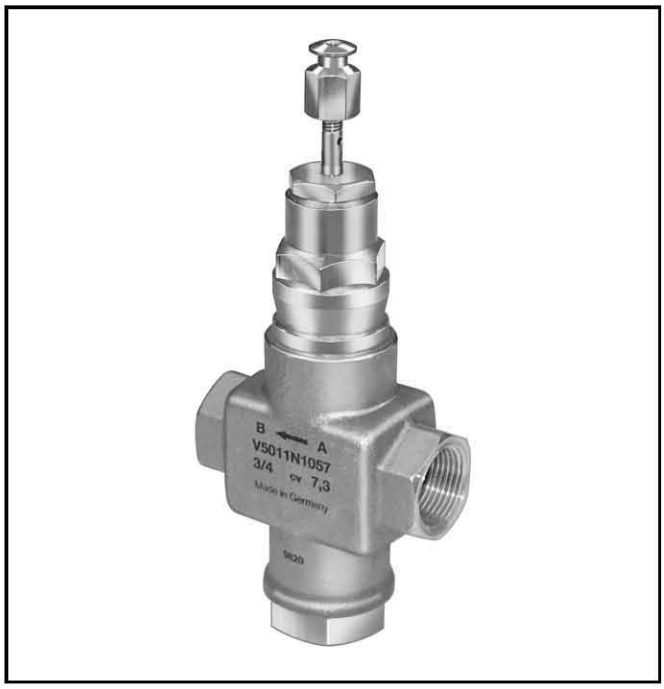
Honeywell

# V5011N
# Two-Way Threaded Globe Valve

PRODUCT DATA




## FEATURES

- Red brass body with NPT-threaded end connections.
- Low seat leakage rate (≤0.05 percent of $C_v$).
- 50:1 rangeability per VDI/VDE 2173.
- Spring-loaded, self-adjusting packing.
- Accurate positioning to ensure state of the art temperature control.
- Directly coupled electric and pneumatic actuators for easy mounting.
- Sizes range from 1/2 in. to 2 in.
- Valve designs provide equal percentage flow characteristic for water and linear flow characteristic for steam.
- Stainless steel stem and metal-to-metal seats.
- Repack and rebuild kits for field servicing.

## APPLICATION

The V5011N is a two-way threaded globe valve that controls steam, water, and glycol solutions (up to 50 percent concentration) in heating or cooling HVAC applications. The valve is used in two-position and modulating control systems. The valve is not suitable for combustible gas service.

# SPECIFICATIONS

*IMPORTANT*

*The specifications given in this publication do not include normal manufacturing tolerances. Therefore, an individual unit may not exactly match the listed specifications. Also, this product is tested and calibrated under closely controlled conditions and some minor differences in performance can be expected if those conditions are changed.*

**Models:**
V5011N Valve: Two-way threaded globe valve for steam, water, or glycol. NPT-threaded pipe connections. Throttling plug provides equal percentage flow characteristic for water (V5011N1xxx, V5011N3xxx), linear flow characteristic for steam (V5011N2xxx).

NOTE: V5011N1xxx and V5011N2xxx are direct acting (stem down to close).
V5011N3xxx is reverse acting (stem up to close).

**Dimensions:** See Fig. 1.

**Valve Sizes and Flow Capacities:** See Table 1.

**Pipe Connections:** Internal NPT-threaded connections.

**Seat:** Stainless steel, replaceable (except V5011N3xxx 3/4 in. to 1-1/4 in. which have an integral brass seat).

**ANSI Body Class:** 150 psi.

**Stem:** Stainless steel.

**Plug:** Brass on V5011N1xxx and V5011N3xxx for water; stainless steel on V5011N2xxx for steam.

**Stroke:** 3/4 in. (20 mm).

**Approximate Leakage Rate:** 0.05 percent $C_v$.

**Pattern:** 2-way, straight-through.

**Body Material:** Red brass.

**Packing:** Spring-loaded, carbon fiber reinforced PTFE V-rings.

**Rangeability:** 50:1 per VDI/VDE 2173.

**Pressure-Temperature Ratings:**
Water: 36°F to 248°F, 217 psi (15 bar).
248°F to 337°F, 185 psi (12.8 bar).
Maximum Water Differential Pressure: 230 psid (15.8 bar).
Steam: 100 psi (6.9 bar) at 337°F (V5011N2xxx).

**Maximum Differential for Quiet Water Service:** 20 psid.

**Valve Flow Characteristics:**
Water: Equal percentage (V5011N1xxx, V5011N3xxx).
Steam: Linear (V5011N2xxx). See Fig. 2.

**Close-Off Pressure Ratings:** See Fig. 3, and Table 2.

**Valve Design Life:** 250,000 full cycles at maximum rated temperature.

**Replacement Parts:** See Fig. 5 and Table 3.

**Motor and Linkage Selection:**

| Electric | Pneumatic |
|---|---|
| ML6421/ML6425 | MP953C (5 and 8 in.) |
| ML7421/ML7425 | MP953E (5 and 8 in.) |
| ML7984/ML6984 | — |
| Modutrol IV with Q5001 | — |
| Damper DCA with Q5020 | — |

**Table 1. Valve Size and Flow Capacities.**

| Size (in.) | Capacity ($C_v$) |
|---|---|
| 1/2 | 0.73 |
| | 1.16 |
| | 1.85 |
| | 2.9 |
| | 4.7 |
| 3/4 | 7.3 |
| 1 | 11.7 |
| 1-1/4 | 18.7 |
| 1-1/2 | 29.3 |
| 2 | 46.8 |

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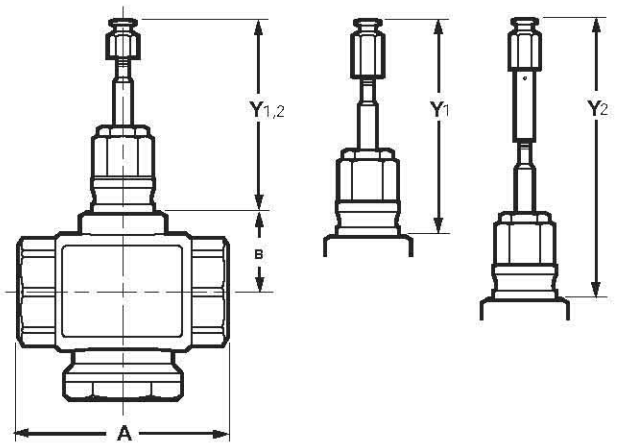
International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.




| VALVE SIZE (IN) | A in. (mm) | B in. (mm) |
|---|---|---|
| 1/2 | 3-1/4 (83) | 1-9/16 (40) |
| 3/4 | | |
| 1 | 4-1/16 (103) | |
| 1-1/4 | 4-3/16 (106) | |
| 1-1/2 | 4-3/4 (120) | 1-13/16 (47) |
| 2 | 5-1/4 (134) | |

| VALVE | Y1 in. (mm) | Y2[a] in. (mm) |
|---|---|---|
| V5011N1XXX OR V5011N2XXX | 3-1/2 (89) | 5-1/4 (133) |
| | STEM FULLY DOWN | |
| V5011N3XXX | 4-3/16 (107) | 5-15/16 (151) |
| | STEM FULLY UP | |

