

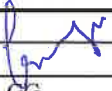
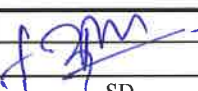
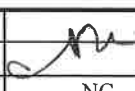

1 GENERAL	
1.1 Tag No.	As per P&ID
1.2 Service	Natural Gas
1.3 Line No.	As per P&ID
1.4 P&ID No.	-
1.5 Quantity	As per P&ID
1.6 Location	As per P&ID
1.7 Reference Drg. No.	-
2 OPERATING CONDITIONS	
2.1 Pressure maximum	49 bar(g)
2.2 Fluid / State	Natural Gas Gaseous
2.3 Flow Rate - Maximum.	As per Operating Condition
2.4 Design Temp. Min / Max	0°C to 60°C
2.5 SP. Gravity / MOL / WT>	-
2.6 Vapor Press / Critical Press	Vendor to furnish
2.7 Pressure Drop (Max. Allowable)	0.5 Barg
2.8 Gas Operating Temperature	25 deg C
2.9 Suspended Solids	
2.10 Filtration efficiency	99.9%, Removing liquid and solid particle of size >5 micron
3 DESING / CONSTRUCTION DATA	
3.1 Filter make / model	Vendor to furnish
3.2 Type of Filter	Cartridge filter
3.3 Number of elements	Vendor to furnish
3.4 Design Code / Standards	ASME VIII DIV I
- Piping Welding Code	ASME Sec IX
- NDE Code	ASME B 31.3, ASME Sec V
3.5 Size of Vessel	
- Shell dia	Vendor to furnish
- Length	Vendor to furnish
- Height Total	Vendor to furnish
- Type of Dish end	2:1
- Top cover	With Quick opening closure as per ASME Sec VIII
- Lifting lugs	Yes, to be Provided
3.6 Material of Construction	
- Shell	SA - 516 Gr. 60 / ASTM - A106 Gr. B
- Heads	SA - 516 Gr. 60
- Filter element	Fiber glass
- Filter element holder (van box)	SS-304
- Top cover ring (Pressure and Segment)	SA 350 LF2 / A 105
- Name Plate	SS 304
- Filter frame	SA - 516 Gr. 60 / ASTM - A106 Gr. B

INDRAPRASTHA GAS LIMITED	DATA SHEET CARTRIDGE FILTER	DATA SHEET NO. P.009355-M-11047-001
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Supports (Skirts)	SA - 516 Gr. 60 / ASTM - A106 Gr. B
Flanges (shell + nozzle + cover)	ASTM - A 105
- Rating	ANSI 16.5, 300#
- Gasket	Spiral Bound SS 316 + PTFE Filled
Nozzle Necks	ASTM A106 Gr. B(Seamless Pipe)
Internal fittings	SS 304 / 316
Bolts / nuts / Washer	SA 320 Gr. 7 or ASTM A 193 B7 / ASTM - 194 Gr. 7 or Gr 2H
Structural attachments	
Internal	SA 516 Gr. 70
External	SA 516 Gr. 70
Insulation	NIL
Vent pipe	ASTM A106 Gr. B(Seamless Pipe)
Base plate	IS:2062 Gr. A
Cover flanges (QOC)	ASTM - A 105
3.7 Add in Design Data	
- Joint efficiency	1.00
PWHT	YES
Radiography	Full (100%), UT/MPI/DPT shall also be carried out as per technical specification & code requirement.
Hydro test Pressure	1.5 X Design Pressure
Corrosion Allowance	3 mm
Impact Test	@ 0°C & at temperature as per material requirement(for base material & after heat treatment)
3.8 Total Erection weight of filter assembly	Vendor to provide
3.9 Painting	Vendor shall submit painting detail for approval as per specification for PAINTING SYSTEM & COLOUR CODE FOR FINAL LAYER enclosed with tender document.
4 Accessories (As applicable)	1. QOC 2. Anchor bolts and nuts 3. Vessel supports 4. Ladder and platform 5. Lifting Lugs 6. Davit arm As applicable

NOTES:

- Vendor to prepare detailed QAP and submit for Owner's approval
- Vendor to submit GAD and fabrication drawing for Owner's approval.

