ISSUED FOR TENDERING PURPOSE ONLY

NOTES:
1. ALL VENTS SHALL BE LOCATED AT A SAFE MIN. HEIGHT OF 3 METER ABOVE THE GROUND LEVEL WITH FLAME ARRESTOR.
2. SKID CANOPY WILL BE PROVIDED.
3. VALVE BELOW 2" SHALL BE SW.
4. CANOPY THICKNESS SHALL BE 14 GAUGE = 1.99mm.
5. VELOCITY OF UNFILTERED GAS SHALL BE 20m/s AND FILTERED GAS SHALL BE 40m/s.

| PROCESS DATA | |
|---|---|
| INLET PRESSURE | :10-19 BARG |
| OUTLET PRESSURE | :4 BARG |
| TEMPERATURE | :-10 TO 50 °C |
| FLOW RATE | :5000 SCMH |
| SERVICE | :NATURAL GAS |
| INLET SIZE | :4"X150# |
| OUTLET SIZE | :4"X150# |
| DESIGN CLASS | :150# |

DRS

LEGENDS :- INSTRUMENT / EQUIPMENT

| | | | | |
|---|---|---|---|---|
| SSV+PCVM | : SLAM SHUT OFF VALVE WITH MONITOR PRESSURE CONTROL VALVE | | DPG | : DIFF. PRESSURE GAUGE |
| | | | PG | : PRESSURE GAUGE |
| PCVA | : ACTIVE PRESSURE CONTROL VALVE | | TM | : TURBINE METER |
| PSV | : PRESSURE SAFETY VALVE | | EVC | : ELECTRONIC VOLUME CORRECTOR |
| CRV | : CREEP RELIEF VALVE | | TE | : TEMP. ELEMENT |
| VBF | : ISOLATION BALL VALVE FLANGED | | RO | : RESTRICTED ORIFICE |
| VBS | : ISOLATION BALL VALVE SOCKETWELD | | JB | : JUNCTION BOX |
| CF | : CARTRIDGE FILTER | | ZSO | : LIMIT SWITCH OPEN |
| ZSC | : LIMIT SWITCH CLOSE | | | : SPECTACLE BLIND |
| FA | : FLAME ARRESTOR | | | |

| | |
|---|---|
| COMPANY NAME | : M/s. MAHARASHTRA NATURAL GAS LTD. |
| PROJECT | : CGD PUNE. |
| P&ID No. | : DRS - 1 |
| TITLE : | P & I DIAGRAM FOR FILTRATION, PRESSURE REDUCING & METERING SKID |
| DATE - 17/07/2023 | |

ISSUED FOR TENDERING PURPOSE ONLY

NOTES:
1. ALL VENTS SHALL BE LOCATED AT A SAFE MIN. HEIGHT OF 3 METER ABOVE THE GROUND LEVEL WITH FLAME ARRESTOR.
2. SKID CANOPY WILL BE PROVIDED.
3. VALVE BELOW 2" SHALL BE SW.
4. CANOPY THICKNESS SHALL BE 14 GAUGE = 1.99mm.
5. VELOCITY OF UNFILTERED GAS SHALL BE 20m/s AND FILTERED GAS SHALL BE 40m/s.
6. UPSTREAM AND DOWNSTREAM METER RUN OF TURBINE METER ARE GIVEN AS PER OEM RECOMMENDATION.

| PROCESS DATA | |
|---|---|
| INLET PRESSURE | :10-19 BARG |
| OUTLET PRESSURE | :4 BARG |
| TEMPERATURE | :-10 TO 50 °C |
| FLOW RATE | :10000 SCMH |
| SERVICE | :NATURAL GAS |
| INLET SIZE | :6"X150# |
| OUTLET SIZE | :6"X150# |
| DESIGN CLASS | :150# |

