
	Offshore Design Section Engineering Services ISO – 9001:2008	FUNCTIONAL SPECIFICATION FOR <u>PRESSURE TRANSMITTER</u> (ELECTRONIC)	Spec. No.	3403
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1.0 SCOPE OF THIS DOCUMENT:

This functional specification describes the essential design considerations for the selection of Pressure transmitter (electronic) for the intended service.

2.0 REFERENCE DOCUMENTS AND SPECIFICATIONS:

- Instrumentation /Process Design Criteria
- Basic Bid Work
- Project P & IDs
- Instrument / Process Data Sheets

3.0 SCOPE OF SUPPLY:


- The quantity to be supplied and installed shall be as per the requirements indicated in the Basic Bid Work, Design Criteria and the P & IDs.
- The vendor shall be responsible for the selection and supply of the Pressure Transmitter suitable for measurement range, accuracy, MOC & standard accessories including valve manifold for its intended application. Δ
- The procurement, tagging, packing, testing & calibration, preparation for shipment, along with accessories, spares, and assistance where required for its installation & commissioning at site shall be come under vendor's responsibility.

4.0 SMART TYPE PRESSURE TRANSMITTER:

4.1 General:

- Hart (Latest edition) type Transmitter shall be SIL2 certified. Δ
- Transmitters shall be immune to Radio frequency interference due to walkie-talkie, paging system, communication system etc. All electronic modules shall be designed for short circuit protection.
- Span shall be continuously adjustable over the transmitter range. The PT shall be provided with ½"NPT (F) cable entries.
- All transmitters shall be provided with Digital integral output meters (with engineering units) visible from grade. Where the display is not visible from grade, blind transmitter (intrinsically safe) with separate loop power indicator shall be provided. Same shall be suitable for use in the hazardous area Class I, Div II, Gr. C&D or Equivalent. Δ
- PT shall have easily approachable zero and span adjustment facility.
- Process connection of the transmitter shall be from the bottom side, 316SS threaded ½" NPTF.
- Over range protection shall be 130% of range or maximum pressure whichever is higher.

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- 4.1.8 Transmitter shall be furnished with all necessary weather and anti-corrosion protection to prevent damage from saline and corrosive process atmosphere.
- 4.1.9 All pressure instruments shall be mounted as close as possible to sensing point.
- 4.1.10 Transmitter shall be tested & supplied with a 3-way-2 valve manifold. The Manifold shall be supplied by the same Instrument vendor or outsourced by the instrument vendor from a reliable manufacturer. Δ
- 4.1.11 The Pressure transmitter shall be intrinsically safe and certified by statutory body like UL/FM/BASIEFA/CCOE/PESO. Δ
- 4.1.12 ‘Universal Hand Held Configurator’ shall be supplied for transmitters’ calibration/ Configuration/ Diagnostics. The number of Configurator’ shall be two per process platform & one per well platform. Δ
- 4.1.13 Vent and drains of the transmitter/tubing/valve manifolds shall be routed to drain header. If the meter is on sour service and harmful fluids like chemical etc. then it will be routed to close drain header with isolation valves. Δ
- 4.1.14 a) Manifold (2-valve, 3 way manifold) shall be integral type (mono block) unit, supplied by the Transmitter vendor or outsourced by the instrument vendor from a reliable manufacturer.
- b) Transmitter with the Instrument valve manifold shall be assembled in the transmitter vendor factory, leak tested and hydro tested [1.5 times MAWP (Max. allowable working pressure) –IDC] with random witnessed to be done by TPI. Selected manifold & valves shall be as per ANSI B16.5 & tested in accordance with standard - MSS-SP-99-2010.
- c) MOC shall be as per the wetted parts requirements for the transmitter, with material traceability certificates with heat & lot no., as per standard (EN 102043.1) and same shall be submitted during inspection, to CA/TPI (ONGC).
- d) Manifold details shall be filled in the data sheet for review and approvals of the PS.
- e) Reputed make 3-way Valve Manifold shall be supplied by the transmitter vendor. Δ

Transmitter vendor shall take the responsibility of the whole system.

