 TORUS	· Owner ELECTRIC CONTROL VALVE ACTUATORS	Document No.	INS-DS-008		
		Revision / Date	A · September 29, 2026		
		Issue purpose	Issued for Review		
INSTRUMENTATION AND CONTROLS · ELECTRIC CONTROL VALVE ACTUATORS					
Rev.	Date	Revision description	Prepared	Reviewed	Approved
A	2026-09-29	Issued for Review			

NOTES

1. This datasheet covers the electric modulating actuators of control valves FCV-131, FCV-132, LCV-104 and TCV-152, with their integral position transmitters. Valve bodies, trim and sizing are on the process control valve datasheets.
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;  INS-RPT-001, Control Philosophy and Functional Narrative;  INS-DWG-002, Typical Loop Diagrams.
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. Switchover between FCV-131 and FCV-132 on a position deviation above 5 % for 30 s ( INS-LST-003) depends on the position transmitter being independent of the demand circuit.
6. The LCV-104 force-close input from the safety PLC is not credited in the LOPA or SIL verification, because an electric actuator needs power to move. SDV-106 is the SIF final element.
7. LCV-104 and TCV-152 are powered at 120 VAC; FCV-131 and FCV-132 at 480 V. Supply sources are set in Volume 6.

GENERAL

Table 1-1: General Data

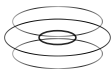
Item	Value	Item	Value
Project	 County, 	Service	120 MMSCFD gas receipt into the receiving pipeline operator's 
Form content	ISA-20; tag numbers to ISA-5.1	Electrical codes	NFPA 70 (2023) Articles 500 and 501; API RP 500
Safety instrumented tags	IEC 61511 and IEC 61508	Sour service	Not required; sweet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



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Item	Value	Item	Value
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
LCV-104	V-101 sump dump valve to T-101	 PRO-DWG-102	0-100 %	BPCS RTU/PLC	JB-101	Class I, Division 2, Group D
ZT-104	LCV-104 position feedback (integral)	 PRO-DWG-102	0-100 %	BPCS RTU/PLC	JB-101	Class I, Division 2, Group D
TCV-152	Burner fuel trim valve	 PRO-DWG-112	0-100 %	BPCS RTU/PLC	JB-150	Class I, Division 2, Group D (fired-equipment area)
ZSL-152	TCV-152 low-fire position switch to BMS-150 (API 556 low-fire start interlock)	 PRO-DWG-112	None	Burner management BMS-150	CP-150	Class I, Division 2, Group D (fired-equipment area)
ZT-152	TCV-152 position feedback (integral)	 PRO-DWG-112	0-100 %	BPCS RTU/PLC	JB-150	Class I, Division 2, Group D (fired-equipment area)
FCV-131	Flow control valve, duty (FIC-131 / PIC-134 low select)	 PRO-DWG-107	0-100 %	BPCS RTU/PLC	JB-130	Class I, Division 2, Group D
FCV-132	Flow control valve, standby	 PRO-DWG-107	0-100 %	BPCS RTU/PLC	JB-130	Class I, Division 2, Group D
ZT-131	FCV-131 position feedback (integral)	 PRO-DWG-107	0-100 %	BPCS RTU/PLC	JB-130	Class I, Division 2, Group D
ZT-132	FCV-132 position feedback (integral)	 PRO-DWG-107	0-100 %	BPCS RTU/PLC	JB-130	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
LCV-104	1,050 psig inlet, 0 psig outlet (liquid) / 70 °F	1,150 psig / 120 °F	1,440 psig / -20 to 150 °F
ZT-104	1,050 psig / 70 °F	1,150 psig / 120 °F	1,440 psig / -20 to 150 °F
TCV-152	10 psig fuel / ambient	25 psig (PCV-162 set) / 110 °F	Class 150 / -20 to 150 °F
ZSL-152	10 psig fuel / ambient	25 psig / 110 °F	Class 150 / -20 to 150 °F
ZT-152	10 psig fuel / ambient	25 psig / 110 °F	Class 150 / -20 to 150 °F
FCV-131	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
FCV-132	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
ZT-131	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
ZT-132	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

ACTUATOR SCHEDULE

Table 1-5 sets the power, speed and failure action of each actuator.



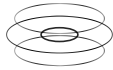
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Table 1-5: Actuator Schedule

Tag	Valve	Power	Full stroke	Fail action	Safety input	Duty class
FCV-131	NPS 8 Class 600 globe, cage, low-noise trim	480 V, 3 phase	30 to 60 s (HOLD H-15)	As-is	No	S4 or S9, 1,200 starts/h
FCV-132	Identical to FCV-131	480 V, 3 phase	30 to 60 s	As-is	No	S4 or S9
LCV-104	NPS 1 Class 600 globe, liquid dump	120 VAC	15 s	As-is	HS-104T force close	S4
TCV-152	NPS 1 globe, fuel gas	120 VAC	15 s	As-is, mechanical low-fire stop	No; burner valves trip	S4

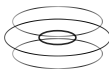
Note 1: Every actuator has a declutchable handwheel.

SPECIFICATION

Table 1-6: Specification

Item	Requirement
Actuator type	Electric modulating, brushless or induction motor with solid-state reversing; self-locking gear train that holds position on loss of power
Control signal	4 to 20 mA demand with HART; stays put on loss of signal
Position feedback	Integral two-wire 4-20 mA transmitter, non-contact sensor, isolated from the demand circuit, accuracy 0.5 %
Resolution and deadband	Resolution 0.25 % of stroke or better; deadband adjustable 0.1 to 2 %, set 0.5 % on the FCVs; overshoot not above 1 %
Stroking speed	FCVs 30 to 60 s, adjustable, to be confirmed against the pressure transient with PIC-134 (HOLD H-15); LCV-104 and TCV-152 about 15 s
Modulating duty	IEC 60034-1 S4 or S9, at least 1,200 starts per hour, continuous modulation
Thrust or torque	At least 1.25 times the valve requirement at 1,440 psig shutoff; seat leakage ANSI/FCI 70-2 Class IV (FCVs and TCV-152) and Class V (LCV-104)
Diagnostics	Fault relay opening on fault, local/remote status, torque or thrust trip, motor overtemperature, torque profile logger
LCV-104 safety input	Separate hardwired close input HS-104T from the safety PLC, energize to close
Local controls	Local/Off/Remote selector padlockable; open and close pushbuttons; LCD position
ZSL-152 low-fire switch	Actuator-integral explosion-proof SPDT switch made at the TCV-152 low-fire stop, wired to BMS-150 as the low-fire start permissive (API RP 556)
Hazardous area rating	Explosion-proof, Class I, Division 1, Group D, T4; NEMA 4X
Environmental	-40 to 158 °F; internal space heater
SIL capability	Not required
Tagging	316 SS plate
Inspection and testing	Factory test on the valve: stroke, linearity at 0, 25, 50, 75 and 100 %, step response to 1 % and 10 % steps, dead time, feedback calibration
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; actuator sizing sheet



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OPEN ITEMS

Table 1-7: Open Items

HOLD	Item	Responsible party
H-15	Actuator model, speed and thrust	Vendor
TBV	Valve sizing, trim and shutoff class	Volume 1 control valve datasheets

