

H-1001
STEAM REFORMER
GJ/H
70 BURNERS
184 TUBES

E-1019 A/B
COOLING JACKET
WATER COOLER
4.2 GJ/H

P-1004 A/B
COOLING JACKET
WATER PUMP
22.2 KW 6)

D-1009
COOLING JACKET
WATER DRUM

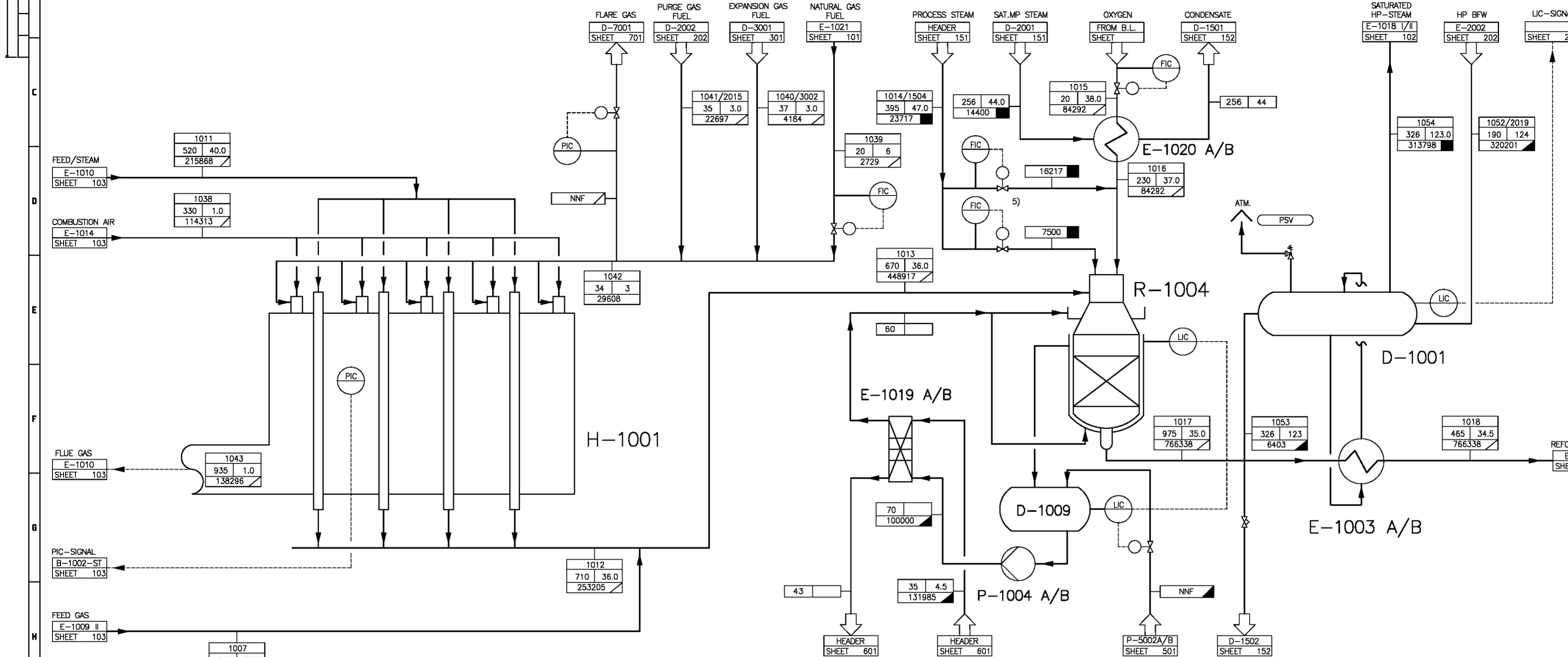
E-1020 A/B
OXYGEN
PREHEATER
23.4 GJ/H

R-1004
AUTOTHERMAL
REFORMER

E-1003 A/B
REFORMED GAS
BOILER
591.5 GJ/H

D-1001
HP-STEAM
DRUM

- NOTES:
- 1) PRESSURES ARE ABSOLUTE UNLESS OTHERWISE INDICATED
 - 2) STANDARD VAPOR CONDITIONS: 15°C, 1.01325 BAR (23.6449 SM3/KMOL)
 - 3) NNF: NORMALLY NO FLOW;
 - 4) TO STEAM / CARBON RATIO CONTROL
 - 5) SEE P&ID NO. 110 FOR CONTROL DETAILS CENTRAL AND SATELLITE BURNERS.
 - 6) RATED POWER



LEGEND :

