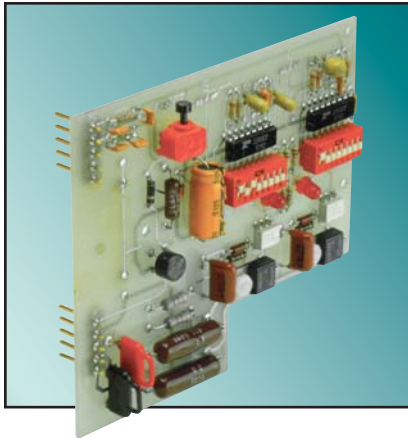




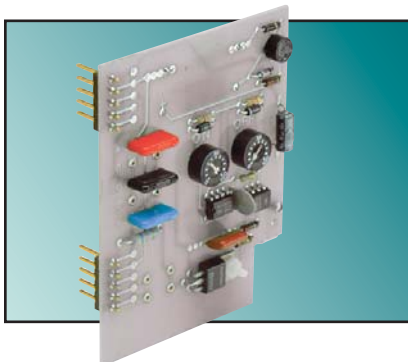
Electric Actuator Accessories

Extended Descriptions



Timer Board—Suffix A

Timer board installs within actuator enclosure. Board shown is for EVR, EVS, and EVT actuators.



Cycle Time Rate Regulator—Suffix B

Cycle time rate regulator installs within actuator enclosure. Board shown is for EVS and EVT actuators.

Timer Board

115 VAC Input—Suffix A

(For EVR, EVS & EVT actuators)

The timer board is a solid state device that allows the user to program actuators to automatically control valves in repetitive on/off functions. The switches for programming the “on” time provide 255 options for setting the length of time the valve remains open. This can range from 6 seconds to 25 minutes. The other set of switches, for programming the “off” time, provide 255 more options to set the length of time the valve remains closed. This range is from 5.5 minutes to almost 24 hours.

Cycle Time Regulator

115 VAC Input—Suffix B

(For EVS & EVT actuators)

The cycle time regulator board allows speed adjustment for both the “opening” and “closing” cycles of the actuator. The adjustments are only available for slowing the cycle down to “pulse” the motor either open or closed. This feature is used primarily to avoid water hammer or large, abrupt flow variations. Cycle time adjustments range from 3-300 times the standard cycle time (depends on torque of actuator model).

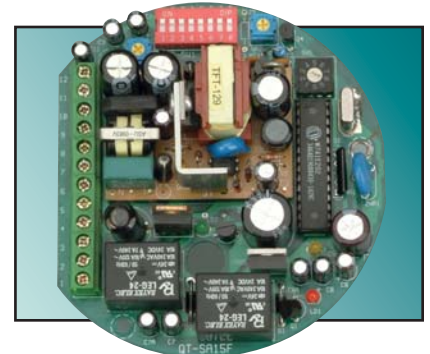
Positioners

Suffix C2E

(For EJM, EVS & EVT actuators)

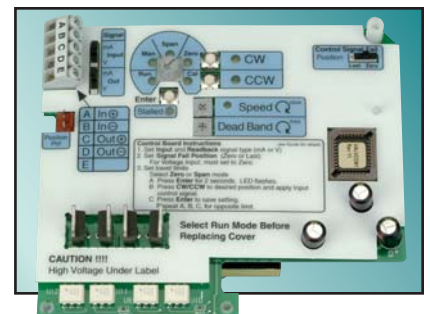
EJM positioners are used for flow-throttling applications in response to an external control signal received from a control panel (or PLC). The signal is usually in the form of current (4-20 mA range), or DC voltage (0-10 VDC range). The positioners have a simple selector switch on the circuit board so that the user can choose either the 4-20 mA or 0-10 VDC control signal, depending on which signal is being transmitted by the control panel (or PLC). The positioners are preset at the factory so at 4 mA

(or 0 VDC), the valve will be in the full closed position, and at 20 mA (or 10 VDC), the valve will be in the full open position. If the positioner receives an external signal within the range of 4-20 mA (or 0-10 VDC), the actuator will simply rotate the valve to achieve a specific position within the 0°-90° of rotation, thus achieving a specific downstream flow rate.



