For Modulating Control with 0 to 10 VDC or 4 to 20 mA Controllers

The "P" Series modulating valves are designed for precise control of fluid flow in a wide variety of heating and cooling applications.

The micro-processor-controlled "P" Series valves are compatible with virtually any 0 to 10 VDC or 4 to 20 mA signal. Feedback is accomplished through optical sensing of reflective and non-reflective areas on the clutch housing of the actuator. This non-contact method provides much longer life than a mechanical potentiometer interface.

Features

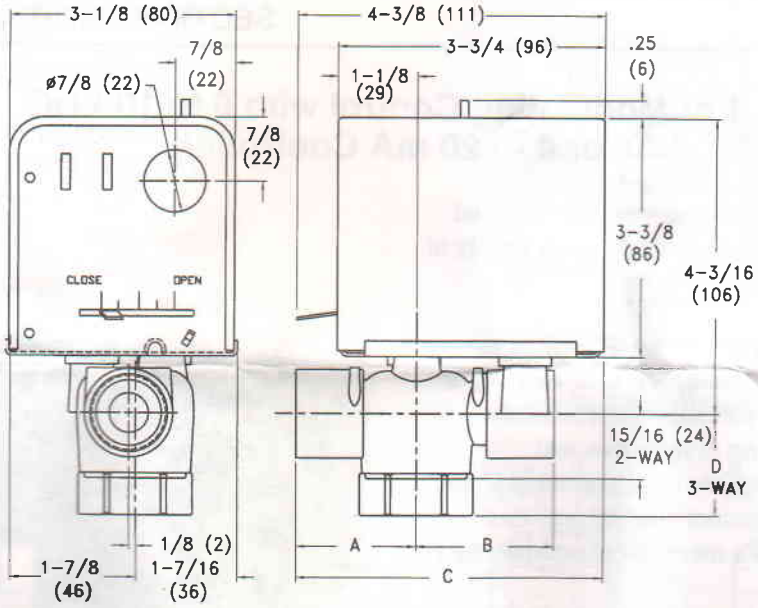
- Magnetic clutch for high reliability and long life
- Microprocessor for self calibration and diagnostics
- Jumper selectable operating range and action
- Manual opening lever/position indicator
- Linear or equal percentage flow characteristics
- Three LEDs for user information and diagnostics

Figure 1: "P" Series Modulating Valves 1/2 " Body Style Shown

Specifications

Operating Pressure Limits	300 PSI (20.7 Bar)
Flow Characteristic .7 to 4.0 Cv 8.0 Cv	Equal Percentage Service, Linear Bypass Linear Service, Linear Bypass
Service	Hot and Chilled Water, up to 50% Glycol
Supply Voltage	Nominal 24 VAC, -15%, +25%, (20-30 VAC), 50/60 Hz
Control Signal	Nominal 0 to 10 VDC, Actual 1.0 to 9.0 VDC Jumper-Selectable 0 to 5 VDC, 5 to 10 VDC, 0-10 VDC Operation, or 4-20mA Control
Control Action	Direct Acting (Valve opens on increase in signal) Field Selectable Reverse Acting
Input Impedence	Voltage 200kΩ Current 150Ω
Current Rating	200 mA Maximum (5 VA)
Stroke Speed	2 Minutes from Full Open to Full Close at 60 Hz
Maximum Close-off Pressure	50 PSI (344 kPa) for C_V from 0.7 to 2.5 35 PSI (240 kPa) for C_V of 4.0 and 8.0
Seat Leakage (Service port)	Zero Leakage (100% Bubble-Tight Close-Off)
Fluid Temperature Limits	32 to 200F (0 to 93C)
Max. Ambient Temperature and Humidity	125F (52C) at 95% RH (Non-Condensing)
Shipping Weight	3.0 lbs. (1360 g)

The specifications above are nominal and conform to generally acceptable industry standards. Erie Controls is not responsible for damages resulting from misapplication or misuse of its products.



VALVE BODY STYLE	A	B	C	D
654 1/2 " SWEAT	1-5/16 (34)	2-3/16 (56)	3-15/16 (100)	1-3/8 (34)
635 3/4 " SWEAT	1-5/16 (34)	2-3/16 (56)	3-15/16 (100)	1-3/4 (34)
691 1/2" FNPT 692 1/2" FBSP	1-5/16 (34)	2-3/16 (56)	3-15/16 (100)	1-5/16 (34)
672 3/4" FNPT 673 3/4" FBSP	1-3/4 (45)	2 (50)	4-3/8 (111)	1-1/2 (37)
682 3/4" MBSP	1-3/16 (30)	2-7/16 (61)	3-3/16 (80)	1-7/16 (36)
647 INVERTED FLARE	1-5/16 (34)	2-3/16 (56)	3-15/16 (100)	1-5/16 (34)
747 INVERTED FLARE 773 1" FNPT 774 1" FBSP	1-7/8 (47)	1-7/8 (47)	4-1/2 (114)	1-5/8 (42)
751 1" SWEAT	1-3/4 (45)	2-3/8 (60)	4-1/8 (105)	1-1/2 (37)

