 TORUS		· Owner PRESSURE TRANSMITTERS		Document No.	INS-DS-001
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INSTRUMENTATION AND CONTROLS · PRESSURE TRANSMITTERS					
Rev.	Date	Revision description	Prepared	Reviewed	Approved
A	2026-09-29	Issued for Review			

NOTES

1. This datasheet covers the electronic gauge pressure transmitters for control system (RTU) and safety system (OPSS) service. The custody pressure transmitters PT-111 and PT-121 are specified on the Volume 2 measurement datasheets and are not covered here.
2. Controlling documents:  GEN-DB-001, Basis of Design;  INS-LST-001, Instrument Index;  INS-LST-002, I/O List;  INS-LST-003, Alarm and Trip Setpoints;  SAF-SRS-001, Safety Requirements Specification;  INS-DWG-004, Instrument Installation Hook-up Typical.
3. Values marked typical are budgetary. The vendor shall confirm them with its proposal and final data (HOLD H-15).
4. Units are US customary. Pressures are gauge unless stated as absolute. Operating cases C1 to C7 are defined in  GEN-DB-001, Section 6; normal conditions are case C2, maximum operating conditions the envelope of C1 to C7, and design conditions those of  GEN-DB-001, Section 7.
5. PT-133A, PT-133B and PT-133C form the two-out-of-three sensor subsystem of the overpressure shutdown system, SIF-01. An identical model for all three is acceptable, because diversity is not needed at SIL 2; the common cause factor is carried in  SAF-CAL-001, SIL Verification Calculation.
6. PT-102A shows barrel pressure before the PR-101 closure is opened. It does not replace the mechanical pressure-warning interlock on the closure.
7. The 0 to 2,000 psig span places normal operating pressure (950 to 1,050 psig) at 48 to 53 % of span and the OPSS trip (1,225 psig) at 61.3 %.

GENERAL

Table 1-1: General Data

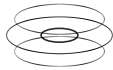
Item	Value	Item	Value
Project	  ,  County, 	Service	120 MMSCFD gas receipt into the receiving pipeline operator's 
Form content	ISA-20; tag numbers to ISA-5.1	Electrical codes	NFPA 70 (2023) Articles 500 and 501; API RP 500
Safety instrumented tags	IEC 61511 and IEC 61508	Sour service	Not required; sweet gas, H ₂ S 4 ppmv maximum (NACE MR0175 not applied)

SITE CONDITIONS

Table 1-2: Site and Environmental Conditions

Item	Value	Item	Value
Ambient design temperature	-5 °F to 110 °F	Electronics rating	-40 °F to 158 °F (-40 °C to 70 °C)
Solar radiation	1,000 W/m ² ; sunshades where exposed	Elevation and atmosphere	1,150 ft MSL; 14.10 psia



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Item	Value	Item	Value
Wind and ice	108 mph (ASCE 7-22, Exposure C); 0.5 in radial ice (HOLD H-06)	Area classification	Class I, Division 2, Group D in process areas; Division 1 within 5 ft of vents and relief outlets (Volume 6 area classification drawing)
Temperature class	T3 minimum (natural gas autoignition about 900 °F)	Enclosure	NEMA 4X (IP66) minimum; 316 SS or copper-free aluminum (below 0.4 % Cu), epoxy coated
Instrument power	24 VDC from the station UPS (GEN-DB-001, Section 9.8) unless noted		

TAG SCHEDULE

Table 1-3 lists every tag in  INS-LST-001 that references this datasheet, and Table 1-4 gives the process conditions at each tag.

Table 1-3: Tag Schedule

Tag	Service	P&ID	Range or set	System	JB	Area classification
PT-101	Station inlet pressure, upstream of SDV-101	 PRO-DWG-101	0 to 2,000 psig	BPCS RTU/ PLC	JB-101	Class I, Division 2, Group D
PT-102A	PR-101 barrel pressure (closure warning, SCADA indication)	 PRO-DWG-101	0 to 2,000 psig	BPCS RTU/ PLC	JB-101	Class I, Division 2, Group D
PT-164	Fuel gas pressure downstream of PCV-162	 PRO-DWG-106	0 to 60 psig	BPCS RTU/ PLC	JB-101	Class I, Division 2, Group D
PT-133A	OPSS pressure transmitter A (2oo3), downstream of control valves	 PRO-DWG-107	0 to 2,000 psig	Safety PLC	JB-130S	Class I, Division 2, Group D
PT-133B	OPSS pressure transmitter B (2oo3), downstream of control valves	 PRO-DWG-107	0 to 2,000 psig	Safety PLC	JB-130S	Class I, Division 2, Group D
PT-133C	OPSS pressure transmitter C (2oo3), downstream of control valves	 PRO-DWG-107	0 to 2,000 psig	Safety PLC	JB-130S	Class I, Division 2, Group D
PT-134	Outlet pressure, PIC-134 override	 PRO-DWG-107	0 to 2,000 psig	BPCS RTU/ PLC	JB-130	Class I, Division 2, Group D
PT-172	Station outlet pressure downstream of SDV-103	 PRO-DWG-108	0 to 2,000 psig	BPCS RTU/ PLC	JB-170	Class I, Division 2, Group D

