

ML6420, ML7420 Non-Spring Return Electric Linear Valve Actuators

PRODUCT DATA



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.

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.

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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 $\pm$ 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		

^aRepresents maximum pressure difference between the outlet and either of the two inlets.

^bDo not exceed 100 psi with V5011G valves used in steam applications.

ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE® wholesaler or distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Honeywell Automation and Control Products Sales Office (check white pages of your phone directory).
2. Honeywell Customer Care
1885 Douglas Drive North
Minneapolis, Minnesota 55422-4386

In Canada—Honeywell Limited/Honeywell Limitée, 35 Dynamic Drive, Scarborough, Ontario M1V 4Z9.

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.

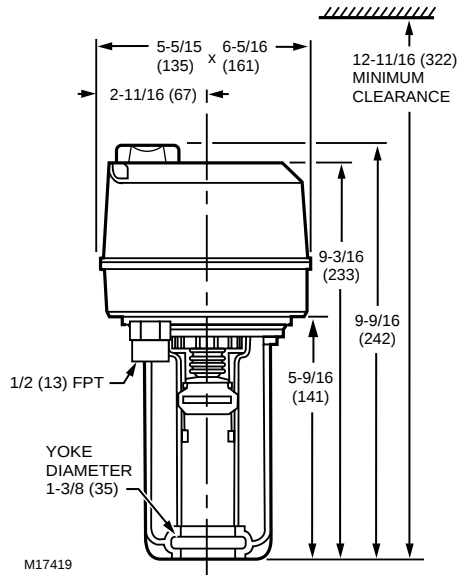


Fig. 1. Approximate dimensions of ML6420, ML7420 Electric Linear Valve Actuator in in. (mm).

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.

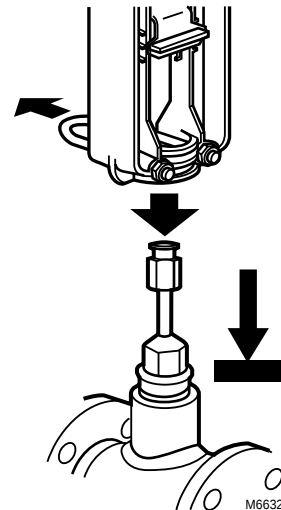


Fig. 2. Attaching actuator to valve collar.

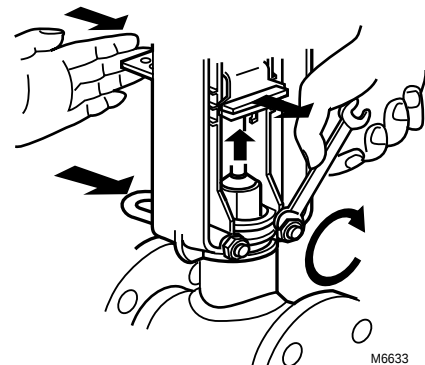


Fig. 3. Securing actuator to valve.

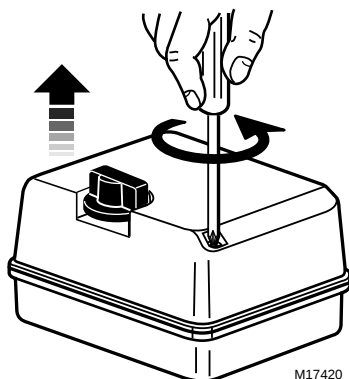


Fig. 4. Removing actuator cover.

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.

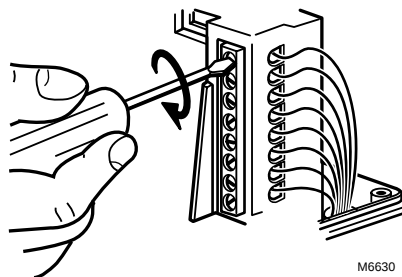


Fig. 5. Connecting power and control wiring.

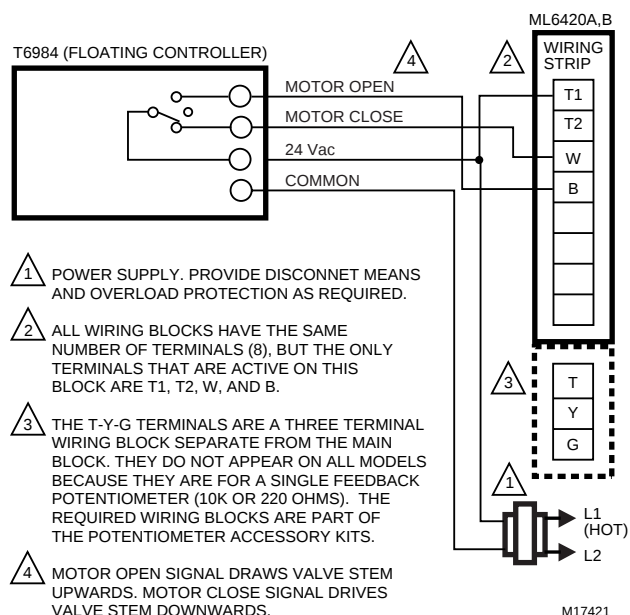


Fig. 6. ML6420 wiring.

