 TORUS	· Owner GAS CHROMATOGRAPH AE-141 / AT-141	Document No.	MEA-DS-003		
		Revision / Date	A · September 29, 2026		
		Issue purpose	Issued for Review		
MEASUREMENT · GAS CHROMATOGRAPH AE-141 / AT-141					
Rev.	Date	Revision description	Prepared	Reviewed	Approved
A	2026-09-29	Issued for Review			

NOTES

1. This sheet defines the custody gas chromatograph that supplies composition and heating value to FQI-110.
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	AE-141 / AT-141	Service	Custody composition and heating value, C6+ BTU analysis
Location	Analyzer shelter B-101, wall mounted	Area classification	Interior of B-101, Class I, Division 2, Group D, T3 ( GEN-DB-001 Section 8.1); electrical to confirm
Sample	From SP-141 through 3/8"-G-1080-T1 at 25 psig; transport lag 15 s ( MEA-CAL-004)	Sample shutoff	SDV-141 and RO-141A at the B-101 wall, closed on station ESD
Standards	GPA 2261, GPA 2172, GPA 2145, GPA 2198, API MPMS Chapter 14.1	Calibration procedure	 MEA-PRC-002

PROCESS AND SAMPLE DATA

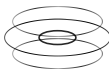
Table 1-2: Sample Conditions

Item	Requirement
Line conditions at the probe	885 to 1,135 psig, 44 to 119 °F
Sample at the GC inlet	Regulated 15 to 25 psig, 35 °F minimum (heated conditioning), filtered to 2 micron
Sample loop flow	0.10 SLPM purge between analyses, typical, vendor to confirm (HOLD H-15)

Table 1-3: Gas Compositions and Calibration Standard

Component	Design (mol %)	Lean (mol %)	Rich (mol %)	Calibration standard (mol %)
Methane	88.50	94.00	83.60	88.72 (balance)
Ethane	6.00	3.00	8.50	6.00
Propane	2.20	0.60	3.60	2.20
i-Butane	0.40	0.10	0.70	0.40
n-Butane	0.50	0.10	0.90	0.40
neo-Pentane	-	-	-	0.10
i-Pentane	0.12	0.03	0.25	0.10
n-Pentane	0.10	0.02	0.20	0.10
C6+ (as n-hexane)	0.10	0.02	0.15	0.08 (n-hexane)



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MEASUREMENT · GAS CHROMATOGRAPH AE-141 / AT-141					
Component	Design (mol %)	Lean (mol %)	Rich (mol %)	Calibration standard (mol %)	
Nitrogen	1.20	1.20	1.10	1.20	
Carbon dioxide	0.88	0.93	1.00	0.70	
HHV (Btu/scf, 14.73 psia, 60 °F)	1,103.7	1,031.7	1,168.8	Per certificate	

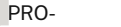
PERFORMANCE

Table 1-4: Performance

Item	Requirement
Components	C1, C2, C3, iC4, nC4, neoC5, iC5, nC5, C6+, N2, CO2
Cycle time	5 min or less
Repeatability	Within GPA 2261 repeatability; HHV repeatability ± 0.25 Btu/scf (0.02 %), typical, vendor to confirm (HOLD H-15)
Calculated values	HHV (dry, 14.73 psia, 60 °F, GPA 2172), relative density, compressibility, Wobbe index, unnormalized total
Averaging	Hourly average of valid analyses to FQI-110 ( MEA-RPT-001 Section 7.2)
Calibration	Automatic, daily or as the Interconnect Agreement requires ( MEA-PRC-002); single-level standard close to pipeline composition
Alarms	Unnormalized total outside 99.0 to 101.0 %, response factor deviation, low carrier pressure, oven temperature, calibration failure, HHV, CO2 or inerts out of specification

UTILITIES

Table 1-5: Utilities

Item	Requirement
Carrier gas	Helium 99.995 % minimum, two cylinders with automatic changeover, regulated to 80 psig; one cylinder per 3 to 4 months, typical, vendor to confirm (HOLD H-15)
Calibration standard	GPA 2198-type certified gravimetric blend (composition above); one cylinder in service and one spare, in a heated blanket to keep it above its dew point
Power	24 VDC from the station UPS ( GEN-DB-001 Section 9.8); 120 VAC only where stated for the controller; the oven heater at 120 VAC may be non-UPS
Vents	Sample and column vents by individual 1/2 in tube (1/2"-V-1131-T1) to atmosphere 3 ft above the B-101 roof ( PRO-DWG-104)

COMMUNICATIONS

Table 1-6: Communications

Item	Requirement
To FQI-110	Modbus RTU or TCP (standard flow computer map): composition, HHV, relative density, alarms, calibration status
Maintenance	Ethernet port for vendor software
Enclosure	Explosion-proof or flameproof for the B-101 classification



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TESTING

Table 1-7: Testing

Item	Requirement
Factory acceptance	 MEA-PRC-003, including ten consecutive analyses of the calibration standard and one of an independent verification standard
Site acceptance	 MEA-PRC-002

OPEN ITEMS

Table 1-8: Open Items

HOLD	Item	Responsible party
H-13	Analysis requirements of the receiving pipeline operator	Receiving pipeline operator
H-15	Vendor data	Vendor
H-12	C6+ or C9+ analysis if the extended analysis shows heavy ends	Owner