4.2 Material:

- 4.2.1 The material requirements for PT shall in general be according to Material Selection Chart provided in Annexure – II of this document Δ
- 4.2.2 All wetted parts shall be suitable for intended process application as a minimum. Associated piping, pipe fitting & piping valves etc. shall be according to FS-2004A for Piping Design (2008) & Piping Material Specification. Δ
- 4.2.3 Transmitter body studs shall be high tensile stainless steel, or other corrosion-resistant material for higher stress levels

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4.2.4 Instrument parts shall be resistant to the corrosive properties of the process fluid and ambient conditions to which they are exposed.

4.3 Accuracy: Δ

$\pm 0.1\%$ of FSD or better. For remote seal transmitters accuracy shall be $\pm 0.2\%$ or better of the span.

4.4 Output Signal:

4.4.1 Output signal shall be 2 wired 4-20 mA DC, and capable of delivering the rated current signal into external load of around 600 ohms when powered with nominal 24V DC (negative earthed).

4.4.2 Transmitters shall have HART / FF protocol for communication for remote calibration and diagnostics from HART maintenance system Δ

4.5 Repeatability:

Flow Transmitters shall have a repeatability of $\pm 0.1\%$.

4.6 Stability: Δ

$\pm 0.1\%$ of URL per 5 years as minimum

4.7 Enclosure Class: Δ

The transmitter shall be weatherproof (IP 65 or better). Aluminium enclosure for PT shall be certified as copper free i.e. less than 0.4% copper by mass, and suitably coated for harsh offshore environment.

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(ELECTRONIC)**

Spec. No. 3403

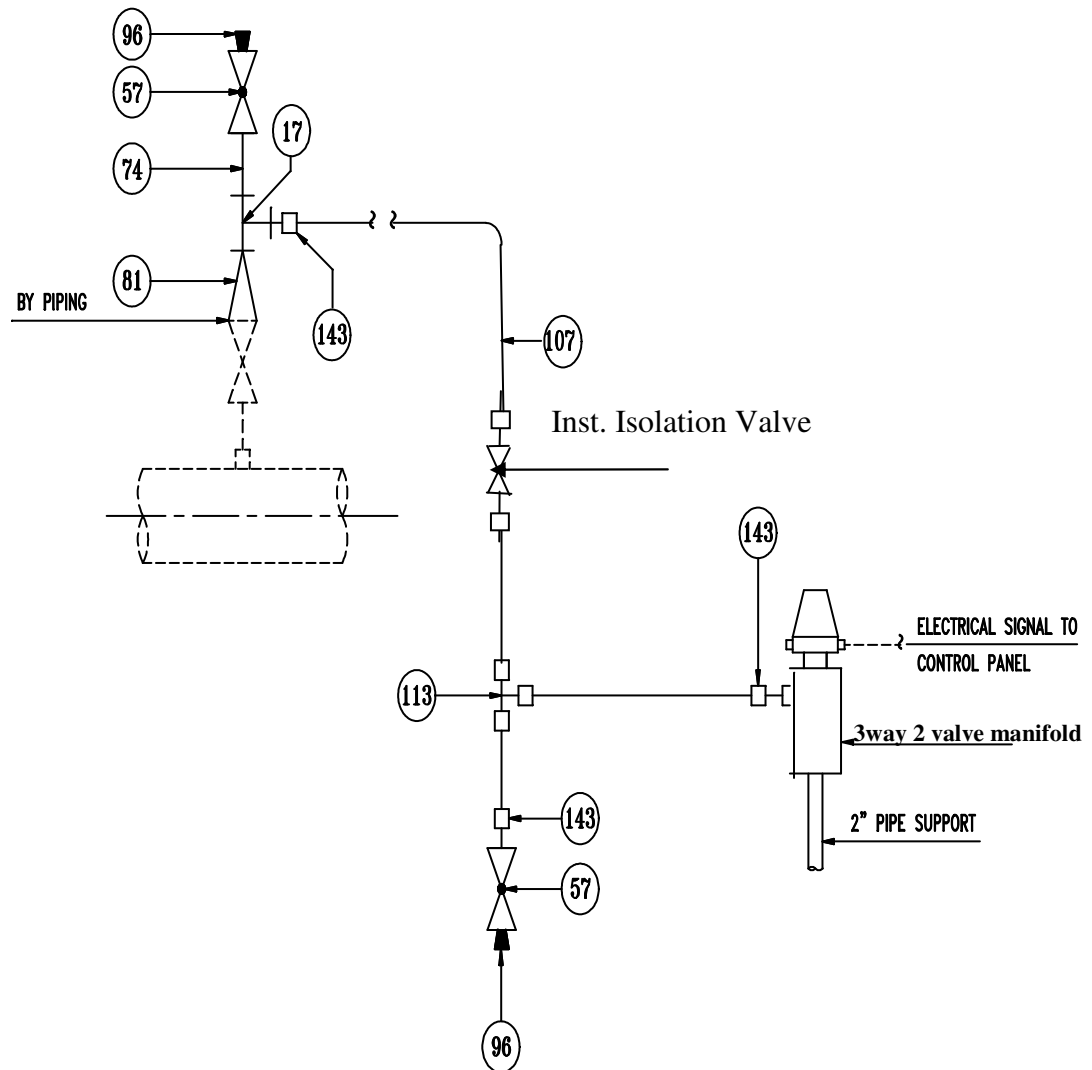
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ANNEXURE – I