[a] Y2 WITH STEM EXTENSION FOR MP953C,E (8 IN. ONLY)

M17378A

**Fig. 1. V5011N body dimensions in in. (mm).**

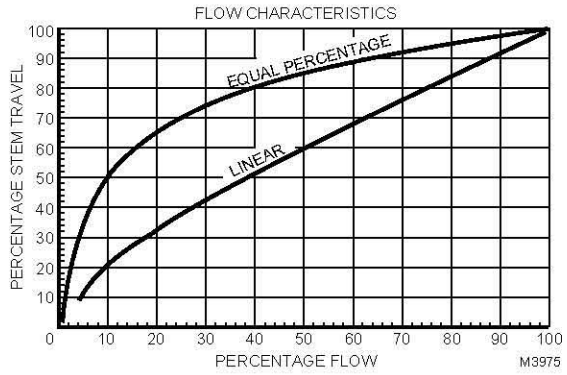



**Fig. 2. Equal percentage and linear flow characteristics.**

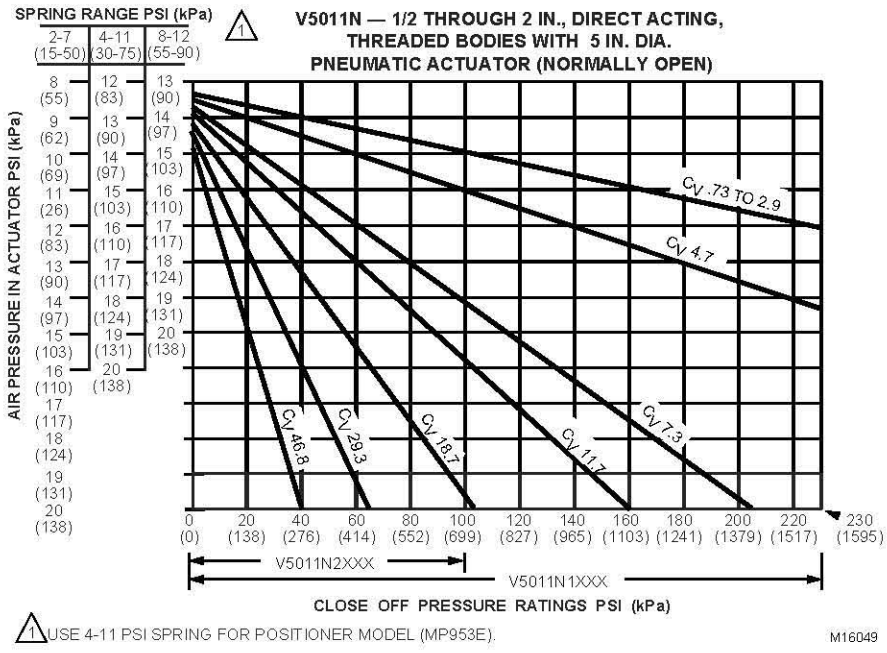
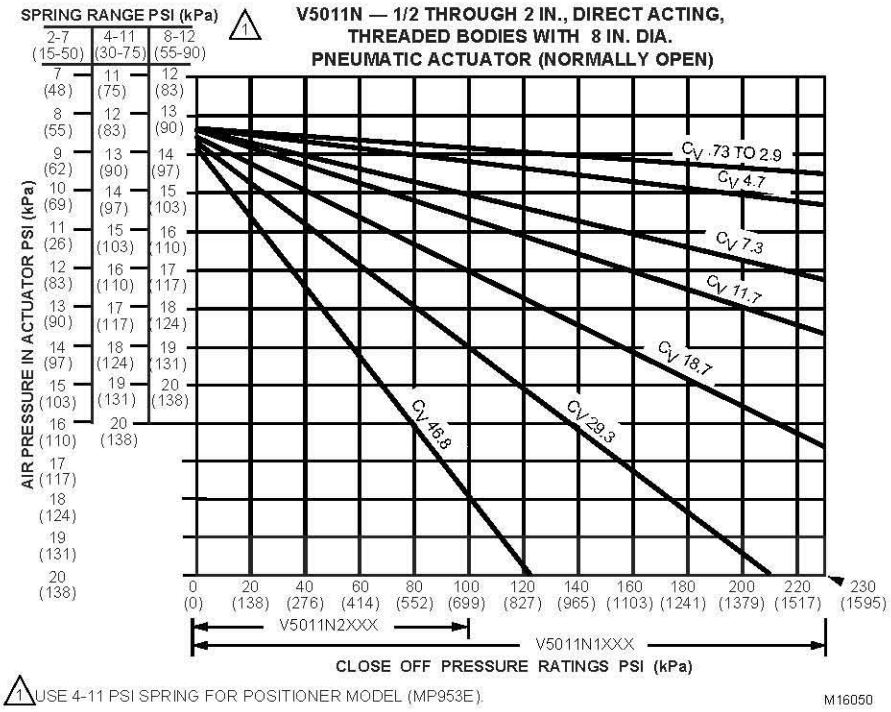
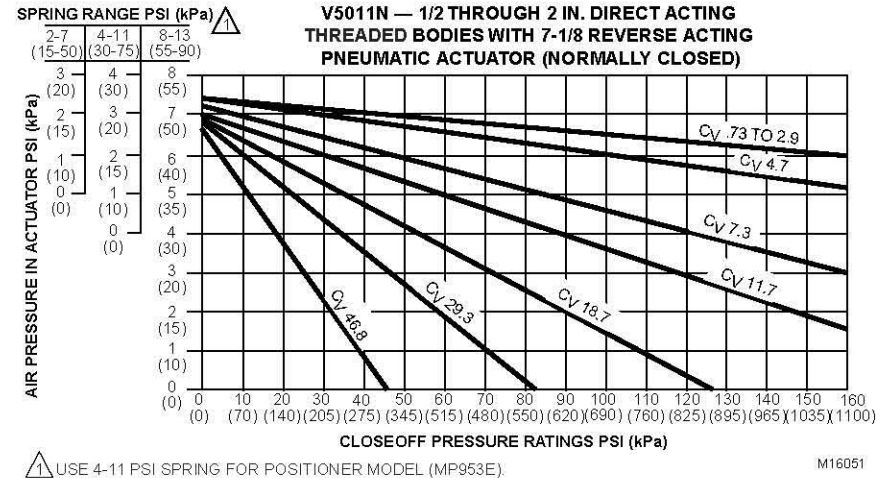