Table 1-4: Process Conditions

Tag	Normal P and T	Maximum operating P and T	Design P and T
PT-101	1,050 psig / 70 °F	1,150 psig / 45 to 120 °F	1,440 psig / -20 to 150 °F
PT-102A	1,050 psig / 70 °F	1,150 psig / 45 to 120 °F	1,440 psig / -20 to 150 °F
PT-164	25 psig / ambient	35 psig (PAH) / 110 °F	285 psig (Class 150) / -20 to 150 °F
PT-133A	950 psig / 45 to 70 °F	1,180 psig (PIC-134 clamp); 1,225 psig OPSS trip / 19 to 120 °F	1,440 psig / -20 to 150 °F
PT-133B	950 psig / 45 to 70 °F	1,180 psig (PIC-134 clamp); 1,225 psig OPSS trip / 19 to 120 °F	1,440 psig / -20 to 150 °F
PT-133C	950 psig / 45 to 70 °F	1,180 psig (PIC-134 clamp); 1,225 psig OPSS trip / 19 to 120 °F	1,440 psig / -20 to 150 °F
PT-134	950 psig / 45 to 70 °F	1,180 psig (PIC-134 clamp); 1,225 psig OPSS trip / 19 to 120 °F	1,440 psig / -20 to 150 °F
PT-172	950 psig / 45 to 70 °F	1,180 psig (PIC-134 clamp); 1,225 psig OPSS trip / 19 to 120 °F	1,440 psig / -20 to 150 °F



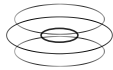
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SPECIFICATION

Table 1-5: Specification

Item	Requirement
Type	Two-wire electronic gauge pressure transmitter, capacitive or piezoresistive sensor, direct mounted on a two-valve manifold
Housing	Dual compartment, copper-free aluminum with epoxy paint or 316 SS; two 1/2 in NPT conduit entries, the unused entry closed with a listed explosion-proof plug
Process connection	1/2 in NPT female through coplanar or in-line flange; two-valve manifold, 316 SS, 6,000 psi (INS-DWG-004 typicals HU-P1, and HU-P2 for safety tags)
Wetted materials	Diaphragm 316L SS; flange, drain and vent 316 SS; silicone fill
Sensor limits	Upper range limit at least 3,000 psig for the 0 to 2,000 psig tags; overpressure rating at least 2,160 psig (1.5 x 1,440 psig hydrotest). PT-164: upper range limit at least 150 psig, overpressure 300 psig or protected by PSV-161
Calibrated range	Per Table 1-3: PT-164 0 to 60 psig; all others 0 to 2,000 psig
Reference accuracy	±0.075 % of calibrated span or better (1.5 psi on 0 to 2,000 psig), typical, vendor to confirm (HOLD H-15)
Total probable error	±0.25 % of span over -5 to 110 °F ambient at 1,440 psig static; stability ±0.2 % of upper range limit over 10 years
Output	4 to 20 mA with HART 7; NAMUR NE43 failure signal downscale (below 3.6 mA) for safety tags, upscale (above 21.0 mA) for control tags
Power	24 VDC loop power from the RTU or safety PLC input module; 10.5 to 42.4 VDC; reverse-polarity protected
Hazardous area rating	Class I, Division 1, Group D explosion-proof (FM, CSA or UL listed), factory sealed, T4 or better
Enclosure	NEMA 4X, IP66/67
Display	Local LCD in psig, rotatable housing; hardware configuration lock, set to write-protect on safety tags after commissioning
SIL capability	PT-133A/B/C: IEC 61508 certified SIL 2 capable in single use and SIL 3 capable in redundant use, safe failure fraction at least 90 %, with safety manual and FMEDA; failure rates to replace those assumed in SAF-CAL-001 (HOLD H-15). Control tags: not required
Diagnostics	Plugged impulse line detection on safety tags where offered; sensor drift, loop integrity and electronics temperature through HART
Surge protection	Integral transient protector terminal block, IEEE C62.41.2 Category B
Mounting	2 in pipe stand with SS bracket and U-bolts; transmitter above the tap so that condensate drains back to the line; sunshade on PT-133A/B/C, PT-134 and PT-172
Independence	PT-133A/B/C each on its own root valve and tap, with separate cables and separate safety PLC input channels; none shared with the control transmitter PT-134
Tagging	Safety instrumented tags (PT-133A/B/C and all safety final elements): yellow stainless plate engraved with the tag and SIF number, and yellow cable markers. Other tags: 316 SS plate, 1/8 in engraved characters, wired to the instrument
Inspection and testing	Factory five-point calibration (0, 25, 50, 75 and 100 %) rising and falling, certificate per tag; safety tags supplied with the proof test procedure from the safety manual
Documentation	Dimensional drawing, wiring diagram, hazardous location certificate, calibration certificate, IEC 61508 certificate and safety manual for safety instrumented tags, installation and maintenance manual and spare parts list, all as searchable PDF



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OPEN ITEMS

Table 1-6: Open Items

HOLD	Item	Responsible party
H-15	Final model, failure rates and SIL certificate	Vendor after award
H-04	Trunkline MAOP, which sets the 1,225 psig OPSS trip	Receiving pipeline operator