

CML Electric Actuator for Baumann™ 24000 Series

CML-250 and CML-750 electronic modulating valve actuators feature state-of-the-art brushless DC motor technology to provide unrestricted, continuous modulation and exacting position control. Performance of these actuators rivals the power of our pneumatic diaphragm sliding-stem designs.

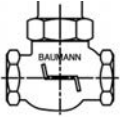
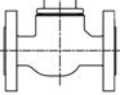
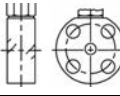
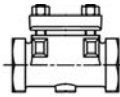
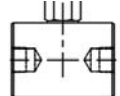
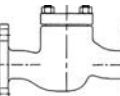
Features

- **Integral Servo Amplifier/Positioner; AC or DC pulse (optional):** Accepts 4-20 mA input signal as standard; dry contact closure
- **Wide Ambient Temperature Operating Range:** -30 to 70°C (-22 to 158°F)
- **Motor Enclosure:** Standard: CSA explosion-proof for Class I, Div 1, Groups C & D; Dust-ignition-proof for Class II, Div 1, Groups E, F, G. Also rated NEMA 4, and 6 (IP67) indoor/outdoor
- **Excellent Positioning Accuracy:** Adjustable deadband 0-10% of analogue signal
- **Brushless DC Motor Technology:** Unrestricted continuous modulating duty
- **Fits Baumann 24000 Series Sliding-Stem Valve Designs:** Baumann 24000 series family of bronze, carbon steel, stainless steel, and special alloy designs, see table 1
- **Top-Mounted Manual Override:** Permits manual operation with loss of power
- **Built-in Loop-Powered Position Transmitter:** 4-20 mA signal
- **Easy Push Button Calibration**



Baumann 24000 CVF Valve with
CML-250 Electric Actuator

Table 1. Valve Body Selections for Electronic Actuators

VALVE BODY STYLE	VALVE SERIES	VALVE BODY MATERIAL	AVAILABLE SIZES	VALVE BODY RATING	AVAILABLE CONNECTIONS	APPLICATION TEMPERATURE RANGE	Cv RATING
			NPS				
	24000	Bronze	1/2 3/4 1 1-1/2 2	ASME CL250	NPT	-20 to 400°F	0.2 - 50.0
	24000C	Carbon Steel WCC	1/2 3/4 1 1-1/2 2	ASME CL150 / PN40 per EN 1092-2	ASME CL150RF or PN10-PN40 RF	-320 to 450°F	0.2 - 52.9
	24000F	316L CF3M	1/2 3/4 1	ASME CL600	Wafer Design CL150/300/600	-320 to 1000°F	0.0005 - 6.5
	24000S	316SS CF8M	1/2 1 1-1/2 2 3	ASME CL300	NPT, Flangeless, or Butt weld	-320 to 1000°F	0.0005 - 61
	24000SB	316L CF3M	1/2 3/4 1	3000 psig	NPT, Socket/Butt weld CL150 - 1500RF	-320 to 1000°F	0.0005 - 6.8
	24000SVF 24000CVF	316L SS CF3M WCC	1/2 3/4 1 1-1/2 2	ASME CL150 or CL300, PN10-40 per EN 1092	ASME CL150 or 300RF, PN10-40 RF	-320 to 850°F	0.0005 - 53.7

Related Documents

- CMA Installation and Maintenance Manual ([PUB094-009](#))
- CMA Range Quick Start Guide ([PUB094-007](#))

Table 2. CML-250 Valve Pressure Drop Limitations (Based on 200 lbf thrust @ 0.13 in/sec)

ORIFICE DIAMETER ⁽¹⁾		SEAT AREA (in ²)	STEM TRAVEL		MAXIMUM SHUTOFF PRESSURE ⁽²⁾			
mm	inch		mm	inch	Class IV		Class VI	
					bar	psi	bar	psi
6.35	0.25	0.08	12.7	0.50	172	2500	157	2280
7.94	0.3125	0.11	12.7	0.50	---	---	111	1615
9.53	0.375	0.15	12.7	0.50	91	1330	79	1155
20.64	0.8125	0.60	12.7	0.50	22.9	330	16.4	235
27.0	1.0625	0.89	12.7	0.50	13.8	200	8.5	125
31.80	1.25	1.35	19.1	0.75	10.2	145	5.7	80
38.10	1.50	1.92	19.1	0.75	7.1	100	3.4	45
50.80	2.00	3.34	19.1	0.75	4.0	55	1.2	15