					TRACTEBEL 
1	12.06.2017	GG	SD	NC	
REV	DATE	PRE	CHKD	APPD	





**PIPING
SPECIFICATIONS**

ITEM	SHORT CODE	SIZE FROM-THRU	END CONNECTION	RATING AND/OR SCHED.	DIMENSION STANDARD	MATERIAL	REMARKS
BALL VALVES	VBA	1/2" - 11/2"	FLGD RF:ANSI B16-5	300# or above	ANSI B16-10	BODY: ASTM A 105	FULL BORE WRENCH OPERATED.
						BALL: SS 316	FIRE SAFE
		2"-3"	FLGD RF:ANSI B16-5	300#	ANSI B16-10	BODY: ASTM A 105 / ASTM A216 Gr. WCB	FULL BORE WRENCH OPERATED.
						BALL: SS 316	FIRE SAFE
		4"-12"	FLGD RF:ANSI B16-5	300#	ANSI B16-10	BODY: ASTM A 105 / ASTM A216 Gr. WCB	FULL BORE GEAR OPERATED.
						BALL: SS 316	FIRE SAFE
GLOBE VALVES	VGL	1/2"-1 1/2"	FLGD RF:ANSI B16-5	300# or above	ANSI B16-10	BODY: ASTM A 105	HANDWHEEL FIRE SAFE
						TRIM: SS 316	
		2" - 12"	FLGD RF:ANSI B16-5	300#	ANSI B16-10	BODY: ASTM A 105 / ASTM A216 Gr. WCB	HANDWHEEL FIRE SAFE
						TRIM: SS 316	
SWING CHECK VALVES	VCH	1/2" - 11/2"	FLGD RF:ANSI B16-5	300# or above	ANSI B16-10	BODY: ASTM A 105	HORIZONTAL INSTALLATION VERTICAL INSTALLATION FLOW UPWARDS
						TRIM: SS 316	
		2"-12"	FLGD RF:ANSI B16-5	300#	ANSI B16-10	BODY: ASTM A 105 / ASTM A216 Gr. WCB	HORIZONTAL INSTALLATION VERTICAL INSTALLATION FLOW UPWARDS
						TRIM: SS 316	