EJM Positioner Board—Suffix C2E

EVS & EVT—actuator positioners contain a few more features on the circuit board than just positioning. **Position Retransmit** (4-20 mA or 0-10 VDC) if chosen to send the current position signal to another electrical device in the process flow loop, **Speed Control** for slower rotation and less sudden flow rate changes, **Adjustable Dead Band** to tune-out surrounding “machine noise” that may interfere with the control signal, and selectable **Position Response** in case of lost control signal (either the actuator can stay in its current position or travel to the home/close position.)



EVS/EVT Positioner Board—Suffix C2E



Electric Actuator Accessories

Extended Descriptions

180° Center-Off

Suffix D

(For EVR, EVS & EVT actuators)

180 degree center off is used with three-way valves. A 2-hole ball (TW) is installed in the valve to provide an OFF position. The actuator moves the ball 180 degrees in 90 degree increments.

This feature is also useful when used with true union blocked end valves for two stage shut-off or dribble control.

Consult factory if this feature is used on actuators with auxiliary limit switches, Suffix S, S2, and S3.

Extended Duty Cycle Motors

75 to 100%—Suffix E

(Standard with all EVS and EVT actuators. Standard with EJM actuators with positioner option)

Actuators for on/off service typically have motors that are rated for a duty cycle of 25%. Actuators used for modulating valves must have motors that are rated at 75 to 100%.

Modulating valves are often required to cycle frequently which increases the heat generation of the motor and increases the temperature within the housing. Extended duty motors are used to allow more frequent periods of operation without overheating.

Mechanical Brake

115 VAC Standard—Suffix K

(For EVS & EVT actuators. Standard on EVR actuators.)

Used when the actuator must be stopped instantaneously and securely. It eliminates actuator "drifting" or "hunting" due to internal valve pressure of turbulence. Mechanical brake is required on butterfly valves to prevent the fluid force on the valve's disc from causing the disc to rotate.

FLOW AT	"TW" BALL	
	AVAILABLE "HCTW" PREFIX	
0°	Port A	Port B
90°	Port A	Port B
CENTER-OFF		
180°	Port A	Port B

Re-Transmitter

115 VAC Input/ 4-20 mA Output—Suffix G

(For EVS & EVT actuators)

The re-transmit module provides a 4-20 mA output signal directly proportional to the actuator/valve angular output drive movement or position. The module has an accuracy of ±0.5% within its rated voltage/temperature bands. This module includes its own power supply.

Note: Use a dual potentiometer when using the re-transmit module if a remote resistance signal is required for EWC or EWB actuators.



Electric Actuator Accessories

Extended Descriptions



Electric Fail-safe (Battery)-Suffix L2

For EVS and EVT actuators.

Electric Fail-Safe (Battery)

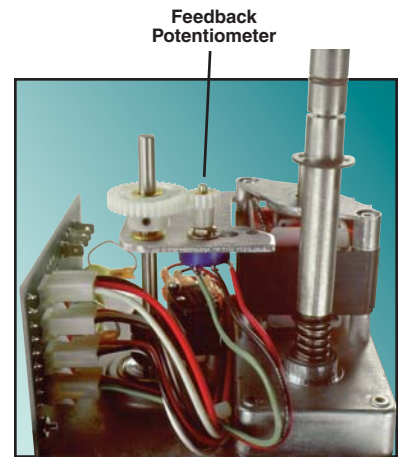
Suffix L2

(For EVS & EVT actuators)

The electric fail-safe board allows the shut down of the process system in the event of an AC power loss. Engineered to supply dependable valve actuation to fail-open or fail-closed. Upon loss of power it can provide up to 15 complete cycles under its own power. The electric actuators are driven by a powerful DC motor that runs on either AC or DC input voltage. The electric fail-safe feature incorporates a rechargeable battery pack on a plug-in modular PC board under the actuator cover. Upon power loss or a signal from an external sensor, the battery pack is automatically activated as the motor power supply. During normal operation, the unit monitors the battery pack to keep it fully charged. After a failure, and once power is restored, the recharging cycle is reactivated. LED indicator shows charge condition. It is recommended that a heater and thermostat be specified if the operational temperature falls below 40°F.