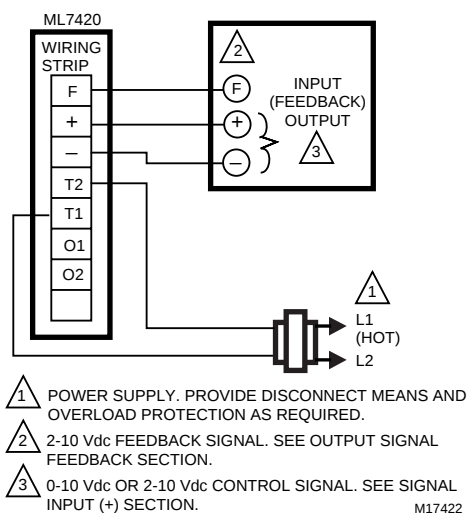


Fig. 7. ML7420 wiring using feedback output from a controller with a common transformer.

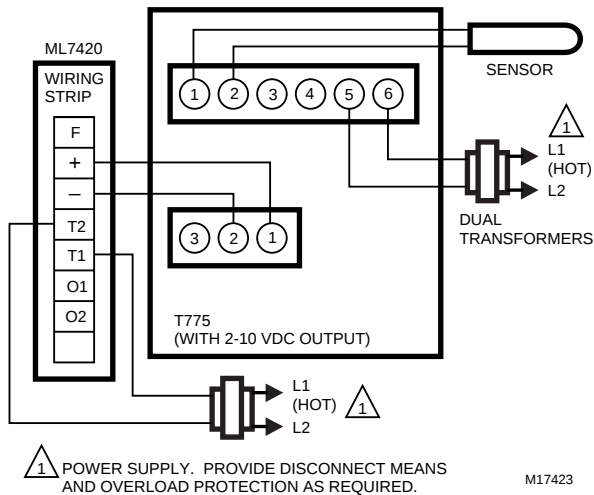


Fig. 8. ML7420 wiring using a 2 to 10 Vdc control signal and separate transformers.

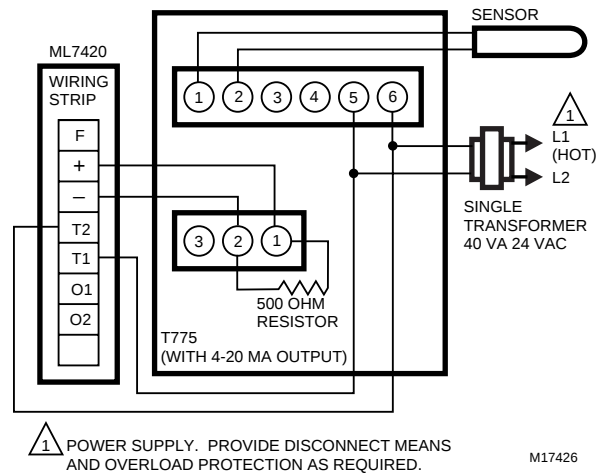


Fig. 11. ML7420 wiring using a 4 to 20 mA control signal and a common transformer.

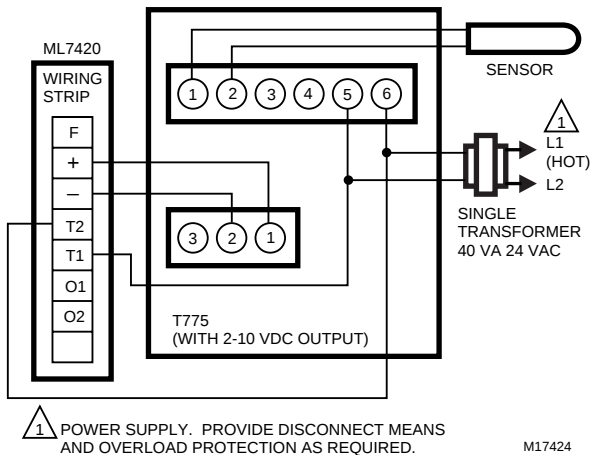


Fig. 9. ML7420 wiring using a 2 to 10 Vdc control signal and a common transformer.