DRS

LEGENDS :- INSTRUMENT / EQUIPMENT

| | | | |
|---|---|---|---|
| SSV+PCVM | : SLAM SHUT OFF VALVE WITH MONITOR PRESSURE CONTROL VALVE | DPG | : DIFF. PRESSURE GAUGE |
| | | PG | : PRESSURE GAUGE |
| PCVA | : ACTIVE PRESSURE CONTROL VALVE | TM | : TURBINE METER |
| PSV | : PRESSURE SAFETY VALVE | EVC | : ELECTRONIC VOLUME CORRECTOR |
| CRV | : CREEP RELIEF VALVE | TE | : TEMP. ELEMENT |
| VBF | : ISOLATION BALL VALVE FLANGED | RO | : RESTRICTED ORIFICE |
| VBS | : ISOLATION BALL VALVE SOCKETWELD | JB | : JUNCTION BOX |
| CF | : CARTRIDGE FILTER | ZSO | : LIMIT SWITCH OPEN |
| ZSC | : LIMIT SWITCH CLOSE | | : SPECTACLE BLIND |
| FA | : FLAME ARRESTOR | | |

| | |
|---|---|
| COMPANY NAME | : M/s. MAHARASHTRA NATURAL GAS LTD. |
| PROJECT | : CGD PUNE. |
| P&ID No. | : DRS - 2 |
| TITLE : | P & I DIAGRAM FOR FILTRATION, PRESSURE REDUCING & METERING SKID |
| DATE - 17/07/2023 | |

| DATASHEET OF RPD METER | | |
|---|---|---|
| **SR. NO.** | **MNGL SPECIFICATION** | **REQUIREMENTS** |
| 1 | MAKE | VENDOR TO SPECIFY |
| 2 | TYPE/ MODEL NO. | VENDOR TO SPECIFY |
| 3 | ACCURACY | +/- 2% (Qmin - 0.1 Qmax)<br>+/- 1% (0.1 Qmax - Qmax) |
| 4 | MAXIMUM INDEX READING | 99999999 m3 |
| 5 | REVOLUTION OF LAST COUNTER | 0.1 m3 |
| 6 | WORKING TEMPERATURE RANGE | -10 to 50 deg C |
| 7 | METER HEAD | IP - 67 PROTECTION, 8 DIGIT, SILICA GEL UNIT |
| 8 | PULSE GENERATOR | LF (TWO NOS.) & HF (ONE) |
| 9 | APPROVAL | EN 12480: 2002 (LATEST) |
| 10 | CONNECTION | FLANGED END, ANSI 150# |
| 11 | SIZE | TO BE SPECIFIED BY VENDOR. |
| 12 | REPEATABILITY | BETTER THAN +/- 0.2 %. |
| 13 | CONSTRUCTION STANDARD | EN 12480 (LATEST) |
| 14 | METER BODY | CORROSION RESISTANT STEEL OR ALUMINIUM OR OTHER SUITABLE MATERIAL FOR PRESSURE REQUIREMENT AND OUTDOOR INSTALLATION |
| 15 | RANGEBILITY | 1: 200 OR BETTER |

MAHARASHTRA NATURAL GAS LIMITED

**PRESSURE RATING: 150# / 300#**
**DESIGN PRESSURE:19 /49 BARG**
**TEMPERATURE RANGE: -10°C-65°C**
**LOCATION CLASS: CLASS IV**
**CORROSION ALL.:1.5 MM inclusive**

## PIPING MATERIAL SPECIFICATION

***CODE: ASME B 31.8 SERVICE: NATURAL GAS GUIDELINES AS PER PNGRB T4S***

| ITEM | SHORT | SIZE FROM-THRU | DESCRIPTION | RATINGS | DIMENSION STANDARD | MATERIAL STANDARD | REMARKS |
|---|---|---|---|---|---|---|---|
| **STATION PIPING** | **SP** | 1/2''-3/4'' | BE / PE SEAMLESS | SCH 160 | ASME B 36.10 | ASTM A333 Gr.6 | A/G - PRIMARILY SEAMLESS |
| | | 1”- 2'' | BE /PE SEAMLESS | SCH 80 | ASME B 36.10 | ASTM A333 Gr.6 | |
| | | 3'' | BE /PE SEAMLESS | SCH 80 | ASME B 36.10 | ASTM A333 Gr.6 | |
| | | 4''-12'' | BE /PE SEAMLESS | 6.4MM | ASME B 36.10 | ASTM A333 Gr.6 | |
| | | | | | | | |
| **VENT PIPE** | **VP** | 1''-1 1/2'' | BE / PE SEAMLESS | SCH 80 | ASME B 36.10 | ASTM A333 Gr.6 | |
| | | 2'' | BE /PE SEAMLESS | SCH 80 | ASME B 36.10 | ASTM A333 Gr.6 | |
| | | 3'' | BE /PE SEAMLESS | SCH 40 | ASME B 36.10 | ASTM A333 Gr.6 | |
| | | 4'' | BE /PE SEAMLESS | 6.4MM /SCH 40 | ASME B 36.10 | ASTM A333 Gr.6 | |
| | | | | | | | |
| **BALL VALVE** | **BLV** | 1/2''- 1 1/2'' | SW OR THREADED | 800# | BS 17292 | BODY ASTM A 350 BALL ASTM A479 SS316/ASTM A351 CF8M + 80 micron ENP | FLOATING BALL VALVE SOCKET WELD ASME B16.11 THREDED - ASME B1.20.1 |
| | | | | | | | |
| **ELBOWS LR/LR BENDS** | **EL** | 1/2'' – ¾"' | SW 1.5 D | 60000# | ASME B 16.11 | ASTM A350 LF2 | SOCKET WELD - ASME B 16.11 |
| | | 1'' -1 1/2'' | SW 1.5 D | 30000# | ASME B 16.11 | ASTM A350 LF2 | SOCKET WELD - ASME B 16.11 |