Battery Replacement

- Should be replaced every 18 to 24 months.



Feedback Potentiometer-Suffix P, P2, and P3

For EJM, EVS, and EVT actuators.

Feedback Potentiometer

Suffix P, P2, and P3

(For EJM, EVS & EVT actuators)

A potentiometer provides continuous, remote status indication of the position of the valve at a control panel or other monitoring equipment. The standard usage is 0 to 1000 ohms, but other resistive values can be supplied.

- Use 90°, 0 to 1000 ohms for two-way valves—Suffix P
- Use no-stop, 0 to 1000 ohms for three-way valves—Suffix P2
- Use dual, 0 to 1000 ohms for applications requiring two distinct feedback signals—Suffix P3



Electric Actuator Accessories

Extended Descriptions



Suffix S shown

Auxiliary Limit Switches— Suffix S to S3

Auxiliary Limit Switches

Suffix S, S2, and S3

(For EVR, EVS & EVT actuators)

A maximum of three additional limit switches can be installed (see Electric Actuator Specifications and Accessories—page 75). Switches are SPDT, rated at 10A @ 250 VAC, and are pre-wired to the internal terminal strip.

Auxiliary limit switches may be set to open/close at any point during the 90° rotation. These are dry contacts, and may be used to trigger alarms, illuminate indicator lights, and other similar devices.

Heater & Thermostat

Suffix T

(For EVR, EVS & EVT actuators, standard on EJM actuators)

A heater and thermostat are designed to electrically warm the inside of the actuator enclosure to approximately 40°F. Its purpose is to inhibit condensation, facilitate better lubrication, and prolong fail-safe battery life in environments as cold as -40°F.

Special Enclosure NEMA 4/4X/7/9

Suffix X2

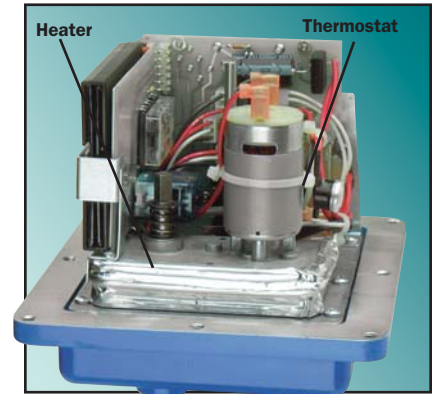
(For EVS & EVT actuators)

In addition to being water and corrosion resistant, these enclosures meet NEMA specifications for Class 1, Division 1 groups A, B, and C Explosion-proof as well as Class 1, Division 1 groups D, E, and F dust-proof.

Optional Motor Voltages—See Below for Respective Suffix

(For all actuators)

- 12D—12 VDC
- 24D—24 VDC
- 24A—24 VAC
- 220A—220 VAC



Heater and Thermostat—Suffix T
For EVR, EVS, and EVT actuators.

Surge Protector—

Suffix W

(For EVS & EVT actuators)

The surge protector, (also known as “voltage transient suppression board”) is designed for installation in 120/240 VAC actuators, and used to protect against voltage surges that could damage the actuator. This module will also protect the capacitors used within each actuator.

Second Conduit Entry

Suffix Y

(For EVS & EVT actuators)

Some applications and electrical codes require that control wires be run in a separate conduit from the power supply wires. A second 1/2” NPT conduit connection can be provided for this purpose.



