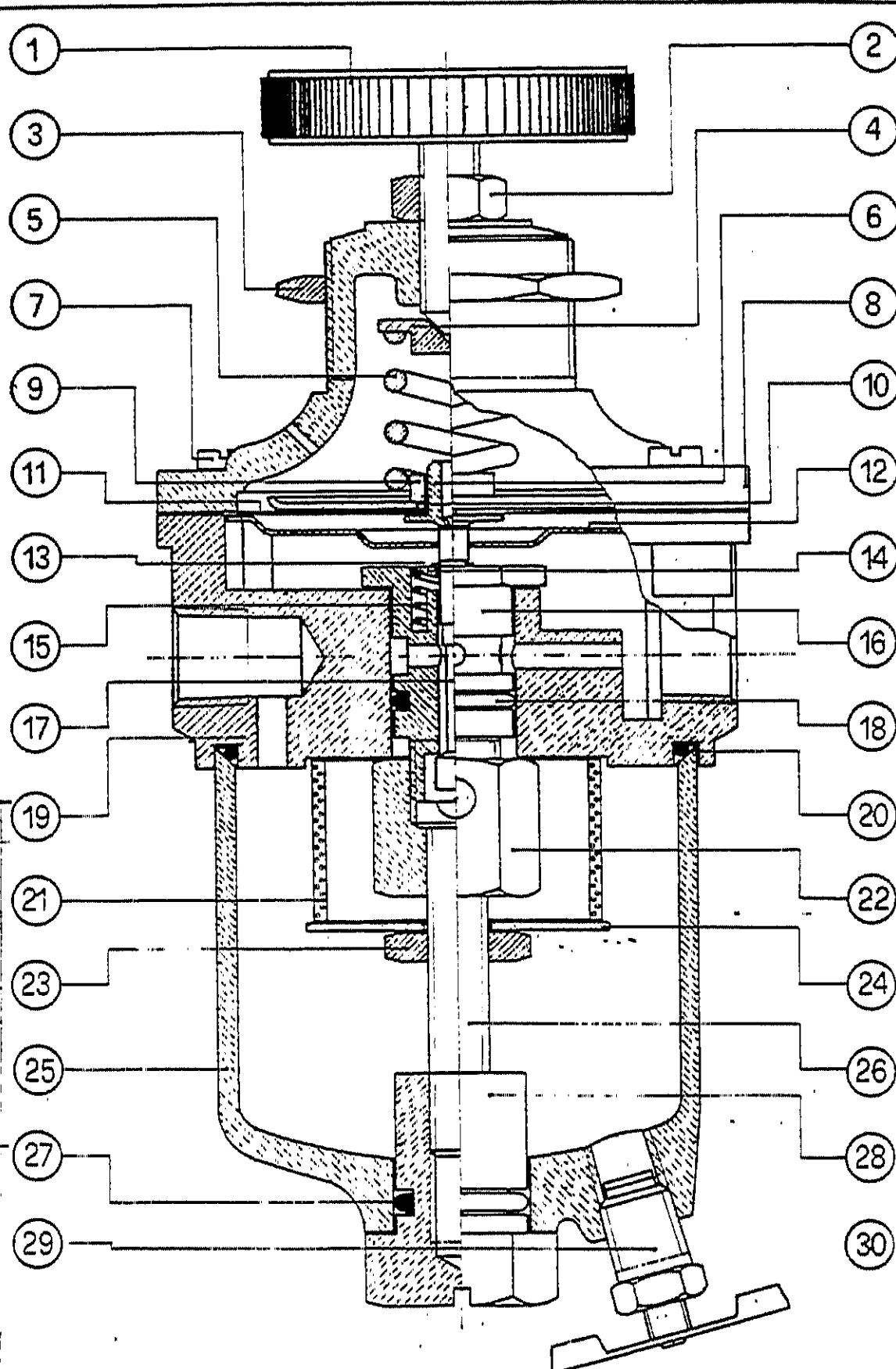
INSTALLATION

The filter regulator installation can be vertical or level-in line, panel or wall type.

In case of level installation it is recommended that the draincock is located downwards. If required, position it loosening bottom nut (28) and rotating cup (25) until the cock is located, then lock the nut.

Unit is provided with 4, 1/4" NPT connections, the inlet connection is marked "E" the outlet one "U".

The further two screwed connections are for possible reduced pressure gauge connections.



For S. A. M. I. REPARAZIONE PER IRRADIAZIONI MISURE INDUSTRIALI via MESSINA		Disegnazione DRT		Materiale Note	
Titolo FILTRO RIDUTTORE					
Scala	2 : 1	IRREALI	DATE	Dn. N°	
Scaduto il			28-10-76		
Scaduto da			29-10-76		
Appr.				FR 10	
				COI	

Questo disegno è stato elaborato
 in base al n. 1. di lavoro per
 la costruzione di un filtro per
 la riduzione della dose di
 radiazione per il personale
 presente all'interno

In operation, with air following through the regulator, only outlet "U" is in the position to produce an aspiration effect on the diaphragm and then a slight "pre-act" action on the regulator. The other two connections, as said, are optional for the use of an outlet pressure indicating gauge.

DISASSEMBLY and MAINTENANCE

Check all air connections and make sure they seal.

Setting screw(1) has to be well lubricated with grease. For replacing the diaphragm group (11) loosen setting screw (1) until the pressure of spring (5) is eliminated, remove screw (7), cover(8), spring (5), spring backing disk (4) and diaphragm group(11). Place new diaphragm group on body(19) with diaphragm supporting plane upwards and repeat above procedure inversely.

To replace plug group (16) proceed as for the diaphragm, removing also the plate (12), then remove bottom plug(28), cup(25), nut(23), filter backing cap((24), filtering baffle (21) and stud plug(22). Now plug can be extracted through the body upper side. To avoid plug group damage during the removal and replacement operations use a box wrench.

Clean the plug by rinsing in a solvent (petrol or similar) and blow it dry with air.

In case the instrument is employed under particular operating conditions, such as continuous and considerable flow a very accurate setting is required, the periodic replacement of the diaphragm and plug is recommended.

Frequency of skin replacement depends on the nature of the service, air cleanliness degree, etc.

To clean filter (21) remove tap(28) lift off cup(25) and cap(24) rinsing in a solvent (petrol, carbon tetrachloride, etc.) and blowing dry with air stream directed inside of filter.

Periodic cleaning is required for cup(25) by opening drain cock(29) with instrument under pressure.

CAUTION

Reassembling the filter regulator, care has to be taken that all points are well tight.

For tightening of bottom nut(19) a 12" screwdriver should be sufficient

In case the necessary tightness of cup(25) is not obtained, replace gasket(27).

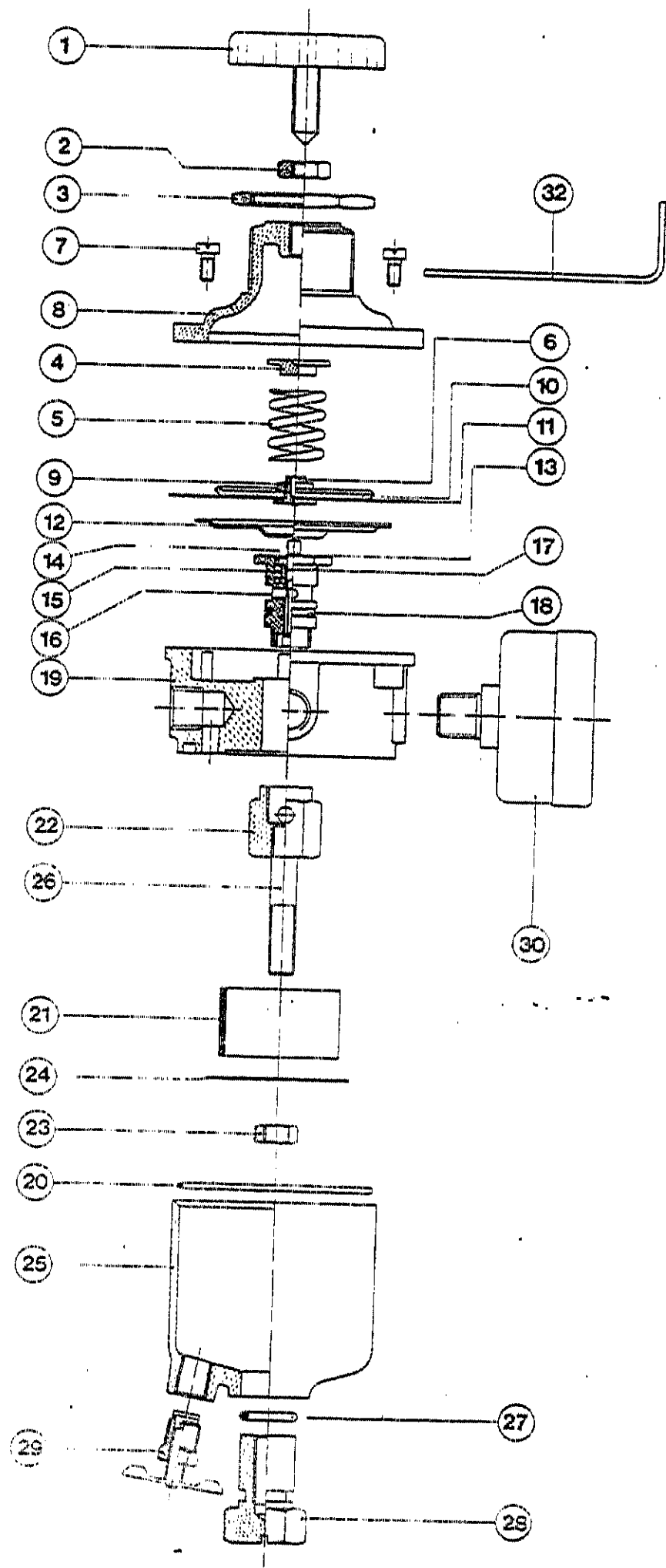


FIG. 2

SPARE PARTS LIST FOR FR 10 FILTER REGULATORS

ITEM	DENOMINATION	Qty	REFERENCE
1°	Knob with setting wcrew	1	OC 272/1
2	Locking nut	1	OC 22
3	Bracket fastening nut	1	OC 29/2
4	Spring backing disk	1	OC 37
5	Range setting spring 0-30 PSI	1	OC 776/1
5a	Range setting spring 0-60 PSI	1	OC 777
7	AISI 303 SS M 4x0,7 screw	6	OC 33
8	Screwed cover	1	OC 271/1
11°	Complete diaphragm group 0-30 PSI	1	OC 40
11a°	Complete diaphragm group 0-60 PSI	1	OC 41
11b°	Complete diaphragm group 0-100 PSI	1	OC 42
12	Plate	1	OC 771
16°	Complete plug group	1	OC 765
19	Central body	1	OC 773
20°	Cup gasket	1	OC 760
21°a	Ceramic filter	1	OC 39
22	Tap with stud bolt	1	OC 769/2
23	Filter nut 5/16"	1	OC 758
24	Filter cap	1	OC 772
25	Cup	1	OC 774
27	Bottom gasket	1	OC 761
28	Bottom tap	1	OC 767
29	Drain cock	1	OC 354.4
30	Gauge 0-30 PSI	1	OC 23
30a	Gauge 0-40 PSI	1	OC 24
30b	Gauge 0-60 PSI	1	OC 25
30c	Gauge 0-100 PSI	1	OC 26
31	Screw 1/4" NPT	2	OC 732/1
32	Bracket	1	OC267/1

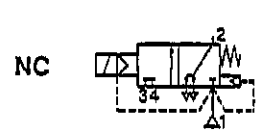
RECOMMENDED SPARE PARTS

LOW POWER SOLEINOID VALVES Series 317



LOW POWER SOLENOID VALVES

pilot operated
with integrated quick exhaust
1/4



3/2
Series:
317

FEATURES

- Brass and stainless steel bodied valves are designed to provide maximum flow and have an integrated quick exhaust function
- Direct lift solenoid valves combined with a pilot operated poppet have a resilient soft seating for absolute tight shut-off on low and high pressure
- The use of first class materials and thorough valve testing ensure a high reliability and a long lifetime
- The valves vent to "zero" bar through two oversized exhaust orifice
- The solenoid valves conform to International standards

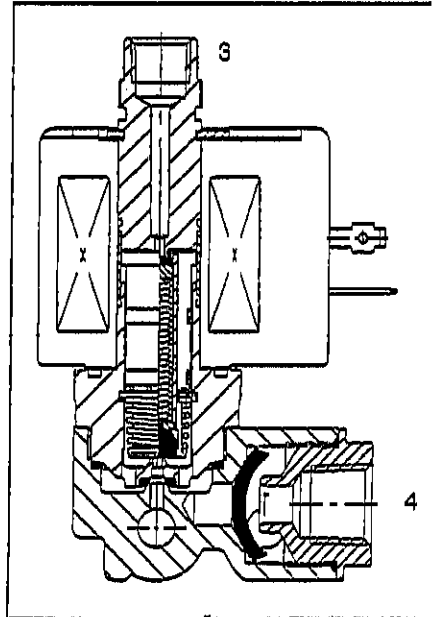
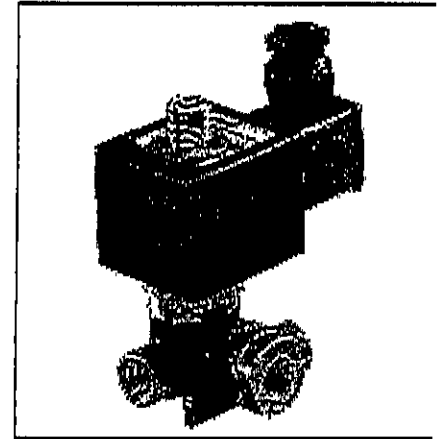
GENERAL

Differential pressure 0,35 - 10 bar [1 bar = 100 kPa]
Maximum allowable pressure 10 bar
Response times 5 - 25 ms

fluids	temperature range	sealings
air, inert gas	-20 to +60°C	NBR (nitrile / buna-n)

CONSTRUCTION

	Brass body	Stainless steel body
Body	Brass	AISI 303 SS
Core tube	Stainless steel	Stainless steel
Core and plugnut	Stainless steel	Stainless steel
Core spring	Stainless steel	Stainless steel
Sealing	NBR	NBR
Disc-core upper	PA (nylon)	PA (nylon)
Disc-core lower	NBR	NBR
Poppet	CR (chloroprene/neoprene)	CR (chloroprene/neoprene)
Cartridge	Welded, packless AISI 430 SS	Welded, packless AISI 430 SS
Nameplate	Aluminium / Polyester	Aluminium / Polyester
Seat	Brass	Stainless steel
Coil insulation class	F	F
Connector	Spade plug (Pg 11P)	Spade plug (Pg 11P)
Connector specification	ISO 4400	ISO 4400
Electrical safety	IEC 335	IEC 335



SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		operating pressure differential (bar)		coil type	catalogue number		OPTIONAL EXPLOSIONPROOF SOLENOID				
				min.	max.				BSI	NEMA	CENELEC		
									Ex N	7 and 9	EEx (e)m	EEx	
NPT	(mm)	(m³/h)	(l/min)			-/■	brass	stainless steel	ZN	EF	PV	EM	IS
1/4	1,6 ⁽¹⁾	0,07	1,2	0,35	10	CMXX-F	SCB317A307	SCB317A308	●	●	●	★	●

(★) Available in AC and DC feature

(●) Available in DC feature

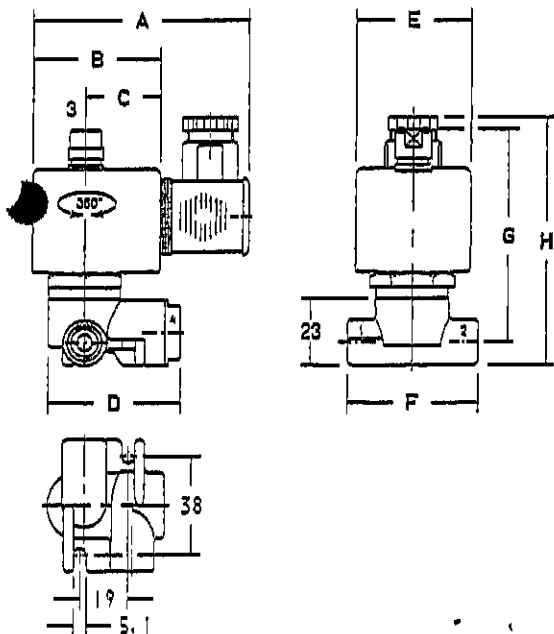
(1) Exhaust orifice Ø 6,4, flow 0,64/11

FOR SOLENOID SPECIFICATIONS AND DIMENSIONS REFER TO PAGES 7 TO 10

INSTALLATION

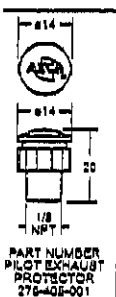
- The valves can be mounted in any position without affecting operation
- Mounting holes are provided in the valve body
- Pipe connection identifier is: B = NPT (ANSI 1.20.3)
- The third digit in the catalogue number indicates the standard pipe connection
- Other pipe threads are available on request
- Installation/maintenance instructions are included with each valve
- Spare Parts Kit and replacement coils are available

DIMENSIONS (mm), WEIGHT (kg)



catalogue number	A	B	C	D	E	F	G	H	weight (1)
SCB317A307	85	50	30	52	45	51	83	96	0.60
CB317A308	85	50	30	52	45	51	83	96	0.70

(1) incl. coil and connector



ASCO®

OPERATORS

for potentially explosive atmospheres
intrinsically safe, II 1 G EEx ia IIC T6
fully moulded enclosure



CE

Series

ISSC

ATEX

FEATURES

- Explosionproof operator, intended for use in Potentially explosive atmospheres, according to Directive ATEX 94/9/EC
- EC type examination certificate compliance with the Essential Health and Safety Requirements has been assured by European Standards EN 50014 and EN 50020
- This highly efficient solenoid operates at very low power level (0.4W)
- The continuous duty class F polypropylene moulded spade plug connector coil contains moulded in solid state components for switch-off peak voltage suppression, independent polarity connection and electronic enhancement
- Ingress protection degree IP65
- The operator can be supplied on all ASCO/JOUCOMATIC valves included in the Low Power catalogue X012

CONSTRUCTION

Solenoid enclosure	Polypropylene (PP)
Core, core tube and plugnut	Stainless steel
Springs	Stainless steel
Seals and discs	NBR
Riderring	PTFE
Connector specification	ISO 4400
Cartridge	Welded, packless AISI 430 SS
Nameplate	Polyester
Safety code	Ex II 1 G EEx ia IIC T6

ELECTRICAL CHARACTERISTICS

Standard voltages (1) DC (=) 24V nominal

TEMPERATURE CLASSIFICATION			
service	solenoid size	insulation class	Max. ambient / T. classification
	W		°C (2)
	MXX		T5
DC	0,4	F	60

(1) A minimum current of 28 mA is necessary for optimal performance

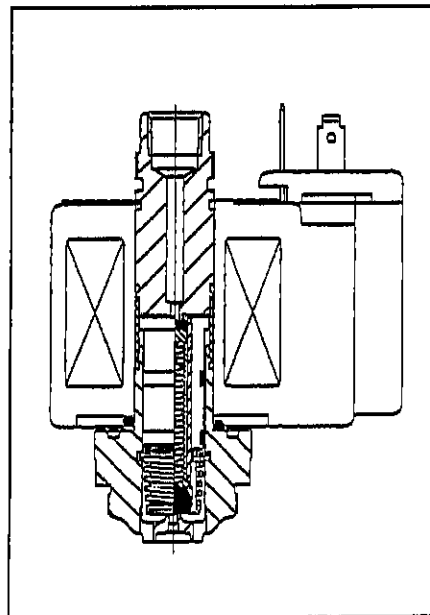
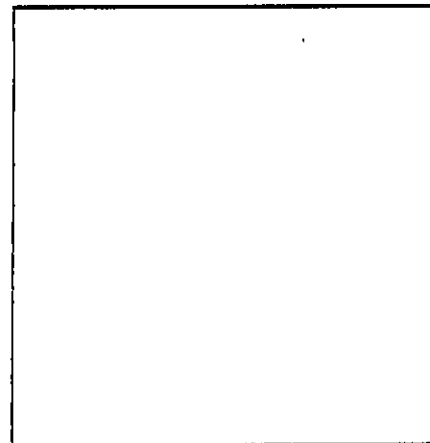
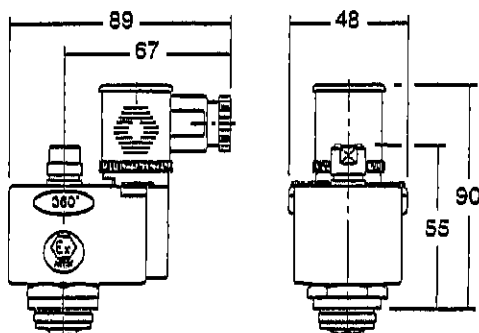
(2) The minimum allowable ambient temperature is -40°C for the solenoid

CONNECTIONS

- The solenoids may be mounted in any position and can be rotated 360° to select the most favourable position for cable entry
- Application of the operator, located within hazardous areas, is not permitted without the addition of an approved and classified device (such as barriers) located between the safe and hazardous area

DIMENSIONS (mm), WEIGHT (kg)

weight: 0,4



ORDERING INFORMATION

A valve supplied with this intrinsically safe operator will be identified with prefix ISSC before the catalogue number.

Example: **ISSC B314A300**

operator

NPT pipe thread

basic number

1

ASCO®

OPERATORS

for potentially explosive atmospheres
intrinsically safe, II 1 G EEx ia IIC T6
(stainless) steel enclosure

CE
ATEX

Series
WPIS
WSIS

FEATURES

- Explosionproof operator, intended for use in Potentially explosive atmospheres, according to Directive ATEX 94/9/EC
- EC type examination certificate compliance with the Essential Health and Safety Requirements has been assured by European Standards EN 50014 and EN 50020
- This highly efficient solenoid operates at very low power level (0.4W)
- The continuous duty class F polypropylene moulded spade plug connector coil contains moulded in solid state components for switch-off peak voltage suppression, independent polarity connection and electronic enhancement
- Ingress protection degree IP67
- The operator can be supplied on all ASCO/JOUCOMATIC valves included in the Low Power catalogue X012

CONSTRUCTION

Solenoid enclosure	steel zinc plated (Prefix WPIS) or AISI 316 SS (Prefix WSIS)
Core, core tube and plugnut	Stainless steel
Springs	Stainless steel
Seals and discs	NBR
Riderring	PTFE
Cartridge	Welded, packless AISI 430 SS
Nameplate	Polyester
Coil connection	Embedded screw terminals
Cable gland	Polyamide (PA), Pg 13,5
Safety code	Ⓔ II 1 G EEx ia IIC T6

ELECTRICAL CHARACTERISTICS

Standard voltages (1) DC (=) 24V nominal

TEMPERATURE CLASSIFICATION			
service	solenoid size	insulation class	Max. ambient / T. classification °C (2)
	W		
DC	MX	F	T6
	0.4		60

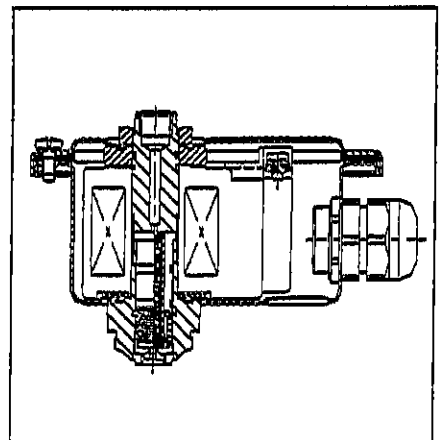
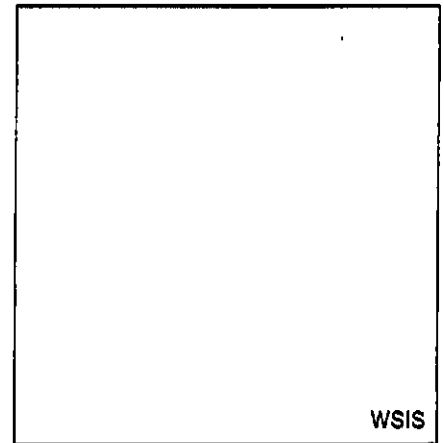
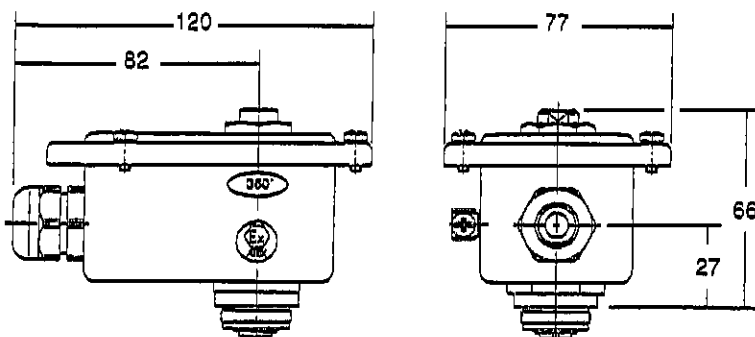
- A minimum current of 28 mA is necessary for optimal performance
- The minimum allowable ambient temperature is -40°C for the solenoid

CONNECTIONS

- The solenoids may be mounted in any position and can be rotated 360° to select the most favourable position for cable entry
- Application of the operator, located within hazardous areas, is not permitted without the addition of an approved and classified device (such as barriers) located between the safe and hazardous area

DIMENSIONS (mm), WEIGHT (kg)

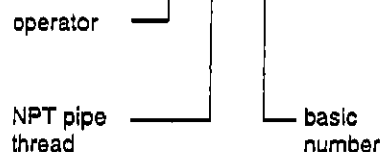
weight: 0,59



ORDERING INFORMATION

A valve supplied with this intrinsically safe operator will be identified with prefixes WPIS or WSIS before the catalogue number.

Example: WPIS B317A308
WSIS B317A308



ASCO/JOUCOMATIC reserves the right to alter the availability design and specifications without notice.

25

INTELLIGENT POSITIONER TZID-C

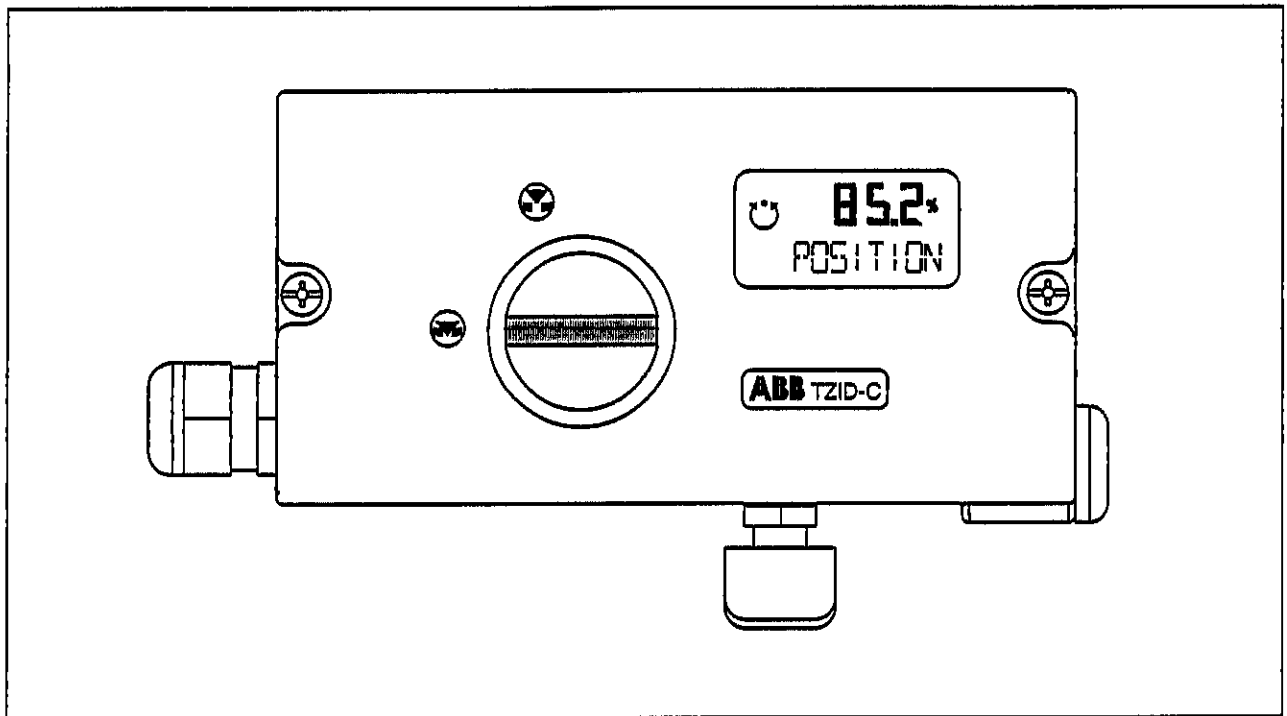
TZID-C

Intelligent Positioner

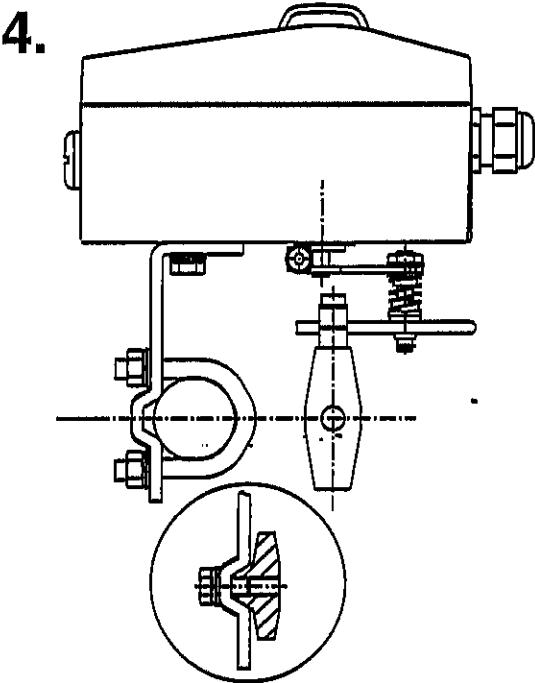
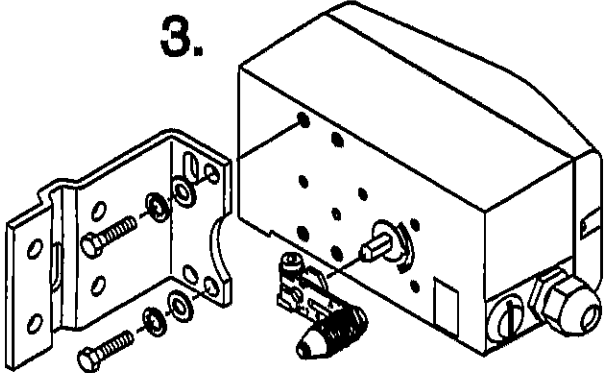
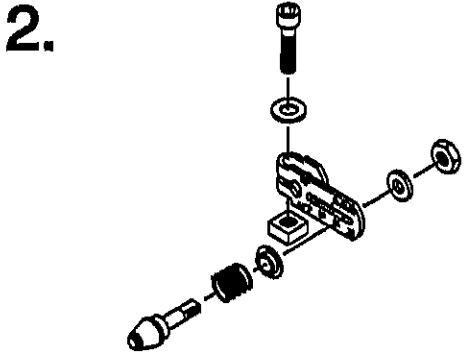
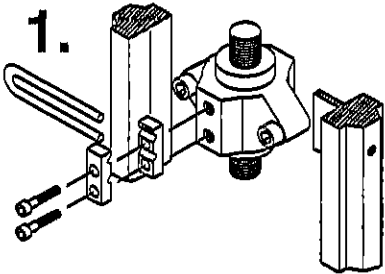
Operating Instructions

42/18-64 EN

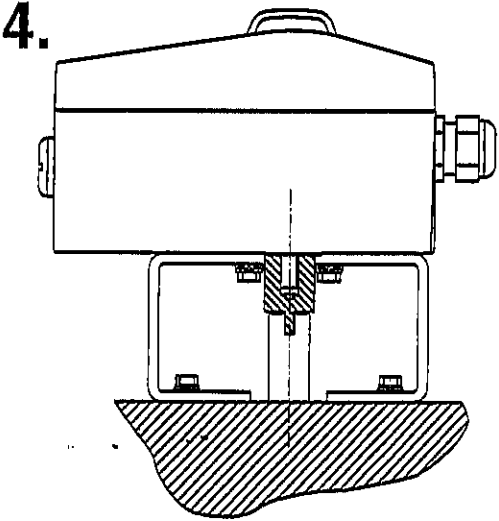
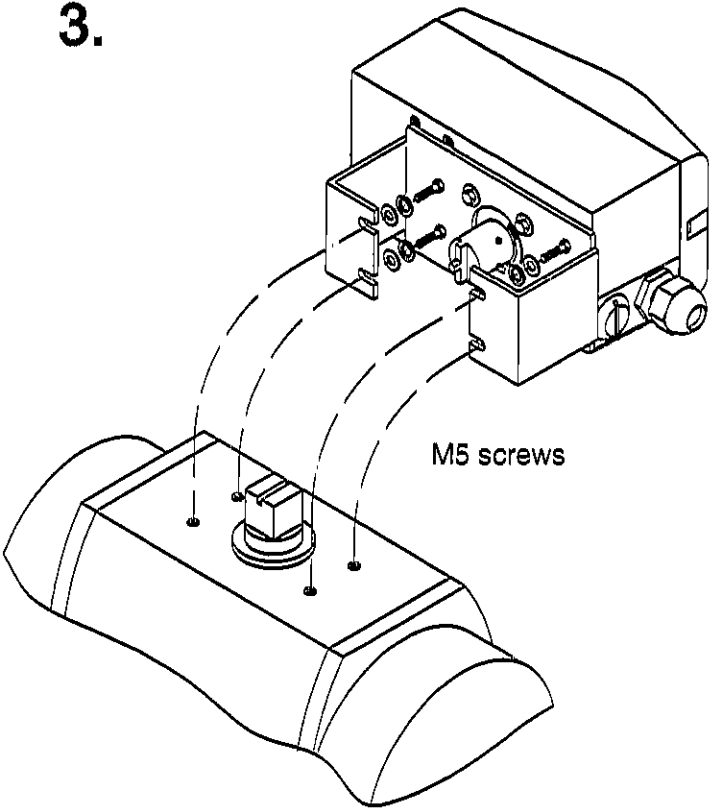
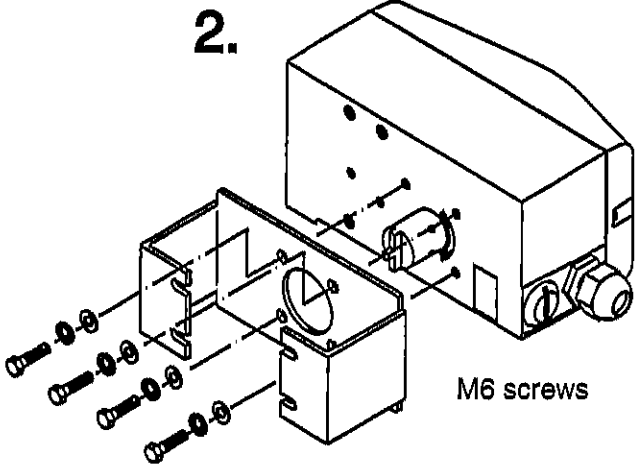
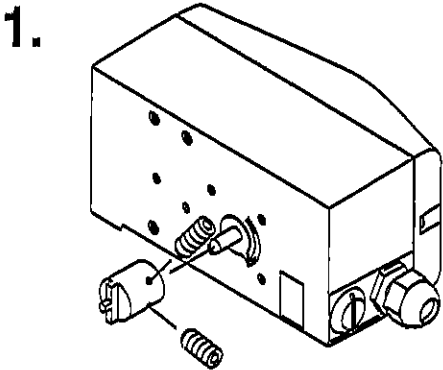
Rev. 4.0



Mounting to linear actuators



Mounting to rotary actuators



0 Brief operating instructions



Read and observe the safety instructions in chapter 1 of these operating instructions.

Mechanical mounting

see fold-out drawing

Pneumatic connection

- Connect the air supply to the in port. Air supply range must be between 1.4 and 6 bar (20 to 90 psi).

Caution: Do not exceed the max. pressure of the actuator!

- Connect the actuator supply to the OUT1 port (and OUT2 port for double acting actuators).

Electrical connection

- Make the electrical connections according to the following terminal designation:

+11/-12	Analog input, 4...20 mA signal
+31/-32	Analog output, position feedback, 4...20 mA signal*
+41/-42	Digital position feedback, SW1 *
+51/-52	Digital position feedback, SW2 *
+81/-82	Digital input
+83/-84	Digital output, alarm contact

+41/-42	Kit for digital position feedback, Limit 2*
+51/-52	Kit for digital position feedback, Limit 1*

+41/-42	Shutdown module*
---------	------------------

41	Kit for digital position feedback, 24 V microswitch, Limit 1, NC contact *
42	Kit for digital position feedback, 24 V microswitch, Limit 1, NO contact*
43	Kit for digital position feedback, 24 V microswitch, Limit 1, input*
51	Kit for digital position feedback, 24 V microswitch, Limit 2, NC contact*
52	Kit for digital position feedback, 24 V microswitch, Limit 2, NO contact*
53	Kit for digital position feedback, 24 V microswitch, Limit 2, input*

* Option

Commissioning

1. Turn on the air supply to the positioner.
2. Apply the 4...20 mA analog input signal to the positioner.
3. Check for proper mounting:
 - Press and hold **MODE**.
 - Additionally briefly press \uparrow or \downarrow until mode 1.3 (manual adjustment within the sensor range) is displayed.
 - Release **MODE**.
 - Press \uparrow or \downarrow to move the actuator to its mechanical limit stops in both directions, and note the values. The angle of rotation is indicated in degrees.

Recommended positions of limit stops:

> -28° and < +28° for linear actuators

> -57° and < +57° for rotary actuators

Minimum angle: 25°

4. Switch to the configuration level:
 - Press and hold \uparrow and \downarrow simultaneously.
 - Additionally briefly press **ENTER**.
 - Wait until the countdown from 3 to 0 is completed.
 - Release \uparrow and \downarrow .

The device will automatically go to parameter group P1.

5. Select the actuator type (parameter P1); select **ROTARY** or **LINEAR** using \uparrow or \downarrow .



Caution

This step must be performed prior to *Autoadjust* (step 6).

6. Start *Autoadjust*:
 - Press and hold **MODE**.
 - Additionally briefly press \uparrow ; until "P1.1" is indicated.
 - Release **MODE**.
 - Press **ENTER** and keep it pressed until the countdown is finished.
 - Release **ENTER**.
Autoadjust is started.
 - If the message "COMPLETE" is displayed to indicate successful *Autoadjust*, briefly press **ENTER** to acknowledge.



It is also possible that *Autoadjust* is automatically cancelled due to troubles, and an error message is displayed. See "P 1.1 Autoadjust" on page 53 for details.

7. Adjust the tolerance band (only necessary for critical actuators, e.g. especially small ones). See "P1.2 Tolerance band" on page 55. Usually, this step is not required.
8. If required test the settings. See "P1.3 Test" on page 56 for details.
9. Save the settings:
 - Press and hold **MODE**.
 - In addition, briefly press **↑** until P1.4 is indicated.
 - Release **MODE**.
 - Select **NV_SAVE** using **↑** or **↓**.
 - Press and hold **ENTER** until the countdown is completed, then release **ENTER**.



The settings are saved in the non-volatile memory, and the positioner returns to the operating level. The last previous operating mode is activated again.

Selecting operating mode

Mode 1.0: Adaptive control

- Press and hold **MODE**.
- Additionally briefly press **↑** as often as required.
-  is displayed.
- Release **MODE**.
-  is displayed, adaptive control is running.

Mode 1.1: Fixed control

- Press and hold **MODE**.
- Additionally briefly press **↑** as often as required.
-  is displayed.
- Release **MODE**
-  is displayed, fixed control is running.

Mode 1.2: Manual adjustment within the stroke range

- Press and hold **MODE**.
- Additionally briefly press **↑** as often as required.

-  is displayed.

- Release **MODE**.

-  is displayed.

- Press **↑** or **↓** to adjust the position within the stroke range.

Mode 1.3: Manual adjustment within the sensor range

- Press and hold **MODE**.
- Additionally briefly press **↑** as often as required.

-  is displayed.

- Release **MODE**.

-  is displayed.

- Press **↑** or **↓** to adjust the position within the sensor range.

See Appendix A for an overview on the configuration level.

Parameter setting example:

"Changing valve action from direct to reverse"

Starting situation: the TZID-C is operating on the operating level in an arbitrary mode.

1. Change over to the configuration level:

- Simultaneously press and hold **↑** and **↓**.
- In addition, briefly press **ENTER**.
- Wait until countdown from 3 to 0 has run down.
- Release **ENTER**.

-  is displayed.

2. Change over to parameter group 2._ (See "Parameter group 2: Setpoint" on page 57):

- Simultaneously press and hold **MODE** and **ENTER**.
- In addition briefly press **↑** once.

-  is displayed.

- Release **MODE** and **ENTER**.

-  is displayed.

3. Select parameter 2.3 "Valve action:

- Press and hold **MODE**.
- In addition, 3 x briefly press **↑**.

-  is displayed.

- Release **MODE**.

4. Change parameter setting:

- Briefly press **↑** to select "REVERSE".

5. Change over to parameter 2.7 "EXIT" and save the new setting:

- Press and hold **MODE**.
- In addition, 4 x briefly press **↑**.

-  is displayed.

- Release **MODE**.
- Briefly press **↑** to select "NV_SAVE".
- Press and hold **ENTER** until the displayed countdown from 3 to 0 has run down.

The positioner saves the new setting and automatically returns to the operating level.

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1 Safety and precautions

1.1 General



Important instructions for your safety!
Read and observe!

Proper and safe operation of the TZID-C positioner requires:

- proper transportation and storage
- installation and commissioning by qualified personnel
- correct operation according to the instructions in this manual
- proper use (see chapter 1.4 on page 2)
- careful maintenance

Only qualified personnel are allowed to work on the device (see chapter 1.5 on page 2).

Observe

- the present operating instructions
- the relevant safety regulations and standards for the installation and operation of electrical systems
- the standards, regulations and directives governing explosion protection, when using intrinsically safe devices

The regulations, standards and directives referred to in these operating instructions are applicable in Germany. When using the TZID-C positioner outside the German Federal jurisdiction, the relevant regulations, standards and directives applicable in the country where the device is used must be observed.

The TZID-C positioner has been designed and tested in accordance with DIN VDE 0411 Part 1.

Safety Requirements for Electronic Measuring Apparatuses

(based on IEC Publication 348) and has been supplied in a safe condition.

The present operating instructions contain warnings and cautions marked with a symbol (see chapter 1.2). The instructions given in these sections must be observed to retain the device in a safe condition and to ensure safe operation. Otherwise, persons can be endangered or the device itself or other devices or equipment may be damaged or fail.

1.2 Explanation of warning signs and notes

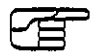
Important information has been marked and emphasized with the following symbols in these operating instructions:



This symbol is printed next to **warnings** indicating a direct **endangerment of a person's health or life**. Also, **major property damages** may occur.



If the **safety notes** marked with this symbol are not observed, **minor personal injuries and property damages** may result.



This symbol is printed next to **notes** containing important informationen pertaining to your TZID-C or its operation.

1.3 Notes on electrical and pneumatic safety



- Only qualified persons may mount, electrically and pneumatically connect, and commission the TZID-C positioner.
- Ensure the electrical safety of all feeding devices.
- When connecting the electrical wiring, observe the specifications according to chapter 8 "Technical data".
- For the electrical installation of ex-protected devices, observe all national regulations, DIN/VDE directives, especially VDE 0165, the directives for explosion protection, and the ex-certificate of the device.
- Observe the safety instructions of the pneumatic actuators when mounting and commissioning the devices. There is danger of injuries due to the high displacement forces of the actuators.

1.4 Proper use

The TZID-C positioner is an electro-pneumatic valve positioner for use with pneumatic linear and rotary actuators.

The device may only be used for the applications listed in these operating instructions and in the data sheet 18-0.22 EN.

1.5 Qualified personnel

Only those persons familiar with the installation, commissioning, operation and maintenance of the TZID-C positioner or similar instruments and who have the required qualification are authorized to work on the device.

These persons are:

- Project specialists who are familiar with the security concepts of process automation.
- Commissioning and service personnel, i. e. persons who have been trained adequately to mount, commission, repair, and maintain the TZID-C positioner or similar automation instruments or who are – according to safety standards and guidelines – permitted to commission, ground, and label electrical circuitry, devices, and systems.
- Operating personnel who is familiar with handling automation equipment and with the contents of these operating instructions, especially the information and notes in chapter 6 "Local operation".

2 Manufacturer's information

2.1 Delivery

When receiving the delivery please immediately check items and scope for damages and completeness. The scope of delivery is stated in the shipping documents. If ordered, the accessories (e.g. mounting material, pressure gauge block, filter regulator) are added to the delivery as individual items. Check items and scope of the delivery by means of the catalog numbers to see if types and quantities are in accordance with your order.

If the positioner is delivered already mounted to the actuator, the positioner, accessories, and actuator are considered as a common delivery item.

A list of catalog numbers and details of the different versions and accessories can be found in the data sheet 18-0.22 EN.

2.2 CE compliance information

We declare that we are the manufacturer of the TZID-C positioner and that the product conforms with the regulations listed below and meets the following requirements of EC regulation 89/336/CEE as of May 1989:

Basic technical standards/product standards

RFI suppression EN 55022 as of May 1995
 EN 50081-1 as of March 1993

EMI/RFI shielding EN 50082-1 as of March 1993

The TZID-C positioner meets the EC regulation for CE conformity.

3 Application and brief description

The TZID-C is an electro-pneumatic valve positioner. It can be mounted to either linear pneumatic actuators in accordance with DIN/IEC 534 or rotary pneumatic actuators according to VDI/VDE 3845. Special integral mounting to control valves 23/24, 23/25 and 23/26 is also possible.

Actuation can be single-acting (spring return) or double-acting (air to open and close).

The positioner is a two-wire instrument. The supply voltage is derived from the 4...20 mA input signal.

Construction

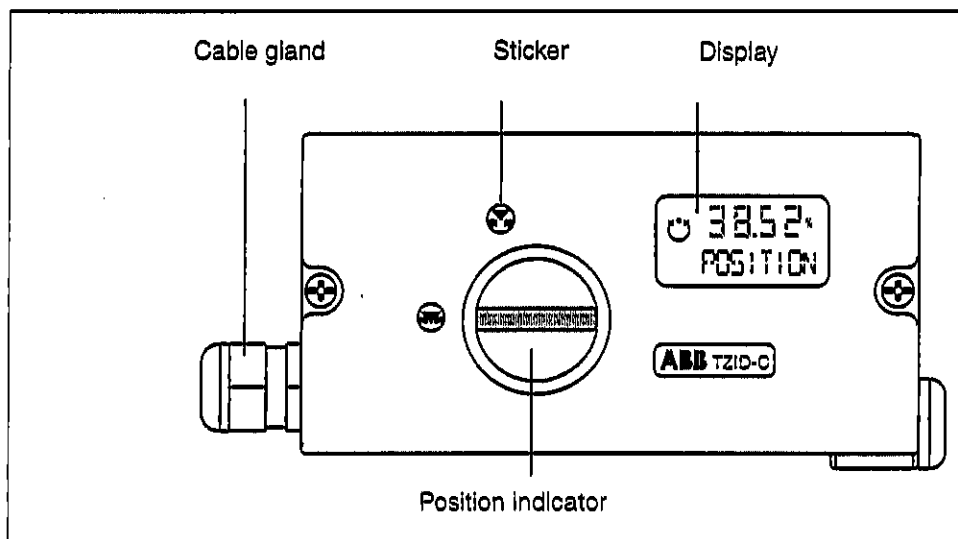


Fig. 1 TZID-C positioner, closed

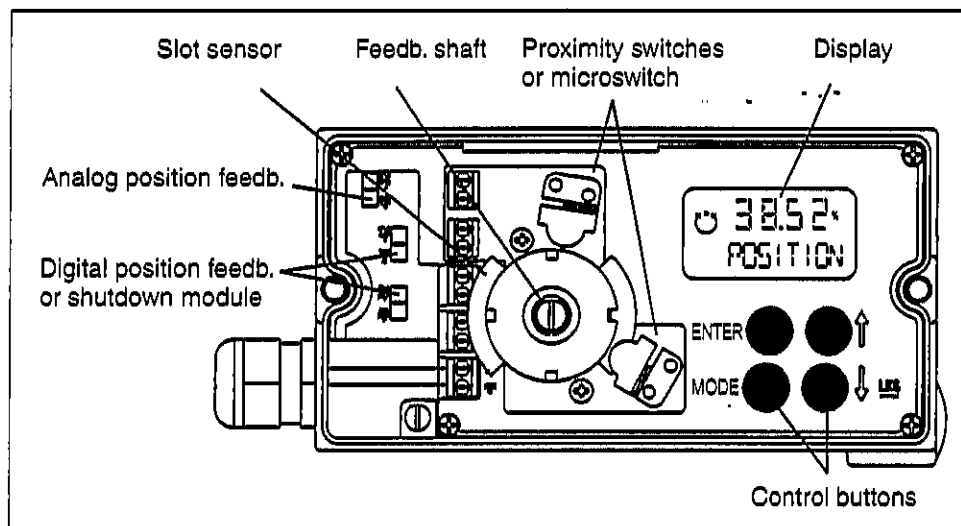


Fig. 2 TZID-C positioner, open

Fig. 1 and Fig. 2 show a fully equipped TZID-C with the following options:

- Mechanical position indicator (special cover with transparent dome, symbol sticker for marking the min. and max. valve positions, mechanical position indicator for mounting to the feedback shaft).
- Kit for digital position feedback, consisting of:
 - two Pepperl & Fuchs proximity switches with slot sensors
 - or
 - two microswitches 24 V DC/ACfor plugging onto the feedback shaft; to be used with mechanical position indicator, only
- Plug-in module for analog position feedback
- Plug-in module for safety shutdown (Shutdown module)
- Plug-in module for digital position feedback

Functional description

The movement of the actuator is coupled to the feedback shaft of the TZID-C positioner, detected by a position sensor, and converted to an electrical signal.

The input (position demand of the 4...20 mA canal) and the actual position are transferred to the electronics (CPU) via an A/D converter.

Using these values the microprocessor calculates the control deviation and – through a P/D control algorithm – a positioning signal that is used to activate an I/P module via an A/D converter (see Fig. 3).

The I/P module is the pneumatic output unit of the positioner. It consists of a pilot stage and an analog 3/3-way valve that is used as the booster stage. The pilot stage converts the electrical signal – via a system of coil/magnet and nozzle/flapper – into a supply pressure that actuates the power stage.