MAHARASHTRA NATURAL GAS LIMITED

**PRESSURE RATING: 150# / 300#**
**DESIGN PRESSURE:19 /49 BARG**
**TEMPERATURE RANGE: -10°C-65°C**
**LOCATION CLASS: CLASS IV**
**CORROSION ALL.:1.5 MM inclusive**

**PIPING MATERIAL SPECIFICATION**

***CODE: ASME B 31.8 SERVICE: NATURAL GAS GUIDELINES AS PER PNGRB T4S***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2''-3'' | BW 1.5 D | M | ASME B 16.9 | ASTM A420 Gr WPL 6 | BUTT WELD - ASME B 16.25 |
| | | 4''-12'' | BW 1.5 D OR 3D | M | ASME B 16.9 | MSSP 75 WPHY 52 (FOR PIPELINE)/ ASTM A420 Gr WPL 6OR (FOR STATION PIPING) | BUTT WELD - ASME B 16.25 |
| | | | | | | | |
| **REDUCERS CONCENTRIC** | **RC** | 2''-3'' | BW | MXM | ASME B 16.9 | ASTM A420 Gr WPL 6 | BUTT WELD - ASME B 16.25 |
| | | 4''-12'' | BW | MXM | ASME B 16.9 | MSSP 75 WPHY 52 (FOR PIPELINE)/ ASTM A420 Gr WPL 6 OR (FOR STATION PIPING) | BUTT WELD - ASME B 16.25 |
| | | | | | | | |
| **TEE EQUAL AND REDUCING** | **T** | 1/2'' – ¾''' | SW | 60000# | ASME B 16.11 | ASTM A350 LF2 | SOCKET WELD - ASME B 16.11 |
| | | 1'' -1 1/2'' | SW | 30000# | ASME B 16.11 | ASTM A350 LF2 | SOCKET WELD - ASME B 16.11 |
| | | 2''-3'' | BW | MXM | ASME B 16.9 | ASTM A420 Gr WPL 6 | BUTT WELD - ASME B 16.25 |
| | | 4''-12'' | BW | MXM | ASME B 16.9 | MSSP 75 WPHY 52 (FOR PIPELINE)/ ASTM A420 Gr WPL 6 OR (FOR STATION PIPING) | BUTT WELD - ASME B 16.25 |
| | | | | | | | |
| **SOCKOLET/ THREDOL ET** | **S** | 1/2'' -1 1/2'' | SW OR THREADED | 3000# | MSS SP 97 | ASTM A350 LF2 | SOCKET WELD - ASME B 16.11 |

MAHARASHTRA NATURAL GAS LIMITED

**PRESSURE RATING: 150# / 300#**
**DESIGN PRESSURE:19 /49 BARG**
**TEMPERATURE RANGE: -10°C-65°C**
**LOCATION CLASS: CLASS IV**
**CORROSION ALL.:1.5 MM inclusive**