(Typical Hook Up Drawing)



BILL OF MATERIAL

ITEM	QTY.	SIZE	DESCRIPTION	MATERIAL
17	1	1/2"	PIPE TEE THxTHxTH NPTF	
57	2	1/2"	GLOBE VALVE SCRWD. NPTF	
74	1	1/2"	PIPE NIPPLE SMLS	
81	1	3/4 x 1/2"	SWAGE NIPPLE PLxTH NPTM	
96	1	1/2"	PIPE PLUG NPTM SCREWED	
107	A/R	1/2"ODx0.065"THK	TUBING	
113	1	1/2"x1/2"x1/2"OD	TUBING TEE	
143	3	1/2"TH.x1/2"OD	MALE TUBING CONNECTOR	

ANNEXURE –II

Pressure Transmitter – Material Selection Chart^Δ

S. No.	Piping Class	Transmitter	
		Sensor	Wetted Part & Valve Manifold
1	A1, B1, D1, E1, F1, XF1, F1, PA1, PB1, PD1, PE1, PXF1, PF1, A2, B2, D2, E2, XG1, A1H, A3, B3, A8	SS 316L	SS 316
2	Raw Sea Water / Produced water /W.I.	MONEL	MONEL/ 904L/ Super DSS
3	A4, A6, A9, B9, D9, E9	HASTALLOY C	SS 316
4	A5	MONEL	MONEL
5	A7	TITANIUM	HASTALLOY C
6	** A1N, B1N, D1N, E1N, F1N, XF1N, PA1N, PB1N, PD1N, PF1N, XG1N	SS 316L	SS 316L
7	A10, B10, D10, E10, F10	HASTALLOY C	SS 316 L
8	A11, B11, D11, E11, F11, PA11, PB11, PD11, PE11, PF11	TITANIUM	HASTALLOY C

[** All Process wetted parts shall be as per NACE MR-01-75 (Latest Edition) as minimum]

The MOC shall be as indicated above or better suiting the Process Conditions

ANNEXURE-III :- Typical data sheet for Pressure Transmitter Δ

PRESSURE TRANSMITTER (ELECTRONIC)									
UNITS :- Flow Liquid – M3/HR Gas – NM3/HR Pressure – kg/cm2 Temperature – deg C Level/length -M									
1	Type		DIAPHRAGM SEAL (Wherever Required)						
2	Function		21	Type					
3	Mounting		22	Wetted Parts					
4	Case & Material		23	Other Material					
5	Electrical Area Class		24	Process Connection					
6	Enclosure Class		25	Facing & Finish					
7	Intrinsically Safe		26	Capillary Material					
8	Power Supply		27	Armour Material					
9	Cable entry		28	Capillary Length					
10	Accuracy		29	Flushing Filling connection.					
11	Repeatability								
			MISCELLANIOUS						
TRANSMITTER			30	Over range protection					
12	Out put		31	Blow out protection					
13	Power supply		32	Options					
14	MEASURING UNIT			a) Mounting accessories					
15	Service								
16	Pressure Element Type / Material								
17	Element Material		33	Load driving capability					
18	Body Material/ Wetted part		34	3 way 2 valve Instrument Valve Manifold (Make & Model)					
19	-		35	Transmitter					
20	-			Make & Model					
TAG No.	RANGE	OPERATING PRESSURE	PRESSURE		TEMP.		FLUID	SERVICE	OPTION S
			OVER	MAX	OPER	MAX			
Vendor Seal and Sign									