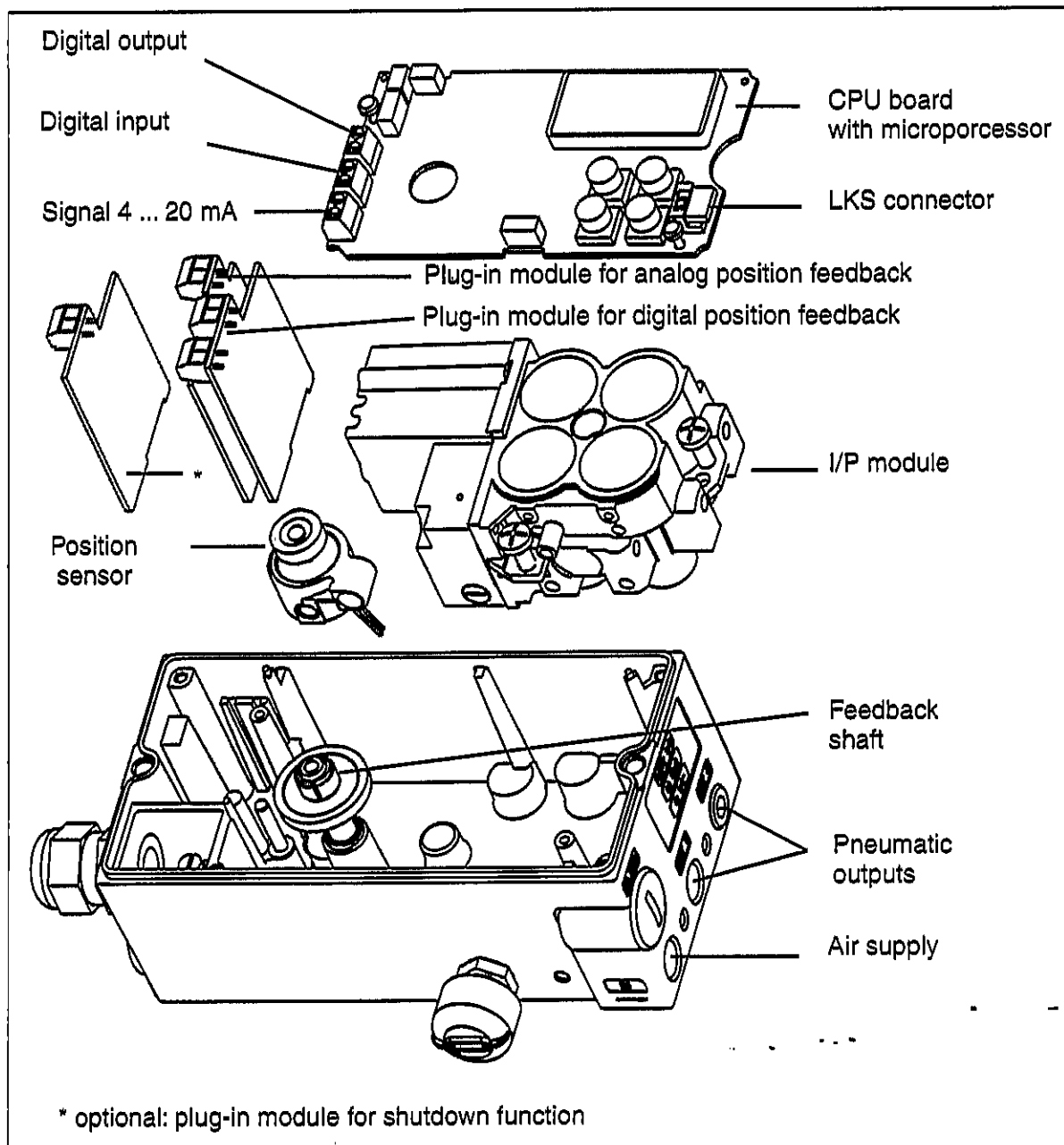


Fig. 3 Overview of the TZID-C assembly groups and connectors

Positioner range

The TZID-C positioner can detect an angle of rotation of 60 degrees for linear actuators and of 120 degrees for rotary actuators (optionally 270°).

There are three different ranges (see Fig. 4):

- Sensor range
- Valve range
- Stroke range

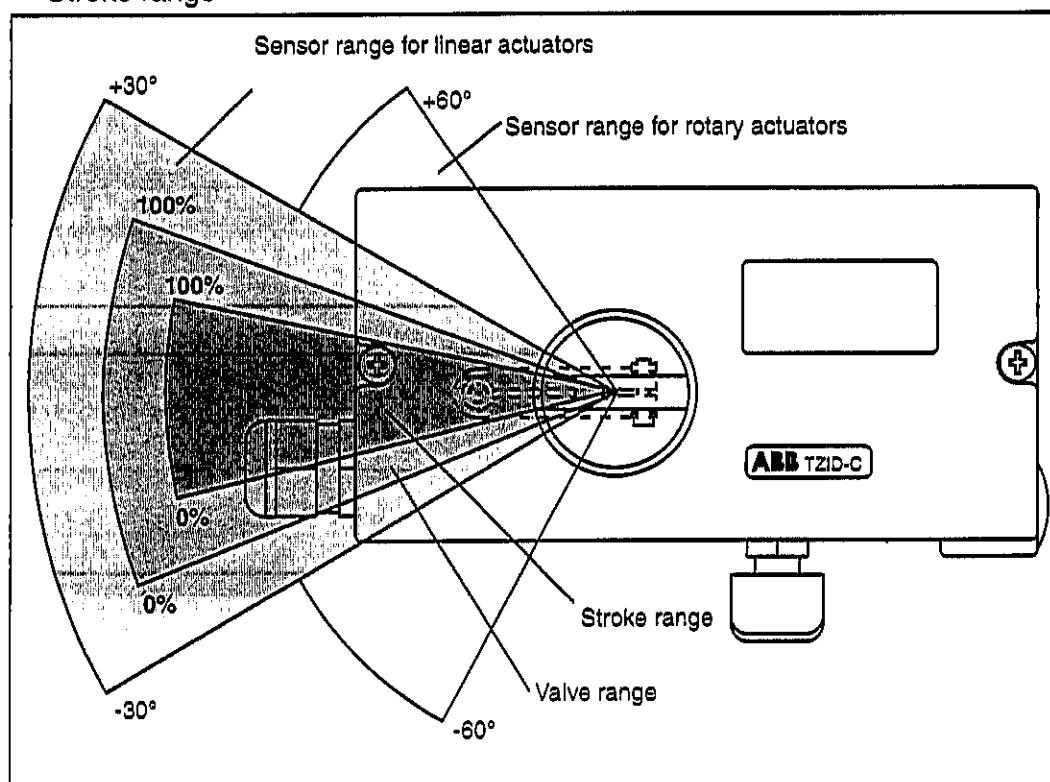


Fig. 4 Positioner range

The **sensor range** is the maximum range in which the movement of the rotary feedback shaft can be measured.

The **valve range** is the maximum range in which the TZID-C positioner can position an attached valve. The limits of the valve range depend on the valve and the respective mechanical mounting. Normally the limits are determined by *Autoadjust* but can also be determined by local or external parameter settings.

The **stroke range** is the user-defined range that limits the valve travel within the valve range. The stroke range value is stated as a percentage of the valve range. If a new valve range is determined (e.g. by *Autoadjust*), the stroke range is recalculated according to the new valve range. The percent value set for the stroke range is maintained. The **set-point range** always relates to the stroke range.

HART® communication

The TZID-C positioner contains a communication connection that enables the positioner to be operated, monitored, and configured via a PC. The communication is executed via an LKS adapter or an FSK modem and based on the HART® protocol. The following equipment is required for communication (see Fig. 5 and Fig. 6):

- LKS adapter or FSK modem
- PC
- Configuration program, e.g. SMART VISION®

For further information consult the separate user manuals for SMART VISION®.

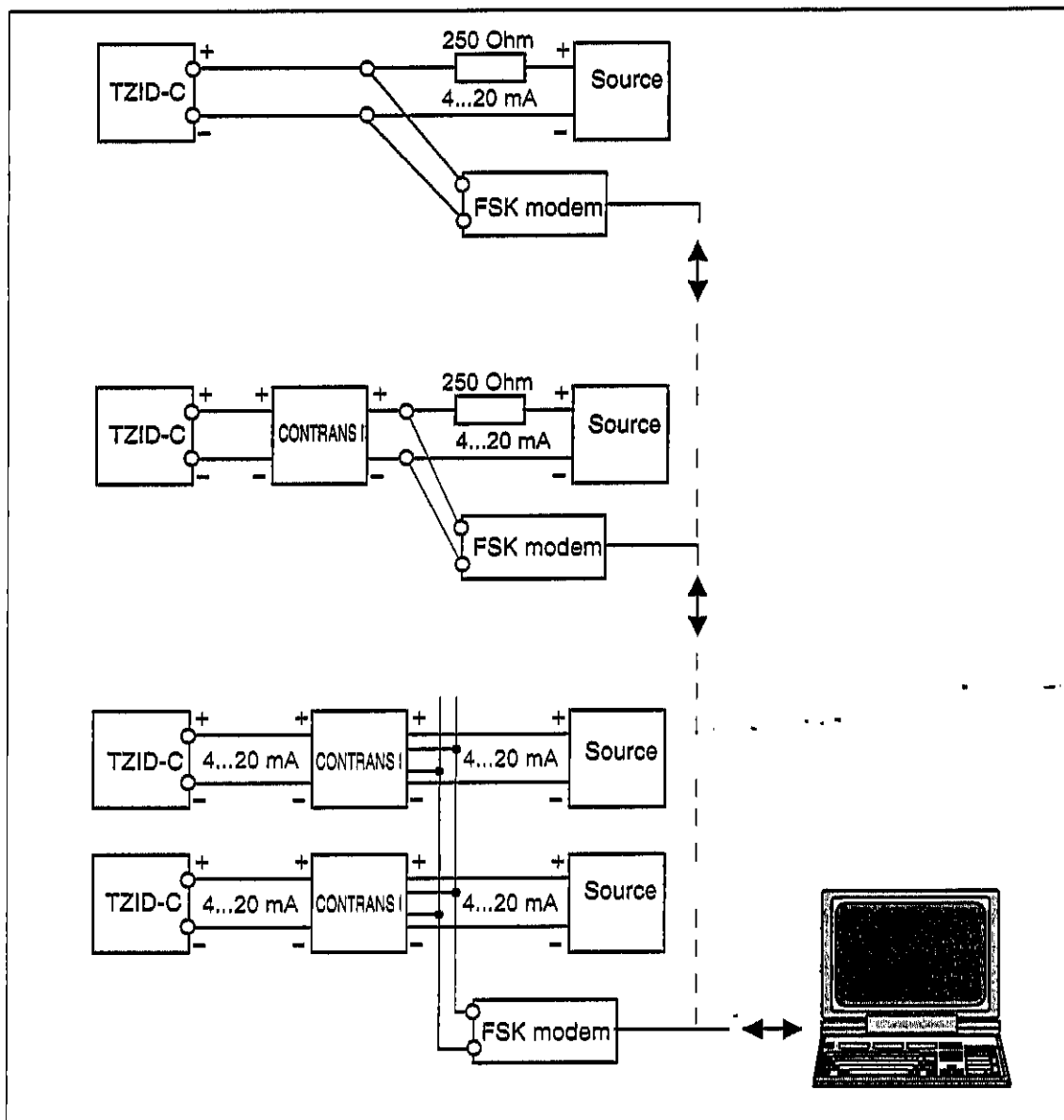


Fig. 5 Communication via FSK Modem

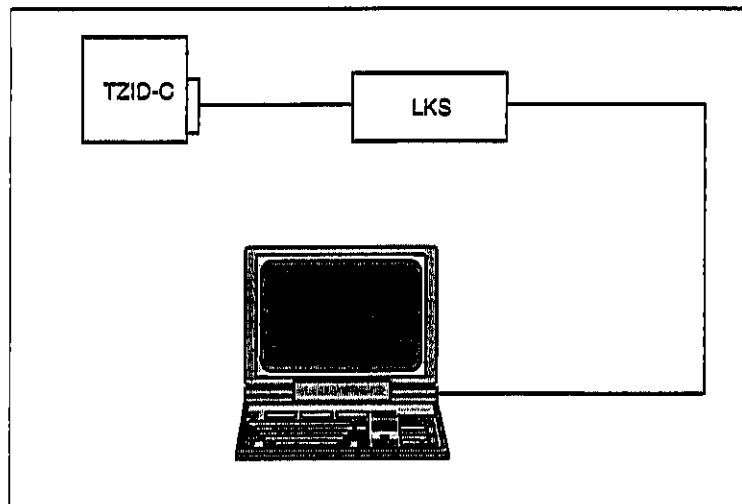


Fig. 6 Communication via LKS adapter

4 Installing and commissioning

4.1 Mechanical mounting

4.1.1 General

These operating instructions explain the mounting to linear actuators according to DIN/IEC 534 (lateral attachment according to Namur), to rotary actuators according to VDI/VDE 3845, and to control valves 23/24, 23/25 and 23/26. Instructions for special actuator-specific attachment are available separately.

When mounting, ensure that the transfer of the stroke or rotation angle for the position feedback is correct. The maximum rotation angle is 60° for mounting to linear actuators and 120° for mounting to rotary actuators (see Fig. 4 on page 7).

The arrow (1) on the feedback shaft (and thus the lever) must travel within the area marked with the small arrows (2) (see Fig. 7).

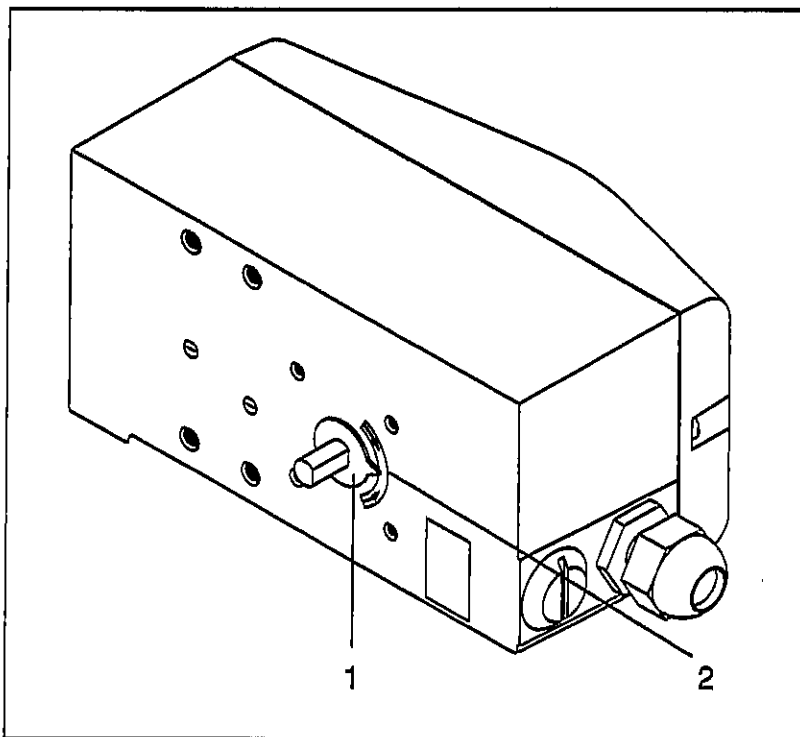


Fig. 7 Operating range

To enable you to use a big range, the lever should be positioned in the center between the arrows at half stroke ($\pm 0^\circ$ sensor position).

During mounting, a rough adjustment of the actually used rotation angle range is sufficient. The fine adjustment is automatically performed during *Autoadjust*.

The total rotational angle must be at least 25°. The position of the segment within the range is arbitrary.



For difficult controlling tasks with high friction or short positioning times it is advantageous to provide a rotation angle range as wide as possible.

For safety reasons the practically used rotation angle range should be kept at a minimum distance of 2° (for linear actuators) or 3° (for rotary actuators) from the final positions of the sensor range.

4.1.2 Operating conditions at the installation site



Warning

Before installing check to ensure that the specifications in terms of safety and control applicable to the TZID-C will not be exceeded.

Ambient temperature:	-30 ... +85 °C
Protection:	IP 65 (type 4X)
Exposion protection:	II 2G EEx ib II C T6
Mounting position:	any orientation allowed, provided that the splash guard cap is in place

4.1.3 Mounting to linear actuator

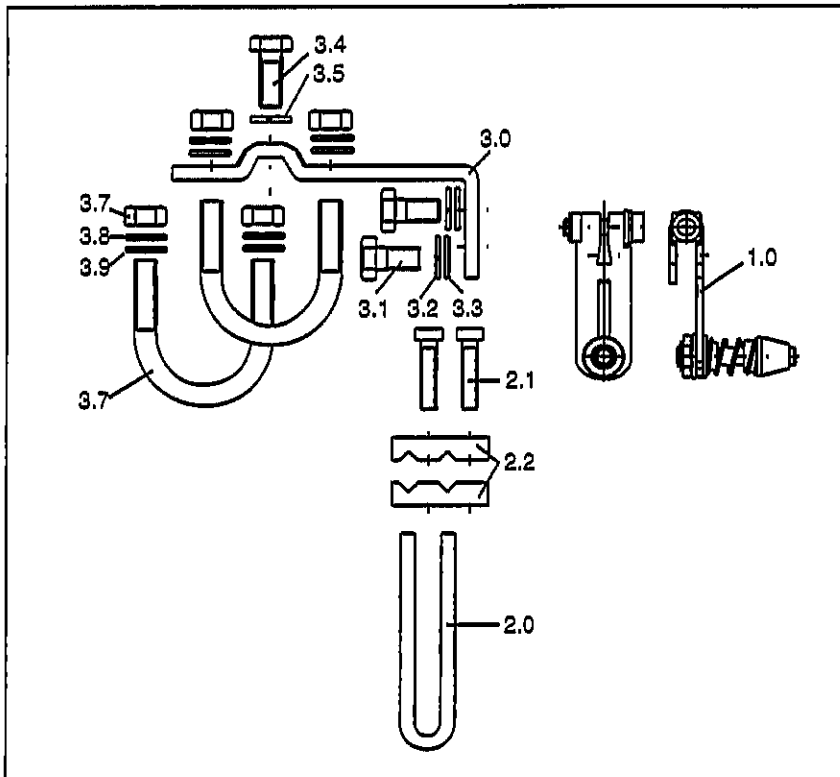


Fig. 8 Mounting kit for linear actuators

A special attachment kit is available for mounting the positioner to a linear actuator according to DIN/IEC 534 (lateral mounting according to Namur) comprising the following parts:

- Lever (1.0) with follower pin, for 10...35 mm or 25...90 mm actuator stroke
- Follower guide (2.0) with two screws (2.1) and clamp plates (2.2)
- Angle bracket (3.0) with two screws (3.1), two spring washers (3.2), and two plain washers (3.3)
- Screw (3.4) and plain washer (3.5) for mounting to cast iron yoke
- Two U-bolts (3.7), each with two nuts (3.8), two spring washers (3.9), and two plain washers (3.10) for mounting to columnar yoke

Tools required: Wrench 10 mm/13 mm
Allen key 4 mm

1. Mounting the follower guide to the actuator

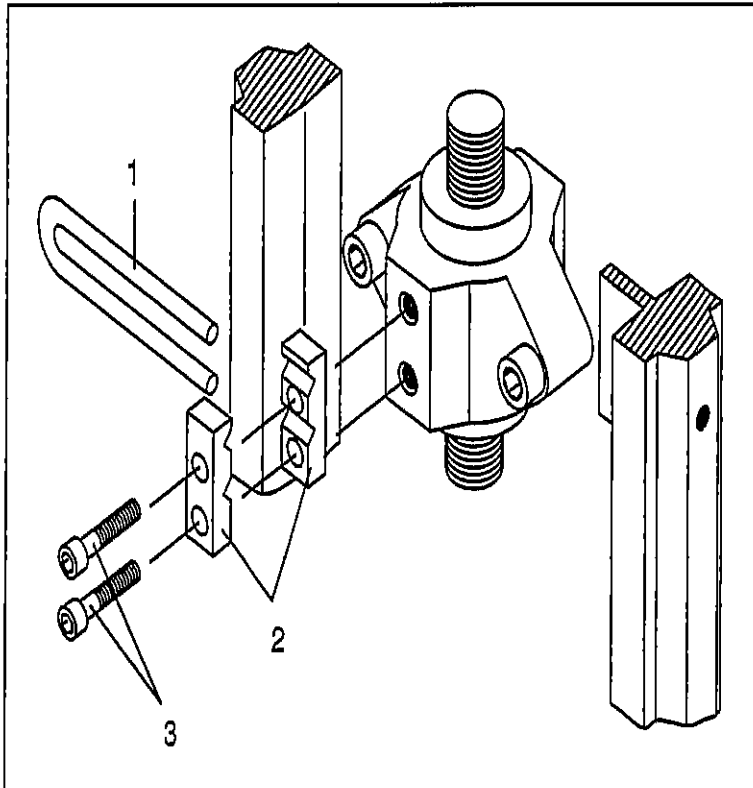


Fig. 9 Mounting follower guide to actuator

- Fasten the follower guide (1) and the clamp plates (2) with screws (3) to the spindle of the actuator; hand-tighten the screws.

2. Assembling lever (if not yet pre-assembled))

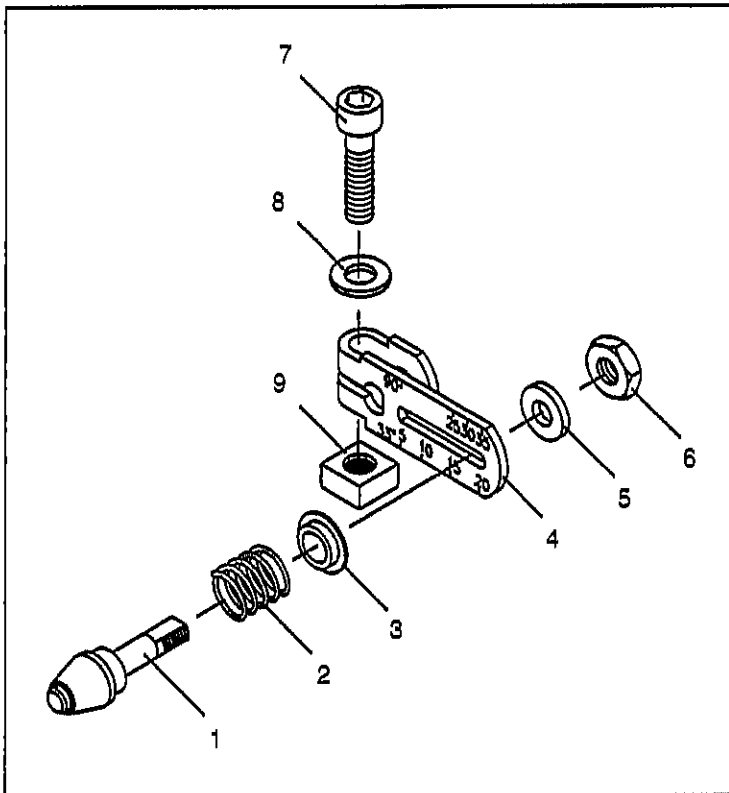


Fig. 10 Assembling lever

- Slip the spring (2) onto the bolt with the follower pin (1).
- Slip the plastic washer (3) onto the bolt and compress the spring with it.
- Insert the bolt with compressed spring into the oblong hole in the lever (4) and fasten it in the desired position using the plain washer (5) and nut (6) at the lever; the scale on the lever indicates the link point for the stroke range (see Fig. 14 on page 17).
- Slip the plain washer (8) onto the screw (7), insert the screw into the lever and counter with the nut (9).

3. Mounting lever and mounting plate to TZID-CI

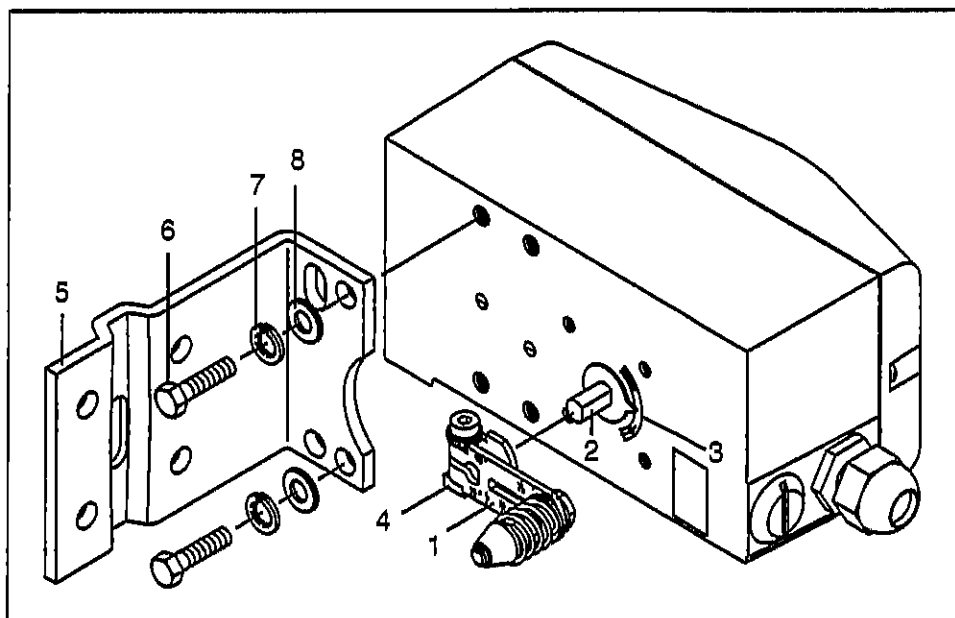


Fig. 11 Mounting lever and angle bracket to TZID-C

- Attach the lever (1) to the feedback shaft (2) at the rear of TZID-C (can only be mounted in one position due to the flat on the side of the feedback shaft).
- Check whether the lever travels within the operating range (between the arrows) by observing the arrow marks (3).
- Hand-tighten the counter nut (4) at the lever.
- Hold the preassembled TZID-C with the angle bracket (5) still loose in such a way against the actuator that the follower pin on the lever introduces into the follower guide, in order to determine the bore holes of the TZID-C to be used for the angle bracket.
- Fasten the angle bracket (5) with screws (6), spring washers (7), and plain washers (8) to the corresponding bore holes in the TZID-C case; if possible, tighten the screws evenly to ensure linearity during operation.

4.a Mounting to cast iron yoke

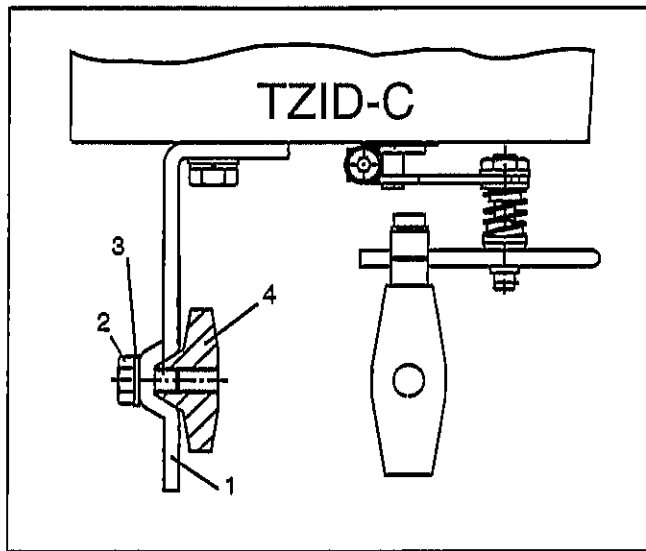


Fig. 12 Mounting to cast iron yoke

- Fasten the angle bracket (1) with screw (2), plain washer (3) to the cast iron yoke (4).

4.b Mounting to columnar yoke

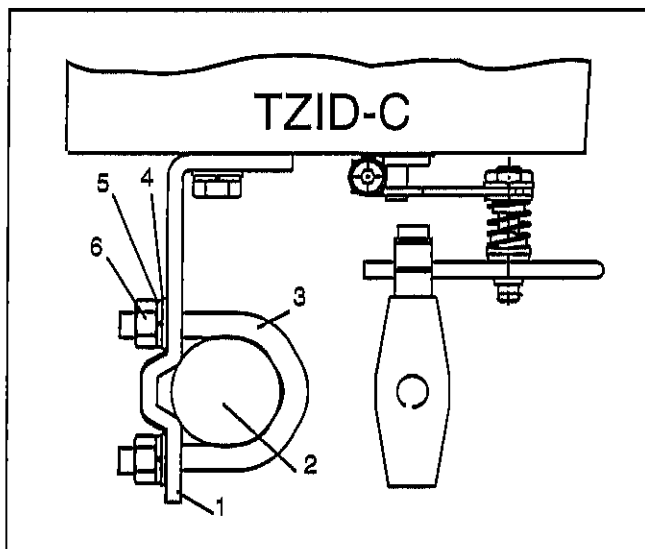



Fig. 13 Mounting to columnar yoke

- Hold the angle bracket (1) in the appropriate position against the columnar yoke (2).
- Insert the U-bolts (3) from the inner side of the columnar yoke through the thru holes in the angle bracket.
- Slip on the plain washers (4), spring washers (5), and nuts (6). Hand-tighten nuts evenly.

 Adjust the height of the TZID-C positioner at the cast iron yoke or the columnar yoke until the lever is horizontal (at visual check) at half stroke ($\pm 0^\circ$ sensor position in mode 1.3). This is especially recommended for mounting to a columnar yoke, as there is no standard bore hole for the mounting, as opposed to the cast iron yoke.

After mounting, check whether the positioner operates within the lever range. Apply air to the actuator and determine whether the lever travels within the range marked by the arrows.

5. Stroke adjustment

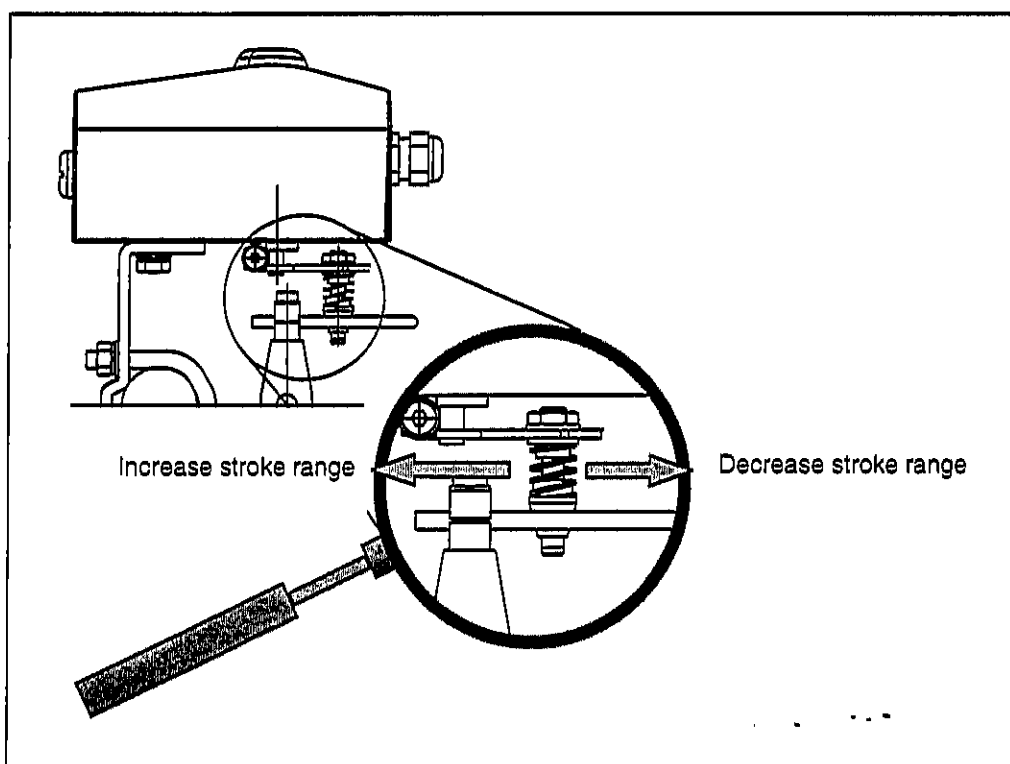


Fig. 14 Stroke adjustment

The scale on the lever indicates the link point for the various stroke ranges.

By shifting the bolt with follower pin in the oblong bore hole of the lever you can change the stroke range (see Fig. 14). If the link point is shifted to the inside, the stroke range is increased; shifting to the outside decreases the range.

The fine adjustment of the link point is done automatically later during *Autoadjust*.

4.1.4 Mounting to rotary actuator

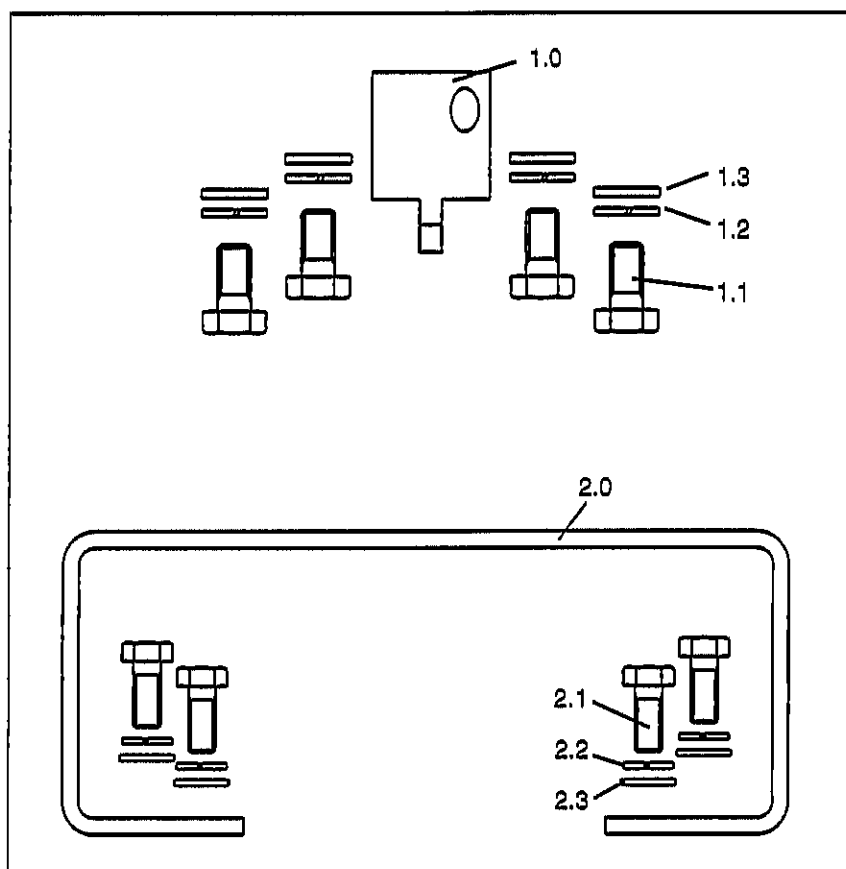


Fig. 15 Mounting kit for rotary actuators

For mounting to a rotary actuator according to VDI/VDE 3845 the following mounting kit is available:

- Namur feedback shaft adapter (1.0)
- Four screws, M6 (1.1), four spring washers (1.2), and four plain washers (1.3) for fastening the mounting bracket (2.0) to the positioner
- Mounting bracket (2.0)
- Four screws, M5 (2.1), four spring washers (2.2), and four plain washers (2.3) for fastening the mounting bracket to the actuator

Tools required: Wrench 10 mm/13 mm
Allen key 3 mm

1. Mounting adapter to positioner

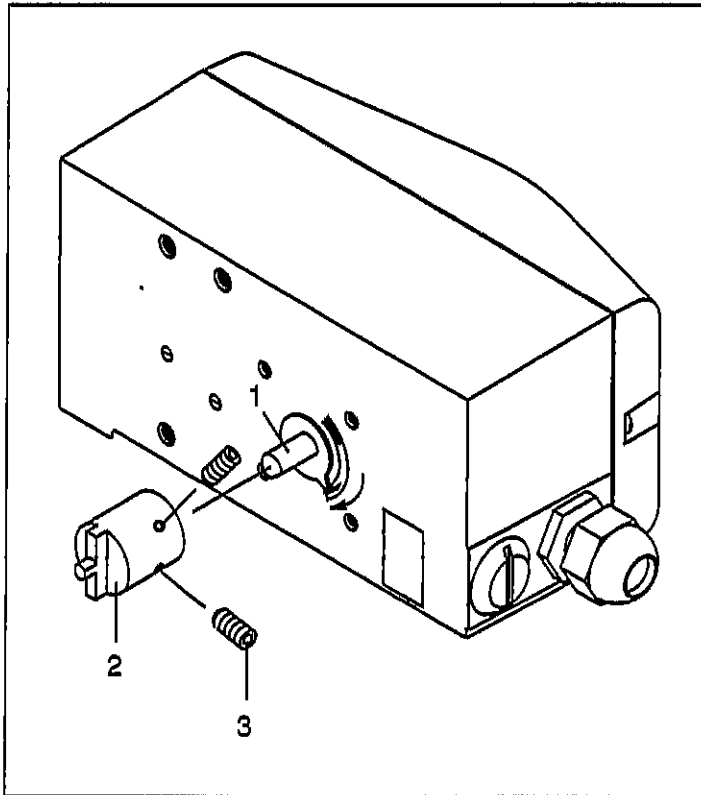
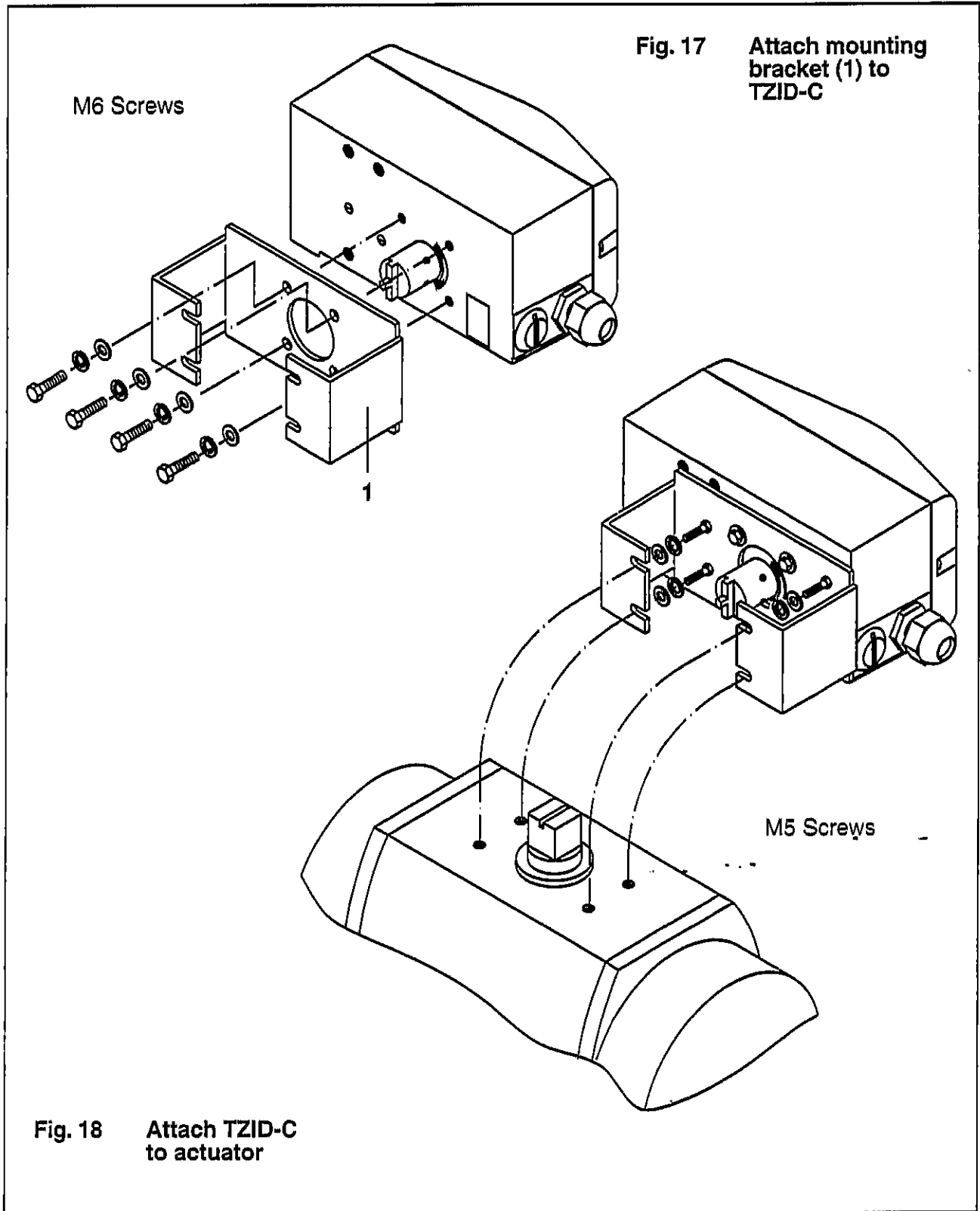


Fig. 16 Mounting adapter to positioner

- Determine the mounting position (in parallel to the actuator or shifted by 90°).
- Determine the direction of rotation of the actuator (clockwise or counterclockwise).
- Move rotary actuator to its home position.
- On the basis of the mounting position, the home position, as well as the direction of rotation it must be determined in which position the feedback shaft (1) of the positioner must be pre-adjusted and in which position the adapter (2) must be placed, to enable the positioner to travel within the proper range (the arrow on the rear of the device must travel within the admissible range, see Fig. 7 on page 10).
- Pre-adjust the feedback shaft.
- Place the adapter on the feedback shaft in the appropriate position and fix it by setscrews (3); ensure that one of the setscrews is engaged on the side of the feedback shaft with the flat.

2. 2. Mounting positioner with mounting bracket



4.1.5 Mounting to control valves 23/24, 23/25

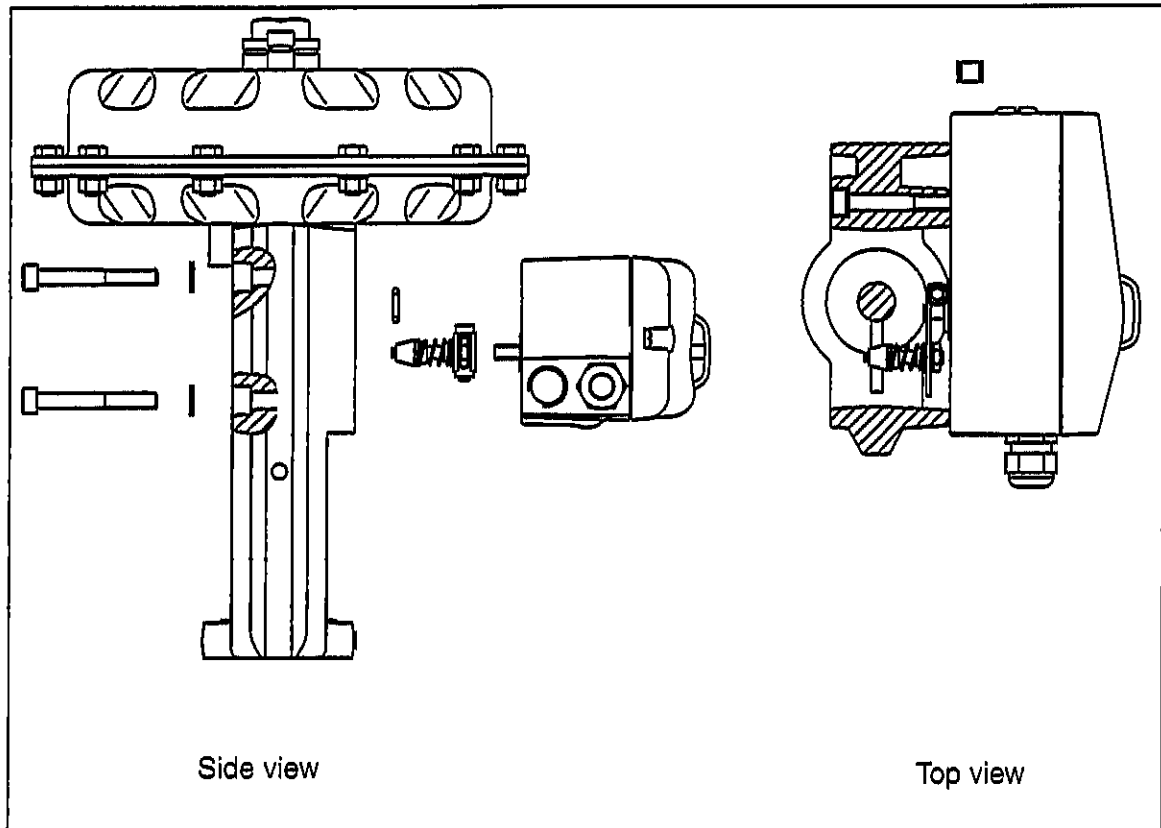


Fig. 19 Integral mounting to valve 23/24, 23/25

- Remove the screw plug and the inserted O-ring at the rear of the TZID-C positioner. Store these parts carefully, as you will need them if you want to mount this positioner to a linear or rotary actuator at a later time.
- Close the pneumatic connection marked OUT 1 by means of the screw plug. The common external piping is dropped, except for the control valve 23/24 and 23/25 with the effective direction "air to close/spring force to open".
- Mount the lever with the follower pin to the rear feedback shaft of the positioner; the flat on the side of the positioner feedback shaft assures a correct positioning.
- Match the position of the follower pin in the oblong hole of the lever to the actuator stroke using the scale.
- Mount the positioner with two screws and two spring washers to the actuator. During mounting, ensure that the follower pin is introduced between the two studs at the spindle which serve for the pick-up of the actuator value.

4.1.6 Mounting to control valve 23/26

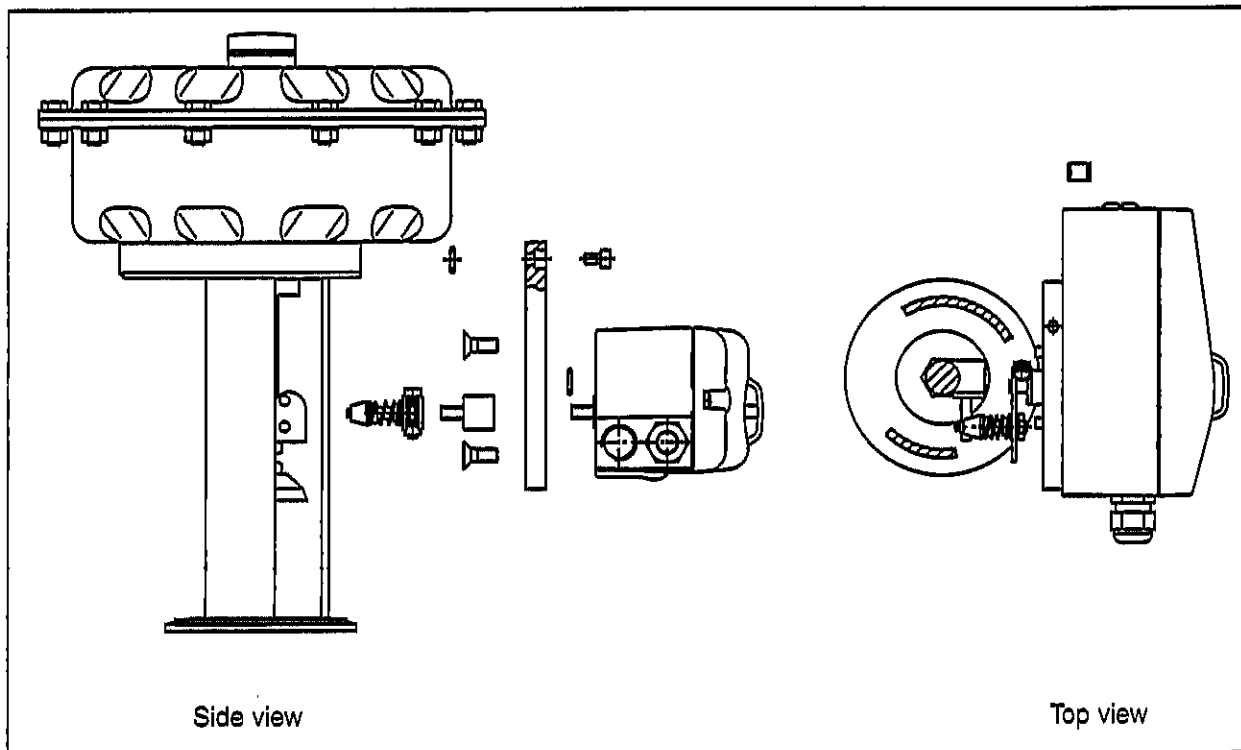


Fig. 20 Integral mounting to valve 23/26

- Remove the screw plug and the inserted O-ring at the rear of the TZID-C positioner. Store these parts carefully, as you will need them if you want to mount this positioner to a linear or rotary actuator at a later time.
- Close the pneumatic connection marked OUT 1 by means of the screw plug. The common external piping is dropped.
- First mount the plate with the screws to the positioner and put on the adapter for a prolongation of the feedback shaft.
- Mount the lever with the follower pin to the rear feedback shaft of the positioner; the flat on the side of the positioner feedback shaft assures a correct positioning.
- Match the position of the follower pin in the oblong hole of the lever to the actuator stroke using the scale.
- Mount the positioner with two screws to the actuator. During mounting, ensure that the follower pin is introduced between the two studs at the spindle which serve for the pick-up of the actuator value.

4.2 Pneumatic connection.



When mounting and commissioning observe the safety regulations of the pneumatic actuators and the accident prevention rules of the Employers Liability Insurance Association.

There is danger of injuries caused by the high torque forces produced by the actuators!



Take suitable measures to ensure that even in case of malfunctions the positioner's max. admissible operating pressure of 6 bar (90 psi) is not exceeded.

Otherwise, the positioner and/or the actuator can be damaged.

Do not exceed the maximum operating pressure of the actuator.

The positioner must be supplied with instrument air that is free of oil, water and dust according to DIN/ISO 8573-1, Class 3

Purity

max. particle size: 5 μm

max. particle density: 5 mg/m^3

Oil contents

max. concentration: 1 mg/m^3

Pressure dew point

Maximum value: 10 K below operating temperature

Before connecting the air pipes, remove dust, splinters and other particles by blowing them out.

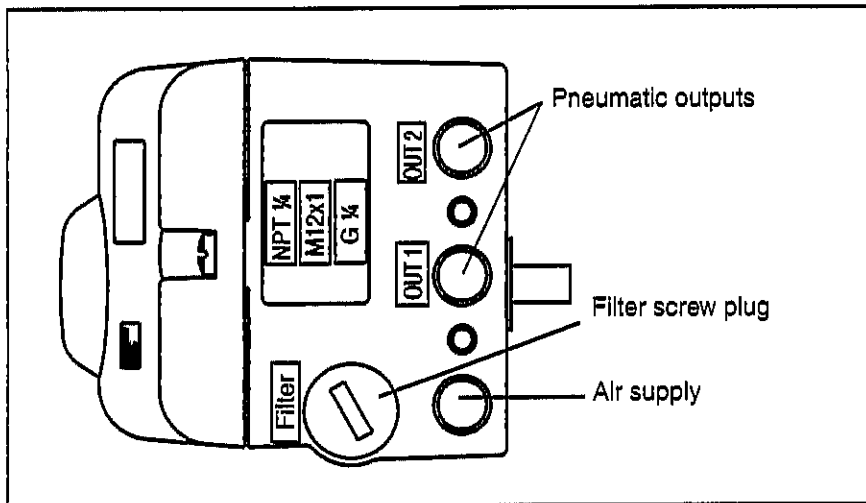


Fig. 21 Pneumatic connections

All pneumatic piping connections are located at the right-hand side of the device (see Fig. 21).

The threaded bores G 1/4 or 1/4-18 NPT, respectively, are provided. The corresponding screwed pipe connections have to be supplied by the customer. We recommend pipes with the dimension 6x1 mm for the pneumatic piping.

The amount of supply pressure has to be matched to the working pressure necessary for the actuation. The values 1.4 and 6 bar are the limit values of the positioner.

The connections have to be arranged, according to their marks, in the following way:

Mark	Connection piping
-	Air supply, pressure 1.4...6 bar (20...90 psi)
OUT1	Output pressure, to actuator
OUT2	Output pressure, to actuator (for double-acting actuators)

4.3 Electrical connection



Warning

During the electrical installation observe the common VDE safety regulations and the accident prevention rules of the Employers Liability Insurance Association.

Observe the common standards/safety regulations for the set-up and the operation of electrical installations.

Observe the additional standards, regulations and guidelines for the set-up and the operation of explosion-proof installations, if explosion-proof devices are used.



Caution

Only connect signal lines from controlled current sources such as mA outputs from controllers or calibrators to terminals +11/-12.

Connecting directly to a 24 VDC power supply will destroy the input circuitry.

The maximum current during a fault must not exceed 500 mA (even if polarity is reversed).

During installation please observe the specifications in chapter 8 "Technical data".

Do not run signal cables close to power lines. Power lines produce interference in their near vicinity which impairs the signals transmitted on the line.

For the cable entry into the case two threaded holes PG 13.5, 1/2 - 14 NPT or M20 x 1.5 are available on the left side of the case (see Fig. 22). The front hole is equipped with a cable gland, in the back one a dummy plug is mounted..

