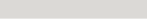
 TORUS	· Owner GAS DETECTORS AND FIRE DETECTION	Document No.	INS-DS-009		
		Revision / Date	A · September 29, 2026		
		Issue purpose	Issued for Review		
INSTRUMENTATION AND CONTROLS · GAS DETECTORS AND FIRE DETECTION					
Rev.	Date	Revision description	Prepared	Reviewed	Approved
A	2026-09-29	Issued for Review			

NOTES

1. This datasheet covers the combustible gas detectors, the heater area flame detector, the B-102 smoke detector and the alarm beacons and horn.
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-RPT-003, Fire and Gas Detection Philosophy and Layout.
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. Voting is set in  SAF-RPT-003: a confirmed gas release in B-101 is one detector at 40 % LEL with the other at 20 % LEL or more.
6. The calibration kit and portable gas monitors are listed with the commissioning spares on  INS-DS-014.

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, H2S 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
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		



 TORUS	· Owner GAS DETECTORS AND FIRE DETECTION	Document No.	INS-DS-009
		Revision / Date	A · September 29, 2026
		Issue purpose	Issued for Review
INSTRUMENTATION AND CONTROLS · GAS DETECTORS AND FIRE DETECTION			

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
GD-205	Combustible gas detector B-101 (1 of 2)	 PRO-DWG-111	0-100 % LEL	Safety PLC	JB-140S	Class I, Division 2, Group D (B-101 interior)
GD-206	Combustible gas detector B-101 (2 of 2)	 PRO-DWG-111	0-100 % LEL	Safety PLC	JB-140S	Class I, Division 2, Group D (B-101 interior)
GD-207	Combustible gas detector B-102 HVAC intake	 PRO-DWG-111	0-100 % LEL	Safety PLC	Home run	Unclassified (B-102 interior)
XS-212	B-102 smoke detector	 PRO-DWG-111	None	Safety PLC	Home run	Unclassified (B-102 interior)
BE-213	H-101 burner area fire detector UV/IR (detects fire at H-101 per Basis of Design Sec. 9.3; location per  SAF-RPT-003)	 PRO-DWG-111	None	Safety PLC	Home run	Class I, Division 2, Group D (fired-equipment area)
XY-214	B-101 and B-102 area beacon / horn	 PRO-DWG-111	None	Safety PLC	Home run	Unclassified (B-102 interior)

Table 1-4: Process Conditions

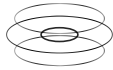
Tag	Normal P and T	Maximum operating P and T	Design P and T
GD-205	Atmospheric / ambient	Atmospheric / -5 to 110 °F	Atmospheric / -5 to 110 °F
GD-206	Atmospheric / ambient	Atmospheric / -5 to 110 °F	Atmospheric / -5 to 110 °F
GD-207	Atmospheric / ambient	Atmospheric / -5 to 110 °F	Atmospheric / -5 to 110 °F
XS-212	Atmospheric / ambient	Atmospheric / -5 to 110 °F	Atmospheric / -5 to 110 °F
BE-213	Atmospheric / ambient	Atmospheric / -5 to 110 °F	Atmospheric / -5 to 110 °F
XY-214	Atmospheric / ambient	Atmospheric / -5 to 110 °F	Atmospheric / -5 to 110 °F

SPECIFICATION

Table 1-5: Specification

Item	Requirement
Gas detectors GD-205, 206, 207	Infrared point combustible gas detector, methane calibrated, 0 to 100 % LEL, dual wavelength with reference beam, not subject to poisoning
Gas detector output	4 to 20 mA three-wire; fault below 3.0 mA, beam block 2.0 mA, overrange 20.5 mA; HART or Modbus optional and not used for trips
Gas alarm levels	High 20 % LEL, high-high 40 % LEL, set in the safety PLC ( INS-LST-003); detector relays not used
Gas detector response	T90 of 10 s or less; accuracy ±3 % LEL up to 50 % LEL
Performance approval	FM 6310/6320 or CSA C22.2 No. 152, ISA 12.13.01
Gas detector accessories	Weather guard, calibration cup and remote calibration tubing (GD-207 at the HVAC intake), bracket; GD-205 and 206 mounted 12 in below the B-101 ceiling because natural gas is lighter than air



 TORUS	· Owner GAS DETECTORS AND FIRE DETECTION	Document No.	INS-DS-009
		Revision / Date	A · September 29, 2026
		Issue purpose	Issued for Review
INSTRUMENTATION AND CONTROLS · GAS DETECTORS AND FIRE DETECTION			
Item	Requirement		
Flame detector BE-213	Multi-spectrum UV/IR, 90° cone of vision, 3 s response to a 1 ft² n-heptane fire at 50 ft (FM 3260), 4-20 mA (20 mA on fire), optical self-test		
BE-213 siting	Outside the heater, viewing the H-101 burner front and fuel train, aimed away from firebox openings and the stack, shielded from the sight ports to avoid nuisance trips		
Smoke detector XS-212	Photoelectric spot detector, 24 VDC four-wire, relay output to a safety PLC input, UL 268		
Beacons and horn XY-214	Explosion-proof LED beacons, red for fire and ESD, amber for gas; horn 100 dB at 10 ft with separate tones for gas and ESD; 24 VDC; outside B-101 and B-102		
Hazardous area rating	Gas detectors, BE-213 and beacons explosion-proof, Class I, Division 1, Group D; XS-212 general purpose (B-102 unclassified)		
Power	24 VDC from the safety PLC and UPS; 5 W per gas detector, 5 W for BE-213		
SIL capability	Not assigned; fire and gas performance is set per ISA-TR84.00.07. SIL 2 capable devices preferred for common spares		
Tagging	316 SS plate; red tag on fire and gas devices		
Inspection and testing	Factory calibration certificate; bump test and calibration with 50 % LEL methane at commissioning		
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; calibration procedure		

OPEN ITEMS

Table 1-6: Open Items

HOLD	Item	Responsible party
H-15	Detector models	Vendor

