Terms of Reference
Issued for HAZOP Meeting

HAZOP Study Review
For
Methanol Production Unit of MEKPC

The intent of "Terms of Reference" is only preparing team members for HAZOP Meetings.
The content of the document will be completed and elaborated in Final HAZOP Report.

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Brief HAZOP Procedure

1.1. Study Method

The technique of Hazard and Operability studies, or in more common terms HAZOP, has been used and developed over approximately four decades for identifying potential hazards and operability problems caused by deviations from the design intent of both new and existing process plants. It is believed that HAZOP methodology is perhaps the most widely used aid to loss prevention.

Essentially, the HAZOP procedure involves taking a full description of a process and systematically questioning every part of it to establish how deviations from the design intent can arise. Once identified, an assessment is made as to whether such deviations and their consequences can have a negative effect upon the safe and efficient operation of the plant. If considered necessary, action is then recommended to be taken to remedy the situation.

This critical analysis is applied in a structured way by the HAZOP team, and it relies upon them releasing their imagination in an effort to discover credible causes of deviations.

In practice, many of the causes will be fairly obvious, such as pump failure causing a loss of circulation in a cooling water facility. However, the great advantage of the technique is that it encourages the team to consider other less obvious ways in which a deviation may occur, however unlikely they may seem at first consideration.

In this way, the study becomes much more than a mechanistic checklist-type review. The result is that there is a good chance that potential failures and problems will be identified, which had not previously been experienced in the type of plant being studied.

An essential feature in this process of questioning and systematic analysis is the use of guidewords and parameters to focus the attention of the team upon deviations and their possible causes. These are defined as follows:

Guidewords, which when combined with a parameter, suggest possible deviations.

Parameters, which focus attention upon a particular aspect of the design intent, an associated process condition or a parameter.

The entire technique of HAZOP revolves around the effective use of guidewords and parameters. So, their meaning and use must be clearly understood by the team.

Examples of often-used guidewords and parameters are listed below. These reflect both the process design intent and operating aspects of the plant being studied. Typical process-oriented words might be as follows.

Table 1. Process Parameters

Flow	Level
Pressure	Composition
Separation	Temperature
Reaction	Corrosion
Purity	Ph

The above list is purely illustrative, as the words employed in a review will depend upon the plant being studied. Added to the above might be relevant operating words such as:

Isolate	Drain	Start-up
Vent	Purge	Shutdown
Inspect	Maintain	

As mentioned above, certain guidewords are applied to the parameters to suggest potential deviations or problems. They tend to be a standard set, as listed below:

Table 2. HAZOP Guidewords

Guideword	Meaning
No	The design intent does not occur (e.g., Flow/No), or the operating aspect is not achievable (Isolate/No)
Less	A quantitative decrease in the design intent occurs (e.g., Pressure/Less)

More	A quantitative increase in the design intent occurs (e.g., Temperature/More)
Reverse	The opposite of the design intent occurs (e.g., Flow/Reverse)
As well as	The design intent is completely fulfilled, but in addition some other related activity occurs (e.g., Flow/As well as indicating contamination in a product stream)
Other than	The activity occurs, but not in the way intended (e.g., Flow/Other than could indicate a leak or product flowing where it should not, or Composition/Other than might suggest unexpected proportions in a feedstock)

In simple terms, the HAZOP study process involves applying in a systematic way all relevant deviations to the plant in question in an effort to uncover potential problems.

The deviations are applied to plants section by section to provide the necessary focus by limiting the scope of study to a certain part of the plant or unit in question each time. Each of these sections is called a 'Node.'

The results of the study are recorded in tabular format under the following headings:

Node:			
Deviation:			
Causes	**Consequences**	**Safeguards**	**Recommendations**

A summarized description of these column headings follows:

Deviations:

The keyword combination being applied, e.g., No Flow. A list of usual deviations used in HAZOP studies is given in section 4.

Causes:

Potential causes that would result in the deviation occurring. There are some assumptions for causes:

Filters obstruction is not considered as a cause for No/Less Flow deviation.

For any deviations, it is supposed that bypass line of control valves is always open.

Failures in independent safety systems such as ESD and interlocks are not considered as causes.

Control valves and similar devices usually have known and assigned failure modes for power failure and/or instrument air failure. However, they may also fail mechanically, sometimes in the opposite direction of their known and designated failure modes.

Consequences:

The consequences that may arise from the effect of the deviation or if appropriate, from the cause itself.

Safeguards:

Any existing protective devices that either prevent the cause or safeguard against the adverse consequences would be recorded in this column. Safeguards need not be restricted to hardware. Where appropriate, credit can be taken for procedural aspects such as regular plant inspections.

Recommendations:

Where a credible cause results in a negative consequence, it must be decided whether some action should be taken. It is at this stage that consequences and associated safeguards are considered. If it is deemed that the protective measures are adequate, then no action need be taken, and words to that effect are recorded in the column.

1.2. Usual Deviations Used in HAZOP's

Deviations	Guide Word	Parameter
No/Less Flow	No/Less	Flow
More Flow	More	Flow
Reverse/Misdirected Flow	Reverse/Misdirected	Flow
Rupture	Other than	Flow
Leakage	As well as	Flow
High Temperature	High	Temperature
Low Temperature	Low	Temperature
High Discharge Pressure	High	Pressure
High Pressure	High	Pressure

Deviations	Guide Word	Parameter
High Suction Pressure	High	Pressure
Low Pressure	Low	Pressure
Low Suction Pressure	Low	Pressure
High Level	High	Level
High/Excess Interface Level	High	Interface Level
High Interface Level	High	Interface Level
Low Interface Level	Low	Interface Level
Low/Reduced Interface Level	Low	Interface Level
High Bottoms Level	High	Level
Low Bottoms Level	Low	Level
Low Level	Low	Level
Low Tray Level	Low	Level
More/Excess Cooling	More	Cool
No/Less Cooling	Less	Cool
Corrosion Hazard	Other than	Corrosion
Fouling formation	Other than	Fouling
More/Excess Heating	More	Heat
More Fire/Explosion Risk	More	Heat
No/Less Heating	Less	Heat
High/Low heat value	High/Low	Heat Value
More Load on Structures	More	Load on Structures
More Load on Flare System	More	Load to Flare
Cavitations	As well as	Performance
Column Flooding/Foaming	Part of	Performance
Loss of Performance	Other than	Performance
High/Low pH	High/Low	pH
Extra phase/Phase missing	As well as/Part of	Phases
Impurities Present	As well as	Purity
Catalyst deactivated/inhibited	As well as	Purity

Deviations	Guide Word	Parameter
High Reaction Rate	More	Reaction
Low Reaction Rate	Less	Reaction
Too much/Too fast Reaction	Other than	Reaction
Too little/Too slow Reaction	Other than	Reaction
Start-up/Shutdown hazards	Other than	Start-up/Shutdown
High Agitation/Recirculation	High	Agitation
Low Agitation/Recirculation	Low	Agitation
No/Less Component Separation	Less	Component Separation
Contaminants	As well as	Composition
Contaminants Enter Compressor	As well as	Composition
Contamination	As well as	Composition
High Concentration of Impurities	As well as	Composition
High Contaminants	As well as	Composition
Start-up/Shutdown Hazards	Other than	Start-up/Shutdown
Failure of service	Other than	Utility
High vibration	High	Vibration
Isolation Problem	Other than	Maintenance
Purging Problem	Other than	Maintenance
Evacuation Problem	Other than	Maintenance
Maintenance Hazards	Other than	Maintenance

1.3. HAZOP Assumptions

The following assumptions are usually taken into consideration during HAZOP studies. Following the usual practice of HAZOP studies and to the best of leader experience, these assumptions facilitate the study and help the team avoid unnecessary duplication of items to study, if applicable:

1. Plant will be operated at or below design rates.
2. The facility will be operated and maintained by qualified, experienced personnel using appropriate operating and maintenance procedures that will be written (or updated) to reflect current design prior to commissioning.

3. Process chemistry is understood and plant model (heat & mass balance) are accurate.
4. Control valves are assumed to operate only in automatic rather than manual mode. Control valves that are operated manually, if any, are reviewed during the study and changing their operation mode from manual to automatic is discussed.
5. Control valves and similar devices usually have known and assigned failure modes for power failure and/or instrument air failure. However, they may also fail mechanically, sometimes in the opposite direction of their known and designated failure modes.
6. All drain and bleed valves are plugged or capped on their open ends. Thus, drains or vent valves will not normally be considered a potential hazard source except in special cases.
7. Simultaneous failure of several equipment items will not be considered. Actually, the probability of such a circumstance is usually very low.
8. Failure of a safeguard will not be considered as a cause of a deviation. The only exception is that when the team realizes the weaknesses of the design, in which case improvement options will be discussed and recorded.
9. In cases where the expression "same as above" appears under Consequences and safeguards column is empty, it means that all consequences of the previous cause (and only that cause) and related safeguards are valid for the case.
10. Whenever the same expression "same as above" is given in Consequences column but not in Safeguards column, any listed safeguards are assumed to be the only ones relevant to the case, although the consequences were the same.
11. Opening of PSV's or bleeding valves is a consequence of overpressure, so it will not be considered as a cause of 'Less Pressure' or 'Misdirected Flow'.
12. Incorrect set point will lead to consequences such as control system failure. So, it will not be considered as an independent cause.
13. Erroneous opening of two valves in series or valves with poor access is considered to be rare cases and will not be considered in the study.

14. Error in opening of all lines and connections that are shown blank-off in P&ID's during normal operation will not be considered in the HAZOP study.
15. The inadvertent Opening/ Closing of a LC/LO/CSC/CSO valves will not be considered because administrative controls are considered adequate safeguard to prevent this situation.
16. Relief valves will not be blocked and removed from service during plant operations unless plant will be designed to allow servicing of relief devices while plant is operating.
17. In new plants where advanced control technologies are employed, enough safeguards are usually present in the form of automatic control systems, secondary safety barriers (like NRV's and PSV's), the ESD system itself, alarms and interlocks. So, local instruments will not generally be considered as safeguards, except for those cases where the operator has enough time to check without being exposed to high risk and the device is effective enough to show the deviation precisely.
18. Line rupture or major leak is not considered a cause of flow reduction, although actually they can. The reason is that possible fire or explosion as a result of such events is far more important than a simple low flow.
19. Wherever the expression "See relevant node" is used it means the reader of the document to refer to the corresponding node for detail causes, consequences and safeguards if applicable.

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List of Drawings

Drawing	Rev.	Title	Place(s) Used [Nodes]
MKP-11-AS-9000-PR-PID-001	Z01	Symbols and Identifications for Piping and Instrument Diagram (1)	
MKP-11-AS-9000-PR-PID-002	Z01	Symbols and Identifications for Piping and Instrument Diagram (2)	
MKP-11-AS-9000-PR-PID-003	Z01	Symbols and Identifications for Piping and Instrument Diagram (3)	
MKP-11-AS-1000-PR-PID-001	Z01	Gas Station	1
MKP-11-AS-1000-PR-PID-002	Z01	Natural Gas Distribution	1
MKP-11-AS-1000-PR-PID-003	Z01	Desulphurisation	2
MKP-11-AS-6000-PR-PID-001	Z01	Steam Condensate Return	3
MKP-11-AS-6000-PR-PID-002	Z01	NG Saturation I	3
MKP-11-AS-6000-PR-PID-003	Z01	NG Saturation II	3
MKP-11-AS-6000-PR-PID-004	Z01	NG Saturation III	3, 4
MKP-11-AS-2000-PR-PID-001	Z01	Process Oxygen	7
MKP-11-AS-2000-PR-PID-002	Z01	Oxygen Preheating	7
MKP-11-AS-2000-PR-PID-003	Z01	S/C Ratio Control I	5
MKP-11-AS-2000-PR-PID-004	Z01	S/C Ratio Control II	5
MKP-11-AS-2000-PR-PID-005	Z01	Flue Gas WHS I	9, 10
MKP-11-AS-2000-PR-PID-006	Z01	Flue Gas WHS II	2, 9, 11, 12
MKP-11-AS-2000-PR-PID-007	Z01	Flue Gas WHS III	2, 5, 6, 11
MKP-11-AS-2000-PR-PID-008	Z01	Prereforming	5
MKP-11-AS-2000-PR-PID-009	Z01	Tubular Reformer	6, 8, 9, 11
MKP-11-AS-2000-PR-PID-010	Z01	Secondary Reformer	7
MKP-11-AS-2000-PR-PID-011	Z01	Secondary Reformer II	13, 14
MKP-11-AS-2000-PR-PID-012	Z01	Steam Superheater	13, 14
MKP-11-AS-2000-PR-PID-013	Z01	Steam Generation	14
MKP-11-AS-2000-PR-PID-014	Z01	Gas Cooling and Separation I	13, 14
MKP-11-AS-2000-PR-PID-015	Z01	Gas Cooling and Separation II	17
MKP-11-AS-2000-PR-PID-016	Z01	Gas Cooling and Separation III	17
MKP-11-AS-2000-PR-PID-017	Z01	Fuel System	8
MKP-11-AS-2000-PR-PID-018	Z01	Start-Up Blower	18
MKP-11-AS-2000-PR-PID-019	Z01	H2 Recycle System	19
MKP-11-AS-2000-PR-PID-020	Z01	Air Cooler AE 2026 Detail	17
MKP-11-AS-3000-PR-PID-001	Z01	Synthesis Gas Compressor	
MKP-11-AS-3000-PR-PID-002	Z01	Synthesis Part I	
MKP-11-AS-3000-PR-PID-003	Z01	Methanol Synthesis	
MKP-11-AS-3000-PR-PID-004	Z01	Methanol R/E Exchanger	
MKP-11-AS-3000-PR-PID-005	Z01	Synthesis Gas Cooling	
MKP-11-AS-3000-PR-PID-006	Z01	Synthesis Part II	
MKP-11-AS-3000-PR-PID-007	Z01	Raw Product Flash	
MKP-11-AS-3000-PR-PID-008	Z01	Air Cooler AE 3002 Detail 1/2/3 Detail	
MKP-11-AS-3000-PR-PID-027	Z01	Synthesis Gas Compressor Package	
MKP-11-AS-3000-SF-PID-001	Z01	Sprinkler System in Unit 3000	
MKP-11-AS-4000-PR-PID-001	Z01	Methanol Tanks (1)	
MKP-11-AS-4000-PR-PID-002	Z01	Methanol Tanks (2)	
MKP-11-AS-4000-SF-PID-001	Z01	Foam System in Unit 4000	

Drawing	Rev.	Title	Place(s) Used [Nodes]
MKP-11-AS-4000-SF-PID-002	Z01	Sprinkler System in Unit 4000	
MKP-11-AS-4000-SF-PID-003	Z01	Sprinkler System for Pumps in Unit 4000	
MKP-11-AS-5000-PR-PID-001	Z01	Crude Methanol Tank	
MKP-11-AS-5000-PR-PID-002	Z01	Stabilizer Column	
MKP-11-AS-5000-PR-PID-003	Z01	Stabilizer Column Reboiler	
MKP-11-AS-5000-PR-PID-004	Z01	Stabilizer Column OH System	
MKP-11-AS-5000-PR-PID-005	Z01	Stabilizer Column Pumps	
MKP-11-AS-5000-PR-PID-006	Z01	LP Methanol Column	
MKP-11-AS-5000-PR-PID-007	Z01	LP Methanol Column Reboiler	
MKP-11-AS-5000-PR-PID-008	Z01	LP Methanol Column OH System	
MKP-11-AS-5000-PR-PID-009	Z01	MP Methanol Column Feed Pump	
MKP-11-AS-5000-PR-PID-010	Z01	MP Methanol Column	
MKP-11-AS-5000-PR-PID-011	Z01	MP Column Reboilers	
MKP-11-AS-5000-PR-PID-012	Z01	MP Methanol Column OH System	
MKP-11-AS-5000-PR-PID-013	Z01	MP Methanol Column by Product	
MKP-11-AS-5000-PR-PID-014	Z01	Methanol Product	
MKP-11-AS-5000-PR-PID-015	Z01	Methanol Product Buffer Tank I	
MKP-11-AS-5000-PR-PID-016	Z01	Methanol Product Buffer Tank II	
MKP-11-AS-5000-PR-PID-017	Z01	Liquid Off-Stream Tank	
MKP-11-AS-5000-PR-PID-018	Z01	Closed Drain Collection	
MKP-11-AS-5000-PR-PID-019	Z01	Slops Collection	
MKP-11-AS-5000-PR-PID-020	Z01	NaOH Dosing Unit X 5003 Utility Diagram	
MKP-11-DE-5000-PR-PID-023	Z01	Air Cooler AE 5005 Detail Part 1	
MKP-11-AS-5000-PR-PID-023	Z01	Air Cooler AE 5005 Detail Part 2	
MKP-11-AS-5000-PR-PID-023	Z01	Air Cooler AE 5005 Detail Part 3	
MKP-11-AS-5000-PR-PID-023	Z01	Air Cooler AE 5005 Detail Part 4	
MKP-11-AS-5000-PR-PID-024	Z01	Air Cooler AE 5004 Detail	
MKP-11-AS-5000-PR-PID-026	Z01	Air Cooler AE 5006 Detail	
MKP-11-AS-5000-SF-PID-001	Z01	Foam System in Unit 5000	
MKP-11-AS-5000-SF-PID-002	Z01	Sprinkler System in Unit 5000	
MKP-11-AS-5000-SF-PID-002	Z01	Sprinkler System in Unit 5000	
MKP-11-AS-5000-SF-PID-003	Z01	Sprinkler System for Pumps in Unit 5003	
MKP-11-AS-5000-SF-PID-004	Z01	Sprinkler System for Pumps in Unit 5001	
MKP-11-AS-7000-PR-PID-006	Z01	HHP-HP Steam Control System	
MKP-11-AS-7000-PR-PID-007	Z01	HP Steam Export/ Import	
MKP-11-AS-7000-PR-PID-008	Z01	MP & LP Steam Control System	
MKP-11-AS-7000-PR-PID-009	Z01	LP Steam Control	
MKP-11-AS-7000-PR-PID-010	Z01	HHP & HP Steam Header	

Drawing	Rev.	Title	Place(s) Used [Nodes]
MKP-11-AS-7000-PR-PID-011	Z01	LP Steam Header	
MKP-11-AS-7000-PR-PID-012	Z01	Deaerator	
MKP-11-AS-7000-PR-PID-013	Z01	BFW Pumps	
MKP-11-AS-7000-PR-PID-014	Z01	BFW Header	
MKP-11-AS-7000-PR-PID-015	Z01	Process Condensate Storage	
MKP-11-AS-7000-PR-PID-016	Z01	Cooling Water Header I Utility Diagram	
MKP-11-AS-7000-PR-PID-017	Z01	Nitrogen Header Utility Diagram	
MKP-11-AS-7000-PR-PID-018	Z01	Plant Air Header Utility Diagram	
MKP-11-AS-7000-PR-PID-019	Z01	Instrument Air Header Utility Diagram	
MKP-11-AS-7000-PR-PID-020	Z01	Demineralized Header Utility Diagram	
MKP-11-AS-7000-PR-PID-021	Z01	Service Water Header Utility Diagram	
MKP-11-AS-7000-PR-PID-022	Z01	Potable Water Header Utility Diagram	
MKP-11-AS-7000-PR-PID-023	Z01	Phosphate Dosing Unit-X 7001 Utility Diagram	
MKP-11-AS-7000-PR-PID-024	Z01	Amonia Dosing Unit-X 7002 Utility Diagram	
MKP-11-AS-7000-PR-PID-025	Z01	Oxygen Scav.Dosing Unit-X 7003 Utility Diagram	
MKP-11-AS-7000-PR-PID-026	Z01	Boiler Blow Down Utility Diagram	
MKP-11-AS-7000-PR-PID-027	Z01	Steam Condensate Recovery Unit	
MKP-11-AS-7000-PR-PID-028	Z01	P7001 A/B BFW Pump	
MKP-11-AS-7000-PR-PID-029	Z01	P7001 C BFW Pump	
MKP-11-AS-7000-PR-PID-030	Z01	Cooling Water Header II Utility Diagram	
MKP-11-AS-7000-PR-PID-031	Z01	Cooling Water Header III Utility Diagram	
MKP-11-AS-7000-PR-PID-032	Z01	Hose Station System I Utility Diagram	
MKP-11-AS-7000-PR-PID-033	Z01	Hose Station System II Utility Diagram	
MKP-11-AS-8000-PR-PID-001	Z01	Pipe Rack and Pipe Net System	
MKP-11-AS-8500-PR-PID-001	Z01	Utility Distribution Diagram Flare Header I	
MKP-11-AS-8500-PR-PID-002	Z01	Utility Distribution Diagram Flare Header II	
MKP-11-AS-8500-PR-PID-003	Z01	Flare K.O Drum	
MKP-11-AS-8500-PR-PID-004	Z01	Flare Stack I	
MKP-11-AS-8500-PR-PID-005	Z01	Flare Stack II	
MKP-11-AS-9400-PR-PID-002	Z01	POC	
MKP-11-AS-9400-PR-PID-003	Z01	Sanitary Wastewater	
MKP-11-AS-0201-SF-PID-001	Z01	Gas Fire Extinguishing System In Unit 0201	
MKP-11-AS-0202-SF-PID-001	Z01	Gas Fire Extinguishing System In Unit 0202	
MKP-11-AS-0300-SF-PID-001	Z01	Foam Station	
MKP-11-AS-0500-PR-PID-001	Z01	Cooling Water Tower	
MKP-11-AS-0500-PR-PID-002	Z01	Cooling Water Turbine Pump 1	
MKP-11-AS-0500-PR-PID-003	Z01	Cooling Water Turbine Pump 2	
MKP-11-AS-0500-PR-PID-004	Z01	Cooling Water Pump	

Drawing	Rev.	Title	Place(s) Used [Nodes]
MKP-11-AS-0500-PR-PID-005	Z01	Cooling Water Filter	
MKP-11-AS-0500-PR-PID-006	Z01	Chemical Dosing Unit	
MKP-11-DE-7200-PR-PID-001	C1	Filter and Heat Exchanger	
MKP-11-DE-7200-PR-PID-002	C1	Mixed-Ion Exchanger	
MKP-11-DE-7200-PR-PID-003	C1	DMW Storage and Feeding	
MKP-11-DE-7200-PR-PID-004	C1	Acid and Alkali Regeneration	
MKP-11-DE-7200-PR-PID-005	C1	Neutralization	
MKP-VD-9000-301-002-A1-G (1 of 14)	G	Cover Sheet	
SOK0880159 (2 of 14)	6	Symbols and Legend	
SOK0880159 (3 of 14)	6	General Notes	
SOK0880159 (4 of 14)	6	Connection List	
SOK0880159 (5 of 14)	6	Lube Oil Console System	
SOK0880159 (6 of 14)	6	Lube Oil Machine System	
SOK0880159 (7 of 14)	6	Control Oil System	
SOK0880159 (8 of 14)	6	Steam System (Condensing)	
SOK0880159 (9 of 14)	6	Steam Condensing System	
SOK0880159 (10 of 14)	6	BCL606/N Seal Gas System	
SOK0880159 (11 of 14)	6	BCL606/N Seal Gas Treatment System	
SOK0880159 (12 of 14)	6	2BCL606/N Seal Gas System	
SOK0880159 (13 of 14)	6	2BCL606/N Seal Gas Treatment System	
SOK0880159 (14 of 14)	6	Casing Seals Monitoring System	
MKP-VD-9000-301-066-A1-0 (1 of 7)	0	Syngas & Recycle Gas Compression	
SOK0887013 (1 of 7)	5	Syngas & Recycle Gas	
SOK0887013 (2 of 7)	5	Syngas & Recycle Gas Compression	
SOK0887013 (3 of 7)	5	Syngas & Recycle Gas Compression	
SOK0887013 (4 of 7)	5	Syngas & Recycle Gas Compression	
SOK0887013 (5 of 7)	5	Syngas & Recycle Gas Compression	
SOK0887013 (6 of 7)	5	Syngas & Recycle Gas Compression	
SOK0887013 (7 of 7)	5	Syngas & Recycle Gas Compression	
MKP-VD-9000-308-049-A4-0	0	Dry Gas Seal System	
MKP-VD-9000-308-053-A4-0	0	Lube Oil System	
MKP-VD-9000-308-060-A4-0	0	Process Gas System	
MKP-VD-9000-306-003-A1	0	C 2002_H2 Recycle Compressor Purge Gas	
MKP-VD-9000-306-004-A1	0	C 2002_H2 Recycle Compressor Process Gas System	
MKP-VD-9000-306-005-A1	0	C 2002_H2 Recycle Compressor Cooling Water System	
MKP-VD-9000-306-006-A1	0	C 2002_H2 Recycle Compressor Unloading Control System	
MKP-VD-9000-306-007-A1	0	C 2002_H2 Recycle Compressor Lube Oil System	
MKP-VD-9000-303-150-A3	2	P7001AB_BFW_PUMP	

Drawing	Rev.	Title	Place(s) Used [Nodes]
MKP-VD-9000-303-155-A3	2	P7001C_BFW_PUMP	
MKP-VD-9000-311-200-A3	2	P0502_1/2_CW_PUMP	
MKP-VD-9000-311-205-A3	1	P0502A/B_CW_PUMP	
MKP-VD-9000-302-120-A1 (1 of 5)	C	Turbine: 1155 Ce (FT-2002)	
MKP-VD-9000-302-120-A1 (2 of 5)	C	Turbine: 1155 Ce (FT-2002)	
MKP-VD-9000-302-120-A1 (3 of 5)	C	Turbine: 1155 Ce (FT-2002)	
MKP-VD-9000-302-120-A1 (4 of 5)	C	Turbine: 1155 Ce (FT-2002)	
MKP-VD-9000-302-120-A1 (5 of 5)	C	Turbine: 1155 Ce (FT-2002)	
MKP-VD-9000-302-145-A1 (1 of 5)	C	Turbine: 685 CeH (FT-2001)	
MKP-VD-9000-302-145-A1 (2 of 5)	C	Turbine: 685 CeH (FT-2001)	
MKP-VD-9000-302-145-A1 (3 of 5)	C	Turbine: 685 CeH (FT-2001)	
MKP-VD-9000-302-145-A1 (4 of 5)	C	Turbine: 685 CeH (FT-2001)	
MKP-VD-9000-302-145-A1 (5 of 5)	C	Turbine: 685 CeH (FT-2001)	
MKP-VD-9000-302-302-A0-B	B3	Fan (F-2001)	
MKP-VD-9000-302-302-A0-B	B3	Fan (F-2002)	

Note: This list would be completed during HAZOP. “Place(s) Used [Nodes]” column of table will be completed during HAZOP.