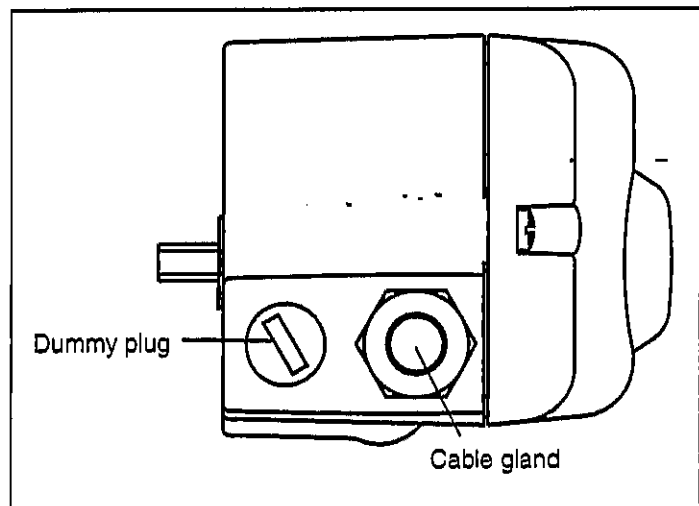


Fig. 22 Cable entry

The screw terminals for wire sizes up to 2.5 mm² inside the case are assigned as follows (siehe Fig. 23):

1. Plug-in module for analog position feedback
2. Plug-in module for digital position feedback (first connector) or plug-in module for shutdown function
3. Plug-in module for digital position feedback (second connector)
4. Kit for digital position feedback, either proximity switches or 24 V microswitch (first connector)
5. Kit for digital position feedback, either proximity switches or 24 V microswitch (second connector)
6. Digital input DI
7. Digital output DO
8. Signal 4...20 mA
9. Enclosure ground

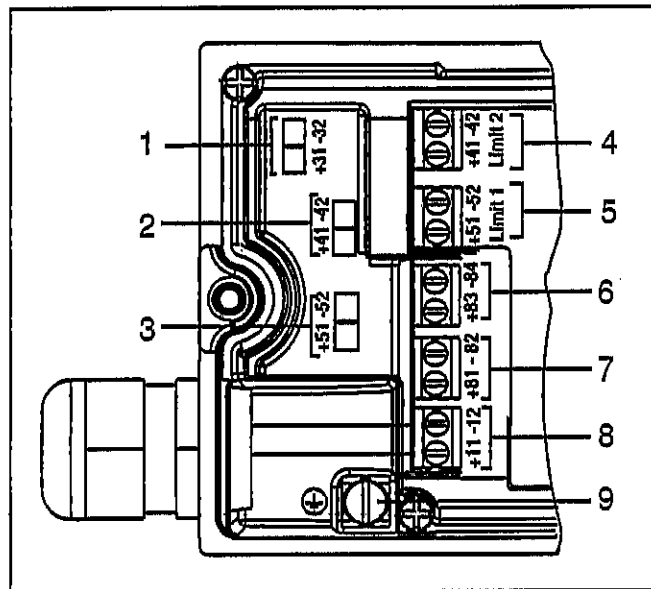


Fig. 23 Screw terminals

Making the connections

Connecting the 4...20 mA signal, the digital signal, and the proximity switches or microswitches:

- Remove 7-10 mm (1/4 - 3/8") of the cable insulation
- Insert the wire ends from the left into the appropriate screw terminal and hand-tighten the screws (access from above)

Connecting the plug-in modules:

- Remove 7-10 mm (1/4 - 3/8") of the cable insulation
- Insert the wire ends from the top into the corresponding screw terminal and hand-tighten the screws (access from the side)

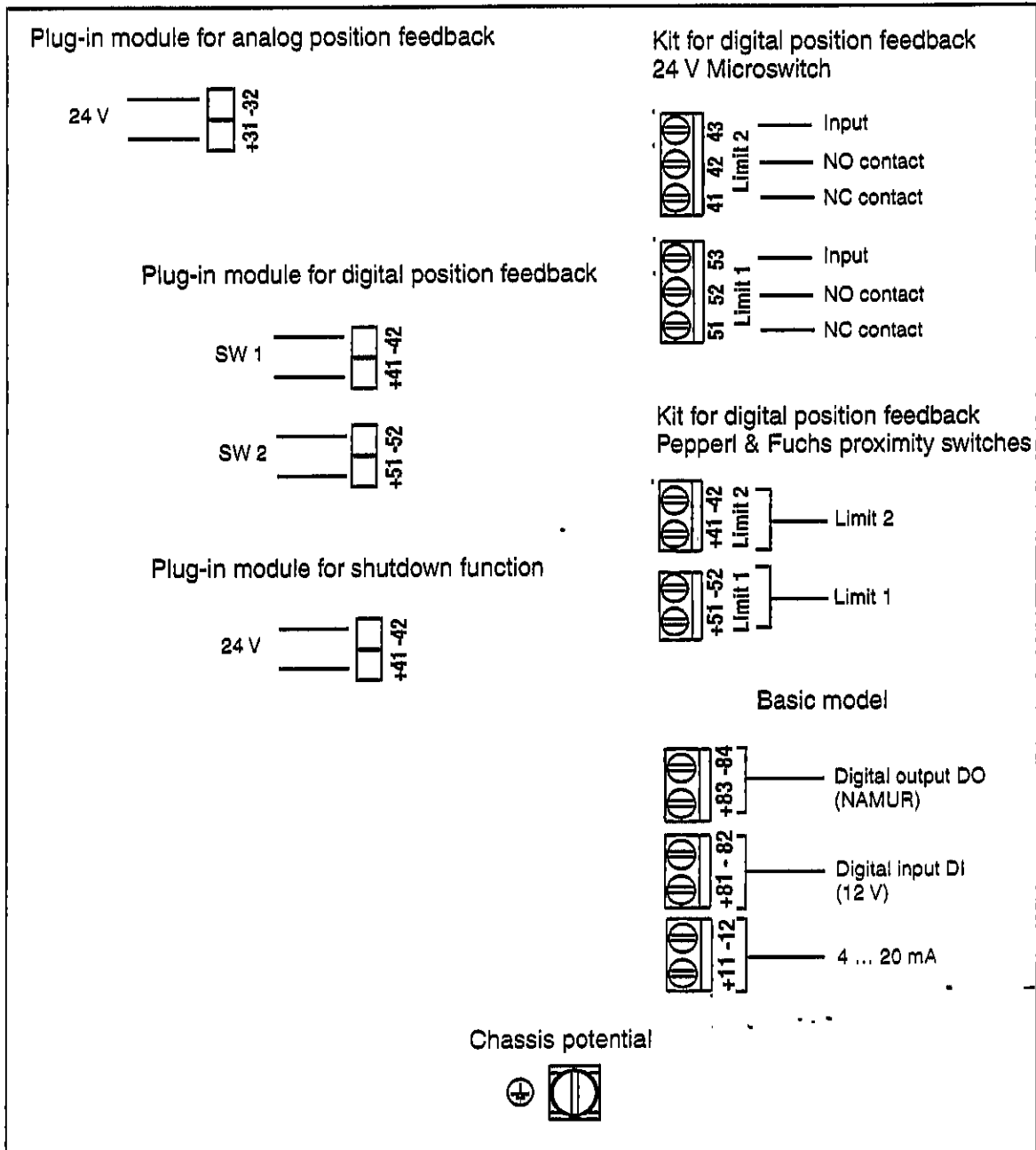


Fig. 24 Terminal assignment

4.4 Mounting the splash guard cap



Caution

Screw the splash guard cap delivered with your positioner into the appropriate hole in the bottom plate of the case, as seen in the illustration below. Make sure that the splash guard cap is always present during operation. Otherwise, protection class IP65 cannot be ensured.

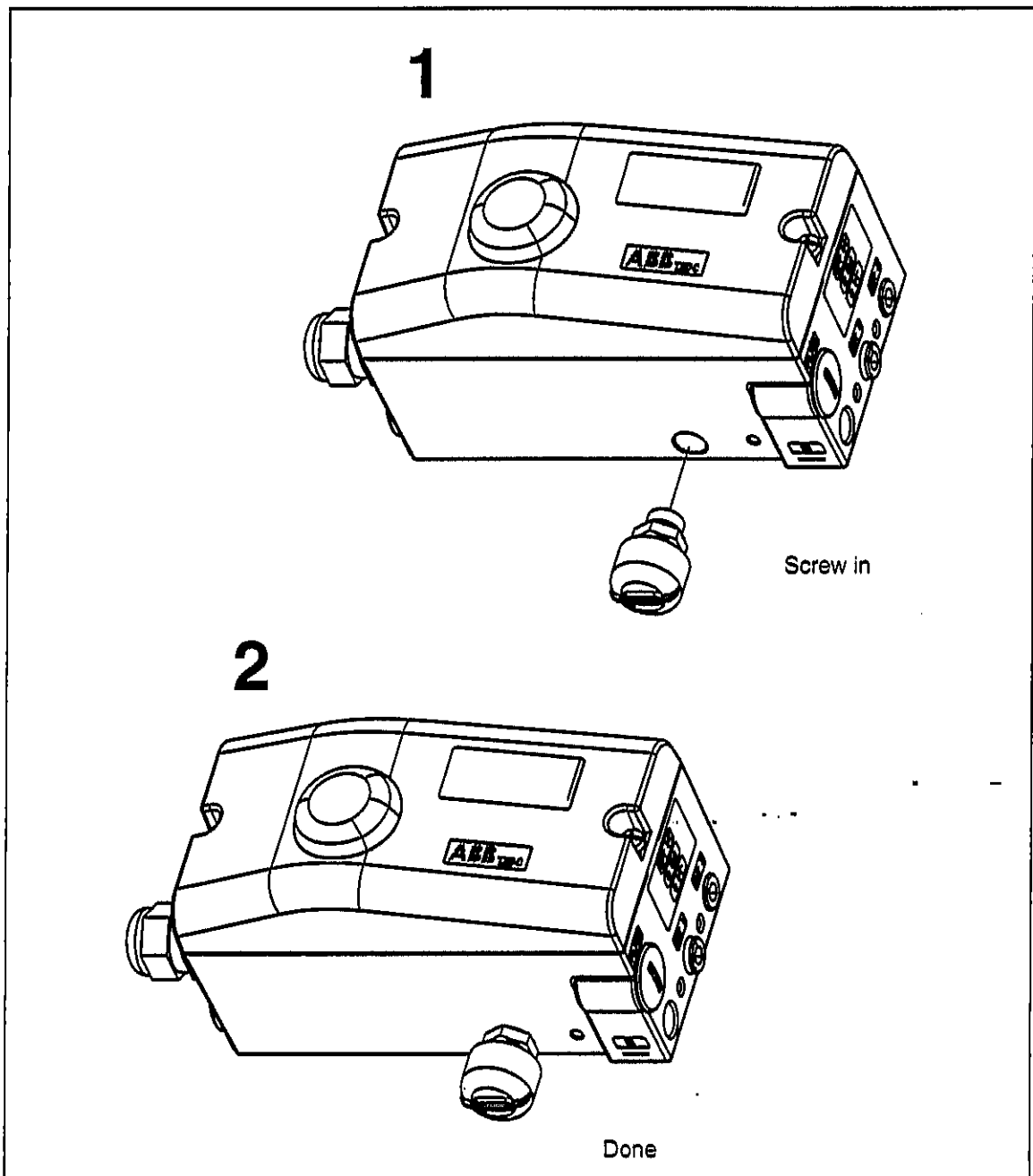


Fig. 25 Mounting the splash guard cap

4.5 Commissioning

After mounting the TZID-C positioner and making the electrical and pneumatic connections you can put the device into operation. First check the mounting and subsequently adjust the TZID-C electronically to the operating data of the actuator or valve

- via a PC with the operating program "SMART VISION[®]" (via communication connection and LKS adapter or FSK modem, see corresponding user manuals) or
- **locally** using the local TZID-C keypad

These operating instructions only describe the local operation and setting of parameters.



Devices that have previously been in operation in another installation should be defaulted to the factory settings prior to commissioning (see page 92).

4.5.1 Checking the mounting

- Supply compressed air between 1.4 and 6 bar (20 and 90 psi) and a current signal between 4 and 20 mA to the TZID-C.



Caution

- Observe the maximum allowable operating pressure of the actuator.
- Observe the sequence described above. First supply compressed air and only then turn on the 4 ... 20 mA current signal.

With the factory setting, the device will start up in mode 1.3 "Manual adjustment in the sensor range". Devices that have previously been in operation start up in the operating mode used last.

- Perform the following steps to switch to operating mode 1.3 "Manual adjustment in the sensor range" (more detailed descriptions of the operating elements, operating modes, and operating levels are to be found in chapter 6):
 - Press and hold **MODE**
 - In addition, press **↑** or **↓** until "1.3, MAN_SENS" is indicated on the display; then, release all buttons to activate the operating mode.

The display indicates the rotation angle in degrees (SENS_POS).

- Press **↑** or **↓** to drive the valve manually to the limit stops.

If the second arrow button is also pressed, the device switches to fast travel.

The limit stops should be within the following range (see Fig. 4 on page 7):

Sensor range

- 28 ° to + 28 ° for linear actuators
- 57 ° to + 57° for rotary actuators
- Minimum angle: 25° (does not apply to special versions)

If the limit stops are outside this range, the mechanical transfer of the actuator range to the rotation angle must be corrected. Otherwise, the *Autoadjust* function started later will stop due to a position error message.

All parameters required for the basic configuration are combined in parameter group P1._ (STANDARD). Proceed as described below to change over to the configuration level:

- Simultaneously press and hold **↑** and **↓**.
- In addition, briefly press **ENTER**.
The display indicates a countdown.
Press and hold the direction buttons until the countdown to zero is finished; otherwise switch-over is not executed.
- Release **↑** and **↓**.
You go directly to parameter group P1._ , parameter 1.0 "ACTUATOR".

After this, use the steps described in chapter 4.5.2 through 4.5.6 to match the positioner to the actuator and the operating conditions. For more detailed information of the operating elements, operating modes, and operating levels refer to chapter 6.

4.5.2 Determining the actuator type

Configure the TZID-C positioner for the corresponding actuator. Press **↑** or **↓** to select the desired actuator type (LINEAR or ROTARY).

4.5.3 Running *Autoadjust*

- Press and hold **MODE**.
- In addition, briefly press **↑**, release the buttons.
The display switches to parameter 1.1 "AUTO_ADJ" (*Autoadjust*), setting "START"
- Press and hold **ENTER**.
A countdown from 3 to 0 is indicated.
Continue to hold **ENTER** until the countdown has run down, then release **ENTER**.
The positioner starts *Autoadjust* (see page 53 for details).
- If *Autoadjust* is successful, the message "COMPLETE" pops up. Confirm with **ENTER**.

In case of troubles *Autoadjust* may be cancelled or aborted, and an error messages is shown in the display. Refer to page 53 for details.

- If required, continue with setting the tolerance band (see chapter 4.5.4); normally, you can directly change over to parameter P1.3 or P1.4.
- To save the autoadjustment results, selet P1.4 (with **MODE** and **↑**), then confirm with **ENTER** (wait until countdown from 3 to 0 has run down).

4.5.4 Setting the tolerance band

During *Autoadjust* the smallest possible value of the tolerance band is determined and adaptively checked and corrected, if necessary, during the ongoing controlling operation. Only in some special cases (e.g. with very small actuators) you should set a bigger value for the tolerance band (see page 55).

- Press and hold **MODE**.
- In addition, briefly press **↑**, release the buttons.
The display switches to parameter 1.2 "TOL_BAND" (tolerance band). The value is indicated as a percentage of the valve range (see page 55)
- Press **↑** or **↓** to change the value.
- If required, continue with testing the settings (see chapter 4.5.5), otherwise save (see chapter 4.5.6).

4.5.5 Testing the settings

With this test the controller is activated. You can check the effects of the changes you made. Proceed as described below:

- Press and hold **MODE**.
- In addition, briefly press **↑**, release the buttons.
The display switches to parameter 1.3 "TEST".
- Press and hold **ENTER**.
A countdown from 3 to 0 is indicated.
Continue to hold **ENTER** until the countdown has run down, then release **ENTER**.
The positioner activates the test mode (see page 56).

The test is automatically stopped after two minutes and can also be cancelled by pressing any button.

4.5.6 Saving the settings

- Press and hold **MODE**.
- In addition, briefly press **↑**, release the buttons.
The display switches to parameter 1.4 "EXIT" (back to operating level).
- Press **↑** or **↓** to save in the non-volatile memory ("NV_SAVE" is seen in the display).
- Press and hold **ENTER**.
Continue to hold **ENTER** until the countdown from 3 to 0 has run down, then release **ENTER**. The positioner saves the data and returns to the last previous operating mode on the operating level (see page 56).

This completes the commissioning procedure.

5 Installation of option cards

Options can either be ordered together with the device - in that case they are delivered already mounted - or they can be installed later. In the latter case proceed as follows:

5.1 Mechanical position indicator

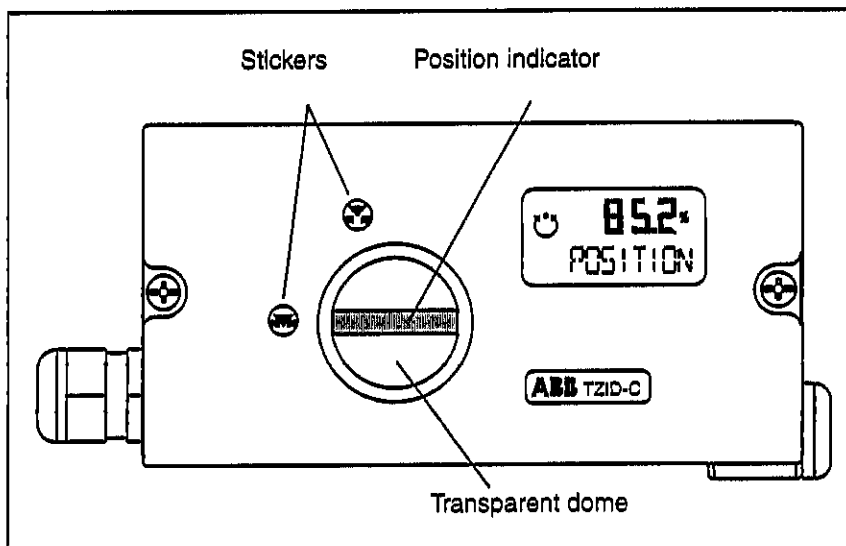


Fig. 26 TZID-C with mechanical position indicator

- Loosen both screws at the case cover and remove the cover.
- Install the long feedback shaft.
- Slip the position indicator onto the feedback shaft.
- Mount the special cover with the transparent dome and fasten to the case.
- Attach the stickers for marking the minimum and maximum valve stroke on the cover.

5.2 Plug-in module for analog position feedback



Installation of the plug-in module for analog position feedback should only be done under shop conditions and when the TZID-C is not powered. Otherwise the sensitive electronics of the device may be damaged.

- Turn off the power supply (4...20 mA signal).
- Turn off the compressed air supply.
- Loosen both screws at the case cover and remove the cover.
- Remove the electrical wiring.
- Remove the position indicator from the feedback shaft (if applicable).

- If the mechanical kit for digital position feedback is installed with the corresponding slot sensors, remove the feedback shaft.
- Take ESD (electrostatic discharge) precautions (i.e. ESD wrist-band).



Caution

Avoid electrostatic discharge to the electronic circuitry that is exposed during the next step. Not taking ESD precautions could result in damage to the electronics.

- Loosen the screws (four) that hold the plastic cover to the case and remove the cover.
- Insert the plug-in module for analog position feedback into the left slot into the case (see Fig. 27 on page 33); ensure that the board engages into the case guides and that the flat cable with the connector is on the right-hand side.
- Connect the plug-in module to the motherboard (see Fig. 27).

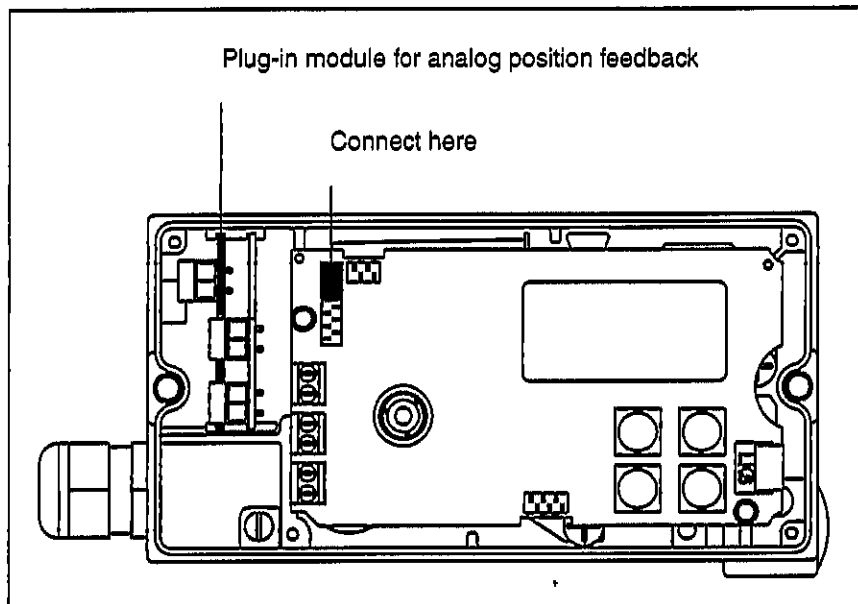


Fig. 27 Installing plug-in module for analog pos. feedb.

- Replace the plastic cover and fasten to the case.
- Screw on the feedback shaft with slot sensors (if applicable).
- Slip the position indicator onto the feedback shaft (if applicable).
- Connect all electrical inputs and outputs, also the new analog output (see chapter 8.2 "Options").
- Turn on the compressed air supply.
- Turn on the 4...20 mA position demand signal.
- Set parameters for analog position feedback, if required:
 - Switch to the configuration level (see page 46).
 - Select parameter group P8.0 (see page 84) and adjust parameters P8.0...P8.3 .
- Replace the case cover; hand-tighten the screws.

5.3 Plug-in module for digital position feedback



Caution

Installation of the plug-in module for digital position feedback should only be done under shop conditions and when the TZID-C is not powered. Otherwise the sensitive electronics of the device may be damaged.

- Turn off the power supply (4...20 mA signal).
- Turn off the compressed air supply.
- Loosen both screws at the case cover and remove the cover.
- Remove the electrical wiring.
- Remove the position indicator from the feedback shaft (if applicable).
- If the mechanical kit for digital position feedback is installed with the corresponding slot sensors, remove the feedback shaft.
- Take ESD (electrostatic discharge) precautions (i.e. ESD wrist-band).



Caution

Avoid electrostatic discharge to the electronic circuitry that is exposed during the next step. Not taking ESD precautions could result in damage to the electronics.

- Loosen the screws (four) that hold the plastic cover to the case and remove the cover.
- Insert the plug-in module for digital position feedback into the right-hand slot into the case (see Fig. 28); ensure that the board engages into the case guides and that the flat cable with the connector is on the right-hand side.
- Connect the plug-in module to the motherboard (see Fig. 28).

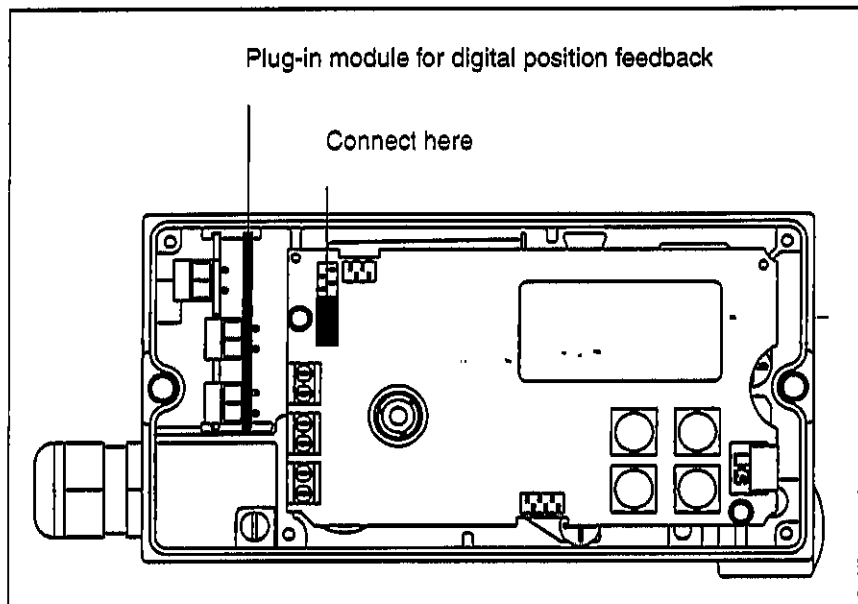


Fig. 28 Installing plug-in module for digital pos. feedb.

- Replace the plastic cover and fasten to the case.
- Screw on the feedback shaft with slot sensors (if applicable).

- Slip the position indicator onto the feedback shaft (if applicable).
- Connect all electrical inputs and outputs, also the new digital output (see chapter 8.2 "Options").
- Turn on the compressed air supply.
- Turn on the 4...20 mA position demand signal.
- Run *Autoadjust* (s. page 53)
- If necessary, adjust upper and lower switching point for the digital position feedback as follows:
 - Switch to configuration level (see page 46).
 - Select parameter P4.1 (see page 47) and adjust lower switching point (see page 47/page 64).
 - Select parameter P4.2 and adjust upper switching point (see page 47/page 64).
- Replace the case cover; hand-tighten the screws.

5.4 Plug-in module for the shutdown function



Installation of the plug-in module for the shutdown function should only be done under shop conditions and when the TZID-C is not powered. Otherwise the sensitive electronics of the device may be damaged.

- Turn off the power supply (4...20 mA signal).
- Turn off the compressed air supply.
- Loosen both screws at the case cover and remove the cover.
- Remove the electrical wiring.
- Remove the position indicator from the feedback shaft (if applicable).
- If the mechanical kit for digital position feedback is installed with the corresponding slot sensors, remove the feedback shaft.
- Take ESD (electrostatic discharge) precautions (i.e. ESD wrist-band).



Avoid electrostatic discharge to the electronic circuitry that is exposed during the next step. Not taking ESD precautions could result in damage to the electronics.

- Loosen the screws (four) that hold the plastic cover to the case and remove the cover.
- Insert the plug-in module for the shutdown function into the right-hand slot into the case (see Fig. 29); ensure that the board engages into the case guides and that the flat cable with the connector is on the right-hand side.

- Disconnect the I/P module cable from the motherboard and pass it under the motherboard such that it ends up to the right of the shutdown module. Then plug the shutdown module connector into the free socket on the motherboard (see Fig. 29).
- Plug the I/P module connector onto the shutdown module as seen in Fig. 29.

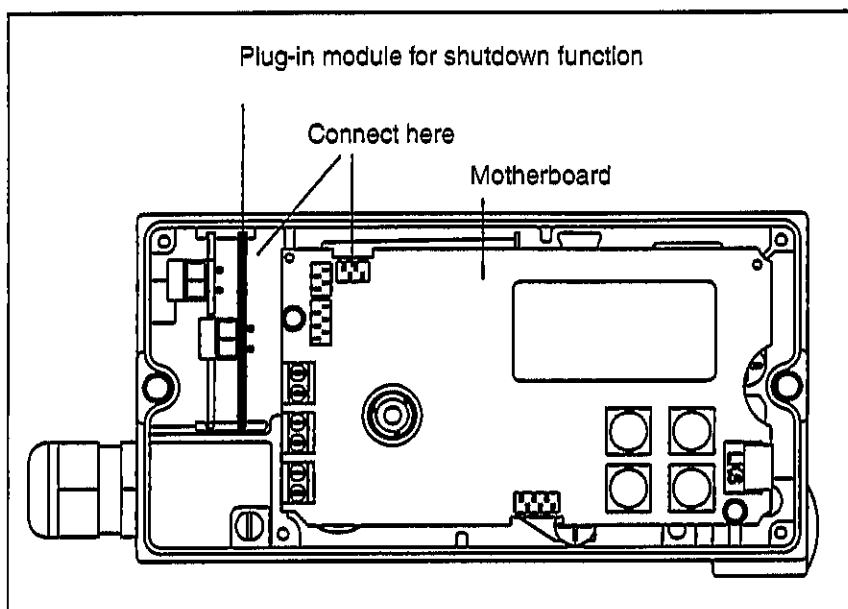



Fig. 29 Installing plug-in module for shutdown function

- Replace the plastic cover and fasten to the case.
- Screw on the feedback shaft with slot sensors (if applicable).
- Slip the position indicator onto the feedback shaft (if applicable).
- Connect all electrical inputs and outputs, also the new digital output (see chapter 8.2 "Options").
- Turn on the compressed air supply.
- Turn on the 4...20 mA position demand signal.

5.5 Mechanical kit for digital position feedback using proximity switches

 The mechanical kit for digital position feedback can only be installed in a device with mechanical position indicator. Only the special cover with transparent dome delivered with this option provides sufficient space for the long feedback shaft and the two slot sensors.

- Turn off the power supply (4...20 mA signal).
- Turn off the compressed air supply.
- Loosen both screws at the case cover and remove the cover.
- Remove the position indicator from the feedback shaft.
- Remove the feedback shaft.



Danger of injuries. The slot sensors are sharp.

- Fasten board with proximity switches to the case, hand-tighten the screws. At the same time mount the special feedback shaft with the two slot sensors and screw it in carefully.
- Replace the position indicator to the feedback shaft.
- Connect the proximity switches (see Fig. 30).
- Turn on the compressed air supply.
- Turn on the 4...20 mA position demand signal.
- If required, adjust the lower and upper switching points for the digital position feedback as follows:
 - Select operating mode 1.2 (see page 45) and move the actuator manually to the lower switching position (see page 49).
 - Use a screwdriver to adjust the slot sensor of proximity switch 1 on the feedback shaft (lower contact, see Fig. 30) until it closes the contact (i.e. just before introducing into the proximity switch); **the slot sensor introduces into proximity switch 1 when turning the feedback shaft clockwise (as seen from the front).**
 - Move the actuator manually to the upper switching position.
 - Use a screwdriver to adjust the slot sensor of proximity switch 2 on the feedback shaft (upper contact, see Fig. 30) until it closes the contact (i.e. just before introducing into the proximity switch); **the slot sensor introduces into proximity switch 2 when turning the feedback shaft counterclockwise (as seen from the front).**
- Replace the case cover; hand-tighten the screws.

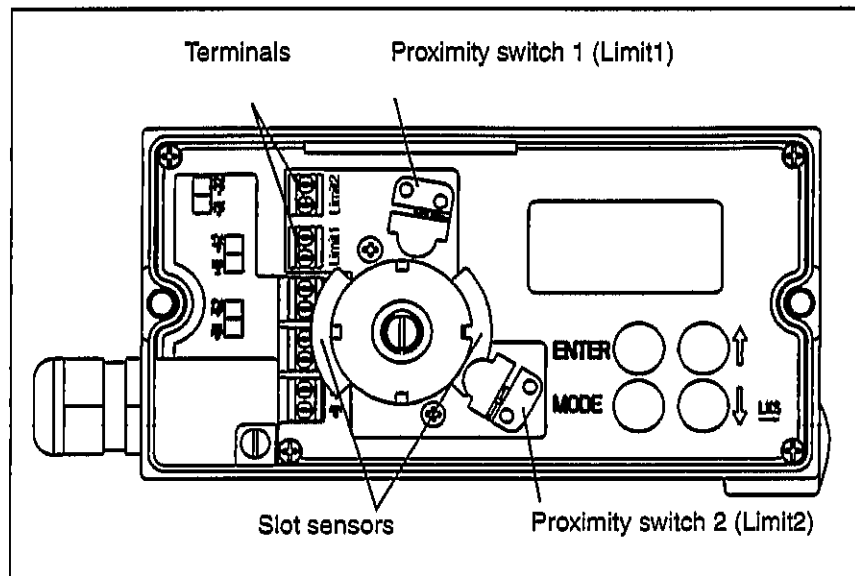


Fig. 30 Mechanical kit for digital position feedback using proximity switches

5.6 Mechanical kit for digital position feedback using proximity switches

 The mechanical kit for digital position feedback can only be installed in a device with mechanical position indicator.

Only the special cover with transparent dome delivered with this option provides sufficient space for the long feedback shaft and the two slot sensors.

- Turn off the power supply (4...20 mA signal).
- Turn off the compressed air supply.
- Loosen both screws at the case cover and remove the cover.
- Remove the position indicator from the feedback shaft.
- Remove the feedback shaft.
- Fasten board with microswitches to the case, hand-tighten the screws.
- Adjust max. contact (1, lower disk)
- Adjust min. contact (2, upper disk); fasten lower disk with special adjustment retainers and turn upper disk manually to adjust.
- Replace the position indicator to the feedback shaft.
- Connect the proximity switches.
- Turn on the compressed air supply.
- Turn on the 4...20 mA position demand signal.
- Replace the case cover, hand-tighten the screws.

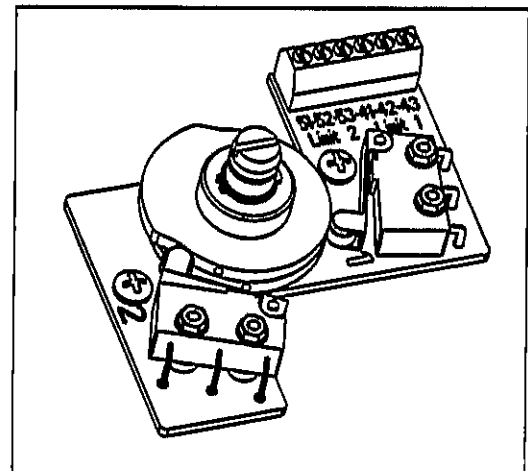


Fig. 31 Mech. kit for digital pos. feedback using micro-switches

5.7 Pressure gage block and filter regulator

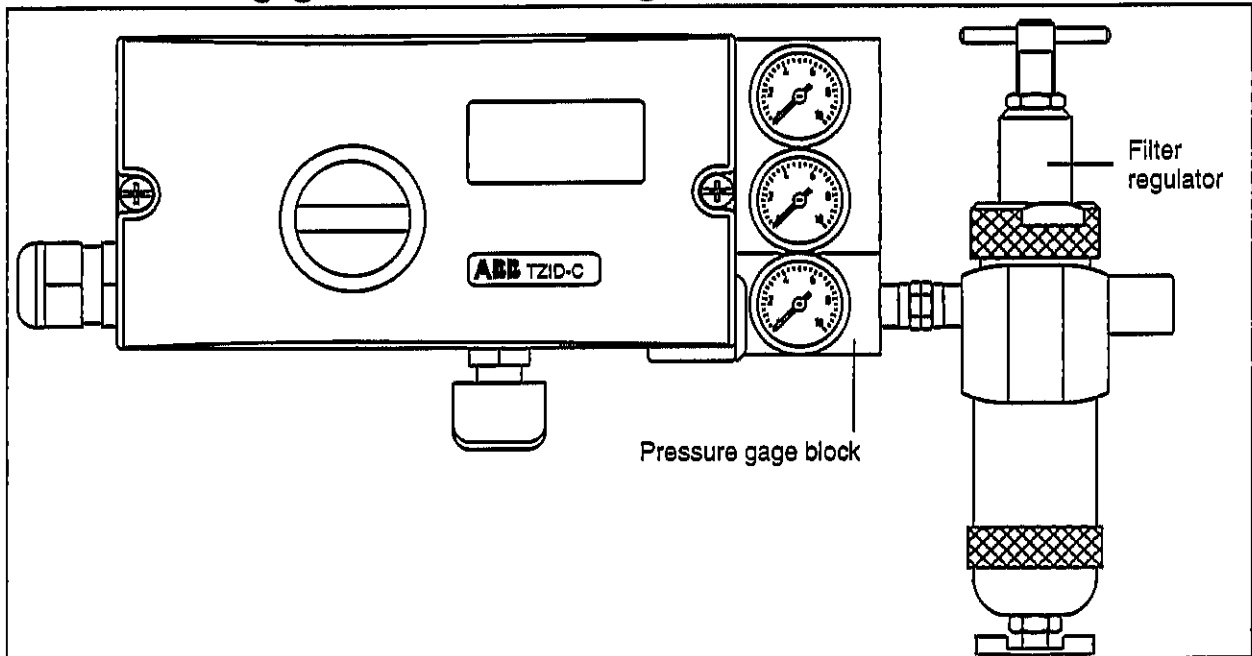


Fig. 32 Pressure gage block with filter regulator

- Remove the plug for output OUT2 for single-acting actuators (pressure gage block contains plug).
- Mount the pressure gage block with the supplied screws on the right hand side of the TZID-C; ensure the correct seating of the O-rings.
- Mount the filter regulator with the filter housing vertically such that condensed water can run off freely.
- Adjust the supply pressure for the TZID-C at the filter regulator; do not exceed max. pressure of 16 bar (235 psi) at the input side of the filter regulator.

5.8 Replacing the I/P module

Replacing the I/P module (pneumatic output unit of the TZID-C positioner) may be necessary when

- changing the output from single-acting to double-acting
- changing the safety position from fail/safe to fail/freeze and v.v.
- dirt or oil has accumulated due to poorly conditioned supply air.



Replacing the I/P module should only be done under shop conditions and when the TZID-C is not powered. Otherwise the sensitive electronics of the device may be damaged.

Procedure:

- Turn off the power supply (4...20 mA signal).
- Turn off the compressed air supply.
- Loosen both screws at the case cover and remove the cover.
- Remove the electrical wiring.
- Remove position indicator from feedback shaft (if applicable).
- If the mechanical kit for digital position feedback is installed with the corresponding slot sensors, remove the feedback shaft.
- Take ESD (electrostatic discharge) precautions (i.e. ESD wrist-band).



Avoid electrostatic discharge to the electronic circuitry that is exposed during the next step. Not taking ESD precautions could result in damage to the electronics.

- Loosen the screws (four) that hold the plastic cover to the case and remove the cover.
- Disconnect the following connectors from the motherboard:
 - I/Pmodule (1)
 - Analog pos. feedback(2) (if present)
 - Digitale position feedback (3) (if present)
 - Position sensor (4)
- Loosen the torx screws (5) of size T10 that hold the motherboard to the case; use special screwdriver.
- Take out the motherboard.

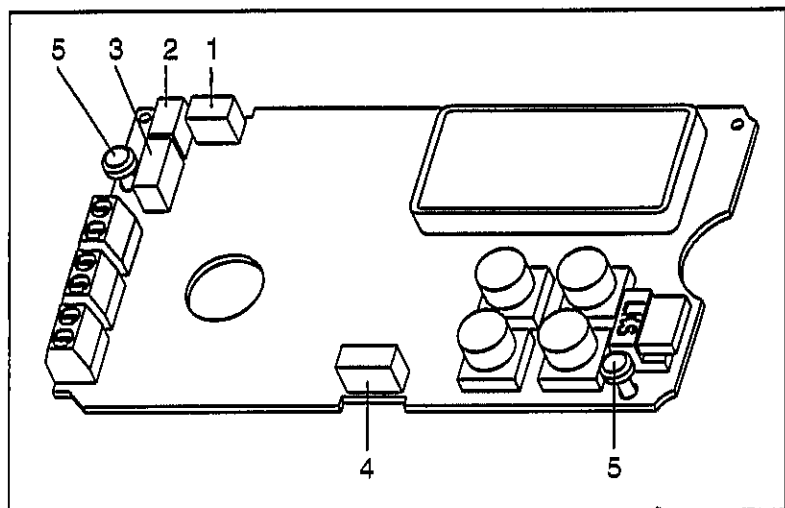


Fig. 33 Motherboard



Only touch the motherboard at the edges and avoid direct contact with the components, strip conductors, and soldering joints.

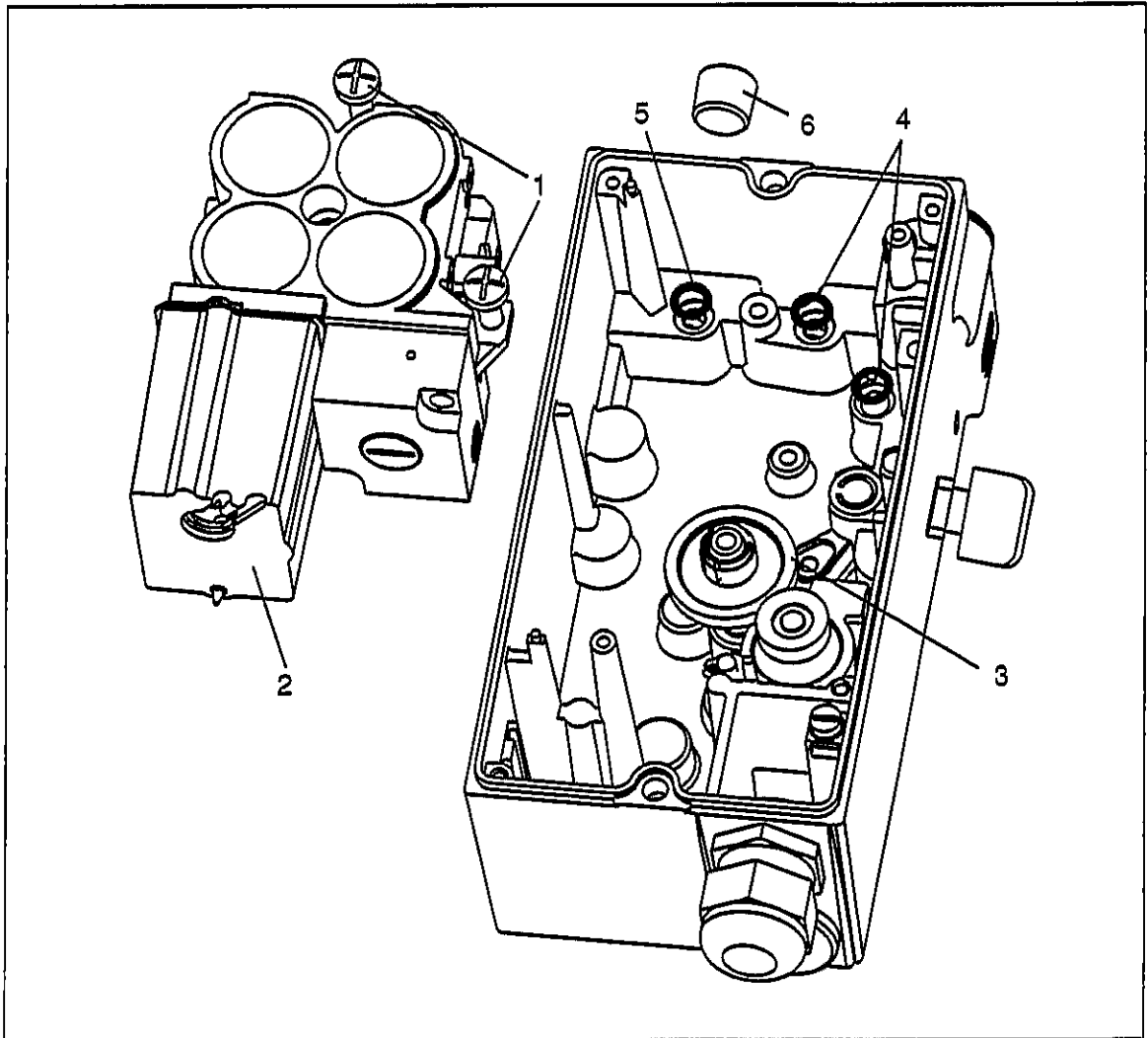


Fig. 34 Replacing the I/P module

- Loosen both screws (1) at the I/P-module (2), slightly tilt the I/P module and remove it from under the gear on the feedback shaft (3).



O rings (4, 5) may stick to the I/P module; remove carefully.

It is recommended to replace the O-rings, as a preventive maintenance action.

- When converting from single- to double-acting, insert an additional O-ring (5) before the pneumatic output OUT2 and remove the plug (6).
- When converting from double- to single-acting, close the output OUT2 with the plug (6).

- Insert new I/P module; slightly tilt I/P module and fit under the gear on the feedback shaft.



Caution

Observe correct seating of the O-rings (4, 5).

- Fasten I/P module with both screws (1) in the case; **torque the fasteners to 350 Ncm (31 in-lbs).**
- Replace the motherboard and fasten with the two torx screws in the case.
- Connect all connectors on the motherboard (see Fig. 33 on page 40); ensure that all connectors snap in correctly.
- Replace the plastic cover and fasten to the case.
- Replace the board with the proximity switches and fasten with screws (if applicable).
- Replace the feedback shaft and fasten with screws.
- Replace the position indicator to the feedback shaft (if applicable).
- Reconnect all electrical inputs and outputs (see chapter 4.3 "Electrical connection").
- When converting from single- to double-acting make the corresponding connection at output OUT2 (see chapter 4.2).
- Feed in the 4...20 mA position demand signal.



Warning

After changing the I/P module type (single-acting <-> double-acting or fail/safe <-> fail/freeze) the TZID-C must be adapted to the module type as described below. Otherwise the actuator can drive the valve at full speed to the mechanical limit stops. Danger of injuries!

- Adjust the TZID-C to the new I/P module type.
 - Switch to the configuration level (see page 46).
 - Select parameter group P11._ (FS / IP) (see page 46 and page 91).
 - Select parameter 11.0 "SAFE_POS" (safe position) and set to "ACTIVE" (see page 47 and page 91).
 - Select parameter 11.2 "I/P type" (see page 93) and set accordingly.
- Turn on the compressed air supply.
- Run *Autoadjust* (see page 53).
- Replace the case cover; hand-tighten the screws.

6 Local operation

6.1 General

The TZID-C positioner has two levels:

- **Operating level**
On the operating level the TZID-C positioner is operating in one of four possible operating modes (two for automatic control and two for manual adjustment). Parameters cannot be changed or saved on this level. See chapter 6.4 for further information
- **Configuration level**
On this level most of the parameters of the positioner can be changed locally. The PC is required to change the limit values for the stroke counter, the travel counter, and the user-defined characteristic curve.



During external configuration via a PC the TZID-C does no longer respond to the position demand signal. Prior to external configuration always move the actuator to the safe position and activate manual adjustment.

To simplify the operation, the parameters have been categorized in parameter groups through which you can navigate by means of the push buttons (see chapter 6.2.2).

On the configuration level the active operating mode is deactivated. The I/P module is in neutral position, and the controlling operation is inactive.

See chapter 6.5 for a detailed description of the individual parameter groups.

6.2 Operating elements

6.2.1 Description

The TZID-C positioner can be operated locally by means of a liquid crystal display and four push buttons.

Liquid crystal display

The liquid crystal display with 160 segments has been specially designed for the TZID-C positioner.



The display has been designed for a temperature range of -25 °C to +80 °C (-13 °F to +176 °F).

At temperatures outside this range the display is too sluggish and will be switched off.

The display (see Fig. 35) is divided into:

- the symbol display
- the value display with unit
- the designator display

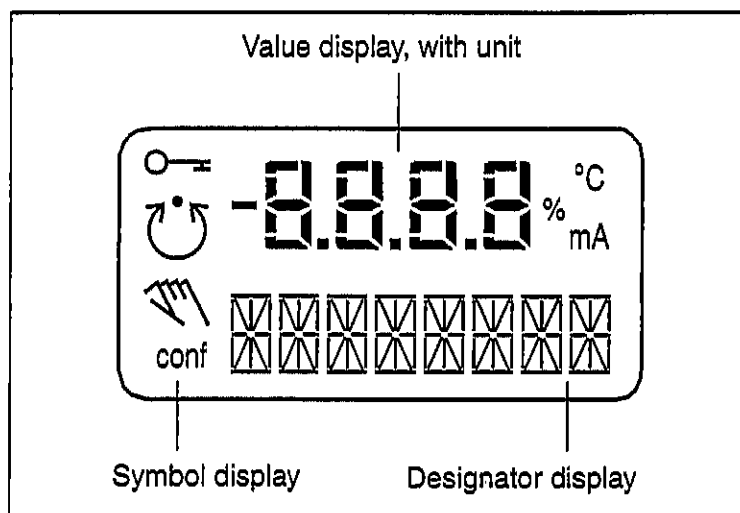


Fig. 35 Liquid crystal display

Symbol display:

The operating modes of the positioner are indicated by four symbols.



The **key symbol** indicates that operation or access is inhibited.



The **control loop symbol** indicates that the control loop is active. The symbol is displayed when the positioner is normally in operating mode 1.0 "CTRL_ADP" (adaptive control) or 1.1 "CTRL_FIX" (fixed control). On the configuration level there are test functions for which the controller will be active as well. The control loop symbol will also be displayed when these functions are active.



The **hand symbol** indicates manual adjustment. The symbol is displayed when the positioner is operating on the operating level in operating mode 1.2 "MANUAL" (manual adjustment within the stroke range) or 1.3 "MAN_SENS" (manual adjustment within the sensor range). On the configuration level, manual adjustment is active when setting the valve range limits (parameter P6.0 "MIN_VR" (min. of valve range) and P6.1 "MAX_VR" (max. of valve range). The symbol will also be displayed when these parameters are being set.

conf

The **configuration symbol** indicates that the TZID-C positioner is operating on the configuration level. The control operation is inactive.

Value display with unit

This 7-segment display with four digits indicates parameter values or parameter reference numbers. For values the physical unit (°C, %, mA) is displayed too.

Designator display

This 14-segment display with eight digits indicates the designators of the parameters and their status, of the parameter groups, and of the operating modes.

Push buttons

The four push buttons **ENTER**, **MODE**, **↑** and **↓** are pressed individually or in certain combinations according to the function desired.

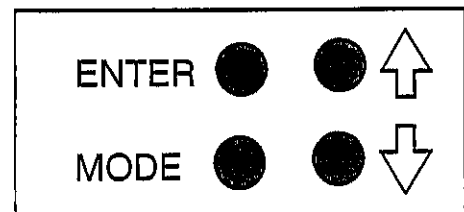


Fig. 36 Push buttons

Basic functions:

- | | |
|--------------|--|
| ENTER | <ul style="list-style-type: none"> • Acknowledge message • Start action • Save in the non-volatile memory |
| MODE | <ul style="list-style-type: none"> • Choose operating mode (operating level) • Select parameter group or parameter (configuration level) |
| ↑ | UP direction button |
| ↓ | DOWN direction button |

6.2.2 Using the operating elements

Changing the mode (operating level)

- Press and hold **MODE**.

The reference number (top) and the designator (bottom) of the active mode are displayed.

- Additionally press **↑** or **↓** until the reference number and the designator of the desired mode are indicated in the display.
- Release the buttons



The desired mode is only activated and saved in the non-volatile memory after releasing the **MODE** button.

Adjusting the contrast (operating level)

- Press and hold **ENTER**.

After approx. 1.5 seconds the display switches to the contrast value.

- Additionally press **↑** or **↓** to change the contrast.

The value selected is active immediately so that you can check the contrast in the display.

- Release the buttons.

After releasing the **ENTER** button the value is saved in the non-volatile memory.

Switching to the configuration level

- Press and hold **↑** and **↓** simultaneously.
- Briefly press and release **ENTER** once;
Keep **↑** and **↓** pressed until the countdown from 3 to 0 is finished.
(Length: appr. 3 seconds)



If you release the direction buttons before the countdown is finished the configuration level is not activated.

- Release **↑** and **↓**.

You enter the configuration level now. The first parameter (P1.0) of group 1 "STANDARD" is displayed. Furthermore, the display indicates the configuration symbol.

Switching to another parameter group

- Press and hold **MODE** and **ENTER** simultaneously

The display indicates the reference number (top) and the designator (bottom) of the current parameter group.

- Additionally press **↑** or **↓** until the reference number and the designator of the desired parameter group are displayed
- Release all buttons

The first parameter of the newly selected parameter group is displayed. You can now adjust the desired parameter within the group.

Selecting a parameter within a group

- Press and hold **MODE**

The display indicates the reference number (top) and the designator (bottom) of the current parameter.

- Additionally press **↑** or **↓** until the reference number and the designator of the desired parameter are displayed
- Release all buttons

The display indicates the value of the selected parameter (top). At the bottom the designator is still shown. For parameters that can assume different states (e.g. ACTIVE or INACTIVE) the reference number is displayed at the top and the state at the bottom. You can change the value/state of the parameter.

Changing a parameter

- Press **↑** or **↓** until the desired value or state is shown



When keeping the respective direction button pressed, parameters with values are changed dynamically. The change rate is increased every second until the limit value of the parameter is reached.

Saving data and exiting the configuration level

- Select the "EXIT" parameter of the respective parameter group and set it to one of the two possible states using **↑** or **↓**:

NV_SAVE Changes will be activated and saved in the non-volatile memory. You return to the operating level.

CANCEL Changes are ignored. You return to the operating level



- **The parameters are only saved in the non-volatile memory when leaving the configuration level with EXIT -> SAVE . . .**
- **It is possible to change several parameters in different groups sequentially. When leaving the last parameter group with EXIT -> SAVE all previously made modifications are saved and applied.**
- Press and hold **ENTER** until the displayed countdown from 3 to 0 is finished
- Release **ENTER**

Depending on the selection the data is saved in the non-volatile memory or discarded. During the save operation a plausibility check is performed. If an error occurs during the check or when data is being saved, an error message is displayed (see chapter 10).