**Fig. 3. Close-off ratings at various control air pressures for V5011N Valves and MP953 Pneumatic Actuators.**



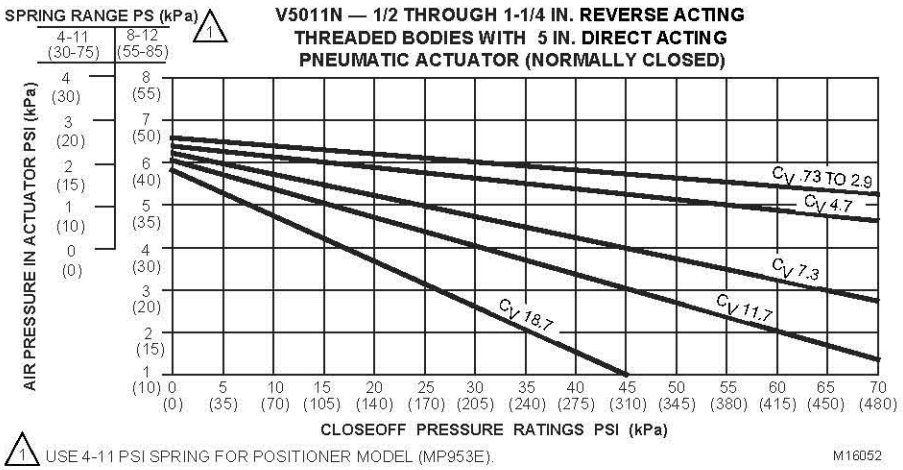
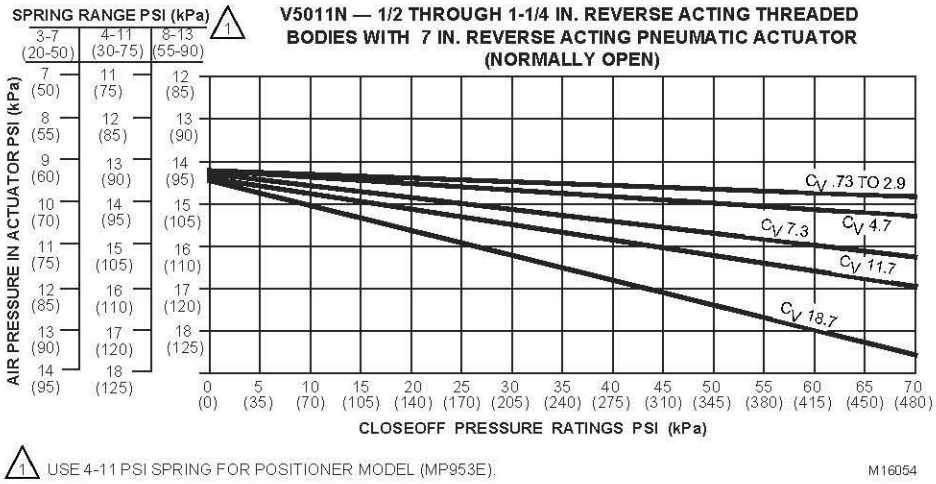
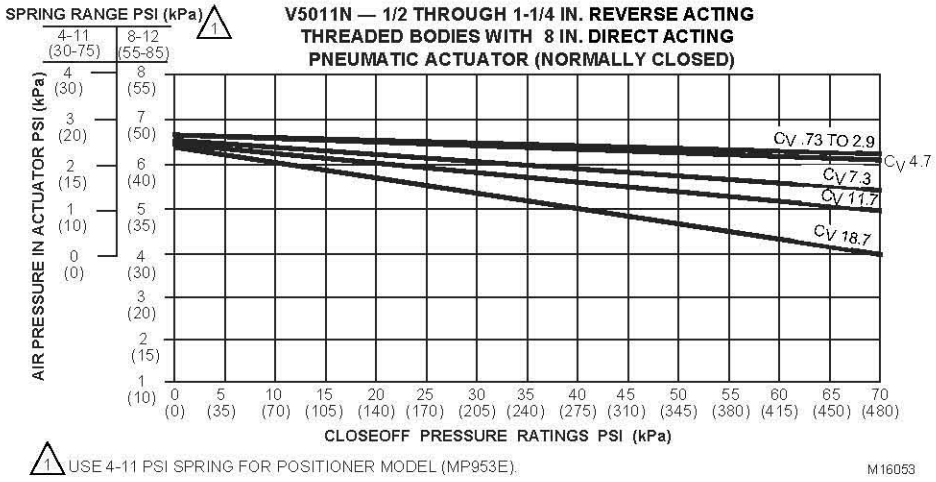




**Fig. 3. Close-off ratings at various control air pressures for V5011N Valves and MP953 Pneumatic Actuators. (continued)**




V5011N — 1/2 THROUGH 1-1/4 IN. REVERSE ACTING THREADED BODIES WITH 7 IN. REVERSE ACTING PNEUMATIC ACTUATOR (NORMALLY OPEN)




V5011N — 1/2 THROUGH 1-1/4 IN. REVERSE ACTING THREADED BODIES WITH 8 IN. DIRECT ACTING PNEUMATIC ACTUATOR (NORMALLY CLOSED)

**Fig. 3. Close-off ratings at various control air pressures for V5011N Valves and MP953 Pneumatic Actuators. (continued)**

# INSTALLATION

## When Installing This Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.

***IMPORTANT***

1. *Do not lift the valve by holding the stem.*
2. *Do not mount the valve with the stem pointed lower than horizontal.*
3. *Mount the valve with the flow arrow pointed in the direction of flow through the valve.*
4. *Mount the valve between aligned pipes. Mounting the valve on pipes that are not aligned causes leakage at the valve-to-pipe connection.*
5. *Ensure complete engagement on pipe to valve body threads.*
6. *Hold the valve body with a clamp or pipe wrench on the hexagonal fitting nearest the pipe to prevent damage to the valve body while mounting on the pipe. Refer to Fig. 4.*
7. *Be sure to allow enough room for installation and service. Clearance for valve installation is dependent on actuator size and the valve pipe size.*

## Location

Select a location where the valve, linkage, and actuator are within the appropriate pressure and temperature ratings.

Leave sufficient clearance above the valve to accommodate actuator installation and allow room for servicing the valve body. (Completely install the valve body in the pipe line before installing the actuator and linkage.)

When selecting a location for the valve, consider actuator mounting restrictions. Modutrol IV™ Motor crankshafts must be mounted horizontally.

## Mounting

The preferred valve mounting position is with the stem vertical. For steam applications, mount with the stem at a 45 degree angle. Do not mount the valve with the stem more than 90 degrees from the vertical (pointing lower than horizontal). Scale and foreign material can collect, scoring the stem and causing packing leakage. Protect the stem from damage due to bending or scratching.

***IMPORTANT***

1. *Before installing linkage and actuator, make sure that the valve stem operates freely. Impaired stem operation can indicate that the body was twisted or the stem was bent. Either of these conditions can require valve replacement.*
2. *Align pipes squarely with valve at each end connection.*
3. *If the pipes are forced into the valve, the body can become twisted and improper seating can result.*
4. *Apply pipe dope sparingly.*
5. *Be careful to prevent pipe debris, such as chips and scale, from entering the piping because this material can lodge in the seat and prevent proper closing.*

NOTE: Threading on threaded bodies conform to NPT.