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List of Nodes

Nodes	Note(s)	Node Color	Type	Equipment IDs	Drawings
1. Natural Gas Station & Distribution		Yellow	Line	X-19011; D-1001;	MKP-11-AS-1000-PR-PID-002
			Filter		MKP-11-AS-1000-PR-PID-001
			Drum		
2. Hydrogenator & Sulphur Absorber		Red	Line	R-1001; R-1002 1/2; E-2004; E-2006;	MKP-11-AS-1000-PR-PID-003
			Reactor		MKP-11-AS-2000-PR-PID-006
			Heater		MKP-11-AS-2000-PR-PID-007
3. NG Saturation		Green	Line	P-6002A; T-6001 1; X-6001A; X-6002A; D-6001; E-6001; P-6001A; E-6004; E-6002;	MKP-11-AS-6000-PR-PID-001
			Saturator		MKP-11-AS-6000-PR-PID-002
			Drum		MKP-11-AS-6000-PR-PID-003
			Filter		MKP-11-AS-6000-PR-PID-004
			Heat Exchanger		
			Centrifugal Pump		
4. Saturator Blow Down Drum		Orange	Line	D-6002; E-6003; P-7003A;	MKP-11-AS-6000-PR-PID-004
			Drum		
			Heat Exchanger		
			Centrifugal Pump		
5. Prereforming		Pink	Line	E-2002; R-2003;	MKP-11-AS-2000-PR-PID-003
			Reactor		MKP-11-AS-2000-PR-PID-004
			Heater		MKP-11-AS-2000-PR-PID-007
					MKP-11-AS-2000-PR-PID-008
6. Tubular Reformer		Orange	Line	E-2001; H-2001;	MKP-11-AS-2000-PR-PID-007
			Reformer		MKP-11-AS-2000-PR-PID-009
			Heater		
7. Secondary Reformer		Blue	Line	X-2001A; X-2002A; E-2008; D-2011; R-2004;	MKP-11-AS-2000-PR-PID-001
			Reformer		MKP-11-AS-2000-PR-PID-002
			Heat Exchanger		MKP-11-AS-2000-PR-PID-010
			Filter		
			Drum		
8. Fuel Gas System		Green	Line	X-2003;	MKP-11-AS-2000-PR-PID-009
			Static Mixer		MKP-11-AS-2000-PR-PID-017
9. Combustion Air		Blue	Line	F-2002; E-2007; H-2001;	MKP-11-AS-2000-PR-PID-005
			Blower		MKP-11-AS-2000-PR-PID-006
			Heater		MKP-11-AS-2000-PR-PID-009
10. Steam Turbine FT-2002		Orange	Line	FT-2002;	MKP-11-AS-2000-PR-PID-005
			Turbine		
11. Flue Gas System		Violet	Blower	H-2001; E-2001; E-2002; E-2004; E-2006; E-2007; F-2001; S-2001;	MKP-11-AS-2000-PR-PID-006
			Heater		MKP-11-AS-2000-PR-PID-007
			Reformer		MKP-11-AS-2000-PR-PID-009
			Stack		
12. Steam Turbine FT-2001		Green	Line	FT-2001;	MKP-11-AS-2000-PR-PID-006
			Turbine		
13. Process Gas Cooling and 1st Separator		Yellow	Line	E-2020 1; E-2021 1&3; E-2022 1~3; D-2002; P-2001A;	MKP-11-AS-2000-PR-PID-011
			Heat Exchanger		MKP-11-AS-2000-PR-PID-012
			Drum		MKP-11-AS-2000-PR-PID-014
			Centrifugal Pump		
14. HHP Steam Production		Red	Line	E-2020 1; E-2021 1&3; D-2001; E-2022 1~3;	MKP-11-AS-2000-PR-PID-011
			Drum		MKP-11-AS-2000-PR-PID-012
			Heat Exchanger		MKP-11-AS-2000-PR-PID-013
					MKP-11-AS-2000-PR-PID-014
15. Process Gas Cooling and 2nd Separator		Pink	Line	D-2003; E-5023;	
			Drum		
			Heat Exchanger		

Nodes	Note(s)	Node Color	Type	Equipment IDs	Drawings
16. Process Gas Cooling and 3rd Separator		Violet	Line Drum Heat Exchanger Centrifugal Pump	D-2004; E-5024 1; P-2002A;	
17. Process Gas Cooling and Final Separator		Orange	Line Drum Heat Exchanger Centrifugal Pump	D-2005; E-2025; E-2027; P-2003A; AE-2026;	MKP-11-AS-2000-PR-PID-015 MKP-11-AS-2000-PR-PID-016 MKP-11-AS-2000-PR-PID-020
18. Start-up Nitrogen Compressor		Blue	Line Centrifugal Compressor	C-2001;	MKP-11-AS-2000-PR-PID-018
19. Hydrogen Recycle Compressor		Violet	Line Centrifugal Compressor	C-2002;	MKP-11-AS-2000-PR-PID-019

Note: This list and Marked-up P&IDs would be completed during HAZOP.

4

Marked-Up P&IDs

SYMBOLS FOR PROCESS AND INSTRUMENTATION

PIPES

- MAIN PROCESS LINE
- OTHER LINE
- STEAM TRACING
- ELECTRIC TRACED
- TRACED-MEDIA UNSPECIFIED
- STEAM JACKETED
- SLOPE DOWN (DOWN)
- SLOPE UP (UP)
- FREE DRAINING

INSTRUMENT LINES

- CONNECT TO PROCESS OR UNDEFINED SIGNAL
- PNEUMATIC SIGNAL
- ELECTRIC SIGNAL
- ELECTRIC BINARY SIGNAL
- CAPILLARY TUBE
- HYDRAULIC SIGNAL
- DATA LINE OR SOFTWARE
- MECHANICAL LINK
- BY VENDOR (B.V.)
- AUTOMATIC MANIFOLD

INSTRUMENT OR FUNCTION

- INSTRUMENT SURROUNDED BY BOX IS PART OF DISTRIBUTED CONTROL SYSTEM / ESD SYSTEM
- FIELD MOUNTED
- PRIMARY LOCATION (MAIN PANEL)
- BEHIND-PANEL DEVICE (NORM. INACCESSIBLE)
- AUXILIARY LOCATION (LOCAL PANEL)
- INTERLOCK FUNCTION (GROUP 1) (IS 1)
- ESD SYSTEM (GROUP 1) (IS 1)
- INTERLOCK LOGIC (GROUP 1)
- SWITCH
- INSTRUMENT WITH ELECTRIC TRACING
- SIGNAL FOR VENDOR TO PLC (PLC)

TYPICAL EQUIPMENT SYMBOLS

- CENTRIFUGAL PUMP
- RECIPROCATING PUMP
- SUBMERGED PUMP
- AIR BLOWER
- VERTICAL PUMP
- MOTOR (M)
- EJECTOR
- TURBINE
- ROOT'S COMPRESSOR
- CRANE

LINE SYMBOLS

- CONTROL VALVE
- CONTROL VALVE WITH POSITIONER
- CONTROL VALVE WITH MANUAL OPERATION DEVICE
- AIR CYLINDER OPERATED VALVE
- HAND OPERATED CONTROL VALVE
- SOLENOID VALVE (S)
- ELECTRIC MOTOR OPERATED VALVE (M)
- SELF OPERATING BACK PRESSURE REGULATING VALVE
- SELF OPERATING PRESSURE REDUCING VALVE
- SPRING VALVE
- SPRING LOADED RELIEF VALVE
- SPRING LOADED QUICK CLOSING VALVE-INTERMITTENT BLOW DOWN
- SPRING LOADED SAFETY RELIEF VALVE
- SPRING LOADED VACUUM RELIEF VALVE
- BREATHER VALVE
- EMERGENCY RELIEF MANHOLE
- RUPTURE DISC
- ORIFICE
- VENTURI
- FLOW NOZZLE
- ROTAMETER
- TURBINE OR PROPELLER TYPE FLOW METER
- ANNUBAR TYPE FLOW ELEMENT
- AVERAGE PILOT TUBE OR ANNUBAR
- POSITIVE DIS-PLACEMENT METER
- VORTEX FLOWMETER
- ULTRASONIC FLOWMETER
- CORIOLIS FLOWMETER
- MAGNETIC FLOWMETER
- 3-WAY SOLENOID VALVE: ARROW INDICATES STATE WHEN DE-ENERGIZED (S)
- INSTRUMENT WITH DIAPHRAGM SEAL
- ELECTRO / PNEUMATIC CONVERTER
- DAMPER
- TEST POINT

SYMBOLS FOR PIPING ELEMENTS

- GATE VALVE
- GLOBE VALVE
- NEEDLE VALVE
- BALL VALVE
- PLUG VALVE
- DIAPHRAGM VALVE
- BUTTERFLY VALVE
- VALVE CAN'T BE FULLY CLOSED (MIN. STOP)
- VALVE WITH ELECTRIC TRACING
- NON-RETURN OR CHECK VALVE
- ANGLE VALVE
- 3-WAY VALVE
- MINIMUM FLOW AND CHECK VALVE
- TEE WITH PIPE CLASS CHANGE
- MIXING TEE
- COMPENSATOR
- PULSATION DAMPER
- SURGE DRUM
- TEMPORARY STRAINER
- Y-STRAINER
- STEAM TRAP WITHOUT STRAINER
- STEAM TRAP WITH STRAINER
- T-STRAINER
- CONICAL STRAINER
- BUCKET TYPE STRAINER
- FIGURE 8-TYPE BLIND, NORMALLY CLOSED
- FIGURE 8-TYPE BLIND, NORMALLY OPEN
- BLIND
- SPACER
- MANIFOLD / COLLECTOR
- MANIFOLD
- HOSE
- HOSE CONNECTION
- FLANGED CONNECTION
- FLANGED END
- CAPPED END
- SCREWED CAP
- VALVE WITH BLIND FLANGE
- PLUG
- MULTIVANE LOUVER

- SPRAY NOZZLE
- SIGHT GLASS
- SPOOL PIECE
- SWING ELBOW
- DRAIN
- SILENCER
- VENT / FLARE
- OPEN VENT
- LIQUID SEAL
- FLAME ARRESTOR / DEMISTER
- AIR INTAKE
- QUENCH NOZZLE
- SPECIAL PIPING ELEMENT (SPE)
- BIRD SCREEN
- CORROSION COUPON
- DITCH
- MULTIFUNCTIONAL HYDRAULIC CONTROL VALVE
- OVERFLOW
- RESIN TRAPPER
- FLEXIBLE CONNECTION
- FOR SUMP
- CALIBRATION POT
- DESICCANT VENT

OFF PAGE CONNECTOR

- XX | XXX — DIAGRAM NO. / OPC NO.
- FROM BATTERY LIMIT
- TO BATTERY LIMIT
- U | U1 — UTILITY | DIAGRAM (U1)
- 2000 ▶ 8000 — FROM/TO PIPE RACK
- CONTRACTOR ▶ VENDOR — CHANGE OF SCOPE (FOR PIPE)

LIMITS

- BATTERY LIMIT
- B24 | D24 — CHANGE OF PIPE CLASS
- DESIGN CONDITIONS
- OPERATING CONDITIONS
- 4"X3" — CHANGE OF NOMINAL DIAMETER
- 4"X3" — ECCENTRIC REDUCER

LETTER CODE FOR INSTRUMENTATION

FIRST LETTER

	MEASURED OR INITIATING VARIABLES	MODIFIER
A	ANALYSIS	
B	BURNER, COMBUSTION	
C		
D		DIFFERENTIAL
E	VOLTAGE (EMF)	
F	FLOW RATE	RATIO (FRACTION)
G		
H	HAND (MANUALLY INITIATED)	
I	CURRENT (ELECTRICAL)	
J	POWER	SCAN
K	TIME, TIME SCHEDULE	TIME, RATE OF CHANGE
L	LEVEL	
M	MONITORING (MOTORS)	
N		
O		
P	PRESSURE, VACUUM	
Q	QUANTITY	INTEGRATE, TOTALIZE
R	RADIOACTIVITY	
S	SPEED, FREQUENCY	SAFETY
T	TEMPERATURE	
U	MULTIVARIABLE	
V	VIBRATION	
W	WEIGHT, FORCE	
X	UNCLASSIFIED	X AXIS
Y	EVENT, STATE, PRESENCE	Y AXIS
Z	POSITION, DIMENSION	Z AXIS
ML	RUNNING	
NL	STOP STATUS	
RL	LOCAL/REMOTE	
XA	FAULT	
YL	READY FOR START	
HS1	STOP	
HS2	START	
LTM	LOAD AND TEMPERATURE MANAGEMENT SYSTEM	
FF	FF INSTRUMENT	

SUCCEEDING LETTER

	MEASURED OR INITIATING VARIABLES	MODIFIER
A	ALARM	
B		
C	CONTROL	
D		
E	PRIMARY ELEMENT	
F		
G	GLASS, GAUGE	
H		HIGH
I	INDICATE	
J		
K	CONTROL STATION	
L	LIGHT	LOW
M		MIDDLE, INTERMEDIAT
N	MANUAL INPUT	
O	ORIFICE (RESTRICTION)	
P	POINT (TEST CONN.)	
Q		
R	RECORD	
S	SWITCH	
T	TRANSMIT	
U	MULTIFUNCTION	MULTIFUNCTION
V	VALVE, DAMPER, LOUVER	
W	WELL	
X	UNCLASSIFIED	UNCLASSIFIED
Y	RELAY, COMPUTE, CONVERT	
Z	DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

ALARM

ALARM ON DCS ARE IDENTIFIED BY PLACING INSTRUMENT DESIGNATION ADJACENT TO THE INSTRUMENT SYMBOLS i.e. :

FICA (H / Y / L)

HIGH ALARM : UPPER RIGHT SIDE
LOW ALARM : LOWER RIGHT SIDE

TYPE OF LEVEL GAUGE:

LG (X)

- B = BICOLOR
- C = CONDUCTIVITY
- M = MAGNETIC
- R = REFLEX
- T = TRANSPARENT

GENERAL NOTE:

1. LETTER CODE FOR INSTRUMENTATION: IDENTIFICATION LETTERS ARE IN ACCORDANCE WITH ANSI -ISA -S 5.1
2. ALL GAS AND STEAM FLOW MEASUREMENTS IN DCS ARE PRESSURE AND TEMPERATURE COMPENSATED

LETTER CODE FOR PROCESS EQUIPMENT ANG PIPING FITTINGS

PROCESS EQUIPMENT

A	PROCESS FILTER
AE	COOLER, CONDENSER
B	BLOWER, DRUM
C	COMPRESSOR
D	VESSEL, SEPARATOR
E	HEAT EXCHANGER
F	FAN
FT	TURBINE
G	ALTERNATOR
H	HEATER
I	NOT TO BE USED
J	EJECTOR
L	ELECTRICAL EQUIPMENT
M	ELECTRIC MOTOR (PREFIX TO K, P, W OR X)
N	CONVEYER
O	NOT TO BE USED
P	PUMP
Q	AVAILABLE
R	REACTOR, CONVERTER
S	STACK, STRUCTURE
T	COLUMN, TOWER
TK	TANK, STORAGE
U	FOUNDATION
U*	FOUNDATION (PREFIX TO B, D, E, F, H, R, T ETC.)
V	VENT, FLARE
W	CRANE, ELEVATOR
X	MISCELLANEOUS EQUIPMENT
Y	INTERNALS (HARDWARE)
Y*	INTERNALS (HARDWARE) (PREFIX TO B, E, F, H, R, T ETC.)
Z	INTERNALS (CATALYST)
Z*	INTERNALS (CATALYST) (PREFIX TO R)
MCV	MULTIFUNCTIONAL HYDRAULIC CONTROL VALVE
PD	POND
RT	RESIN TRAPPER
SU	FOR SUMP

PIPING FITTINGS

ARV	AUTOMATIC RECIRCULATION VALVE
BDV	BLOW DOWN VALVE
ERM	EMERGENCY RELIEF MANHOLE
FA	FLAME ARRESTOR / DEMISTER
FO	RESTRICTION ORIFICE
FX	FLEXIBLE CONNECTION
FZ	SPRAY NOZZLE
MSV	MINIMUM STOP VALVE
MX	MIXER
OF	OVER FLOW
PSV	SAFETY RELIEF VALVES
PVRV	PRESSURE AND VACUUM RELIEF VALVE (BREATHING VALVE)
RD	RUPTURE DISC
SEW	SAFETY SHOWER AND EYE WASHER
SPE	SPECIAL PIPING ELEMENT
ST	STEAM TRAP
STR	STRAINER
XG	SIGHT GLASS
XH	HOSE

DESIGNATION OF NOZZLES ON PROCESS EQUIPMENT

A	INLET
B	OUTLET
C	
D	DRAIN
E	LEVEL SWITCH
G	LEVEL GAUGE
H	HANDHOLE
I	
J	
K	
L	LEVEL INSTRUMENT
M	MANHOLE
N	
O	SAMPLE CONNECTION
P	PRESSURE MEASUREMENT
Q	
R	
S	SAFETY VALVE
T	TEMPERATURE MEASUREMENT
U	UTILITY
V	VENT
W	
X	
Y	
Z	

IDENTIFICATION:

PIPE NUMBER:

12"-SG-50401-B23-H1

- 12" — NOMINAL DIAMETER
- SG — FLUID CODE
- 50401 — UNIT NUMBER
- B23 — SEQUENCE NUMBER
- H1 — PIPE CLASS CODE
- INSULATION PURPOSE
- INSULATION CLASS

EQUIPMENT NUMBER:

R 5001 1/2 or A/B

- R — EQUIPMENT GROUP LETTER
- 5001 — UNIT NUMBER
- 1/2 — SERIAL NUMBER
- A/B — FIRST OF TWO PARTS
- MAIN STAND BY

INSTRUMENT NUMBER:

FIC -0001 1/2 or A/B

- FIC — FUNCTIONAL IDENTIFICATION
- 0001 — LOOP OR INSTRUMENT NUMBER
- 1/2 — FIRST OF TWO PARTS
- A/B — MAIN STAND BY

FLUID CODES:

AM	AMMONIA WATER
BD	BOILER BLOW DOWN
BFW	BOILER FEED WATER
BW	WARM UP WATER
CBD	CONTINOUS BLOW DOWN
CD	CLOSED DRAIN
CH1	CORROSION INHIBITOR SOLUTION
CH2	ANTISCALE SOLUTION
CLO	$Ca(ClO)_2$ SOLUTION
CS	CAUSTIC SOLUTION
CSW	CLEAN SALTY WATER
CWR	COOLING WATER RETURN
CWS	COOLING WATER SUPPLY
DR	DRAIN
DMW	DEMINERALIZED WATER
FF	FOAM SOLUTION
FG	FUEL GAS
FLG	FLARE VENT GAS
FW	FIRE FIGHTING WATER
HG	HYDROGEN GAS
HHPC	HIGH HIGH PRESSURE STEAM CONDENSATE
HHPS	HIGH HIGH PRESSURE STEAM
HPC	HIGH PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HZ	OXYGEN SCAVENGER
IA	INSTRUMENT AIR
LO	LUBRICANT OIL
LOS	LIQUID OFF STREAM METHANOL
LPC	LOW PRESSURE STEAM CONDENSATE
LPS	LOW PRESSURE STEAM
MC	CONDENSATE LIQUID
ME	METHANOL
MPC	MEDIUM PRESSURE STEAM CONDENSATE
MPS	MEDIUM PRESSURE STEAM
N	NITROGEN
NG	NATURAL GAS
NS	NaOH SOLUTION
OW	OILY WATER
PA	PROCESS AIR
PG	OFF GAS
PH	PHOSPHATE SOLUTION
PMC	CRUDE METHANOL
PMP	RICH METHANOL LIQUID
PMV	RICH METHANOL GAS
PMW	METHANOL WATER
PO	PROCESS OXYGEN
POC	POTENTIALLY OILY CONTAMINATE WATER
PRC	PROCESS CONDENSATE
PRG	PROCESS GAS -HDS
PW	POTABLE WATER
RO	RO WATER
RFG	REFORMED GAS
SG	SYNTHESIS GAS
SN	SANITARY SEWAGE
SU	H_2SO_4 SOLUTION (98%)
SW	SERVICE WATER
TC	TURBINE CONDENSATE
VA	VENT TO ATMOSPHERE
VE	VENT EXTRACTION
VG	VENT GAS

GENERAL NOTES:

1) LOOP TAG NUMBERING EG. FHS, FHIC.

F = LOOP DESIGNATION
H = HAND
S = SWITCH
I = INDICATING
C = CONTROLER

2) AUTOSTART:

FAILURE OF RUNNING PUMP TO START STANDBY PUMP.

IDENTIFICATION:

VALVE STATE

CSC	CAR SEALED CLOSED
CSO	CAR SEALED OPEN
FO	FAILURE OPEN
FC	FAILURE CLOSED
FL	FAILURE LOCKED
FLO	FAILURE LOCKED OPEN
FLC	FAILURE LOCKED CLOSED
LO	LOCKED OPEN
LC	LOCKED CLOSED
NO	NORMALLY OPEN
NC	NORMALLY CLOSED

INSULATION CODES:

C	COLD INSULATED
H	HOT INSULATED
N	NOT INSULATED
P	PERSONNEL PROTECTION INSULATED

HEAT TRACING CODES:

ET	ELECTRIC TRACED
ST	STEAM TRACED
SJ	STEAM JACKETED
TR	TRACED -MEDIA UNSPECIFIED

PIPE CLASS CODES:

FIRST LETTER INDICATES FLANGE RATING:

- B = class 150
- D = class 300
- F = class 600
- G = class 900
- H = class 1500
- J = class 2500

EXAMPLE: B24

MISCELLANEOUS:

C1A =	CS
G1A =	CS / GALV
G1B =	CS / GALV
L1A =	CS / PVC LINED
N0A =	PVC-U
N0C =	PE
N2A =	GRP
N2B =	HDPE
N2C =	PVC-C
N2D =	PP-R
U1A =	CS PTFE COATED
B24U =	
B24 FOR UNDERGROUD	

NUMBER MATERIA

- 24 = CS
- 34 = P11
- 36 = P22
- 40 = SS304L
- 42 = SS316L
- 44 = SS321
- 50 = SS304
- 64 = SS321H
- 66 = SS347H
- 70 = MNL

	class 150 RF
	class 150 RF
	class 150 RF
	class 150 RF
	GRAVITY FLOW
	GRAVITY FLOW
	class 150 RF
	class 150 RF
	PN16 FF
	PN16 FF
	class 150 RF

LIST OF DIAGRAMS

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S02	SYMBOLS AND IDENTIFICATIONS	1341709
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P02	PROCESS OXYGEN	1341712
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P06	NG SATURATION I	1341716
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P24	METHANOL SYNTHESIS	1341734
P25	METHANOL F E EXCHANGER	1341735
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P27	SYNTHESIS, PART III	1341737
P28	RAW PRODUCT FLASH	1341738
P29	CRUDE METHANOL TANK	1341739
P30	STABILIZER COLUMN	1341740
P31	STABILIZER COLUMN REBOILER	1341741
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P34	LP METHANOL COLUMN	1341744
P35	LP METHANOL COLUMN REBOILER	1341745
P36	LP METHANOL COLUMN OH SYSTEM	1341746
P37	MP METHANOL COLUMN FEED PUMP	1341747
P38	MP METHANOL COLUMN	1341748
P39	MP COLUMN REBOILERS	1341749
P40	MP METHANOL COLUMN OH SYSTEM	1341750
P41	MP METHANOL COLUMN BY PRODUCT	1341751
P42	METHANOL PRODUCT	1341752
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U03	HHP-HP CONTROL STEAM	1341759
U04	HP STEAM EXPORT IMPORT	1341760
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U08	LP STEAM HEADER	1341764
U09	DEAERATOR	1341765
U10	BFW PUMPS	1341766
U11	BFW HEADER	1341767
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U13	AMINE DOSING UNIT-X 7002	1341769
U14	OXYGEN SCAV. DOSING UNIT-X 7003	1341770
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U17	H2 RECYCLE SYSTEM	1341773
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U19	FLARE HEADER I	1341775
U20	FLARE HEADER II	1341776
U21	FLARE STACK	1341777
U22	PROCESS CONDENSATE STORGE	1353319
U23A	ION EXCHANGE UNIT (OPTIONAL)	1353320
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U24	NaOH DOSING UNIT X 5003	1353322
U25	LIQUID OFF STREAM STRIPPER	1354612

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	XuYekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	30.12.2019	XuYekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	02.02.2018	XuYekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	06.11.2017	XuYekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	05.05.2017	XuYekun		Xu Hang	Liu Shengkai	
A	**Issued for Review**	22.03.2017	**XuYekun**		Xu Hang	Liu Shengkai	
A	Issued for Review	22.01.2017	XuYekun		Xu Hang	Liu Shengkai	
A	Issued for Review	10.10.2016	Jiang Yu		Xu Hang	Liu Shengkai	
A	Issued for Review	25.06.2016	Jiang Yu		Xu Hang	Liu Shengkai	

OWNER:
Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S, COPENHAGEN DENMARK
DOCUMENT NAME: SYMBOLS AND IDENTIFICATIONS FOR PIPING AND INSTRUMENT DIAGRAM(1)
JOB NO. S-02115 | DOC. DISP. 42 | REV. 1
DWG. NO. 1341778 | DIAGRAM S01

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-9000-PS07-PID-001
SHEET 01 | TOTAL 01

SUB-CONTRACTOR:
SUB-CONTRACTOR DRAWING NO. –
SHEET – | TOTAL –

Counter Signing	Sign	Date

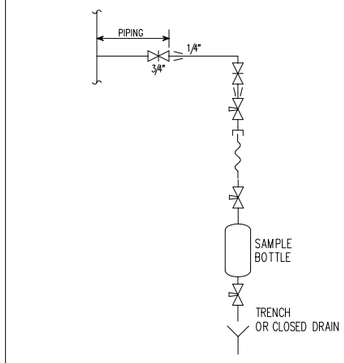
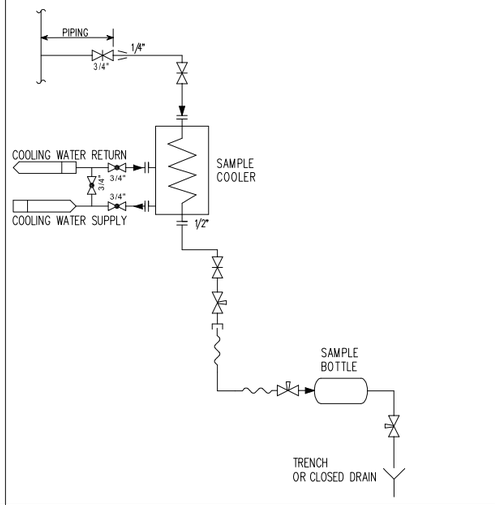
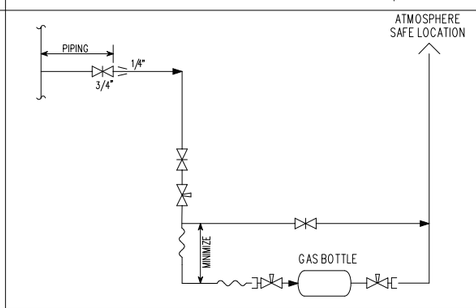
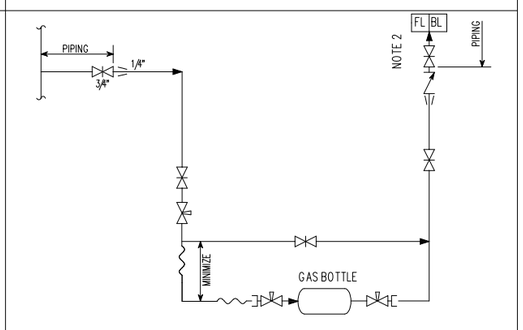
SYMBOLS AND INDENTIFICATIONS FOR PIPING AND INSTRUMENT DIAGRAM(1)