Starting an action

- Press and hold **ENTER** until the displayed countdown from 3 to 0 is finished
- Release **ENTER**

The selected action is started.



If you release **ENTER** before the countdown is finished the action is not started.

To acknowledge a message

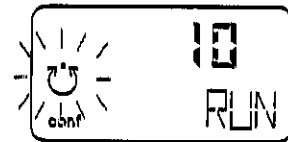
In the course of some actions (e.g. *Autoadjust*) messages are displayed that have to be acknowledged. Messages that must be acknowledged are identified by the value display (top line) being empty (see adjacent example).

- press **ENTER** briefly

The TZID-C positioner continues with the action respectively finishes the procedure.



Acknowledgement required



No acknowledgement

To cancel an action

- Press **ENTER** briefly

The TZID-C positioner cancels the action in progress (e.g. *Autoadjust*)

6.3 Inhibiting operation

Configuration changes to the program in the TZID-C positioner can be inhibited completely or partially via the digital input and the parameter 10.0 "FUNCTION" in parameter group "DIG_IN" (digital input, see page 89). This allows the user to prevent or restrict operating actions of unauthorized personnel as desired. When operation is disabled in this way, the key symbol is indicated in the display.

The following levels of configuration locks are possible:

- **Inhibiting the local setting of parameters**
Local operation on the operating level and remote operation and setting of parameters via a PC are still possible.
- **Inhibiting all local operating functions**
No local operating actions can be executed. Both the operating level and the configuration level are locked. Remote operation and setting of parameters via a PC is still possible.
- **Inhibiting local operation and remote setting of parameters**
The TZID-C positioner can neither be operated locally nor can parameters be set remotely from a PC.



Caution

This lock can only be activated when a voltage of 12 ... 24 V is applied to the digital input of the TZID-C positioner (See "P10.0 Function selection" on page 89).

6.4 Operation on the operating level

On the operating level, the TZID-C positioner is operating in one of the following modes:

- 1.0 CTRL_ADP (Adaptive control)
- 1.1 CRTL_FIX (Fixed control without adaptation)
- 1.2 MANUAL (Manual adjustment within the stroke range)
- 1.3 MAN_SENS (Manual adjustment within the sensor range) _

For details regarding switching between the modes see page 45. . .

When the 4 ... 20 mA signal is fed in the positioner automatically starts up in the previously active mode. Devices from the factory start up in operating mode 1.2. This also applies to devices that have been reset to the factory setting.

In both manual modes the valve can be adjusted manually by pressing ↑ or ↓.

The two automatic control modes are indicated by the control loop symbol in the display. For the manual modes the hand symbol is shown in the display.

6.5 Setting parameters



Operating mode 1.0: Adaptive control

Controlling operation with automatic adaptation of the control parameters

The internal control parameters are adaptively adjusted. You should only use this operating mode, if fixed control does not yield acceptable results.



The valve position is indicated as a percentage of the stroke range (from 0...100%). The assignment of the limit positions is adjustable between 0% and 100%.



Operating mode 1.1: Fixed control

Controlling operation with fixed parameters

The settings determined during *Autoadjust* are not adaptively adjusted. This is the normal recommended operating mode

The valve position is indicated as a percentage of the stroke range (from 0...100%). The assignment of the limit positions is adjustable between 0% and 100%. The display in this operating mode is identical to operating mode 1.0.



No leakage monitoring.

Caution

In both control modes 1.0 and 1.1 several values can be displayed besides the actuator position:

Setpoint display:

- Press and hold ↑



The setpoint is displayed
In addition, briefly press **ENTER**

The setpoint display is toggled between the setpoint current at the input terminals in mA and the setpoint as a percentage of the stroke range.



Temperature display:

- Press and hold ↓

The temperature inside the case is displayed.

- In addition, briefly press **ENTER**

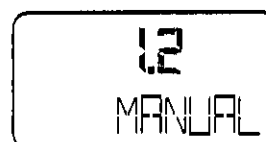
The temperature display is toggled between °C and °F.



Display of control deviation:

- Press and hold ↑ and ↓.

The control deviation is displayed as a percentage of the stroke range



Operating mode 1.2: Manual adjustment within stroke range

The valve stroke is adjusted manually using the direction buttons ↑ and ↓.

- Press and hold the button for the desired positioning direction
- To activate the high speed mode in the manual mode, press the second arrow button

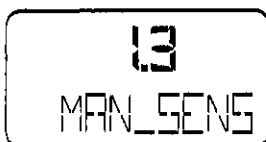


Caution

If air escapes due to a leakage and the actuator position changes, the positioner will not automatically restore the setpoint. Configured stroke limit positions and stroke times are not effective in the manual mode.



In this operating mode the valve position is indicated as a percentage of the stroke range.



Operating mode 1.3: Manual adjustment within sensor range

see operating mode 1.2



Unlike step 1.2, this operating mode is used to determine whether the available detection range of the position sensor is used correctly after mounting the positioner to the actuator. In this mode, the valve position is indicated in angular degrees with respect to the sensor range (i.e. 0...140°).

Most parameters of the TZID-C positioner can be set locally, so that configuring via the communication interface (LKS) or FSK modem and a PC or hand-held terminal is only necessary occasionally.

You may also disable local modification and saving of parameters by denying or restricting access to the configuration level (see chapter 6.3 and page 89)

To simplify the process, the different parameters have been grouped as follows:

ID	Designator	Name	see
P1._	STANDARD	Standard	page 53
P2._	SETPOINT	Setpoint	page 57
P3._	ACTUATOR	Actuator	page 61
P4._	MESSAGES	Messages	page 64
P5._	ALARMS	Alarms	page 67
P6._	MAN_ADJ	Man. adjustment	page 70
P7._	CTRL_PAR	Controlparameters	page 74
P8._	ANLG_OUT	Analog output	page 84
P9._	DIG_OUT	Digital output	page 87
P10._	DIG_IN	Digital input	page 89
P11._	FS / IP	Factory settings, I/P type	page 91

Please refer to Appendix A for an overview of the overall structure of the parameters and the parameter groups.


Parameter group 1: Standard



P1.0 Actuator type

With this parameter you can configure the TZID-C positioner for operation on a linear actuator (sensor range +/-30°) or on a rotary actuator (sensor range +/-60°). No mechanical changes at the device are required.



 **Autoadjust must be executed after setting the actuator type.** Selecting the wrong actuator will result in a non-linearity error.

Selection:

- LINEAR Linear actuator
- ROTARY Rotary actuator
- Factory setting: LINEAR

P 1.1 Autoadjust

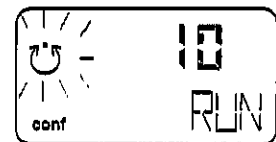
The following values are determined by *Autoadjust*:

- Direction of the actuator
- Stroking distance of the actuator
- Stroke time for both directions
- Control parameters
- Offset for the I/P module



To start *Autoadjust*, press and hold **ENTER** until the countdown displayed has run down from 3 to 0. During the countdown, the *Autoadjust* mode selected with parameter P6.4 is displayed. While *Autoadjust* is running, the control loop symbol flashes in the display, and the current state of *Autoadjust* is indicated with the messages listed below.

 The *Autoadjust* mode can be set with parameter 6.4.

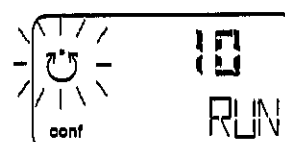


Parameter group 1 - Standard



All messages except "RUN" must be acknowledged with **ENTER**.

RUN	<i>Autoadjust</i> is running.
CALC_ERR	Plausibility check has not been passed.
COMPLETE	<i>Autoadjust</i> completed successfully.
BREAK	<i>Autoadjust</i> has been stopped by the operator. This can be done locally by pressing ENTER .
OUTOFRNG	Sensor range of the positioner has been exceeded; <i>Autoadjust</i> was stopped.
NO-SCALE	Valve range limits have not yet been determined; therefore, partial <i>Autoadjust</i> cannot be completed.
RNG_ERR	Less than 10 % of the sensor range are used.
TIMEOUT	Time-out; parameter could not be determined within 2 minutes. <i>Autoadjust</i> was stopped.
SPR_ERR	The actual spring action does not match the configured direction.



No acknowledgement



Acknowledgement required

When *Autoadjust* is completed without error the device displays the message "RUN" in the bottom line and a code number in the top line, indicating the currently executed step:

- 10 Air is completely evacuated from actuator (OUT1).
- 11 Fully evacuated position is saved.
- 12 Resolution (A/D conversion) is determined and saved.
- 20 Actuator (OUT1) is completely filled with air.
- 21 Fully pressurized position is saved.
- 22 - 30 Determining of stroke time is prepared.
- 31 Actuator travels from 100% to 0%, stroke time is measured and saved.
- 32 Actuator travels from 0% to 100%, stroke time is measured and saved.

Parameter group 1: Standard



40 Tolerance band is determined and saved (minimum value). PD parameters for fast control > tolerance band is determined and saved.

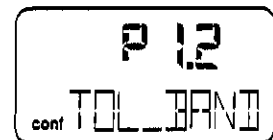
50 - 120 PID control parameters for fine adjustment of control deviation < tolerance band are determined and saved.

200 *Autoadjust* is complete.

When a partial run of *Autoadjust* has been selected (see Parameter P6.4), the following code numbers are shown:

- Stops only: steps 10 - 32 and step 200
- Parameters only: steps 40 - 120 and step 200
- Zero only:
 - 10** actuator is driven to closed position
 - 11** closed position is saved
 - 12** resolution (A/D-conversion) is determined and saved
 - 13** zero adjustment takes place
 - 200** *Autoadjust* is complete (-> save!)

P1.2 Tolerance band



With this function you can define the tolerance band for control.

During *Autoadjust* the positioner determines a minimum tolerance band that cannot be fallen below. You can adjust the tolerance band upward from this minimum to a maximum value of 10%.

The tolerance band defines a +/- range around the setpoint. When the valve position reaches this range, the parameter set of the controller is toggled to a fixed PID- algorithm that is used to continue with slow controlling action.

Only when reaching the sensitivity range the system is considered as balanced. (see "P7.8 Sensitivity" on page 82).

Input value: **0.30...10.00%**
in steps of 0.01%

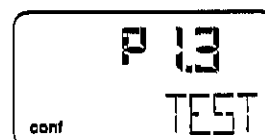
Factory setting: **0.30%**

Parameter group 1: Standard



P1.3 Test

With this test the controller is activated, and you can check the effects of the changes to this parameter group, e.g. by introducing setpoint changes or setpoint ramps using a current source.



Normally, **INACTIVE** is shown on the display. To start the test press and hold **ENTER** until the countdown from 3 to 0 is finished.

The test is activated. The display shows the control loop symbol and a flashing message.



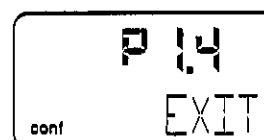
The test is automatically stopped after two minutes and can also be stopped by pressing any button.



- You cannot start the test when the safe position is active (see parameter 11.0). Instead, the message "FAIL_POS" is displayed.

P1.4 Return to operating level

With this parameter you can leave the configuration level and return to the operating level. Here you can either save data in the non-volatile memory or discard all previously made changes (also the changes in other parameter groups).



To leave the configuration level (with or without saving), press and hold **ENTER** until the countdown from 3 to 0 is finished.

The active saving process is indicated by the message "NV_SAVE". After saving a plausibility check is executed.

If an error occurs during the check or while saving, the data cannot be saved; an error message is displayed instead (see chapter 10).

Selection:

NV_SAVE Saves the settings in the non-volatile memory

CANCEL Discards all changes made since the last permanent save operation

Parameter group 2: Setpoint

P2.
conf SETPOINT

P2.0 Min. of setpoint range

The setpoint range is the input current range for which the valve travels 100% of the full positioning range.

P2.0
conf MIN_RGE

 The adjusted setpoint range must not be smaller than 10% (1.6 mA).

With parameter 2.0 you determine the **low** limit of the setpoint range. You can enter a value within the admissible value range of 4...20 mA, with one decimal.

Input value: 4.0...20.0 mA

Factory setting: 4.0 mA

P2.1 Max. of setpoint range

The setpoint range is the input current range for which the valve travels 100% of the full positioning range.

P2.1
conf MAX_RGE

 The adjusted setpoint range must not be smaller than 10% (1.6 mA).

With parameter 2.0 you determine the **high** limit of the setpoint range. You can enter a value within the admissible value range of 4...20 mA, with one decimal.

Input value: 4.0...20.0 mA

Factory setting: 20.0 mA

Setting examples:

Setpoint range: Min.=8.3 mA, Max.=15.6 mA

Split range: Min.=4.0 mA, Max.=12.0 mA

Parameter group 2: Setpoint

P2
conf SETPOINT

P2.2 Characteristic curve

With this parameter you can select the characteristic curve of the setpoint channel. The setpoint characteristic curve transforms the input setpoint according to a predetermined course for the controller.

P22
conf CHARACTER

Besides five predefined curves you can also select a user-configurable curve, which can be defined via a PC with the appropriate configuration software.

Selection:

LINEAR	linear
EP 1/25	equal percentage 1:25
EP 1/50	equal percentage 1:50
EP 25/1	equal percentage 25:1
EP 50/1	equal percentage 50:1
USERDEF	user-configurable
Factory setting:	LINEAR USERDEF: linear

P2.3 Valve action

The valve action describes the relation between setpoint and travel direction of the valve, i.e. the assignment of the limits of setpoint range and stroke range.

P23
conf ACTION

With direct action the valve travels with an increasing setpoint towards 100%. Thus, the low setpoint limit is assigned to the low stroke limit and the high setpoint limit to the high stroke limit.

With reverse action the valve travels with an increasing setpoint towards 0%. Thus, the low setpoint limit is assigned to the high stroke limit and the high setpoint limit to the low stroke limit.

The assignments are independent from the effective direction of the valve, i.e. from the assignment of supply air and direction of travel of the valve.

Parameter group 2: Setpoint

P2
conf SETPOINT

P2.3 Valve action (continued)

Selection:

DIRECT Signal 4...20 mA
 = Position 0...100%

REVERSE Signal 20...4 mA
 = Position 0...100%

Factory setting: **DIRECT**

2.4 Shut-off value

The shut-off value defines a percentage of the setpoint (with one decimal place) from which on the valve is driven to its zero position. If the setpoint reaches the shut-off range, the valve is immediately driven to the 0% stroke limit.

P2.4
conf SHUT_OFF



This parameter is only active in control mode. When limiting the stroke range at its low limit, the valve is not driven to its mechanical stop by totally filling it with air or evacuating the air completely.

Input value: OFF...0.1...20.0%

Factory setting: **OFF**

P2.5 Setpoint ramp (up)

Here the stroke time for the actuator can be increased. A setpoint change is not directly transferred to the controller but with reduced speed (100% of the set time). The set value should always be greater than the stroke time determined during *Autoadjust*.

P2.5
conf RAMP ^

Input value: OFF...1...200 seconds

Factory setting: **OFF**



- In manual mode, with active safe position, and after errors, parameter 2.5 is disabled.

- When pressing and holding **ENTER**, the stroke time is shown (UP stroke time).

20
conf TIME ^

Parameter group 2: Setpoint

P2.
conf SETPOINT

P2.6 Setpoint ramp (down)

Here the stroke time for the actuator can be increased. A setpoint change is not directly transferred to the controller but with reduced speed (100% of the set time). The set value should always be greater than the stroke time determined during *Autoadjust*.

Input value: OFF...1...200 seconds

Factory setting: OFF.



- In manual mode, with active safe position, and after errors, parameter 2.6 is disabled.

- When pressing and holding **ENTER**, the stroke time is shown (DOWN stroke time for parameter 2.6).

P26
conf RAMP^v

20
conf TIME^v

P2.7 Return to operating level

With this parameter you can leave the configuration level and return to the operating level. Here you can either save data in the non-volatile memory or discard all previously made changes (also the changes in other parameter groups).

P27
conf EXIT

To leave the configuration level (with or without saving), press and hold **ENTER** until the countdown from 3 to 0 is finished.

The active saving process is indicated by the message "NV_SAVE". After saving a plausibility check is executed.

If an error occurs during the check or while saving, the data cannot be saved; an error message is displayed instead (see chapter 10).

Selection:

NV_SAVE Saves the settings in the non-volatile memory

CANCEL Discards all changes made since the last permanent save operation

Parameter group 3: Actuator



3.0 Min. of stroke range

You can configure the stroke range to be smaller than the actual mechanical valve stops. The setpoint range always refers to the stroke range. With this parameter you determine the low stroke range limit.



If the stroke range changes, the absolute positions of the switching points with respect to the valve position are changed, too. When reducing the stroke range (<100%), the mechanical stops can no longer be reached by completely filling with air or evacuating the air.

A stroke range reduction is only effective in control mode. In manual mode the full mechanical valve stroke can be reached. If power fails and a fail-safe I/P module is used, the valve is automatically set to the mechanical stop.



The product of stroke range and valve range must be greater than 10% of the sensor range.

Input value: 0.0...100.0%

Factory setting: 0.0%



The display of the TZID-C positioner in operating modes 1.0 through 1.2 always refers to the stroke range configured and indicates the position in %. An exception is operating mode 1.3.

Parameter group 3: Actuator

P3.
conf ACTUATOR

P3.1 Max. of stroke range

You can configure the stroke range to be smaller than the actual mechanical valve stops. The setpoint range always refers to the stroke range. With this parameter you determine the high stroke range limit.

P3.1
conf MAX_RANGE



Caution

If the stroke range changes, the absolute positions of the switching points with respect to the valve position are changed, too. When reducing the stroke range (<100%), the mechanical stops can no longer be reached by completely filling with air or evacuating the air.

A stroke range reduction is only effective in control mode. In manual mode the full mechanical valve stroke can be reached. If power fails and a fail-safe I/P module is used, the valve is automatically set to the mechanical stop.



The product of stroke range and valve range must be greater than 10% of the sensor range.

Input value: 0.0...100.0%

Factory setting: 100.0%



The display of the TZID-C positioner in operating modes 1.0 through 1.2 always refers to the stroke range configured and indicates the position in %. An exception is operating mode 1.3.


Parameter group 3: Actuator



P3.2 Zero position

With this parameter you can assign the zero position of the display to the stop which the lever shaft (for rotary actuators the rotating shaft) reaches when rotating clockwise or counterclockwise (looking into the open case).



 The zero point position is not determined during *Autoadjust* and must be set by the operator.

Selection:

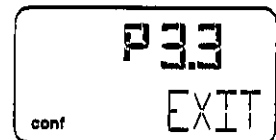
CLOCKW Stop reached turning clockwise

CTCLOCKW Stop reached turning ctclockw.

Factory setting: **CTCLOCKW**

3.3 Return to operating level

With this parameter you can leave the configuration level and return to the operating level. Here you can either save data in the non-volatile memory or discard all previously made changes (also the changes in other parameter groups).



To leave the configuration level (with or without saving), press and hold **ENTER** until the countdown from 3 to 0 is finished.

The active saving process is indicated by the message "NV_SAVE". After saving a plausibility check is executed.

If an error occurs during the check or while saving, the data cannot be saved; an error message is displayed instead (see chapter 10).

Selection:

NV_SAVE Saves the settings in the non-volatile memory

CANCEL Discards all changes made since the last permanent save operation

Parameter group 4: Messages

P4
conf MESSAGES

P4.0 Deadband time limit

With this parameter you can monitor the valve stroke time in control mode. As soon as the valve position is outside the tolerance band, it is monitored if the setpoint is reached within the set time. Otherwise, an alarm is signalled, provided that this has been enabled (see parameter 5.4).

P4.0
conf TIME_OUT



Caution

With active shutdown function there is no alarm message.

After reaching the setpoint the alarm is automatically reset. Always choose the dead band time limit greater than the time determined by *Autoadjust*.

When pressing and holding **ENTER**, the stroke time is shown. By pressing **ENTER** briefly again you can toggle between UP stroke time and DOWN stroke time.

20
conf TIME^v

Input value: OFF...1...200 seconds

Factory setting: OFF

P4.1 Switching point SW1

With this parameter you can define the switching point SW1 as a percentage of the stroke range.

P4.1
conf POS_SW_1

If the valve position exceeds or falls below SW1, the corresponding signal output on the plug-in module is activated (see also parameter group P9.)



Changing the stroke range also changes the absolute positions of the switching points with respect to the valve position.

Input value: 0.0...100.0%

Factory setting: 0.0%

Parameter group 4: Messages



P4.2 Switching point SW2

With this parameter you can define the switching point SW2 as a percentage of the stroke range.

If the valve position exceeds or falls below SW1, the corresponding signal output on the plug-in module is activated (see also parameter group P9._).



Changing the stroke range also changes the absolute positions of the switching points with respect to the valve position.

Input value: 0.0...100.0%

Factory setting: 100%



P4.3 Active direction SW1

With this parameter you determine the switching point activation for SW1, i.e. you define whether the message is to be triggered for exceeding or falling below switching point SW1.

EXCEED Message when exceeding switching point SW1

FALL_BEL Message when falling below switching point SW1

Factory setting: **FALL_BEL**



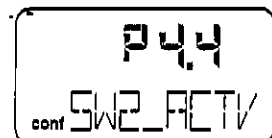
P4.4 Active direction SW2

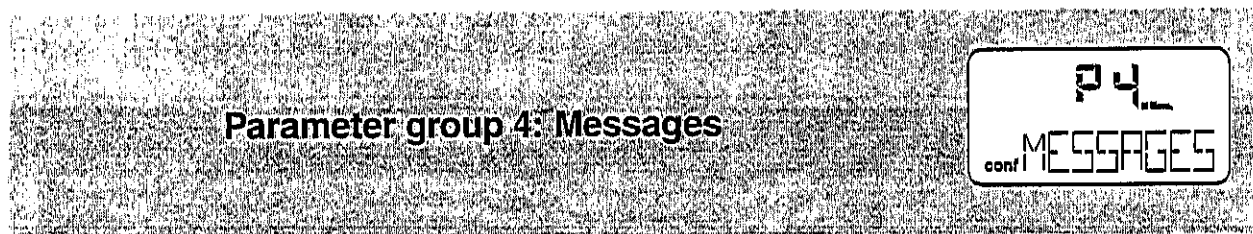
With this parameter you determine the switching point activation for SW2, i.e. you define whether the message is to be triggered for exceeding or falling below switching point SW2.

EXCEED Message when exceeding switching point SW2

FALL_BEL Message when falling below switching point SW2

Factory setting: **EXCEED**





P4.5 Return to operating level

With this parameter you can leave the configuration level and return to the operating level. Here you can either save data in the non-volatile memory or discard all previously made changes (also the changes in other parameter groups).



To leave the configuration level (with or without saving), press and hold **ENTER** until the countdown from 3 to 0 is finished.

The active saving process is indicated by the message "NV_SAVE". After saving a plausibility check is executed.

If an error occurs during the check or while saving, the data cannot be saved; an error message is displayed instead (see chapter 10).

Selection:

- NV_SAVE** Saves the settings in the non-volatile memory

- CANCEL** Discards all changes made since the last permanent save operation

Parameter group 5: Alarms*



P5.0 Leakage to actuator

With this parameter you can determine that an air leakage into the pipe to/from the actuator is recognized as an alarm (can be enabled for adaptive control, only).

ACTIVE Leakage to the actuator is activated as an alarm source.

INACTIVE Condition is not activated as an alarm source

Factory setting: **INACTIVE**



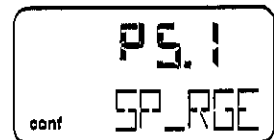
P5.1 Outside setpoint range

With this parameter you can determine that a corresponding alarm is signalled when falling below or exceeding the setpoint range (below 3.8 mA or above 20.5 mA).

ACTIVE Falling below or exceeding the setpoint range is activated as an alarm source.

INACTIVE Condition is not activated as an alarm source.

Factory setting: **INACTIVE**



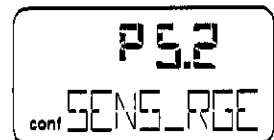
P5.2 Zero error

With this parameter you can determine that a corresponding alarm is signalled when the zero position of the valve range changes by more than 4%. This indicates improperly adjusted mounting.

ACTIVE Zero error is activated as an alarm source.

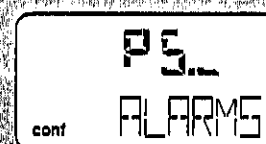
INACTIVE Condition is not activated as an alarm source.

Factory setting: **INACTIVE**



* Active alarms are signalled at the digital output and through the optional modules for digital or analog feedback.

Parameter group 5: Alarms*



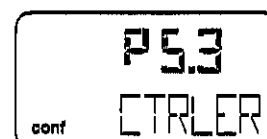
P5.3 Controller inactive

With this parameter you can determine that a corresponding alarm is signalled when the controller is not active, i.e. control is interrupted by another operating mode or by configuration.

ACTIVE Inactive controller is activated as an alarm source.

INACTIVE Condition is **not** activated as an alarm source.

Factory setting: **INACTIVE**



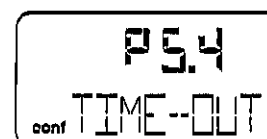
P5.4 Positioning time-out

With this parameter you can determine that a corresponding alarm is signalled if the setpoint is not reached within the predefined stroke time while in control mode. (See also "P4.0 Deadband time limit" on page 64).

ACTIVE Positioning time-out is activated as an alarm source.

INACTIVE Condition is **not** activated as an alarm source.

Factory setting: **INACTIVE**



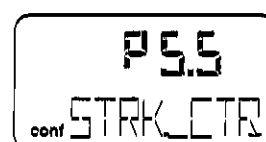
P5.5 Stroke counter

With this parameter you can determine that a corresponding alarm is indicated when the stroke counter exceeds the predefined limit value. The limit value is edited externally via a PC.

ACTIVE Exceeding the stroke counter limit is activated as an alarm source.

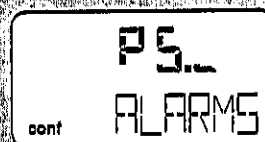
INACTIVE Condition is **not** activated as an alarm source.

Factory setting: **INACTIVE**



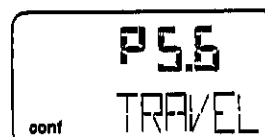
* Active alarms are signalled at the digital output and through the optional modules for digital or analog feedback.

Parameter group 5: Alarms*



P5.6 Travel counter

With this parameter you can determine that a corresponding alarm is signalled when the travel counter exceeds the predefined limit value. The limit value is edited remotely via a PC.



Conditions:

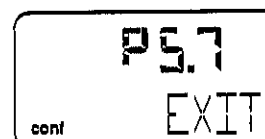
ACTIVE Exceeding the limit of the travel counter is activated as an alarm source.

INACTIVE Condition is not activated as an alarm source.

Factory setting: **INACTIVE**

P5.7 Return to operating level

With this parameter you can leave the configuration level and return to the operating level. Here you can either save data in the non-volatile memory or discard all previously made changes (also the changes in other parameter groups).



To leave the configuration level (with or without saving), press and hold **ENTER** until the countdown from 3 to 0 is finished.

The active saving process is indicated by the message "NV_SAVE". After saving a plausibility check is executed.

If an error occurs during the check or while saving, the data cannot be saved; an error message is displayed instead (see chapter 10).

Selection:

NV_SAVE Saves the settings in the non-volatile memory

CANCEL Discards all changes made since the last permanent save operation

* Active alarms are signalled at the digital output and through the optional modules for digital or analog feedback.

Parameter group 6: Manual adjustment



P6.0 Minimum valve range

Normally the valve range is determined automatically during *Autoadjust*. A partial run of *Autoadjust* that is limited to the control parameters (CTRL_PAR, see parameter P6.4, page 73), however, requires manual adjustment of the valve range. A partial run of *Autoadjust* is required if the actuator does not have mechanical stops or the valve cannot be driven to the stops for any reason.



When this parameter is being set, the manual mode is active and the hand symbol flashes in the display.

You can manually position the valve and use this position as the limit value..



Warning After manual adjustment of the end position it is mandatory to limit the stroke range to >0.1 und < 99.9. Otherwise, the valve may be driven at full speed to an end position.

Danger of injuries!

The range between high and low valve range limit must be at least 10% of the full range. Otherwise, the message "VR<10%" is displayed.

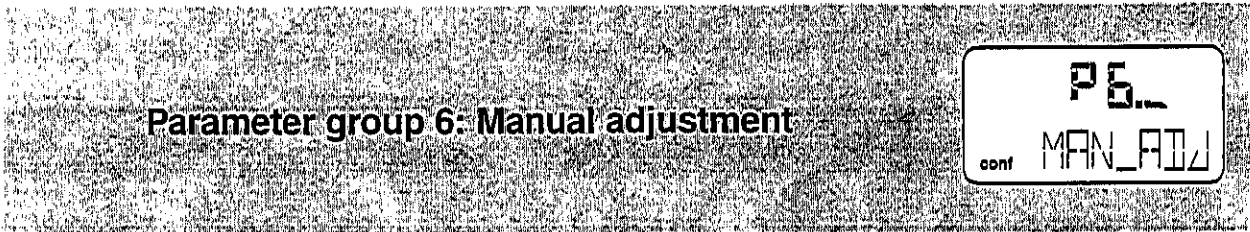
Observe the stroke range. It is recommended to use as wide a span as possible. This parameter is not active when the safe position is active. The display then shows the message "FAIL_POS".

With P6.0 you can define the low valve range limit as follows:

- Press **↑** or **↓** in order to travel to the desired position.
- Press and hold **ENTER** until the countdown is finished (MIN_SET). The position is taken over as min. limit value.
- Briefly press **ENTER**.
The set limit value is displayed for 2 seconds.
(MIN_SAVE)

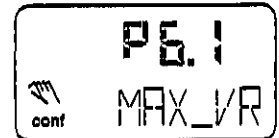
Adjustable value: **0.0...100.0% in sensor range**

Factory setting: **0.0%**



P6.1 Max. of valve range

Normally the valve range is determined automatically during *Autoadjust*. A partial run of *Autoadjust* that is limited to the control parameters (CTRL_PAR, see parameter P6.4, page 73), however, requires manual adjustment of the valve range. A partial run of *Autoadjust* is required if the actuator does not have mechanical stops or the valve cannot be driven to the stops for any reason.



When this parameter is being set, the manual mode is active and the hand symbol flashes in the display.

You can manually position the valve and use this position as the limit value..



Warning After manual adjustment of the end position it is mandatory to limit the stroke range to >0.1 und < 99.9. Otherwise, the valve may be driven at full speed to an end position.

Danger of injuries!

The range between high and low valve range limit must be at least 10% of the full range. Otherwise, the message "VR<10%" is displayed.

Observe the stroke range. It is recommended to use as wide a span as possible. This parameter is not active when the safe position is active. The display then shows the message "FAIL_POS".

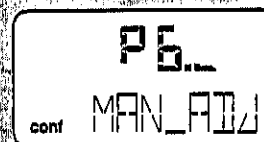
With P6.0 you can define the high valve range limit as follows:

- Press **↑** or **↓** in order to travel to the desired position.
- Press and hold **ENTER** until the countdown is finished (MIN_SET). The position is taken over as min. limit value.
- Briefly press **ENTER**.
The set limit value is displayed for 2 seconds. (MIN_SAVE)

Adjustable value: 0.0...100.0% in sensor range

Factory setting: 100.0%

Parameter group 6: Manual adjustment



P6.2 Actuator type

With this parameter you can configure the TZID-C positioner for manual adjustment when operating it at a linear or rotary actuator (see P1.0 on page 53).

Selection:

LINEAR Linear actuator

ROTARY Rotary actuator

Factory setting: **LINEAR**



P6.3 Spring action (Y2)



Warning

Incorrect inputs may result in the actuator travelling to a mechanical stop at full speed.

Danger of injuries



This parameter defines the stop to which the valve is set by spring action with a single-acting actuator (vented). This position is determined by *Autoadjust* by means of the valve stops. *Autoadjust* limited to the control parameters (CTRL_PAR, see parameter P6.4, page 73), however, requires manual adjustment of the spring action.

The parameter defines whether the shaft (lever or rotating, depending on actuator type) is set to the stop by spring action (with evacuated valve chamber) when rotating clockwise or counterclockwise. For double-acting actuators the spring action corresponds to filling with air through pneumatic output OUT2.

CLOCKW Stop reached turning clockw.

CTCLOCKW Stop reached turning ctclockw.

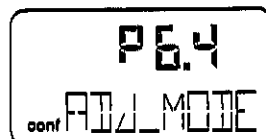
Factory setting: **CTCLOCKW**

Parameter group 6: Manual adjustment



P6.4 Autoadjust mode

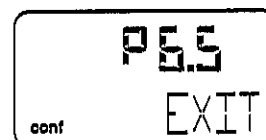
With this parameter you determine the mode or scope of the *Autoadjust* function.



- FULL** Full *Autoadjust*
- STROKE** Stops only
- CTRL_PAR** Control parameters only
- ZERO_POS** Zero position only (parameterized stops required)
- LOCKED** No *Autoadjust*
- Factory setting: **FULL**

P6.5 Return to operating level

With this parameter you can leave the configuration level and return to the operating level. Here you can either save data in the non-volatile memory or discard all previously made changes (also the changes in other parameter groups).



To leave the configuration level (with or without saving), press and hold **ENTER** until the countdown from 3 to 0 is finished.

The active saving process is indicated by the message "NV_SAVE". After saving a plausibility check is executed.

If an error occurs during the check or while saving, the data cannot be saved; an error message is displayed instead (see chapter 10).


Selection:

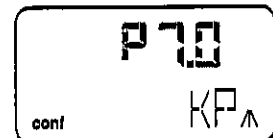
- NV_SAVE** Saves the settings in the non-volatile memory
- CANCEL** Discards all changes made since the last permanent save operation

Parameter group 7: Control parameters



P7.0 KP value (up)

 All control parameters are determined in an optimum way for most actuators during *Autoadjust*. Changes should only be made when *Autoadjust* cannot be executed or control stability cannot be achieved.



The KP value is the gain of the PD controller and results, for example, in a positioning signal of 100% for KP=1 and a control deviation of 100%. The controlling speed and stability are influenced by the KP value. With higher KP values the controlling speed increases.

 The control precision is not affected by the KP value.

To compensate for existing dissymmetries in the controlled system, the KP value is to be set separately for both directions (up/down).

For most actuators sufficient control action can be achieved with a KP value between 2.0 and 10.0. Choosing a KP value smaller than 5.0 can – despite go pulse – result in starting times longer than 400 ms.

In such a case you can shorten the starting time without impairing the stability of the control loop by proportionally increasing the KP and TV value.

If the control loop continues to show instable behavior, even if the KP value has been decreased, a too high offset has been chosen for the output value or other parameters are highly unbalanced.

With parameter P7.0 you can adjust the KP value for the positioning direction **up (towards 100%)**.


Input value: 1.0...400.0

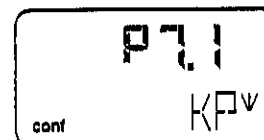
Factory setting: 5.0

Parameter group 7: Control parameters



P7.1 KP value (down)

 All control parameters are determined in an optimum way for most actuators during *Autoadjust*. Changes should only be made when *Autoadjust* cannot be executed or control stability cannot be achieved.



The KP value is the gain of the PD controller and results, for example, in a positioning signal of 100% for KP=1 and a control deviation of 100%. The controlling speed and stability are influenced by the KP value. With higher KP values the controlling speed increases.

 The control precision is not affected by the KP value.

To compensate for existing dissymmetries in the controlled system, the KP value is to be set separately for both directions (up/down).

For most actuators sufficient control action can be achieved with a KP value between 2.0 and 10.0. Choosing a KP value smaller than 5.0 can – despite go pulse – result in starting times longer than 400 ms.

In such a case you can shorten the starting time without impairing the stability of the control loop by proportionally increasing the KP and TV value.

If the control loop continues to show instable behavior, even if the KP value has been decreased, a too high offset has been chosen for the output value or other parameters are highly unbalanced.

With parameter P7.1 the KP value for positioning direction **down** (towards 0%) is adjusted.

Input value: 1.0...400.0

Factory setting: 5.0

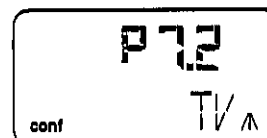
Parameter group 7: Control parameters



P7.2 TV value (up)



All control parameters are determined in an optimum way for most actuators during *Autoadjust*. Changes should only be made when *Autoadjust* cannot be executed or control stability cannot be achieved.



The TV value is the derivative time of the PD controller and results, for example, in an output signal of 100% for TV=100 ms in balanced condition, together with KP=1 for a dynamic control deviation of 100%/100 ms.

Speed and stability are affected by the TV value in such a way that it counteracts dynamically to the KP value. The speed of the control action decreases for an increasing TV value.

To compensate for existing dissymmetries in the controlled system, the TV value is to be set separately for both directions (up/down).

For most actuators satisfactory control action is achieved with a TV value between 20 and 200 ms. In manual configuration choose a TV value of approximately

$$8 \dots 10 \times \text{KP value [ms]}.$$

With parameter P7.2 you set the TV value for the positioning direction **up** (towards 100%).

Input value: **10...800 ms**

Factory setting: **200 ms**

Parameter group 7: Control parameters



P7.3 TV value (down)

The TV value is the derivative time of the PD controller and results, for example, in an output signal of 100% for TV=100 ms in balanced condition, together with KP=1 for a dynamic control deviation of 100%/100 ms.

Speed and stability are affected by the TV value in such a way that it counteracts dynamically to the KP value. The speed of the control action decreases for an increasing TV value.

To compensate for existing dissymmetries in the controlled system, the TV value is to be set separately for both directions (up/down).

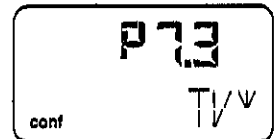
For most actuators satisfactory control action is achieved with a TV value between 20 and 200 ms. In manual configuration choose a TV value of approximately

8 ... 10 X KP value [ms].

With parameter P7.3 you can set the TV value for the positioning direction down (towards 0%).

Input value: 10...800 msec

Factory setting: **200 msec**



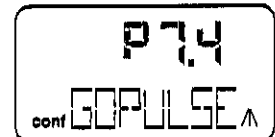
Parameter group 7: Control parameters



P7.4 Go pulse (up)



All control parameters are determined in an optimum way for most actuators during *Autoadjust*. Changes should only be made when *Autoadjust* cannot be executed or control stability cannot be achieved.



The controller issues an amplified positioning signal for the defined pulse length and with the actuator not moving, in order to achieve accelerated starting of the actuator.

In this way the time required to build the pressure needed to begin moving the actuator is reduced.

To compensate for existing dissymmetries in the controlled system, the go pulse is to be set separately for both directions (up/down).

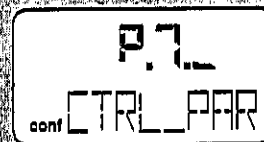
The value determined by *Autoadjust* should not be increased, as this may result in overshooting! If the actuator consistently overshoots the setpoint, decrease the go pulse. For small and fast actuators it may be necessary to set the go pulse to 0, even if *Autoadjust* has determined a higher value.

With P7.4 the go pulse for positioning direction up (towards 100%) is set.

Input value: **0...200 ms**,
in steps of 20 ms

Factory setting: **0 ms**

Parameter group 7: Control parameters



P7.5 Go pulse (down)



All control parameters are determined in an optimum way for most actuators during *Autoadjust*. Changes should only be made when *Autoadjust* cannot be executed or control stability cannot be achieved.



The controller issues an amplified positioning signal for the defined pulse length and with the actuator not moving, in order to achieve accelerated starting of the actuator.

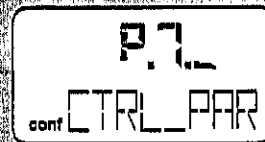
In this way the time required to build the pressure needed to begin moving the actuator is reduced.

To compensate for existing dissymmetries in the controlled system, the go pulse is to be set separately for both directions (up/down).

The value determined by *Autoadjust* should not be increased, as this may result in overshooting! If the actuator consistently overshoots the setpoint, decrease the go pulse. For small and fast actuators it may be necessary to set the go pulse to 0, even if *Autoadjust* has determined a higher value.

With P7.5 the go pulse for positioning direction **down** (towards 0%) is set.

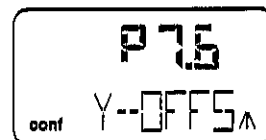
Parameter group 7: Control parameters



P7.6 Y offset (up)



All control parameters are determined in an optimum way for most actuators during *Autoadjust*. Changes should only be made when *Autoadjust* cannot be executed or control stability cannot be achieved.



The "offset for the output signal" linearizes the behavior of the I/P module used and enables fast control even for small control deviations. The value is limited at the low end by a minimum value (neutral zone)

The offset substantially affects the controlling speed for control deviations smaller than 5%. In manual mode the offset values are issued for fine adjustment to the I/P module.

To compensate for existing dissymmetries in the controlled system, the offset is to be set separately for both directions (up/down).

For most actuators satisfactory control is achieved with offset values between 40 and 80%. If the valve overshoots, both offset values should be decreased.

Both offset values should be increased when the actuator stops outside the tolerance band. For larger, slower actuators *Autoadjust* may determine values higher than 80%. In these cases there will be no noticeable difference between fine and coarse adjustment while in manual mode.

With parameter P7.6 the Y offset for positioning direction **up** (towards 100%) is set.

Input value: **Y min...100.0%**

Factory setting: **24.0%**

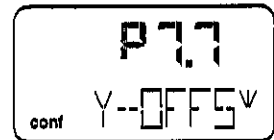
Parameter group 7: Control parameters



P7.7 Y offset (down)



All control parameters are determined in an optimum way for most actuators during *Autoadjust*. Changes should only be made when *Autoadjust* cannot be executed or control stability cannot be achieved.



The "offset for the output signal" linearizes the behavior of the I/P module used and enables fast control even for small control deviations. The value is limited at the low end by a minimum value (neutral zone)

The offset substantially affects the controlling speed for control deviations smaller than 5%. In manual mode the offset values are issued for fine adjustment to the I/P module.

To compensate for existing dissymmetries in the controlled system, the offset is to be set separately for both directions (up/down).

For most actuators satisfactory control is achieved with offset values between 40 and 80%. If the valve overshoots, both offset values should be decreased.

Both offset values should be increased when the actuator stops outside the tolerance band. For larger, slower actuators *Autoadjust* may determine values higher than 80%. In these cases there will be no noticeable difference between fine and coarse adjustment while in manual mode.

With parameter P7.7 the Y offset for positioning direction **down** (towards 0%) is set.

Input value: **Y min...100.0%**

Factory setting: **24.0%**

Parameter group 7: Control parameters



P7.8 Sensitivity



All control parameters are determined in an optimum way for most actuators during *Autoadjust*. Changes should only be made when *Autoadjust* cannot be executed or control stability cannot be achieved.



The sensitivity determines the smallest position change that can be detected in the sensor range. This value is dependent on the quality of the position measurement and on external disturbances.

The triple sensitivity defines the achievable control precision. Furthermore, the sensitivity determines the smallest step change recognizable by the PD controller.

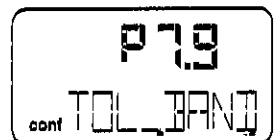
Normally it is not necessary to choose sensitivity values higher than 0.03%.

Input value: **0.03...0.10%**,
with respect to the sensor range

Factory setting: **0.03%**

P7.9 Tolerance band

With this function you can define the tolerance band for control. During *Autoadjust* the positioner determines a minimum tolerance band that cannot be fallen below. You can adjust the tolerance band upward from this minimum to a maximum value of 10%.



The tolerance band defines a +/- range around the setpoint. When the valve position reaches this range, the parameter set of the controller is toggled to a fixed PID- algorithm that is used to continue with slow controlling action.

Only when reaching the sensitivity range the system is considered as balanced (see also P1.2 (page 55)).

Input value: **0.30...10.00%**
in steps of 0.01%

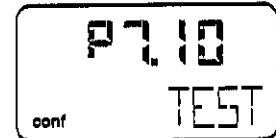
Factory setting: **0.30%**

Parameter group 7: Control parameters



P7.10 Test


With this test the controller is activated, and you can check the effects of the changes to this parameter group, e.g. by introducing setpoint changes or setpoint ramps using a current source.



Normally, **INACTIVE** is shown on the display. To start the test press and hold **ENTER** until the countdown from 3 to 0 is finished.

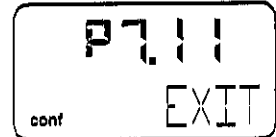
The test is activated. The display shows the control loop symbol and a flashing message. (see also P1.3, page 56).

The test is automatically stopped after two minutes and can also be stopped by pressing any button.

 You cannot start the test when the safe position is active (see parameter 11.0). Instead, the message "FAIL_POS" is displayed.

P7.11 Return to operating level

With this parameter you can leave the configuration level and return to the operating level. Here you can either save data in the non-volatile memory or discard all previously made changes (also the changes in other parameter groups).



To leave the configuration level (with or without saving), press and hold **ENTER** until the countdown from 3 to 0 is finished.

The active saving process is indicated by the message "NV_SAVE". After saving a plausibility check is executed.

If an error occurs during the check or while saving, the data cannot be saved; an error message is displayed instead (see chapter 10).

Selection:

NV_SAVE Saves the settings in the non-volatile memory

CANCEL Discards all changes made since the last permanent save operation


Parameter group 8: Analog output



P8.0 Minimum of current range

With this parameter you determine the low current range limit for the analog position feedback. The current range corresponds to the configured stroke range.



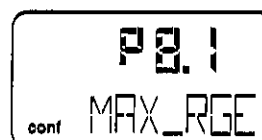
 The current range limits can be freely configured between 4 and 20 mA. However, the current range must not be smaller than 10% (1.6 mA) of the range.


Input value: 4.0...20.0 mA

Factory setting: 4.0 mA

P8.1 Maximum of current range

With this parameter you determine the high current range limit for the analog position feedback.



 The current range limits can be freely configured between 4 and 20 mA. However, the current range must not be smaller than 10% (1.6 mA) of the range.

Input value: 4.0...20.0 mA

Factory setting: 20.0 mA

P8.2 Valve action

With this parameter you determine the valve action for the analog feedback. With direct action the plug-in module for analog position feedback delivers a current that is proportional to the stroke. With reverse action the current is inversely proportional to the stroke.



DIRECT Signal 4...20 mA
 = Position 0...100%

REVERSE Signal 20...4 mA
 = Position 0...100%

Factory setting: **DIRECT**

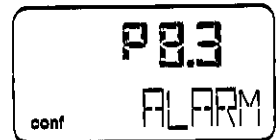
*on the plug-in module for digital position feedback

Parameter group 8: Analog output



P8.3 Alarm message

With this parameter you can define the alarm current for the analog output.



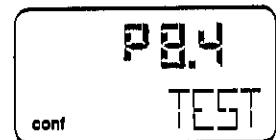
HIGH_CUR Alarm current $I > 20.5$ mA


LOW_CUR Alarm current $I < 3.8$ mA

Factory setting: **HIGH_CUR**

P8.4 Test

This test is used to force the analog position signal to a defined value during commissioning, without affecting the normal process.



 The test is automatically stopped after two minutes. While the test is running, the corresponding message (see below) flashes in the display.

NONE No function

FAILED Simulation of position feedback failure (CPU)
 $I > 20.5$ mA (default setting) or
 $I < 3.8$ mA (only adjustable in factory upon special request)

ALRM_CUR Simulation of an alarm current
 $I < 3.8$ mA or $I > 20.5$ mA resp.

CURRENT Output of the actual current value (setpoint current = analog output) under consideration of all parameters of the setpoint channel and of the analog output.

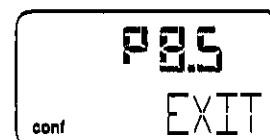
** on the plug-in module for analog feedback*

Parameter group 8: Analog output*



P8.5 Return to operating level

With this parameter you can leave the configuration level and return to the operating level. Here you can either save data in the non-volatile memory or discard all previously made changes (also the changes in other parameter groups).



To leave the configuration level (with or without saving), press and hold **ENTER** until the countdown from 3 to 0 is finished.

The active saving process is indicated by the message "NV_SAVE". After saving a plausibility check is executed.

If an error occurs during the check or while saving, the data cannot be saved; an error message is displayed instead (see chapter 10).

Selection:

NV_SAVE Saves the settings in the non-volatile memory

CANCEL Discards all changes made since the last permanent save operation

** on the plug-in module for analog feedback*

Parameter group 9: Digital output



P9.0 Alarm output logic level

With this parameter you can determine the logic level of the alarm output.



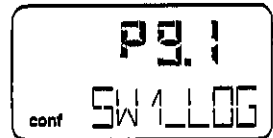
Selection:

ACTIV_HI Alarm with $I > 2$ mA

ACTIV_LO Alarm with $I < 1$ mA

P9.1 SW 1 logic level

With this parameter you can determine the active level for switching output SW1*.



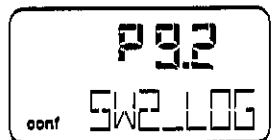
Selection:

ACTIV_HI active with current $I > 2$ mA

ACTIV_LO active with current $I < 1$ mA

P9.2 SW 2 logic level

With this parameter you can determine the active level for switching output SW2*.



Selection:

ACTIV_HI active with current $I > 2$ mA

ACTIV_LO active with current $I < 1$ mA

*SW1 and SW2 are on the plug-in module for digital feedback

Parameter group 9: Digital output

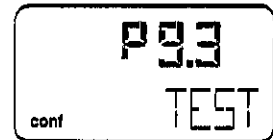


P9.3 Test

Test is for simulation for the digital output



The test is automatically stopped after two minutes and can be aborted by pressing any button.



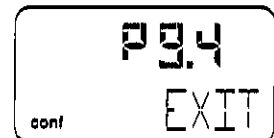
While the test is running, the corresponding message (see below) flashes in the display.

Selection:

- NONE No function
- ALRM_ON Alarm is simulated (DO active)
- SW1_ON Reaching switching point 1 is simulated (SW1 active)
- SW2_ON Reaching switching point 2 is simulated (SW2 active)
- ALL_ON Alarm and switching points are simulated (all DOs active)

P9.4 Return to operating level

With this parameter you can leave the configuration level and return to the operating level. Here you can either save data in the non-volatile memory or discard all previously made changes (also the changes in other parameter groups).



To leave the configuration level (with or without saving), press and hold **ENTER** until the countdown from 3 to 0 is finished.

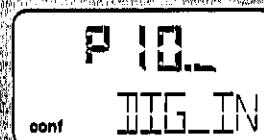
The active saving process is indicated by the message "NV_SAVE". After saving a plausibility check is executed.

If an error occurs during the check or while saving, the data cannot be saved; an error message is displayed instead (see chapter 10).

Selection:

- NV_SAVE Saves the settings in the non-volatile memory
- CANCEL Discards all changes made since the last permanent save operation

Parameter group 10: Digital input



P10.0 Function selection

The digital input defines six functions in the TZID-C positioner that can be selected via local operation.



The functions **POS_0%**, **POS_100%**, and **POS_HOLD** are executed on the operating level in the two control modes. If the respective function has been selected in parameter P10.0, a defined setpoint is given for the controller, when a voltage < 10 V is applied to the digital input. The actuator is then driven to the position defined in P10.0 considering all parameters (setpoint ramp, stroke range, etc.). When the binary setpoint is active, the message "BIN_CTRL" is shown.

When a voltage > 12 V is applied to the digital input, the positioner is working in the selected operating mode.

NONE	No function
POS_0%	The actuator is moved to the 0% position when a voltage < 10 V is applied to the digital input.
POS_100%	The actuator is moved to the 100% position when a voltage < 10 V is applied to the digital input.
POS_HOLD	The actuator holds the last position, when a voltage < 10 V is applied to the digital input.

The operating locks that can be configured with **CNF_LOCK**, **OP_LOCK**, and **ALL_LOCK** can only be selected locally with this parameter after activating the digital input by applying a voltage of 12...24 V prior to entering the configuration level. Thus the accidental activation of a lock is prevented. When a lock is selected, the key symbol starts flashing, to indicate, that the lock will become active upon the next save. If a lock has been activated and saved and no 12...24 V voltage is applied, the key will be permanently displayed. Active locks can be released on the operating level by applying a voltage of 12...24 V to the digital input.