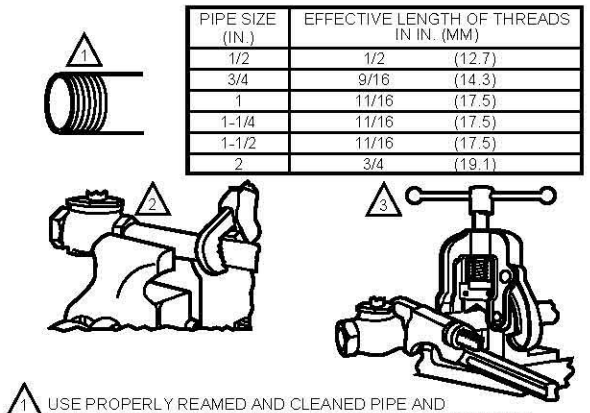
Refer to the table in Fig. 4 for valve pipe sizes and thread lengths. Fig. 4 also shows two effective methods of holding the valve and pipe when attaching it. Refer to installation information furnished with the linkage and motor when installing these controls.

**Table 2. Close-off Ratings (psid) for V5011N Valves with Electric/Electronic Actuators.**

| | Mod IV Motor with Q5001 Linkages | | | ML6421A, ML7421A | ML6425, ML7425 ML6420, ML7420 | ML7984, ML6874 |
|---|---|---|---|---|---|---|
| Valve Size (NPT) | 320 lb | 160 lb | 80 lb | 405 lb | 135 lb | 160 lb |
| V5011N1xxx and V5011N3xxx Valves | | | | | | |
| 1/2 | — | 230[a] | 230[a] | — | 230[a] | 230[a] |
| 3/4 | — | 230[a] | 131 | | | |
| 1 | 230[a] | 196 | 91 | 230[a] | 163 | 196 |
| 1-1/4 | 230[a] | 126 | 57 | 230[a] | 104 | 126 |
| 1-1/2 | 173 | 81 | 36 | 221 | 67 | 81 |
| 2 | 98 | 46 | 19 | 126 | 37 | 46 |
| V5011N2xxx Valves | | | | | | |
| 1/2, 3/4 | — | 100[a] | 100[a] | — | 100[a] | 100[a] |
| 1 | 100[a] | 100[a] | 91 | 100[a] | | |
| 1-1/4 | 100[a] | 100[a] | 57 | | | |
| 1-1/2 | 100[a] | 81 | 36 | 100[a] | 67 | 81 |
| 2 | 98 | 46 | 19 | 100[a] | 37 | 46 |

[a]Pressure is limited by fluid temperature. See valve temperature/pressure ratings.

**Fig. 4. Installing valves with threaded connections.**



# CHECKOUT

Use the following procedure to check for proper valve operation:

1. Check valve body and connections for leaks.

***IMPORTANT***

*Before installing linkage (if used) and actuator, make sure that the valve stem operates freely. Impaired stem operation can indicate that the body was twisted or the stem was bent. Either of these conditions can require valve replacement.*

2. After installing linkage and actuator, check operation according to installation information furnished with these controls.
3. Operate system through one complete cycle to ensure valve controls properly.
4. Check valve at regular intervals for leakage around packing.

   NOTE: Packing is spring-loaded and should seldom require attention.

5. If leakage is discovered and inspection shows that the packing gland is screwed down tightly, then repack the valve.

**Table 3. Valve Rebuild and Repack Kits.**

| Valve OS No. | NPT Size (in.) | Flow Capacity ($C_v$) | Stem Diameter (in.) | Repack Kit | Rebuild Kit | Stem Button |
|---|---|---|---|---|---|---|
| V5011N1008 | 1/2 | 0.73 | 1/4 | 0901786A | 0901746A | 0901116A[a] |
| V5011N1016 | | 1.16 | | | 0901747A | |
| V5011N1024 | | 1.85 | | | 0901748A | |
| V5011N1032 | | 2.9 | | | 0901749A | |
| V5011N1040 | | 4.7 | | | 0901750A | |
| V5011N1057 | 3/4 | 7.3 | | | 0901751A | |
| V5011N1065 | 1 | 11.7 | | | 0901752A | |
| V5011N1073 | 1-1/4 | 18.7 | | | 0901753A | |
| V5011N1081 | 1-1/2 | 29.3 | 3/8 | 0901787A | 0901754A | |
| V5011N1099 | 2 | 46.8 | | | 0901755A | |
| V5011N2006 | 1/2 | 0.73 | 1/4 | 0901786A | 0903422A | |
| V5011N2014 | | 1.16 | | | 0903423A | |
| V5011N2022 | | 1.85 | | | 0903424A | |
| V5011N2030 | | 2.9 | | | 0903425A | |
| V5011N2048 | | 4.7 | | | 0903426A | |
| V5011N2055 | 3/4 | 7.3 | | | 0903427A | |
| V5011N2063 | 1 | 11.7 | | | 0903428A | |
| V5011N2071 | 1-1/4 | 18.7 | | | 0903429A | |
| V5011N2089 | 1-1/2 | 29.3 | 3/8 | 0901787A | 0903430A | |
| V5011N2097 | 2 | 46.8 | | | 0903431A | |
| V5011N3004 | 1/2 | 2.9 | 1/4 | 0901786A | 0901759A | |
| V5011N3012 | | 4.7 | | | 0901760A | |
| V5011N3020 | 3/4 | 7.3 | | | 0901761A | |
| V5011N3038 | 1 | 11.7 | | | 0901762A | |
| V5011N3046 | 1-1/4 | 18.7 | | | 0901763A | |

[a]Each 0901116A contains 10 stem buttons.

NOTE: Seat removal tools are required to rebuild valves:
32003941-001 for 1/2 in. through 1-1/4 in. sizes.
32003941-002 for 1-1/2 in. through 2 in. sizes.