1. See respective valve bulletins for port diameters.
2. Do not exceed valve body pressure-temperature rating.

Table 3. CML-750 Valve Pressure Drop Limitations (Based on 750 lbf thrust @ 0.018 in/sec)

ORIFICE DIAMETER ⁽¹⁾		SEAT AREA (in ²)	STEM TRAVEL		MAXIMUM SHUTOFF PRESSURE ⁽²⁾			
mm	inch		mm	inch	Class IV		Class VI	
					bar	psi	bar	psi
6.35	0.25	0.08	12.7	0.50	206	3000	206	3000
7.94	0.3125	0.11	12.7	0.50	---	---	206	3000
9.53	0.375	0.15	12.7	0.50	206	3000	206	3000
20.64	0.8125	0.60	12.7	0.50	85.8	1245	80.6	1170
27.0	1.0625	0.89	12.7	0.50	51.8	750	47.9	695
31.80	1.25	1.35	19.1	0.75	38.0	550	34.6	500
38.10	1.50	1.92	19.1	0.75	26.9	390	23.9	345
50.80	2.00	3.34	19.1	0.75	15.3	220	13.1	190

1. See respective valve bulletins for port diameters.
2. Do not exceed valve body pressure-temperature rating.

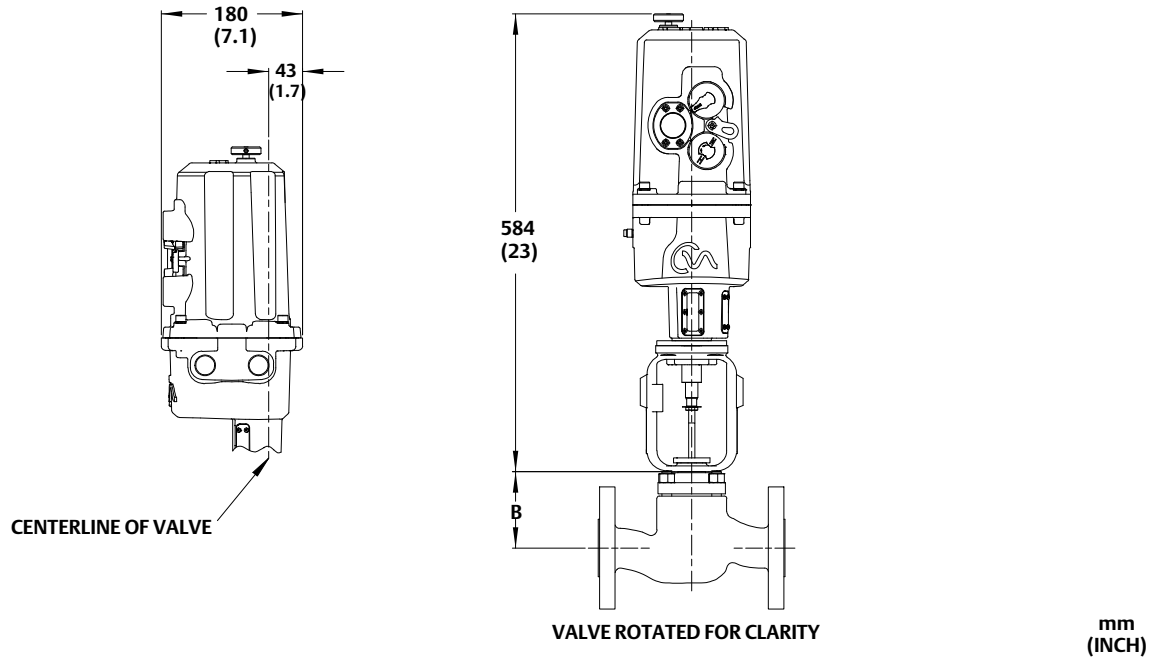
Specifications

See table 4 for actuator specifications.