CNF_LOCK	Local access to the configuration level is inhibited. However, local operation on the operating level is possible. The TZID-C can be configured externally (via LKS/modem and PC).
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Parameter group 10: Digital input

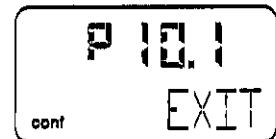


When the operator tries to activate the configuration level, the text "CNF_LOCK" is indicated for appr. 5 seconds in the display.

- OP_LOCK** Local operation is completely locked, i.e. local access to the configuration level and to the operating level is inhibited. For every operator attempt to execute operating steps the text "OP_LOCK" is indicated for appr. 5 seconds in the display.
- ALL_LOCK** Both local operation (operating level and configuration level) and external configuration via LKS/modem and PC are inhibited. For every local attempt to execute operating steps the text "ALL_LOCK" is indicated for approx. 5 seconds on the display.

P10.1 Return to operating level

With this parameter you can leave the configuration level and return to the operating level. Here you can either save data in the non-volatile memory or discard all previously made changes (also the changes in other parameter groups).



To leave the configuration level (with or without saving), press and hold **ENTER** until the countdown from 3 to 0 is finished.

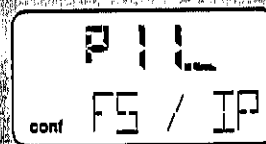
The active saving process is indicated by the message "NV_SAVE". After saving a plausibility check is executed.

If an error occurs during the check or while saving, the data cannot be saved; an error message is displayed instead (see chapter 10).

Selection:

- NV_SAVE** Saves the settings in the non-volatile memory
- CANCEL** Discards all changes made since the last permanent save operation

**Parameter group 11:
Factory setting/IP-Type**



P11.0 Safe position

Use this parameter to activate the safe position prior to loading the factory settings (parameter P11.1) or change the I/P module type (parameter P11.2). Note that this step is mandatory. After setting parameters P11.1 and P11.2 as required, you have to deactivate the safe position again by setting parameter P11.0 again.



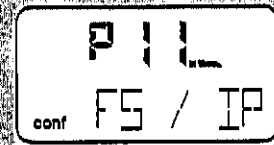
Which safe position is activated - fail safe or fail freeze - can be defined with parameter P11.2. It depends on the I/P-module installed.

Activating/deactivating the safe position:

- Press and hold **ENTER** until the countdown from 3 to one is finished, then release **ENTER**.

The safe position is activated or deactivated, respectively.

**Parameter group 11:
Factory setting/IP-Type**



P11.1 Factory settings

With this parameter you can reset the TZID-C positioner to the factory settings. This is recommended, for example, when an already configured positioner has been mounted to a different actuator



Warning

Make sure that the I/P module type parameter corresponds to the actual I/P module type of the device after loading the factory settings. Otherwise, a dangerous situation may occur during controlling operation. It may happen that the actuator is driven at full speed to the end position.

Danger of injuries!



You can only load the factory settings when the actuator is in safe position (parameter P11.0). Otherwise the action is inhibited, and the message "NO_F_POS" is indicated in the display. If you save the settings in the non-volatile memory after loading the factory setting, operating mode 1.3 is automatically activated on the operating level.

Proceed as follows to load the factory settings:

- Press and hold **ENTER** until the countdown from 3 to 0 has been completed.

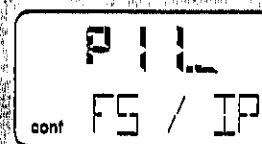
The TZID-C positioner is reset to the factory settings. The message "COMPLETE" is displayed

- Press **ENTER** to acknowledge the message.

Selection:

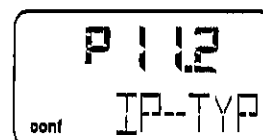
FS_LOAD Loads the factory settings

Parameter group 11: Factory setting/IP-Type



P11.2 I/P module type

With this parameter the TZID-C software is adapted to the installed I/P-module. Setting of this parameter is mandatory upon installation of another I/P module type .



Warning

Make sure that the I/P module type parameter corresponds to the actual I/P module type of the device. Otherwise dangerous situations may occur during controlling operation. It may happen that the actuator is driven at full speed to the end position.

Danger of injuries!



Warning

For safety reasons this parameter must be checked for correct setting after restoring the factory settings.

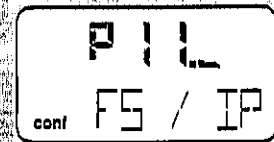


You can only set the I/P module type when the actuator is in safe position (parameter P11.0). Otherwise the action is inhibited and the message "NO_F_POS" is indicated in the display.

Selection:

F_SAFE_1	fail safe, single-acting
F_SAFE_2	fail safe, double-acting
F_FREEZ1	fail freeze, single-acting
F_FREEZ2	fail freeze, double-acting

**Parameter group 11:
Factory setting/IP-Type**



P11.3 Return to operating level

With this parameter you can leave the configuration level and return to the operating level. Here you can either save data in the non-volatile memory or discard all previously made changes (also the changes in other parameter groups).



To leave the configuration level (with or without saving), press and hold **ENTER** until the countdown from 3 to 0 is finished.

The active saving process is indicated by the message "NV_SAVE". After saving a plausibility check is executed.

If an error occurs during the check or while saving, the data cannot be saved; an error message is displayed instead (see chapter 10).

Selection:

NV_SAVE Saves the settings in the non-volatile memory

CANCEL Discards all changes made since the last permanent save operation

7 Maintenance

The TZID-C positioner is virtually maintenance-free.

The device electronics do not contain any adjustable components. User actions of any kind at the electronics are not permissible and not required.



Manipulation of the electronics by the user will invalidate the warranty.

To ensure error-free operation, the positioner must only be operated with instrument air that is free of oil, water and dust according to DIN/ISO 8573-1 (purity and oil content should meet the requirements according to class 3, pressure dew point 10 K below the operating temperature).

We recommend to check the integrated air filter and to replace it if it becomes plugged with dirt (see chapter 7.1).

If dirt or oil has accumulated due to poorly conditioned supply air, the filter in the I/P module may need to be replaced (see chapter 7.2 on page 97). In some cases it may even be necessary to replace the I/P module itself. See chapter 5.8 (page 39) for further information.

If the optional filter regulator has been installed, this filter and water trap should be inspected (see chapter 7.3 on page 99).

Furthermore, the control position should be checked regularly for conformity of the tolerance limit (see chapter 7.4 on page 99).

7.1 Checking the air filter in the positioner

The TZID-C positioner has been equipped with a plastic filter that can collect small amounts of dirt for short periods of time. The filter prevents the sensitive throttles and the air nozzle from being clogged with dirt or damaged. Note that despite the filter the correct conditioning of the supply air according to DIN/ISO 8573-1 is still required.

If the air is excessively polluted the filter element can become clogged and must be replaced. To do this, proceed as described below:

- **Switch off supply air and vent positioner!**



Filter screw is under pressure with air supply switched on.

Warning Danger of injuries!

- Loosen the filter screw with a screwdriver.
- Take out the filter segment with tweezers, check for pollution and replace, if necessary (insert with the truncated end first).
- Screw in and hand-tighten the screw plug.
- Switch on the supply air again.

Immediately after inserting the new filter the positioner is operational. No further measures are required.

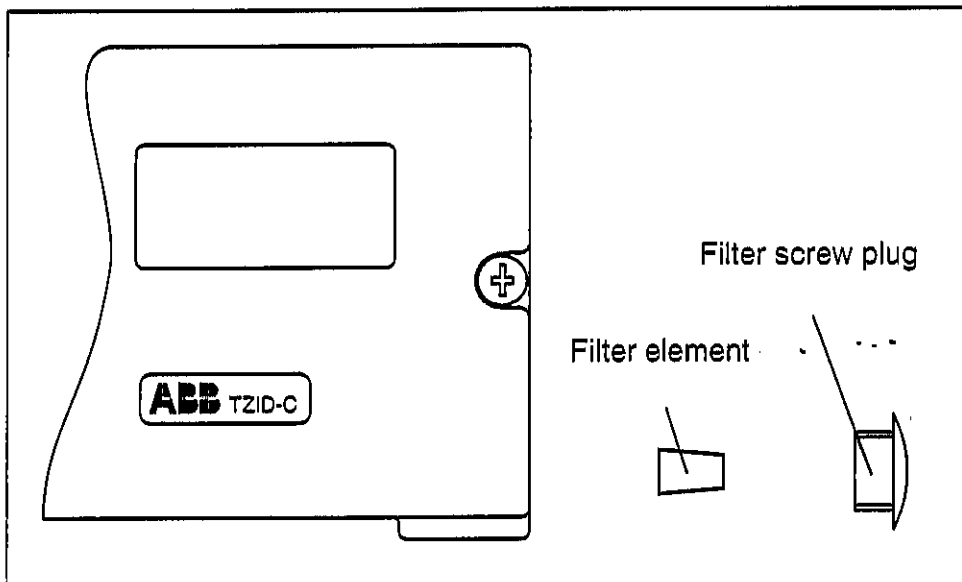


Fig. 37 Filter screw plug (right side of case)

7.2 Replacing the air filter in the I/P module

Deinstall the I/P module to be able to access this air filter. Follow the instructions below:

- Turn off the power supply (4...20 mA signal).
- Turn off the compressed air supply.
- Loosen both screws at the case cover and remove the cover.
- Remove the electrical wiring.
- Remove position indicator from feedback shaft (if applicable).
- If the mechanical kit for digital position feedback is installed with the corresponding slot sensors, remove the feedback shaft.
- Take ESD (electrostatic discharge) precautions (i.e. ESD wrist-band).



Avoid electrostatic discharge to the electronic circuitry that is exposed during the next step.

Caution

Not taking ESD precautions could result in damage to the electronics.

- Undo the screws (four) that hold the plastic cover to the case and remove the cover.

- I/P module (1)
- Analog pos. feedback(2) (if present)
- Digitale position feedback (3) (if present)
- Position sensor (4)

- Loosen the torx screws (5) of size T10 that hold the motherboard to the case; use special screwdriver.

- Take out the motherboard.



Caution

Only touch the motherboard at the edges and avoid direct contact with the components, strip conductors, and soldering joints.

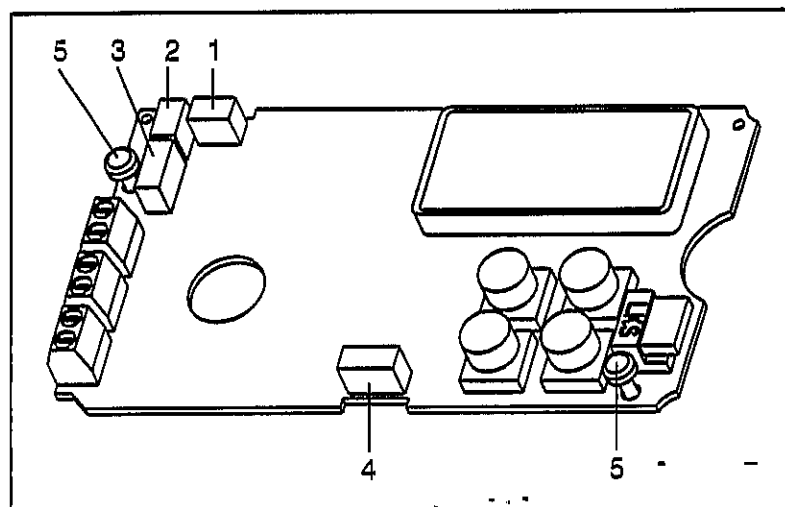


Fig. 38 Motherboard

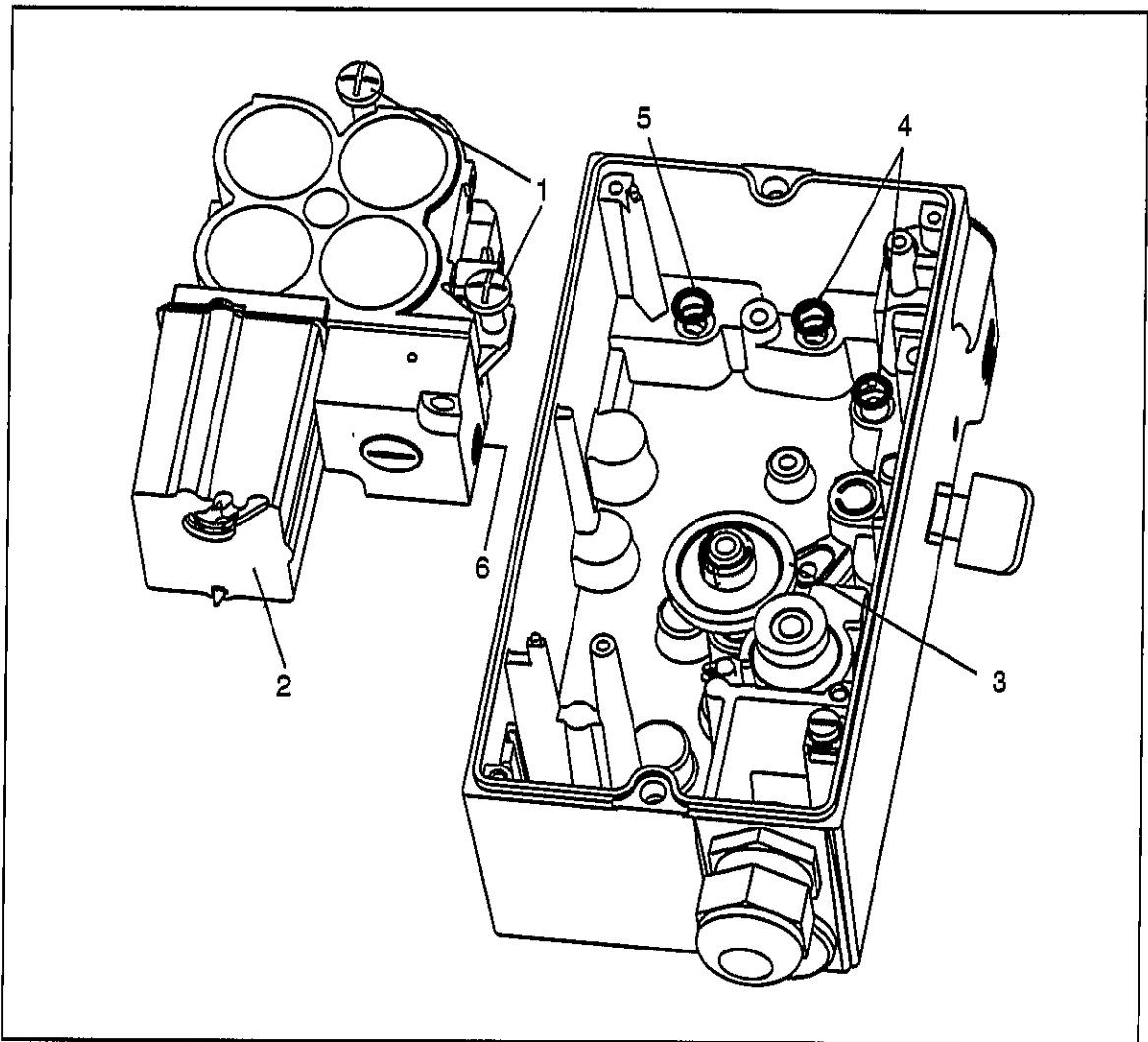


Fig. 39 Filter element in I/P module

- Loosen both screws (1) at the I/P module (2), slightly tilt the I/P module and remove it from under the gear on the feedback shaft (3)



O-rings (4, 5) may stick to the I/P module; remove carefully.

It is recommended to replace the O-rings in this step, as a preventive maintenance action.

- Undo the filter screw on the I/P module (6) using a screw driver.
- Remove the filter element using tweezers. Insert a new filter element.
- Fasten the filter screw again.
- Replace the I/P module. Slightly tilt the I/P module and fit under the gear on the feedback shaft



Caution

Observe correct seating of the O-rings (4, 5)

- Fasten I/P module with both screws (1) in the case; **torque the fasteners to 350 Ncm (31 in-lbs).**
- Replace the motherboard and fasten with the two torx screws in the case.
- Connect all connectors on the motherboard (see Fig. 38 on page 97); ensure that all connectors snap in correctly.
- Replace the plastic cover and fasten to the case.
- Replace the board with the proximity switches and fasten with screws (if applicable).
- Replace the feedback shaft and fasten with screws.
- Replace the position indicator to the feedback shaft (if applicable).
- Reconnect all electrical inputs and outputs (see chapter 4.3 "Electrical connection")
- Feed in the 4...20 mA position demand signal.
- Turn on the compressed air supply.
- Replace the case cover; hand-tighten the screws.

7.3 Checking the filter regulator

Regularly open the drain screw on the air filter regulator housing in order to drain condensed water that may accumulate during operation.

Furthermore, the filter element (bronze sinter) should be checked for dirt. If necessary clean and replace the filter element.

7.4 Functional test/re-adjustment

Check the zero point during operation and adjust, if required (see page 63).

During a plant shutdown, run *Autoadjust* in order to update the operational settings (see page 53).

8 Technical data

8.1 Basic model

Input

Signal range

Nominal range 4...20 mA, split range configurable between 20...100% of nominal range

Two-wire circuitry

Supply voltage 8.7 V DC, without explosion protection
 9.7 V DC for intrinsically safe device

Resistance 435 ohms at 20 mA and 8.7 V DC
 485 ohms at 20 mA and 9.7 V DC

Digital input

Control voltage 12 ... 24 V DC
Current max. 4 mA

Output

Range

0...6 bar (0...90 psi)

Air capacity

at supply pressure of 1.4 bar (20 psi)
5.0 kg/h = 3.9 Nm³/h = 2.3 scfm

at supply pressure of 6 bar (90 psi)
13 kg/h = 10 Nm³/h = 6.0 scfm (Booster, for increasing air capacity, on request)

Function

for single or double acting actuators, air is vented from actuator or actuator is blocked in case of an electrical power failure

Shut-off value

Range 0...20% of positioning signal (if the value falls below the set value, the positioner immediately moves the actuator to the closing position)

Digital output (control current circuit to DIN 19234)

Supply voltage 5 ... 11 VDC

Current < 1.2 mA Logical "0"

Current > 2.1 mA Logical "1"

Effective direction: Normally logical "0" or logical "1" (configurable)

Travel

Angle of rotation

Used range 25 ... 120 ° (rotary actuators)
 25 ... 60 ° (linear actuators)

Stroke time

Range 0...200 seconds, individually configurable for each direction

Dead band time limit

Range 0...200 seconds (monitoring parameter for control until the deviation is within the tolerance band)

Stroke limiting

Min. and max. limits,
freely configurable within 0...100% of total travel (> 10 %)

Air supply**Instrument air**

free of oil, water and dust to DIN/ISO 8573-1
pollution and oil contents according to Class 3
(Purity: max. particle size 5 µm, max. particle density
5mg/m³; Oil contents: max. concentration 1 mg/m³;
Dew point at least 10 °C below operating temperature)

Supply pressure

1.4...6 bar (20...90 psi)

Caution: Do not exceed the max. operating pressure of the actuator!

Air consumption

< 0.03 kg/h (0.08 scfm) (independent of supply pressure)

Transmission data and influences**Direction (output signal or pressure in the actuator)**

Increasing: Increasing signal 4...20 mA
Increas. pressure OUT₁ in the actuator
Decreasing: Increasing signal 4...20 mA
Decreas. pressure OUT₁ in the actuator

Valve action

Direct: Signal 4...20 mA = position 0...100%
Reverse: Signal 20...4 mA = position 0...100%

Characteristic curve (travel = f { signal })

linear, equal percentage 1:25 or 1:50 or 25:1 or 50:1
and freely configurable with 20 reference points

Characteristic deviation

≤ 0.5%

Tolerance band (sensitivity threshold)

0.3...10%, adjustable

Resolution (A/D conversion)

> 4000 steps

Sample rate

20 ms

Influence of ambient temperature

≤ 0.5% for every 10 °C change in temperature

Influence of vibration

≤ +/-1% up to 10g and 80 Hz

Seismic requirements

Meets requirements of DIN/IEC 68-3-3 Class III for strong and strongest earthquakes

Influence of mounting position

No effect

Meets the following requirements

EMC directive 89/336/CEE as of May 1989

EC directive for the CE conformity marking

Communication

HART® protocol

Communication link via

Connector for LKS adapter (standard)

FSK modem for frequency-modulated tapping (optional)

Environmental capabilities

Ambient temperature

-30 to +85 °C

for operation, storage and transport

Relative humidity

< 75% (95% for a short time), non-condensing

Explosion protection

⊕ II 2G EEx ib II C T6

EC type approval certificate TÜV 98 ATEX 1370

EEx ia under preparation

FM/CSA

Case

Material/surface

Aluminum, protection IP 65 (Type 4x)

Bottom part of case varnished black, RAL 9005, matt,

Cover white aluminum RAL 9006

Electrical connections

Screw terminals, internal, for CSA of 2.5 mm²

Cable entry

2 threads Pg. 13.5, 1/2-14 NPT or M20x1.5

1 with cable gland and 1 with pipe plug

Pneumatic connections

Threads G 1/4 or 1/4-18 NPT

Weight: 1.7 kg

Mounting position: any orientation allowed

Dimensions: see dimensional drawings

8.2 Options

Plug-in module for analog position feedback

Signal range 4 ... 20 mA (split ranges configurable)

Two-wire circuitry, power supply 10...30 V DC
(or 48 V DC without explosion protection)

Valve action direct or reverse (configurable)

Characteristic deviation $\leq 1\%$

(The module can be configured for alarm reporting through modulation of the output signal to < 4 mA or > 20 mA.)

Plug-in module for digital position feedback

2 switches for the min. and max. positions
(position adjustable within the range of 0 ... 100%)

Current circuits to DIN 19234

Supply voltage 5 ... 11 V DC

Control current < 1.2 mA= switching state logical "0"

Control current > 2.1 mA= switching state logical "1"

Effective direction: normally logical "0" or logical "1"
(configurable)

Plug-in module for the shutdown function*

In case of a 24 V DC power failure, the positioner can let the valve move to the safe position by depressurizing the actuator independently of the processor. To achieve this, the I/P module power supply is separated by an optocoupler. Both the communication and feedback are still active, since the positioner is powered via the 4 ... 20 mA 2-wire cable.

The shutdown input is electrically isolated from the 4 ... 20 mA signal.

- * The plug-in modules for analog and for digital position feedback are plugged in different slots and, thus, can be installed together.

The plug-in module for the shutdown function, however, plugs into the same slot as the module for digital position feedback, so that these two modules cannot be used together.

Kit for mechanical position indicator

Indicator disk
 Special cover with transparent dome
 Symbol stickers
 Special feedback shaft (prolongated)

Kit for digital position feedback with proximity switches **

2 proximity switches for min. and max. position
 (position adjustable within range of 0 ... 100%)

Current circuit to DIN 19234
 Supply voltage 5 ... 11 V DC
 Control current < 1 mA= switching state logical "0"
 Control current > 3 mA= switching state logical "1"

(works independently of the software and the electronics of the positioner)

Direction of action (logical state):

Slot-type initiator	Position			
	< min.	> min.	< max.	> max.
SJ2-SN (NC)	0	1	1	0
SJ2-S1N (NO)	1	0	0	1

¹⁾ The "digital position feedback" option is directly actuated by the feedback shaft of the TZID-C and can only be used together with the mechanical position indicator described above.

Kit for digital position feedback with 24 V microswitches**

Two 24 V DC/AC microswitches for the min. and max. position.
 Switching points adjustable between 0 and 100 %

Not approved for use in the hazardous areas !

** The "digital position feedback" option is directly actuated by the feedback shaft of the TZID-C and can only be used together with the mechanical position indicator described above.

8.3 Accessories

Mounting material

Attachment kit for linear actuators to DIN/IEC 534
(lateral attachment to Namur)

Attachment kit for rotary actuators to VDI/VE 3845

Kit for integral mounting to 23/24, 23/25 and 23/26 valves

Attachment kit for actuator-specific attachment on request

Pressure gauge block

With pressure gauges for supply and output pressure,
Pressure gauges with plastic case γ 28 mm,
with connection block made of aluminum, varnished black
inclusive of mounting material for attachment to TZID-C.

Filter regulator

All metal version, brass varnished black

Bronze filter element, 40 μ m, with condensate drain

Max. pre-pressure 16 bar, output adjustable to 1.4...6 bar

Spare parts kit

Contains the following spare parts:

No.	Designation	Description
5	Filter	Filter element (housing)
5	Filter	Filter element (I/P module)
1	Sealing ring	Sealing ring for cap
2	Screws	Screws for cap
1	Dust cap	Dust cap IP65
1	Filter screw plug	Filter screw plug for filter element (housing)
1	Sealing ring	Sealing ring washer for filter screw plug
1	Optical position indicator	Optical position indicator
1	Sticker	Sticker for optical position indicator
1	Hinging bolt	Hinging bolt with plastic cone
5	Spring	Spring on hinging bolt
1	Brief operat. instructions	Brief operating instructions

PC adapter for communication

LKS adapter for connector on TZID-C

FSK modem for frequency-shift-keying

PC software for remote configuration and operation

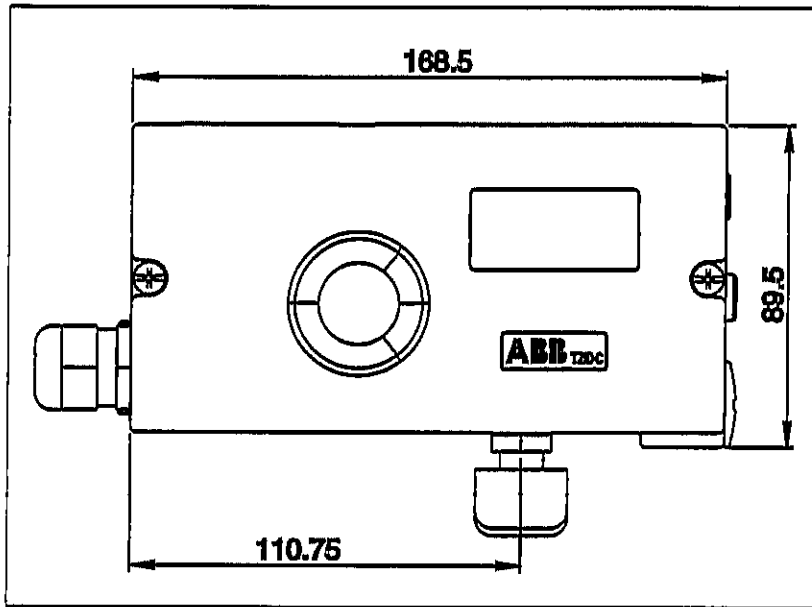
SMART VISION® (Standard) as CD-ROM

Isolating amplifier for signal range 0/4...20 mA

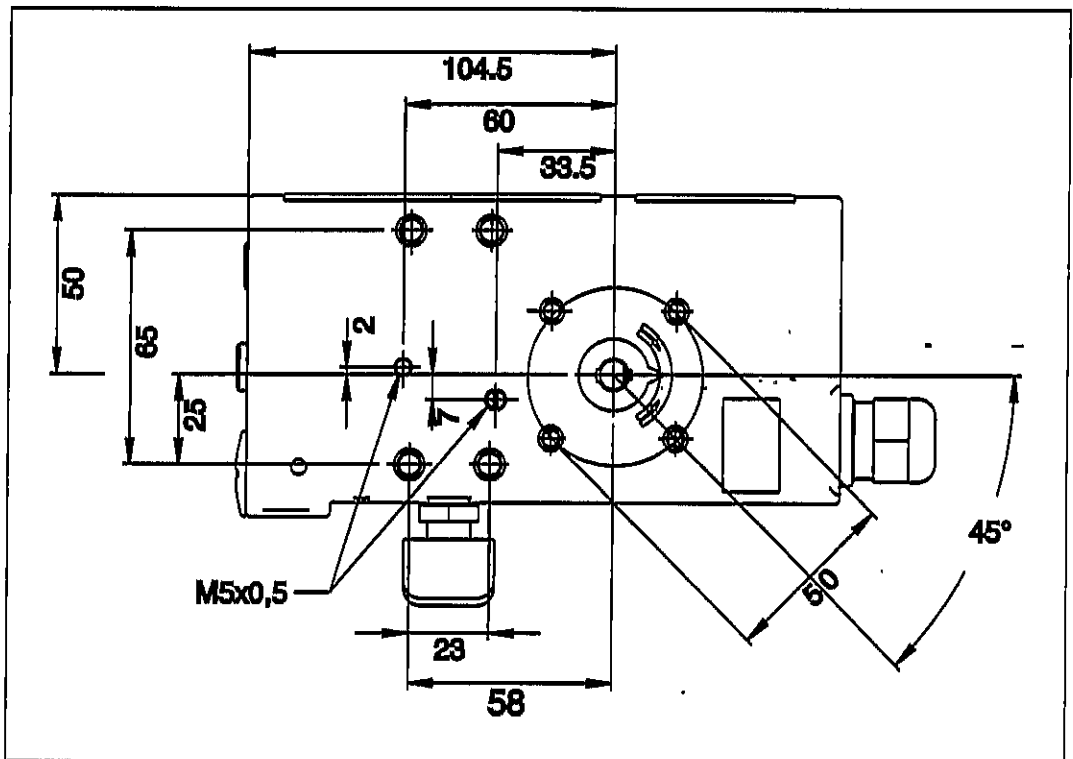
Contrans I or Contrans I_remote
(see separate data sheets for details)

9 Dimensional drawings

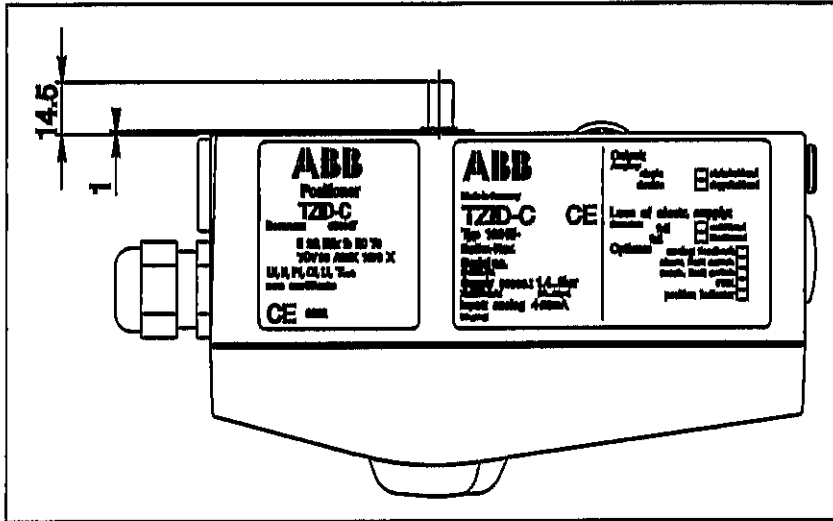
All dimensions in mm



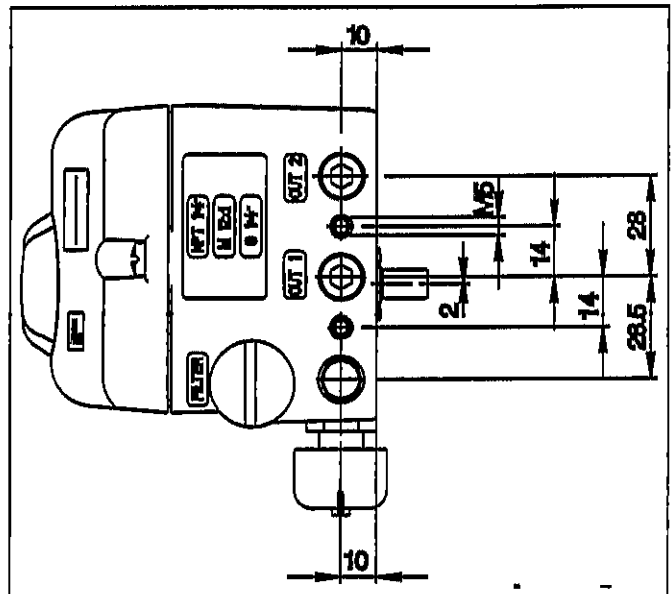
Front view



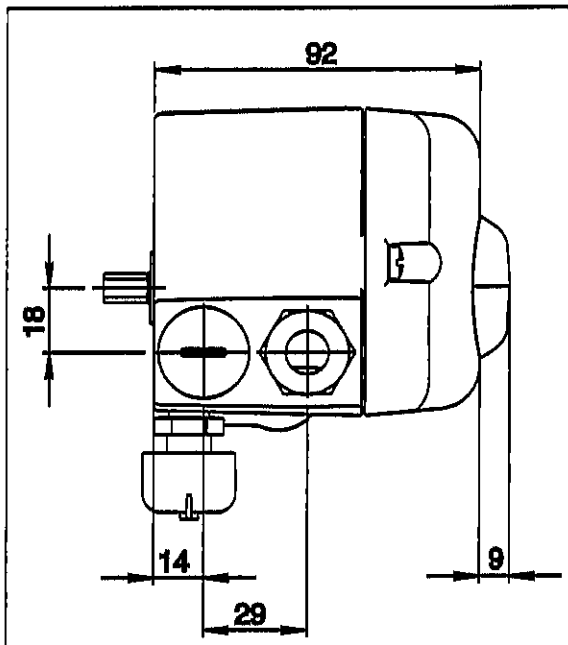
Rear view



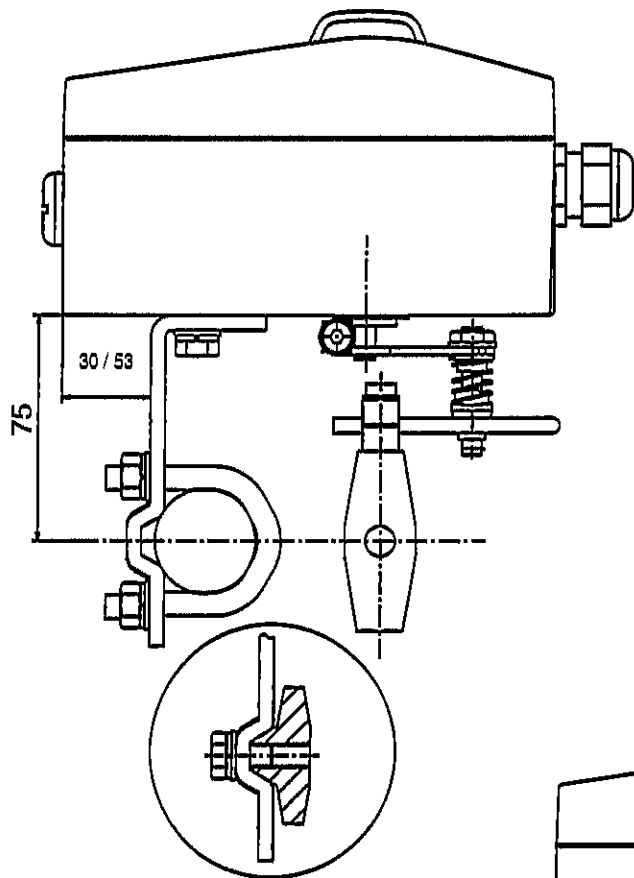
Top view



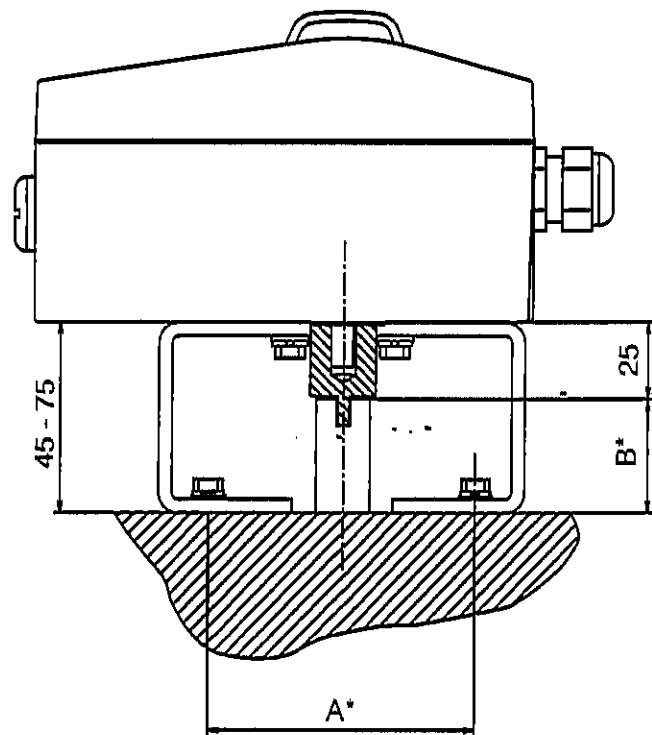
Side view (right)



Side view (left)

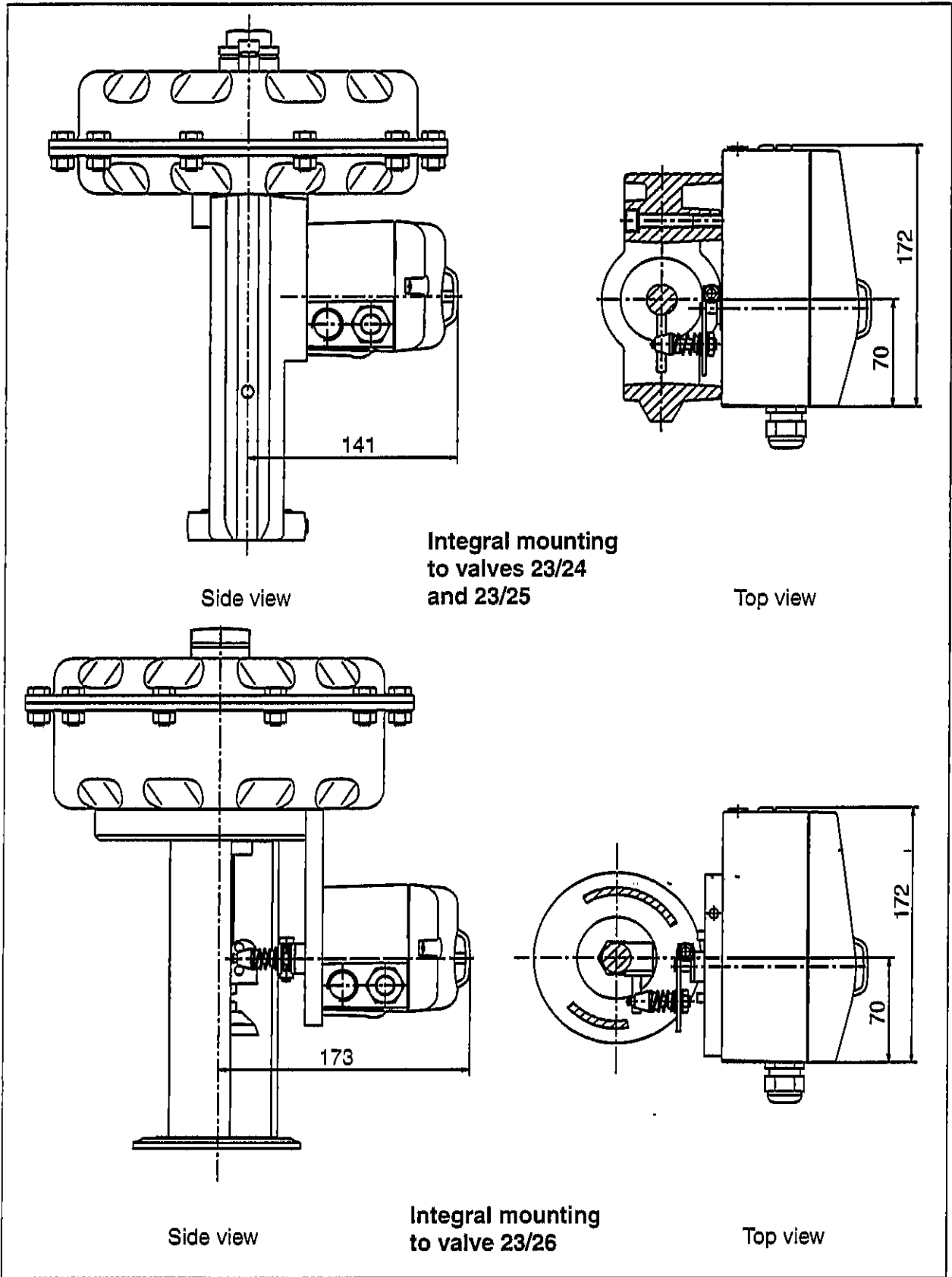


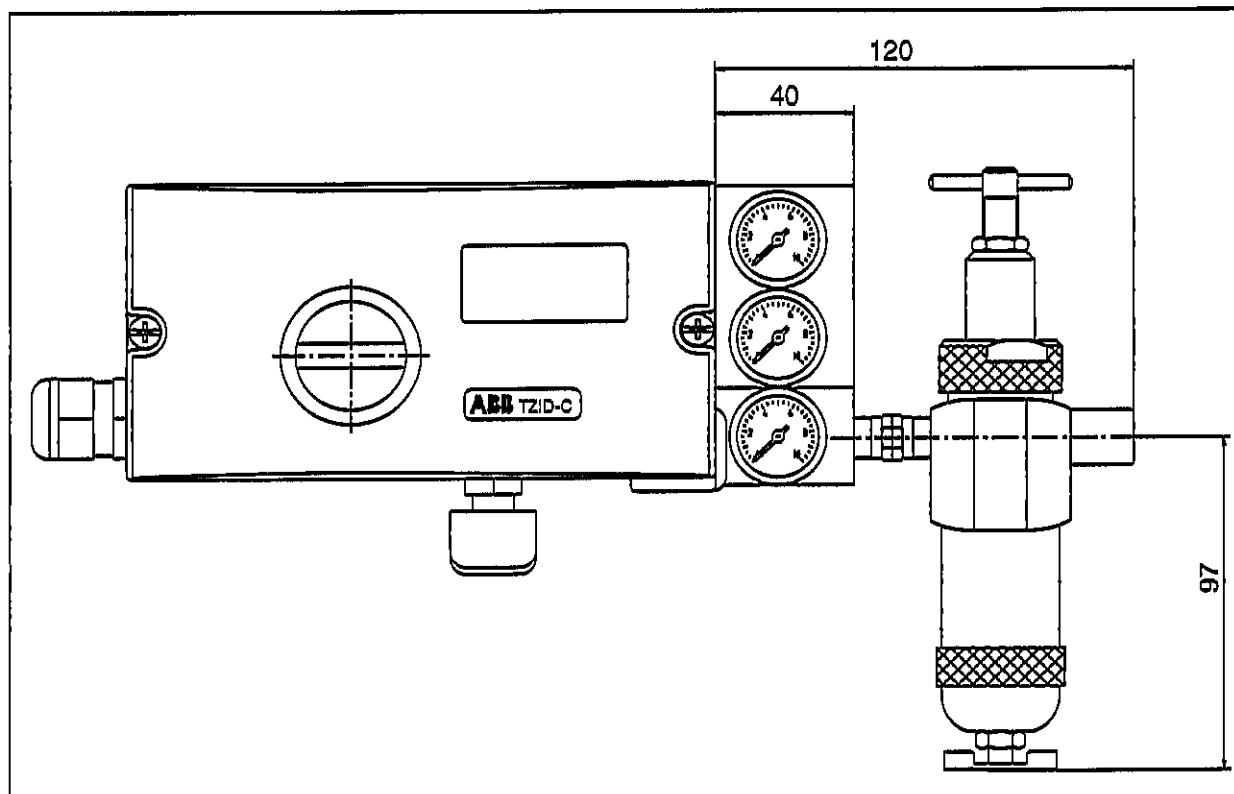
**Mounting to linear actuators
to DIN/IEC 534 / Namur**



*) Dimensions A and B depend on rotary actuator size

**Mounting to rotary actuators to
VDI/VDE 3845**





Pressure gauge block with filter regulator

10 Error codes, alarms, messages

10.1 Error codes

Error description	Code
<p>Explanation: The supply voltage was interrupted or low for more than 20 milliseconds.</p> <p>This error is displayed after resetting the device to indicate the reason for the reset.</p> <p>Measure(s): Check the power source and the wiring.</p>	<p>ERROR 10</p>
<p>Explanation: The supply voltage has fallen below the minimum voltage.</p> <p>Impact: The actuator is moved to the safe position. After appr. 5 seconds the TZID-C positioner is automatically reset and starts up again with "ERROR 10".</p> <p>If a local communication interface (LKS) is connected, the device will go to operating mode "LKS Supply".</p> <p>Measure(s): Check the power source and the wiring.</p>	<p>ERROR 11</p>
<p>Explanation: The position is outside the sensor range. Possible reason is a malfunction in the position sensor.</p> <p>Impact: In control mode: The actuator is moved to the safe position. On the configuration level: The output is set to neutral until a button is pressed. After appr. 5 seconds the TZID-C positioner is automatically reset in control mode and on configuration level.</p> <p>Measure(s): Check the mounting.</p>	<p>ERROR 12</p>

Error description	Code
<p>Explanation: No access possible to the data in the EEPROM.</p> <p>Impact: The actuator is moved to the safe position. After appr. 5 seconds the TZID-C positioner is automatically reset. Attempts are made to restore the data. This compensates for intermittent errors in the communication environment with the EEPROM.</p> <p>Measure(s): If there is still no access to the EEPROM data after resetting the device, load the factory settings (see page 92). If the error still persists, return the device for repair to the manufacturer.</p>	ERROR 20
<p>Explanation: Error during processing the measured values, pointing to an error in the working data (RAM).</p> <p>Impact: The actuator is moved to the safe position. After appr. 5 seconds the TZID-C positioner is automatically reset and the RAM is initialized.</p> <p>Measure(s): If the error still persists after resetting the TZID-C positioner, return the device for repair to the manufacturer.</p>	ERROR 21
<p>Explanation: Error during the table processing, pointing to an error in the working data (RAM).</p> <p>Impact: The actuator is moved to the safe position. After appr. 5 seconds the TZID-C positioner is automatically reset and the RAM is initialized.</p> <p>Measure(s): If the error still persists after resetting the TZID-C positioner, return the device for repair to the manufacturer.</p>	ERROR 22

Error description	Code
<p>Explanation: Error when verifying the checksum of the configuration data (RAM).</p> <p>Impact: The actuator is moved to the safe position. After appr. 5 seconds the TZID-C positioner is automatically reset and the RAM is initialized.</p> <p>Measure(s): If the error still persists after resetting the TZID-C positioner, return the device for repair to the manufacturer.</p>	<p>ERROR 23</p>
<p>Explanation: Error in the processor function registers (RAM).</p> <p>Impact: The actuator is moved to the safe position. After appr. 5 seconds the TZID-C positioner is automatically reset and the RAM is initialized.</p> <p>Measure(s): If the error still persists after resetting the TZID-C positioner, return the device for repair to the manufacturer.</p>	<p>ERROR 24</p>
<p>Explanation: Internal error.</p> <p>Impact: The actuator is moved to the safe position. After appr. 5 seconds the TZID-C positioner is automatically reset.</p> <p>Measure(s): If the error can be reproduced and occurs in the same position after resetting, return the device for repair to the manufacturer.</p>	<p>ERROR 50 ⋮ ERROR 99 - -</p>

10.2 Alarms

Alarm description	Code
<p>Explanation: Leakage between TZID-C positioner and actuator.</p> <p>Impact: Depending on how well the leakage can be compensated there are small control action in regular intervals.</p> <p>Measure(s): Check the piping.</p>	ALARM 1
<p>Explanation: The setpoint current is outside the admissible range, i.e. it is < 3.8 mA or > 20.5 mA.</p> <p>Impact: None</p> <p>Measure(s): Check the current source.</p>	ALARM 2
<p>Explanation: Alarm of the zero monitor. The zero has shifted by more than 4%.</p> <p>Impact: None In control mode a position outside the valve range can only be reached by driving to the limit stops, as the setpoint is limited to 0...100%.</p> <p>Measure(s): Correct the mounting.</p>	ALARM 3
<p>Explanation: Controlling is inactive, because the device does not operate in controlling mode or the digital input is switched.</p> <p>Impact: The controller does not follow the setpoint.</p> <p>Measure(s): Switch to control mode or switch off the digital input.</p>	ALARM 4

Alarm description	Code
<p>Explanation: Positioning timed out. The settling time needed exceeds the configured stroke time.</p> <p>Impact: None, or adaptive control is performed (in adaptive mode).</p> <p>Measure(s): Make sure that</p> <ul style="list-style-type: none"> - the actuator is not blocked - the supply air pressure is adequate - the given time limit is higher than 1.5 times the longest stroke time of the actuator. <p>When the adaption cannot run uninterruptedly for an actuator you should switch on the adaption until the alarm does not occur anymore during controlling actions.</p>	<p>ALARM 5</p>
<p>Explanation: The defined limit value for the stroke counter has been exceeded.</p> <p>Impact: None</p> <p>Measure(s): Reset the counter (only possible via a connected PC with SMART VISION®).</p>	<p>ALARM 6</p>
<p>Explanation: The defined limit value for the travel counter has been exceeded.</p> <p>Impact: None</p> <p>Measure(s): Reset the counter (only possible via a connected PC with SMART VISION®).</p>	<p>ALARM 7</p>

10.3 Messages

Message description	Code
Action stopped by operator	BREAK
Error during plausibility check	CALC_ERR
Action completed, acknowledgement required	COMPLETE
Memory error, data could not be saved	EEPROM_ERR
Safe position is active, action cannot be executed	FAIL_POS
Safe position required, but not active	NO_SF_POS
Valve range limits have not yet been determined; therefore, partial <i>Autoadjust</i> cannot be run	NO_SCALE
Data is saved in the non-volatile memory	NV_SAVE
Sensor range is exceeded, <i>Autoadjust</i> was automatically stopped	OUTOFRNG
Data (factory settings) are being loaded	LOAD
Less than 10 % of the sensor range are used	RNG_ERR
Action running	RUN
Simulation has been started externally from a PC via HART® Protocol; switching outputs, alarm output and analog position feedback are no longer influenced by the process	SIMUL
Actual spring action is different from the adjusted one	SPR_ERR
Time-out; parameter could not be determined within two minutes; <i>Autoadjust</i> was automatically stopped	TIMEDOUT

11 Approvals/Certificates



(1) EG-Baumusterprüfbescheinigung

(2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen - Richtlinie 94/9/EG



(3) **TÜV 98 ATEX 1370 X**

(4) Gerät: Stellungsregler Typ Doc. 901047 (TZID-C)

(5) Hersteller: Hartmann & Braun GmbH & Co. KG
Geschäftsbereich Gerätetechnik

(6) Anschrift: D-30179 Hannover, Hackethalstr. 7

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Baumusterprüfbescheinigung festgelegt.

(8) Der TÜV Hannover/Sachsen-Anhalt e.V., TÜV CERT-Zertifizierungsstelle, bescheinigt als benannte Stelle Nr. 0032 nach Artikel 9 der Richtlinie des Rates der Europäischen Gemeinschaften vom 23. März 1994 (94/9/EG) die Erfüllung der grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie.

Die Ergebnisse der Prüfung sind in dem vertraulichen Prüfbericht Nr. 98/PX25180 festgelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit

EN 50 014:1997

EN 50 020:1994

(10) Falls das Zeichen "X" hinter der Bescheinigungsnummer steht, wird auf besondere Bedingungen für die sichere Anwendung des Gerätes in der Anlage zu dieser Bescheinigung hingewiesen.

(11) Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf die Konzeption und den Bau des festgelegten Gerätes. Weitere Anforderungen dieser Richtlinie sind für die Herstellung und das Inverkehrbringen dieser Geräte zu erfüllen.

(12) Die Kennzeichnung des Gerätes muß die folgenden Angaben enthalten:

II 2 G EEx Ib IIC T6

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Hannover, 08.12.1998

ghw

Der Leiter



0 214 100 000 000 1 11

Diese EG-Baumusterprüfbescheinigung darf nur unverändert weiterverbreitet werden.
Auszüge oder Änderungen bedürfen der Genehmigung des TÜV Hannover/Sachsen-Anhalt e.V.

Seite 1/3

(13)

ANLAGE

(14) **EG-Baumusterprüfbescheinigung Nr. TÜV 98 ATEX 1370 X**

(15) **Beschreibung des Gerätes**

Der Stellungsregler Typ Doc. 901047 (TZID-C) dient zur Steuerung bzw. Regelung von pneumatisch angetriebenen Ventilen durch einen eingepprägten Signalstrom von 4 ... 20 mA. Ein integrierter Wegsensor ermittelt die aktuelle Position des Ventilantriebes. Ein integrierter Strom/Druckwandler (I/P) wird zur Steuerung der pneumatischen Hilfsenergie verwendet.