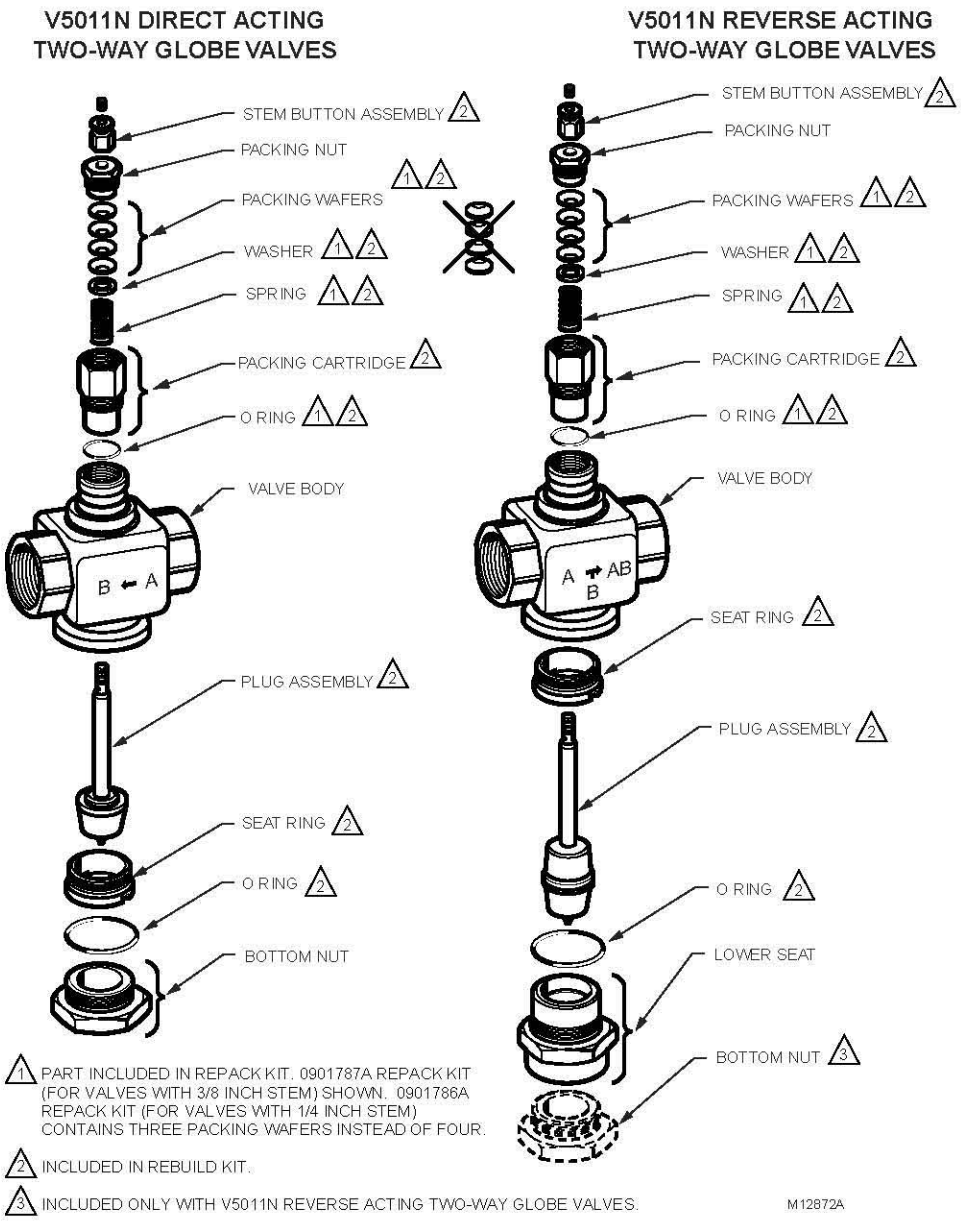



**Fig. 5. V5011N replacement parts.**

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Honeywell International Inc.
1985 Douglas Drive North
Golden Valley, MN 55422

Honeywell Limited-Honeywell Limitée
35 Dynamic Drive
Scarborough, Ontario
M1V 4Z9

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Control Products
Honeywell Building
17 Changi Business Park Central 1
Singapore 486073

**Honeywell Europe S.A.**
3 Avenue du Bourget
1140 Brussels
Belgium

**Honeywell Latin American Region**
480 Sawgrass Corporate Parkway
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Sunrise FL 33325

Honeywell

# ML6420, ML7420 Non-Spring Return Electric Linear Valve Actuators

PRODUCT DATA

## APPLICATION

The ML6420 Non-Spring Return Electric Linear Valve Actuators are floating control actuators used with controllers that provide a switched or floating single-pole double-throw (spdt) output. These actuators operate standard Honeywell valves in heating, ventilating, and air conditioning (HVAC) applications.

The ML7420 Non-Spring Return Electric Linear Valve Actuators are modulating control actuators used with controllers that provide an analog output of 0 to 10 Vdc or 2 to 10 Vdc. These actuators operate standard Honeywell valves in HVAC applications. An internal selector plug can be used to reverse the direction of action.

## FEATURES

- **Quick and easy installation.**
- **No separate linkage required.**
- **Conduit connector is standard.**
- **No adjustments required.**
- **Low power consumption.**
- **High close-off ratings.**
- **Force-limiting end switches.**
- **Manual operator.**
- **Synchronous motor.**
- **Corrosion resistant design.**
- **Maintenance free.**
- **Direct/reverse acting with ML7420.**
- **Position feedback signal included with ML7420.**
- **Selectable 0 to 10 Vdc or 2 to 10 Vdc signal input with ML7420.**

### Contents






63-2533-2

# SPECIFICATIONS

**Models:**

| Model | Run Time in sec at 60 Hz | Stroke in in. (mm) | Description |
|---|---|---|---|
| ML6420A | 30 or 60[a] | 3/4 (20) | Electric Linear Valve Actuator |
| ML7420A | | | |

[a] Dependant on actuator model.

**Dimensions:** See Fig. 1.

**Weight:** 2.9 lb (1.3 kg).

**Electrical Ratings:**
Power Input: 24 Vac ±15%, 60 Hz.
Power Consumption:
ML6420: 6 VA maximum at 24 Vac.
ML7420: 7 VA maximum at 24 Vac.
Signal Source Output Resistance: 1K ohm maximum.
Signal Load: 1 mA maximum.

**Ambient Ratings:**
Temperature:
Ambient: 14°F to 122°F (-10°C to +50°C).
Storage: -40°F to +158°F (-40°C to +70°C).
Maximum Valve Medium: 300°F (150°C).
Humidity: 5 to 95 percent relative humidity, noncondensing.

**Stem Force:** 135 lbf (600N).

**Signal Inputs (Supply Voltage Between Terminals):**
ML6420:
B and 24 Vac: Drives valve stem down.
W and 24 Vac: Draws valve stem up.
ML7420: 0 to 10 Vdc or 2 to 10 Vdc.

**Actuator Material:**
Cover: ABS-FR plastic.
Base: PBTP-FR plastic.
Yoke: Diecast aluminum.

**Actuator Stroke:** 3/4 in. (20 mm).

**Close-off Pressure Ratings:** See Table 1.

**Protection Standard:** IP54.

**Approvals:**
Canadian Standards Association Listed.
Underwriter's Laboratories, Inc. UL94-5V Flame Retardant.
Meets CE requirements.

**Cable entry:** Conduit connector and one knockout on case.

**Accessories:**
43191679-111 Single Auxiliary 10K ohm Potentiometer.
43191679-112 Single Auxiliary 220 ohm Potentiometer.
43191680-105 Dual Auxiliary Switch (for 24 Vac use *only*).
43196000-001 High Temperature Kit (1/2 to 3 in. valves).
Increases temperature range high-end to 428°F (220°C).