PROJECT	MKP Methanol Project
UNIT	General Technical
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-9000-PR-PID-001

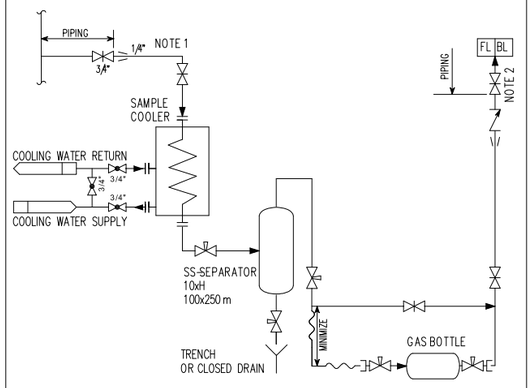
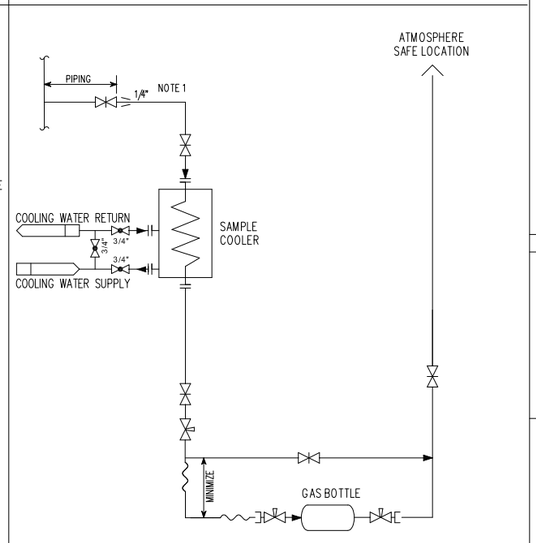
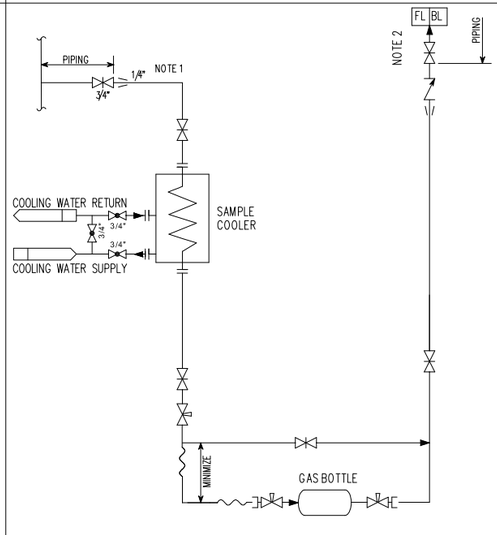
SCALE: – | SHEET: 1 | TOT.: 1 | SIZE: A1

VARIOUS SYMBOLS

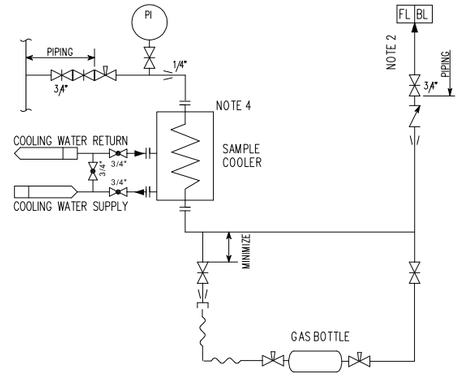
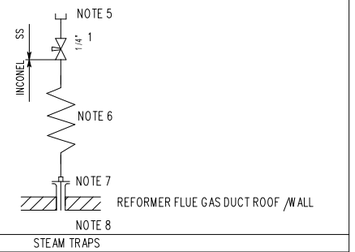
SAMPLE STATIONS

SYMBOLS ON P&I DIAGRAM	DETAIL DRAWING
AP TYPE 1 NON-FLASHING LIQUIDS BELOW 60 °C OR LIQUID METHANOL	
AP TYPE 2 FLASHING LIQUIDS OR NON-FLASHING LIQUIDS ABOVE 60 °C OR NON-HAZARDOUS VAPOR	
AP TYPE 3 GAS BELOW 60 °C VENT TO ATMOSPHERE AT SAFE LOCATION	
AP TYPE 4 FLASHING OR HAZARDOUS LIQUID OR GAS BELOW 60 °C VENT TO FLARE	

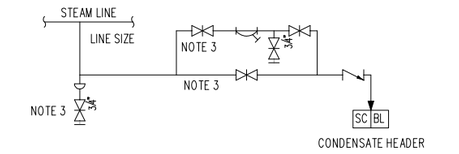
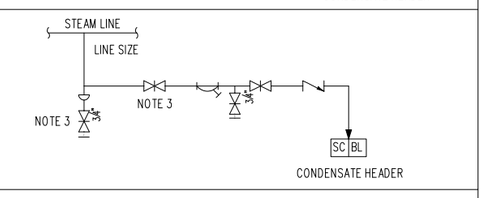
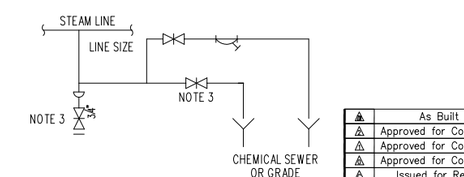
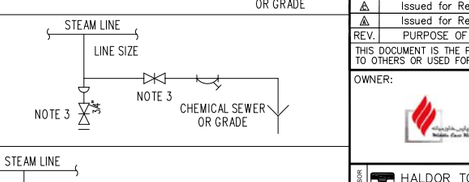
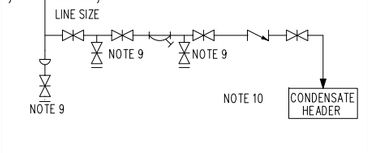
SAMPLE STATIONS

SYMBOLS ON P&I DIAGRAM	DETAIL DRAWING
AP TYPE 5 CONDENSABLE GAS ABOVE 60 °C	
AP TYPE 6 NON HARZARDOUS FLASHING LIQUIDS OR GAS ABOVE 60 °C VENT TO ATMOSPHERE AT SAFE LOCATION	
AP TYPE 7 FLASHING OR HAZARDOUS LIQUID OR GAS ABOVE 60 °C VENT TO FLARE	

SAMPLE STATIONS

SYMBOLS ON P&I DIAGRAM	DETAIL DRAWING
AP TYPE 8 NH3 ANALYSIS IN HP LOOP	
AP TYPE 9 HOT FLUE GAS UNDER VACUUM	

STEAM TRAPS

SYMBOLS ON P&I DIAGRAM	DETAIL DRAWING
T 1 SC BL	
T 2 SC BL	
T 3	
T 4	
T 5 XXSC	

NOTES:

1) MINIMUM 4m BARE TUBE FOR AIR COOLING BEFORE ENTERING WATER COOLER.
2) VALVE TO FLARE TO BE IN ACCORDANCE WITH PROCESS PIPECLASS.
3) VALVES TO BE DOUBLED IN HIGH PRESSURE SYSTEMS.
4) SAMPLE COOLER TO BE OMITTED IF TEMPERATURE <60 °C.
5) CONNECTION TO SUIT PORTABLE SAMPLE BOTTLE WITH VACUUM PUMP OR PORTABLE ANALYSER.
6) MIN 4m OF BARE 1/4" INCONEL TUBE.
7) CONAX FITTING WITH LAVA SEAL.
8) TUBE INSERTED CLOSE TO EDGE OF BRICK WORK.
9) THE PRINCIPLE FOR DRAIN VALVES AS FOLLOWS:
   A. USING ONE SHUT-OFF VALVE AND THREADED PIPE CAP IF PIPE CLASS LESS THAN CLASS 600.
   B. USING TWO SHUT-OFF VALVES AND BLIND FLANGE IF PIPE CLASS EQUAL OR MORE THAN CLASS 600, BUT LESS THAN CLASS 1500.
   C. USING TWO WELDING SHUT-OFF VALVES AND ONE SHORT PIPE IN THE END IF PIPE CLASS EQUAL CLASS 1500.
10) THE PRINCIPLE FOR STEAM CONDENSATE HEADER AS FOLLOWS:
   A. FOR HHPS STEAM PIPE, CONDENSATE HEADER HHPSC.
   B. FOR HPS AND MPS STEAM PIPE, CONDENSATE HEADER HPSC.
   C. FOR LPS STEAM PIPE, CONDENSATE HEADER LPSC.

GENERAL NOTES:

1) REQUIREMENTS FOR TRACING TO BE CONSIDERED.
2) ALL SAMPLE CONNECTIONS SHALL BE FROM TOP OF PROCESS PIPE.
3) ALL SAMPLE TUBING TO BE 1/4" SS.

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	06.11.2017	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	22.03.2017	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	22.01.2017	Xu Yekun		Xu Hang	Liu Shengkai	
A	Issued for Review	10.10.2016	Jiang Yu		Xu Hang	Liu Shengkai	
A	Issued for Review	25.06.2016	Jiang Yu		Xu Hang	Liu Shengkai	

OWNER: Middle East Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S, COPENHAGEN DENMARK
DOCUMENT NAME: SYMBOLS AND IDENTIFICATIONS FOR PIPING AND INSTRUMENT DIAGRAM(2)
JOB NO. S-02115 | DOC. GRP. 42 | DWG. NO. 1341709 | DIAGRAM S01 | REV. 2

CONTRACTOR: 中國天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-9000-PS07-PID-002
SHEET 01 TOTAL 01

SUB-CONTRACTOR
SUB-CONTRACTOR DRAWING NO. –
SHEET – TOTAL –

SYMBOLS AND IDENTIFICATIONS FOR PIPING AND INSTRUMENT DIAGRAM(2)

PROJECT	MKP Methanol Project
UNIT	General Technical
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-9000-PR-PID-002

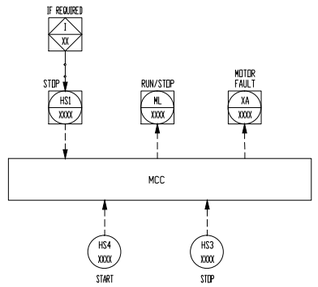
SCALE: – | SHEET: 1 | TOT.: 1 | SIZE: A1

Counter Signing	Sign	Date

SYMBOLS FOR TYPICAL MCC

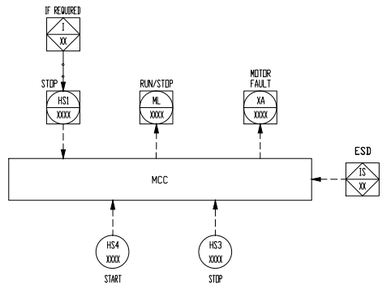
TYPICAL MOTOR TYPE A1

LOW VOLTAGE MOTOR



TYPICAL MOTOR TYPE A2

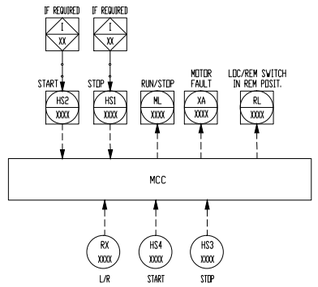
LOW VOLTAGE MOTOR



TYPICAL MOTOR TYPE B1

LOW VOLTAGE MOTOR

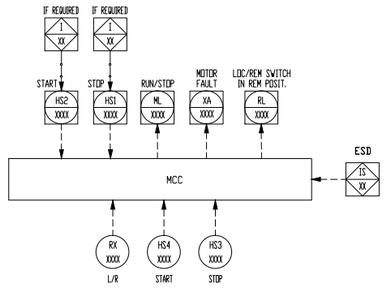
LOCAL & FCS COMMAND



TYPICAL MOTOR TYPE B2

LOW VOLTAGE MOTOR

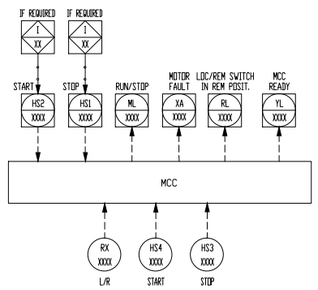
LOCAL & FCS COMMAND



TYPICAL MOTOR TYPE C1

MEDIUM VOLTAGE MOTOR

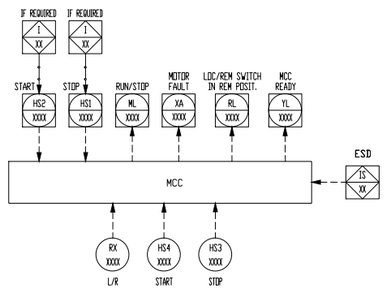
LOCAL & FCS COMMAND



TYPICAL MOTOR TYPE C2

MEDIUM VOLTAGE MOTOR

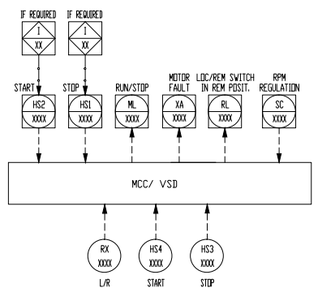
LOCAL & FCS COMMAND



TYPICAL MOTOR TYPE D1

LOW VOLTAGE MOTOR

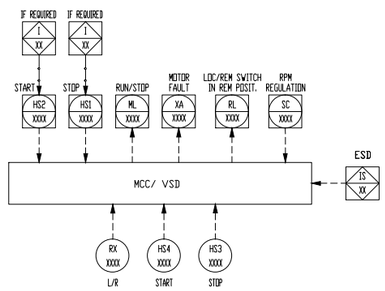
LOCAL & FCS COMMAND& VSD



TYPICAL MOTOR TYPE D2

LOW VOLTAGE MOTOR

LOCAL & FCS COMMAND& VSD

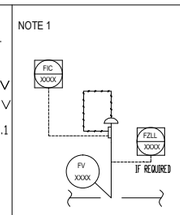


SYMBOLS FOR TYPICAL VALVE

TYPICAL VAVLE

FV,HV,LV PV,PDV,TV

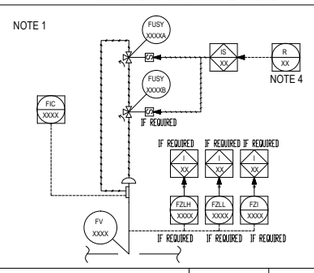
TYPE R1.1



TYPICAL VAVLE

FV,HV,LV PV,PDV,TV

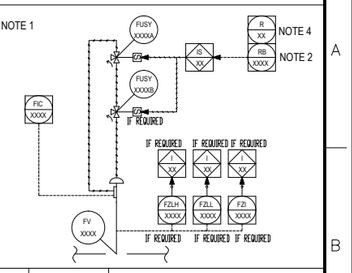
TYPE R2.1



TYPICAL VAVLE

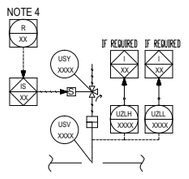
FV,HV,LV PV,PDV,TV

TYPE R2.2



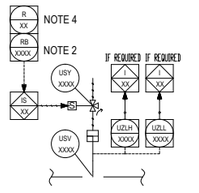
TYPICAL VAVLE

USV TYPE S1.1



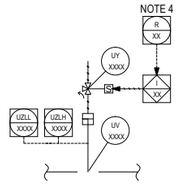
TYPICAL VAVLE

USV TYPE S1.2



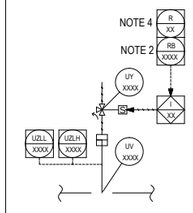
TYPICAL VAVLE

UV TYPE U.1



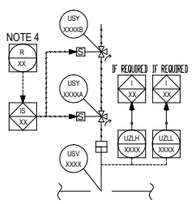
TYPICAL VAVLE

UV TYPE U.2



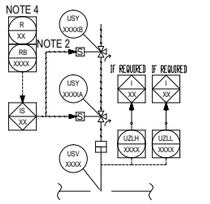
TYPICAL VAVLE

USV TYPE S2.1



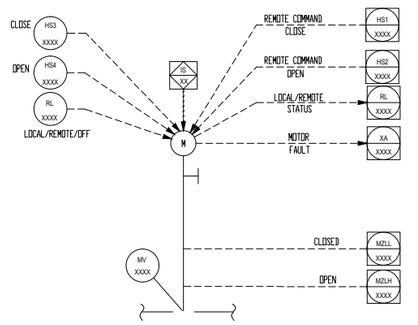
TYPICAL VAVLE

USV TYPE S2.2



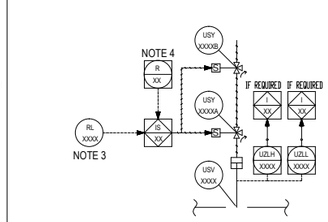
TYPICAL VAVLE

MV TYPE M



TYPICAL VAVLE

USV TYPE S2.3



NOTES:

1. "F" SHALL BE "F", "H", "L", "P", "PD", OR "T" FOR DIFFERENT SERVICE.
2. RB: FINAL ELEMENT TO BE RESET ON CONTROL PANEL AFTER RESET OF IS-UNIT OR I-UNIT.
3. RL: FINAL ELEMENT TO BE RESET LOCALLY AFTER RESET OF IS-UNIT.
4. R: RESET OF IS-UNIT OR I-UNIT.

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	15.05.2017	Xu Yekun		Xu Hang	Liu Shengkai	
A	Issued for Review	05.05.2017	Xu Yekun		Xu Hang	Liu Shengkai	
A	Issued for Review	22.03.2017	Xu Yekun		Xu Hang	Liu Shengkai	

OWNER: Middle East Kimiaye Pars Company

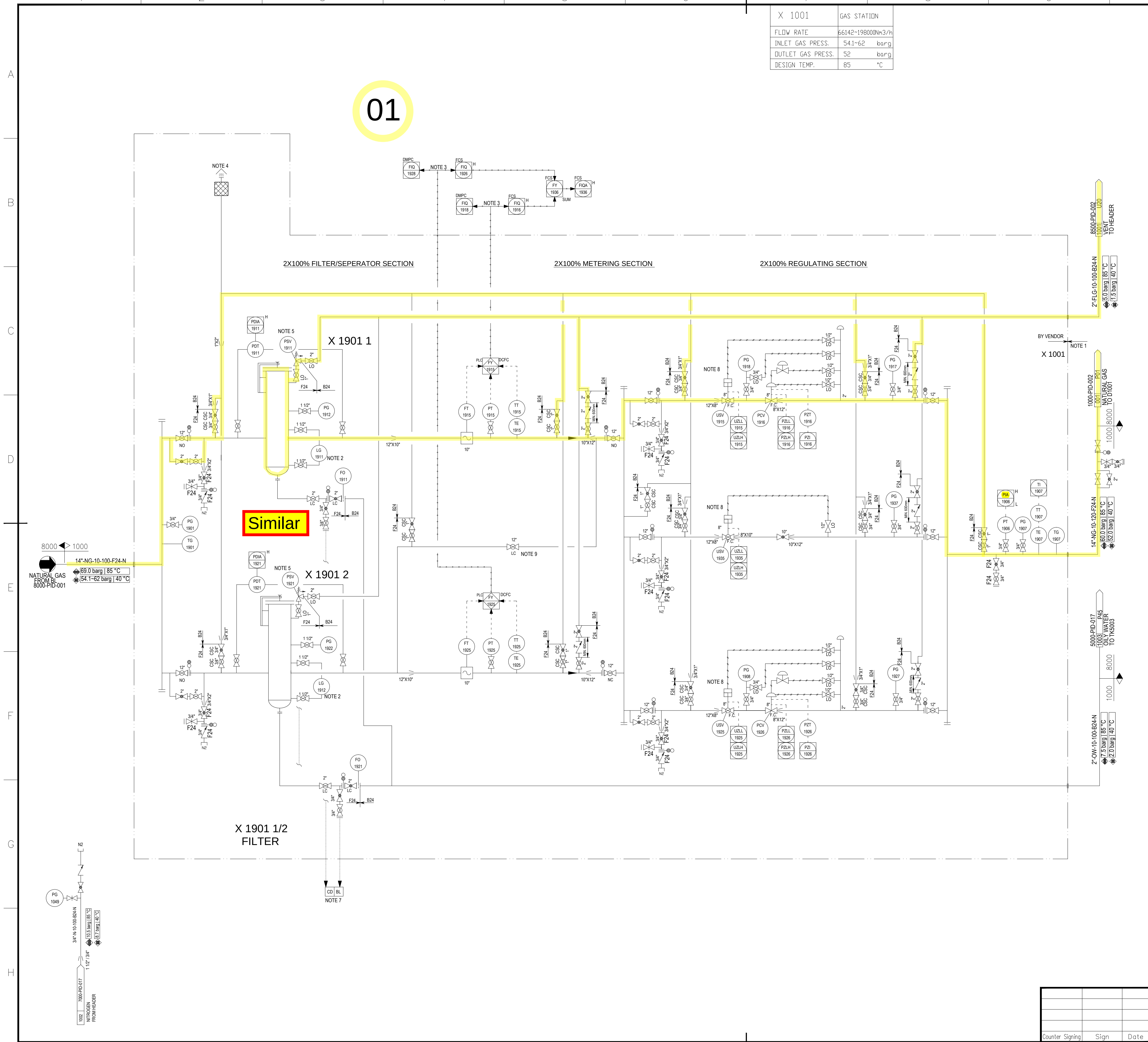
LICENSOR: HALDOR TOPSØE A/S, COPENHAGEN DENMARK — DOCUMENT NAME: — JOB NO. — DOC. CONT. — DWG. NO. — DIAGRAM — REV.

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION — CONTRACTOR DRAWING NO. MKP-11-AS-9000-PS07-PID-003 — SHEET 01 TOTAL 01

SUB CONTRACTOR: — SUB-CONTRACTOR DRAWING NO. — — SHEET – TOTAL –

SYMBOLS AND IDENTIFICATIONS FOR PIPING AND INSTRUMENT DIAGRAM(3)	PROJECT	MKP Methanol Project	
	UNIT	General Technical	
	PHASE	As Built Drawing	
SCALE: – / SHEET:1 / TOT.:1 / SIZE: A1	OWNER DWG NO.	MKP-11-AS-9000-PR-PID-003	

Counter Signing	Sign	Date



GENERAL NOTES

NOTES:

1) DETAILS OF X1001 TO BE UPDATED ACCORDING TO TECHNICAL DOCUMENTS PROVIDED BY VENDOR.
2) THE LEVEL GAUGE SHOULD BE VISIBLE TO THE OPERATOR AT POSITION OF DRAIN VALVES.
3) FIQ CALCULATED INSIDE DUEL CHANNEL FLOW COMPUTER. ONE SIGNAL SENT TO DMPC, AND ANOTHER SENT TO FCS.
DCFC: DUAL CHANNEL FLOW COMPUTER.
4) VENT TO SAFE AREA.
5) REQUIREMENT OF PSV ON DRY GAS FILTER TO BE CONFIRMED BY VENDOR.
6) VENT AND DRAIN TO BE FORESEEN GENERALLY AT HIGH AND LOW POINTS.
7) THE CLOSED DRAIN WILL BE COLLECTED IN A PORTABLE SEALED CONTAINER.
8) TIGHT SHUT OFF TYPE(TSO), SLAM SHUT-OFF VALVE.
9) DOUBLE LOCKED BY DMPC AND OWNER.
10) THE HIGH ALARMS FOR FIQ-1915/1925/1935 ARE FOR REAL TIME FLOW RATE, NOT FOR ACCUMULATED VALUE.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
201	As Built	30.04.2020	Xu Yekun		Xu Hang	Liu Shengkai	
5	Approved For Construction	30.12.2019	Xu Yekun		Xu Hang	Liu Shengkai	
4	Approved For Construction	02.02.2018	Xu Yekun		Xu Hang	Liu Shengkai	
3	Approved For Construction	06.11.2017	Xu Yekun		Xu Hang	Liu Shengkai	
2	Approved For Construction	22.03.2017	Jiang Yu		Xu Hang	Liu Shengkai	
1	Approved For Construction	16.01.2017	Jiang Yu		Xu Hang	Liu Shengkai	
0	Approved For Construction	11.11.2016	Jiang Yu		Xu Hang	Liu Shengkai	
C1	Issued for Approval	13.10.2016	Jiang Yu		Xu Hang	Liu Shengkai	
C	Issued for Approval	24.06.2016	Jiang Yu		Xu Hang	Liu Shengkai	
A	Issued for Comments	29.4.2016	Jiang Yu		Xu Hang	Liu Shengkai	

OWNER:
Middle East Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S, COPENHAGEN DENMARK

DOCUMENT NAME:

JOB NO. | DOC. GRP. | DWG. NO. | DIAGRAM

CONTRACTOR: 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION

CONTRACTOR DRAWING NO.
MKP-11-AS-1000-PS07-PID-001
SHEET 01 TOTAL 01

SUB CONTRACTOR

SUB-CONTRACTOR DRAWING NO.
-
SHEET - TOTAL -

GAS STATION
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Desulphurisation Unit
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-1000-PR-PID-001

SCALE: - | SHEET: 1 | TOT.: 1 | SIZE: A1

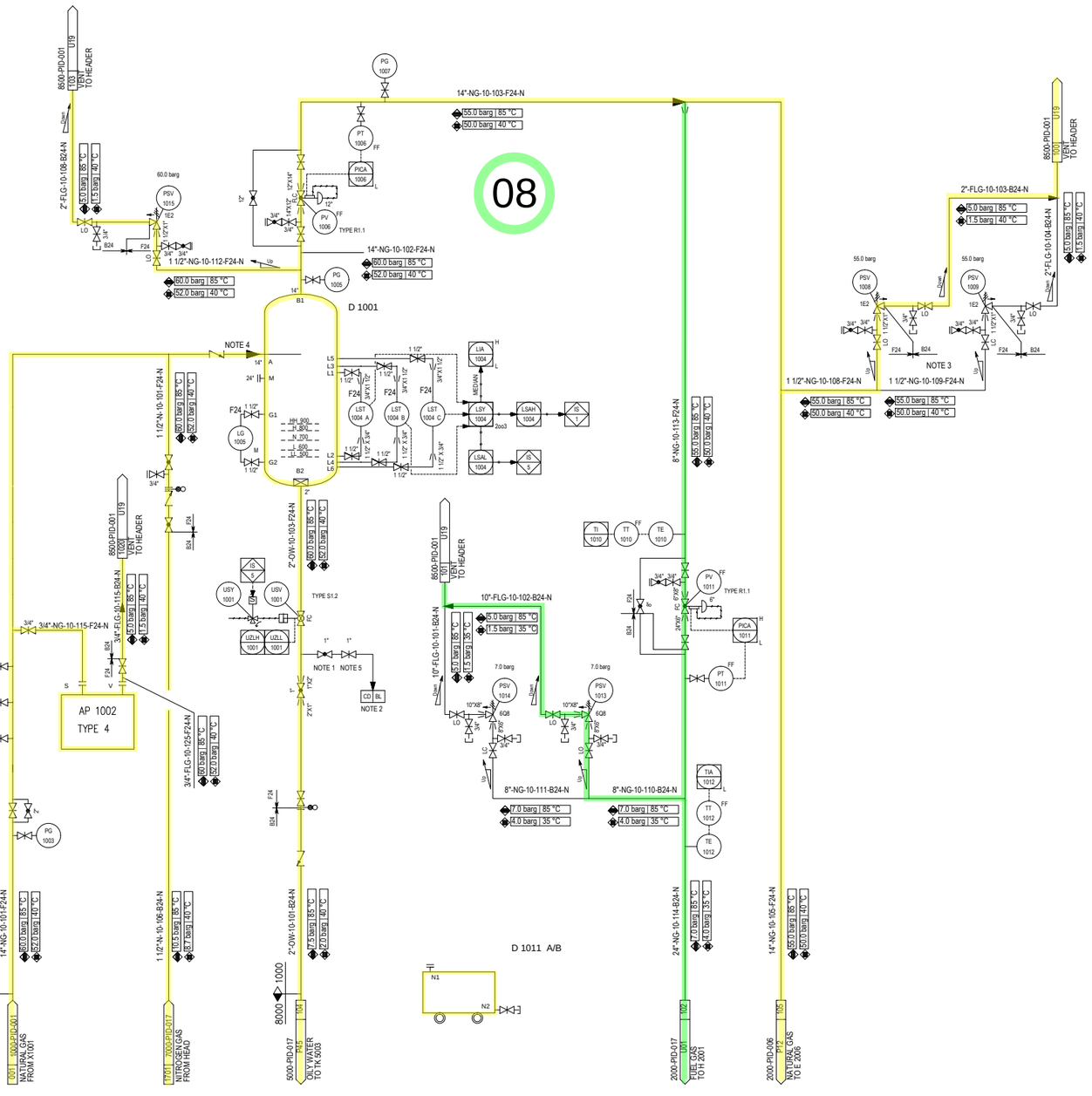
Counter Signing | Sign | Date

D 1001	NATURAL GAS K.O. DRUM
ID x LENGTHCT-T)	1550 x 2550mm
DESIGN PRESS.	60 barg
DESIGN TEMP.	85 °C
INSULATION	NO
CLADDING/LINING	NONE

D 1011 A/B	PORTABLE DRAIN DRUM
LENGTH x HEIGHT	~1000x1000x1000mm
DESIGN PRESS.	ATM barg
DESIGN TEMP.	85 °C
INSULATION	NO
CLADDING/LINING	NONE

01

08



GENERAL NOTES

+NOTES:

1) TO BE VISIBLE FROM LG 1005.
2) THE CLOSED DRAIN WILL BE COLLECTED IN A PORTABLE SEALED CONTAINER.
3) BETWEEN THESE TWO PSV, ALWAYS ONE INLET BLOCK VALVE SHALL BE L.O. AND THE OTHER ONE SHALL BE L.C..
4) THE MIN. DISTANCE OF CHECK VALVE BEFORE D 1001 SHALL BE AT LEAST 10 TIMES OF LINE INNER DIAMETER.
5) WHEN DRAINING, OPEN GATE VALVE FULLY AND THEN SLOWLY OPEN 1" GLOBE VALVE FOR DRAINING THE LIQUID AND DURING CLOSING DO REVERSE AND MAKE SURE THE DRAIN LINE IS FULLY CLOSED AFTER THE DRAIN.