LIQUIDS

STREAM NO.	°C	BAR	KG/H
°C	BAR	KG/H	

GASES

STREAM NO.	°C	BAR	SM3/H
°C	BAR	SM3/H	

STEAM

°C	BAR	KG/H	
°C	BAR	KG/H	

TEMPERATURE TEMP./PRESSURE

°C	°C	BAR	
°C	°C	BAR	

Stream No.:	1007	1011	1012	1013	1014/1504	1015	1016	1017	1018	1038	1039	1040/3002	1041/2015	1042	1043	1052/2019	1053	1054	
Process Stream	Feed Gas from E-1009 to R-1004	Reformed Gas from H-1001	Reformed Gas from H-1001	Feed Gas to R-1004	Process Steam to R-1004	Oxygen from B.L.	Oxygen to R-1004	Reformed Gas from R-1004	Reformed Gas from E-1003A/B	Combustion Air to H-1001	Natural Gas Fuel to H-1001	Expansion Gas Fuel to H-1001	Purge Gas Fuel to H-1001	Fuel Mixture to H-1001	Flue Gas to H-1001	BFW from Unit 200	Blow Down from D-1001	Saturated Steam from D-1001	
Phase	Vapor	Vapor	Vapor	Vapor	Vapor	Vapor	Vapor	Vapor	Vapor	Vapor	Vapor	Vapor	Vapor	Vapor	Vapor	Vapor	Vapor	Vapor	
Comp.	Molweight	kmol/h	mol %	kmol/h	mol %	kmol/h	mol %	kmol/h	mol %	kmol/h	mol %	kmol/h	mol %	kmol/h	mol %	kmol/h	mol %	kmol/h	mol %
O2	44.010	50.1	0.61	157.0	1.72	611.6	5.71	661.7	3.49										
CO	28.010	6.0	0.07	1.8	0.02	336.8	3.15	342.9	1.81										
H2	2.018	127.5	1.54	537.9	5.89	3361.1	31.39	3486.6	18.37										
CH4	16.043	4205.2	50.81	2975.4	32.59	2185.8	20.41	6391.0	33.66										
N2	28.016	191.5	2.31	138.6	1.52	138.6	1.29	330.1	1.74										
O2	32.000																		
H2O	18.015	3865.3	44.28	5518.5	58.28	4074.4	38.05	7739.6	40.77	1318.5	100.00								
CH3OH	32.042	1.4	0.02			1.4	0.01												
C2H6	30.069	19.4	0.23			19.4	0.10												
C3H8	44.096	10.1	0.12			10.1	0.05												
C4H10	58.123																		
CSH12	72.151																		
Argon	39.948	0.7	0.01	0.5	0.01	0.5	<0.01	1.1	0.01										
Low Boilers																			
High Boilers																			
Total Flow	kmol/h	8277.2		9129.6		10708.7		18985.8		1316.5		3564.9		3564.9		32410.3		32410.3	
Total Flow	kg/h	142591		155491		155492		288083		23717		114130		435933		288083		137677	
Total Flow	Sm³/h	195712		215868		253205		448917		84292		84292		766338		766338		766338	
Molweight	kg/kmol	17.227		17.032		14.520		15.700		10.015		13.450		13.450		20.470		26.052	
Stand.Dens.	kg/Sm³	0.73		0.72		0.61		0.66		0.76		1.35		1.35		0.71		1.10	
Eff.Density	kg/m³	8.15		10.40		6.38		7.18		16.40		51.15		28.14		4.52		3.48	
Specific Heat	kJ/kg°C	3.21		2.77		3.07		3.14		2.37		0.98		2.53		1.08		2.15	
Viscosity	cP	0.030		0.028		0.033		0.032		0.020		0.028		0.031		0.011		0.013	
Enthalpy	GJ/h	411.91		435.88		494.00		901.14		75.35		5.42		28.84		1526.56		935.03	
Temp.	°C	640		520		710		670		395		20		37		37		35	
Pressure	bar ab	36.0		40.0		36.0		36.0		47.0		38.0		37.0		35.0		34.5	
Liquid Molar Fraction																			

4 | GRELAK | 12.01.04 | ZMM | LAE | 12.01.04 | AFD | ZAGROS COMMENTS 25-IF/A-032 INCLUDED

3 | GRELAK | 14.04.03 | ZMM | LAE | 17.04.03 | AFD | REVISION ACC. DETAIL DESIGN

2 | HERRL | 27.11.01 | ZMM | DRJH | 27.11.01 | AFD | REVISION ZAGROS COMMENTS INCLUDED

1 | HERRL | 23.10.01 | ZMM | DRJH | 23.10.01 | AFD | REVISION ZAGROS COMMENTS INCLUDED

0 | HERRL | 13.07.01 | ZMM | KRER | 13.07.01 | F | FIRST ISSUE

REV.	PREPARED/CHANGED	NAME	DATE	NAME	DATE	STATUS	KIND OF REVISION

ZAGROS PETROCHEMICAL COMPANY OWNER: NATIONAL PETROCHEMICAL COMPANY ZAGROS PETROCHEMICAL COMPLEX

DISPOSITION: NO COMMENT COMMENTS AS MARKED. FABRICATION CAN PROCEED ACCORDINGLY. REVISIONS DO NOT TO BE ISSUED EITHER FOR REVIEW OR AS FINAL CERTIFIED. HOWEVER, ZAGROS WILL CHECK THIS REVISION DOCUMENT FOR PROPER INCORPORATION.

PROJECT: 4th METHANOL PROJECT

CONTRACTOR: PETROCHEMICAL INDUSTRIES DESIGN & ENGINEERING COMPANY

DWG. NO.: DIG-PR-009

SCALE: ORIGINAL SIZE: A1

NOMINATION: STEAM REFORMER AUTOTHERMAL REFORMER UNIT 100

BASIC DOCUMENT: PROCESS FLOW DIAGRAM SHEET 104

REVISIONS: 4

EDV-IDNET-NO.: IGS7 E:\PIPE\696660\PPFD\RU D-02039.PID 009 12.01.04 REBS IGW60