Table 4. Actuator Specifications

ACTUATOR	CML-250	CML-750
ACTUATOR HOUSING	Cast Aluminum	
ENVIRONMENTAL RATINGS	FM, CSA, ATEX, IEC	
OPTIONAL RATINGS	FM, CSA, ATEX, IEC	
STANDARD ENCLOSURE	FM NEMA 4 and 6 / IP67 Class 1 Div 1 Gr C, D Class II Div I E, F, G	
STANDARD TEMPERATURE RATING	-30°C to 70°C (-22°F to 158°F)	
HAZARDOUS AREA TEMPERATURE RANGE	-20°C to 65°C (-4°F to 150°F)	
CONDUIT CONNECTION	3/4" - 14 NPT (M25 x 1.50p optional)	
MOTOR TYPE	Brushless DC	
OPTIONAL VOLTAGES	120VAC, 240VAC, 24VDC (24VAC not available)	
STANDARD POWER	120VAC/240VAC	
THRUST RATING	250 lbs Mod/Run (1112.1 N) 375 lbs Seating (1668.1 N)	750 lbs Mod/Run (3336.2 N) 1125 lbs Seating (5004.2 N)
THRUST ADJUSTABILITY	60-150% Rated Thrust	
MAX SPEED	0.13 in/sec (adjustable from 50-100%)	
MAX STROKE	38.1 mm (1.5 inch)	50.8 mm (2 inch)
STANDARD CONTROL	Full range 4-20mA / Split Range 4/12 or 12-20mA ** optional: 0-5Vdc and 0-10Vdc	
STANDARD FEEDBACK	4-20mA loop powered feedback (Includes 2 adjustable relay outputs)	
CONTROL OPTIONS (SPECIAL)	Discrete On/Off RIRO (24Vdc or 120VAC control), HART, Foundation Fieldbus, DeviceNet, Profibus, Modbus, PaksScan	
HMI/GUI SETUP	LCD - TEXT	
MODULATING DUTY CYCLE	Unrestricted and Continuous	
RESOLUTION	0.2% (adjustable deadband 0-10% of analogue signal)	
SENSITIVITY	0.2%	
RESPONSE TIME	20 milliseconds	
STANDARD FAILURE ACTION	Close valve/Open Valve/Hold-in-Place/Fail to Position on loss of input signal (selectable), Holds in place on power failure (standard)	
CUSTOMER SETTINGS SAVED	Yes (standard)	
POWER BACKUP OPTION	Available: Super Capacitors, Fail to Position on Loss of Power, Adjustable to Fail Closed/Fail Open/Fail to Position/Fail in Place	
LOCAL CONTROL OPTION	Available: Separate option, Local Controls come standard with Super Capacitor Power Back-up	
WEIGHT (ACTUATOR ONLY)	8.3 kg (18.4 lbs)	11.5 kg (25.4 lbs)