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved For Construction	02.02.2018	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved For Construction	22.08.2017	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved For Construction	05.05.2017	Jiang Yu		Xu Hang	Liu Shengkai	
A	Approved For Construction	22.03.2017	Jiang Yu		Xu Hang	Liu Shengkai	
A	Approved For Construction	22.01.2017	Jiang Yu		Xu Hang	Liu Shengkai	
A	Approved For Construction	11.11.2016	Jiang Yu		Xu Hang	Liu Shengkai	
A	Approved For Construction	13.10.2016	Jiang Yu		Xu Hang	Liu Shengkai	
A	Approved For Construction	31.08.2016	Jiang Yu		Xu Hang	Liu Shengkai	
A	Approved For Construction	24.06.2016	Jiang Yu		Xu Hang	Liu Shengkai	
A	Issued for Comments	29.04.2016	Jiang Yu		Xu Hang	Liu Shengkai	

OWNER:

Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S
DOCUMENT NAME: NATURAL GAS DISTRIBUTION PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC. NO. 42 | REV. A
DWG. NO. 1341711 | DIAGRAM P01

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-1000-PS07-PID-002
SHEET 01 | TOTAL 01

SUB-CONTRACTOR:
SUB-CONTRACTOR DRAWING NO. –
SHEET – | TOTAL –

NATURAL GAS DISTRIBUTION PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Desulphurisation Unit
PHASE	As Built Drawing

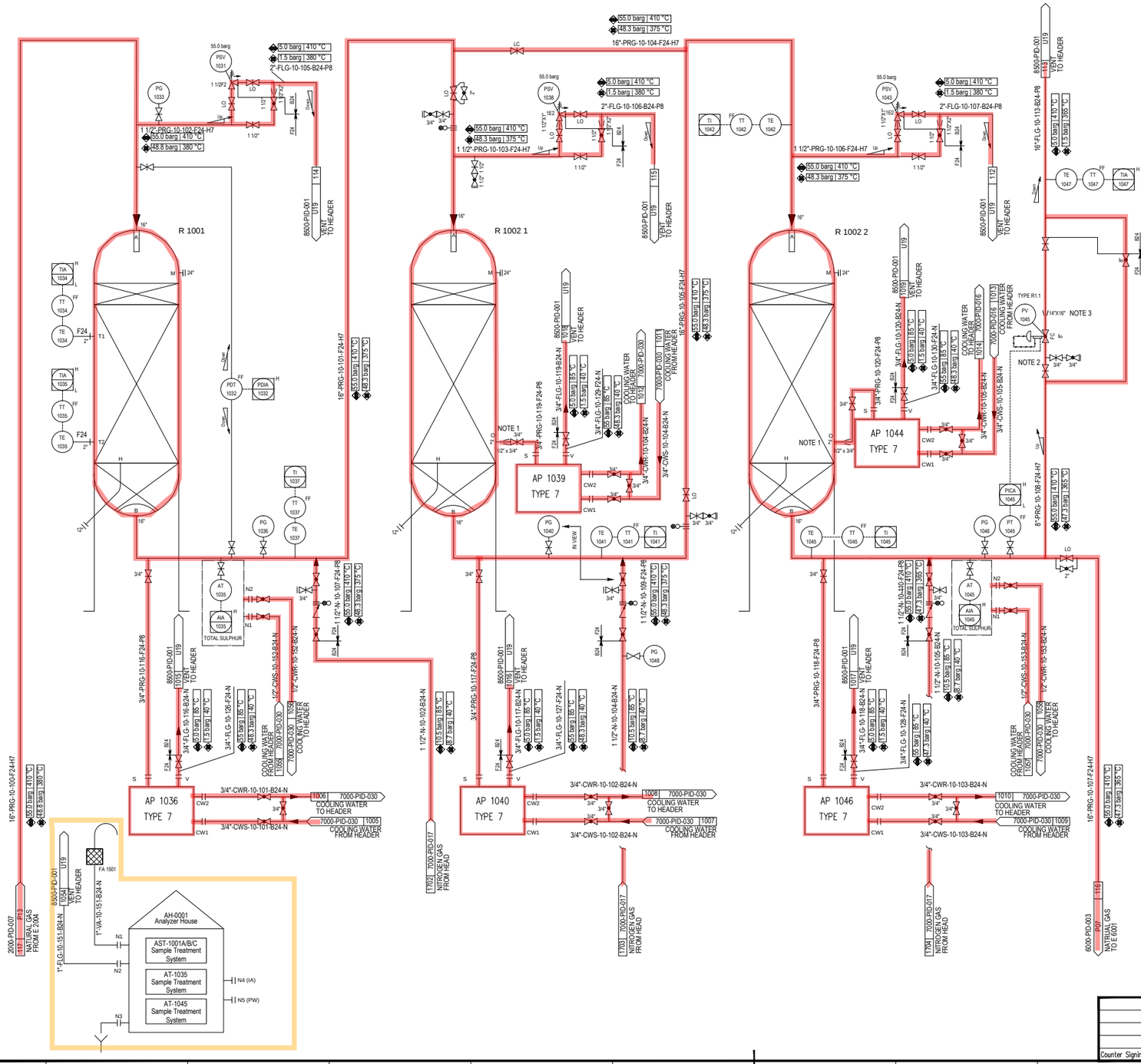
SCALE: – | SHEET: 1 | TOT.: 1 | SIZE: A1 | OWNER DWG NO. MKP-11-AS-1000-PR-PID-002

Counter Signing	Sign	Date

R 1001	HYDROGENATOR
ID x LENGTH(T-T)	4450x3100 mm
DESIGN PRESS.	55 barg
DESIGN TEMP.	410 °C
INSULATION	YES
CLADDING/LINING	NONE

R 1002 1/2	SULPHUR ABSORBER
ID x LENGTH(T-T)	4000x1500 mm
DESIGN PRESS.	55 barg
DESIGN TEMP.	410 °C
INSULATION	YES
CLADDING/LINING	NONE

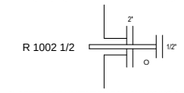
02



GENERAL NOTES

NOTES:

1) NOZZLE O OF R 1002 1/2 IS AN INNER EXTENSION TUBE, CONNECTING PIPE OF AP 1039/1044 WITH 1/2" FLANGE, WHICH IS MORE RELIABLE THAN NPT CONNECTION.



2) SOFTWARE LIMITATION FOR CHANGING SET POINT VALUE MUST NOT BE MORE THAN 5%.

3) PV-1045 INCLUDES 4 NOISE REDUCTION DISKS, THE SIZE IS 8"-10"-12"-14", AND THE REDUCER CONSIDERED BY PIPING.

GENERAL NOTE:

1) LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Xu Yekun		Xu Hang	Liu Shengkai	
4	Approved For Construction	06.11.2017	Xu Yekun		Xu Hang	Liu Shengkai	
3	Approved For Construction	05.05.2017	Jiang Yu		Xu Hang	Liu Shengkai	
2	Approved For Construction	22.03.2017	Jiang Yu		Xu Hang	Liu Shengkai	
1	Approved For Construction	22.01.2017	Jiang Yu		Xu Hang	Liu Shengkai	
0	Approved For Construction	11.11.2016	Jiang Yu		Xu Hang	Liu Shengkai	
B	Approved For Construction	13.10.2016	Jiang Yu		Xu Hang	Liu Shengkai	
A	Approved For Construction	31.08.2016	Jiang Yu		Xu Hang	Liu Shengkai	
0	Approved For Construction	24.06.2016	Jiang Yu		Xu Hang	Liu Shengkai	
A	Issued for Comments	29.04.2016	Jiang Yu		Xu Hang	Liu Shengkai	

OWNER:

Middle East Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S, COPENHAGEN DENMARK

DOCUMENT NAME: DESULPHURISATION PIPING AND INSTRUMENT DIAGRAM

JOB NO. S-02115 | DOC. DEP. 42 | DOC. NO. 1341714 | DIAGRAM P04 | REV. 5

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION

CONTRACTOR DRAWING NO. MKP-11-AS-1000-PS07-PID-003

SHEET 01 | TOTAL 01

SUB-CONTRACTOR: –

SUB-CONTRACTOR DRAWING NO. –

SHEET – | TOTAL –

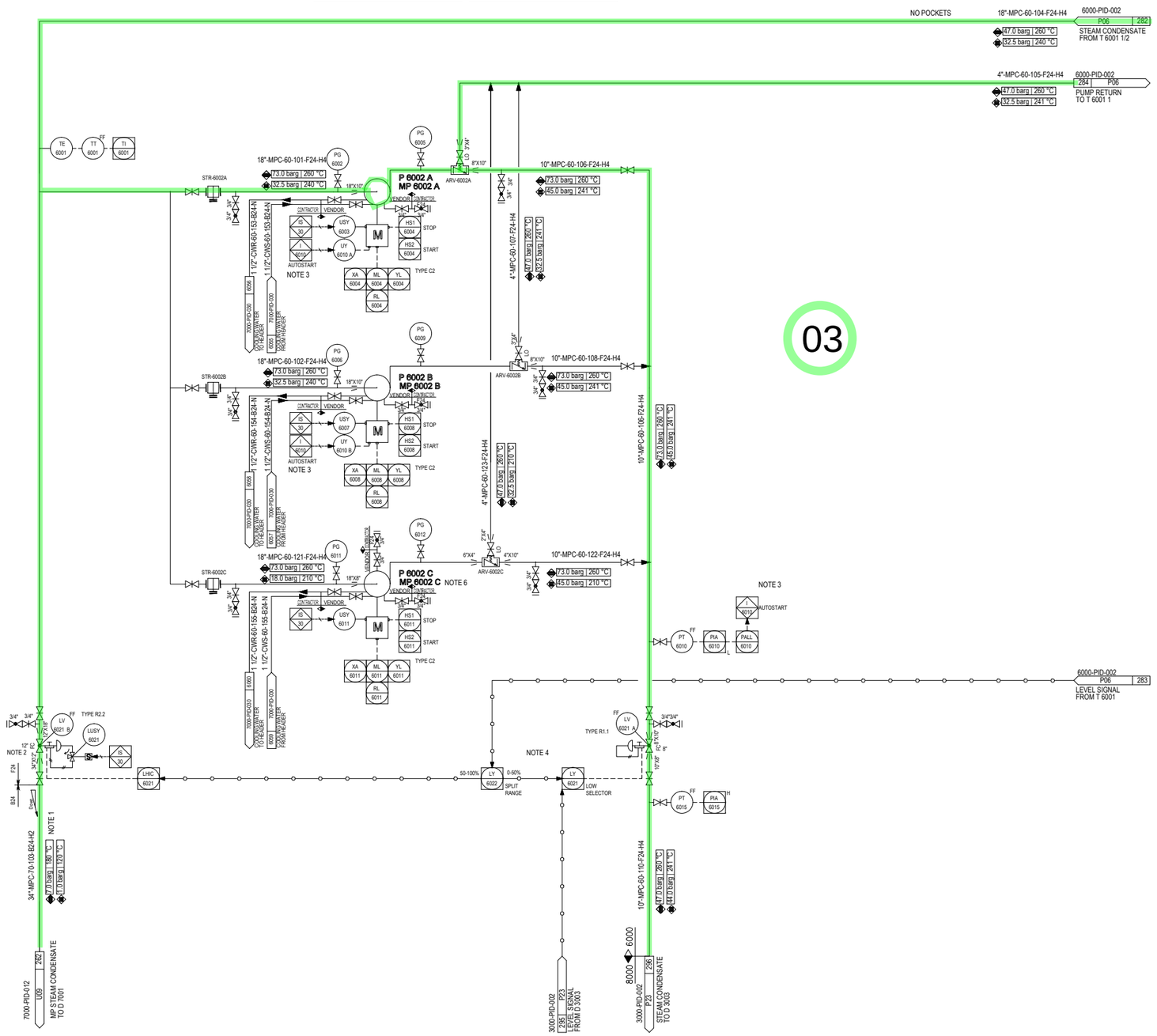
DESULPHURISATION PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Desulphurisation Unit
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-1000-PR-PID-003

SCALE: – | SHEET: 1 | TOT.: 1 | SIZE: A1

Counter Signing	Sign	Date

P 6002 A/B	STEAM CONDENSATE RETURN PUMP		P 6002 C	STEAM CONDENSATE RETURN PUMP	
RATED CAPACITY	351.6	m3/h	RATED CAPACITY	157	m3/h
HEAD	155.7	m	HEAD	322	m
DENSITY@DT	814	kg/m3	DENSITY@DT	853	kg/m3
INSULATION/TRACING	NONE		INSULATION/TRACING	NONE	
AUXILIARY PIPING	By Vendor		AUXILIARY PIPING	By Vendor	
ELEV. OF EQUIPMENT	EL +101.230m		ELEV. OF EQUIPMENT	EL +101.230m	



03

GENERAL NOTES

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

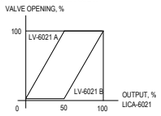
+NOTES:

1) TWO PHASE FLOW.

2) LV-6021 B MUST BE LOCATED AS CLOSE AS POSSIBLE TO D-7001. ELEVATION ABOVE D 7001.

3) THE SPARE PUMP OF P 6002 A/B WOULD AUTOSTART WHEN THE OUTLET PRESSURE DECREASED.

4) FUNCTION OF LICA-6021.



6) P 6002 C JUST FOR STARTUP CASE.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	30.12.2019	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	02.01.2018	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	06.11.2017	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	05.05.2017	Xu Yekun		Xu Hang	Shi Jing	
A	Approved for Construction	22.03.2017	Xu Yekun		Xu Hang	Shi Jing	
A	Approved for Construction	22.01.2017	Xu Yekun		Xu Hang	Shi Jing	
A	Approved for Construction	13.10.2016	Xu Yekun		Xu Hang	Shi Jing	
A	Issued for Approval	31.08.2016	Xu Yekun		Xu Hang	Shi Jing	
A	Issued for Approval	25.06.2016	Xu Yekun		Xu Hang	Shi Jing	
A	Issued for Comments	29.04.2016	Xu Yekun		Xu Hang	Shi Jing	

OWNER:

Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S, COPENHAGEN DENMARK

DOCUMENT NAME: STEAM CONDENSATE RETURN PIPING AND INSTRUMENT DIAGRAM

JOB NO. S-02115 | DOC. SEQ. 42 | REV. 4 | DRW. NO. 1341715 | DIAGRAM P05

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION

CONTRACTOR DRAWING NO. MKP-11-AS-6000-PS07-PID-001

SHEET 01 TOTAL 01

SUB-CONTRACTOR: –

SUB-CONTRACTOR DRAWING NO. –

SHEET – TOTAL –

Counter Signing	Sign	Date

STEAM CONDENSATE RETURN PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Saturator Unit
PHASE	As Built Drawing

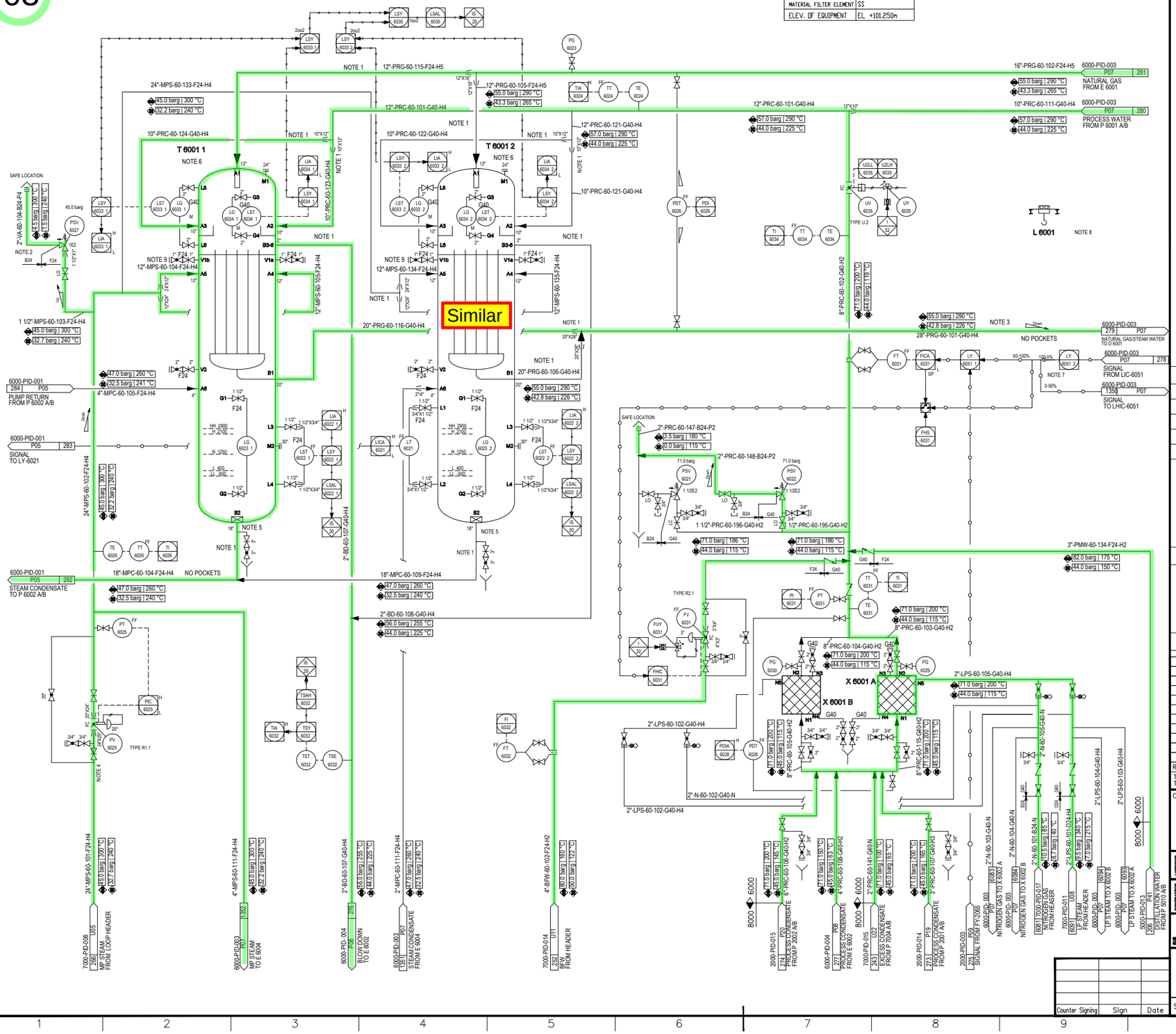
SCALE: – | SHEET: 1 | TOT.: 1 | SIZE: A1 | OWNER DWG NO. MKP-11-AS-6000-PR-PID-001

03

T 6001 1/2	SATURATOR	
DUTY	124.1	MW
DESIGN PRESS.(TU/SH)	55/FV-45	barg
DESIGN TEMP.(TU/SH)	290/300	°C
INSULATION	YES	
ELEV. OF EQUIPMENT	EL +107.240m	

X 6001A/B	PARTICLE FILTER	
FILTER SURFACE	N/A	m2
CAPACITY	178000	kg/hr
DESIGN PRESS.	71	barg
DESIGN TEMP.	200	°C
MATERIAL SHELL	SS	
MATERIAL FILTER ELEMENT	SS	
ELEV. OF EQUIPMENT	EL +101.250m	

L 6001	HOIST 6001	
TYPE	CHAIN HOIST	
CAPACITY	3	t
LIFT HEIGHT	6	m
SLIDING DISTANCE	7	m



GENERAL NOTES

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

+NOTES:

1) SYMMETRICAL PIPING

2) 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT TO SAFE AND SUITABLE LOCATION.

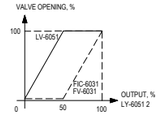
3) TWO PHASE FLOW.

4) STEAM TRAPS TO BE PROVIDED AT LOW POINTS.

5) NOZZLE B2 ON T 6001 1/2 MUST BE ELEVATED MIN. 4 m ABOVE P 6002 A/B. TO BE CONFIRMED BY VENDOR.

6) T 6001 1/2 MUST BE LOCATED AT SAME ELEVATION. NOZZLE B2 ON T 6001 1/2 MUST BE LOCATED MIN. 4m ABOVE P 6002 A/B. TO BE CONFIRMED BY VENDOR.

7) FUNCTION OF LY-6051 2.



8) HOIST IS USED FOR CLEANING OF X 6001 A/B.

9) AS PER EQUIPMENT ENGINEER AND VENDOR'S SUGGESTION, THE VENT NOZZLE OF T 6001 1/2 (V1) ARE MOVED TO THE HIGHEST POINT OF T 6001 1/2 SHELL SIDE TO INCREASE VENTING PERFORMANCE. SINCE THE SPACE IS VERY LIMITED, THE VEN NOZZLE (V1, 2") IS SEPARATED TO TWO NOZZLES (V1 AND V3 ,1").

