 TORUS		· Owner FLOW COMPUTER FQI-110		Document No.	MEA-DS-008
				Revision / Date	A · September 29, 2026
				Issue purpose	Issued for Review
MEASUREMENT · FLOW COMPUTER FQI-110					
Rev.	Date	Revision description	Prepared	Reviewed	Approved
A	2026-09-29	Issued for Review			

NOTES

1. This sheet defines the dual-run custody flow computer, its calculations, records and interfaces.
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	FQI-110	Service	Dual-run custody electronic gas measurement for FE-111 / FE-121, gas quality, sampler control, data interface
Location	Control building B-102 (unclassified), panel mounted	Standards	API MPMS Chapter 21.1, AGA Report No. 8 Parts 1 and 2, AGA 9, AGA 10, GPA 2172

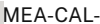
INPUTS PER RUN

Table 1-2: Inputs per Run

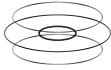
Item	Requirement
Meter	Modbus from FT-111 / FT-121 (volume and diagnostics) and a frequency input for totalizer checking
Pressure	PT-111 / PT-121, absolute, 0 to 1,500 psia, HART or 4-20 mA or digital
Temperature	TT-111 / TT-121, 4-wire Pt100 direct input, or HART transmitter with Callendar-Van Dusen constants
Composition	AT-141 by Modbus; AT-142, AT-143 and AT-144 by Modbus or 4-20 mA
Status	Positions of MOV-111, MOV-112, MOV-121, MOV-122 and MOV-115 (from the RTU); SMP-146 status

CALCULATIONS

Table 1-3: Calculations

Item	Requirement
Volume at base conditions	$Q_b = Q_f (P_f / P_b) (T_b / T_f) (Z_b / Z_f)$ at 14.73 psia and 60 °F
Equation of state	AGA 8 Detail as default; GERG-2008 selectable (HOLD H-01,  MEA-CAL-003)
Energy	$Q_b \times \text{HHV}$ (GPA 2172, dry)
Speed of sound check	AGA 10 speed of sound per run against the meter; alert at $\pm 0.25\%$, alarm at $\pm 0.40\%$ ( MEA-CAL-003)
Composition source	Live, last good or fixed hierarchy, with flags ( MEA-RPT-001 Section 7.2)



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Item	Requirement		
Run switching	Per MEA-RPT-001 Section 5.3. The standby run outlet valve stays open at all times so the run is never blocked in. The standby inlet valve opens when the duty run exceeds 80 ft/s for 60 s, and closes when the per-run velocity falls below 30 ft/s for 10 min. Diagnostic failover is make-before-break. A run with both valves closed raises an alarm.		
Sampler	Bite pulse per set volume; stop on cylinder full		
Calculation tolerance	Within API MPMS Chapter 21.1 limits (50 ppm)		

RECORDS

Table 1-4: Records

Item	Requirement
Quantity transaction records	Hourly and daily per run and station: volume, energy, flow time, average pressure and temperature, HHV, relative density, Z_f , Z_b , composition source, status
Retention in the flow computer	At least 35 days hourly and 24 months daily (HOLD H-01)
Logs	Configuration, event and alarm logs with user ID and time stamp; audit trail per API MPMS Chapter 21.1
Security	Role-based passwords; sealable write-protect

COMMUNICATIONS AND POWER

Table 1-5: Communications and Power

Item	Requirement
Ports	Two Ethernet, four serial; Modbus TCP and RTU
To RTU / SCADA	Modbus TCP
To the receiving pipeline operator	Modbus through the demarcation panel (HOLD H-14)
Time	NTP or GPS time from the RTU
Power	24 VDC from the station UPS ( GEN-DB-001 Section 9.8); 120 VAC only where stated

OPEN ITEMS

Table 1-6: Open Items

HOLD	Item	Responsible party
H-01	Equation of state, record retention	Owner and receiving pipeline operator
H-14	Point list and communications interface	Receiving pipeline operator
H-15	Vendor data	Vendor