**Table 1. Close-off ratings for ML6420, ML7420 Electric Linear Valve Actuators and Honeywell Valves (psi).**

| Type | Valve | 1/2 in. | 3/4 in. | 1 in. | 1-1/4 in. | 1-1/2 in. | 2 in. | 2-1/2 in. | 3 in. |
|---|---|---|---|---|---|---|---|---|---|
| Flange | V5011A | — | — | — | — | — | — | 28 | 16 |
| | V3350/3351/3450/3451 | — | — | — | — | — | — | 21 | 14 |
| | V5013B,C; V3360/3361/3460/3461 | — | — | — | — | — | — | 21[a] | 14[a] |
| NPT | V5011F,G | 150[b] | 150[b] | 150[b] | 134[b] | 77 | 49 | 28 | 16 |
| | V5011H,J | 150 | 150 | 150 | 145 | — | — | — | — |
| | V5011N1xxx, V5011N3xxx, V5013N | 230 | 230 | 163 | 104 | 67 | 37 | | |
| | V5011N2xxx | 100 | 100 | 100 | 100 | | | | |
| | V5013F | 150 | 150 | 150 | 126 | 77 | 49 | | |

[a]Represents maximum pressure difference between the outlet and either of the two inlets.

[b]Do not exceed 100 psi with V5011G valves used in steam applications.

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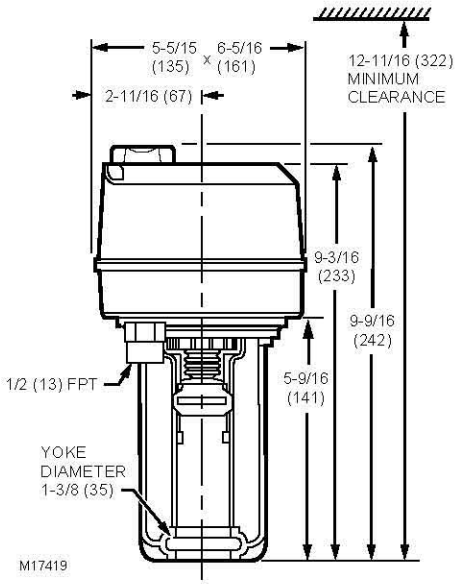


**Fig. 1. Approximate dimensions of ML6420, ML7420 Electric Linear Valve Actuator in in. (mm).**

# INSTALLATION

## When Installing this Product...

1. Read instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check ratings and description given in the specifications to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.

## ⚠ CAUTION

**Electrical Shock or Equipment Damage Hazard.**
**Can shock individuals or short equipment circuitry.**
Disconnect power supply before installation.

## Location

Install the actuator in a location that allows enough clearance for mounting accessories and for servicing.

## ⚠ CAUTION

**Equipment Damage Hazard.**
**Can damage actuator due to condensation or a valve gland leak.**
Install the actuator in a position above horizontal.

## Mounting

1. Place the actuator on the valve with the U-bolt around the valve collar. See Fig. 2.
2. Place the U-bolt against the valve collar and secure the actuator to the valve by turning each U-bolt nut clockwise.

   NOTE: To assure even pressure on the collar, first tighten the nuts finger-tight and then alternate turning each U-bolt nut until both are snug.

3. Push aside the stem button retaining clip and hold. See Fig. 3.
4. Lift valve stem until the head of the valve stem button is inside the large slot of the stem button retaining clip on the actuator.
5. Release the stem button retaining clip to secure the stem button. Check to make certain the stem button is secured by the retaining clip.
6. Remove the cover from the actuator using a Phillips or crosspoint screwdriver. See Fig. 4.

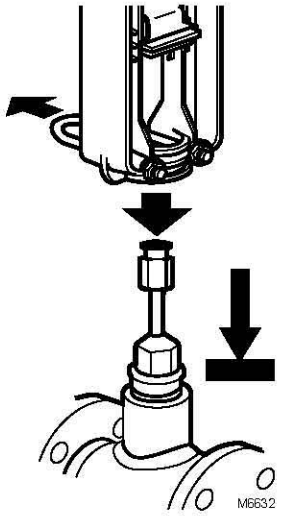


**Fig. 2. Attaching actuator to valve collar.**

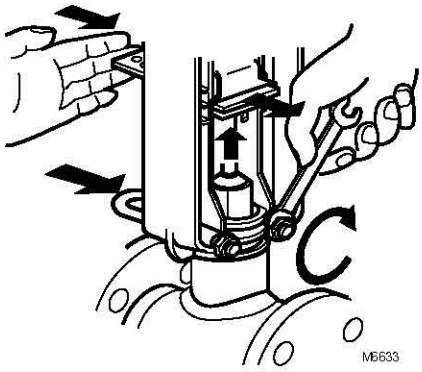


**Fig. 3. Securing actuator to valve.**

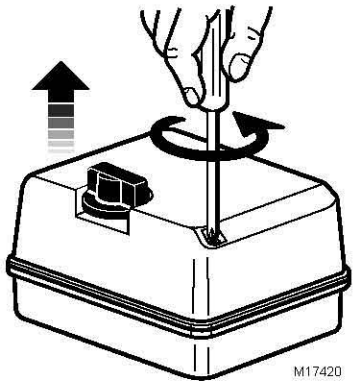


Fig. 4. Removing actuator cover.

## Wiring

**⚠ CAUTION**

**Electrical Shock or Equipment Damage Hazard.**
**Can shock individuals or short equipment circuitry.**
Disconnect power supply before installation.

All wiring must comply with local electrical codes, ordinances and regulations. Voltage and frequency of the transformer used with the actuator must correspond with the power supply and actuator characteristics. See Fig. 6 through 11 for typical wiring hookups.

1. Feed power and control wires through the conduit connector located on the bottom of the actuator case. See Fig. 5.

**⚠ CAUTION**

**Equipment Damage Hazard.**
**Conduit connection or removal can break an unsupported connector.**
When removing or attaching conduit, use a wrench to support the motor connector.

2. Using the wiring diagram in Fig. 6, connect power and control wires. Make sure that all wiring is correct.
3. For ML7420 only: Check the selector plugs for proper settings. See Signal Input Failure section for details.
4. When wiring is complete, replace the actuator cover. See Fig. 7.
5. Apply power and control signals to the actuator.

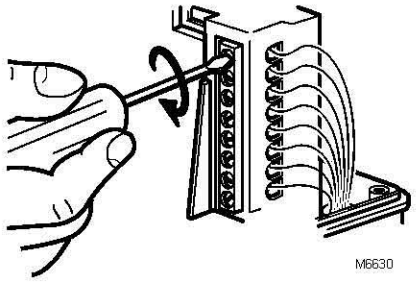


Fig. 5. Connecting power and control wiring.