**PIPING MATERIAL SPECIFICATION**

***CODE: ASME B 31.8 SERVICE: NATURAL GAS GUIDELINES AS PER PNGRB T4S***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | THREADED - ASME 1.20.1 |
| | | 2''-3'' | BW OR FLGD RF 125-250 AARH | 300# | API 6D | BODY ASTM A 352 Gr. LCB BALL ASTM A479 SS316/ASTM A351 CF8M + 80 micron ENP | FLOATING BALL VALVE BUTT WELD ASME B16.25 FLANGED END - ASME B16.5 |
| | | | | | | | |
| **WELDOLET** | **W** | 2''-12'' | BW | MXM | MSS SP 97 | ASTM A350 LF2 | BUTT WELD ASME B 16.5 |
| | | | | | | | |
| **END CAP** | **C** | 1/2''- ¾ “' | SW | 60000# | ASME B 16.11 | ASTM A350 LF2 | SOCKET WELD - ASME B 16.11 |
| | | 1''-1 1/2'' | SW | 30000# | ASME B 16.11 | ASTM A350 LF2 | BUTT WELD - ASME B 16.25 |
| | | 2''-12'' | BW | M | ASME B 16.9 | ASTM A420 Gr WPL 6 | |
| | | | | | | | |
| **PIPE NIPPLE** | **NIPL** | 1/2''-3/4'' | PE SEAMLESS | SCH 160 | ASME B 36.10 | ASTM A 333 Gr 6 | |
| | | 1''-1 1/2'' | PE SEAMLESS | SCH 80 | ASME B 36.10 | ASTM A 333 Gr 6 | |
| | | | | | | | |
| **COUPLING (HALF/FULL)** | **COUP** | 1/2'' – 3/4'' | SW OR THREADED | 6000# | ASME B 16.11 | ASTM A350 LF2 | SOCKET WELD - ASME B 16.11 THREADED - ASME 1.20.1 |
| | | 1'' - 1 1/2'' | SW OR THREADED | 3000# | ASME B 16.11 | ASTM A350 LF2 | |
| | | | | | | | |
| **FLANGE** | **FW** | 1/2'' - 1 1/2'' | SORF 125-250 AARH | 300# /150# | ASME B 16.5 | ASTM A350 LF2 | |
| | | 2''-3'' | WNRF 125-250 AARH | 300'' BEVEL END WT M | ASME B 16.5 | ASTM A350 LF2 | |

MAHARASHTRA NATURAL GAS LIMITED

**PRESSURE RATING: 150# / 300#**
**DESIGN PRESSURE:19 /49 BARG**
**TEMPERATURE RANGE: -10°C-65°C**
**LOCATION CLASS: CLASS IV**
**CORROSION ALL.:1.5 MM inclusive**

**PIPING MATERIAL SPECIFICATION**

***CODE: ASME B 31.8 SERVICE: NATURAL GAS GUIDELINES AS PER PNGRB T4S***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 4''-12'' | WNRF 125-250 AARH | 300'' BEVEL END WT M | ASME B 16.5 | MSS SP 44 GR F52 (FOR PIPELINE)/ ASTM A350 LF2 (FOR STATION PIPING) | |
| | | | | | | | |
| **BLIND FLANGE** | **FB** | 1/2'' - 1 1/2'' | RF,125-250 AARH | 300# / 150# | ASME B 16.5 | ASTM A350 LF2 | |
| | | 2''-3'' | RF,125-250 AARH | 300# / 150# | ASME B 16.5 | ASTM A350 LF2 | |
| | | 4''-12'' | RF,125-250 AARH | 300# / 150# | ASME B 16.5 | MSS SP 44 GR F52 (FOR PIPELINE)/ ASTM A350 LF2 (FOR STATION PIPING) | |
| | | | | | | | |
| **SPECTACLE BLIND** | **FSB** | 2''-12'' | RF,125-250 AARH | 300# 150# | ASME B 16.48 | ASTM A350 LF2 | |
| | | | | | | | |
| **STUD & NUT BOLT** | **B** | 1/2'' - 12'' | - | - | ASME B 18.2 | STUD: ASTM A 320 Gr L7 NUT: ASTM A 194 Gr.2H ASTM A153 | HOT DIP GALVANIZED |
| | | | | | | | |
| **GASKET SPIRAL WOUND** | **G** | 1/2''- 12'' | - | 0.175'' THICKNESS | ASME B 16.20 | SPIRAL WOUND CNAF FILLER + INNER & OUTER RING SS316 | COMPATIBLE WITH ASME B16.5 FLANGE S |
| | | | | | | | |
| **NOTE 1.M=THICKNESS TO MATCH PIPE WALL THICKNESS** | | | | | | | |
| | | | | | | | |