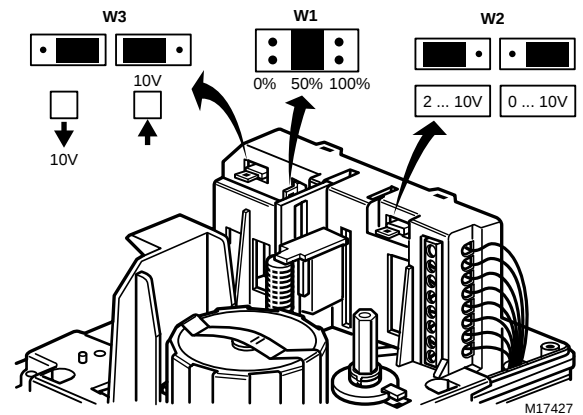


Fig. 12. Location of W1, W2, and W3 selector plugs.

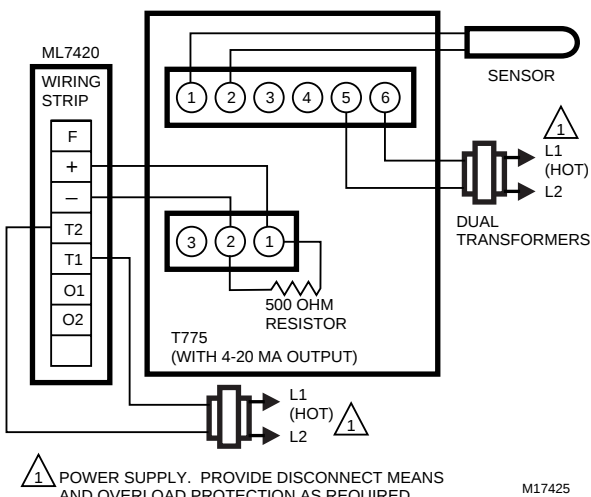


Fig. 10. ML7420 wiring using a 4 to 20 mA control signal and separate transformers.

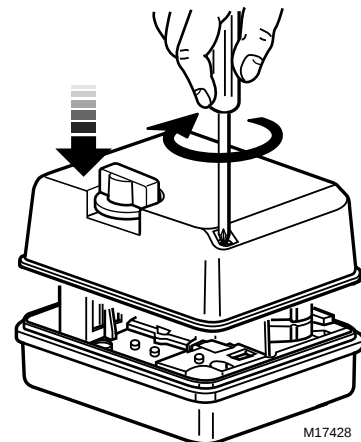


Fig. 13. Replacing actuator cover.

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.

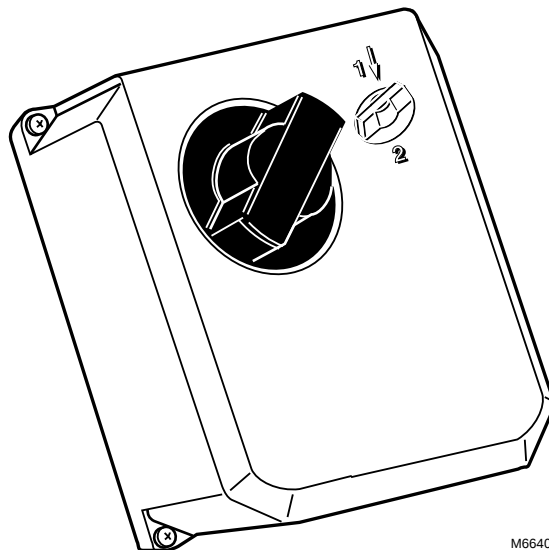


Fig. 14. Manual operator knob.

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.

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.

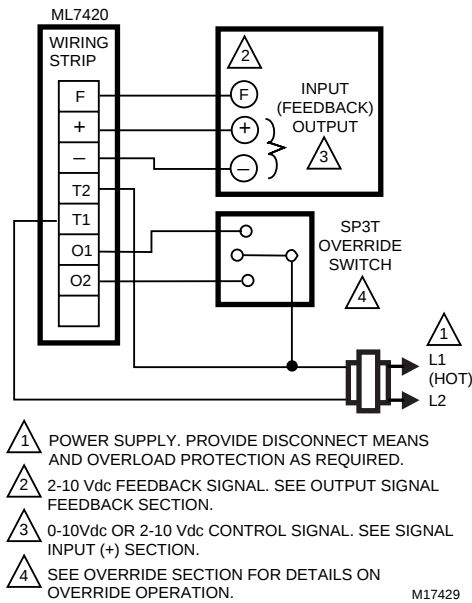


Fig. 15. Connections for overriding control signal to drive ML7420 to a specific position.

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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