Electric Actuator Specifications and Accessories

Features/ Accessories/Voltages		General Specifications				
		Actuator Model				
Standard Actuator Features		EATB	EAU	EVR	EVS/EVT	EJM
Motor Drive Rotation		Uni	Uni	Rev	Rev	Rev
NEMA Rating (Available)		4, 4X	4, 4X	4, 4X	4, 4X	4, 4X
Enclosure Material (Top/Bottom)		GFPPL/GFPPL	GFPPL/GFPPL	PVC/ZA	Al/Al	Al/Al
Manual Override (De-Clutching)				Standard	Standard	Back-Drive
Position Indicator				Standard	Standard	Standard
Position Indication w/LED		POA	POA	POA	POA	POA
Standard Voltage (VAC)		115	115	115	115	115
Prewired to Terminal Strip			Standard	Standard	Standard	Standard
Motor Thermal Protector		Standard	Standard	Standard	Standard	Standard
Automatic Reset		Standard	Standard	Standard	Standard	Standard
Auxiliary Limit Switches (SPDT)			1 STD	Optional	Optional	2 STD
Auxiliary Limit Switch (Amp Rating)		5	5	10	15	EJM 2&3 5, all others 15
Low Ambient Limit without "T" (°F)		40°F	40°F	40°F	40°F	N/A
High Ambient Limit (°F)		160°F	160°F	160°F	160°F	150°F
Motor Brake		Standard	Standard	Standard	Optional	Self-Locking Gearing
Conduit Entry Size, NPT		1/2"	1/2"	1/2"	1/2"	1/2"
Permanent Lubrication		Standard	Standard	Standard	Standard	Standard
Mounting Position		Any	Any	Any	Any	Any
Min/Max Wire Size		18/16	18/16	18/14	18/14	20/12
Optional Actuator Accessories	Suffix	EATB	EAU	EVR	EVS/EVT	EJM
Timer Board	A			Optional	Optional	
Cycle Time Rate Regulator	B				Optional	
Positioner (4-20 mA)	C2E				Optional	Optional
180 Degree Center-Off	D			Optional	Optional	
Extended Duty	E				Standard	Optional
Handwheel	H			Optional		Standard
Mechanical Brake	K		Standard	Standard	Optional	Self-Locking Gearing
Electric Fail-safe (Battery Backup)	L2				Optional	
Feedback Potentiometer						
90 Degree, 0 to 1000 Ohms	P				Optional	Optional
No-Stop, 0 to 1000 Ohms	P2				Optional	
Dual, 0 to 1000 Ohms	P3				Optional	
Auxiliary Limit Switches Available*						
Auxiliary Limit Switch w/cam 1	S			Optional	Optional	
Auxiliary Limit Switch w/cam 2	S2			Optional	Optional	Standard
Auxiliary Limit Switch w/cam 3	S3				Optional	
Heater & Thermostat	T			Optional	Optional	Standard
Enclosure, NEMA 4,7,9	X2				Optional	
316 SS Tags w/Stamped Valve Numbers	YSS2	Optional	Optional	Optional	Optional	Optional
Optional Voltages	Suffix	EATB	EAU	EVR	EVS/EVT	EJM
12 VAC	12A		Optional			Optional
24 VAC	24A		Optional	Optional	Optional	Optional
220 VAC	220A		Optional	Optional	Optional	Optional
12 VDC	12D		Optional	Optional	Optional	Optional
24 VDC	24D		Optional	Optional	Optional	Optional

*Should additional auxiliary limit switches be required greater than quantity shown, consult factory.

- Notes:**
1. K Option, Mechanical Brake, is required with Actuators for butterfly valves.
 2. E Option, Extended Duty, is included with Positioners.
 3. EVS and EVT Actuators can be CSA certified. Price on application.
 4. Positioners with 12-24 VDC input are available. Consult factory.
 5. EJM Actuators over 800 in-lb torque include handwheel.

Important Note: The valve and actuator combinations shown in this catalog have been tested and approved by Hayward Flow Control Systems when properly installed into compatible process systems. Should actuators, accessories or mounting hardware other than those supplied by Hayward be used for the operation of these valves, the installer assumes all responsibility for the performance of those valves.