Der zulässige Umgebungstemperaturbereich in Abhängigkeit von der Temperaturklasse ist der folgenden Tabelle zu entnehmen:

Temperaturklasse	Umgebungstemperaturbereich
T4	-40°C bis +85°C
T5	-40°C bis +50°C
T6	-40°C bis +35°C

Elektrische Daten

Signalstromkreis
Klemme 11(+), 12(-)

in Zündschutzart Eigensicherheit EEx ib IIC
nur zum Anschluß an einen bescheinigten eigensicheren Stromkreis mit den Höchstwerten:
 $U_1 = 30 \text{ V}$
 $I_1 = 320 \text{ mA}$
 $P_1 = 1,1 \text{ W}$

wirksame innere Kapazität $C_1 = 6,6 \text{ nF}$
Die wirksame innere Induktivität ist vernachlässigbar klein.

Schalteingang
Klemme 81(+), 82(-)

in Zündschutzart Eigensicherheit EEx ib IIC
nur zum Anschluß an einen bescheinigten eigensicheren Stromkreis mit den Höchstwerten:
 $U_1 = 30 \text{ V}$

wirksame innere Kapazität $C_1 = 3,7 \text{ nF}$
Die wirksame innere Induktivität ist vernachlässigbar klein.

Schaltausgang
Klemme 83(+), 84(-)

in Zündschutzart Eigensicherheit EEx ib IIC
nur zum Anschluß an einen bescheinigten eigensicheren Stromkreis mit den Höchstwerten:
 $U_1 = 30 \text{ V}$
 $P_1 = 500 \text{ mW}$

wirksame innere Kapazität $C_1 = 3,7 \text{ nF}$
Die wirksame innere Induktivität ist vernachlässigbar klein.

**Anlage zur EG-Baumusterprüfbescheinigung TÜV 98 ATEX 1370 X**

Lokale Kommunikations- zum Anschluß an ein Programmiergerät außerhalb des
schnittstelle (LKS) explosionsgefährdeten Bereiches

Die eigensicheren Stromkreise sind untereinander bis 60 V sicher galvanisch getrennt. Die lokale Kommunikationsschnittstelle (LKS) ist mit dem Signalstromkreis verbunden.

(16) Prüfungsunterlagen sind im Prüfbericht Nr.: 98/PX25180 aufgelistet.

(17) Besondere Bedingung

Die „Lokale Kommunikationsschnittstelle“ (LKS) darf nur außerhalb des explosionsgefährdeten Bereiches betrieben werden.

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

keine zusätzlichen



CSA INTERNATIONAL

Certificate of Compliance

Certification: 1052414

Master Contract: 203012

Project: 1052414

Date Issued: July 31, 2000

Issued to: ABB Automation Products GmbH
Schillerstraße 72
D-32425 Minden
Germany
Attention: Mr. Wolfgang Lasarzik

The products listed below are eligible to bear the CSA Mark shown



Issued by: Dorin Stochitoiu

Signature: _____

PRODUCTS

CLASS 2258 02 - PROCESS CONTROL EQUIPMENT - For Hazardous Locations

Class I, Div 2, Groups A, B, C and D; Class II, Div 2, Groups E, F and G; Class III; Enclosure Type 4X:

Model TZID-C, P/N V18345-x0x2x2xx0x Intelligent Positioner; input rated 30V dc max, 4-20mA; max output pressure 90 psi; max ambient 85 Deg C.

CLASS 2258 04 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations

Class I, Div 1, Groups A, B, C and D; Class II, Div 1, Groups E, F and G; Class III, Div 1; Enclosure Type 4X:

Model TZID-C, P/N V18345-x0x2x2xx0x, Intelligent Positioner; input rated 30V dc max, 4-20mA; max output pressure 90 psi; intrinsically safe with entity parameters of: Terminals 11/12: V max = 30V, I max = 104mA, Ci = 6.6nF, Li = 0uH; Terminals 81/82: V max = 30V, I max = 110mA, Ci = 3.7nF, Li = 0uH; Terminals 83/84: V max = 30V, I max = 96mA, Ci = 3.7nF, Li = 0uH; Terminals 31/32: V max = 30V, I max = 110mA, Ci = 6.6nF, Li = 0uH; Terminals 41/42 and 51/52: V max = 30V, I max = 96mA, Ci = 3.7nF, Li = 0uH; Terminals Limit 2 41/42 and Limit 1 51/52: V max = 15.5V, I max = 52mA, Ci = 20nF, Li = 30uH; when installed per installation Drawing No 901064; Temperature Code T4; Max Ambient 85 Deg C.

Note 1: The "x" in P/N denotes minor mechanical variations or optional features.

Note 2: Local communication interface LKS shall not be used in hazardous location.

Note 3: Each pair of conductors of each in intrinsic safety circuit shall be shielded.



CSA INTERNATIONAL

Certification: 1052414

Master Contract: 203012

Project: 1052414

Date: July 31, 2000

APPLICABLE REQUIREMENTS

CAN/CSA-C22.2 No 94-M91	- Special Purpose Enclosures
CSA Std C22.2 No 142-M1987	- Process Control Equipment
CAN/CSA-C22.2 No 157-92	- Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations
CSA Std C22.2 No 213-M1987	- Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations
CAN/CSA-C22.2 No 25-1966	- Enclosures for use in Class II Groups E, F and G Hazardous Location

MARKINGS

- CSA Monogram
- Company Name
- Model Number
- Serial Number
- Electrical Rating
- Hazardous Location Designation
- Entity Parameters (V max, I max, Ci, Li)
- Special Purpose Enclosure Designation, "Type 4X"
- Maximum Ambient
- The Symbol "Exia"
- The Words "INTRINSICALLY SAFE/SECURITE INTRINSEQUE"
- Reference to Installation Instructions
- A statement re: Changing Components
- Caution statement re: Disconnection of Circuits...
- Statement: Local Communication Interface LKS cannot be Used in Hazardous Locations.



CSA INTERNATIONAL

Supplement to Certificate of Compliance

Certificate: 1052414

Master Contract: 203012

Project: 1052414

Issued to: ABB Automation Products GmbH
SchillerstraBe 72
D-32425 Minden
Germany
Attention: Mr. Wolfgang Lasarzik

*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Issued By: Dorin Stochitoiu

Signature: _____

Product Certification History

Project	Date	Description
1052414	July 31, 2000	Original Certification - Model TZID-C Positioner.

APPROVAL REPORT

**TZID-C POSITIONER
FOR
HAZARDOUS (CLASSIFIED) LOCATIONS**

PREPARED FOR:

**ABB AUTOMATION PRODUCTS
SCHILLERSTR 72
32425 MINDEN, GERMANY**

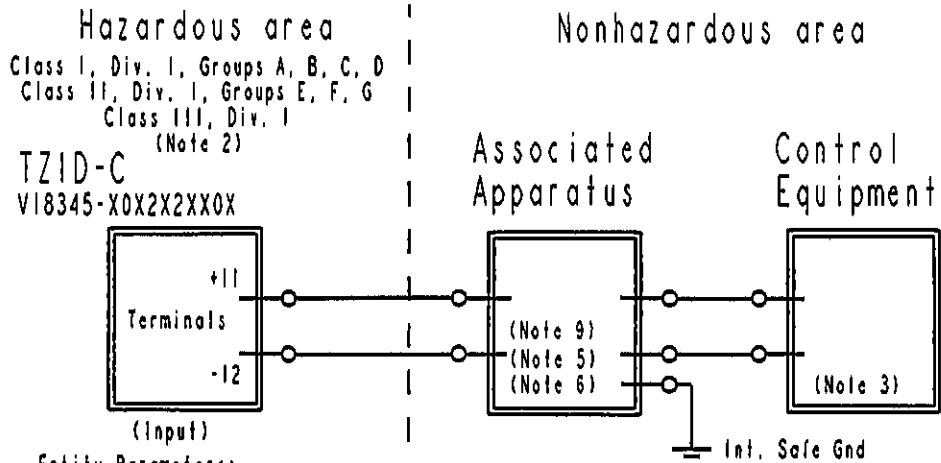
**J.I. 3005029
3610, 3611
August 17, 2000**

FACTORY MUTUAL |



1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, Massachusetts 02062

CONTROL DOCUMENT NO 901064

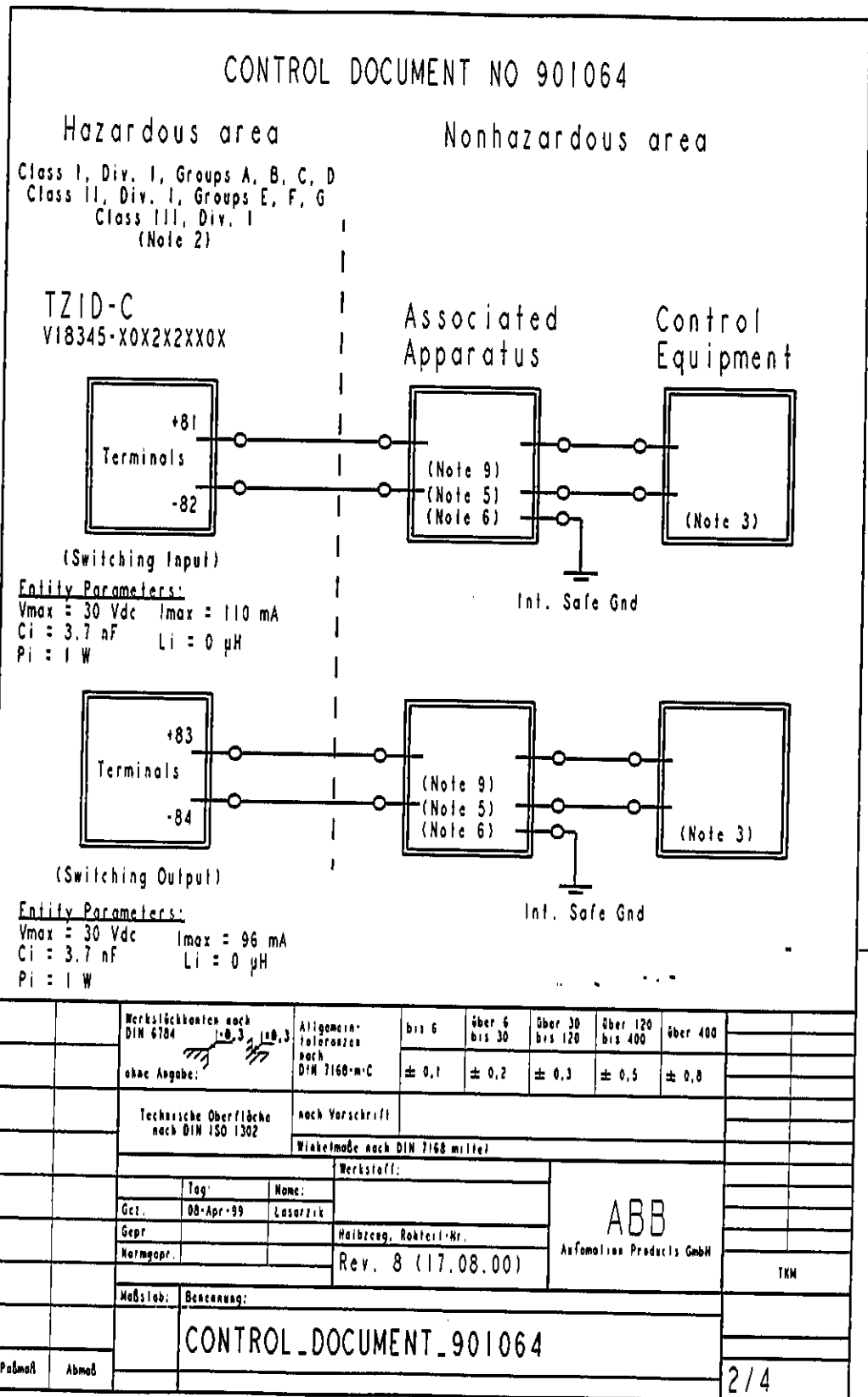


Entity Parameters:
 $V_{max} = 30 \text{ Vdc}$ $I_{max} = 104 \text{ mA}$
 $C_i = 6.6 \text{ nF}$ $L_i = 0 \text{ pH}$
 $P_i = 1 \text{ W}$

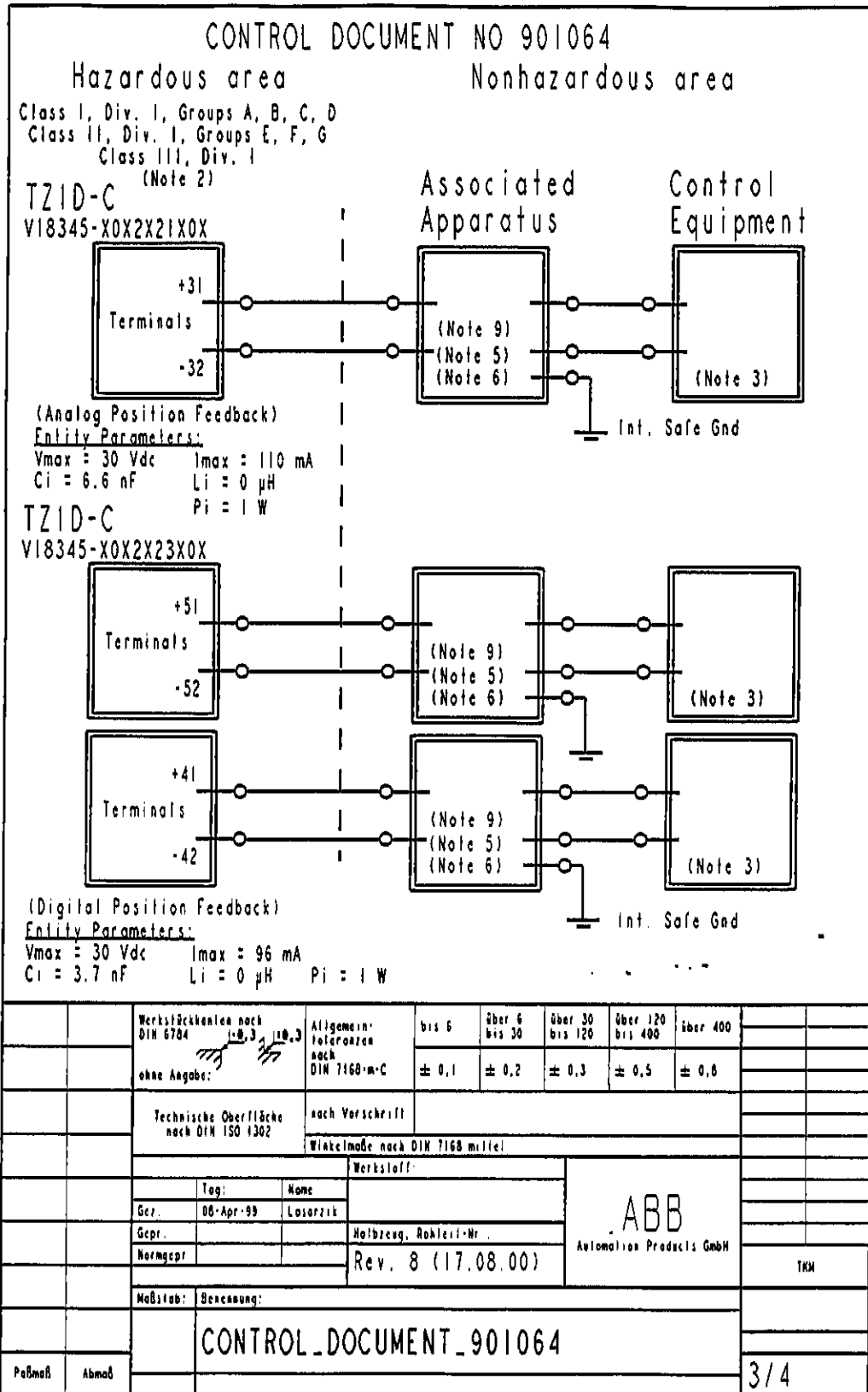
- Notes**
1. V_{oc} or $V_i \leq V_{max}$, I_{sc} or $I_i \leq I_{max}$, $C_a \geq C_i + C_{cable}$, $L_a \geq L_i + L_{cable}$; $P_o \leq P_i$
 2. Dust-tight conduit seal must be used when installed in Class II and Class III environments.
 3. Control equipment connected to barrier must not use or generate more than 250 Vrms or Vdc
 4. Installation should be in accordance with ANSI/ISA RPI2.6 "Installation of Intrinsically Safe System for Hazardous (Classified) Locations" and the National Electrical Code (ANSI/NFPA 70).
 5. The configuration of associated apparatus must be FMRC Approved/CSA Approved as required.
 6. Associated apparatus manufacturers installation drawing must be followed when installing this equipment.
 7. When connecting conduit to the enclosure use conduit hubs that have the same environmental rating as the enclosure.
 8. No revision to drawing without prior FMRC Approval/CSA Approval.
 9. OUTPUT CURRENT MUST BE LIMITED BY A RESISTOR SUCH THAT THE OUTPUT VOLTAGE CURRENT PLOT IS A STRAIGHT LINE DRAWN BETWEEN OPEN CIRCUIT VOLTAGE AND SHORT CIRCUIT CURRENT.
 10. Tampering and replacement with non-factory components may adversely affect the safe use of the system. Substitution of components may impair suitability for hazardous locations.
 11. FOR DIV. 2 USE: Do not connect or disconnect unless the power was switched off or the area is known to be non hazardous.
 12. Local communication interface LKS shall not be used in hazardous locations.
 13. To maintain intrinsic safety, wiring associated with each channel must be run in separate cable shields connected to intrinsically safe (associated apparatus) ground.

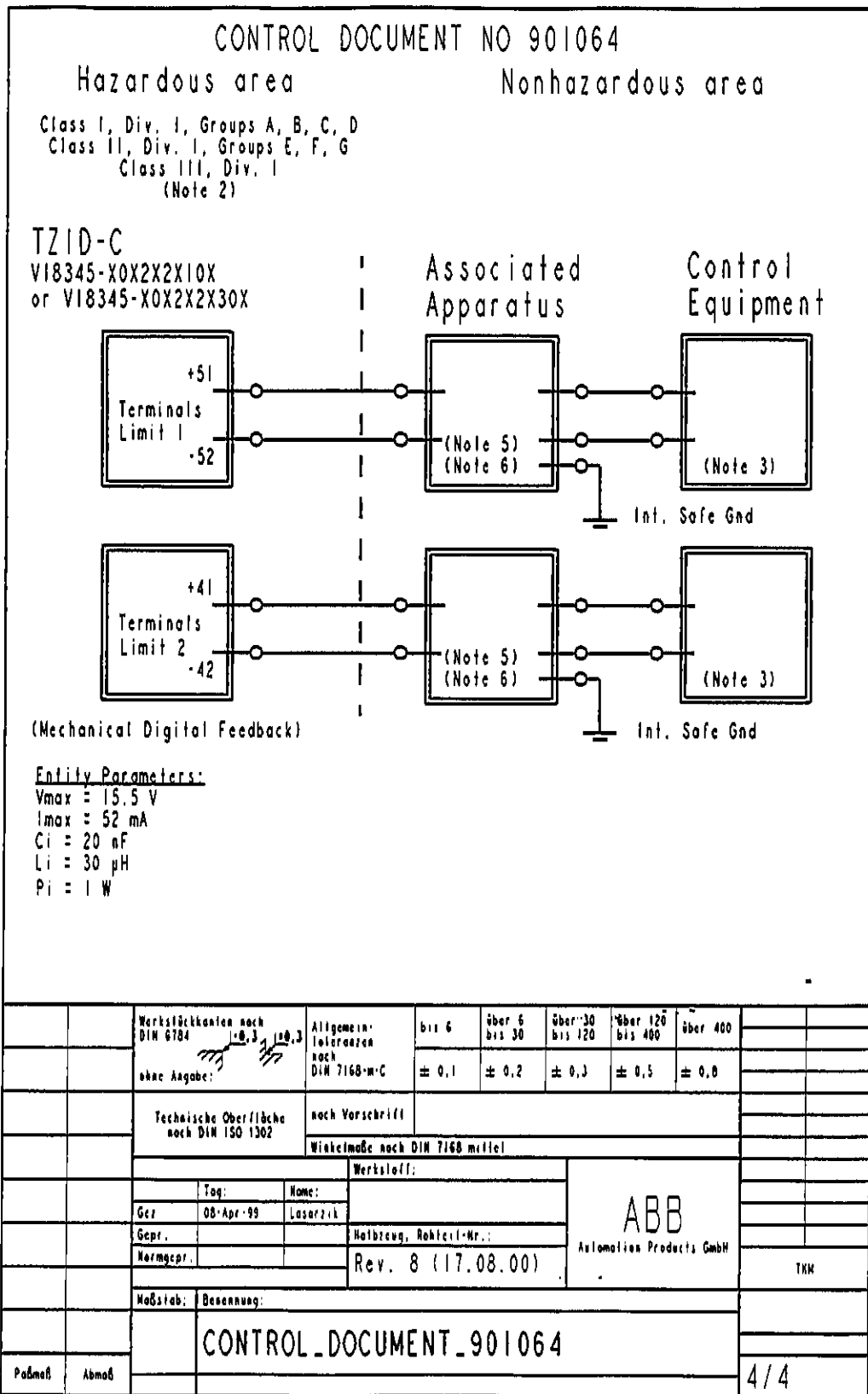
Das Maßverzechnis an dieser Zeichnung stellt sich als Verantwortlichkeit und nicht rechtliche Bestätigung durch Empfänger an. Details sind durch die Zeichnung zu erlangen.

Werkstückkonten nach DIN 6784 $\pm 0,3$ $\pm 0,3$ ohne Angabe:		Allgemeine Toleranzen nach DIN 7168-m-C		bis 6	über 6 bis 30	über 30 bis 120	über 120 bis 400	über 400		
				$\pm 0,1$	$\pm 0,2$	$\pm 0,3$	$\pm 0,5$	$\pm 0,8$		
Technische Oberfläche nach DIN ISO 1302		nach Vorschrift								
		Winkelmaße nach DIN 7168 mittel								
		Werkstoff:								
		Tag: 08-Apr-99	Name: Lasarzik	<div style="text-align: center;"> <p>ABB Automotive Products GmbH</p> </div>						
		Gepr.:	Halbzeug, Rohleil-Nr.:							
		Normgepr.:	Rev. 8 (17.08.00)							
		Maßstab:	Bezeichnung:	<div style="text-align: center;"> <h3>CONTROL_DOCUMENT_901064</h3> </div>						
Paßmaß	Abmaß									1 / 4



Das Weiterverbreiten an dieser Zeichnung außerhalb des Verantwortungsbereichs der ABB ist ausdrücklich untersagt.



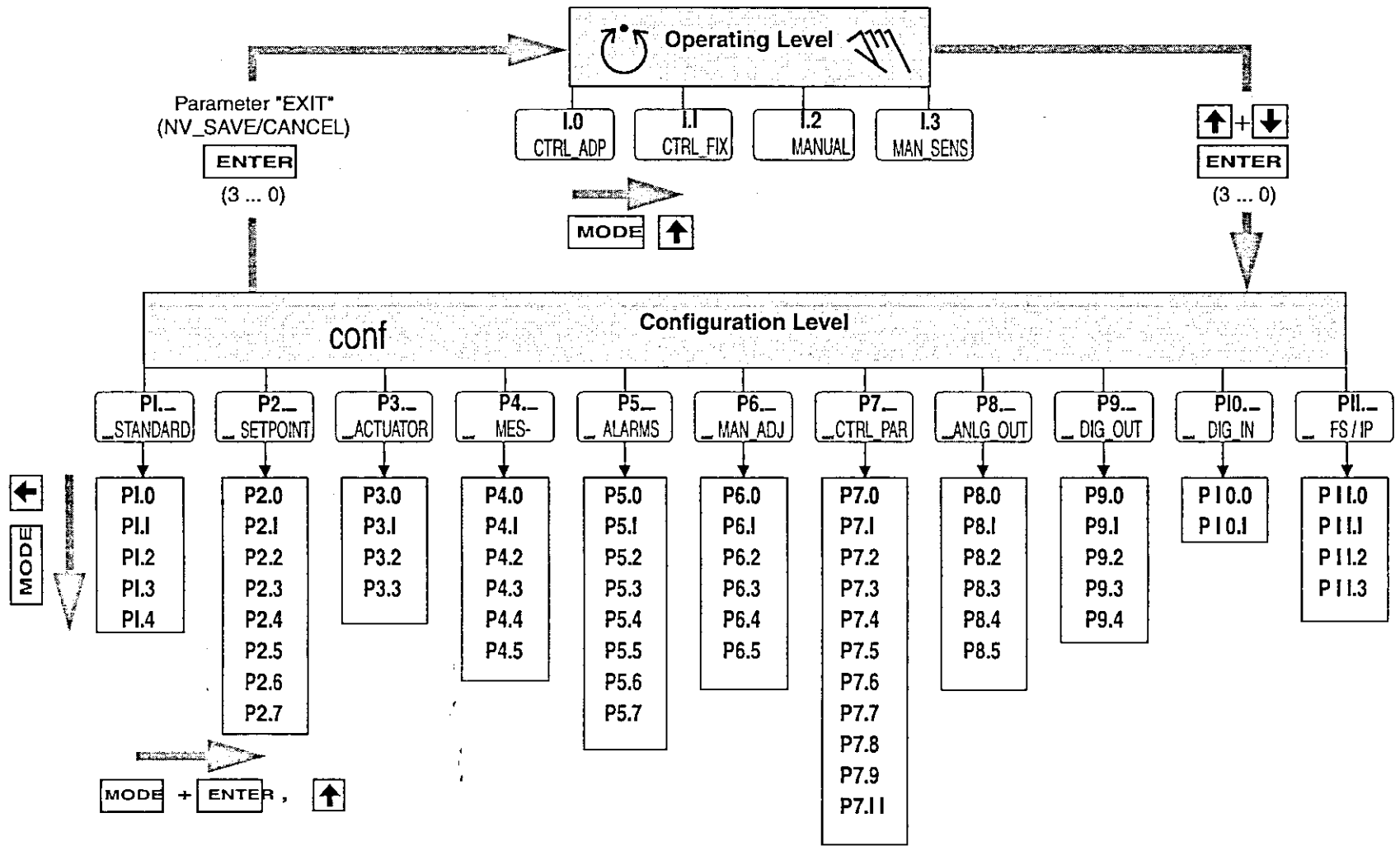


Das Weiterrecht an dieser Zeichnung verbleibt bei der Verantwortlichkeit und widerrechtliche Benutzung durch Empfänger od. Dritte ist ausdrücklich Folge.

Appendix A: Parameter overview

ID	Designator	Name	see
P1._	STANDARD		
P1.0	ACTUATOR	Actuator type	page 53
P1.1	AUTO_ADJ	<i>Autoadjust</i>	page 53
P1.2	TOL_BAND	Tolerance band	page 55
P1.3	TEST	Test	page 56
P1.4	EXIT	Return to operat. level	page 56
P2._	SETPOINT		
P2.0	MIN_RGE	Min. of setpoint range	page 57
P2.1	MAX_RGE	Max. of setpoint range	page 57
P2.2	CHARACT	Characteristic curve	page 58
P2.3	ACTION	Valve action	page 58
P2.4	SHUT-OFF	Shut-off value	page 59
P2.5	RAMP [^]	Setpoint ramp, up	page 59
P2.6	RAMP [∨]	Setpoint ramp, down	page 60
P2.7	EXIT	Return to operat. level	page 60
P3._	ACTUATOR		
P3.0	MIN_RGE	Min. of stroke range	page 61
P3.1	MAX_RGE	Max. of stroke range	page 62
P3.2	ZERO_POS	Zero position	page 63
P3.3	EXIT	Return to operat. level	page 63
P4._	MESSAGES		
P4.0	TIME_OUT	Deadband time limit	page 64
P4.1	POS_SW1	Switching point SW1	page 64
P4.2	POS_SW2	Switching point SW2	page 65
P4.3	SW1_ACTV	Active direction SW1	page 65
P4.4	SW2_ACTV	Active direction SW2	page 65
P4.5	EXIT	Return to operat. level	page 66
P5._	ALARMS		
P5.0	LEAKAGE	Leakage to actuator	page 67
P5.1	SP_RGE	Outside setpoint range	page 67
P5.2	SENS_RGE	Zero error	page 67
P5.3	CTRLER	Controller inactive	page 68
P5.4	TIME-OUT	Positioning time-out	page 68
P5.5	STRK_CTR	Stroke counter	page 68
P5.6	TRAVEL	Travel counter	page 69
P5.7	EXIT	Return to operat. level	page 69

ID	Designator	Name	see
P6._	MAN_ADJ		
P6.0	MIN_VR	Min. valve range	page 70
P6.1	MAX_VR	Max. valve range	page 71
P6.2	ACTUATOR	Actuator type	page 72
P6.3	SPRNG_Y2	Spring action (Y2)	page 72
P6.4	ADJ_MODE	<i>Autoadjust</i> mode	page 73
P6.5	EXIT	Return to operat. level	page 73
P7._	CTRL_PAR		
P7.0	KP [^]	KP value, up	page 74
P7.1	KP ^v	KP value, down	page 75
P7.2	TV [^]	TV value, up	page 76
P7.3	TV ^v	TV value, down	page 77
P7.4	GOPULSE [^]	Go pulse, up	page 78
P7.5	GOPULSE ^v	Go pulse, down	page 79
P7.6	Y-OFFSET [^]	Y offset, up	page 80
P7.7	Y-OFFSET ^v	Y offset, down	page 81
P7.8	SENSITIV	Sensitivity	page 82
P7.9	TOL_BAND	Tolerance band	page 82
P7.10	TEST	Test	page 83
P7.11	EXIT	Return to operat. level	page 83
P8._	ANLG_OUT		
P8.0	MIN_RGE	Min. of current range	page 84
P8.1	MAX_RGE	Max. of current range	page 84
P8.2	ACTION	Valve action	page 84
P8.3	ALARM	Alarm message	page 85
P8.4	TEST	Test	page 85
P8.5	EXIT	Return to operat. level	page 86
P9._	DIG_OUT		
P9.0	ALRM_LOG	Alarm output logic level	page 87
P9.1	SW1_LOG	SW1 logic level	page 87
P9.2	SW2_LOG	SW2 logic level	page 87
P9.3	TEST	Test	page 88
P9.4	EXIT	Return to operat. level	page 88
P10._	DIG_IN		
P10.0	FUNCTION	Function selection	page 89
P10.1	EXIT	Return to operat. level	page 90
P11._	FS / IP		
P11.0	FAIL_POS	Safe position	page 91
P11.1	FACT_SET	Factory setting	page 91
P11.2	IP_TYP	I/P module type	page 93
P11.3	EXIT	Return to operat. level	page 94



Parameter overview

Subject to technical changes.

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42/18-64 EN Rev. 4.0
Issue 06.01

PART 4



Masonellan

MASONEILAN ORDER(S) :

02-04648 / 02-04909 / 02-04910 / 02-04911 / 02-04912 / 02-04913 / 02-04914 / 02-04915

C : SOFT GOODS

L1 : WEARING PART LEVEL 1

L2 : WEARING PART LEVEL 2

Spare Parts Interchangeability Record

Somme QTY / VALVE			DIA *	VALVE SERIES	TAG
			0.5	1	
LEVEL	PART NO	PART DESIGNATION	REF.		
	9719771063430000	SEAL RING	B011	2728260	
	9719771121930000	SEAL RING 2"	B011		
	9719771123430000	SEAL RING 2"	B011		
	9719771203430000	SEAL RING 4"	B027		
	9719771213430000	SEAL RING 6"	B027		
	9719771233430000	SEAL RING	B011		
	9719771243430000	SEAL RING 12"	B027		
	9719771253430000	PISTON RING	B027		
	9719771299310000	SEAL-RING	B011		
	9719771309310000	OUTER SEAL RING	B011		
	9719771329310000	OUTER SEAL RING	B027		
	9719771339310000	SEAL RING	B011		
	9719771349310000	SEAL RING	B011		
	9720010107890000	INCO ROD WIPER	A011		
	9720010117890000	INCO ROD WIPER	A011		
	9720010127890000	INCO ROD WIPER	A011		
	180000182228200000	GASKET	A015		
	180000182338200000	GASKET	A019		
	180000454196970000	O-RING	B028		
	180000463146970000	O-RING	B090		
	18000465876970000	O-RING	B090		
	180000664177790000	PACKING SET	B006		
	790000288129700000	PACKING	B006		
	790000288199700000	PACKING	B006		
	790000288299700000	PACKING	B080		
	790000288359700000	PACKING	B080		
	(13a)250036	GASKET KIT L1DL2D A 12 component :	0		
	(13b)180170	GASKET	0		
	(13c)4097	SEAL STRIP	0		
	(13d)4429	PACKING RING	0		
	(13e)250519	GASKET KIT BJ20,BJ/KL,KL component :	0		
	(13f)3877	O-RING	0		
	(13g)2508	O-RING	0		
	(13h)4413	O-RING	0		
	(13i)4413	O-RING	0		
	(13j)4395	BEARING STRIP	0		
	(13k)201084	STRIP	0		
	(13l)4421	BEARING STRIP	0		
	(13m)201081	STRIP	0		
	(13n)3844	PISTON RING	0		
	(15a) 250058	GASKET KIT L1DMHC 16 component :	0		
	(15b)647080	GASKET	0		
	(15c)231320	SEAL STRIP	0		
	(15d)4015	PACKING RING	0		
	(15e)250523	GASKET KIT BJ32,BJ/KL,KL component :	0		
	(15f)2626	O RING	0		
	(15g)230107	O RING	0		
	(15h)230124	O RING	0		
	(15i)198190	BEARING	0		
	(15j)198200	BEARING	0		
	(15k)230111	BEARING STRIP	0		
	(15l)201083	STRIP	0		
	(15m)230110	BEARING STRIP	0		
	(15n)201083	STRIP	0		
	(15o)230127	PISTON RING	0		
	(16a)250037	GASKET KIT L1DL2D A 14 component :	0		
	(16b)648610	GASKET	0		
	(16c)231190	SEAL STRIP	0		
	(16d)2835	PACKING RING	0		
	(16e)250521	GASKET KIT BJ25,BJ/KL,KL component :	0		
	(16f)2625	O-RING	0		
	(16g)2511	O-RING	0		
	(16h)4414	O-RING	0		
	(16i)4414	O-RING	0		
	(16j)4396	BEARING STRIP	0		
	(16k)4422	BEARING STRIP	0		
	(16l)3845	PISTON RING	0		
	(18m)251353	GASKET KIT NK/NI 600/700 component :	0		
	(18n)232292	O-RING	0		
	(18o)230435	SNAP RING	0		
	(18p)201638	SEAL STRIP	0		
	(18a)H026045	GASKET KIT L5 6,7L17 300T component :	0		
	(18b)647040	GASKET	0		
	(18c)230000	BODY SEAL	0		
	(18d)H006785	V-RING SET	0		
	(18e)250519	GASKET KIT BJ20,BJ/KL,KL component :	0		
	(18f)3877	O RING	0		
	(18g)2508	O RING	0		



Masonellan®

MASONEILAN ORDER(S):

02-04648 / 02-04909 / 02-04910 / 02-04911 / 02-04912 / 02-04913 / 02-04914 / 02-04915

C : SOFT GOODS

U1 : WEARING PART LEVEL 1

U2 : WEARING PART LEVEL 2

Spare Parts Interchangeability Record

Somme QTY / VALVE				DIA "		VALVE SERIES		TAG												
				0.5	1															
LEVEL	PART NO	PART DESIGNATION	REF.	2728260	3353202	2828270	3353202	3535602	8721014	8821014	8821114	8821124	8821123	8821715	8821014EB	8821114EB	3535202	3535602	8821105	8821115
	108683971630000	PLUG STEM 1/2"	B001																	
	108684271630000	PLUG STEM 1/2"	B001																	
	111561811630000	PLUG STEM 3/4"X3/4"	B001																	
	114790805870000	3" 21000 300LB PLUG	B016																	
	114791015870000	3" 21000 SEAT-RING CV=31	B014																	
	114791411630000	6" 21000 - % PLUG CV 400	B016																	
	114791412080000	6" 21000 - % PLUG CV 400	B016																	
	114791512080000	2" % CV 46 21000 PLUG	B016																	
	114791525870000	1"1/2 21000 % CONTOURED PLUG	B016																	
	114791872080000	4" 21000 SEAT RING	B014																	
	114791952200000	3/4" 21000 % PLUG	B016																	
	114797341630000	1" 21000 % PLUG	B016																	
	114797342080000	1" 21000 % PLUG	B016																	
	114797382080000	4" 21000 % PLUG	B016																	
	114797956870000	3" 21000 PLUG-% CV31	B016																	
	114821218880000	0-50 PSI INSTRUMENT GAUGE	K014																	
	114821258880000	0-100 PSI GAUGE SUPPLY	K012																	
	114821268880000	0-100 PSI OUTPUT GAUGE	K013																	
	121521801530000	PLUG STEM 1"X3/4"	B001																	
	121521802150000	PLUG STEM 1"X3/4"	B001																	
	121521921630000	PLUG STEM 1"X3/4"	B001																	
	121521922150000	PLUG STEM 1"X3/4"	B001																	
	121521962150000	PLUG STEM 1"X3/4"	B001																	
	121522061630000	1" X 3/4" PLUG STEM	B001																	
	121522062150000	PLUG STEM 1"X3/4"	B001																	
	210002812080000	3/4" - 2" 21000 PLUG	B016																	
	210002821630000	PLUG	B016																	
	210002832080000	PLUG	B016																	
	210002832200000	1" 21000 LINEAR PLUG	B016																	
	210002835870000	3/4-1" CV1.7 21K LINEARE PLUG	B016																	
	210002852080000	PLUG	B016																	
	210003025870000	11/2" 21K LODB CV8 PLUG	B016																	
	210003042080000	3/4-1" 600 21K LODB CV4 PLUG	B016																	
	210003911630000	3/4-1" CV6 21K QUICK CH SEAT	B014																	
	210003912200000	3/4-1" CV6 21K QUICK CH SEAT	B014																	
	210003932200000	3/4-1" CV1.7 21K QUICK C SEAT	B014																	
	210003932280000	3/4-1" CV12 21K THREADED SEAT	B014																	
	210004511630000	3/4-1" CV3 8 21K THREADED SEAT	B014																	
	210004512080000	3/4-1" CV3 8 21K THREADED SEAT	B014																	
	210004521630000	3/4-1" CV1.7 21K THREADED SEAT	B014																	
	210004522080000	3/4-1" CV1.7 21K THREADED SEAT	B014																	
	210012815870000	3/4" - 2" 21000 PLUG	B016																	
	210013672080000	2" CV15 21K THREADED SEAT	B014																	
	210013715870000	2" CV26 21K THREADED SEAT	B014																	
	210023045870000	2" 21K LODB CV25 PLUG	B016																	
	210023625870000	SEAT RING 2" 21K QUICK CHANGE	B014																	
	210023722080000	2" CV46 21K THREADED SEAT	B014																	
	210032815870000	3" 21000 LIN CONTOUR. PLUG	B016																	
	210032825870000	3" 21000 PLUG	B016																	
	210032985870000	3" 21000 PLUG -%	B016																	
	210033032080000	3" 21K LODB CV75 PLUG	B016																	
	210033035870000	3" 21K LODB CV75 PLUG	B016																	
	210033742080000	3" 21000 SEAT RING	B014																	
	210033745870000	CV 110 THREADED SEAT RING ST#B	B014																	
	210033755870000	3" 21000 SEAT RING	B014																	
	210043305870000	4" 21000 LO-DB PLUG	B016																	
	210043645870000	CV-113 QUICK CHANGE SEAT R. NG	B014																	
	210043722080000	4" 21000 SEAT RING	B014																	
	210043735870000	4" 21000 SEAT RING	B014																	
	210063711630000	6" 21000 SEAT RING	B014																	
	210063712080000	6" 21000 SEAT RING	B014																	
	290001025960000	CV 0.6-1.2 PLUG	B012																	
	290001402130000	CV 1.2-2.3 SEAT RING	B003																	
	290001432130000	CV 0.25-0.6 SEAT RING	B003																	
	350001841530000	CV 14 SEAT RING	B002																	
	350001851630000	1" CAMFLEX II SEAT CV 5.6	B002																	
	350001899990000	CV 5.6 SOFT SEAT RING S/A	B002																	
	350011841630000	CV 30 SEAT RING	B002																	
	350031045940000	PLUG 3" CAMFLEX	B004																	
	350041245940000	4" PLUG	B004																	
	350061045940000	CII 6" PLUG	B004																	
	350081055940000	CII 8" REDUC. AREA PLUG	B004																	
	350081851630000	CV 340 SEAT RING	B002																	
	350101045940000	FACT 1 PLUG FULL CAPACITY	B004																	
	350121045940000	PLUG FULL CAPACITY	B004																	
	400022932150000	2" 45400 MACHINING PLUG	B015																	
	400024512080000	2" 45400 MACHINING PILOT	B020																	
	400032915960000	3" 45400 PLUG	B015																	
	400034512080000	MACHINING PILOT	B020																	
	400034525960000	45000 3" PILOT	B020																	
	400042922150000	PLUG 4P	B015																	
	512900019990000	BELLOWS S/A	0																	
	512900099990000	BELLOWS S/A	0																	
	550006586600000	COMPLETE POSITIONER FVP110-F1A3N-G/LC1/KS15	0																	
	40004798316300000	PACKING SPACER VFK B	B032																	
	4000682035960000	3" 21000 PLUG CV 47	B016																	
	40006840016300000	SEAT R. NG CAMFLEX 3" FACTOR 0.6	B002																	
	40006853558700000	SEAT CV 0.05-0.025-0.034-0.310	B003																	
	40006853957900000	PLUG	B153																	
	4000687121500000	PLUG STEM 1/2"X1/2"	B001																	



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MASONEILAN ORDER(S) :

02-04648 / 02-04909 / 02-04910 / 02-04911 / 02-04912 / 02-04913 / 02-04914 / 02-04915

C : SOFT GOODS
U1 : WEARING PART LEVEL 1
U2 : WEARING PART LEVEL 2

Spare Parts Interchangeability Record

Table with columns: Somme QTY / VALVE, DIA = 0.5, VALVE SERIES 1, TAG, 1.5, LEVEL, PART NO, PART DESIGNATION, REF. Includes a list of parts such as (7e) SPRING, (7f) SEAL, (9e)C316845 ELECTROVALVE REPAIR KIT, and V18345-1021150001 COMPLETE POSITIONNER TZID-C(with gauge).



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MASONEILAN ORDER(S) :

02-04548 / 02-04909 / 02-04910 / 02-04911 / 02-04912 / 02-04913 / 02-04914 / 02-04915

Spare Parts Interchangeability Record

Somme QTY / VALVE

LEVEL	PART NO	PART DESIGNATION	REF	2		3	
				882115EB	3535202	3535202	3535202
	(18h)4413	O RING	0				
	(18)4395	BEARING STRIP	0				
	(18)201084	STRIP	0				
	(18k)4421	BEARING STRIP	0				
	(18)201081	STRIP	0				
	(18m)3844	PISTON RING	0				
	(1e)250011	GASKET KIT L1C/L2C-A24L6-30 component :	0				
	(1e)4026049	GASKET KIT L5 6.7 8 350 T component :	0				
	(1b)647040	GASKET	0				
	(1b)647080	GASKET	0				
	(1c)231001	SEAL STRIP	0				
	(1c)231190	SEAL STRIP	0				
	(1d)3394	PACKING RING	0				
	(1d)4018017	V-RING SET	0				
	(1e)250519	GASKET KIT BJ20 BJK/L KL component :	0				
	(1e)250523	GASKET KIT BJ32 BJK,BJL component :	0				
	(1f)2626	O RING	0				
	(1f)3877	O RING	0				
	(1g)230107	O RING	0				
	(1g)2508	O RING	0				
	(1h)230124	O RING	0				
	(1h)4413	O RING	0				
	(1i)198190	BEARING	0				
	(1i)4395	BEARING STRIP	0				
	(1j)198200	BEARING	0				
	(1j)201084	STRIP	0				
	(1k)230111	BEARING STRIP	0				
	(1k)4421	BEARING STRIP	0				
	(1l)201081	STRIP	0				
	(1l)201083	STRIP	0				
	(1m)230110	BEARING STRIP	0				
	(1m)3844	PISTON RING	0				
	(1n)201083	STRIP	0				
	(1o)230127	PISTON RING	0				
	(23a)253011	GASKET KIT L1C/L2C-A24L6-30 component :	0				
	(23b)647080	GASKET	0				
	(23c)231001	SEAL STRIP	0				
	(23d)3394	PACKING RING	0				
	(23e)250523	GASKET KIT BJ32 BJK,BJL component :	0				
	(23f)2626	O RING	0				
	(23g)230107	O RING	0				
	(23h)230124	O RING	0				
	(23i)198190	BEARING	0				
	(23j)198200	BEARING	0				
	(23k)230111	BEARING STRIP	0				
	(23l)201083	STRIP	0				
	(23m)230110	BEARING STRIP	0				
	(23n)201083	STRIP	0				
	(23o)230127	PISTON RING	0				
	(24a)253008	GASKET KIT L1C/L2C-A16 component :	0				
	(24b)606250	GASKET	0				
	(24c)230001	SEAL STRIP	0				
	(24d)3859	PACKING RING	0				
	(24e)250521	GASKET KIT BJ25 BJK/L KL component :	0				
	(24f)2626	O RING	0				
	(24g)2511	O RING	0				
	(24h)4414	O RING	0				
	(24i)4396	BEARING STRIP	0				
	(24j)4422	BEARING STRIP	0				
	(24k)3845	PISTON RING	0				
	(9a)250003	GASKET KIT L1C/L2C A 06 component :	0				
	(9b)174180	GASKET	0				
	(9c)4496	SEAL STRIP	0				
	(9d)2905	PACKING RING	0				
	(9e)250513	GASKET KIT BJ10 BJK/L KL component :	0				
	(9f)2527	O RING	0				
	(9g)234905	O RING	0				
	(9h)4410	O RING	0				
	(9i)3544	O RING	0				
	(9j)4423	BEARING STRIP	0				
	(9k)201081	STRIP	0				
	(9l)4419	BEARING STRIP	0				
	(9m)201079	STRIP	0				
	(9n)4399	PISTON RING	0				
	(9o)200880	STRIP	0				
U1	92911058200000	PIN SHAFT GASKET	0				
	101683901630000	PLUG STEM 1/2" X 1/2"	0				
	108681931630000	PLUG STEM 1/2" X 1/2"	0				
	108681961630000	PLUG STEM 1/2" X 1/2"	0				
	108681982150000	PLUG STEM 1/2" X 1/2"	0				
	108682711630000	PLUG STEM	0				
	108682712150000	PLUG STEM	0				
	108682801630000	PLUG STEM	0				
	108682802150000	PLUG STEM	0				
	108683011630000	PLUG STEM 1/2" 20 UNF 3A	0				
	108683261630000	1/2"X1/2" P LUG STEM	0				
	108683281630000	PLUG STEM 3/4" 16 UNF 3A	0				
	108683611630000	PLUG STEM 1/2"	0				
	108683622150000	PLUG STEM 20 UNF 3A	0				
	108683662150000	PLUG STEM 20 UNF 3A	0				

MASONELLAN ORDER(S) :

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Spare Parts Interchangeability Record

Somme QTY / VALVE

LEVEL	PART NO	PART DESIGNATION	REF	8821715EB	3535202	3535602	8778103	8821125	8878121	8878128	8821155EB	8821124EB	8821125EB	8821914EB	3535102	3535202	3535602	3535602	8721105	8741355	8821715	8841335	8721105EB	8721125EB	8821155EB	8821125EB	
	(7e) SPRING		0	30 PV 70063A																							
	(7f) SEAL		0	30 LV 60034A																							
	(9a) C316845	ELECTROVALVE REPAIR KIT (WSTISS317A-308) component	0	30 LV 60121																							
	(9b) PLUNGER		0	30 FV 70061																							
	(9c) DISC		0	30 LDV 30024																							
	(9d) SEAT		0	30 PV 30182																							
	(9e) SPRING		0	30 TV 40137																							
	(9f) SEAL		0	30 LV 60045																							
	(9g) 743820	SEAT L1C06A	0	30HV 10128 TO																							
	V18345-1021150001	COMPLETE POSITIONER TZID-C(with gauge)	0	30HV 10828																							
U2	210004111930000	1" 21000 600LB CAGE	B013	30 FV 70082																							
	210004121530000	3/4-1" 600LB 21KRC LINEAR CAGE	B013	30 TV 80402																							
	210024151530000	CAGE 2" 21904 2 STAGE CV37	B013	30 TV 80406 A																							
	350001201630000	PLUG SHAFT	B019	30 TV 80406 B																							
	350001212150000	PLUG SHAFT	B019	30 PV 80411																							
	350002441630000	SEAT RING RETAINER	B003	30 LV 40065																							
	350011201630000	PLUG SHAFT	B019	30 TV 50072																							
	35001212150000	PLUG SHAFT	B019	30 LV 30153																							
	350012441630000	SEAT RING RETAINER	B003	30 LV 40063																							
	350021201630000	PLUG SHAFT	B019	30 PV 70083B																							
	350021212150000	PLUG SHAFT	B019	30 PV 40073																							
	350031201630000	PLUG SHAFT	B019	30 PV 20001																							
	350031212150000	PLUG SHAFT	B019	30 UV 80102																							
	350031642200000	LOWER GUIDE BUSHING	B022	30 FV 40093																							
	350031645670000	LOWER BUSHING	B022	30 LV 40171																							
	350041201630000	PLUG SHAFT 4"	B019	30 TV 70048																							
	350041212150000	PLUG SHAFT	B019	30 FV 40121																							
	350041642200000	LOWER GUIDE BUSHING	B022	30 TV 30071																							
	350041645670000	LOWER BUSHING	B022	30 LV 30701B																							
	350061201630000	PLUG SHAFT	B019	30 LV 60041																							
	350061212150000	PLUG SHAFT	B019	30 LV 60043																							
	350061642200000	LOWER GUIDE BUSHING	B022	30 UV 30101																							
	350061645670000	LOWER BUSHING	B022	30 FV 80011																							
	350081201630000	PLUG SHAFT	B019	30FV 101198 TO																							
	350081212150000	PLUG SHAFT	B019	30FV 109198																							
	350081642200000	LOWER GUIDE BUSHING	B022	30FV 30152																							
	350081645670000	LOWER BUSHING	B022	30 TV 30154																							
	4000718583990000	SPRING WASHER	B012	30 PV 70023 A																							
	4000718583990000	SPRING WASHER	B012	30 UV 60002																							
	4000901928880000	NEEDLE BEARING AX5-25-42	B009	30 FV 70021																							
	4000901938880000	NEEDLE BEARING AX5-30-47	B009	30 PV 70024																							
	4000901948880000	NEEDLE BEARING AX5-35-52	B009	30 PV 70081																							
	4000901958880000	NEEDLE BEARING	B009	30 FV 70084																							
	400090325670000	LOWER GUIDE BUSH 6" VMX	B006	30 LV 40081																							
	400090325670000	LOWER GUIDE BUSH 6" VMX	B007	30 LV 40222																							
	4000927981630000	SHAFT 8" VMX	B008	30 TV 80062																							
	4000927982150000	SHAFT 8" VMX	B008	30 FV 70065																							
	4000927992150000	10" SHAFT VAR MAX	B008																								
	4000928001630000	SHAFT 12" VMX	B008																								
	4000928002150000	SHAFT 12" VMX	B008																								
	4000928202200000	LOWER GUIDE BUSH 8" VMX	B006																								
	4000928205670000	LOWER GUIDE BUSH 8" VMX	B006																								
	4000928205960000	LOWER GUIDE BUSH 8" VMX	B006																								
	4000928212200000	LOWER GUIDE BUSH 10" VMX	B006																								
	4000928222200000	LOWER GUIDE BUSH 12" VMX	B006																								
	4000928225960000	LOWER GUIDE BUSH 12" VMX	B006																								
	4000928232200000	UPPER GUIDE BUSH 8" VMX	B007																								
	4000928235670000	UPPER GUIDE BUSH 8" VMX	B007																								
	4000928235960000	UPPER GUIDE BUSH 8" VMX	B007																								
	4000928242200000	UPPER GUIDE BUSH 10" VMX	B007																								
	4000928252200000	UPPER GUIDE BUSH 12" VMX	B007																								
	4000928255960000	UPPER GUIDE BUSH 12" VMX	B007																								
	400093E291630000	SHAFT 6" VMX	B008																								
	4000968741700000	SEAT RING RETAINER	B005																								
	4000968781700000	SEAT RING RETAINER 8" VMX	B005																								