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	30.12.2019	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	13.12.2018	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	06.11.2017	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	05.05.2017	Xu Yekun		Xu Hang	Shi Jing	
A	Approved for Construction	22.03.2017	Xu Yekun		Xu Hang	Shi Jing	
A	Approved for Construction	22.01.2017	Xu Yekun		Xu Hang	Shi Jing	
A	Approved for Construction	13.10.2016	Xu Yekun		Xu Hang	Shi Jing	
A	Issued for Approval	31.08.2016	Xu Yekun		Xu Hang	Shi Jing	
A	Issued for Approval	25.06.2016	Xu Yekun		Xu Hang	Shi Jing	
A	Issued for Comments	29.04.2016	Xu Yekun		Xu Hang	Shi Jing	

OWNER:

Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S
COPENHAGEN DENMARK

DOCUMENT NAME: NG SATURATION I PIPING AND INSTRUMENT DIAGRAM

JOB NO. S-02115 | DOC. QNT. 42 | REV. 1
DWG. NO. 1341718 | DIAGRAM P08

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION

CONTRACTOR DRAWING NO.
MKP-11-AS-6000-PS07-PID-002
SHEET 01 | TOTAL 01

SUB-CONTRACTOR: –

SUB-CONTRACTOR DRAWING NO.
–
SHEET – | TOTAL –

NG SATURATION I
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Saturator Unit
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-6000-PR-PID-002

SCALE: – | SHEET: 1 | TOT.: 1 | SIZE: A1

Counter Signing | Sign | Date

X 6002A/B	PARTICLE FILTER	
FILTER SURFACE	N/A	m2
CAPACITY	32200	kg/hr
DESIGN PRESS.	71	barg
DESIGN TEMP.	200	°C
MATERIAL SHELL	SS	
MATERIAL FILTER ELEMENT	SS	
ELEV. OF EQUIPMENT	EL +101.150m	

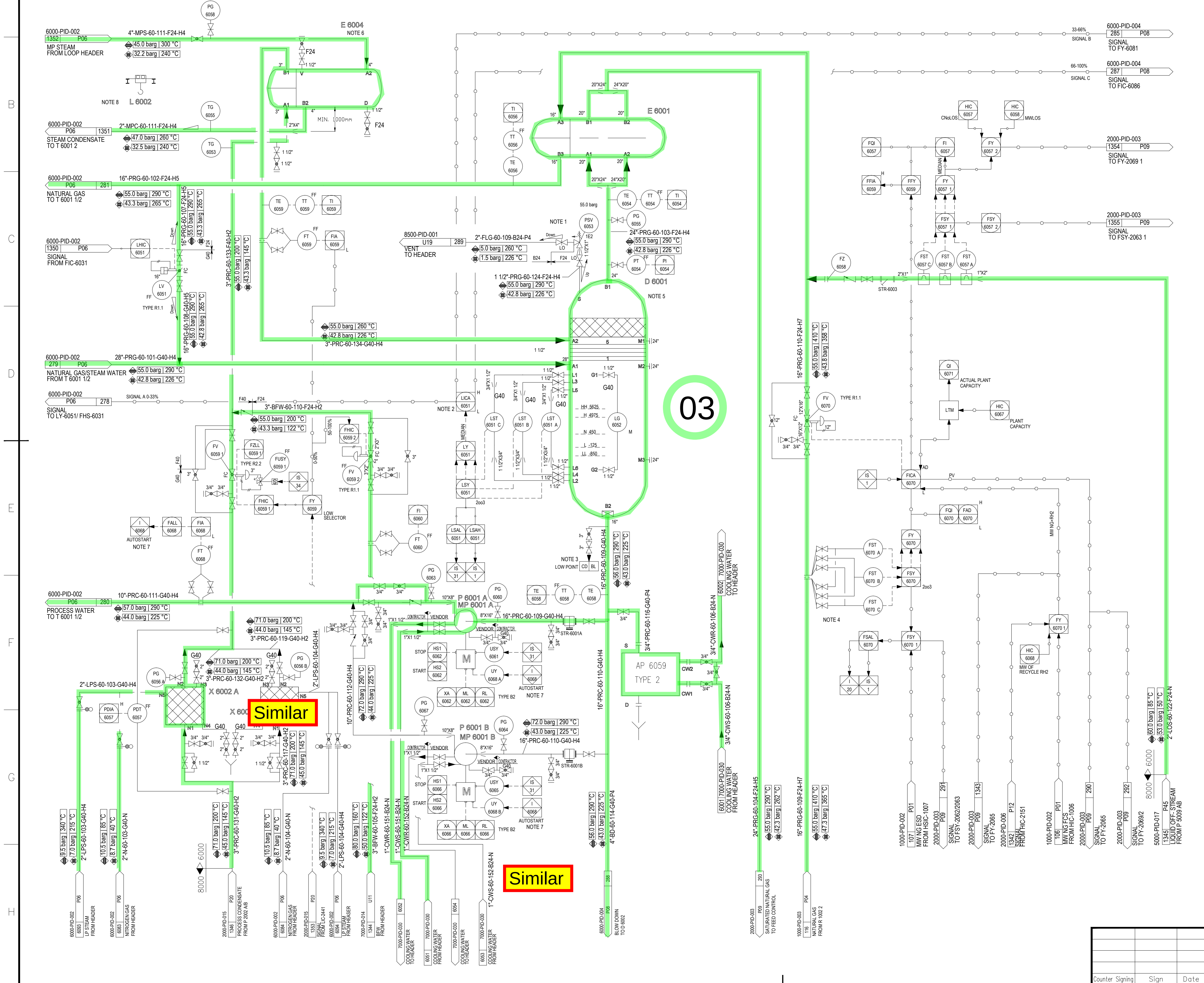
L 6002	HOIST 6002	
TYPE	CHAIN HOIST	
CAPACITY	2	t
LIFT HEIGHT	6	m
SLIDING DISTANCE	6	m

E 6004	WASH WATER PREHEATER	
DUTY	2.9	MW
DESIGN PRESS.(TU./SH.)	55/45	barg
DESIGN TEMP.(TU./SH.)	260/300	°C
INSULATION	YES	
ELEV. OF EQUIPMENT	EL +121.550m	

P 6001 A/B	SATURATOR CIRCULATION PUMP	
RATED CAPACITY	416.8	m3/h
HEAD	43.5	M
DENSITY@OT	832	kg/m3
INSULATION/TRACING	NONE	
AUXILIARY PIPING	By Vendor	
ELEV. OF EQUIPMENT	EL +101.260m	

D 6001	FEED GAS SCRUBBER SEPARATOR	
ID x LENGTH(T-T)	3400 x 12400	mm
DESIGN PRESS.	55/FV	barg
DESIGN TEMP.	290	°C
INSULATION	YES	
CLADDING/LINING	NONE	
ELEV. OF EQUIPMENT	EL +105.140m	

E 6001	SATURATOR FEED/EFFL. EXCHANGER	
DUTY	10.0	MW
DESIGN PRESS.(TU./SH.)	55/55	barg
DESIGN TEMP.(TU./SH.)	410/290	°C
INSULATION	YES	
ELEV. OF EQUIPMENT	EL +126.350m	



GENERAL NOTES

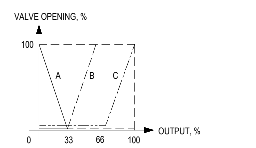
GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

NOTES:

1) TO BE LOCATED ABOVE FLARE HEADER.

2) FUNCTION OF LIC-6051



3) THE CLOSED DRAIN WILL BE COLLECTED IN A PORTABLE SEALED CONTAINER.

4) P&T COMPENSATION FROM PIC-1045,TI-1045; MW COMPENSATION FROM HIC-1006.

5) NOZZLE B2 ON D 6001 MUST BE LOCATED MIN 2 m ABOVE P 6001 A/B. (TO BE CONFIRMED BY PUMP VENDOR.)

6) E 6004 TO BE LOCATED MIN. 5m ABOVE MAX LEVEL IN T 6001 1/2.

7) THE SPARE PUMP OF P 6001 A/B WOULD AUTOSTART WHEN THE OUTLET FLOWRATE DECREASED.

8) HOIST IS USED FOR CLEANING OF X 6002 A/B.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
	As Built	30.04.2020	Xu Yekun		Xu Hang	Liu Shengkai	
	Approved for Construction	30.12.2019	Xu Yekun		Xu Hang	Liu Shengkai	
	Approved for Construction	13.12.2018	Xu Yekun		Xu Hang	Liu Shengkai	
	Approved for Construction	02.02.2018	Xu Yekun		Xu Hang	Liu Shengkai	
	Approved for Construction	06.11.2017	Xu Yekun		Xu Hang	Liu Shengkai	
	Approved for Construction	05.05.2017	Xu Yekun		Xu Hang	Shi Jing	
	Approved for Construction	22.03.2017	Xu Yekun		Xu Hang	Shi Jing	
	Approved for Construction	22.01.2017	Xu Yekun		Xu Hang	Shi Jing	
	Approved for Construction	13.10.2016	Xu Yekun		Xu Hang	Shi Jing	
	Issued for Approval	31.08.2016	Xu Yekun		Xu Hang	Shi Jing	
	Issued for Approval	25.06.2016	Xu Yekun		Xu Hang	Shi Jing	
	Issued for Comments	29.04.2016	Xu Yekun		Xu Hang	Shi Jing	

OWNER:

Middle East Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S COPENHAGEN DENMARK

DOCUMENT NAME: NG SATURATION II PIPING AND INSTRUMENT DIAGRAM

JOB NO. S-02115 | DOC. GRP. 42 | REV. 1

DWG. NO. 1341717 | DIAGRAM P07

CONTRACTOR: 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION

CONTRACTOR DRAWING NO. MKP-11-AS-6000-PS07-PID-003

SHEET 01 TOTAL 01

SUB-CONTRACTOR DRAWING NO. –

SHEET – TOTAL –

NG SATURATION II
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Saturator Unit
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-6000-PR-PID-003

SCALE: – | SHEET: 1 | TOT.: 1 | SIZE: A1

Counter Signing | Sign | Date

E6002	PROCESS CONDENSATE PREHEATER
DUTY	0.7 MW
DESIGN PRESS.(TU/SH)	71/56 barg
DESIGN TEMP.(TU/SH)	255/ 255 °C
INSULATION	YES
ELEV. OF EQUIPMENT	EL +101.230m

P 7003 A/B/C	EXCESS PROCESS CONDENSATE PUMP
RATED CAPACITY	22 m3/h
HEAD	632.2 M
DENSITY@DT	959 kg/m3
INSULATION/TRACING	NONE
AUXILIARY PIPING	By Vendor
ELEV. OF EQUIPMENT	EL +101.060m

D 6002	SATURATOR BLOW DOWN DRUM
ID x LENGTH(T-T)	1300 x 4375mm
DESIGN PRESS.	3.5 barg
DESIGN TEMP.	125 °C
INSULATION	NO
CLADDING/LINING	PERSONNEL PROTECTION
ELEV. OF EPUIPMENT	EL +107.240m

E 6003	SATURATOR BLOW DOWN COOLER
DUTY	1.9 MW
DESIGN PRESS.(TU/SH)	7.5/9.9 barg
DESIGN TEMP.(TU/SH)	100/125 °C
INSULATION	YES
ELEV. OF EQUIPMENT	EL +101.355m

03

04

E 6002

D 6002

E 6003

P 7003 A
MP 7003 A

P 7003 C
MP 7003 C

Similar

Similar

NOTE 1

NOTE 2

NOTE 3

NOTE 4

NOTE 5

NOTE 6

NOTE 7

GENERAL NOTES

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

+NOTES:

1) TWO PHASE FLOW.

2) FV-6081 AND FV-6086 MUST BE LOCATED CLOSE TO D 6002.

3) FUNCTION OF LIC-6082

+4) NOZZLE B ON D 6002 MUST BE LOCATED MIN. 5m ABOVE P 7003 A/B/C (TO BE CONFIRMED BY PUMP VENDOR).

5) THE SPARE PUMP OF P 7003 A/B/C WOULD AUTOSTART WHEN THE OUTLET PRESSURE DECREASED.

6) IN NORMAL CONDITION, THE FLOW RATE OF LINE 4"-BD-60-138-B40-N IS 0. THE MAXIMUM OPERATING TEMPERATURE OF THIS LINE IS 65°C WHEN ITS FLOW RATE ACHIEVED THE MAXIMUM VALUE.

7) DURING THE MAXIMUM FLOW RATE PHASE, ALL OF THE THREE PUMPS WILL BE UNDER OPERATION.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	02.02.2018	Xu Yekun		Xu Hang	Liu Shengkai	
A	Approved for Construction	05.05.2017	Xu Yekun		Xu Hang	Shi Jing	
A	Approved for Construction	22.03.2017	Xu Yekun		Xu Hang	Shi Jing	
A	Approved for Construction	22.01.2017	Xu Yekun		Xu Hang	Shi Jing	
A	Approved for Construction	13.10.2016	Xu Yekun		Xu Hang	Shi Jing	
A	Approved for Construction	31.08.2016	Xu Yekun		Xu Hang	Shi Jing	
A	Issued for Approval	25.06.2016	Xu Yekun		Xu Hang	Shi Jing	
A	Issued for Comments	29.04.2016	Xu Yekun		Xu Hang	Shi Jing	

OWNER:

Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S (LYNGBY DENMARK)

DOCUMENT NAME: NG SATURATION III PIPING AND INSTRUMENT DIAGRAM

JOB NO. S-02115 | DOC. SEQ. 42 | REV. A

DWG NO. 1341718 | DIAGRAM P08

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION

CONTRACTOR DRAWING NO. MKP-11-AS-6000-PS07-PID-004

SHEET 01 | TOTAL 01

SUB-CONTRACTOR: –

SUB-CONTRACTOR DRAWING NO. –

SHEET – | TOTAL –

NG SATURATION III
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Saturator Unit
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-6000-PR-PID-004

SCALE: – | SHEET: 1 | TOT.: 1 | SIZE: A1

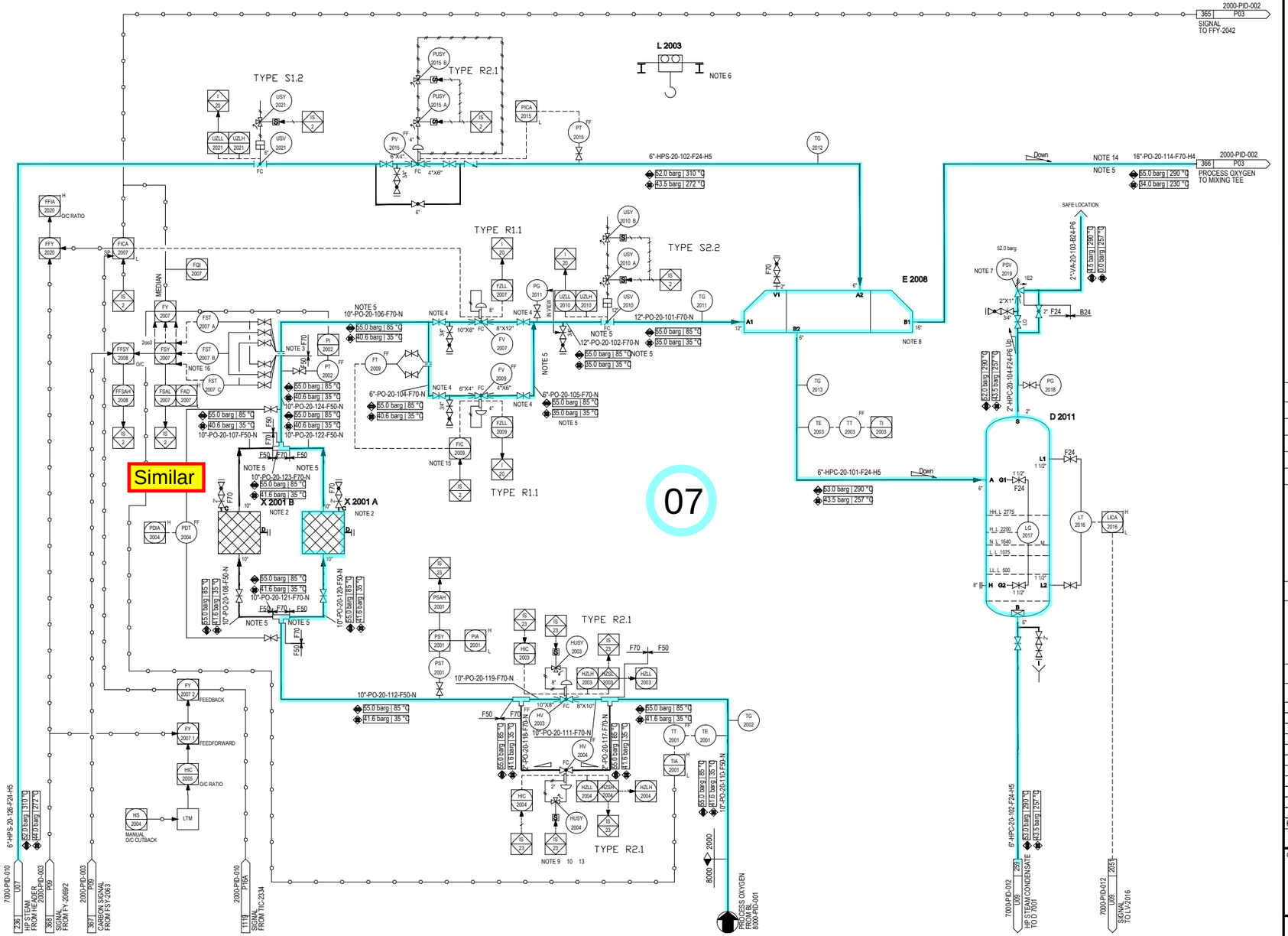
Counter Signing	Sign	Date

X 2001A/B	OXYGEN FILTER
FILTER SURFACE	BY VENDOR m2
CAPACITY	93939 kg/hr
DESIGN PRESS.	55 barg
DESIGN TEMP.	85 °C

L 2003	HOIST
TYPE	CHAIN HOIST
CAPACITY	2 t
LIFT HEIGHT	5 m
SLIDING DISTANCE	8.5 m

E 2008	OXYGEN PREHEATER
DUTY	4.8 MW
ID x LENGTH	650x5200 mm
DESIGN PRESS.(TU/SH)	55/52 barg
DESIGN TEMP.(TU/SH)	290/310 °C
Insulation	YES

D 2011	STEAM CONDENSATE K.O. DRUM FOR E2008
ID x LENGTH	700 x 3275 mm
DESIGN PRESS.	FV/52 barg
DESIGN TEMP.	290 °C
Insulation	YES
CLADDING/LINING	NONE



07

GENERAL NOTES

+NOTES:

2) X 2001 A/B MUST BE LOCATED CLOSE TO E 2008 AT GROUND LEVEL.BOTH FILTERS TO BE PRESSURIZED SIMULTANEOUSLY DURING START UP.ONCE PRESSURIZED,ONE BLOCK INLET FILTER MAY BE CLOSED. FILTERS NOT TO BE REPLACED ON STREAM
3) ORIFICE FLANGE TO BE PROVIDED WITH INDIVIDUAL PRESSURE TAPPING FOR EACH TRANSMITTERS.
4) ALL INTERNALS FOR VALVES IN OXYGEN SERVICE MUST BE MONEL.
5) IN OXYGEN PIPES ALL SHARP BENDS MUST BE AVOIDED.LONG RADIUS BENDS 3D.
6) THE HOIST IS USED FOR X-2001A/B MAINTENANCE.
7) 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT AND ROUTED TO SAFE AND SUITABLE LOCATION BELOW TAPPING POINT.
8) E 2008 CONDENSATE OUTLET NOZZLE TO BE ELEVATED ABOVE A NOZZLE ON D 2011.E 2008 MUST BE LOCATED ABOVE SEC. REFORMER BURNER.
9) BY PASS FOR PRESSURIZATION SHALL BE MADE OF MONEL. CONNECTIONS HAVE TO BE TOP OF MAIN LINE.
10) VALVE TO BE IN MONEL INCL. MIN. 8 DIAMETERS DOWNSTREAM PIPING.
13) AUTOMATIC VALVE AT BL IS OPTIONAL.NOT A HTAS REQUIREMENT
14) DOWNWARDS SLOPE MINIMUM 0.5 % IN COLD CONDITIONS AS WELL AS AT MAX.OPERATING TEMPERATURE.
15) P&T COMPENSATION FROM PI-2002,TI-2001
16) P&T COMPENSATION FROM PI-2002,TI-2001
GENERAL NOTE:
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furu		Gao Zhihu	Liu Shengkai	
9	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihu	Liu Shengkai	
8	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihu	Liu Shengkai	
7	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihu	Liu Shengkai	
6	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihu	Liu Shengkai	
5	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihu	Liu Shengkai	
4	Approval for Construction	10.11.2016	Wang Furu		Gao Zhihu	Liu Shengkai	
3	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihu	Liu Shengkai	
2	Approval for Construction	31.08.2016	Wang Furu		Gao Zhihu	Liu Shengkai	
1	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihu	Liu Shengkai	
0	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihu	Liu Shengkai	

OWNER: Middle East Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S COPENHAGEN DENMARK
DOCUMENT NAME: PROCESS OXYGEN PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 DWG NO. 1341712 DOC GRP. 42 DISCIPLIN P02 REV. 5

CONTRACTOR: 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-001
SHEET 01 TOTAL 01

SUB-CONTRACTOR
SUB-CONTRACTOR DRAWING NO. –
SHEET – TOTAL –

Counter Signing	Sign	Date

PROCESS OXYGEN PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-001

SCALE | SHEET: 1 | TOT: 1 | SIZE: A1

X 2002A/B	STEAM FILTER	
FILTER SURFACE	N/A	m2
CAPACITY	9200	kg/hr
DESIGN PRESS.	52	barg
DESIGN TEMP.	410	°C

L 2001	HOIST	
TYPE	CHAIN HOIST	
CAPACITY	2	t
LIFT HEIGHT	5	m
SLIDING DISTANCE	7	m

SI 2001	HP STEAM SILENCER-1	
CAPACITY	4000	kg/hr
DESIGN PRESS.	52	barg
DESIGN TEMP.	410	°C

GENERAL NOTES

+NOTES:

2) ORIFICE FLANGE TO BE PROVIDED WITH INDIVIDUAL PRESSURE TAPPING FOR EACH TRANSMITTERS.
3) NO POCKETS ALLOWED.
4) DETAILED DESIGNER MUST CONSIDER THERMAL STRESSES IN THE MIXING POINT.
THE TEE MUST BE MOUNTED TO ENSURE A STRAIGHT FLOW OF OXYGEN.
5) ANY ELBOWS BETWEEN O2 / STEAM MIXING TEE AND R 2004 MUST BE WITH LONG RADIUS (1.5 D)
6) IN OXYGEN PIPES ALL SHARP BENDS MUST BE AVOIDED.LONG RADIUS BENDS 3D.
7) MIN. LENGTH OF MONEL PIPE FROM MIXING POINT: 4m. DISTANCE TO R 2004 MUST BE MINIMIZED.
8) PIPE MUST BE DESIGNED IN MATERIALS AS SPECIFIED IN F70 (MONEL) BUT MUST BE ABLE TO WITHSTAND DESIGN TEMPERATURE AND DESIGN PRESSURE AS SPECIFIED.
9) BLEED TO BE TAKEN FROM BOTTOM OF OXYGEN LINE AND ROUTED TO SAFE LOCATION BELOW TAPPING POINT.
10) START-UP PREHEATEING OF OXYGEN LINE.IT MUST BE POSSIBLE TO OPERATE THIS BLEED AFTER IS-2 IS RESET BUT BEFORE DOUBLE BLOCK AND BLEED IS RESET
11) 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT AND ROUTED TO SAFE AND SUITABLE LOCATION BELOW TAPPING POINT.
12) STEAM TRAPS AT LOW POINTS/ DEAD ENDS MUST BE PROVIDED.
13) MI CABLE TRACING TO 250 °C.
14) THE HOIST IS USED FOR X-2002A/B MAINTENANCE.
15) BYPASS LINE IN MANIFOLD IS NOT ALLOWED
16) P&T COMPENSATION FROM PIC-7003,TI-7007

+GENERAL NOTE:
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.
IN OXYGEN PIPES ALL SHARP BENDS MUST BE AVOIDED.LONG RADIUS BENDS 3D.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	30.12.2019	Wang Furui		Gao Zhihui	Liu Shengkai	
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A	Approval for Construction	05.05.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	22.03.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	23.01.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	10.11.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	12.10.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	31.08.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	16.06.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Issued for Comments	29.04.2016	Wang Furui		Gao Zhihui	Liu Shengkai	

OWNER:
Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S — COPENHAGEN DENMARK
DOCUMENT NAME: OXYGEN PREHEATING PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC. GRP. 42 | DWG NO. 1341713 | DIAGRAM P03 | REV. 5

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-002
SHEET 01 | TOTAL 01

SUB CONTRACTOR
SUB-CONTRACTOR DRAWING NO. –
SHEET – | TOTAL –

Counter Signing	Sign	Date

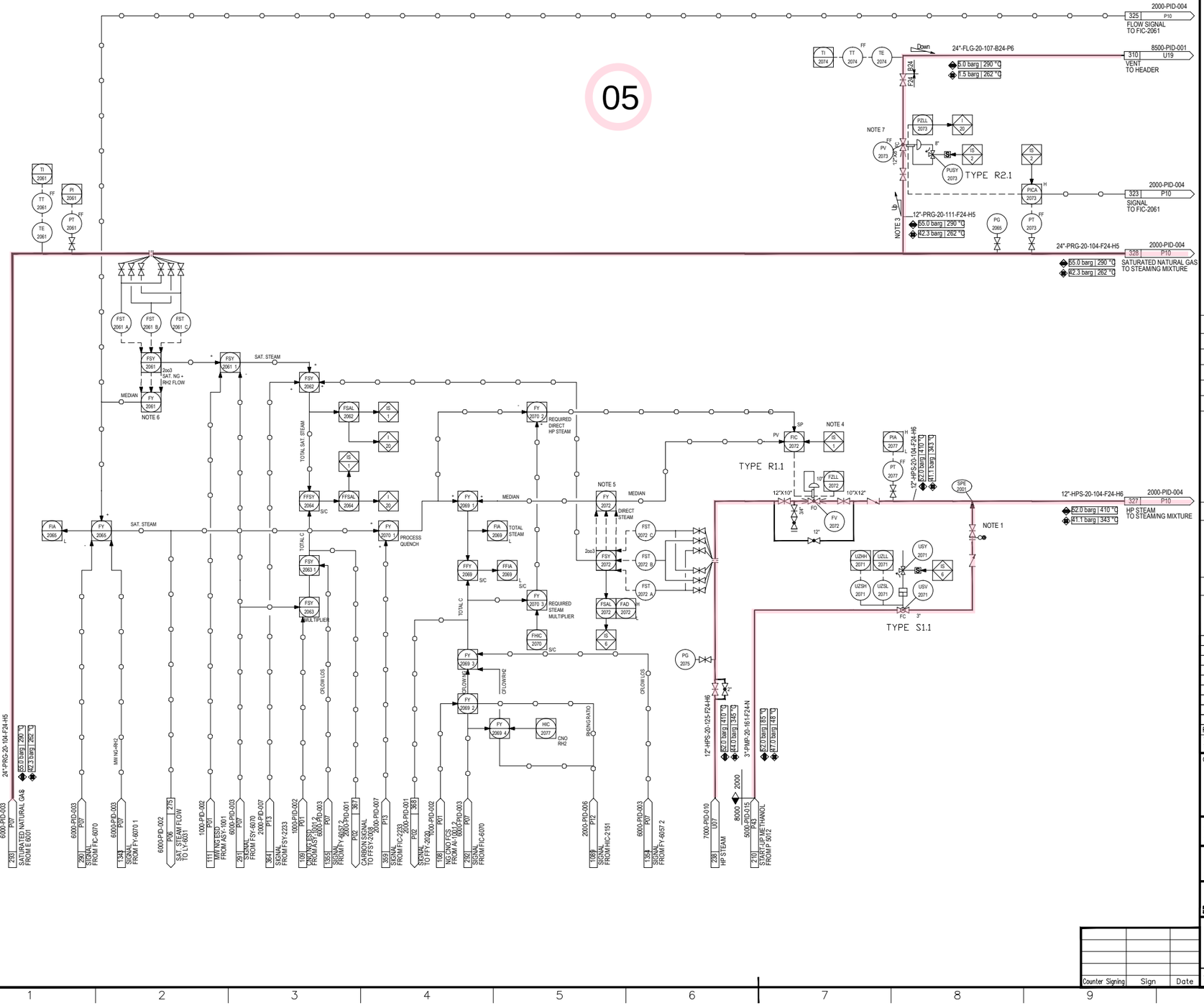
OXYGEN PREHEATING
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing

SCALE | SHEET: 1 | TOT: 1 | SIZE: A1 | OWNER DWG NO. MKP-11-AS-2000-PR-PID-002

Similar

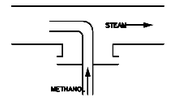
07



GENERAL NOTES

+NOTES:

1) METHANOL INJECTION CONNECTION.



