INTERPLANT STANDARD - STEEL INDUSTRY		
IPSS	**Specification for Smart Pressure & Differential Pressure Transmitter**	**IPSS: 2-07-104-15**
	Corresponding IS does not exist	

1. Scope

1.1 This Interplant Standard covers the requirement of Smart pressure and differential pressure transmitters.

2. Principle of operation

2.1 Shall operate over a standard 2-wire system. Shall use piezo-resistive or capacitive or silicon resonant sensor, with metallic or ceramic isolating diaphragm and microprocessor-based electronics

3. Features

- Self diagnostics
- Configuration by Smart portable configurators
- Can be Digitally integrated with Automation System using configuration toolkit, for remote configuration and diagnostics. Configuration software to be included in Scope of supply for such integration,
- Higher Rangeability (Span - turndown ratio) and better accuracy

- Field level accuracy in the system when digitally integrated, eliminating inaccuracy due to D/A and A/D conversions

- Choice of linear or square root output, by simple configuration selection

- Local digital display with configurable engineering units

- Local zero and span setting

- Lightning Protection : A terminal block with circuitry that shall protect the transmitter from transient surges induced by nearby lightning strikes. Transient protection minimum 2.5 kv

4. Range : Lower Range Limit (LRL) to Upper Range Limit (URL)

4.1 For Differential pressure transmitters :

i) -10 to 10 mili bar

ii) -40 to 40 mili bar

iii) -160 to 160 mili bar

iv) -400 to 400 mili bar

v) -650 to 650 mili bar

vi) -1000 to 1000 mili bar

vii) -1600 to 1600 mili bar

viii) -6 to 6 bar

ix) -24 to 24 bar

x) -80 to 80 bar

xi) -160 to 160 bar

4.2 For Gauge Pressure transmitters

i) -10 to 10 mili bar

ii) -40 to 40 mili bar

iii) -160 to 160 mili bar

iv) -400 to 400 mili bar

v) -650 to 650 mili bar

vi) 10 mili bar abs to 1000 mili bar

vii) 10 mili bar abs to 1600 mili bar

viii) 10 mili bar abs to 6 bar

ix) 10 mili bar abs to 24 bar

x) 10 mili bar abs to 80 bar

xi) 10 mili bar abs to 160 bar

4.3 For Absolute Pressure transmitters

i) 0.7 mili bar abs to 160 mili bar

ii) 0.7 mili bar abs to 400 mili bar

iii) 0.7 mili bar abs to 650 mili bar

iv) 0.7 mili bar abs to 1000 mili bar

v) 0.7 mili bar abs to 1600 mili bar

vi) 0.7 mili bar abs to 6 bar

vii) 0.7 mili bar abs to 24 bar

viii) 0.7 mili bar abs to 80 bar

ix) 0.7 mili bar abs to 160 bar

5. Maximum Span : Equals to Upper Range Value (URV)

6. Turndown Ratio : 100 to 1

7. Zero Elevation and Suppression

7.1 Zero and span shall be adjustable to any value within the range limits, as long as calibrated span ≥ minimum span.

8. Output / Communication options

- DC 4-20 mA, superimposed HART (latest version)
- FOUNDATION Fieldbus / Profibus PA
- Wireless HART as per IEC 62591 / ISA 100

9. Accuracy (including combined effects of linearity, hysteresis, and repeatability)

9.1 In Analog Mode : ±0.075% of calibrated span or upper range value (URV), whichever is greater

9.2 In Digital Mode : ±0.0625% of calibrated span or upper range value (URV), whichever is greater

9.3 ±0.1% for very low range application (up to -40 to 40 mili bar)

10. Power supply Range : 10.8 to 42 V DC

11. Current Range : 3.8 to 20.5 mA

12. Load Resistance: 0 to 1,440 ohms, depending on supply voltage

13. Supply Voltage Effect : 0.005% of span per volt

14. Damping Time Constant : Adjustable from 0 to 32 seconds

15. Stability

15.1 ±0.15% of URL over a five years period

15.2 ±0.25% of URL over a five years period for very low range application (up to -40 to 40 mili bar)

16. Vibration effect : ±0.10% of URL

17. Ambient Temperature limit : - 20 to 65 Deg. C

18. Ambient Humidity limit : 0 to 95 % RH (non condencing)

19. Maximum Allowable Working Pressure : Up to 150% of line pressure.

20. Diaphragm (wetted parts) Material : 316L SS / Hastelloy C / Monel / Tantalum

21. Fill Fluid : Silicone oil / CTFE (Chlorotrifluoroethylene) / Other Inert fluids

22. Housing : Low Copper-Aluminum / Stainless steel (optional)

23. Protection class : Weather proof NEMA 4X – IP66 or better

24. Explosion proof / Intrinsically safe certifications (any of the following) :

- FM Approvals
- Canadian Standards Association (CSA)
- International Electrotechnical Commission (IECEx)
- ATEX
- CMRI

25. Process Connections : 1/4-inch NPT or 1/2-inch NPT (with adapter)

26. Options

26.1 Flanged diaphragm seals

26.2 Capillary diaphragm seals

26.3 SIL Compliance : Shall be SIL certified to IEC 61508 for non-redundant use in SIL 2 related Safety Systems (single use) and for redundant use in SIL 3 Safety Systems.

26.4 NAMUR NE43 Compliance : Shall provide software to meet NAMUR NE43 requirement for failsafe software. Transmitter failure information shall be generated when the measuring information is no longer valid.

27. Accessories

27.1 Mounting Bracket : Carbon Steel / Stainless Steel ; angle bracket or flat bracket for 2 inch pipe mounting

27.2 Manifold : SS Three way valve manifold for Differential pressure transmitters and SS Two way valve manifold for Pressure transmitters

28. Selection Guideline

28.1 For low range application (up to 600 mm WC), capacitance type sensor shall be preferred.

28.2 For safety related applications, 4-20 mA DC signal shall be used.

28.3 While selecting communication protocol (HART / FOUNDATION Fieldbus / Profibus PA / Wireless HART), compatibility with Automation system of the subject plant to be ensured.

28.4 Wireless transmitters shall be used for monitoring purpose only, not for control applications.

28.5 Wetted parts material shall be selected based on process fluid.

28.6 For Ammonia liquor or highly corrosive acid application, Hastelloy C wetted parts material shall be used.

28.7 Transmitter for oxygen application shall be properly degreased. Fill fluid shall be CTFE / Inert fluid.