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Spare Parts Interchangeability Record

LEVEL	PART NO	PART DESIGNATION	REF	4	5	6
C	396202400	COIL	0			
	4014000000	DIAPHRAGM	A011			
	1904604820000	GASKET	A015			
	1904628820000	GASKET	A019			
	56756467790000	PACKING SPLIT RING	0			
	56757939130000	PACKING	B006			
		5/8 X 1 X 3/16 PACKING	B017			
	56757949130000	1 X 1/8 X 5/16 PACKING	B006			
			B017			
	56757959130000	1 1/2 X 2 1/4 X 3/8 PACKING	B017			
	56757969130000	1 3/4 X 2 3/4 X 1/2 PACKING	B017			
	56757979130000	2 X 3 X 1/2 PACKING	B017	7	7	7
	56757989130000	1 1/4 X 1 3/4 X 1/4 PACKING	B006			
	56758039130000	5/16 X 15/16 X 5/16 PACKING	B006			
	56758039200000	5/16 X 15/16 X 5/16 PACKING	B006			
	56758049130000	3/4 X 1 1/4 X 1/4 PACKING	B006			
	56758099130000	1/2 X 7/8 X 3/16 PACKING	B006			
	56758099200000	1/2 X 7/8 X 3/16 PACKING	B006			
	83870018860000	DIAPHRAGM	A039			
	91917437790000	SEAT GASKET	B015			
	92915497790000	SEAT GASKET	B011			
	92915507790000	BODY GASKET	B015			
	92915517790000	SEAT GASKET	B011			
	92915527790000	BODY GASKET	B011			
	92915567790000	BODY GASKET	B015			
	92915877790000	SEAT GASKET	B011			
	92915887790000	BODY GASKET	B011			
	92915907790000	BODY GASKET	A011			
	102710156860000	DIAPHRAGM	A039			
	102750236860000	DIAPHRAGM	A025			
	108640037790000	DIAPHRAGM	A025			
	108650037790000	DIAPHRAGM	A025			
	108660037790000	DIAPHRAGM	A025			
	108670037790000	DIAPHRAGM	A021			
	115690050000000	TRAVEL STOP	0			
	211142066660000	DIAPHRAGM	A136			
	291000507160000	DIAPHRAGM	A040			
	351040407160000	DIAPHRAGM	A040			
	351060407160000	DIAPHRAGM	A040			
	351070407160000	DIAPHRAGM	0			
	363060111790000	BACK UP RING METAL SEAL	0			
	363060257790000	SEAL RING 316SS	A112			
	513240012500000	RETAINER CLIP	0			
	596651000000000	ELECTROVALVE REPAIR KIT	K152			
	3491881109990000	DIAPHRAGM SA	K146			
	3492791108880000	GASKET SA	B010			
	4000724348250000	BODY GASKET	B010			
	4000724358260000	BODY GASKET	B010			
	4000724368260000	BODY GASKET	B010			
	4000724378260000	BODY GASKET	B010			
	4000842528260000	BODY GASKET	B012			
	4000871568260000	BODY GASKET 21000 2" 2500LB	B011			
	4000883097790000	TEC-RING GASKET	B011			
	4000883107790000	TEC-RING GASKET	B011			
	4000883117790000	TEC-RING GASKET	B011			
	4000883127790000	TEC-RING GASKET	B013			
	4000901709130000	PACKING 6" VMX	B013			
	4000901719130000	PACKING 8" VMX	B013			
	4000901729130000	PACKING	B013			
	4000901739130000	PACKING 12" VMX	B025			
	4000910746800000	RADIAL SEAL RING 6"	B025			
	4000910756800000	RADIAL SEAL RING 8"	B025			
	4000910766800000	RADIAL SEAL RING 10"	B025			
	4000910776800000	RADIAL SEAL RING 12"	A032			
	4000930509130000	PACKING	A032			
	4000930519130000	PACKING	B010			
	4000964238260000	BODY GASKET	A133			
	4000953077160000	DIAPHRAGM	B013			
	4000999209130000	PACKING 16" VMX	B025			
	4000999246800000	RADIAL SEAL RING	B011			
	4000999251810000	RETAINING RING (DIA. 56)	B006			
	4001179979720000	PACKING	B006			
	4001179999720000	PACKING 5/8 X 1 X 3/16	B006			
	4001180029700000	PACKING 1 X 1 5/8 X 5/16	B011			
	4001195577900000	TEC-RING GASKET 2"	B011			
	4001195637900000	TEC-RING GASKET 4"	B014			
	4001195928260000	SEAT GASKET 41005 6"	BC24			
		CAGE GASKET 41005 6"				



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MASONEILAN ORDER(S) :

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Spare Parts Interchangeability Record

LEVEL	PART NO	PART DESIGNATION	REF.	4	5	6
	(18h)4413	O RING	0			
	(18h)4395	BEARING STRIP	0			
	(18h)201084	STRIP	0			
	(18h)4421	BEARING STRIP	0			
	(18h)201081	STRIP	0			
	(18m)3844	PISTON RING	0			
	(1e) 250011	GASKET KIT L1CA,2C-A24/L6-30 component:	0			
	(1e)H026049	GASKET KIT L5,6,7,8,350 T component:	0			
	(1b)647040	GASKET	0			
	(1b)647080	GASKET	0			
	(1c)231001	SEAL STRIP	0			
	(1c)231190	SEAL STRIP	0			
	(1d)3394	PACKING RING	0			
	(1d)H018017	V-RING SET	0			
	(1e)250519	GASKET KIT B,20 BJK, L, KL component:	0			
	(1e)250523	GASKET KIT B,32,BJK,BJL component:	0			
	(1f)2626	O RING	0			
	(1f)3877	O RING	0			
	(1g)230107	O RING	0			
	(1g)2508	O RING	0			
	(1h)230124	O RING	0			
	(1h)4413	O RING	0			
	(1i)198190	BEARING	0			
	(1i)4395	BEARING STRIP	0			
	(1j)198200	BEARING	0			
	(1j)201084	STRIP	0			
	(1k)230111	BEARING STRIP	0			
	(1k)4421	BEARING STRIP	0			
	(1j)201081	STRIP	0			
	(1j)201083	STRIP	0			
	(1m)230110	BEARING STRIP	0			
	(1m)3844	PISTON RING	0			
	(1n)201083	STRIP	0			
	(1o)230127	PISTON RING	0			
	(23e) 250011	GASKET KIT L1CA,2C-A24/L6-30 component:	0			
	(23b)647080	GASKET	0			
	(23c)231001	SEAL STRIP	0			
	(23d)3394	PACKING RING	0			
	(23e) 250523	GASKET KIT B,32,BJK,BJL component:	0			
	(23f)2626	O-RING	0			
	(23g)230107	O-RING	0			
	(23h)230124	O-RING	0			
	(23i)198190	BEARING	0			
	(23j)198200	BEARING	0			
	(23k)230111	BEARING STRIP	0			
	(23l)201083	STRIP	0			
	(23m)230110	BEARING STRIP	0			
	(23n)201083	STRIP	0			
	(23o)230127	PISTON RING	0			
	(24e) 250008	GASKET KIT L1CA,2C-A16 component:	0			
	(24b)606260	GASKET	0			
	(24c)230001	SEAL STRIP	0			
	(24d)3394	PACKING RING	0			
	(24e)250521	GASKET KIT B,25 BJK,L, KL component:	0			
	(24f)2525	O-RING	0			
	(24g)2511	O-RING	0			
	(24h)4414	O-RING	0			
	(24i)4395	BEARING STRIP	0			
	(24j)4422	BEARING STRIP	0			
	(24k)3845	PISTON RING	0			
	(9a)250003	GASKET KIT L1CA,2C-A 06 component:	0			
	(9b)174185	GASKET	0			
	(9c)4436	SEAL STRIP	0			
	(9d)2935	PACKING RING	0			
	(9e)250513	GASKET KIT B,10,BJK,L, KL component:	0			
	(9f)2527	O-RING	0			
	(9g)234805	O-RING	0			
	(9h)4410	O-RING	0			
	(9i)3544	O-RING	0			
	(9j)4423	BEARING STRIP	0			
	(9k)201081	STRIP	0			
	(9l)4419	BEARING STRIP	0			
	(9m)201079	STRIP	0			
	(9n)4399	PISTON RING	0			
	(9o)200580	STRIP	0			
U1	92911098200000	PIN SHAFT GASKET	0			
	101683901630000	PLUG STEM 1/2" X 1/2"	0			
	106581931630000	PLUG STEM 1/2" X 1/2"	0			
	106581961630000	PLUG STEM 1/2" X 1/2"	0			
	106581962150000	PLUG STEM 1/2" X 1/2"	0			
	106582711630000	PLUG STEM	0			
	106582712150000	PLUG STEM	0			
	106582801630000	PLUG STEM	0			
	106682802150000	PLUG STEM	0			
	10668301630000	PLUG STEM 1/2" 20 UNF 3A	0			
	106683281630000	1/2X1/2 PLUG STEM	0			
	106683281630000	PLUG STEM 3/4" 16 UNF 3A	0			
	106683611630000	PLUG STEM 1/2"	0			
	106683622150000	PLUG STEM 20 UNF 3A	0			
	106683682150000	PLUG STEM 20 UNF 3A	0			

MASONEILAN ORDER(S):
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Spare Parts Interchangeability Record

Somme QTY / VALVE

Table with columns: LEVEL, PART NO, PART DESIGNATION, REF, and multiple columns for valve types and quantities (e.g., 30 LV 30701A, 30 PV 20022B, etc.).



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MASONEILAN ORDER(S) :

02-04648 / 02-04909 / 02-04910 / 02-04911 / 02-04912 / 02-04913 / 02-04914 / 02-04915

Spare Parts Interchangeability Record

Somme QTY / VALVE				10										12										14		16		24		Total												
LEVEL	PART NO	PART DESIGNATION	REF.	30 PV 60102 B	30 PV 50022 A	30 TV 40104	30 LV 40207	30 PV 50105	30 PV 60427	30 LV 50122	30 FV 40137	30 UV 60001	30 FV 40211 A	30 FV 40181	30 PV 40201	30 PV 60032	30 PV 60122 B	30 PV 70023 C	30 PV 70083 C	30 PV 30153	30 PV 20022 A	30 PV 40121	30 PV 60401	30 TV 30104	30 TV 30104	30 TV 40075 A	30 FV 20001	30 PV 40102	30 PDV 20031	30 PV 20083 B	30 PV 20083 A	30 PV 20083 A	30 PV 20083 A	30 PV 50132 B	30 PV 30002	30 PV 50132 A						
	(16c) 743900	SEAT L1C14A	0																																							1
	(18a) C316845	ELECTROVALVE REPAIR KIT (WST/ISB317A-308) component :	0			1																																			1	
	(18b)	PLUNGER	0			1																																			1	
	(18c)	DISC	0			1																																			1	
	(18d)	SEAT	0			1																																			1	
	(18e)	SPRING	0			1																																			1	
	(18f)	SEAL	0			1																																			1	
	(18g)	SEAL	0			1																																			1	
	(18h) 743880	SEAT L1C12A	0																																					2		
	(19a) C316845	ELECTROVALVE REPAIR KIT (WST/ISB317A-308) component :	0																																						2	
	(19b)	PLUNGER	0																																						2	
	(19c)	DISC	0																																						2	
	(19d)	SEAT	0																																						2	
	(19e)	SPRING	0																																						2	
	(19f)	SEAL	0																																						2	
	(19g)	SEAL	0																																						2	
	(19h) 743900	SEAT L1C14A	0																																						2	
	(19i) 743980	SEAT L1C24A	0																																						2	
	(20a) C316845	ELECTROVALVE REPAIR KIT (WST/ISB317A-308) component :	0																																						2	
	(20b)	PLUNGER	0																																						2	
	(20c)	DISC	0																																						2	
	(20d)	SEAT	0																																						2	
	(20e)	SPRING	0																																						2	
	(20f)	SEAL	0																																						2	
	(21a) C316845	ELECTROVALVE REPAIR KIT (WST/ISB317A-308) component :	0																																						2	
	(21b)	PLUNGER	0																																						2	
	(21c)	DISC	0																																						2	
	(21d)	SEAT	0																																						2	
	(21e)	SPRING	0																																						2	
	(21f)	SEAL	0																																						2	
	(22a) C316845	ELECTROVALVE REPAIR KIT (WST/ISB317A-308) component :	0																																						2	
	(22b)	PLUNGER	0																																						2	
	(22c)	DISC	0																																						2	
	(22d)	SEAT	0																																						2	
	(22e)	SPRING	0																																						2	
	(22f)	SEAL	0																																						2	
	(23a) C316845	ELECTROVALVE REPAIR KIT (WST/ISB317A-308) component :	0																																						2	
	(23b)	PLUNGER	0																																						2	
	(23c)	DISC	0																																						2	
	(23d)	SEAT	0																																						2	
	(23e)	SPRING	0																																						2	
	(23f)	SEAL	0																																						2	
	(23g) 743980	SEAT L1C24A	0																																						2	
	(24) 743920	SEAT L1C16A	0																																						2	
	(25a) C316845	ELECTROVALVE REPAIR KIT (WST/ISB317A-308) component :	0																																						2	
	(25b)	PLUNGER	0																																						2	
	(25c)	DISC	0																																						2	
	(25d)	SEAT	0																																						2	
	(25e)	SPRING	0																																						2	
	(25f)	SEAL	0																																						2	
	(36a) C316845	ELECTROVALVE REPAIR KIT (WST/ISB317A-308) component :	0																																						2	
	(36b)	PLUNGER	0																																						2	
	(36c)	DISC	0																																						2	
	(36d)	SEAT	0																																						2	
	(36e)	SPRING	0																																						2	
	(36f)	SEAL	0																																						2	
	(37a) C316845	ELECTROVALVE REPAIR KIT (WST/ISB317A-308) component :	0																																						2	
	(37b)	PLUNGER	0																																						2	
	(37c)	DISC	0																																						2	
	(37d)	SEAT	0																																						2	
	(37e)	SPRING	0																																							


PART 5

Fieldbus device information summary breakdown

TECHNIP
VENDOR DOCUMENT REVIEW
<input type="checkbox"/> 1 REVISÉ AND RESUBMIT
<input type="checkbox"/> 2 TO BE ISSUED AS FINAL PROVIDED COMMENTS ARE INCORPORATED
<input checked="" type="checkbox"/> 3 NO COMMENT - FINAL ISSUE

THIERRY GRANDRY | TECHNIP
2003.04.08 10:17:58 +01'00'
<none>

STATUS CERTIFIED "FINAL"
ISSUED BY : S. LEGE
DATE : 04/04/03

0	04/04/03	FIRST ISSUE
REV	DATE	DESCRIPTION
TECHNIP	NATIONAL PETROCHEMICAL COMPANY PARS PETROCHEMICAL COMPANY 	TP REQUISITION NUMBER 6465C-30-MR-1541-01-0-1007 PPC REQUISITION NUMBER 3930-30-MR-1541-01-0-1007 EQUIPMENT NAME: Control valves
Project:	3930 - 9TH-OLEFIN COMPLEX Ethane cracking plant	
DRESSER Flow Control	DOCUMENT TITLE : Fieldbus device information summary breakdown	DOCUMENT CODE : A 5015
	PURCHASE ORDER : 02-4648 02-4909 to 02-4915	Sheet 01 of 03
		Rev 0

FIELDBUS DEVICE INFORMATION SUMMARY BREAKDOWN

Mn	Serial Number	Qty	Present Fieldbus Device configuration			Fieldbus Builder Configuration		Discrepancy	Device Rev N°	DD Rev N°
			Device ID	Device Tag Name	Nodde Address	Device Tag	Address			
02-04909-07		1	4456440001J0002681	TV20024	0xF7	TV20024	0xF5	Nodde Address	3	1
02-04909-08		1	4456440001J0002684	PDV20031	0xF5	PDV20031	0xF5		3	1
02-04909-09		1	4456440001J0002830	30LDV20051	0xF7	LDV20051	0xF5	Device Tag Name - Nodde Address	3	1
02-04909-10		1	4456440001J0002682	FV20061	0xF7	FV20061	0xF6	Nodde Address	3	1
02-04909-12		1	4456440001J0002825	FV20071	0xF6	FV20071	0xF6		3	1
02-04909-13		1	5945430001J0000949	30LV20081	0xF7	LV20081	0xF6	Device Tag Name - Nodde Address	2	1
02-04909-14		1	5945430001J0000972	30FV20081	0xF7	FV20081	0xF7	Device Tag Name	2	1
02-04910-01		1	4456440001J0002820	PV30002	0xF7	PV30002	0xF7		3	1
02-04910-02		1	5945430001J0000944	30LV30004	0xF7	LV30004	0xF4	Device Tag Name - Nodde Address	2	1
02-04910-03		1	5945430001J0000974	30LV30022	0xF7	LV30022	0xF5	Device Tag Name - Nodde Address	2	1
02-04910-04		1	4456440001J0002679	LDV30024	0xF7	LDV30024	0xF3	Nodde Address	3	1
02-04910-05		1	4456440001J0002684	LV30032	0xF7	LV30032	0xF6	Nodde Address	3	1
02-04910-06		1	4456440001J0002688	LV30042	0xF7	LV30042	0xF7		3	1
02-04910-08		1	4456440001J0002685	LV 30052	0xF7	LV30052	0xF7	Device Tag Name	3	1
02-04910-10		1	4456440001J0002829	LV30071	0xF7	LV30071	0xF5	Nodde Address	3	1
02-04910-11		1	4456440001J0002800	TV30071	0xF7	TV30071	0xF7		3	1
02-04910-12		1	4456440001J0002801	LV30073	0xF7	LV30073	0xF0	Nodde Address	3	1
02-04910-13		1	5945430001J0001449	30LV30075	0xF7	LV30075	0xF7	Device Tag Name	2	1
02-04910-14		1	5945430001J0001441	30LV30093	0xF7	LV30093	0xF3	Device Tag Name - Nodde Address	2	1
02-04910-16		1	4456440001J0002796	LV30102	0xF7	LV30102	0xF7		3	1
02-04910-17		1	5945430001J0001450	30LV30103	0xF7	LV30103	0xF6	Device Tag Name - Nodde Address	2	1
02-04910-18		1	4456440001J0002804	TV30104	0xF5	TV30104	0xF5		3	1
02-04910-19		1	?	?	?	TV30107	0xF4	no report	?	?
02-04910-25		1	5945430001J0001440	30LV30151	0xF7	LV30151	0xF2	Device Tag Name - Nodde Address	2	1
02-04910-26		1	5945430001J0000991	30FV30152	0xF7	FV30152	0xF6	Device Tag Name - Nodde Address	2	1
02-04910-27		1	5945430001J0001444	30LV30153	0xF7	LV30153	0xF5	Device Tag Name - Nodde Address	2	1
02-04910-29		1	5945430001J0000950	30TV30154	0xF7	TV30154	0xF7	Device Tag Name	2	1
02-04910-32		1	4456440001J0002802	LV 30161	0xF7	LV30161	0xF4	Device Tag Name - Nodde Address	3	1
02-04910-33		1	4456440001J0002795	PV30162	0xF7	PV30162	0xF5	Nodde Address	3	1
02-04910-34		1	4456440001J0002803	LV30164	0xF7	LV30164	0xF0	Nodde Address	3	1
02-04911-02		1	4456440001J0002814	LV40051	0xEC	LV40051	0xEC		3	1
02-04911-03		1	4456440001J0002832	TV40053	0xED	TV40053	0xED		3	1
02-04911-04		1	4456440001J0002816	LV40053	0xEF	LV40053	0xEF		3	1
02-04911-05		1	4456440001J0002808	LV40061	0xF3	LV40061	0xF3		3	1
02-04911-07		1	4456440001J0002926	LV40063	0xF2	LV40063	0xF2		3	1
02-04911-08		1	4456440001J0002806	LV40065	0xF5	LV40065	0xF5		3	1
02-04911-09		1	4456440001J0002868	PV40071	0xF6	PV40071	0xF6		3	1
02-04911-12		1	4456440001J0002826	PV40073	0xF7	PV40073	0xF7		3	1
02-04911-17		1	4456440001J0002827	LV40103	0xF7	LV40103	0xF1	Nodde Address	3	1
02-04911-19		1	5945430001J0001447	30FV40108	0xF7	FV40108	0xF6	Device Tag Name - Nodde Address	2	1

FIELDBUS DEVICE INFORMATION SUMMARY BREAKDOWN

Mn	Serial Number	Qty	Device ID	Present Fieldbus Device configuration		Fieldbus Bullder Configuration		Discrepancy	Device Rev N°	DD Rev N°
				Device Tag Name	Nodde Address	Device Tag	Address			
02-04911-29		1	4456440001J0002836	30fv40138	0xF7	FV40138	0xF7	Device Tag Name	3	1
02-04911-32		1	5945430001J0001431	FV40151	0xF6	FV40151	0xF6		2	1
02-04911-33		1	4456440001J0002863	TV40158	0xF5	TV40158	0xF5		3	1
02-04911-45		1	4456440001J0002835	LV40222	0xF1	LV40222	0xF1		3	1
02-04911-46		1	4456440001J0002833	LV40224	0xF5	LV40224	0xF5		3	1
02-04911-47		1	4456440001J0002812	LV40226	0xF3	LV40226	0xF3		3	1
02-04912-02		1	4456440001J0002842	LV50021	0xF0	LV50021	0xF0		3	1
02-04912-08		1	4456440001J0002805	PV50031	0xF7	PV50031	0xF7		3	1
02-04912-10		1	4456440001J0002822	LV50033	0xF7	LV50033	0xF7		3	1
02-04912-16		1	?	?	?	TV60062	0xF7	no report	?	?
02-04912-17		1	4456440001J0002898	PV50071	0xF6	PV50071	0xF6		3	1
02-04912-18		1	4456440001J0002840	TV50072	0xF5	TV50072	0xF5		3	1
02-04912-21		1	4456440001J0002828	PV50121	0xE9	PV50121	0xE9		3	1
02-04912-25		1	5945430001J0000976	TV50141	0xF4	TV50141	0xF4		2	1
02-04912-27		1	?	?	?	TV50152	0xF5	no report	?	?
02-04913-01		1	5945430001J0001439	30LV60001A	0xF7	LV60001A	0xF7	Device Tag Name	2	1
02-04913-02		1	5945430001J0001442	30lv60001b	0xF7	LV60001B	0xF6	Device Tag Name - Nodde Address	2	1
02-04913-03		1	4456440001J0002652	PV60007	0xF7	PV60007	0xF7		3	1
02-04913-04		1	5945430001J0001448	30PV60008A	0xF7	PV60008A	0xF6	Device Tag Name - Nodde Address	2	1
02-04913-05		1	5945430001J0001451	30PV60008B	0xF7	PV60008B	0xF7	Device Tag Name	2	1
02-04913-06		1	4456440001J0002821	30FV60011	0xF7	FV60011	0xF4	Device Tag Name - Nodde Address	3	1
02-04913-07		1	4456440001J0002799	30LV60021	0xF7	LV60021	0xF7	Device Tag Name	3	1
02-04913-08		1	4456440001J0002811	30 LV 60023	0xF7	LV60023	0xF3	Device Tag Name - Nodde Address	3	1
02-04913-19		1	4456440001J0002844	LV60211	0xF7	LV60211	0xF7		3	1
02-04913-20		1	5945430001J0001443	30PV60211	0xF7	PV60211A	0xF7	Device Tag Name	2	1
02-04913-21		1	5945430001J0001432	30LV60211B	0xF7	PV60211B	0xF7	Device Tag Name	2	1
02-04914-01		1	5945430001J0001446	30PV70002	0xF7	PV70002	0xF7	Device Tag Name	2	1
02-04914-02		1	4456440001J0002916	FV70021	0xF6	FV70021	0xF6		3	1
02-04914-06		1	4456440001J0002888	FV70024	0xF6	FV70024	0xF6		3	1
02-04914-16		1	4456440001J0002880	30PV70081A	0xF7	PV70081A	0xF6	Device Tag Name - Nodde Address	3	1
02-04914-17		1	4456440001J0002818	30PV70081B	0xF7	PV70081B	0xF7	Device Tag Name	3	1
02-04914-18		1	4456440001J0002677	30FV70082	0xF7	FV70082	0xF4	Device Tag Name - Nodde Address	3	1
02-04914-19		1	4456440001J0002841	FV70091	0xF6	FV70091	0xF6		3	1
02-04914-20		1	4456440001J0002843	PV70091	0xF7	PV70091	0xF7		3	1
02-04914-21		1	4456440001J0002683	30PV70094A	0xF7	PV70094A	0xF7	Device Tag Name	3	1
02-04914-22		1	4456440001J0002837	30PV70094B	0xF7	PV70094B	0xF7	Device Tag Name	3	1

IMPORTANT NOTE: TAG AND NODDE ADDRESS SHALL BE MODIFIED DURING THE PRE-COMMISSIONING PHASE IN ORDER TO BE IN ACCORDANCE WITH TAG AND NODDE ADDRESS AS CONFIGURED IN FIELDBUS CONTROL SYSTEM.



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 12-3-2002
Time: 16:37:46

GENERAL DATA

- Tag/Address

Pd-Tag	TV20024	Node Address	0x17
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- Device Identifier

Device ID	4456440001J0002681	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4909.07.1		
Valve Model	35-35202	Actuator Model	CAMFLEX 7" --
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	SOYER	Calibration Date	12/03/02
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	132.597656	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.293533	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	1.911804	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	7.631104	Measured Gain	7.707153
Valve TC	120.958984	Valve Hysteresis	2.990051
Valve Slip Width	0.520096		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	99.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%	PV Lower Range (EU0)	0.000000
PV Upper Range (EU100)	100.000000		

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	1	Total Cycle Count (times)	8
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
------	---------------------

- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	2.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-27-2003
Time: 14:02:48

GENERAL DATA

- Tag/Address

Pd-Tag	PDV20031	Node Address	0xf5
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- Device Identifier

Device ID	4456440001J0002834	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4909.08.1		
Valve Model	30-30122	Actuator Model	VARIMAX N 9
Valve S/N	0	Actuator S/N	None
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	DELAROCHE	Calibration Date	12/06/02
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	50.000000	Reset (I) (sec.)	7.000000
Rate (D) (sec.)	0.300000	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	2.000000	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	4.427734	Measured Gain	4.427734
---------------	----------	---------------	----------

Valve TC	158.558594	Valve Hysteresis	4.667725
Valve Slip Width	0.503357		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	98.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
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Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

- General

Valve Action	Air To Close	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		- -

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	173	Total Cycle Count (times)	1541
Total Open Time (hours)	9	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	3.800000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-6-2003
Time: 10:28:23

GENERAL DATA

- Tag/Address

Pd-Tag	30LDV20051	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002830	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4909.09.1		
Valve Model	88-21125	Actuator Model	88-6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/06/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	37.036098	Reset (I) (sec.)	7.037350
Rate (D) (sec.)	0.147362	Derivative Gain	5.000000
Dead Zone (%)	0.308899		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	5.767456	Measured Gain	5.767456
Valve TC	29.600098	Valve Hysteresis	5.222412
Valve Slip Width	0.568497		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	75.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%	PV Lower Range (EU0)	0.000000
PV Upper Range (EU100)	100.000000		

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	9	Total Cycle Count (times)	26
Total Open Time (hours)	9	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.210000	Supply Pressure	1.400000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 12-3-2002
Time: 16:04:07

GENERAL DATA

- Tag/Address

Pd-Tag	FV20061	Node Address	0x17
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- Device Identifier

Device ID	4456440001J0002682	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4909.10.1		
Valve Model	35-35202	Actuator Model	CAMFLEX 6"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	D11 Tag	D11
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	DELAROCHE	Calibration Date	01/01/00
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	87.242188	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.224159	Derivative Gain	5.000000
Dead Zone (%)	0.300369		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	1.535583	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	13.437012	Measured Gain	13.444336
Valve TC	77.599609	Valve Hysteresis	5.009155
Valve Slip Width	0.511673		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	100.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%	PV Lower Range (EU0)	0.000000
PV Upper Range (EU100)	100.000000		

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	11	Total Cycle Count (times)	24
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

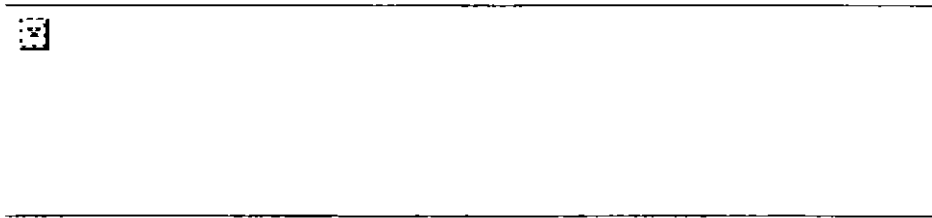
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	1.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-20-2003
Time: 09:33:29

GENERAL DATA

- Tag/Address

Pd-Tag	FV20071	Node Address	0xf6
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- Device Identifier

Device ID	4456440001J0002825	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-F1A3N/LC1/KS15
Tag Desc.	02.4909.12.1		
Valve Model	41935	Actuator Model	88-16" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/10/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	176.410004	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.400000	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	2.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	5.192383	Measured Gain	5.192383
Valve TC	220.804688	Valve Hysteresis	2.584045
Valve Slip Width	0.540085		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	94.500000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%	PV Lower Range (EU0)	0.000000
PV Upper Range (EU100)	100.000000		

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	4
Total Open Time (hours)	9	Total Close Time (hours)	1
Total Near Close Time (hours)	1		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	2.070000
Pressure Lower Range (EU0)	0.410000	Supply Pressure	2.800000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-6-2003
Time: 14:54:02

GENERAL DATA

- Tag/Address

Pd-Tag	30LV20081	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0000949	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- FIA3N/LC1/KS15
Tag Desc.	02.4909.13.1		
Valve Model	88-21014	Actuator Model	88-6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DII Tag	DII
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/06/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	116.530998	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.268959	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	7.256348	Measured Gain	7.256348
Valve TC	105.599609	Valve Hysteresis	2.944031
Valve Slip Width	0.543320		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	78.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	8	Total Cycle Count (times)	25
Total Open Time (hours)	12	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.590000
Pressure Lower Range (EU0)	0.760000	Supply Pressure	2.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-7-2003
Time: 14:21:58

GENERAL DATA

- Tag/Address

Pd-Tag	30FV20081	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0000972	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4909.14.1		
Valve Model	21125	Actuator Model	88-10" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	D11 Tag	D11
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/07/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	120.546997	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.275101	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	4.319702	Measured Gain	4.319702
Valve TC	109.439453	Valve Hysteresis	2.398376
Valve Slip Width	0.516068		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	94.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	10	Total Cycle Count (times)	25
Total Open Time (hours)	11	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Linear
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

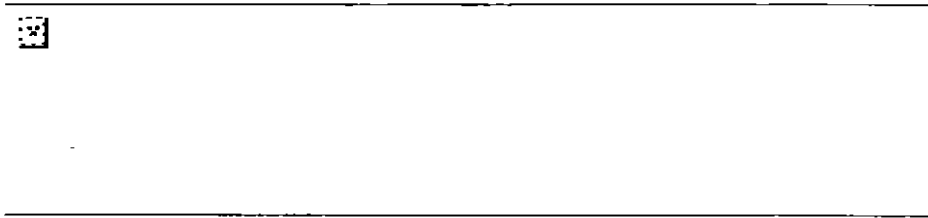
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	3.100000
Pressure Lower Range (EU0)	1.450000	Supply Pressure	3.800000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-28-2003
Time: 14:29:56

GENERAL DATA

- Tag/Address

Pd-Tag	PV30002	Node Address	0xF7
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- Device Identifier

Device ID	4456440001J0002820	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-F1A3N/LC1/KS15
Tag Desc.	02.4910.01.1		
Valve Model	NELES	Actuator Model	24"
Valve S/N	0	Actuator S/N	0 - -
Valve Manufacturer	Dresser Flow Control (0x445644)	Actuator Manufacturer	Dresser Flow Control (0x445644)

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
SPLT Tag	OS		

- Calibration

Calibration Name	DELAROCHE	Calibration Date	01/29/03
Calibration Location	CONDE	Servo Tuning Info.	-----

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	15.279800	Reset (I) (sec.)	14.000000
Rate (D) (sec.)	0.114080	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	2.900000	Boost On Th 2	3.900000
Boost Off Th 1	2.000000	Boost Off Th 2	2.000000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	0.673706	Servo P Alpha	0.000000
Internal Gain	1.052400	Servo Offset	54.980469

- Self Check Parameters

Valve TC	8.800049	Measured Gain	1.249054
Valve Slip Width	0.682587	Valve Hysteresis	7.433838
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	98.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	9	Total Cycle Count (times)	62
Total Open Time (hours)	0	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Linear
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	4.000000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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 <End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-7-2003
Time: 11:48:36

GENERAL DATA

- Tag/Address

Pd-Tag	30LV30004	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0000944	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- FIA3N/LC1/KS15
Tag Desc.	02.4910.02.1		
Valve Model	21125	Actuator Model	88-6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	D11 Tag	D11
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/07/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	52.600601	Reset (I) (sec.)	14.320300
Rate (D) (sec.)	0.171165	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	6.386597	Measured Gain	6.386597
Valve TC	44.479492	Valve Hysteresis	9.592285
Valve Slip Width	0.579788		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	85.000000
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	7	Total Cycle Count (times)	21
Total Open Time (hours)	12	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Linear
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.210000	Supply Pressure	1.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-8-2003
Time: 08:51:52

GENERAL DATA

- Tag/Address

Pd-Tag	30LV30022	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0000974	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4910.03.1		
Valve Model	21125	Actuator Model	88-6"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DII Tag	DII
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/08/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	52.349602	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.170784	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	6.914185	Measured Gain	6.914185
Valve TC	44.240234	Valve Hysteresis	11.921387
Valve Slip Width	0.583496		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	82.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	8	Total Cycle Count (times)	19
Total Open Time (hours)	11	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.210000	Supply Pressure	1.400000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 12-4-2002
Time: 08:47:46

GENERAL DATA

- Tag/Address

Pd-Tag	LDV30024	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002679	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-F1A3N/LC1/KS15
Tag Desc.	02.4910.04.1		
Valve Model	35-35602	Actuator Model	4*1/2 - -
Valve S/N	None	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	SOYER	Calibration Date	12/03/02
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	32.434601	Reset (I) (sec.)	5.000000
Rate (D) (sec.)	0.140320	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.674789	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	14.261719	Measured Gain	13.351563
Valve TC	25.200195	Valve Hysteresis	3.198608
Valve Slip Width	0.525040		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	98.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	6
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Equal percent(50:1)
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	1.400000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 12-4-2002
Time: 17:53:42

GENERAL DATA

- Tag/Address

Pd-Tag	LV30032	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002684	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-F1A3N/LC1/KS15
Tag Desc.	02-4910-05-1		
Valve Model	35-35202	Actuator Model	4" 1/2
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	SOYER	Calibration Date	12/04/02
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	33.856400	Reset (I) (sec.)	5.000000
Rate (D) (sec.)	0.142494	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	10.797607	Measured Gain	12.545898
Valve TC	26.399902	Valve Hysteresis	4.752441
Valve Slip Width	0.526520		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	99.000000
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Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 12-3-2002
Time: 16:55:36

GENERAL DATA

- Tag/Address

Pd-Tag	LV30164	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002803	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- FIA3N/LC1/KS15
Tag Desc.	02.4910.34.1		
Valve Model	35-35202	Actuator Model	CAMFLEX 4" 1/2
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	D11 Tag	D11
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	SOYER	Calibration Date	12/03/02
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	32.936523	Reset (I) (sec.)	5.000000
Rate (D) (sec.)	0.141087	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.611069	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	16.260742	Measured Gain	16.762207
Valve TC	25.680176	Valve Hysteresis	2.686707
Valve Slip Width	0.511108		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	97.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	8
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
------	---------------------

- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

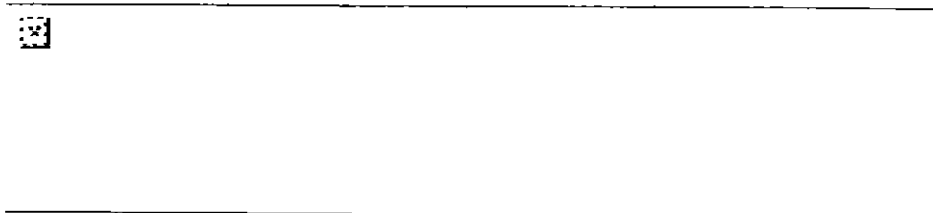
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	1.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 12-3-2002
Time: 13:29:52

GENERAL DATA

- Tag/Address

Pd-Tag	LV30042	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002688	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- FIA3N/LCI/KS15
Tag Desc.	02.4910.06.1		
Valve Model	35.35202	Actuator Model	4"1/2 - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	DELAROCHE	Calibration Date	12/03/02
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	33.689453	Reset (I) (sec.)	5.000000
Rate (D) (sec.)	0.142239	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.595413	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	11.643799	Measured Gain	12.000488
Valve TC	26.399902	Valve Hysteresis	2.434143
Valve Slip Width	0.562668		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	97.000000
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	1	Total Cycle Count (times)	8
Total Open Time (hours)	10	Total Close Time (hours)	1
Total Near Close Time (hours)	1		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

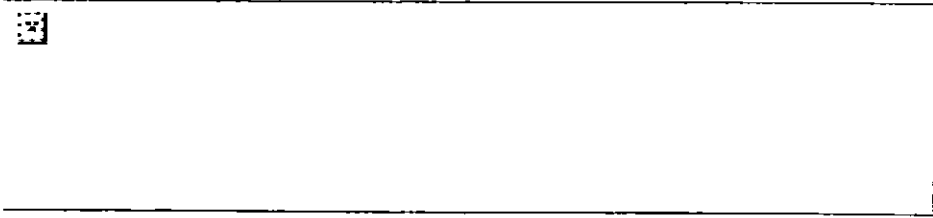
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	1.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 12-3-2002
Time: 14:23:57

GENERAL DATA

- Tag/Address

Pd-Tag	LV 30052	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002685	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-F1A3N/LC1/KS15
Tag Desc.	02.4910.08.1		
Valve Model	35-35202	Actuator Model	None - -
Valve S/N	0	Actuator S/N	CAMFLEX 4"1/2
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	DELAROCHE	Calibration Date	12/03/02
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	34.609375	Reset (I) (sec.)	5.000000
Rate (D) (sec.)	0.143646	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.686127	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	10.822754	Measured Gain	11.169189
Valve TC	27.279785	Valve Hysteresis	3.223877
Valve Slip Width	0.520096		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	97.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	9	Total Cycle Count (times)	19
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	1.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 12-3-2002
Time: 15:37:39

GENERAL DATA

- Tag/Address

Pd-Tag	LV30071	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002829	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- FIA3N/LC1/KS15
Tag Desc.	02.4910.10.1		
Valve Model	35-35202	Actuator Model	CAMFLEX 4" 1/2
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DII Tag	DII
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	DELAROCHE	Calibration Date	12/03/02
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	32.182598	Reset (I) (sec.)	5.000000
Rate (D) (sec.)	0.139935	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.670059	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	12.795410	Measured Gain	15.190918
Valve TC	25.040039	Valve Hysteresis	3.059692
Valve Slip Width	0.546127		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	98.000000
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	0
Total Open Time (hours)	0	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	1.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 12-3-2002
Time: 15:47:29

GENERAL DATA

- Tag/Address

Pd-Tag	TV30071	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002800	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02 -4910-11-1		
Valve Model	35-35202	Actuator Model	CAMFLEX 6"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DII Tag	DII
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	DELAROCHE	Calibration Date	12/03/02
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	78.123047	Reset (I) (sec.)	14.664551
Rate (D) (sec.)	0.210209	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	1.263580	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	12.979492	Measured Gain	13.381592
Valve TC	68.880859	Valve Hysteresis	3.451538
Valve Slip Width	0.534439		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	100.000000
--------------------------	------------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	5	Total Cycle Count (times)	16
Total Open Time (hours)	10	Total Close Time (hours)	1
Total Near Close Time (hours)	1		

OPTION DATA

- Position Characterization Type

Type	Linear
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

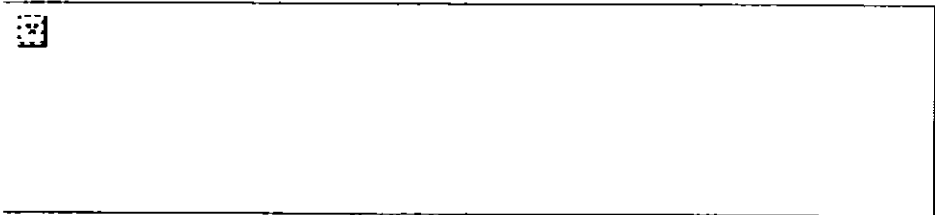
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	1.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 12-3-2002
Time: 13:48:24

GENERAL DATA

- Tag/Address

Pd-Tag	LV30073	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002801	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02-4910-12-1		
Valve Model	35-35202	Actuator Model	4"1/2 - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DII Tag	DII
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	DELAROCHE	Calibration Date	12/03/02
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	32.852539	Reset (I) (sec.)	6.081177
Rate (D) (sec.)	0.140961	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.806198	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	12.171387	Measured Gain	12.545166
Valve TC	25.600098	Valve Hysteresis	4.648682
Valve Slip Width	0.508911		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	100.000000
--------------------------	------------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	40	Total Cycle Count (times)	155
Total Open Time (hours)	15	Total Close Time (hours)	12
Total Near Close Time (hours)	15		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
------	---------------------

- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

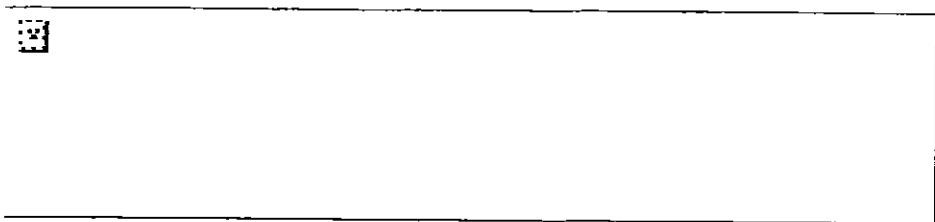
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	1.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-7-2003
Time: 10:53:32

GENERAL DATA

- Tag/Address

Pd-Tag	30LV30075	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0001449	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4910.13.1		
Valve Model	21715	Actuator Model	88-6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/07/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	47.496101	Reset (I) (sec.)	5.879880
Rate (D) (sec.)	0.163361	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	3.648071	Measured Gain	3.648071
Valve TC	39.599609	Valve Hysteresis	2.514709
Valve Slip Width	0.528366		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	77.500000
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	8	Total Cycle Count (times)	23
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	2.070000
Pressure Lower Range (EU0)	0.410000	Supply Pressure	2.800000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 12-3-2002
Time: 16:17:27

GENERAL DATA

- Tag/Address

Pd-Tag	LV30102	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002796	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- FIA3N/LC1/KS15
Tag Desc.	02.4910.16.1		
Valve Model	35-35202	Actuator Model	CAMFLEX 6"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	DELAROCHEI	Calibration Date	12/03/02
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	61.386719	Reset (I) (sec.)	11.297852
Rate (D) (sec.)	0.184608	Derivative Gain	5.000000
Dead Zone (%)	0.411148		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	1.482941	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	13.761230	Measured Gain	13.918213
Valve TC	52.879883	Valve Hysteresis	7.778687
Valve Slip Width	0.524506		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	100.000000
--------------------------	------------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	1	Total Cycle Count (times)	10
Total Open Time (hours)	10	Total Close Time (hours)	15
Total Near Close Time (hours)	15		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	1.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-27-2003
Time: 14:14:43

GENERAL DATA

- Tag/Address

Pd-Tag	TV30104	Node Address	0xf5
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- Device Identifier

Device ID	4456440001J0002804	Mfg. ID	445644
Device Type	I	Device Rev	3
DD Rev	I	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4910.18.1		
Valve Model	LW5C NELES	Actuator Model	12" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	delaroché	Calibration Date	01/23/03
Calibration Location	conde	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	55.864300	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.176159	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	2.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	11.272949	Measured Gain	11.272949
Valve TC	47.599609	Valve Hysteresis	99.527344
Valve Slip Width	0.531799		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	97.000000
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	64	Total Cycle Count (times)	182
Total Open Time (hours)	11	Total Close Time (hours)	1
Total Near Close Time (hours)	1		

OPTION DATA

• Position Characterization Type

Type	Linear
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	4.000000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-7-2003
Time: 13:41:58

GENERAL DATA

- Tag/Address

Pd-Tag	30FV30152	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0000991	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4910.26.1		
Valve Model	21715	Actuator Model	88-16" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/07/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	160.878998	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.380188	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	9.269287	Measured Gain	9.269287
Valve TC	175.121094	Valve Hysteresis	5.070190
Valve Slip Width	0.539398		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	87.000000
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	9	Total Cycle Count (times)	15
Total Open Time (hours)	12	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

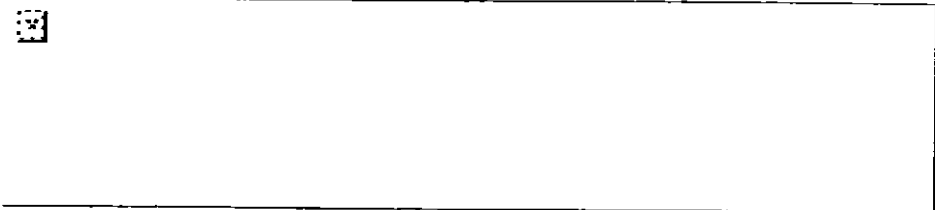
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.590000
Pressure Lower Range (EU0)	0.760000	Supply Pressure	2.100000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-6-2003
Time: 11:30:18

GENERAL DATA

- Tag/Address

Pd-Tag	30LV30153	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0001444	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4910.27.1		
Valve Model	88.21124.EB	Actuator Model	88.6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	D11 Tag	D11
D12 Tag	D12	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	GREE	Calibration Date	01/06/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	44.065399	Reset (I) (sec.)	5.000000
Rate (D) (sec.)	0.158112	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	7.014404	Measured Gain	7.014404
Valve TC	36.320313	Valve Hysteresis	3.786743
Valve Slip Width	0.529831		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	80.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	7	Total Cycle Count (times)	19
Total Open Time (hours)	8	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Linear
------	--------

- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.590000
Pressure Lower Range (EU0)	0.760000	Supply Pressure	2.100000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-7-2003
Time: 09:57:56

GENERAL DATA

- Tag/Address

Pd-Tag	30TV30154	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0000950	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4910.29.1		
Valve Model	21715	Actuator Model	88-16"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	D11 Tag	D11
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/07/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	160.500000	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.378410	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	10.403076	Measured Gain	10.403076
Valve TC	174.007813	Valve Hysteresis	5.996704
Valve Slip Width	0.507156		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	88.000000
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	8	Total Cycle Count (times)	15
Total Open Time (hours)	12	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Linear
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

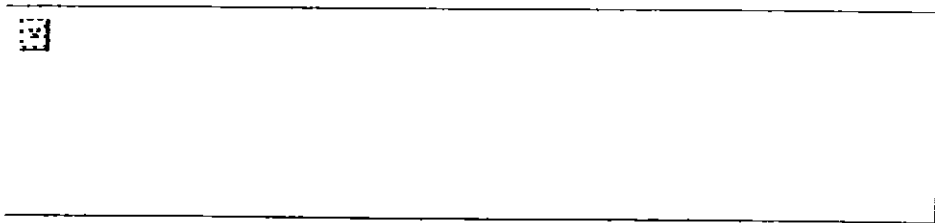
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.590000
Pressure Lower Range (EU0)	0.760000	Supply Pressure	2.100000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 12-3-2002
Time: 14:47:58

GENERAL DATA

- Tag/Address

Pd-Tag	LV 30161	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002802	Mfg. ID	445644
Device Type	I	Device Rev	3
DD Rev	I	Model	FVP110- FIA3N/LC1/KS15
Tag Desc.	02.4910.32.1		
Valve Model	35-35202	Actuator Model	4" 1/2 - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	DELAROCHE	Calibration Date	12/03/02
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	31.011230	Reset (I) (sec.)	5.000000
Rate (D) (sec.)	0.138145	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.692215	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	13.551270	Measured Gain	13.833008
Valve TC	23.839844	Valve Hysteresis	3.743530
Valve Slip Width	0.518021		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	98.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	8
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

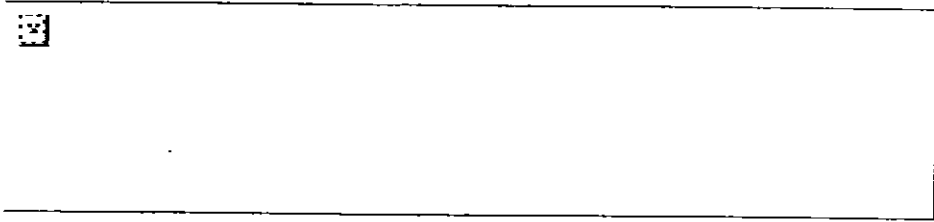
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	1.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 12-4-2002
Time: 08:56:44

GENERAL DATA

- Tag/Address

Pd-Tag	PV30162	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002795	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-FIA3N/LC1/KS15
Tag Desc.	02.4910.33.1		
Valve Model	35-35602	Actuator Model	4" 1/2 - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	SOYER	Calibration Date	12/03/02
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	32.936501	Reset (I) (sec.)	5.000000
Rate (D) (sec.)	0.141087	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.690613	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	14.282715	Measured Gain	14.562500
Valve TC	25.680176	Valve Hysteresis	3.482056
Valve Slip Width	0.524399		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	98.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	1	Total Cycle Count (times)	8
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Equal percent(50:1)
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

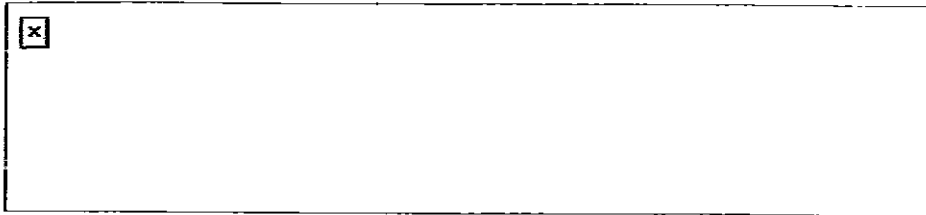
• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	1.400000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-19-2003
Time: 14:05:16

GENERAL DATA

- **Tag/Address**

Pd-Tag	LV40051	Node Address	0xec
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- **Device Identifier**

Device ID	4456440001J0002814	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-F1A3N/LC1/KS15
Tag Desc.	02-4911-02-1		
Valve Model	88-41515-EB	Actuator Model	88-10"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- **Block Tag**

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- **Calibration**

Calibration Name	ALEX	Calibration Date	11/02/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	83.560501	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.218529	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	1.371338	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	3.489624	Measured Gain	4.816162
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Valve TC	73.119141	Valve Hysteresis	5.079346
Valve Slip Width	0.538940		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	92.599998
--------------------------	-----------

AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
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Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		- -

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	4
Total Open Time (hours)	9	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Equal percent(30:1)
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

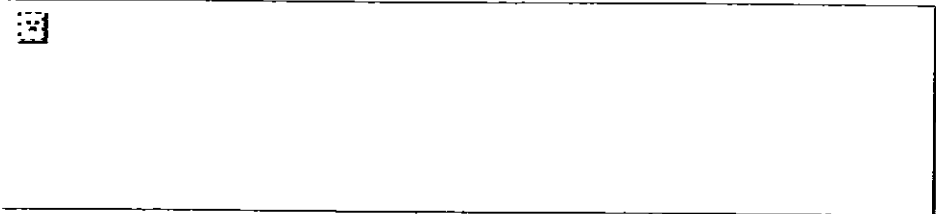
• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	2.070000
Pressure Lower Range (EU0)	0.410000	Supply Pressure	3.800000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-20-2003
Time: 09:12:16

GENERAL DATA

- Tag/Address

Pd-Tag	TV40053	Node Address	0xed
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- Device Identifier

Device ID	4456440001J0002832	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02-4911-03-1		
Valve Model	30-3022 / 6"	Actuator Model	# 30 n°5 - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	D11 Tag	D11
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	A.MARIE	Calibration Date	02/03/03
Calibration Location	Condé S/N	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	45.571301	Reset (I) (sec.)	5.328130
Rate (D) (sec.)	0.160416	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	0.789200	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	3.488281	Measured Gain	3.715820
Valve TC	38.000000	Valve Hysteresis	3.050354
Valve Slip Width	0.525238		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	97.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	0
Total Open Time (hours)	0	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.720000
Pressure Lower Range (EU0)	0.480000	Supply Pressure	2.800000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 3-6-2003
Time: 08:57:51

GENERAL DATA

- Tag/Address

Pd-Tag	LV40053	Node Address	0xef
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- Device Identifier

Device ID	4456440001J0002816	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- FIA3N/LC1/KS15
Tag Desc.	02-4911-04-1		
Valve Model	41525-EB	Actuator Model	88-16"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	03/06/03
Calibration Location	CONDE	Servo Tuning Info.	

• Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	43.061501	Reset (I) (sec.)	10.873500
Rate (D) (sec.)	0.156578	Derivative Gain	5.000000
Dead Zone (%)	0.400963		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	3.337891	Measured Gain	3.337891
---------------	----------	---------------	----------

Valve TC	35.360352	Valve Hysteresis	7.524170
Valve Slip Width	0.533478		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	86.000000
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
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Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		-

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	10	Total Cycle Count (times)	17
Total Open Time (hours)	9	Total Close Time (hours)	0
Total Near Close Time (hours)	0		.

OPTION DATA

• Position Characterization Type

Type	Linear
------	--------

- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

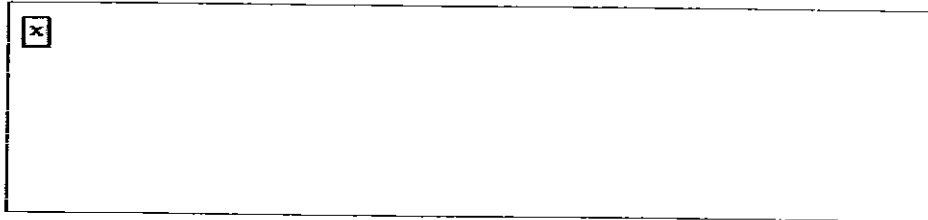
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	2.070000
Pressure Lower Range (EU0)	0.410000	Supply Pressure	2.800000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-25-2003
Time: 10:46:25

GENERAL DATA

- Tag/Address

Pd-Tag	LV40061	Node Address	0xf3
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- Device Identifier

Device ID	4456440001J0002808	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02-4911-05-01		
Valve Model	21115 EB	Actuator Model	88/10
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DII Tag	DII
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	LUCAS	Calibration Date	02/24/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	120.000000	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.220000	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
-------------------	------------	--------------------	------------

- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	7.706299	Measured Gain	4.716064
---------------	----------	---------------	----------

Valve TC	70.080078	Valve Hysteresis	2.572083
Valve Slip Width	0.528580		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	87.000000
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AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
----------------------	--------------	---------------------	------------

Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		- -

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	1	Total Cycle Count (times)	10
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Equal percent(50:1)
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.590000
Pressure Lower Range (EU0)	0.760000	Supply Pressure	2.100000

• Others

Bumpless Transfer	Bumpless	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-20-2003
Time: 09:45:16

GENERAL DATA

- Tag/Address

Pd-Tag	LV40063	Node Address	0xf2
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- Device Identifier

Device ID	4456440001J0002926	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02-4911-07-1		
Valve Model	88-21125-EB	Actuator Model	88-6"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	ALEX	Calibration Date	02/04/03
Calibration Location	CONDE	Servo Tuning Info.	

• Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	41.806599	Reset (I) (sec.)	7.169430
Rate (D) (sec.)	0.154655	Derivative Gain	5.000000
Dead Zone (%)	0.312065		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• **FAULT CONTROL**

FAULT CONTROL

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	0.985641	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	2.920715	Measured Gain	2.854126
---------------	----------	---------------	----------

Valve TC	34.799805	Valve Hysteresis	4.504150
Valve Slip Width	0.481537		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	99.000000
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AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
----------------------	--------------	---------------------	------------

Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		- -

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	1	Total Cycle Count (times)	8
Total Open Time (hours)	11	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.590000
Pressure Lower Range (EU0)	0.760000	Supply Pressure	2.100000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-19-2003
Time: 11:20:29

GENERAL DATA

- Tag/Address

Pd-Tag	LV40065	Node Address	0xf5
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- Device Identifier

Device ID	4456440001J0002806	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- FIA3N/LC1/KS15
Tag Desc.	02-4911-08-1		
Valve Model	88-21115-EB	Actuator Model	88-6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	alex	Calibration Date	02/04/03
Calibration Location	conde	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	32.601601	Reset (I) (sec.)	5.000000
Rate (D) (sec.)	0.140575	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	0.637314	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	1.993439	Measured Gain	2.451294
Valve TC	24.959961	Valve Hysteresis	3.981689
Valve Slip Width	0.630524		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	98.199997
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	6
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Equal percent(30:1)
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

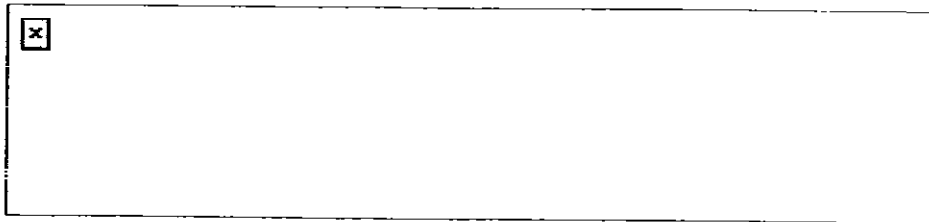
• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	2.100000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-26-2003
Time: 12:11:58

GENERAL DATA

- Tag/Address

Pd-Tag	PV40071	Node Address	0xf6
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- Device Identifier

Device ID	4456440001J0002868	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02-4911-09-1		
Valve Model	30-30222	Actuator Model	N 7
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	SOYER	Calibration Date	02/26/03
Calibration Location	CONDE FRANCE	Servo Tuning Info.	

• Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	93.685501	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.234013	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	3.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	4.289307	Measured Gain	4.366211
---------------	----------	---------------	----------

Valve TC	85.679688	Valve Hysteresis	3.309082
Valve Slip Width	0.531021		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	98.000000
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AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
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Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

- General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		- -

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	22	Total Cycle Count (times)	61
Total Open Time (hours)	9	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
------	---------------------

- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

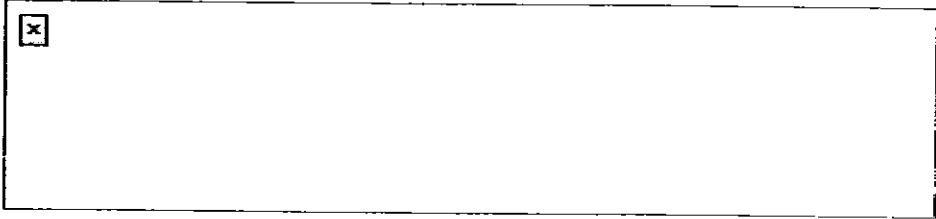
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.720000
Pressure Lower Range (EU0)	0.480000	Supply Pressure	3.100000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-19-2003
Time: 14:40:53

GENERAL DATA

- **Tag/Address**

Pd-Tag	PV40073	Node Address	0xf7
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- **Device Identifier**

Device ID	4456440001J0002826	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-F1A3N/LCI/KS15
Tag Desc.	02-4911-12-1		
Valve Model	88-21914-EB	Actuator Model	88-6"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- **Block Tag**

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- **Calibration**

Calibration Name	ALEX	Calibration Date	10/02/03
Calibration Location	CONDE	Servo Tuning Info.	

• Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	45.823200	Reset (I) (sec.)	5.400150
Rate (D) (sec.)	0.160801	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	0.822968	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	3.713867	Measured Gain	3.526611
---------------	----------	---------------	----------

Valve TC	37.759766	Valve Hysteresis	3.362549
Valve Slip Width	0.502930		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	90.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
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Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		- -

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	1	Total Cycle Count (times)	6
Total Open Time (hours)	9	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
------	--------

- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

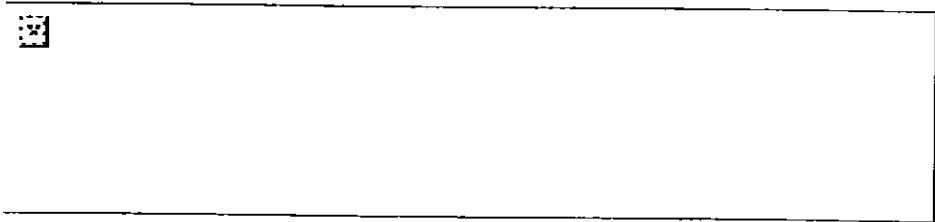
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	3.100000
Pressure Lower Range (EU0)	1.450000	Supply Pressure	3.500000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 12-3-2002
Time: 10:43:54

GENERAL DATA

- Tag/Address

Pd-Tag	LV40103	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002827	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-FIA3N/LCI/KS15
Tag Desc.	0.4911.17.1		
Valve Model	35-35202	Actuator Model	CAMFLEX 6" -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	DELAROCHE	Calibration Date	12/03/02
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	61.721699	Reset (I) (sec.)	9.960210
Rate (D) (sec.)	0.185120	Derivative Gain	5.000000
Dead Zone (%)	0.310341		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	1.235199	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	11.395752	Measured Gain	11.395752
Valve TC	53.200195	Valve Hysteresis	5.258423
Valve Slip Width	0.518860		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	99.000000
--------------------------	-----------

AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

- General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	26	Total Cycle Count (times)	56
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

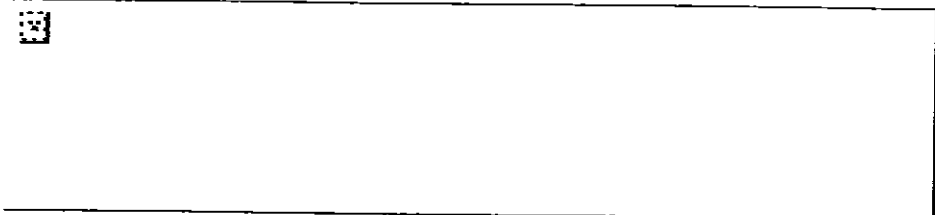
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	1.800000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-8-2003
Time: 15:27:25

GENERAL DATA

- Tag/Address

Pd-Tag	30fv40138	Node Address	0x7
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- Device Identifier

Device ID	4456440001J0002836	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4911.29.1		
Valve Model	21125	Actuator Model	88.6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	GREE	Calibration Date	01/08/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	50.591801	Reset (I) (sec.)	6.768070
Rate (D) (sec.)	0.168095	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	5.957642	Measured Gain	5.957642
Valve TC	42.559570	Valve Hysteresis	3.577454
Valve Slip Width	0.527328		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	92.000000
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AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

- General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	10	Total Cycle Count (times)	34
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.210000	Supply Pressure	1.400000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-20-2003
Time: 09:51:25

GENERAL DATA

- Tag/Address

Pd-Tag	FV40151	Node Address	0xf6
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- Device Identifier

Device ID	5945430001J0001431	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4911.32.1		
Valve Model	88-41935	Actuator Model	88-16" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/06/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	10.000000	Reset (I) (sec.)	5.000000
Rate (D) (sec.)	0.103968	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	2.900000	Boost On Th 2	3.900000
Boost Off Th 1	2.000000	Boost Off Th 2	2.000000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	0.500000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	0.864868	Measured Gain	0.864868
Valve TC	2.479980	Valve Hysteresis	0.874634
Valve Slip Width	0.533905		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	92.000000
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%	PV Lower Range (EU0)	0.000000
PV Upper Range (EU100)	100.000000		

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	2
Total Open Time (hours)	8	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	2.070000
Pressure Lower Range (EU0)	0.410000	Supply Pressure	2.800000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 3-7-2003
Time: 09:24:16

GENERAL DATA

- Tag/Address

Pd-Tag	TV40158	Node Address	0xf5
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- Device Identifier

Device ID	4456440001J0002863	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4911.33.1		
Valve Model	.41555	Actuator Model	88.16" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DII Tag	DII
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	GREE	Calibration Date	03/05/03
Calibration Location	CONDE/NOIREAU	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	50.000000	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.292000	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	2.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	3.509155	Measured Gain	3.509155
Valve TC	120.000000	Valve Hysteresis	7.555176
Valve Slip Width	0.717026		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	77.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	17	Total Cycle Count (times)	155
Total Open Time (hours)	9	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	3.100000
Pressure Lower Range (EU0)	1.450000	Supply Pressure	3.800000

- Others

Bumpless Transfer	Bumpless	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-19-2003
Time: 15:45:31

GENERAL DATA

- **Tag/Address**

Pd-Tag	LV40222	Node Address	0xf1
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- **Device Identifier**

Device ID	4456440001J0002835	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-F1A3N/LC1/KS15
Tag Desc.	02-4911-45-1		
Valve Model	88-21115-EB	Actuator Model	88-10"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- **Block Tag**

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- **Calibration**

Calibration Name	ALEX	Calibration Date	11/02/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	99.291000	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.242588	Derivative Gain	5.000000
Dead Zone (%)	0.336227		

- Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	1.778839	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	9.074951	Measured Gain	7.499268
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Valve TC	89.199219	Valve Hysteresis	4.926147
Valve Slip Width	0.558395		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	84.099998
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AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
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Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

- General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		- -

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	6
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(30:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.590000
Pressure Lower Range (EU0)	0.760000	Supply Pressure	2.100000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-19-2003
Time: 15:28:06

GENERAL DATA

- Tag/Address

Pd-Tag	LV40224	Node Address	0xf5
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- Device Identifier

Device ID	4456440001J0002833	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- FIA3N/LC1/KS15
Tag Desc.	02-4911-46-1		
Valve Model	35-35202 / 8"	Actuator Model	#35 7" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	D11 Tag	D11
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	A.Marie	Calibration Date	01/15/03
Calibration Location	Condé S/N	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	111.092003	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.260643	Derivative Gain	5.000000
Dead Zone (%)	0.500000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	2.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	49.442383	Measured Gain	3.058167
Valve TC	9.600098	Valve Hysteresis	3.589355
Valve Slip Width	0.530396		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	96.000000
--------------------------	-----------

AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%	PV Lower Range (EU0)	0.000000
PV Upper Range (EU100)	100.000000		

ACTUATOR DATA

- General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	0
Total Open Time (hours)	0	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.480000	Supply Pressure	2.800000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-20-2003
Time: 09:17:32

GENERAL DATA

- Tag/Address

Pd-Tag	LV40226	Node Address	0xf3
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- Device Identifier

Device ID	4456440001J0002812	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02-4911-47-1		
Valve Model	35-35202	Actuator Model	6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	lepley	Calibration Date	01/21/03
Calibration Location	condé	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	68.582001	Reset (I) (sec.)	11.928200
Rate (D) (sec.)	0.195614	Derivative Gain	5.000000
Dead Zone (%)	0.342209		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	1.402313	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	12.752441	Measured Gain	13.014404
Valve TC	59.759766	Valve Hysteresis	6.055176
Valve Slip Width	0.522400		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	98.000000
--------------------------	-----------

AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

- General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Linear (Reciprocating)

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	1	Total Cycle Count (times)	8
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Equal percent(50:1)
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.480000	Supply Pressure	1.800000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-20-2003
Time: 10:07:30

GENERAL DATA

- Tag/Address

Pd-Tag	LV50021	Node Address	0x0
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- Device Identifier

Device ID	4456440001J0002842	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4912.02.1		
Valve Model	35-35602	Actuator Model	6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	delaroché	Calibration Date	01/21/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	66.742203	Reset (I) (sec.)	11.400400
Rate (D) (sec.)	0.192799	Derivative Gain	5.000000
Dead Zone (%)	0.305000		

- Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	1.285828	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	11.364990	Measured Gain	14.121826
Valve TC	57.200195	Valve Hysteresis	6.151001
Valve Slip Width	0.528885		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	97.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F. Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	0
Total Open Time (hours)	0	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	0.480000
Pressure Lower Range (EU0)	1.030000	Supply Pressure	1.300000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-25-2003
Time: 11:17:10

GENERAL DATA

- Tag/Address

Pd-Tag	PV50031	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002805	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4912.08.		
Valve Model	41355	Actuator Model	88/10
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	LUCAS	Calibration Date	02/25/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	125.652000	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.282913	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	4.489502	Measured Gain	4.489502
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Valve TC	114.320313	Valve Hysteresis	3.161133
Valve Slip Width	0.567459		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	97.000000
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AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
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Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		- -

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	8	Total Cycle Count (times)	33
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	3.100000
Pressure Lower Range (EU0)	1.450000	Supply Pressure	3.800000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-20-2003
Time: 09:26:01

GENERAL DATA

- Tag/Address

Pd-Tag	LV50033	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002822	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02-4912-10-1		
Valve Model	35.35202.	Actuator Model	6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	Robbes	Calibration Date	01/21/03
Calibration Location	Condé	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	68.500000	Reset (I) (sec.)	11.904300
Rate (D) (sec.)	0.195488	Derivative Gain	5.000000
Dead Zone (%)	0.338478		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	1.391937	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	11.709961	Measured Gain	14.653809
Valve TC	59.679688	Valve Hysteresis	5.962036
Valve Slip Width	0.510925		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	98.000000
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AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%	PV Lower Range (EU0)	0.000000
PV Upper Range (EU100)	100.000000		

ACTUATOR DATA

- General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	31	Total Cycle Count (times)	70
Total Open Time (hours)	9	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Equal percent(50:1)
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

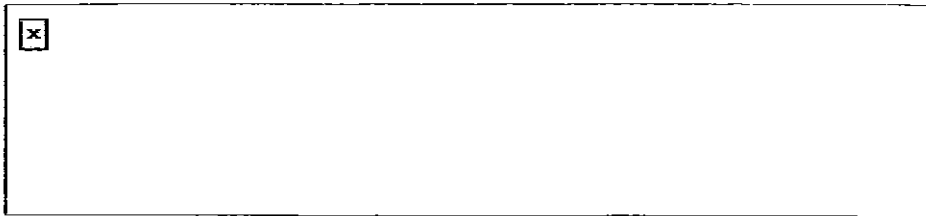
• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.480000	Supply Pressure	1.800000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-19-2003
Time: 14:27:23

GENERAL DATA

- **Tag/Address**

Pd-Tag	PV50071	Node Address	0xf6
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- **Device Identifier**

Device ID	4456440001J0002898	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02-4912-17-01		
Valve Model	88-21914-EB	Actuator Model	88-16"
Valve S/N	02-4912-17-1	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- **Block Tag**

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- **Calibration**

Calibration Name	alex	Calibration Date	02/03/03
Calibration Location	conde	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	80.000000	Reset (I) (sec.)	25.000000
Rate (D) (sec.)	0.400000	Derivative Gain	15.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	0.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	3.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
-------------------	------------	--------------------	------------

- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	2.000000	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	4.225342	Measured Gain	4.225342
---------------	----------	---------------	----------

Valve TC	189.558594	Valve Hysteresis	1.504700
Valve Slip Width	0.517441		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	98.199997
--------------------------	-----------

AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
----------------------	--------------	---------------------	------------

Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

- General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		-

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	39	Total Cycle Count (times)	251
Total Open Time (hours)	13	Total Close Time (hours)	1
Total Near Close Time (hours)	1		

OPTION DATA

- Position Characterization Type

Type	Equal percent(30:1)
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	3.100000
Pressure Lower Range (EU0)	1.450000	Supply Pressure	3.500000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-19-2003
Time: 15:04:05

GENERAL DATA

- Tag/Address

Pd-Tag	TV50072	Node Address	0xf5
--------	---------	--------------	------

- Device Identifier

Device ID	4456440001J0002840	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-F1A3N/LG1/KS15
Tag Desc.	02-4912-18-1		
Valve Model	88-21115	Actuator Model	88-6"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	ALEX	Calibration Date	10/02/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	31.262699	Reset (I) (sec.)	5.000000
Rate (D) (sec.)	0.138527	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	0.629623	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	3.408630	Measured Gain	3.541016
---------------	----------	---------------	----------

Valve TC	24.239746	Valve Hysteresis	2.870850
Valve Slip Width	0.529388		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	76.650002
--------------------------	-----------

AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
----------------------	--------------	---------------------	------------

Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		- -

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	1	Total Cycle Count (times)	4
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Equal percent(30:1)
------	---------------------

- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

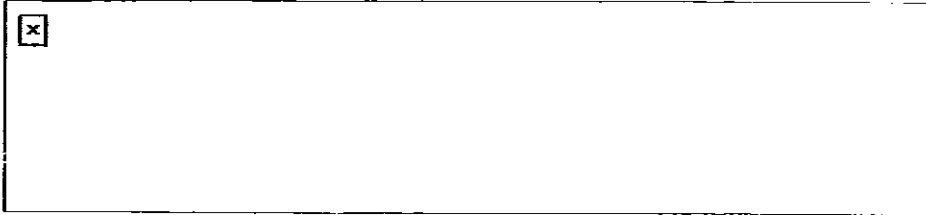
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	3.100000
Pressure Lower Range (EU0)	1.450000	Supply Pressure	3.500000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-25-2003
Time: 13:32:47

GENERAL DATA

- Tag/Address

Pd-Tag	PV50121	Node Address	0xe9
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- Device Identifier

Device ID	4456440001J0002828	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LG1/KS15
Tag Desc.	02-4912-21-1		
Valve Model	41355	Actuator Model	88/23
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	LUCAS	Calibration Date	02/25/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	10.000000	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.400000	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	3.858765	Measured Gain	3.858765
---------------	----------	---------------	----------

Valve TC	326.187500	Valve Hysteresis	2.767822
Valve Slip Width	0.536133		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	91.500000
--------------------------	-----------

AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
----------------------	--------------	---------------------	------------

Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

- General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		-

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	20	Total Cycle Count (times)	78
Total Open Time (hours)	9	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

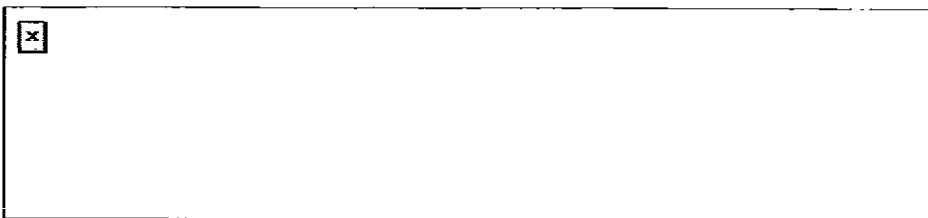
• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	3.100000
Pressure Lower Range (EU0)	1.450000	Supply Pressure	3.800000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-25-2003
Time: 11:50:17

GENERAL DATA

- Tag/Address

Pd-Tag	TV50141	Node Address	0xf4
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- Device Identifier

Device ID	5945430001J0000976	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110-F1A3N/LC1/KS15
Tag Desc.	02-4912-25-1		
Valve Model	21115EB	Actuator Model	88/16
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DII Tag	DII
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	LUCAS	Calibration Date	02/25/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	50.000000	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.390327	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	3.814819	Measured Gain	3.814819
---------------	----------	---------------	----------

Valve TC	181.457031	Valve Hysteresis	1.870880
Valve Slip Width	0.555954		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	93.500000
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
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Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

- General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		- -

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	14	Total Cycle Count (times)	81
Total Open Time (hours)	11	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

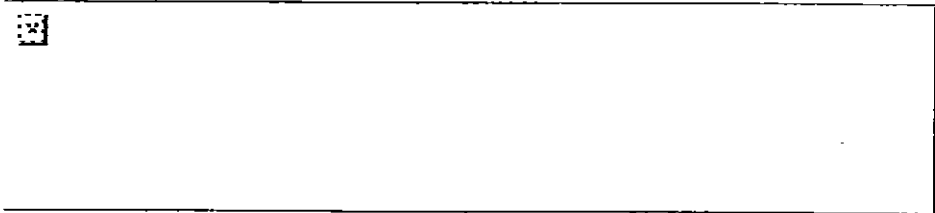
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	3.100000
Pressure Lower Range (EU0)	1.450000	Supply Pressure	3.500000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-9-2003
Time: 10:58:03

GENERAL DATA

- Tag/Address

Pd-Tag	30LV60001A	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0001439	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4913.01.1		
Valve Model	21125	Actuator Model	88-23" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	D11 Tag	D11
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/09/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	100.000000	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.400000	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	4.728760	Measured Gain	4.728760
Valve TC	303.765625	Valve Hysteresis	3.139954
Valve Slip Width	0.515732		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	89.500000
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	7	Total Cycle Count (times)	21
Total Open Time (hours)	8	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
------	--------

• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

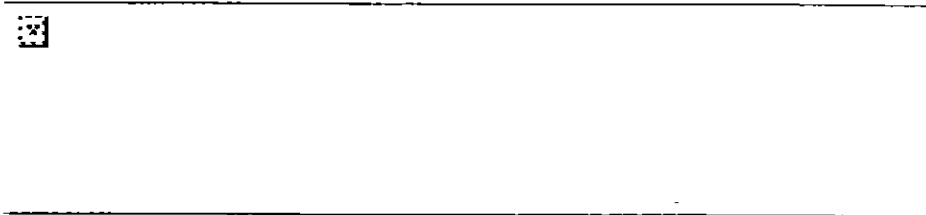
• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	3.100000
Pressure Lower Range (EU0)	1.450000	Supply Pressure	3.800000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-8-2003
Time: 08:24:06

GENERAL DATA

- Tag/Address

Pd-Tag	30lv60001b	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0001442	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4913.02.1		
Valve Model	21125	Actuator Model	88-10" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DII Tag	DII
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/08/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	117.871002	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.271011	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	4.645996	Measured Gain	4.645996
Valve TC	106.880859	Valve Hysteresis	2.726013
Valve Slip Width	0.524307		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	93.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	7	Total Cycle Count (times)	17
Total Open Time (hours)	8	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
------	--------

• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	3.100000
Pressure Lower Range (EU0)	1.450000	Supply Pressure	3.800000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-19-2003
Time: 15:36:52

GENERAL DATA

- Tag/Address

Pd-Tag	PV60007	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002652	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02-4913-03-1		
Valve Model	35-35502 / 6"	Actuator Model	#35 / 7" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	D11 Tag	D11
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	A.Marie	Calibration Date	01/15/03
Calibration Location	Condé S/N	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	111.092003	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.260643	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	1.628845	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	7.196289	Measured Gain	7.491699
Valve TC	100.240234	Valve Hysteresis	2.904297
Valve Slip Width	0.506180		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	96.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Close	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	0
Total Open Time (hours)	0	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

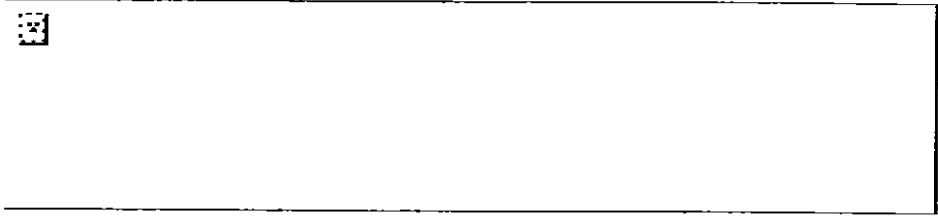
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.480000	Supply Pressure	2.500000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-6-2003
Time: 09:10:27

GENERAL DATA

- Tag/Address

Pd-Tag	30PV60008A	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0001448	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- FIA3N/LC1/KS15
Tag Desc.	02.4913.04.1		
Valve Model	88-21125	Actuator Model	88-6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/06/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	49.253899	Reset (I) (sec.)	6.384280
Rate (D) (sec.)	0.166046	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	6.579224	Measured Gain	6.579224
Valve TC	41.280273	Valve Hysteresis	3.204224
Valve Slip Width	0.498535		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	81.000000
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AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

- General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	8	Total Cycle Count (times)	19
Total Open Time (hours)	8	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Linear
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.210000	Supply Pressure	1.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-7-2003
Time: 15:09:53

GENERAL DATA

- Tag/Address

Pd-Tag	30PV60008B	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0001451	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4913.05.1		
Valve Model	21125	Actuator Model	88-23"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DII Tag	DII
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/07/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	120.000000	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.220000	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	6.773560	Measured Gain	4.828247
Valve TC	81.439453	Valve Hysteresis	2.577881
Valve Slip Width	0.529099		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	88.000000
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AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

- General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	7	Total Cycle Count (times)	17
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	3.100000
Pressure Lower Range (EU0)	1.450000	Supply Pressure	3.800000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-6-2003
Time: 11:55:09

GENERAL DATA

- Tag/Address

Pd-Tag	30FV60011	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002821	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4913.06.1		
Valve Model	87-41355	Actuator Model	87-10" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	D11 Tag	D11
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/06/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	79.292999	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.211998	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	5.778564	Measured Gain	5.778564
Valve TC	70.000000	Valve Hysteresis	6.676147
Valve Slip Width	0.554214		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	98.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Close	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	17	Total Cycle Count (times)	33
Total Open Time (hours)	9	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

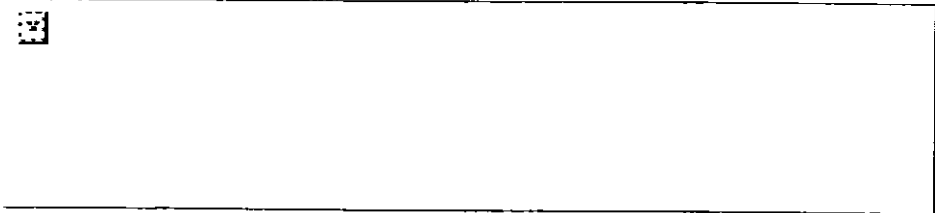
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.210000	Supply Pressure	2.100000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-7-2003
Time: 10:31:36

GENERAL DATA

- Tag/Address

Pd-Tag	30LV60021	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002799	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-FIA3N/LC1/KS15
Tag Desc.	02-4913-07-1		
Valve Model	21125	Actuator Model	88-10" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DII Tag	DII
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	LUCAS	Calibration Date	01/07/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	100.212997	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.243999	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	4.410889	Measured Gain	4.410889
Valve TC	90.000000	Valve Hysteresis	2.642212
Valve Slip Width	0.514694		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	90.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	8	Total Cycle Count (times)	27
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	3.100000
Pressure Lower Range (EU0)	1.450000	Supply Pressure	3.800000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-15-2003
Time: 09:59:47

GENERAL DATA

- Tag/Address

Pd-Tag	30 LV 60023	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002811	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02-4913-08-1		
Valve Model	35-35202 / 6"	Actuator Model	#35 7" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DII Tag	DII
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	A.Marie	Calibration Date	01/15/03
Calibration Location	Condé S/N	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	109.835999	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.258720	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	6.073120	Measured Gain	6.448975
Valve TC	97.279297	Valve Hysteresis	2.590820
Valve Slip Width	0.499603		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	96.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	3	Total Cycle Count (times)	10
Total Open Time (hours)	0	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

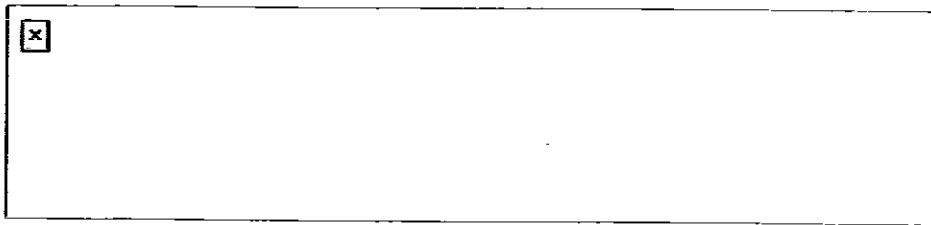
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	2.800000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-7-2003
Time: 10:33:07

GENERAL DATA

- Tag/Address

Pd-Tag	LV60211	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002844	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-FIA3N/LC1/KS15
Tag Desc.	02-4913-19 -1		
Valve Model	35-35202	Actuator Model	35; 4.5"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	p-rahain	Calibration Date	02/07/03
Calibration Location	conde	Servo Tuning Info.	

• Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	37.957001	Reset (I) (sec.)	5.235350
Rate (D) (sec.)	0.148769	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	9.301758	Measured Gain	9.301758
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Valve TC	30.479980	Valve Hysteresis	4.141235
Valve Slip Width	0.527390		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	98.000000
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
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Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

- General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		- -

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	24	Total Cycle Count (times)	66
Total Open Time (hours)	10	Total Close Time (hours)	1
Total Near Close Time (hours)	1		

OPTION DATA

- Position Characterization Type

Type	Linear
------	--------

- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.480000	Supply Pressure	1.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-7-2003
Time: 09:32:06

GENERAL DATA

- Tag/Address

Pd-Tag	30PV60211	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0001443	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4913.20.1		
Valve Model	88-21125	Actuator Model	88-6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DII Tag	DII
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/07/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-7-2003
Time: 11:23:57

GENERAL DATA

- Tag/Address

Pd-Tag	30lv30093	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0001441	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110-FIA3N/LC1/KS15
Tag Desc.	02.4910.14.1		
Valve Model	21125	Actuator Model	88-6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/07/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	49.002899	Reset (I) (sec.)	6.312260
Rate (D) (sec.)	0.165665	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	6.177246	Measured Gain	6.177246
Valve TC	41.040039	Valve Hysteresis	3.959534
Valve Slip Width	0.524567		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	78.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	7	Total Cycle Count (times)	17
Total Open Time (hours)	8	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.210000	Supply Pressure	1.400000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-6-2003
Time: 10:01:56

GENERAL DATA

- Tag/Address

Pd-Tag	30LV60211B	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0001432	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- FIA3N/LC1/KS15
Tag Desc.	02.4913.21.1		
Valve Model	88.21125	Actuator Model	88.6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	GREE	Calibration Date	01/06/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	37.120098	Reset (I) (sec.)	5.673830
Rate (D) (sec.)	0.147488	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	6.796875	Measured Gain	6.796875
Valve TC	29.680176	Valve Hysteresis	4.404297
Valve Slip Width	0.514572		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	85.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	6	Total Cycle Count (times)	20
Total Open Time (hours)	8	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

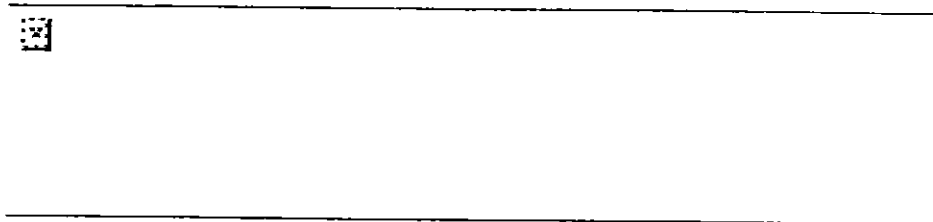
• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.210000	Supply Pressure	2.400000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-6-2003
Time: 15:17:22

GENERAL DATA

- Tag/Address

Pd-Tag	30PV70002	Node Address	0xf7
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- Device Identifier

Device ID	5945430001J0001446	Mfg. ID	445644
Device Type	1	Device Rev	2
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4914.01.1		
Valve Model	88-41355	Actuator Model	88-10" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Valve Division	Actuator Man. ID	Dresser Valve Division

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	D11 Tag	D11
DI2 Tag	DI2	PID Tag	PID
OS Tag	Not Installed		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/06/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	No	Signature Activation	No
Boot Functional Class	Basic	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	119.125000	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.272926	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	4.654663	Measured Gain	4.654663
Valve TC	108.080078	Valve Hysteresis	3.343872
Valve Slip Width	0.533325		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	88.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	7	Total Cycle Count (times)	18
Total Open Time (hours)	8	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Equal percent(50:1)
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	3.100000
Pressure Lower Range (EU0)	1.440000	Supply Pressure	3.800000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-19-2003
Time: 11:42:05

GENERAL DATA

- Tag/Address

Pd-Tag	FV70021	Node Address	0xf6
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- Device Identifier

Device ID	4456440001J0002916	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02-4914-02-1		
Valve Model	87-21125-EB	Actuator Model	87-10"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	alex	Calibration Date	02/03/03
Calibration Location	conde	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	84.564499	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.220062	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	1.392303	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	6.953979	Measured Gain	6.953979
---------------	----------	---------------	----------

Valve TC	75.039063	Valve Hysteresis	3.917725
Valve Slip Width	0.529099		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

- Other

Open Stop Adjustment (%)	99.000000
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AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
----------------------	--------------	---------------------	------------

Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Close	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		-

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	6
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
------	--------

- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

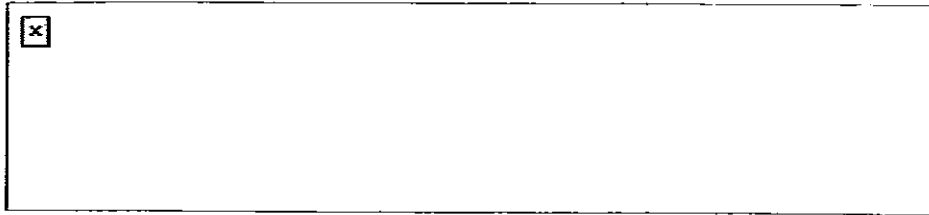
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	100.000000
Pressure Lower Range (EU0)	20.000000	Supply Pressure	140.000000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-19-2003
Time: 12:00:39

GENERAL DATA

- Tag/Address

Pd-Tag	FV70024	Node Address	0xf6
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- Device Identifier

Device ID	4456440001J0002888	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-F1A3N/LC1/KS15
Tag Desc.	02-4914-06-1		
Valve Model	87-21125-EB	Actuator Model	87-10"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	ALEX	Calibration Date	06/02/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	86.908203	Reset (I) (sec.)	15.000000
Rate (D) (sec.)	0.223644	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

- Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	10.000000	Boost Value 2	12.000000
Servo I Sleep Limit	1.477264	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	7.456055	Measured Gain	7.456055
---------------	----------	---------------	----------

Valve TC	77.279297	Valve Hysteresis	4.468506
Valve Slip Width	0.522812		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	98.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
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Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

- General

Valve Action	Air To Close	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		-

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	29	Total Cycle Count (times)	85
Total Open Time (hours)	11	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Linear
------	--------

- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

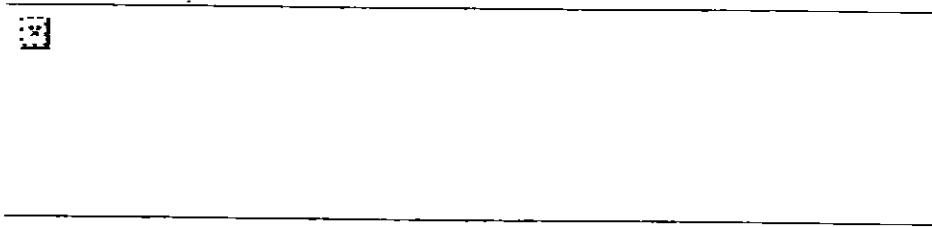
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.200000	Supply Pressure	2.100000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-6-2003
Time: 13:14:38

GENERAL DATA

- Tag/Address

Pd-Tag	30PV70081A	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002680	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4914.16.1		
Valve Model	88-21125	Actuator Model	88-6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	D11 Tag	D11
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/06/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	50.257801	Reset (I) (sec.)	6.672120
Rate (D) (sec.)	0.167583	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	3.380005	Measured Gain	3.380005
Valve TC	42.240234	Valve Hysteresis	2.833252
Valve Slip Width	0.527481		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	95.000000
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	7	Total Cycle Count (times)	23
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
------	--------

• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

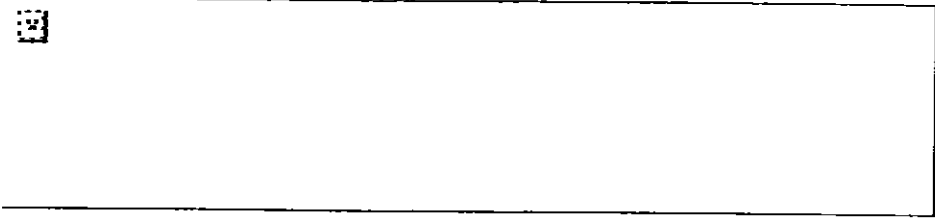
• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	2.070000
Pressure Lower Range (EU0)	0.410000	Supply Pressure	2.400000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-22-2003
Time: 13:39:43

GENERAL DATA

- Tag/Address

Pd-Tag	30PV70081B	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002818	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- FIA3N/LC1/KS15
Tag Desc.	02.4914.17.1		
Valve Model	35.35602	Actuator Model	4" 1/2
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DII Tag	DII
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	launay	Calibration Date	01/22/03
Calibration Location	conde	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	33.019501	Reset (I) (sec.)	5.000000
Rate (D) (sec.)	0.141216	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	10.676270	Measured Gain	10.676270
Valve TC	25.759766	Valve Hysteresis	3.082275
Valve Slip Width	0.517303		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	97.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	17	Total Cycle Count (times)	29
Total Open Time (hours)	9	Total Close Time (hours)	1
Total Near Close Time (hours)	1		

OPTION DATA

• Position Characterization Type

Type	Equal percent(50:1)
------	---------------------

• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

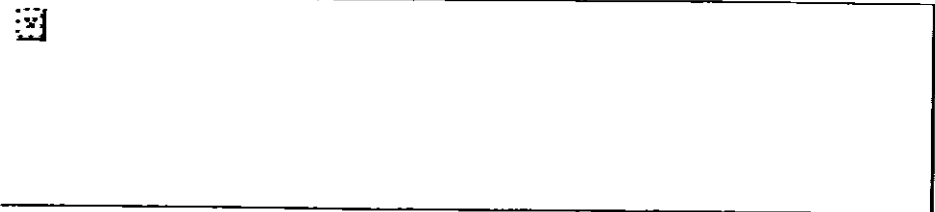
• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.480000	Supply Pressure	1.400000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-9-2003
Time: 13:11:56

GENERAL DATA

- Tag/Address

Pd-Tag	30FV70082	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002677	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4914.18.1		
Valve Model	21125	Actuator Model	88-6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/09/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	40.550800	Reset (I) (sec.)	9.312740
Rate (D) (sec.)	0.152737	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	3.723083	Measured Gain	3.723083
Valve TC	32.959961	Valve Hysteresis	6.587646
Valve Slip Width	0.565964		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	75.000000
--------------------------	-----------

AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	9	Total Cycle Count (times)	29
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	3.100000
Pressure Lower Range (EU0)	1.440000	Supply Pressure	3.800000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-20-2003
Time: 09:58:10

GENERAL DATA

- Tag/Address

Pd-Tag	FV70091	Node Address	0xf6
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- Device Identifier

Device ID	4456440001J0002841	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02.4914.19.1		
Valve Model	35-35202	Actuator Model	4"1/2 - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	delaroché	Calibration Date	01/22/03
Calibration Location	conde	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	27.999001	Reset (I) (sec.)	6.982790
Rate (D) (sec.)	0.133537	Derivative Gain	5.000000
Dead Zone (%)	0.307587		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.798431	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	12.729004	Measured Gain	12.729004
Valve TC	20.959961	Valve Hysteresis	5.189697
Valve Slip Width	0.550003		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	98.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

- Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	0	Total Cycle Count (times)	0
Total Open Time (hours)	0	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

- Position Characterization Type

Type	Equal percent(50:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.480000	Supply Pressure	1.800000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 2-19-2003
Time: 14:51:05

GENERAL DATA

- Tag/Address

Pd-Tag	PV70091	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002843	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-FIA3N/LC1/KS15
Tag Desc.	02-4914-20-1		
Valve Model	88-21014-EB	Actuator Model	88-6"
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	ALEX	Calibration Date	10/02/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

- Servo Parameters

Gain (P)	50.591801	Reset (I) (sec.)	9.328860
Rate (D) (sec.)	0.168095	Derivative Gain	5.000000
Dead Zone (%)	0.363892		

- Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

- Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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- Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

- Advanced Parameters

Boost On Th 1	0.900000	Boost On Th 2	1.900000
Boost Off Th 1	0.500000	Boost Off Th 2	0.500000
Boost Value 1	12.000000	Boost Value 2	14.000000
Servo I Sleep Limit	1.227203	Servo P Alpha	0.000000

- Self Check Parameters

Internal Gain	4.919556	Measured Gain	6.356934
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Valve TC	42.559570	Valve Hysteresis	6.597290
Valve Slip Width	0.537384		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	71.199997
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
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Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	1	Total Cycle Count (times)	4
Total Open Time (hours)	10	Total Close Time (hours)	1
Total Near Close Time (hours)	1		

OPTION DATA

• Position Characterization Type

Type	Equal percent(30:1)
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- Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

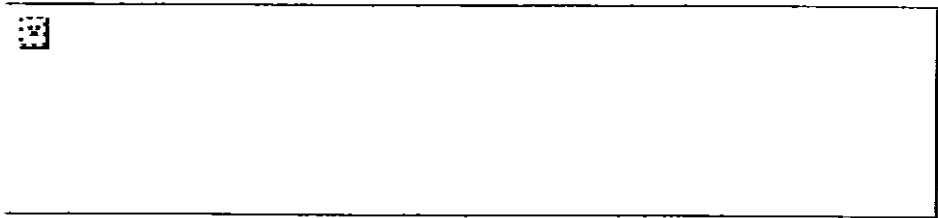
- Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.210000	Supply Pressure	1.400000

- Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-6-2003
Time: 14:28:31

GENERAL DATA

- Tag/Address

Pd-Tag	30PV70094A	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002683	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110-FIA3N/LC1/KS15
Tag Desc.	02.4914.21.1		
Valve Model	88-21125	Actuator Model	88-6" - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	MAUNOURY	Calibration Date	01/06/03
Calibration Location	CONDE	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	52.349602	Reset (I) (sec.)	7.272220
Rate (D) (sec.)	0.170784	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	1.000000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	10.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	3.107239	Measured Gain	3.107239
Valve TC	44.240234	Valve Hysteresis	2.944397
Valve Slip Width	0.540527		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	100.000000
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AO BLOCK DATA

- Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

- Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

- Options

Control	0x0000 (None)
Status	0x0000 (None)

- PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

- Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

- Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

- General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	6	Total Cycle Count (times)	24
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Linear
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

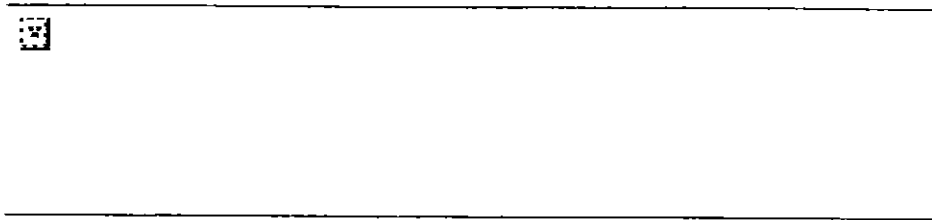
• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	2.070000
Pressure Lower Range (EU0)	0.410000	Supply Pressure	2.400000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>



Foundation Fieldbus Valve Positioner Configuration Report

User: Admin
Date: 1-22-2003
Time: 11:43:57

GENERAL DATA

- Tag/Address

Pd-Tag	30PV70094B	Node Address	0xf7
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- Device Identifier

Device ID	4456440001J0002837	Mfg. ID	445644
Device Type	1	Device Rev	3
DD Rev	1	Model	FVP110- F1A3N/LC1/KS15
Tag Desc.	02-4914-22-1		
Valve Model	35-35202	Actuator Model	4"1/2 - -
Valve S/N	0	Actuator S/N	0
Valve Man. ID	Dresser Flow Control	Actuator Man. ID	Dresser Flow Control

- Block Tag

RB Tag	RS	TB Tag	TB
AO Tag	AO	DI1 Tag	DI1
DI2 Tag	DI2	PID Tag	PID
OS Tag	OS		

- Calibration

Calibration Name	rahain	Calibration Date	01/22/03
Calibration Location	conde	Servo Tuning Info.	

- Others

PID Block Activation	Activated	Pressure Sensor Installation	No
Link Master Activation	Activated	Signature Activation	No
Boot Functional Class	Link Master	Macro Cycle Duration	32000

POSITION DATA

• Servo Parameters

Gain (P)	28.835400	Reset (I) (sec.)	6.880130
Rate (D) (sec.)	0.134815	Derivative Gain	5.000000
Dead Zone (%)	0.000000		

• Position Limit

Tightshutoff Below (%)	0.100000	Full Open Above (%)	110.000000
Pos. Lower Limit (%)	-10.000000	Pos. Upper Limit (%)	110.000000
Near Closed Value (%)	5.000000		

• Limit Switch Threshold

Threshold Low (%)	-10.000000	Threshold High (%)	110.000000
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• Fault Control

Error Band (%)	110.000000	Time 1 (sec.)	-1.000000
Time 2 (sec.)	-1.000000		

• Advanced Parameters

Boost On Th 1	1.900000	Boost On Th 2	2.900000
Boost Off Th 1	1.000000	Boost Off Th 2	1.000000
Boost Value 1	8.000000	Boost Value 2	10.000000
Servo I Sleep Limit	0.000000	Servo P Alpha	0.000000

• Self Check Parameters

Internal Gain	11.699707	Measured Gain	12.059814
Valve TC	21.759766	Valve Hysteresis	5.128052
Valve Slip Width	0.528900		
Measured Exhaust Pressure	0.000000	Measured Supply Pressure	0.000000
Measured Spring Range Upper	0.000000	Measured Spring Range Lower	0.000000

• Other

Open Stop Adjustment (%)	97.000000
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AO BLOCK DATA

• Limits

Set Point High (%)	100.000000	Set Point Low (%)	0.000000
Set Point Up Rate Limit (%/s)	1.#INF	Set Point Down Rate Limit (%/s)	1.#INF

• Options

I/O	0x0050 (SP tracks PV if Man.+SP tracks PV if LO.)
Status	0x0000 (None)

PID BLOCK DATA

• Options

Control	0x0000 (None)
Status	0x0000 (None)

• PID Parameters

Proportional Gain	1.000000	Integral Time (sec.)	10.000000
Derivative Time (sec.)	0.000000		
F.F. Gain	0.000000	F.F Value (Manual Reset Bias)	0.000000

• Limits

Set Point High Limit	100.000000 %	Set Point Low Limit	0.000000 %
Output High Limit (%)	100.000000	Output Low Limit (%)	0.000000
Deviation Alarm High Limit	1.#INF %	Deviation Alarm Low Limit	-1.#INF %
High Alarm Limit	1.#INF %	Low Alarm Limit	-1.#INF %
High/High Alarm	1.#INF %	Low/Low Alarm	-1.#INF %

• Others

PV Unit Code	%		
PV Upper Range (EU100)	100.000000	PV Lower Range (EU0)	0.000000

ACTUATOR DATA

• General

Valve Action	Air To Open	Actuator Type	Single Acting
Relay Type	Normal (Direct Acting Instrument)	Valve Type	Rotary

• Continuous Data Limit

Travel Limit (strokes)	4294967295	Cycle Count Limit (times)	4294967295
Open Time Limit (hours)	4294967295	Close Time Limit (hours)	4294967295
Near Close Time Limit (hours)	4294967295		

CONTINUOUS DIAGNOSTICS DATA

Total Travel (strokes)	43	Total Cycle Count (times)	57
Total Open Time (hours)	10	Total Close Time (hours)	0
Total Near Close Time (hours)	0		

OPTION DATA

• Position Characterization Type

Type	Equal percent(50:1)
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• Position Characterization Data

Setpoint (%)	Position (%)	Setpoint (%)	Position (%)
0	0.0	10	10.000000
20	20.000000	30	30.000000
40	40.000000	50	50.000000
60	60.000000	70	70.000000
80	80.000000	90	90.000000
100	100.0		

• Pressure

Pressure Unit Code	bar	Pressure Upper Range (EU100)	1.030000
Pressure Lower Range (EU0)	0.480000	Supply Pressure	1.800000

• Others

Bumpless Transfer	No	Temperature Unit Code	degC
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<End of Report>