3) DISTANCE MINIMISED BETWEEN PROCESS VENT AND E 2002 B.
4) SUBSEQUENT TO IS-1 THIS SET POINT IS RAMPED DOWN.
5) P&T COMPENSATION FROM PIC-7003,TI-7007
6) P&T COMPENSATION FROM PI-2061,TI-2061
7) PV-2073 includes 4 noise reduction disks, the size is 14"-24" and the reducer considered by piping.

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
4	As Built	30.04.2020	Wang Furui		Gao Zhihui	Liu Shengkai	
3	Approval for Construction	30.12.2019	Wang Furui		Gao Zhihui	Liu Shengkai	
2	Approval for Construction	05.05.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
1	Approval for Construction	22.03.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
0	Approval for Construction	10.11.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
C	Approval for Construction	12.10.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
B	Approval for Construction	31.08.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	16.06.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
	Issued for Comments	29.04.2016	Wang Furui		Gao Zhihui	Liu Shengkai	

OWNER:
Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S (COPENHAGEN DENMARK)
DOCUMENT NAME: S/C RATIO CONTROL I PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DWG NO. 1341719 | DOC. SEP. 42 | DIAGRAM P09 | REV. 4

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-003
SHEET 01 | TOTAL 01

SUB-CONTRACTOR:
SUB-CONTRACTOR DRAWING NO. --
SHEET – | TOTAL –

Counter Signing	Sign	Date

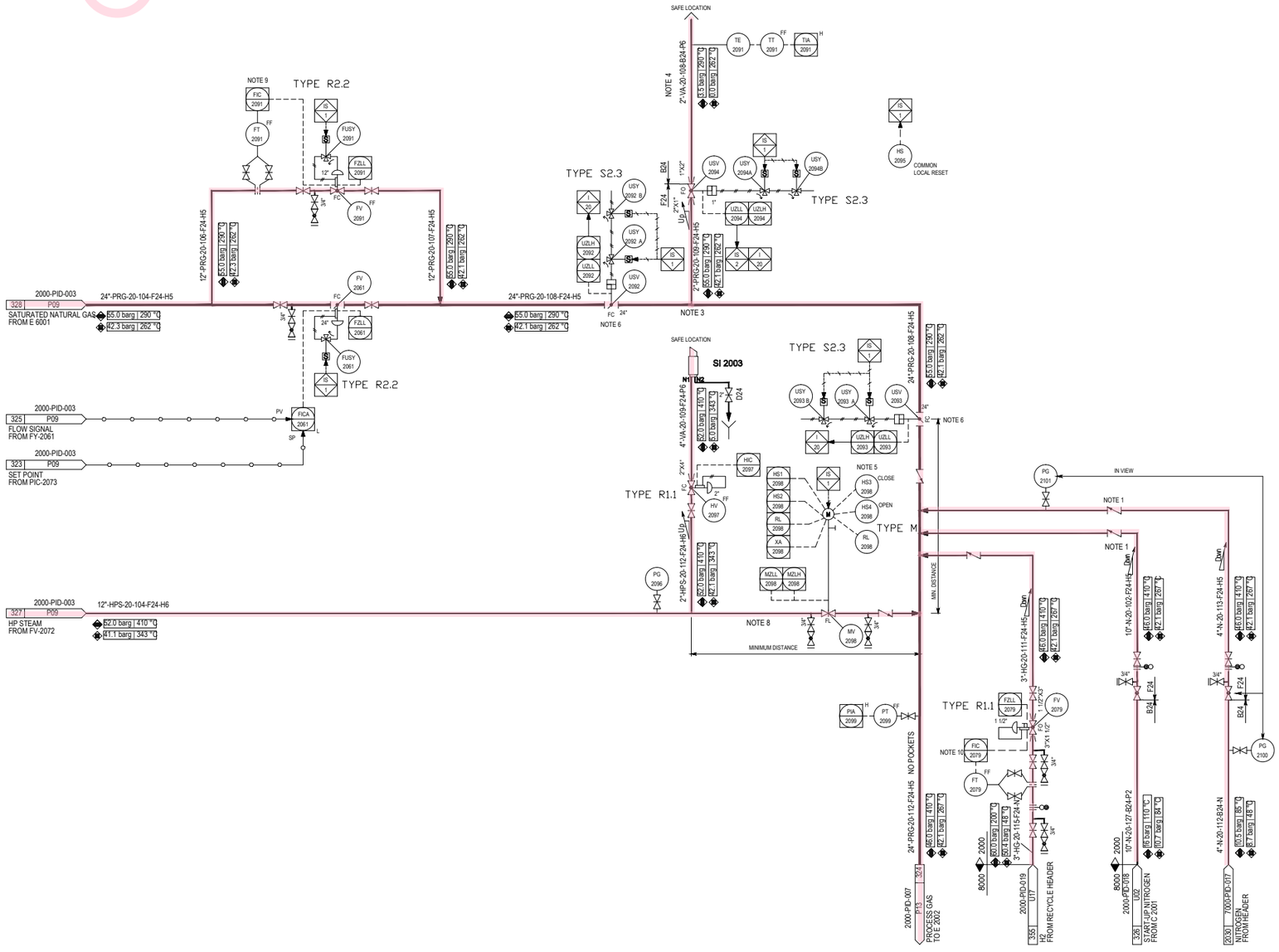
S/C RATIO CONTROL I
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-003

SCALE | SHEET: 1 | TOT: 1 | SIZE: A1

SI 2003	HP STEAM SILENCER-2	
CAPACITY	4000	kg/hr
DESIGN PRESS.	52	barg
DESIGN TEMP.	410	°C

05



GENERAL NOTES

+NOTES:

1) TOP ENTRY CONNECTION.

3) DISTANCE MINIMIZED BETWEEN PROCESS VENT AND E 2002.
4) 1/2" DRIPHOLE TO BE DRILED AT LOW POINT TO SAFE AND SUITABLE LOCATION.
5) OPERATED LOCAL.
6) MIN. DISTANCE BETWEEN USV-2092 AND USV-2093.

8) CONSIDER DRAIN LINE AT LOW POINT.
9) P&T COMPENSATION FROM PIC-2073,TI-2061.
10) P&T COMPENSATION FROM PI-2150,TI-2150.

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	30.12.2019	Wang Furui		Gao Zhihui	Liu Shengkai	
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A	Approval for Construction	23.01.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
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A	Issued for Comments	29.04.2016	Wang Furui		Gao Zhihui	Liu Shengkai	

OWNER:
Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S, COPENHAGEN DENMARK
DOCUMENT NAME: S/C RATIO CONTROL II PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC. NO. 42 | REV. 1
DWG NO. 1341720 | DIAGRAM P10

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-004
SHEET 01 | TOTAL 01

SUB-CONTRACTOR
SUB-CONTRACTOR DRAWING NO. –
SHEET – | TOTAL –

S/C RATIO CONTROL II
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-004

SCALE | SHEET:1 | TOT:1 | SIZE: A1

Counter Signing	Sign	Date

F 2002	COMBUSTION AIR BLOWER
CAPACITY	424237 kg/hr
PRESS. (SUC./DIS.)	-0.012/0.034 barg
TEMP. (SUC./DIS.)	48/ °C
GRIVE POWER	1400 kW
AUXILIARY PIPING	By Vendor

FT 2002	STEAM TURBINE FOR F 2002
TYPE	BACK PRESSURE
DESIGN PRESS.	52 barg
DESIGN TEMP.	410 °C
RATED POWER	1350 kW

SI 2005	HP STEAM SILENCER-3
CAPACITY	6000 kg/hr
DESIGN PRESS.	52 barg
DESIGN TEMP.	410 °C

GENERAL NOTES

+NOTES:

1) AIR INTAKE WITH DUST FILTER TO BE LOCATED MINIMUM 5 m ABOVE GRADE.
2) PIPE SIZES FOR STEAM AT FT-2002 BY TURBINE VENDOR.
3) VENDOR SCOPE, TO BE DETAILED BY VENDOR.
4) 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT TO SAFE AND SUITABLE LOCATION.
5) VALVE SIZE WILL BE COMFIRMED BY VENDOR.
6) AIR DUCTING SIZE WILL BE CONFIRMED BY VENDOR FINALLY
7) THE SUPPLY SCOPE OF PRIMARY REFORMER VENDOR INSTRUMENTS ARE OUT OF VENDOR SUPPLY SCOPE IF NO SPECIAL INSTRUCTIONS
8) THE FLOWMETER ELEMENT IS SUPPLIED BY PRIMARY REFORMER VENDOR
9) P&T COMPENSATION FROM PIC-7003,TI-7007
10) P&T COMPENSATION FROM PI-2111,TI-2111
11) THE TEMPERATURE INDICATOR/GAUGE(TT-2851/2852) AND THE PRESSURE INDICATOR/GAUGE (PT-2854/PT-2855/PG-2851) ARE SUPPLIED BY FT2002 VENDOR.
PLEASE FIND VENDOR DOCUMENT FOR DETAILS.

+GENERAL NOTE:
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihui	Liu Shengkai	
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A	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	10.11.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	31.08.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihui	Liu Shengkai	

OWNER:
Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S
DOCUMENT NAME: FLUE GAS WHS I PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC GRP. 42 | DRWG NO. 1341721 | DIAGRAM P11 | REV. 4

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-005
SHEET 01 TOTAL 01

SUB-CONTRACTOR
SUB-CONTRACTOR DRAWING NO. –
SHEET – TOTAL –

FLUE GAS WHS I
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
SCALE	
SHEET: 1	TOT: 1
SIZE: A1	
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-005

Counter Signing	Sign	Date

S 2001	FLUE GAS STACK	
CAPACITY	4392510	Nm3/hr
DESIGN PRESS.	Ambient	barg
DESIGN TEMP.	250	°C

F 2001	FLUE GAS BLOWER	
CAPACITY	469314	kg/hr
PRESS. (SUC./DIS.)	-0.05/0	barg
TEMP. (SUC./DIS.)	150/	°C
DRIVE POWER	2350	kW
AUXILIARY PIPING	By Vendor	

FT 2001	STEAM TURBINE FOR F 2001	
TYPE	BACK PRESSURE	
DESIGN PRESS.	52	barg
DESIGN TEMP.	410	°C
RATED POWER	2500	kW

E 2007	COMBUSTION AIR PREHEATER	
DUTY	14.3	MW
DESIGN PRESS.(CDIL)	BY VENDOR	barg
DESIGN TEMP.(CDIL)	210	°C

E 2006	1st NATURAL GAS FEED PREHEAT COIL	
DUTY(EDR-rich gas)	17.7	MW
DESIGN PRESS.(CDIL)	55	barg
DESIGN TEMP.(CDIL)	350	°C

SI 2006	HP STEAM SILENCER-4	
CAPACITY	8000	kg/hr
DESIGN PRESS.	52	barg
DESIGN TEMP.	410	°C

GENERAL NOTES

NOTES:

1) PST-2163 A/B/C TO BE LOCATED AS CLOSE AS POSSIBLE TO H 2001.
2) GUIDE VANES
3) PIPE SIZES FOR STEAM AT FT 2001 BY TURBINE VENDOR.
4) 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT TO SAFE AND SUITABLE LOCATION.
5) VALVE SIZE WILL BE COMFIRMED BY VENDOR.
7) SIZE OF AIR DAMPER IS DETERMINED BY VENDOR
8) AIR DUCTING SIZE WILL BE CONFIRMED BY VENDOR FINALLY
9) THE SUPPLY SCOPE OF PRIMARY REFORMER VENDOR.
INSTRUMENTS ARE OUT OF VENDOR SUPPLY SCOPE IF NO SPECIAL INSTRUCTIONS
10) THE PIPE AND VALVE FOR AP-2160 IS SUPPLIED BY PRIMARY REFORMER VENDOR
11) P&T COMPENSATION FROM PI-2150,TI-2150
12) P&T COMPENSATION FROM PIC-1006,TI-2151
13) P&T COMPENSATION FROM PIC-7003,TI-7007
14) THE TEMPERATURE INDICATOR/GAUGE(TT-2801/2802) AND THE PRESSURE INDICATOR/GAUGE (PT-2804/PT-2805/PG-2801) ARE SUPPLIED BY FT2001 VENDOR.
PLEASE FIND VENDOR DOCUMENT FOR DETAILS.

GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDEDD URING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
14	As Built	30.04.2020	Wang Furu		Gao Zhihui	Liu Shengkai	
13	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihui	Liu Shengkai	
12	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
11	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
10	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
9	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
8	Approval for Construction	28.12.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
7	Approval for Construction	10.11.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
6	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
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4	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
3	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihui	Liu Shengkai	

OWNER:
Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S
DOCUMENT NAME: FLUE GAS WHS II PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC. GRP. 42 | REV. 4
TAG NO. 1341722 | DIAGRAM P12

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-006
SHEET 01 | TOTAL 01

SUB-CONTRACTOR:
SUB-CONTRACTOR DRAWING NO. –
SHEET – | TOTAL –

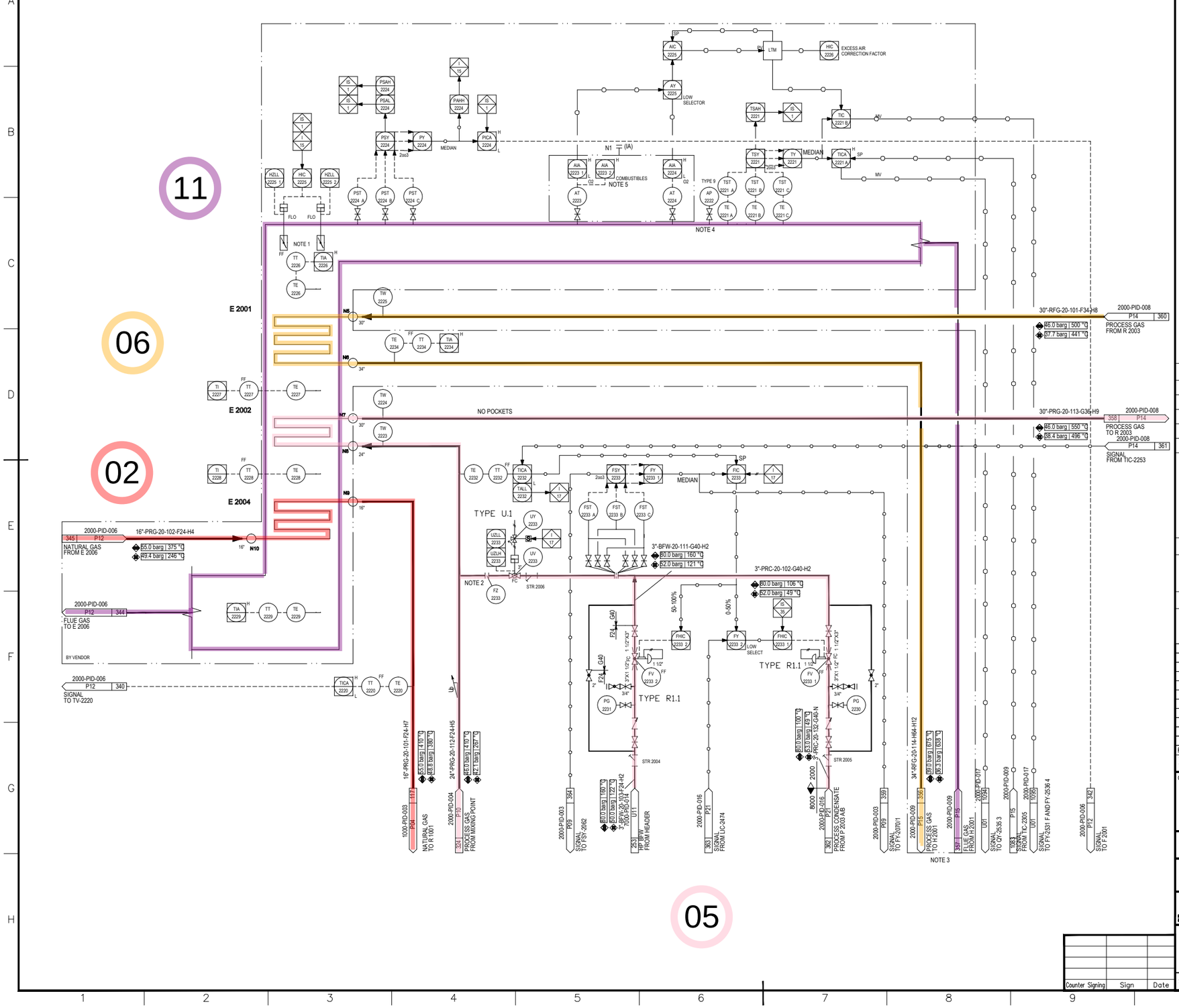
FLUE GAS WHS II PIPING AND INSTRUMENT DIAGRAM	PROJECT: MKP Methanol Project
	UNIT: Reformer
	PHASE: As Built Drawing
SCALE	SHEET: 1 / TOT: 1 / SIZE: A1
	OWNER DWG NO.: MKP-11-AS-2000-PR-PID-006

Counter Signing	Sign	Date

E 2001	REFORMER FEED PREHEAT COIL	
DUTY(EDR-rich gas)	53.5	MW
DESIGN PRESS.(COIL)	46	barg
DESIGN TEMP.(COIL)	705	°C

E 2002	PREREFORMER FEED PREHEAT COIL	
DUTY(EDR-rich gas)	61.8	MW
DESIGN PRESS.(COIL)	46	barg
DESIGN TEMP.(COIL)	610	°C
Elevation	EL +107.05m	

+E 2004	2nd NATURAL GAS FEED PREHEAT COIL	
DUTY(EDR-rich gas)	14.3	MW
DESIGN PRESS.(COIL)	55	barg
DESIGN TEMP.(COIL)	440	°C



GENERAL NOTES

+NOTES:

1) FALSE AIR DAMPER.

2) SPRAY NOZZLES TO BE INSTALLED ACCORDING TO VENDOR INSTRUCTIONS.

3) THE SUPPLY SCOPE OF PRIMARY REFORMER VENDOR INSTRUMENTS ARE OUT OF VENDOR SUPPLY SCOPE IF NO SPECIAL INSTRUCTIONS

4) THE PIPE AND VALVE FOR AP-2222 IS SUPPLIED BY PRIMARY REFORMER VENDOR

5) WHEN THERE IS NO INSTRUMENT AIR SUPPLY FOR THE ANALYZER AT-2223, THE LAST EFFECTIVE DATA SHALL BE RECORDED IN FCS.

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	30.12.2019	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	06.11.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	05.05.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	22.03.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	23.01.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	10.11.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	12.10.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	31.08.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	16.06.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Issued for Comments	29.04.2016	Wang Furui		Gao Zhihui	Liu Shengkai	

OWNER:
Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S, DENMARK
DOCUMENT NAME: FLUE GAS WHS III PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC. SUP. 42 | REV. A
DWG. NO. 1341723 | DIAGRAM P13

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-007
SHEET 01 | TOTAL 01

SUB-CONTRACTOR:
SUB-CONTRACTOR DRAWING NO. –
SHEET – | TOTAL –

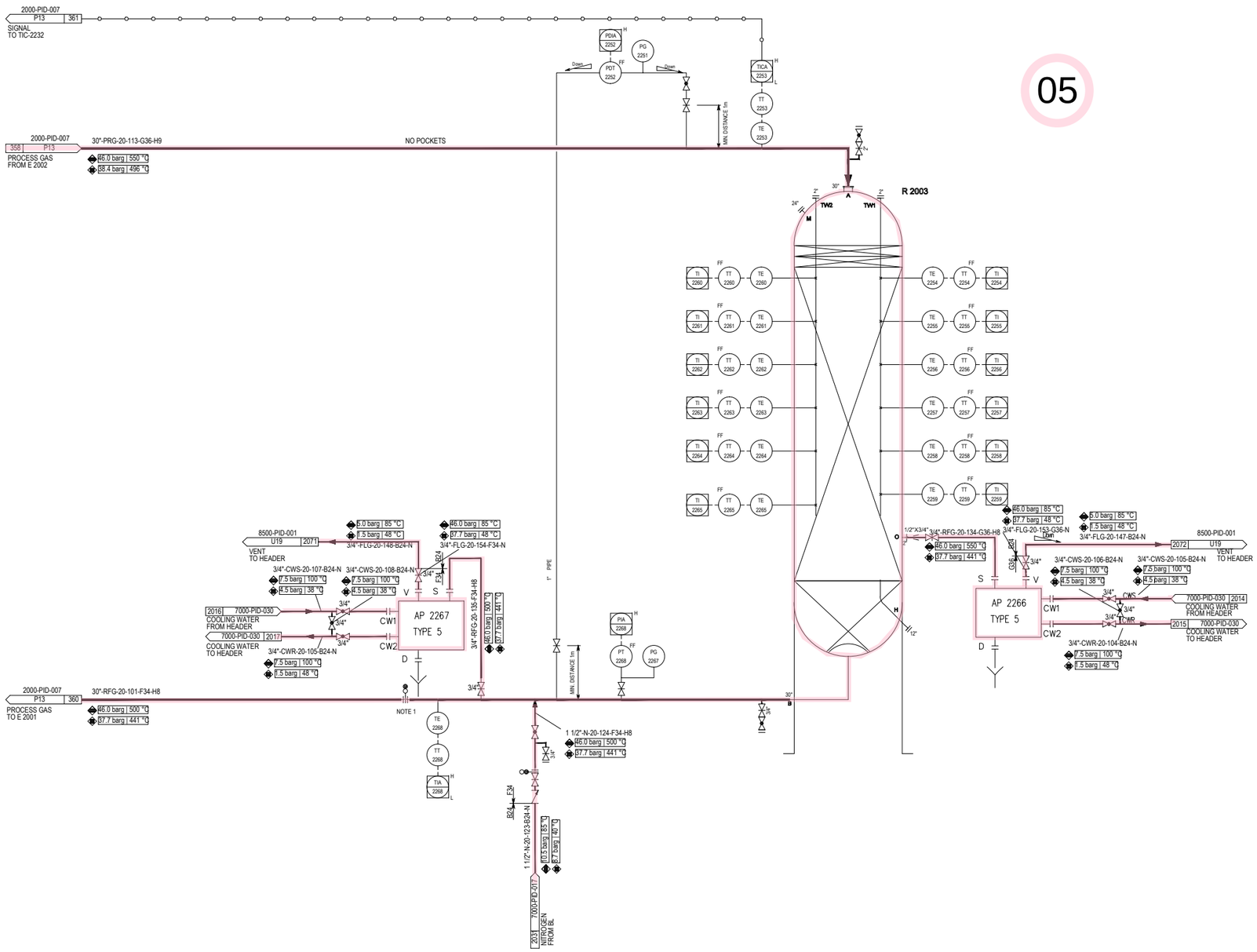
FLUE GAS WHS III
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-007

SCALE | SHEET:1 | TOT:1 | SIZE:A1

Counter Signing	Sign	Date

R 2003	PREREFORMER
ID x LENGTH	3900 x 2600mm
DESIGN PRESS.	46 barg
DESIGN TEMP.	550 °C
Insulation	YES
CLADDING/LINING	NONE



05

GENERAL NOTES

+NOTES:

1) ISOLATE PREREFORMER DURING OPENING OF DOWNSTREAM SYSTEM TO PREVENT AIR INGRESS TO CATALYST.