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TRACTEBEL		QUALITY ASSURANCE PLAN SKID FABRICATION										QAP No P.009355-Q-11098-001 Rev. 1		Date 12.06.2017		Prepared by MA		Checked by MC		SD	
Sr.No	Description	Characteristic	Class	Type of Check	Quantum of Check	Reference Document	Acceptance Norms	Format Of Records			Inspection By		Remarks								
								M	TPIA	Owner	M	Owner									
1	Incoming Material for skid spool fabrication																				
1.1	Pipe	As per Specification	Major	laboratory + Dimensional	1 piece per pipe size	ASTM A106 Gr. B (Seamless)	ASTM A106 Gr. B (Seamless)	Mfr / lab cert.	P	W	W/R										
1.2	Pipe Fittings	As per Specification	Minor	laboratory	Per heat	ASTM A105	ASTM A105	Mfr / lab cert.	P	W	W/R										
1.3	Flanges	As per Specification	Minor	laboratory	100%	ANSI B16.9	ANSI B16.9	Mfr cert.	P	W	W/R										
1.4	Stud and Bolts/ gaskets	Chemical, physical and impact test	Minor	Visual + 10% Dimensional	Random selection one piece/size	ASTM A105	ASTM A105	Mfr / lab cert.	P	W	W/R										
1.5	Structure	Dimensional	Minor	Visual + Dimensional	100%	ANSI 16.5	ANSI 16.5	Mfr cert.	P	R	W/R	Fabricator W/S									
2	Welding, NDT & Testing for skid Piping fabrication																				
2.1	WPS/WQP/PQR	Welders Qualification & Welding Procedure	Major	Welders Qualification & Welding Procedure	100%	Approved WPS/WQP/PQR	ASME Sec IX	WPS/WQP/PQR	P	R	W/R										
2.2	UT or DPT of Non Radiography for Joints	DPT after Final Welding	Major	DPT on other than butweld joints + UT Report	100%	DPT Report + UT Report	ASME + Sec. V	DPT Report + UT Report	P	10%W	W/R	UT / DPT Report 100% Review									
2.3	Radiography Test	Radiography after Final Welding	Major	100% Process Piping	100%	Radiography Report	ASME Sec. VIII/ Div. 1 & ASME Sec. V	Radiography Report	P	* R	* W/R	* Film to be Reviewed									
2.4	Hydro Test for Interconnecting Pipe spools (with 0.2% Inhibitor)	Hydro Test at 1.4 times the Design Pressure	Major	Strength	100%	GA Drawing and hydro test procedure	ASME B 31.8, IGE/TD/13, No Leakage	Hydro Test Report	P	W	W/R										
2.5	Internal Cleaning of Pipe Spools after Hydro Test.	Internal Surface Finish	Major	Visual	100%	Internal Report	Internal Report	Internal Report	P	R	W/R										
2.6	Surface Preparation and Painting of Skid	Surface Preparation and Painting	Major	Visual + DFT Measurement	100%	Approved Painting Specification	Approved Painting Specification	Inspection Report	P	W	W/R	Random DFT Measurement Witness									
2.7	Pneumatic Leak Test for skid	Pneumatic Leak Test at 7.7 Bar for 30 min.	Major	leakage	100%	GA Drawing and Pneumatic test procedure attached	ASME B 31.8, IGE/TD/13, No Leakage	Pneumatic Report	P	W	W/R										
2.8	Final Inspection of Assembled Skid with all Instruments	Tender Specs.	Major	Visual	100%	GA Drawing + P&ID	Approved Specification	Internal Report	P	W	W/R										
2.9	Skid Preservation with N2 purging	N2 Purging - 2Kg/cm2g Preservation-0.3Kg/cm2g	Major	Visual	100%	GA & N2 Drg. + Preservation Procedure	No Leakage	Internal Report	P	R	W/R										
2.10	Necessary Protection during Transportation		Major	Visual	100%	Protection Procedure	Protection Procedure	Internal Report	P	R	W/R										

Sr.No	Description	Characteristic	Class	Type of Check	Quantum of Check	Reference Document	Acceptance Norms	Inspection By			Remarks	
								M	TPIA	Owner		
3	Incoming Material Identification of Boughtout Items											
3.1	Ball Valve	As per specifications	Major	As per specifications	As per specifications	As per specifications	Approved Specification	MFR's TC	P	W/R	W/R	
3.2	Globe Valve / Check valve	As per specifications	Major	As per specifications	As per specifications	As per specifications	Approved Data Sheet	MFR's TC	P	W/R	W/R	
3.3	Pressure Safety Valve	As per attached QAP	Major	As per attached QAP	100%	As per attached QAP	Approved Data Sheet	MFR's TC	P	W/R	W/R	
3.4	Pressure & Temperature Transmitter/Level Gauge, DPT, LJT etc	As per attached QAP	Major	As per attached QAP	As per attached QAP	Vendor's QAP	Approved Data Sheet	MFR's TC	P	W/R	W/R	
3.5	Mass Flow Meter	Dimensional Drawing	Major	Dimensional, Visual, Model Operation of Orifice Assembly	100%	Vendor's Manual	Approved Data Sheet	MFR's TC	P	R	W/R	
3.6	Panel / FC	Physical / Electrical	Major	Continuity check	100%	Loop Diagram, Panel GA	Approved Data Sheet	MFR's TC	P	W	W/R	
3.7	Natural Gas Filter	As per specifications	Major	As per specifications	As per specifications	As per specifications	Approved Data Sheet	MFR's TC	P	W/R	W/R	
3.8	Slam Shut Valve + Regulators	As per attached QAP	Major	As per attached QAP	As per attached QAP	As per attached QAP	Approved Data Sheet	MFR's TC	P	W/R	W/R	
3.9	SS Fittings	As per specifications	Major	As per specifications	As per specifications	As per specifications	Approved Data Sheet	MFR's TC	P	W/R	W/R	
3.10	Pressure Gauge/Temperature Gauge/DPG	As per attached QAP	Major	Calibration, Dimensional, Range Model & Visual	100%	Approved Data Sheet	Approved Data Sheet	MFR's TC	P	W/R	W/R	
3.11	Cable	Test Reports	Major	MTC, Visual & Dimensional	100%	MTC's, tender Specification	Approved Data Sheet	MFR's TC	P	W/R	W/R	
3.12	Junction Box & Cable Gland	Visual & Dimensional Review of Certificates	Major	Visual & Dimensional	100%	Approved P&ID and GA Drawing	Approved P&ID and GA Drawing	MFR's TC	P	R	W/R	