Figure 2: Dimensions, in.(mm)

0 _ _ _ P 0 2 _ _ E A 0 0

BODY STYLE/SIZE		Cv	2-WAY	3-WAY
1/2 " SWEAT	654	0.7	81	91
3/4 " SWEAT	635	1.5	82	92
1" SWEAT	751**	2.5	83	93
1/2 " NPT	691	4.0*	84	94
1/2" FBSP	692	8.0**	85	95
3/4 " NPT	672			
3/4" FBSP	673			
3/4" MBSP	682			
1" NPT	773**			
1" FBSP	774**			
1/2" INV. FLARE	647			
1" INV. FLARE	747**			

Note: Inverted flare models (647 & 747) require fittings. Please see catalog pages MT-29 and MT-30 for selections.

Example: To order a 1/2" NPT valve, 2-way, with 1.5 Cv, specify: 0691P0282EA00
*Not available in 647 style. **Available only in 1" models (747.751.773.774)
**Available only in 8.0 Cv Configuration

Figure 3: Ordering Data

Piping

The "P" Series modulating valves must be piped such that *the plug closes against the direction of flow.* For 2-way valves, flow is from B to A. For 3-way valves, B is the service port and A is the bypass port. **The three way valve must be piped in a mixing configuration.** Refer to Figure 4.

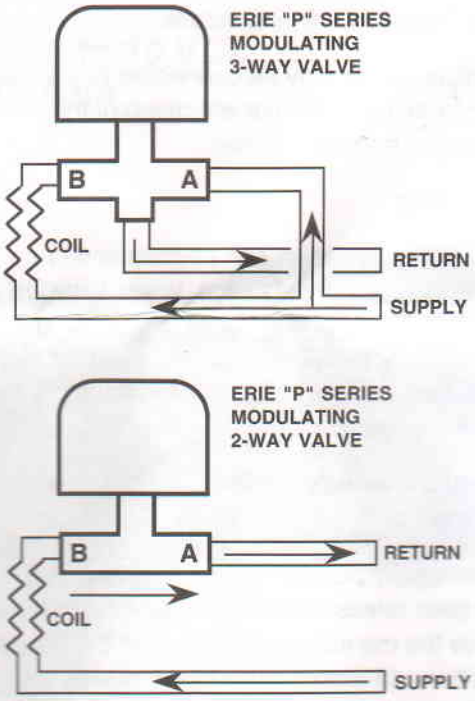


Figure 4: Piping Details

Field Set-Up

Operating Range

The "P" Series actuator is furnished with a jumper to allow for different operating ranges of the valve (see Figure 5). All units are shipped with the jumper in the "0 to 10" VDC position. To change the operating range, at any time, simply remove the jumper and install it on the 0 to 5 VDC or 5 to 10 VDC pins, or 4 to 20 mA pins.

Control Action

The actuator is also provided with a jumper to allow the action to be reversed. All units are shipped with the actuator in the DA (direct acting) mode, which means that the valve opens upon receiving an increasing control signal. To change the action to reverse action (valve closes upon receiving an increasing control signal), simply remove the action jumper and relocate it to the RA (reverse acting) pins.

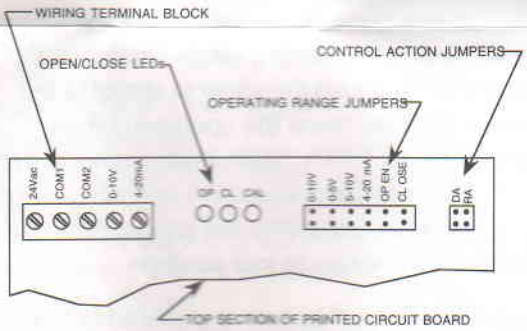


Figure 5: Actuator Board Features

Calibration

The "P" Series valve self-calibrates on power-up by counting the motor rotations as the valve runs full stroke. It resets its zero position every time the valve closes and re-zeros every ten days. While calibrating and running, LEDs indicate the status of the valve. The LEDs also aid in the diagnosis of any problems.

Status Indication

Set Point Satisfied: All LEDs off and motor off.

Valve Closing: Red LED on continuously, except 4-5 times per second indicating motion detection.

Valve Opening: Green LED on continuously, except 4-5 times per second indicating motion detection.

Calibrating and Zeroing: Red and Green LEDs as above and Yellow LED flashing twice per second.

Low Power-up Voltage (< 20 VAC): Red and green LEDs off, Yellow LED flashing twice per second.

Low Operating Voltage (<18 VAC): All LEDs off. Position maintained if power is restored within 5 seconds.