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furui		Gao Zhihui	Liu Shengkai	
3	Approval for Construction	02.02.2018	Wang Furui		Gao Zhihui	Liu Shengkai	
2	Approval for Construction	06.11.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
1	Approval for Construction	05.05.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
0	Approval for Construction	22.03.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
C	Approval for Construction	10.11.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
B	Approval for Construction	12.10.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	31.08.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
0	Approval for Construction	16.06.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Issued for Comments	29.04.2016	Wang Furui		Gao Zhihui	Liu Shengkai	

OWNER:

Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S, COPENHAGEN DENMARK

DOCUMENT NAME: PREREFORMING PIPING AND INSTRUMENT DIAGRAM

JOB NO. S-02115 | DOC GRP. 42 | REV. 3 | DWG NO. 1341724 | DIAGRAM P14

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION

CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-008

SHEET 01 | TOTAL 01

SUB-CONTRACTOR: SUB-CONTRACTOR DRAWING NO. –

SHEET – | TOTAL –

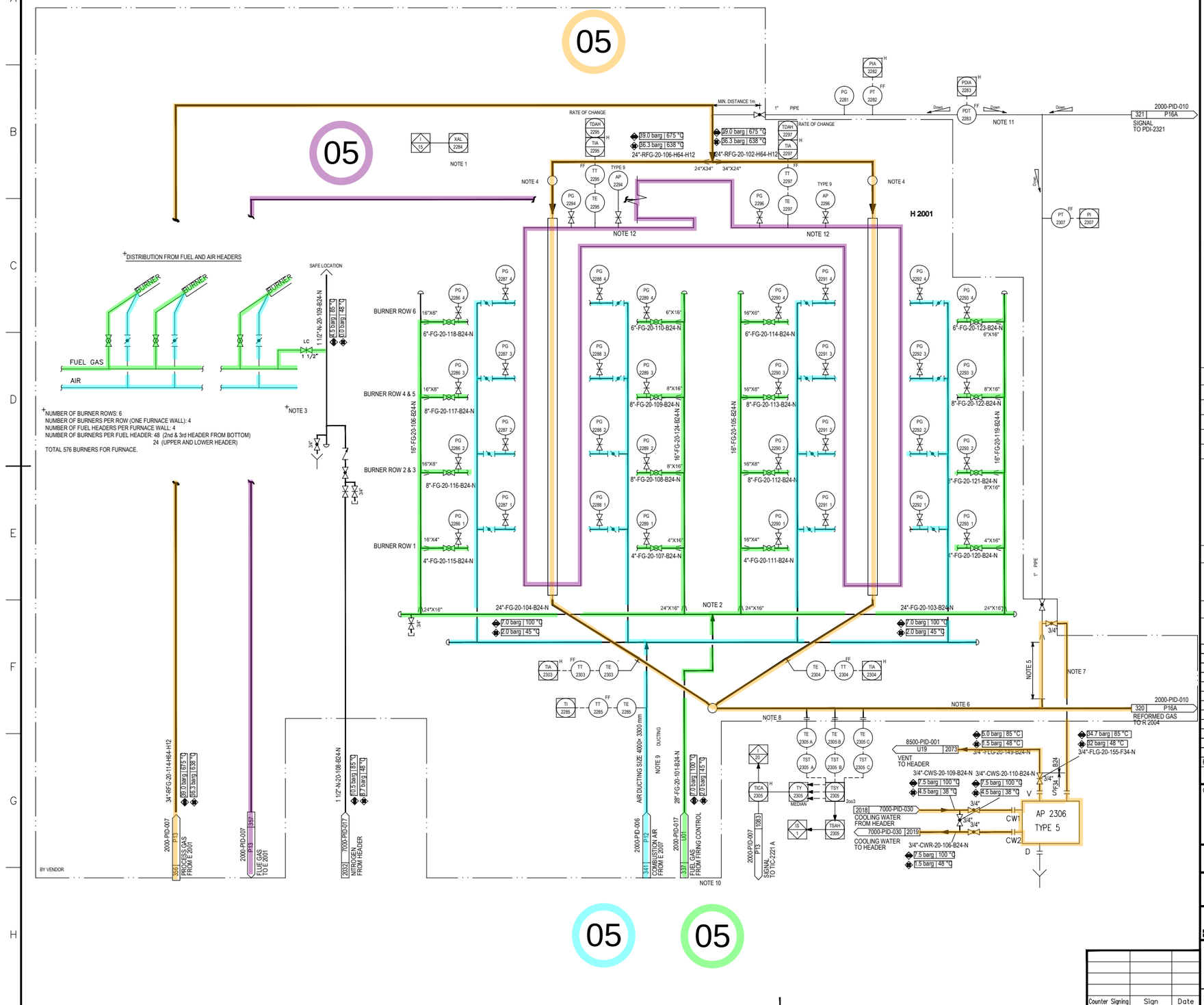
PREREFORMING
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing

SCALE | SHEET: 1 | TOT: 1 | SIZE: A1 | OWNER DWG NO. MKP-11-AS-2000-PR-PID-008

Counter Signing	Sign	Date

H 2001	PRIMARY REFORMER	
CAPACITY	154.1	MW
DESIGN PRESS.(COIL)	39	barg
DESIGN TEMP.(COIL)	850	°C



GENERAL NOTES

+NOTES:

1) HIGH PRESSURE IN REFORMER FURNACE BOX ACTIVATES HAZARD FLASHERS, THREE FLASHERS ARE LOCATED AT EACH END OF THE REFORMER AND ON EACH FLOOR.
2) FUEL PIPING TO BE SYMMETRICAL
3) FUEL PIPING AND AIR DUCTING TO BE SUPPLIED WITH FLANGES AT THE END OF SUBHEATERS. IF WELDED CAPS ARE SUPPLIED THESE MUST BE REMOVED FOR PIPE BLOWING
4) END CAP FOR DISTRIBUTOR TO BE FIELD WELDED AFTER PIPE BLOWING.
5) MIN 4 m INCOLOY 600 PIPE OF 1".
6) COLD COLLECTOR IS REFRACTORY LINE.THE OPERATING/DESIGN PRESSURE IS 32.0/34.7 BARG.
THE OPERATING TEMPERATURE FOR PROCESS GAS IS 742 .
THE OPERATING/DESIGN TEMPERATURE FOR SHELL AFTER LINING IS 150/400 .
7) THE LINE IS IN THE SUPPLY SCOPE OF AP-2306 VENDOR.
8) NEW STANDARD IS THREE THERMOWELLS ONE FOR EACH THERMOCOUPLE.
(THREE INDIVIDUAL THERMOELEMENTS IN THE SAME THERMOWELL IS ACCEPTABLE IF ALREADY IMPLEMENTED)
9) AIR DUCTING SIZE WILL BE CONFIRMED BY VENDOR FINALLY
10) THE SUPPLY SCOPE OF PRIMARY REFORMER VENDOR
INSTRUMENTS ARE OUT OF VENDOR SUPPLY SCOPE IF NO SPECIAL INSTRUCTIONS
11) THE PIPE AND VALVE FOR PT-2282/2307/PG-2283/PDT-2283 ARE SUPPLIED BY PRIMARY REFORMER VENDOR
12) THE PIPE AND VALVE FOR AP-2294/2296 IS SUPPLIED BY PRIMARY REFORMER VENDOR

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	30.12.2019	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	02.02.2018	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	06.11.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	05.05.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	22.03.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	23.01.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	10.11.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	12.10.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	31.08.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Comments	16.06.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Issued for Comments	29.04.2016	Wang Furui		Gao Zhihui	Liu Shengkai	

OWNER:
Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S, COPENHAGEN DENMARK
DOCUMENT NAME: TUBULAR REFORMER PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC. NO. 42 | REV. A
DWG NO. 1341725 | DIAGRAM P15

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-009
SHEET 01 | TOTAL 01

SUB-CONTRACTOR:
SUB-CONTRACTOR DRAWING NO. –
SHEET – | TOTAL –

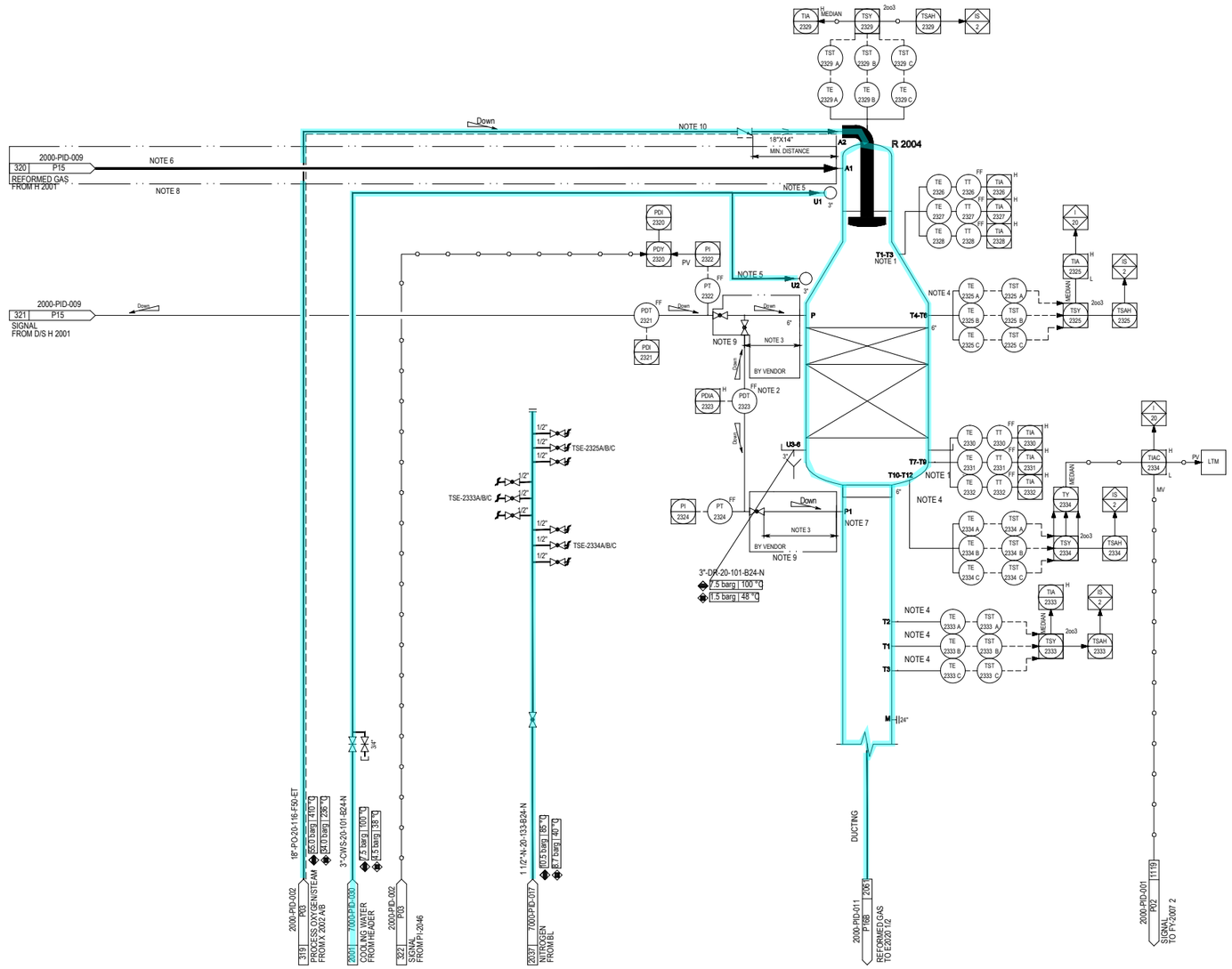
Counter Signing	Sign	Date

TUBULAR REFORMER
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
SCALE	
SHEET: 1	TOT: 1
SIZE: A1	
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-009

R 2004	SECONDARY REFORMER
ID x LENGTH	5400 x 8231mm
DESIGN PRESS.	34.7 barg
DESIGN TEMP.	400 °C
Insulation	YES
CLADDING/LINING	LINING

07



GENERAL NOTES

+NOTES:

1) SHELL TEMPERATURE MONITORING.
2) TRANSMITTERS MUST BE INSTALLED ABOVE R 2004 WITH SLOPE BACK TO THE PROCESS.IMPULSE LINES MUST BE MIN. 1" PIPE.
3) MIN 4 m INCOLOY 600 PIPE OF 1".
4) NITROGEN REQUIRED AT THERMOWELL.
5) WATER SPRAYING FOR SHELL COOLING IN CASE OF HOT SPOT TO OPEN DRAIN.
6) COLD COLLECTO IS REFRACTORY LINE.THE OPERATING/DESIGN PRESSURE IS 32.0/34.7 BARG.
   THE OPERATING TEMPERATURE FOR PROCESS GAS IS 742 .
   THE OPERATING/DESIGN TEMPERATURE FOR SHELL AFTER LINING IS 150/400 .
7) P1 IS POSITIONED ON MANIFOLD TO E2020 1/2 (P1 IN PROCESS SPECIFICATION)
8) THE SUPPLY SCOPE OF PRIMARY REFORMER VENDOR
   INSTRUMENTS ARE OUT OF VENDOR SUPPLY SCOPE IF NO SPECIAL INSTRUCTIONS
9) THE PIPE AND VALVE FOR PT-2324/2322/PDT-2323/2321 ARE SUPPLIED BY PRIMARY REFORMER VENDOR
10) MINIMUM DISTANCE TO SPE-0201

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	30.12.2019	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	06.11.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	22.03.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	10.11.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	12.10.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	31.08.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	16.06.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Issued for Comments	29.04.2016	Wang Furui		Gao Zhihui	Liu Shengkai	

OWNER:

Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S COPENHAGEN DENMARK

DOCUMENT NAME: SECONDARY REFORMER PIPING AND INSTRUMENT DIAGRAM

JOB NO. S-02115 | DOC. GRP. 42 | REV. A | TAGE NO. 1341726 | DIAGRAM P16A

CONTRACTOR: 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION

CONTRACTOR DRAWING NO.
MKP-11-AS-2000-PS07-PID-010
SHEET 01 TOTAL 01

SUB-CONTRACTOR DRAWING NO.
–
SHEET – TOTAL –

SECONDARY REFORMER PIPING AND INSTRUMENT DIAGRAM	PROJECT	MKP Methanol Project	
	UNIT	Reformer	
	PHASE	As Built Drawing	
SCALE	SHEET: 1	TOT: 1	SIZE: A1
	OWNER DWG NO.	MKP-11-AS-2000-PR-PID-010	

Counter Signing	Sign	Date

E 2020 1/2	WASTE HEAT BOILER	
DUTY	82.5	MW
ID x LENGTH(T-T)	2890x7000	mm
DESIGN PRESS.(TU/SH)	31/113	barg
DESIGN TEMP.(TU/SH)	400/330	°C
Insulation	NA	

13

14

2000-PID-010 P16A 2061
REFORMED GAS FROM R2001A
DUCTING

E 2020 1

NOTE 8

NOTE 5

NOTE 6

2000-PID-012 P17 2052
SIGNAL FROM TY-2335

2000-PID-012 334 P17
REFORMED GAS TO E 2021 1

TYPE R1.1

2"-BD-20-102-G24-P6
f13.0 barg | 330 °C
f03.0 barg | 313 °C

TIC 2336 MEDIAN PV
TDIA 2337 H

THIC 2360 1 + - 5% BIAS
TY 2360 1 LOW SELECTOR

2000-PID-012 P17 329
SIGNAL FROM TIC-2360

2000-PID-012 P17 2053
SIGNAL FROM TY-2336

TIC 2336 MEDIAN PV
TY 2360 2 LOW SELECTOR
THIC 2360 2 + - 5% BIAS

E 2020 2

Similar

NOTE 7

2000-PID-012 335 P17
REFORMED GAS TO E 2021 2

TYPE R1.1

HV 2334
HV 2335
NOTE 1
NOTE 2

6"-BD-20-140-G24-P2
f13.0 barg | 330 °C
f2.0 barg | 135 °C

2"-BD-20-139-G24-P6
f13.0 barg | 330 °C
f03.0 barg | 313 °C

6"-BD-20-101-G24-P2
f13.0 barg | 330 °C
f2.0 barg | 135 °C

7000-PID-026 U16 285
INTERMITTENT BLOW DOWN TO D 7003

2000-PID-013 P18 330
REFERS TO D 2001

2000-PID-013 P18 333
REFERS TO D 2001

2000-PID-013 P18 332
FROM DOWNCOMERS FROM D 2001

2000-PID-013 P18 331
DOWNCOMERS FROM D 2001

GENERAL NOTES

+NOTES:

1) BLOW DOWN VALVE TO BE PLACED AS CLOSE AS POSSIBLE TO D 7003. NO POCKETS ON BOILER BLOW DOWN LINE DOWNSTREAM BLOW DOWN VALVE.
2) TWO PHASE FLOW.

5) TO BE PROVIDED WITH ADJUSTABLE MINIMUM STOP.

6) E 2020 1 AND E 2021 1 ARE DIRECT CONNECTION.

7) E 2020 2 AND E 2021 2 ARE DIRECT CONNECTION.

8) SYMMETRICAL DUCTING.

+GENERAL NOTE:
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	30.12.2019	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	06.11.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	22.03.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	10.11.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	12.10.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Issued for Approval	31.08.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Issued for Approval	16.06.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Issued for Comments	29.04.2016	Wang Furui		Gao Zhihui	Liu Shengkai	

OWNER:
Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S
DOCUMENT NAME: SECONDARY REFORMER II PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115
DWG NO. 1341756
DOC. GRP. 42
DIAGRAM P16B
REV. 2

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-011
SHEET 01 TOTAL 01

SUB-CONTRACTOR
SUB-CONTRACTOR DRAWING NO. –
SHEET – TOTAL –

Counter Signing	Sign	Date

SECONDARY REFORMER II
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing

SCALE | SHEET: 1 | TOT: 1 | SIZE: A1 | OWNER DWG NO. MKP-11-AS-2000-PR-PID-011

E 2021 1/2	STEAM SUPERHEATER
DUTY	22.01 MW
ID x LENGTH(T-T)	2500x9000 mm
DESIGN PRESS.(TU/SH)	112/31 barg
DESIGN TEMP.(TU/SH)	490/450 °C
Insulation	YES

SI 2004	HHP Steam SILENCER-1
CAPACITY	117000 kg/hr
DESIGN PRESS.	22 barg
DESIGN TEMP.	490 °C

E 2021 3	STEAM SUPERHEATER
DUTY	15.8 MW
ID x LENGTH(T-T)	1675x7200 mm
DESIGN PRESS.(TU/SH)	112/31 barg
DESIGN TEMP.(TU/SH)	370/440 °C
Insulation	YES

Similar

13

14

E 2021 1

E 2021 2

E 2021 3

SI 2004

TYPE R1.1

TYPE R1.1

GENERAL NOTES

+NOTES:

1) SYMMETRICAL STEAM PIPING AROUND E 2021 1/2.
2) E 2020 1 AND E 2021 1 ARE DIRECT CONNECTION.
3) E 2020 2 AND E 2021 2 ARE DIRECT CONNECTION.
4) SYMMETRICAL PIPING.
5) VALVE SIZE WILL BE COMFIRMED BY VENDOR.
6) THE FLANGE CLASS FOR INLET OF SAFETY-RELIEF VALVES PSV-2354~2360 SHOULD BE CL600 DIFFERING FROM PIPE.

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	10.11.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	31.08.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihui	Liu Shengkai	

OWNER:
Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S
DOCUMENT NAME: STEAM SUPERHEATER PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC GRP. 42 | INDEX NO. 1341727 | DIAGRAM P17 | REV. 4

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-012
SHEET 01 TOTAL 01

SUB-CONTRACTOR:
SUB-CONTRACTOR DRAWING NO. –
SHEET – TOTAL –

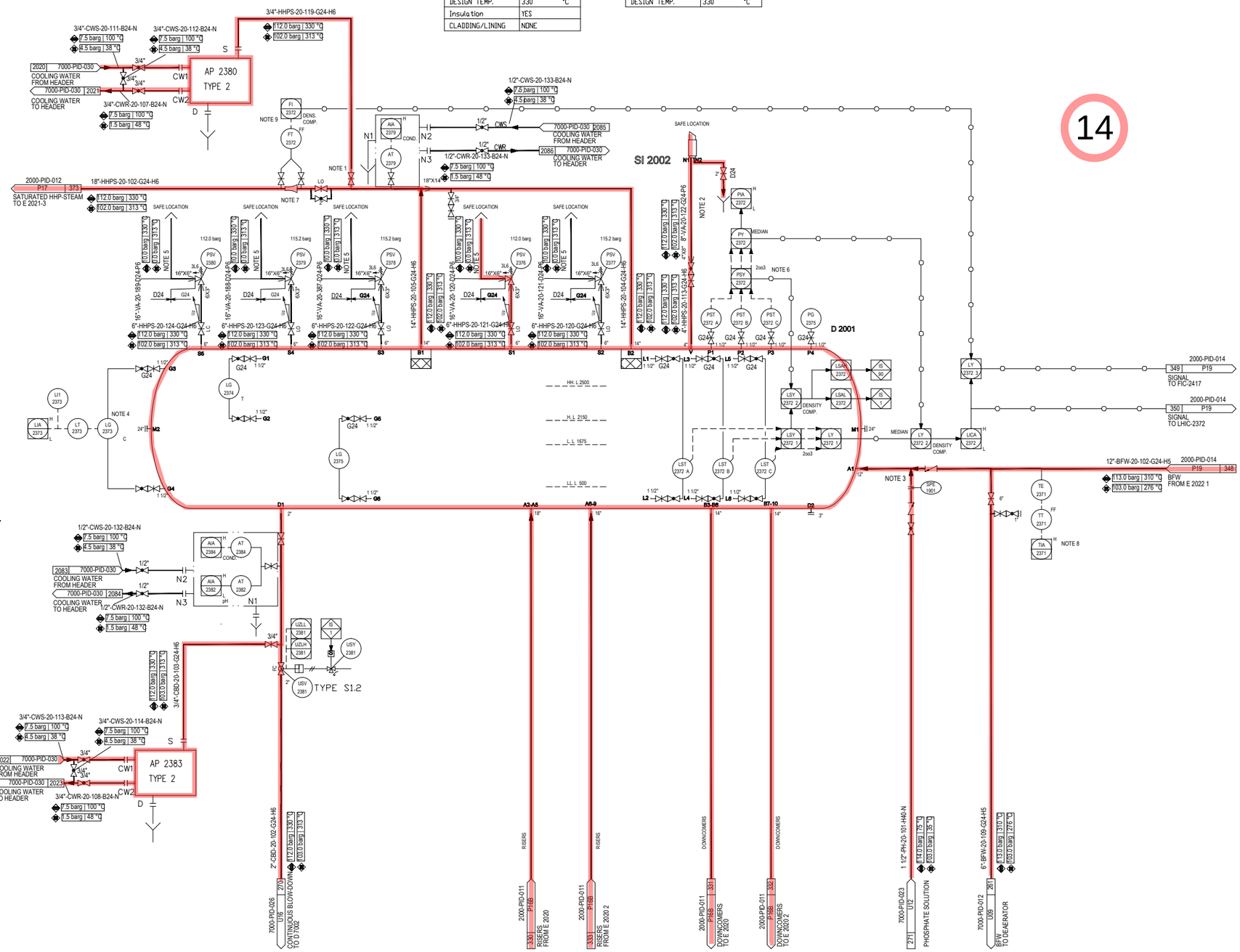
Counter Signing	Sign	Date

STEAM SUPERHEATER
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
SCALE	SHEET: 1 / TOT: 1 / SIZE: A1
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-012

D 2001	HHP STEAM DRUM	
ID x LENGTHKT-T)	3325 x 17000mm	
DESIGN PRESS.	112	barg
DESIGN TEMP.	330	°C
Insulation	YES	
CLADDING/LINING	NONE	

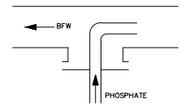
SI 2002	HHP Steam SILENCER-2	
CAPACITY	4000	kg/hr
DESIGN PRESS.	112	barg
DESIGN TEMP.	330	°C



GENERAL NOTES

NOTES:

1) ACCESIBLE FROM PLATFORM.
2) LINE SIZING BY SILENCER VENDOR.
3) SPE-1901: PHOSPHATE INJECTION CONNECTION.



4) HYDRASTEP WITH LOCAL INDICATOR AT GROUND LEVEL AND SIGNAL TO DCS.
5) 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT TO SAFE AND SUITABLE LOCATION.
6) PRESSURE COMPENSATION.
7) FLOW NOZZLE TO BE LOCATED ABOVE D 2001.
8) ALARM TO BE PROGRAMMED DEPENDANT ON PI-2372 READING: AH = 100 x (√((PI-2372+1))) - 10
9) PRESSURE COMPENSATION FROM PI-2372

GENERAL NOTE:
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
4	As Built	30.04.2020	Wang Furu		Gao Zhihui	Liu Shengkai	
3	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihui	Liu Shengkai	
2	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
1	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
0	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
B	Approval for Construction	07.12.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
C	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
D	Approval for Construction	31.08.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
E	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
F	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihui	Liu Shengkai	

OWNER:
Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S, LYNGBY, DENMARK
DOCUMENT NAME: STEAM GENERATION PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC. NO. 42 | REV. 4
DWG NO. 1341728 | DIAGRAM P18

CONTRACTOR: 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-013
SHEET 01 | TOTAL 01
SUB-CONTRACTOR DRAWING NO. --
SHEET – | TOTAL –

STEAM GENERATION PIPING AND INSTRUMENT DIAGRAM	PROJECT: MKP Methanol Project
	UNIT: Reformer
	PHASE: As Built Drawing
SCALE	SHEET: 1 / TOT: 1 / SIZE: A1
	OWNER DWG NO.: MKP-11-AS-2000-PR-PID-013

Counter Signing | Sign | Date

E 2022 1	BFW Preheater
DUTY	34.8 MW
ID x LENGTHKT-T)	1450x10000 mm
DESIGN PRESS.(TU/SH)	113/29 barg
DESIGN TEMP.(TU/SH)	310/390 °C
Insulation	YES

E 2022 2/3	BFW Preheater
DUTY	41.6 MW
ID x LENGTHKT-T)	1450x10000 mm
DESIGN PRESS.(TU/SH)	113/29 barg
DESIGN TEMP.(TU/SH)	310/280 °C
Insulation	YES

P 2001 A/B	PROCESS CONDENSATE PUMP NO.1
CAPACITY	32.3 m3/h
HEAD	274.3 m
DENSITY	903 kg/m3
INSULATION/TRACING	YES
AUXILIARY PIPING	By Vendor

D 2002	1st SEPARATOR
ID x LENGTHKT-T)	3750 x 4850 mm
DESIGN PRESS.	29 barg
DESIGN TEMP.	200 °C
Insulation	YES
CLADDING/LINING	NONE
Elevation of Equipment	EL +103.54m

D 2003	2nd SEPARATOR
ID x LENGTHKT-T)	3650 x 4750 mm
DESIGN PRESS.	29 barg
DESIGN TEMP.	200 °C
Insulation	YES
CLADDING/LINING	NONE

GENERAL NOTES

+NOTES:

1) TWO PHASE FLOW.
2) SWITCHING BY FHS-2417 (SYMBOLIC INDICATED) FROM 3-ELEMENT LEVEL CONTROL VIA FIC- 2417 TO SINGLE ELEMENT LEVEL CONTROL IS DONE WITH AUTOMATIC CHANGE OF TUNING CONSTANTS IN LIC-2372.
3) NOZZLE B2 ON D2002 MUST BE LOCATED MIN. 1.5 m ABOVE P 2001 A/B TO BE CONFORMED BY PUMP VENDOR.
4) VALVE SIZE WILL BE COMFIRMED BY VENDOR.
5) MOUNT ON STANDPIPE OR BRIDLE. AL TERNATIVELY ADD A SET OF NOZZLES (ONE SET FOR EACH LT-).
6) PIA-2416 LOW PRESSURE THEN I-2001 WORK MAKE STAND-BY PUMP AUTOSTART.
7) PV-2406 INCLUDES 3 NOISE REDUCTION DISKS, THE SIZE IS 16"-24" AND THE REDUCER CONSIDERED BY PIPING.

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	10.11.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Issued for Approval	31.08.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Issued for Approval	16.06.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihui	Liu Shengkai	

OWNER:
Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S, COPENHAGEN DENMARK
DOCUMENT NAME: GAS COOLING AND SEPARATION I PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC. NO. 42 | REV. 1 | DWG NO. 1341729 | DIAGRAM P19

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-014
SHEET 01 TOTAL 01

SUB-CONTRACTOR:
SUB-CONTRACTOR DRAWING NO. –
SHEET – TOTAL –

Counter Signing	Sign	Date

GAS COOLING AND SEPARATION I
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-014

SCALE | SHEET: 1 | TOT: 1 | SIZE: A1

D 2004	3rd SEPARATOR
ID x LENGTH(T-T)	3350 x 4825 mm
DESIGN PRESS.	29 barg
DESIGN TEMP.	200 °C
Insulation	YES
CLADDING/LINING	NONE
Elevation of Equipment	EL +103.8m

P 2002 A/B	PROCESS CONDENSATE PUMP NO.2
CAPACITY	116.5 m3/h
Head	279.9 m
DENSITY	928 kg/m3
INSULATION/TRACING	YES
AUXILIARY PIPING	By Vendor

E 2025	DMW PREHEATER
DUTY	9.4 MW
ID x LENGTH(T-T)	1000x1800 mm
DESIGN PRESS.(TU/SH)	29/14 barg
DESIGN TEMP.(TU/SH)	200/100 °C
Insulation	YES

16

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TYPE R1.1

TYPE C2

TYPE R2.2

D 2004
NOTE 1

E 2025

MSV-2002

P 2002 A
MP 2002 A

P 2002 B
MP 2002 B

Similar

GENERAL NOTES

+NOTES:

1) NOZZLE B2 ON D 2004 MUST BE LOCATED MIN 1.5m ABOVE P2002 A/B. TO BE CONFIRMED BY PUNP VENDOR.
2) MOUNT ON STANDPIPE OR BRIDLE. AL TERNATIVELY ADD A SET OF NOZZLES (ONE SET FOR EACH LT-).
3) FUNCTION OF LIC-2441

4) PIA2453 LOW PRESSURE THEN I-2002 WORK MAKE STAND-BY PUMP AUTOSTART.