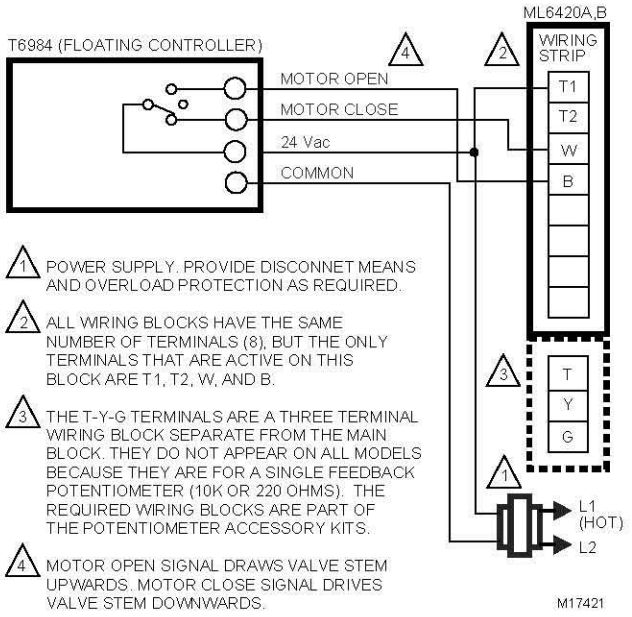


Fig. 6. ML6420 wiring.

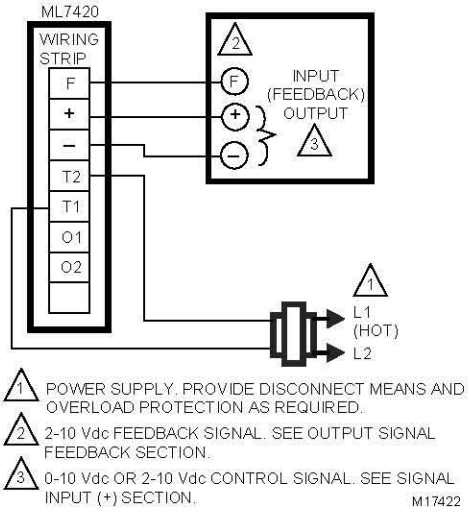


Fig. 7. ML7420 wiring using feedback output from a controller with a common transformer.

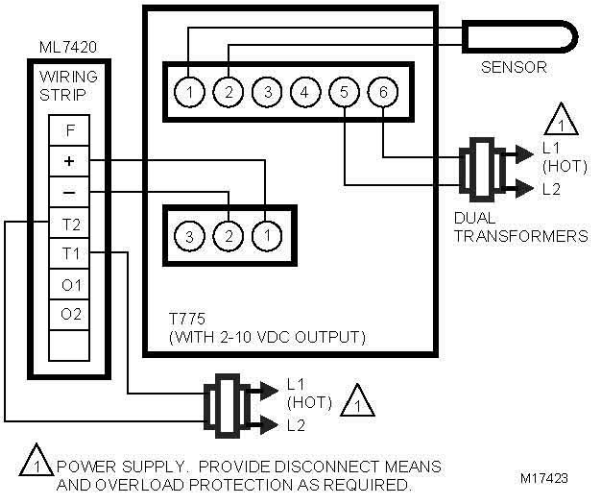


**Fig. 8. ML7420 wiring using a 2 to 10 Vdc control signal and separate transformers.**

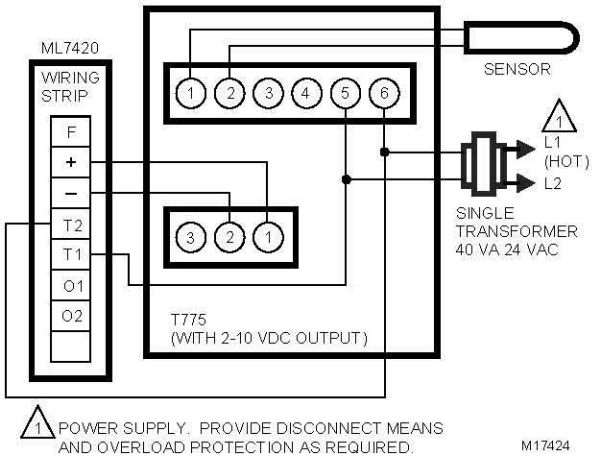


**Fig. 9. ML7420 wiring using a 2 to 10 Vdc control signal and a common transformer.**

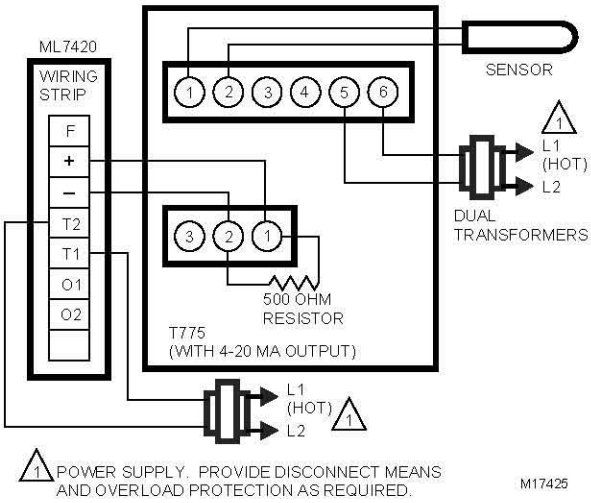


**Fig. 10. ML7420 wiring using a 4 to 20 mA control signal and separate transformers.**

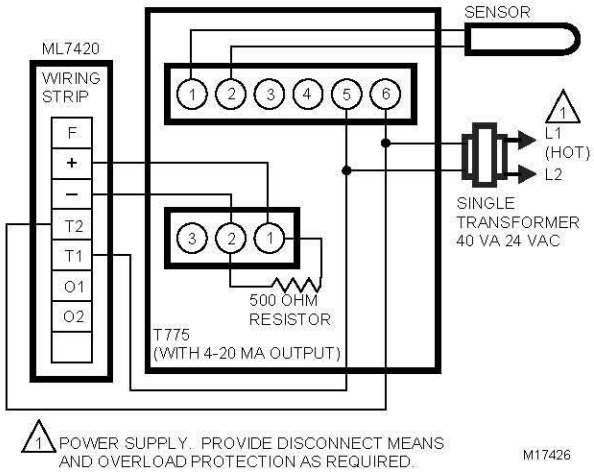


**Fig. 11. ML7420 wiring using a 4 to 20 mA control signal and a common transformer.**

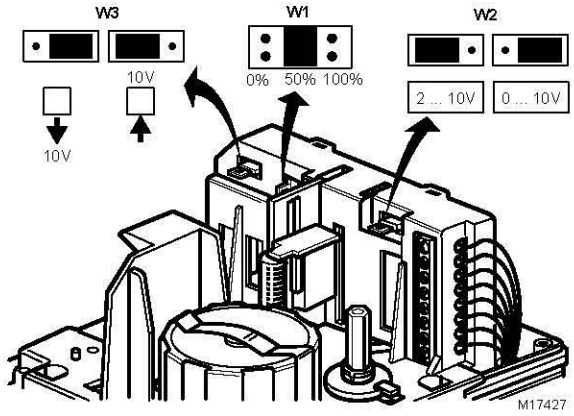


**Fig. 12. Location of W1, W2, and W3 selector plugs.**

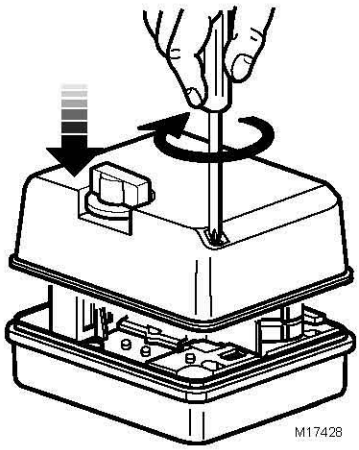


**Fig. 13. Replacing actuator cover.**

### Auxiliary Potentiometers

The 43191679 Auxiliary Potentiometers can be used as feedback potentiometers and to provide remote indication of valve position. See the Installation Instructions packed with the potentiometers.