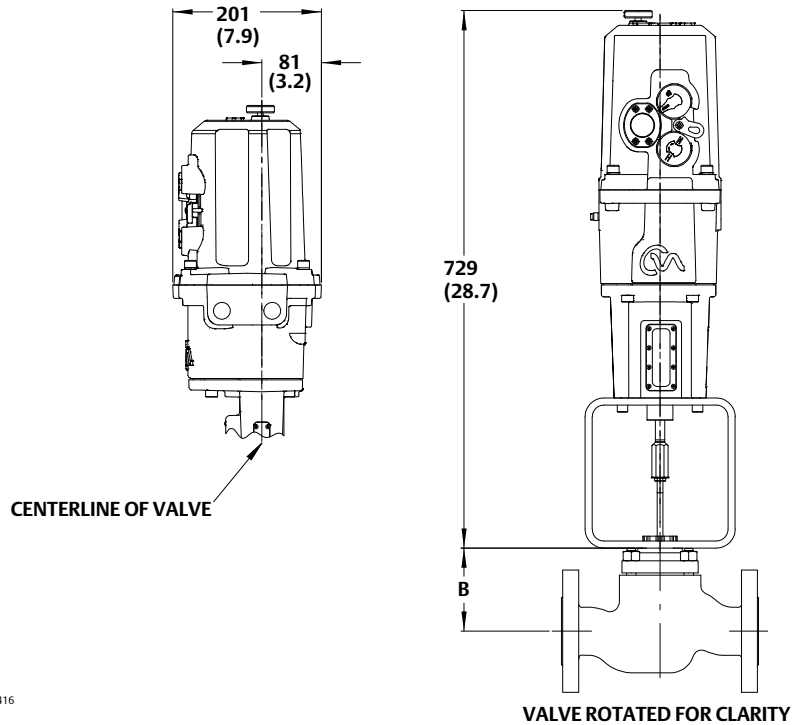
Figure 1. CML-250 Dimensions



CE90415

Note: B dimension varies upon valve selection; reference appropriate valve bulletin.

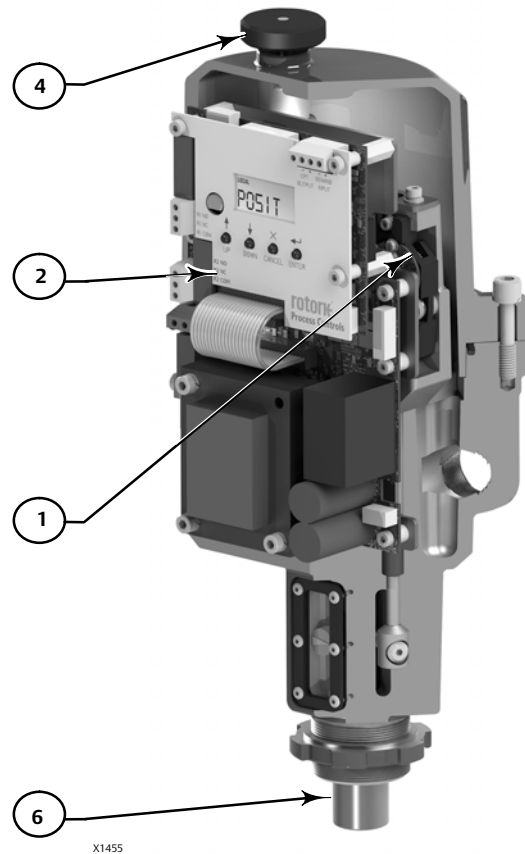
Figure 2. CML-750 Dimensions



CE90416

Note: B dimension varies upon valve selection; reference appropriate valve bulletin.

Figure 3. CML Linear Actuator Key Actuation Components



Key Action Components

1. Encoder Technology

The CML utilizes absolute encoder technology where a unique digital code corresponds to the stroke length of the actuator.

To achieve high resolution, the position sensor location eliminates any backlash effect in the gearing. The sensor is 12-bit for the CML, fitted at the output gear stages, removing any internal backlash effect that may exist in the drive train.

2. User Interface

Two programmable relays energize upon reaching a desired position or any other available condition among the programmable options.

Field selectable adjustments for:

- Deadband
- Zero and span
- Command signal type
- Standard or reverse acting
- Manual-auto operation
- Fail to position on loss of signal capability

3. DC Brushless Motor

The CML uses a high efficiency, continuous rated, brushless DC motor allowing for maintenance-free operation with continuous modulation duty.

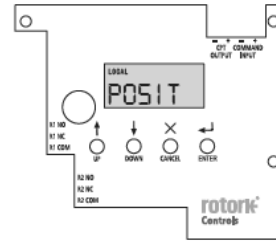
4. Hand Drive

A hand drive mechanism is provided as standard for all CML actuators to allow manual operation of the valve. Pressing down on the hand-knob shaft engages a gear in the upper section of the drive train and releasing the knob causes the spring to disengage the gear.

5. Gear train

The simple yet durable high efficiency spur gear drive is lubricated for life with proven high reliability.

Figure 4. Programmable User Interface



E1660

**CML-250 AND CML-750
MAJOR COMPONENT IDENTIFICATION**

6. Output Drive

The CML may be adapted to suit individual valves.

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