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	10.11.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	31.08.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihui	Liu Shengkai	

OWNER:

Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S
DOCUMENT NAME: GAS COOLING AND SEPARATION II PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC GRP. 42 | REV. 1
DRW NO. 1341730 | DIAGRAM P20

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-015
SHEET 01 | TOTAL 01

SUB-CONTRACTOR:
SUB-CONTRACTOR DRAWING NO. –
SHEET – | TOTAL –

Counter Signing	Sign	Date

GAS COOLING AND SEPARATION II
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
SCALE	SHEET: 1 / TOT: 1 / SIZE: A1
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-015

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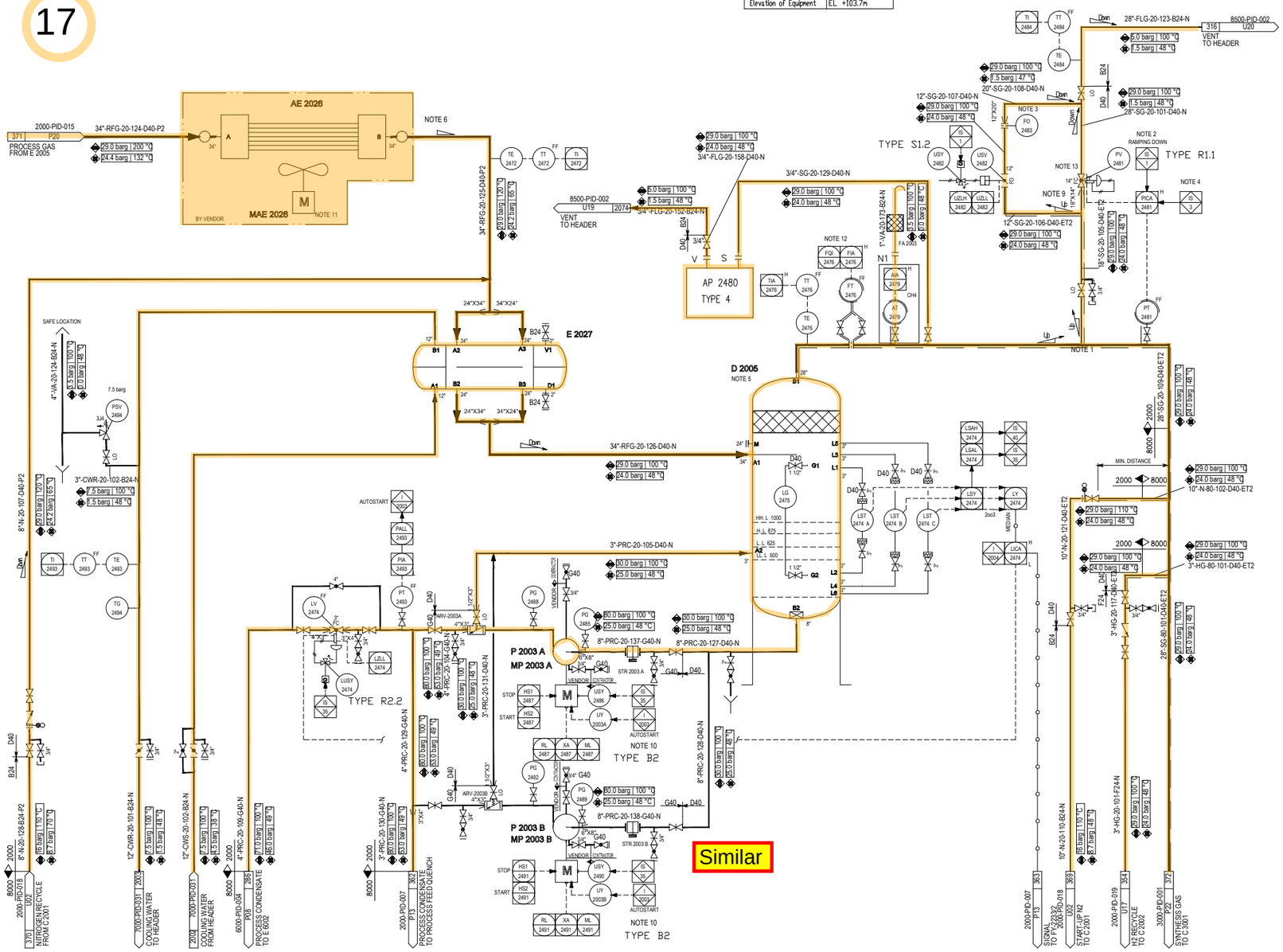
AE 2026	AIR COOLER	
DUTY	51.3	MW
ID x LENGTHCT-T)	BY VENDOR	mm
DESIGN PRESS.(TU/SH)	29	barg
DESIGN TEMP.(TU/SH)	200	°C

P 2003 A/B	PROCESS CONDENSATE PUMP NO.3	
CAPACITY	83	m3/h
Head	351	m
DENSITY	989	kg/m3
INSULATION/TRACING	NONE	
AUXILIARY PIPING	By Vendor	

E 2027	WATER COOLER	
DUTY	6.5	MW
ID x LENGTHCT-T)	1400x10000	mm
DESIGN PRESS.(TU/SH)	7.5/29	barg
DESIGN TEMP.(TU/SH)	100/120	°C
Insulation	NA	

D 2005	FINAL SEPARATOR	
ID x LENGTHCT-T)	3500 x 4825	mm
DESIGN PRESS.	29	barg
DESIGN TEMP.	100	°C
Insulation	NONE	
CLADDING/LINING	NONE	
Elevation of Equipment	EL. +103.7m	



GENERAL NOTES

*NOTES:

1) TOP EXIT CONNECTION.
2) CONTROLLER TO AUTO WHEN SIGNAL FROM IS-1. SETPOINT EQUAL TO PROCESS VALUE BEFORE TRIP. SETPOINT MUST BE RAMPED DOWN TO 3 barg OVER 10 min.
3) PRESSURE TO BE HALVED EVERY 4 MINUTES OF DEPRESSURISATION.
4) IS-3 TO PUT CONTROLLER IN MANUAL OPEN VALVE TO AN OPENING CORRESPONING TO THE FLOW AT TIME OF TRIP THEN PIC-2481 IS PUT IN AUTO WITH SET POINT EQUAL TO ACTUAL PRESSURE AT TIME OF TRIP.
5) D 2005 TO BE LOCATED CLOSE TO C 3001. NOZZLE B2 ON D 2005 MUST BE LOCATED MIN 1.5m ABOBVE P 2003 A/B. TO BE CONFIRMED BY PUMP VENDOR.
6) TW IS TO BE INSTALLED ON EACH OUTLET HEADER FROM AE 2026.

9) VALVE SIZE WILL BE COMFIRMED BY VENDOR.
10) PIA2493 LOW PRESSURE THEN I-2003 WORK MAKE STAND-BY PUMP AUTOSTART.
11) DETAIL DRAWING FOR AE 2026 PLEASE SEE MKP-11-DE-2000-PR-PID-020
12) P&T COMPENSATION FROM PI-2481,TI-2476
13) PV-2481 INCLUDES 3 NOISE REDUCTION DISKS, THE SIZE IS 16"-28" AND THE REDUCER CONSIDERED BY PIPING.

*GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furu		Gao Zhihu	Liu Shengkai	
A	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihu	Liu Shengkai	
A	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihu	Liu Shengkai	
A	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihu	Liu Shengkai	
A	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihu	Liu Shengkai	
A	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihu	Liu Shengkai	
A	Approval for Construction	28.12.2016	Wang Furu		Gao Zhihu	Liu Shengkai	
A	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihu	Liu Shengkai	
A	Issued for Review	31.08.2016	Wang Furu		Gao Zhihu	Liu Shengkai	
A	Issued for Review	16.06.2016	Wang Furu		Gao Zhihu	Liu Shengkai	
A	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihu	Liu Shengkai	

OWNER:
Middle East Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S, COPENHAGEN DENMARK
DOCUMENT NAME: GAS COOLING AND SEPARATION III PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC. GRP. 42 | REV. A
DWG NO. 1341731 | DIAGRAM P21

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS07-PID-016
SHEET 01 | TOTAL 01

SUB-CONTRACTOR:
SUB-CONTRACTOR DRAWING NO. –
SHEET – | TOTAL –

Counter Signing	Sign	Date

GAS COOLING AND SEPARATION III
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-016

SCALE | SHEET: 1 | TOT: 1 | SIZE: A1

X 2003	STATIC FUEL GAS MIXER	
MIXER SIZE	BY VENDOR MM	
CAPACITY	55280	kg/hr
DESIGN PRESS.	7	barg
DESIGN TEMP.	100	°C

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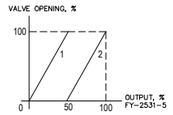
GENERAL NOTES

NOTES:

1) MIN. DISTANCE BETWEEN FT-2531 AND PV-1011: 10 meter ALTERNATIVE INCREASE PIPE DIAMETER TO ACHIVE IDENTICAL GAS VOLUME. REQUIREMENTS OF FLOW MEASURING EQUIPMENT MUST ALSE BE CONSIDERED.
2) 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT TO SAFE AND SUITABLE LOCATION.
3) DISTANCE TO FURNACE TO BE MINIMIZED.
4) SOLENOID VALVES TO BE IN 2oo2D CONFIGURATION FOR SAFETY AND AVAILABILITY.
5)



6) VALVE SIZE WILL BE COMFIRMED BY VENDOR.
7) THE DESIGN SCOPE OF PRIMARY REFORMER VENDOR
8) WHEN THERE IS NO INSTRUMENT AIR SUPPLY FOR THE ANALYZER AT-2531/AT-2532, THE LAST EFFECTIVE DATA SHALL BE RECORDED IN FCS.
9) P&T COMPENSATION FROM PIC-1011,TI-1012
10) P&T COMPENSATION FROM PIC-2536A,TI-2536
11) PV-2536B includes 1 noise reduction disks, the size is 14" and the reducer considered by piping.

GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furu		Gao Zhihui	Liu Shengkai	
3	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihui	Liu Shengkai	
2	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
1	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
0	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
C	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
B	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	31.08.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
0	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
0	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihui	Liu Shengkai	

OWNER:
Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S
DOCUMENT NAME: FUEL SYSTEM PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC. GRP. 42 | REV. 4
DWG NO. 1341757 | DISCIPLINE U01

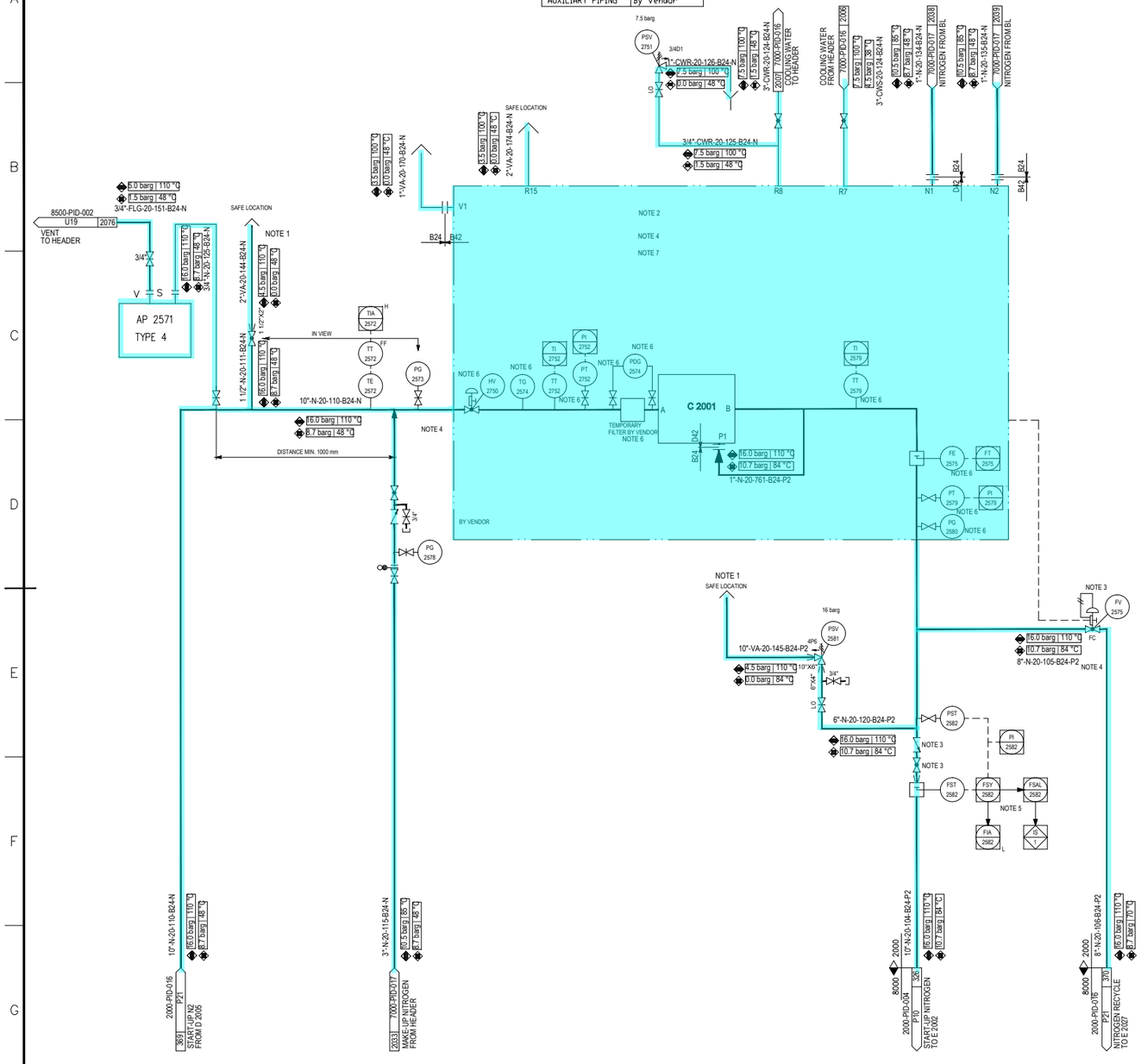
CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS09-PID-001
SHEET 01 | TOTAL 01

SUB CONTRACTOR:
SUB-CONTRACTOR DRAWING NO. –
SHEET – | TOTAL –

FUEL SYSTEM PIPING AND INSTRUMENT DIAGRAM	PROJECT	MKP Methanol Project
	UNIT	Reformer
	PHASE	As Built Drawing
SCALE	SHEET: 1	TOT: 1	SIZE: A1	OWNER DWG NO.	MKP-11-AS-2000-PR-PID-017

Counter Signing	Sign	Date

C 2001	START-UP NITROGEN COMPRESSOR	
CAPACITY	31189	Nm3/h
PRESS. (SUC./DIS.)	6/8	barg
TEMP. (SUC./DIS.)	48/	°C
GRIVE POWER	400	kW
AUXILIARY PIPING	By Vendor	



GENERAL NOTES

+NOTES:

1) 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT TO SAFE AND SUITABLE LOCATION.
2) DETAILS BY VENDOR.
3) THE FV-2575 BLOCK VALVE AND CHECK VALVE WILL BE SUPPLIED BY C 2001 VENDOR LOOSE.
4) THE PROCESS NITROGEN PIPE CONNECTING WITH INLET AND OUTLET OF C 2001 IS SUPPLIED BY TCC
5) PRESSURE COMPENSATION FROM PT-2582.
6) THE TEMPERATURE INDICATOR/GAUGE(TG-2574/TT-2752/2579), THE PRESSURE INDICATOR/GAUGE (PT-2752/PT-2579/PG-2580),THE FLOWMETER(FT-2575),THE DIFFIERENT PRESSURE GAUGE (PDG-2574) AND TEMPORARY FILTER ARE SUPPLIED BY C2001 VENDOR.
7) PLEASE FIND VENDOR DOCUMENT FOR DETAILS.

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furu		Gao Zhihui	Liu Shengkai	
9	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihui	Liu Shengkai	
8	Approval for Construction	02.02.2018	Wang Furu		Gao Zhihui	Liu Shengkai	
7	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
6	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
5	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
4	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
3	Approval for Construction	31.08.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
2	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
1	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihui	Liu Shengkai	

OWNER:
Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S, COPENHAGEN DENMARK
DOCUMENT NAME: START-UP BLOWER PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC. NO. 42 | REV. 3
DWG NO. 1341758 | DIAGRAM U02

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS09-PID-002
SHEET 01 | TOTAL 01

SUB-CONTRACTOR:
SUB-CONTRACTOR DRAWING NO. –
SHEET – | TOTAL –

START-UP BLOWER PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-018

SCALE | SHEET: 1 | TOT: 1 | SIZE: A1

Counter Signing	Sign	Date

C 2002	HYDROGEN RECYCLE COMPRESSOR	
CAPACITY	5078	Nm3/h
PRESS. (SUC./DIS.)	24/50.4	barg
TEMP. (SUC./DIS.)	48/	°C
DRIVE POWER	200	kW
AUXILIARY PIPING	By Vendor	

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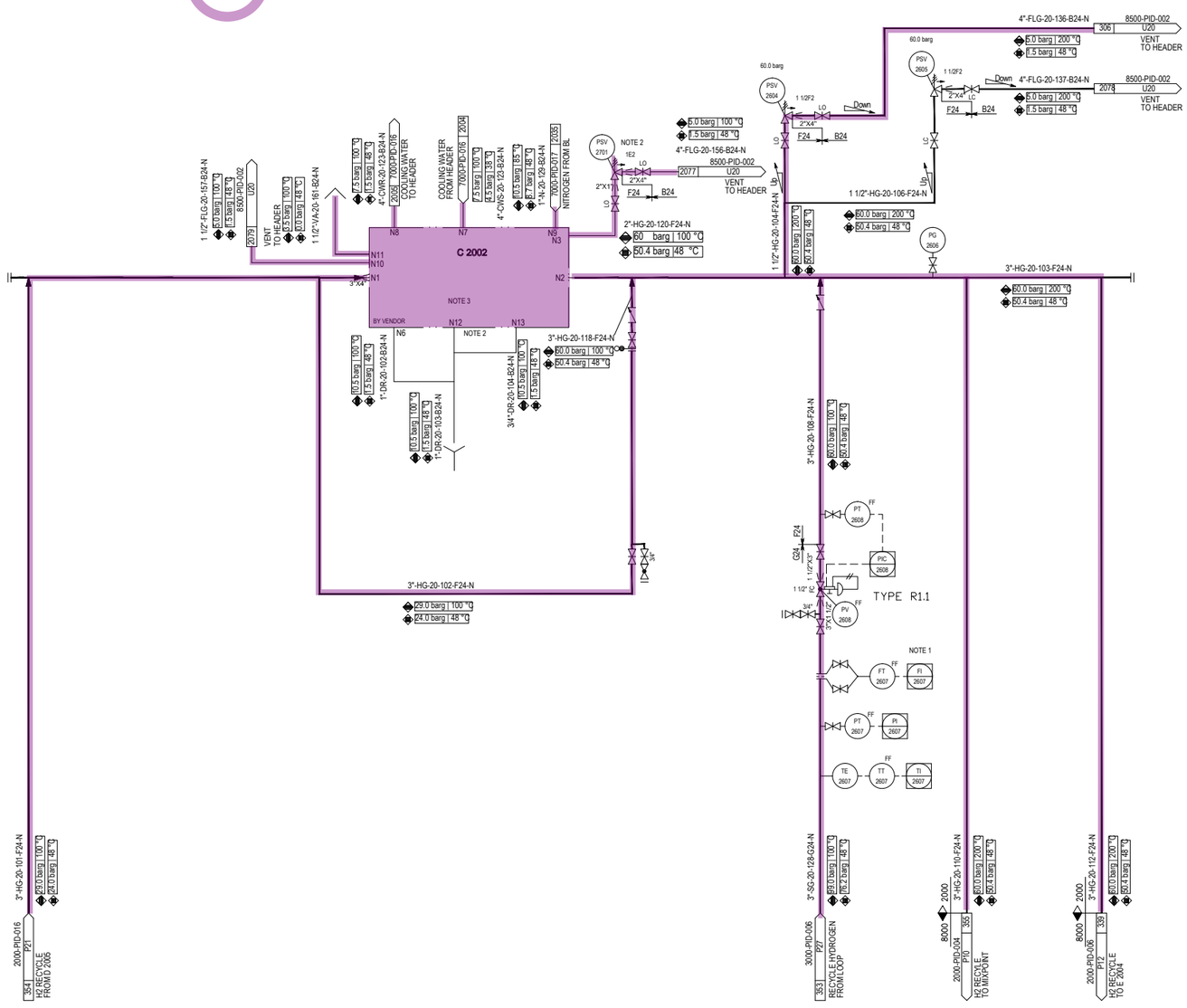


GENERAL NOTES

+NOTES:

1) P&T COMPENSATION FROM PI-2607,TI-2607
2) PSV-2701 IS SUPPLIED BY C2002 VENDOR
3) PLEASE FIND VENDOR DOCUMENT FOR DETAILS.

+GENERAL NOTE:

LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furu		Gao Zhihui	Liu Shengkai	
8	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihui	Liu Shengkai	
7	Approval for Construction	02.02.2018	Wang Furu		Gao Zhihui	Liu Shengkai	
6	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
5	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
4	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
3	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihui	Liu Shengkai	
2	Approval for Construction	10.11.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
1	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
0	Approval for Construction	31.08.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihui	Liu Shengkai	
A	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihui	Liu Shengkai	

OWNER:

Middle East
Kimiaye Pars Company

LICENSOR: HALDOR TOPSØE A/S, COPENHAGEN DENMARK
DOCUMENT NAME: H2 RECYCLE SYSTEM PIPING AND INSTRUMENT DIAGRAM
JOB NO. S-02115 | DOC. GRP. 42 | DWG NO. 1341773 | DIAGRAM U17 | REV. 2

CONTRACTOR: 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION
CONTRACTOR DRAWING NO. MKP-11-AS-2000-PS09-PID-003
SHEET 01 TOTAL 01

SUB-CONTRACTOR: SUB-CONTRACTOR DRAWING NO. –
SHEET – TOTAL –

Counter Signing	Sign	Date

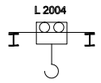
H2 RECYCLE SYSTEM
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-019

SCALE | SHEET: 1 | TOT: 1 | SIZE: A1

L 2004	CANTILEVER CRANE	
TYPE	COLUMN CANTILEVER	
CAPACITY	1	t
LIFT HEIGHT	20	m
SLIDING DISTANCE	1.8	m

AE 2026	AIR COOLER	
DUTY	51.3	MW
ID x LENGTH(T-T)	BY VENDOR	mm
DESIGN PRESS.(TU/SH)	29	barg
DESIGN TEMP.(TU/SH)	200	°C



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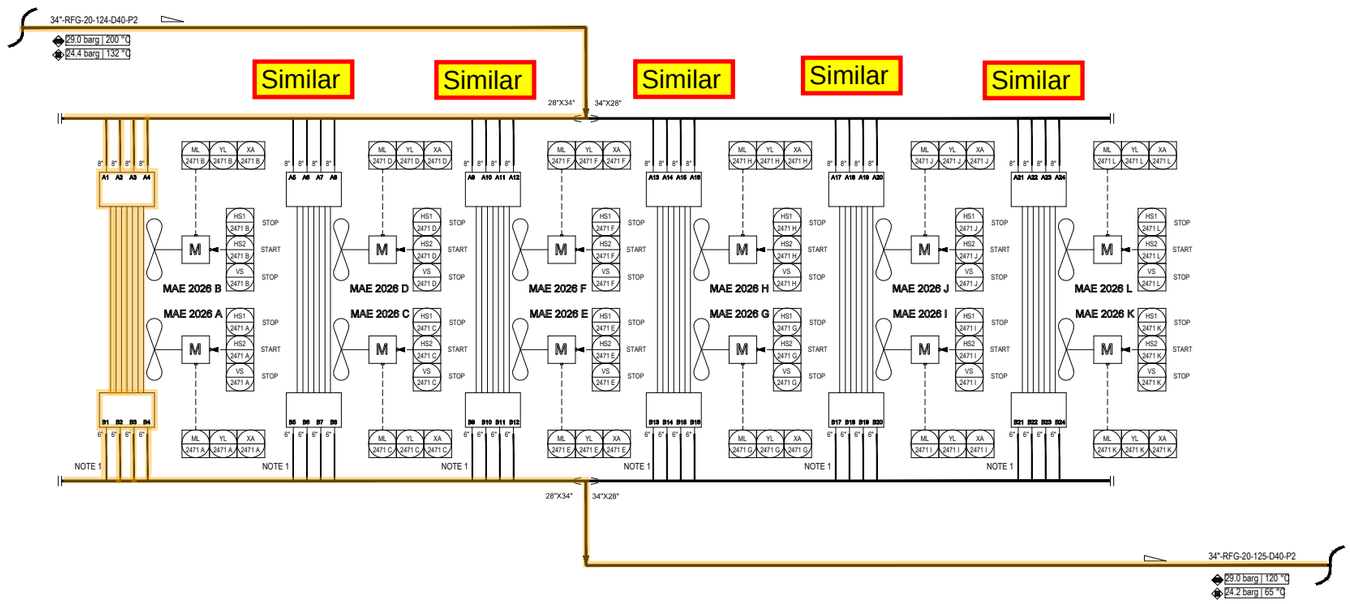
AE 2026



GENERAL NOTES

+NOTES:

1) THERMOWELL TABEL IS SHOWED BELOW (ONE TW FOR EACH TUBE BOX OUTLET):

MAE2026A, MAE2026B	MAE2026G, MAE2026H
B1 TW2473A	B13 TW2473G
B3 TW2473B	B15 TW2473H
MAE2026C, MAE2026D	MAE2026I, MAE2026J
B5 TW2473C	B17 TW2473I
B7 TW2473D	B19 TW2473J
MAE2026E, MAE2026F	MAE2026K, MAE2026L
B9 TW2473E	B21 TW2473K
B11 TW2473F	B23 TW2473L

2) CANTILEVER CRANE IS USED FOR AE-2026 MAINTENANCE.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
A	As Built	30.04.2020	Wang Furui		Gao Zhihui	Liu Shengkai	
3	Approval for Construction	05.05.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
2	Approval for Construction	22.03.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
1	Approval for Construction	23.01.2017	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Issued for Review	28.12.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Issued for Review	12.10.2016	Wang Furui		Gao Zhihui	Liu Shengkai	
A	Issued for Comments	31.08.2016	Wang Furui		Gao Zhihui	Liu Shengkai	

OWNER:

Middle East
Kimiaye Pars Company

LICENSOR | DOCUMENT NAME: | JOB NO. | DOC. GRP. | REV. | DWG NO. | DIAGRAM

CONTRACTOR: TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION

CONTRACTOR DRAWING NO.
MKP-11-AS-2000-PS07-PID-017
SHEET 01 TOTAL 01

SUB-CONTRACTOR | SUB-CONTRACTOR DRAWING NO. –
SHEET – TOTAL –

AIR COOLER AE 2026 DETAIL
PIPING AND INSTRUMENT DIAGRAM

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing

SCALE | SHEET: 1 | TOT: 1 | SIZE: A1 | OWNER DWG NO. MKP-11-AS-2000-PR-PID-020

Counter Signing	Sign	Date