Motor/Circuit Failure: Red, Green, and Yellow LEDs on continuously. No operation until power loss or daily reset.

Gear Failure: Yellow LED on, normal operation attempted.

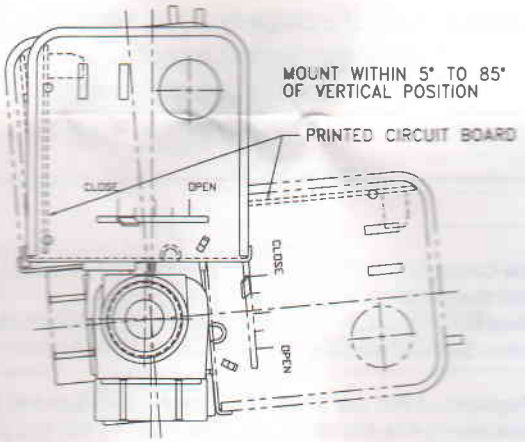


Figure 6: Mounting Instructions

Wiring

See Figure 7 for wiring details.

Multiple valves may be connected to a single controller, up to the current rating of the controller and transformer.

Mounting

The "P" Series valve can be mounted in horizontal or vertical piping. When installed in horizontal piping, the actuator must be above the valve body, with the circuit board protected from moisture damage. See Figure 6 for mounting limitations.

Manual Override Feature

Without 24 VAC Supply

To manually position valve, simply press the red gear release button on top of the valve and move the manual position lever to the desired position. (If moved while under power, the calibration will be invalid until the valve reaches fully opened or closed.)

With 24 VAC Supply

To manually position the valve while it is under power, use the operating range jumper (see Figure 5). To cause the valve to stroke to the closed position, place the operating range jumper on "CLOSE". To cause the valve to stroke to the open position, place the operating range jumper on "OPEN". With the jumper removed, the valve will stroke to mid-position.

Note: A "time out" feature is provided to turn the motor (and LEDs) off within 5 seconds of reaching fully open or closed.

Caution: Use of a properly sized, inherently limited, Class 2 transformer is recommended. Continuous operation with supply voltages well above the nominal may reduce motor life.

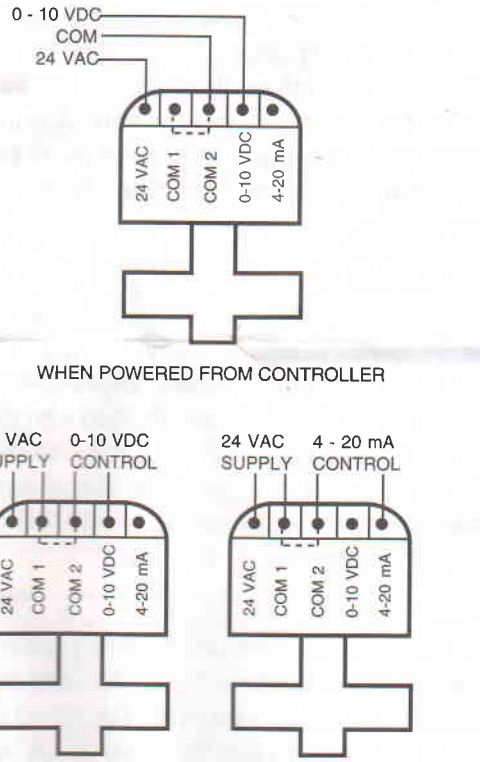


Figure 7: Wiring Details

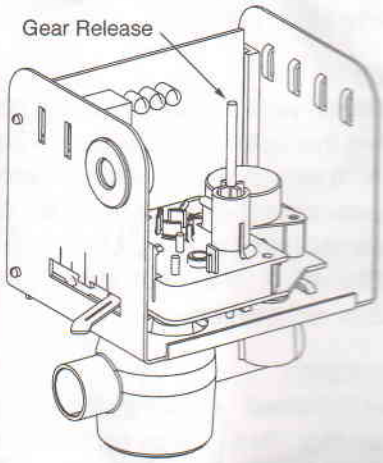


Figure 8: Isometric View, Cover Removed

Erie Controls
4000 South 13th Street
Milwaukee, WI 53221
United States of America

Telephone +1 800 558 3916
Facsimile +1 414 483 6610

Erie Controls-Canada
RR 3
Stouffville, Ontario L4A 7X4
Canada

Telephone +1 905 640 2363
Facsimile +1 905 640 2256

Erie Controls-Europe
Industriepark Wolfstee
B-2220 Heerentals
Belgium, Europe

Telephone -32 1421 4095
Facsimile -32 1421 4881

Erie Controls-Hong Kong
22nd Floor Silvertech Tower
26 Cheung Lee Street
Chai Wan, Hong Kong

Telephone +1 852 2515 3731
Facsimile +1 852 2898 2935