Signature

SKRISHNA TE

**QUALITY ASSURANCE PLAN
SKID FABRICATION**

QAP No
Date
Prepared by
Approved by

P.009355-Q-11098-001 Rev. 1
12.06.2017
MA
MC

Checked by
SD

Sr.No	Description	Characteristic	Class	Type of Check	Quantum of Check	Reference Document	Acceptance Norms	Inspection By			Remarks
								Format Of Records	M	TPIA	
4 Final Inspection											
4.1	Factory Acceptance Test (Panel)	FAT as per Submitted FAT Manual	Major	FAT Procedure	100%	Approved FAT Manual	Approved FAT Manual	Inspection Report	P	W	W/R
4.2	Completeness + Inspection Release Certificate (IRC)	---	Major	Visual + Dimensions	100%	Approved Bill of Material	Approved Bill of Material	Inspection Report	P	W	W/R
5 Packing and Shipping Control											
5.1	Dispatch	---	Major	Verification of Documentation	100%	Verification of Documentation	Verification of Documentation	Dispatch Clearance by Client	---	R	W/R
5.2	Name Plate Verification	Name Plate Verification	---	Name Plate Verification	100%	Approved Drawing	Approved Drawing	Approved Drawing	---	R	W/R
6 Site Acceptance Test											
6.1	Pneumatic Leak Test for Skid Assembly	Pneumatic Leak Test at 7.7 Bar for 30 min.	Major	Strength	100%	Approved P&ID and GA Drawing	No Leakage	Inspection Report	---	W	W/R
6.2	Site Acceptance Test	SAT as per submitted SAT Manual	Major	SAT Procedure	100%	Approved SAT Manual & FDS	Approved SAT Manual & FDS	Inspection Report	---	W	W/R
7 Final Documentation											
7.1	Design and Calculation, Material TC, Calibration, Inspection and Test Report, As Built GA Drawing and P&ID	As per Tender Copy	Major	Verification of Documentation	100%	Approved Specification & As per Tender Doc.	Approved Specification & As per Tender Doc.	Vendor Document Report	---	R	W/R

Legend

M	Manufacturer	P	Perform
C	Client/Owner	R	Review
TPIA	Third Party Inspection Agency appointed by bidder.	W	Witness
		W/R	Witness of Test & Review of Certificates & Documents as per QAP

Bought-out items may be procured under 3.1 certification. However, TPJA carrying out the final inspection of the skid will review all 3.1 certification of bought-out items and include the details in the final inspection report.

NOTE

- * Review of existing WPS/PQR by TPJA for suitability. If not suitable, Testing has to be carried out under witness of TPJA Panel shall be offered to TPI at POR factory for inspection. This shall be a part of FAT
- 1 Pressure Regulators and Siam shut valve shall be witnessed by TPJA for functionality check at Manufacturer's work.
- 3 Consultant / Owner's inspection shall not be a Hold Point.

(Handwritten signatures and initials)
M. S. H. (M. S. H.)
M. S. H. (M. S. H.)