 TORUS	· Owner SAMPLE PROBE SP-141	Document No.	MEA-DS-009		
		Revision / Date	A · September 29, 2026		
		Issue purpose	Issued for Review		
MEASUREMENT · SAMPLE PROBE SP-141					
Rev.	Date	Revision description	Prepared	Reviewed	Approved
A	2026-09-29	Issued for Review			

NOTES

1. This sheet defines the pressure-reducing sample probe that feeds the analyzers and the composite sampler.
2. Values marked typical are budgetary. The vendor shall confirm them with its proposal and final data (HOLD H-15).
3. Units are US customary. Pressures are gauge unless stated as absolute; standard volumes are at 14.73 psia and 60 °F.
4. Operating cases C1 to C7 are defined in  GEN-DB-001, Basis of Design, Section 6.

GENERAL

Table 1-1: General Data

Item	Value	Item	Value
Tag	SP-141	Type	Insertion pressure-reducing probe with a heated regulator in the probe head and a line-pressure port upstream of the regulator
Standards	API MPMS Chapter 14.1, GPA 2166; wake frequency per ASME PTC 19.3 TW-2016 ( MEA-CAL-004)	Location	Top of 12"-G-1020 at plot coordinates (104, 116) per the piping general arrangement (Volume 4); 15.8 pipe diameters downstream of the last outlet header tee
Area classification	Class I, Division 2, Group D, T3 (API RP 500); electrical area classification drawing to confirm	Quantity	1

PROCESS DATA

The unheated regulator outlet temperature shows why the regulator is heated: at C1 the gas would reach -48.6 °F, below the hydrocarbon dew point.

Table 1-2: Process Conditions and Regulator Heating

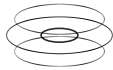
Case	Pressure (psig)	Temperature (°F)	ρ (lb/ft ³)	Velocity (ft/s)	Outlet unheated (°F)	Inlet for 35 °F outlet (°F)
C1 / C6	1,135	44.2	5.038	19.1	-48.6	103.1
C2	1,041	69.6	4.122	17.5	-4.0	98.5
C3	1,000	60.0	4.065	2.0	-14.0	96.4
C4	1,085	119.4	3.706	26.0	59.4	119.4
C5	885	59.2	3.534	27.2	-5.6	90.4
C7 (rich gas)	1,085	59.2	5.011	20.5	-33.0	106.3

CONSTRUCTION

Table 1-3: Construction

Item	Requirement
Connection	2 in ASME B16.5 Class 600 RF flange on a 2 in weldolet, flange face 5.0 in above the pipe OD
Stem	1.00 in OD straight, 0.50 in bore, 316 SS; a 0.75 in stem is not acceptable ( MEA-CAL-004)



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Item	Requirement		
Insertion	4.50 in into the 11.374 in bore (tip in the center third); unsupported length 10.19 in		
Wake frequency	$f_{n,c}$ = 239 Hz, f_s = 72 Hz at C5; ratio 0.300, below the 0.4 limit; velocity limit 36 ft/s		
Tip	Bevelled, opening facing downstream		
Isolation	Full-bore probe root valve and outlet block valves, Class 600, 316 SS		
Regulator	Heated, outlet set at 25 psig, heater set at 140 °F, outlet gauge; downstream relief PSV-141G after PCV-141E in B-101 (PRO-DWG-104)		
Outlet relief	PSV-141B on the regulator outlet (3/8"-G-1080-T1), outside B-101 and upstream of SDV-141, set at 50 psig, 316 SS, discharging through 1/2"-V-1121-T1 to the MOV bleed header 1"-V-1120 (PRO-DWG-103). It is sized for the regulator failed-open flow at 1,150 psig and limits the pressure at RO-141A, so that a tubing break inside B-101 stays within the ventilation dilution capacity (PRO-CAL-007, GEN-RPT-003). It may be integral to the probe head, typical, vendor to confirm (HOLD H-15)		
Heater	Electric, 120 VAC, 50 to 100 W, T3 or better, typical, vendor to confirm (HOLD H-15)		
Line-pressure port	1/4 in, to SMP-146 through 1/4"-G-1139-T1, with isolation and bleed valves		
Design	1,440 psig, -20 to 150 °F; hydrostatic test with the line		

VENDOR DATA

Table 1-4: Vendor Data Required

Item	Requirement
Calculations	ASME PTC 19.3 TW-2016 calculation for the final dimensions
Regulator and heater	Regulator and heater data, including the failed-open flow coefficient
Relief valve	PSV-141B capacity and set-pressure certificate
Certification	Certificate for the area classification

OPEN ITEMS

Table 1-5: Open Items

HOLD	Item	Responsible party
H-15	Probe, regulator, heater and relief valve data	Vendor