### Auxiliary Switches

The 43191680 Dual Auxiliary Switch can be used on both the ML6420 and ML7420 Electric Linear Valve Actuators. Switching points are adjustable over the full length of the actuator stroke; for example, the switch can be used to switch pumps or to provide remote indication of any stroke position. See the Installation Instructions packed with the auxiliary switch.

## ⚠ CAUTION

**Equipment Damage Hazard.**
**Improper voltage damages the auxiliary switch beyond repair.**
Use the 43191680 Dual Auxiliary Switch only with 24 Vac applications.

# OPERATION

## General

In the actuator, the drive of a synchronous motor is converted into the linear motion of the actuator stem by using a spur gear transmission. A button retainer clip connects the actuator stem to the valve stem.

## Manual Operation

The ML6420 and ML7420 are equipped with a manual operator knob (see Fig. 14) to open or close the valve in the event of power failure:

1. Turn off or disconnect the power supply before manually operating the actuator.
2. Push down on the manual operator knob and turn the knob:
   a. Counterclockwise to drive the stem downward.
   b. Clockwise to draw the stem upward.

*IMPORTANT*

*Manual operation allows very high closing force that can jam the actuator spindle, exceed the force switch ratings, and stop the motor. After a manual valve close-off operation, release the spindle one turn by turning the manual operator knob. This will ensure automatic disengagement of the manual operator upon power resumption.*

NOTE: If the manual operator knob is not pushed in while turned, it will rotate only a short distance before disengaging without power resumption.

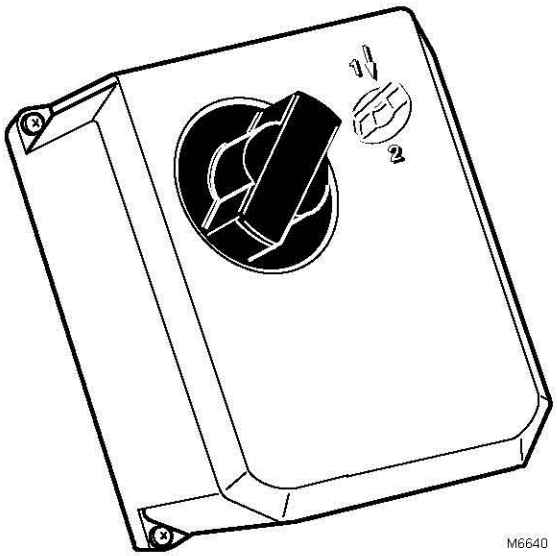


**Fig. 14. Manual operator knob.**

# ML7420

### Signal Input (+)

The analog input signal (+) range is set at the factory to 0 to 10 Vdc. Changing the position of the W2 selector plug sets the range to 2 through 10 Vdc. Selector plugs W1, W2, and W3 are positioned on the back side of the printed circuit board. See Fig. 12 for location of the selector plugs.

### Signal Input Failure

Using selector plug W1, the actuator can be set to run to one of three positions in event of a signal failure:

- 0% Actuator position corresponds with 0 or 2 Vdc signal.
- 50% Actuator in mid-position.
- 100% Actuator position according to 10 Vdc signal.

NOTE: W1 is factory set at the mid-position.

### Output Signal Feedback (F)

An analog output signal (2 to 10 Vdc) that represents the actual actuator stem position is available at terminal F. It can be used for remote indication of the stem position. When the actuator stem is fully downward, the output signal is 10 Vdc.

When the valve stem is up, the output signal is 0 or 2 Vdc. The output of the signal does not change when the action of the actuator is reversed using W3. See Direction of Action.

### Actuator Override

To override the control signal (for freeze protection or similar applications), connect the 24 Vac common (T2) to either terminal O1 or O2. Connecting to terminal O1 fully extends the actuator stem. Connecting to O2 fully retracts the actuator stem.

The control signal (+) is ignored when the override signal is applied to terminal O1 or O2. This override can be achieved with a switch or a relay. See Fig. 15.

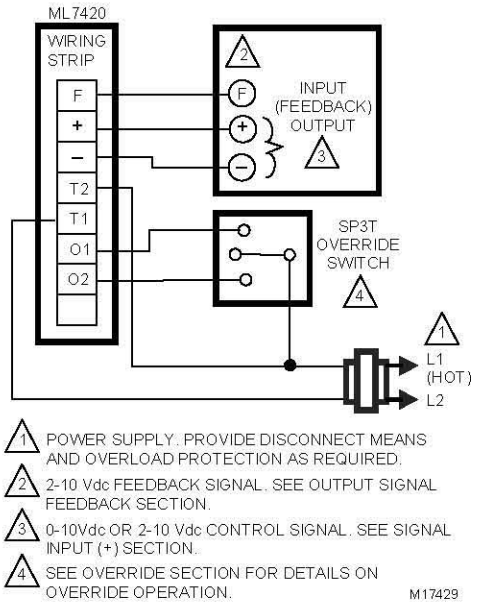


**Fig. 15. Connections for overriding control signal to drive ML7420 to a specific position.**

## Direction of Action

The direction of the actuator action can be changed by repositioning selector plug W3, which is factory set so that the actuator drives the valve stem down on increasing signal and draws the valve stem up on decreasing signal. With the valve stem up, the output signal from the feedback (F) function is either 0 or 2 Vdc. The output of the signal does not change when W3 is used to reverse the actuator action. See Fig. 12.

# CHECKOUT

The actuator can be checked out either directly or by using a controller.

## Direct Checkout

1. Mount the actuator for the required application; see Installation section.
2. Check the valve position and make sure that 24 Vac is correctly applied to the actuator.
3. Apply the power to the appropriate leadwires to move the valve.
4. If the actuator does not move, make sure the actuator is properly installed/wired.
5. If the actuator installation and wiring are both correct and the actuator does not run, replace the actuator.

## Controller Checkout

1. Adjust the setpoint of the controller to call for opening the valve. Observe the actuator.
2. If the valve is closed, it should begin to open.
3. If the valve remains closed, move the setpoint further toward the open setting.
4. If the valve does not move, check for 24 Vac in the actuator power input.
5. If 24 Vac is present and the actuator does not operate, check the voltage across the controller leadwires to determine if the device is miswired.
6. If the wiring is correct, 24 Vac is present on the power input terminals, and the actuator does not run, replace the actuator.

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