

ML7425A,B Spring Return Electric Linear Valve Actuator

PRODUCT DATA



APPLICATION

The ML7425A,B Spring Return Electric Linear Valve Actuators are modulating control actuators used with controls that provide an analog output of 0 to 10 Vdc or 2 to 10 Vdc. These actuators operate standard Honeywell valves in Heating, Ventilating, and Air Conditioning (HVAC) applications. An internal selector plug can be used to reverse the direction of action.

FEATURES

- Quick and easy installation.
- No separate linkage required.
- ML7425A extends actuator stem on power failure; ML7425B retracts actuator stem on power failure.
- Conduit connector is standard.
- No adjustments required.
- True spring return on power failure.
- Accurate valve positioning.
- Low power consumption.
- High close-off ratings.
- Force-limiting end switches.
- 0 to 10 Vdc or 2 to 10 Vdc signal input.
- Position feedback signal.
- Direct/reverse action.
- Fail-safe position selection.
- Synchronous motor.
- Corrosion resistant design.
- Maintenance free.

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SPECIFICATIONS

Models:

Model	Description	Spring Return Action
ML7425A 3013	Electric Linear Valve Actuator	Extends actuator stem on power failure
ML7425B 3012		Retracts actuator stem on power failure

Electrical Ratings:

Power Input: 24 Vac (±15%), 60 Hz.
Power Consumption: 12 VA maximum at 24 Vac.

Signal Inputs:

0 to 10 Vdc or 2 to 10 Vdc.

Signal Source Output Resistance:

1K ohm maximum.

Load:

1 mA maximum.

Stem Force:

135 lbf (600N).

Actuator Stroke:

3/4 in. (20 mm).

Actuator Run Time at 60 Hz:

90 seconds.

Spring Return Time:

90 seconds.

Ambient Temperature Ratings:

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) to 428°F (220°C) with High Temperature Kit (see Accessories).

Humidity:

5 to 95% relative humidity, non condensing.

Close-off Pressure Ratings:

See Table 1.

Table 1. Close-off ratings for ML7425A,B Electric Linear Valve Actuators and Honeywell Valves.

Valve	Type	1/2 in.	3/4 in.	1 in.	1-1/4 in.	1-1/2 in.	2 in.	2-1/2 in.	3 in.
V5011A	Flange	—	—	—	—	—	—	28	16
V5011F,G	Screw	150 ^a	150 ^a	150 ^a	134 ^a	77 ^a	49 ^a	28 ^a	16 ^a
V5011H,J	Screw	150	150	150	145	—	—	—	—
V5011N1,3	Screw	230	230	163	104	67	37	—	—
V5011N2	Screw	100	100	100	100	67	37	—	—
V5013B	Flange	—	—	—	—	—	—	21	14
V5013C	Flange	—	—	—	—	—	—	21	14
V5013F	Screw	150	150	150	126	77	49	—	—
V5013N	Screw	230	230	163	104	67	37	—	—
V3350,1	Flange	—	—	—	—	—	—	21	14
V3360,1	Flange	—	—	—	—	—	—	21 ^b	14 ^b
V3450,1	Flange	—	—	—	—	—	—	21	14
V3460,1	Flange	—	—	—	—	—	—	21 ^b	14 ^b

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

^b Maximum pressure difference between the outlet and either of the two inlets.

Protection Standard:
IP54.

Insulation:
Protection Class II (24 Vac).

Approvals:
UL94-5V Flame Retardant.
Meets CE requirements.

Cable Entry:
Conduit connector and two knockouts are standard on actuator case.

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

Weight:
5.1 lb (2.3 kg).

Dimensions:
See Fig. 1.

Accessories:

- 43191679-112 Single Auxiliary 220 Ohm Potentiometer.
- 43191679-111 Single Auxiliary 10 KOhm Potentiometer.
- 43191680-105 Dual Auxiliary Switch (for 24 Vac use only).
- 43196000-101 High Temperature Kit (1/2...1 1/2 in. valves). Includes 1/4 in. and 3/8 in. stem extenders. The kit increases the temperature range to 428°F (220°C).
- 43196000-102 High Temperature Kit (2...3 in. valves). Includes 1/4 in. and 3/8 in. stem extenders. The kit increases the temperature range to 428°F (220°C).

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.

! 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. See Fig. 1.

! 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. 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 the 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.

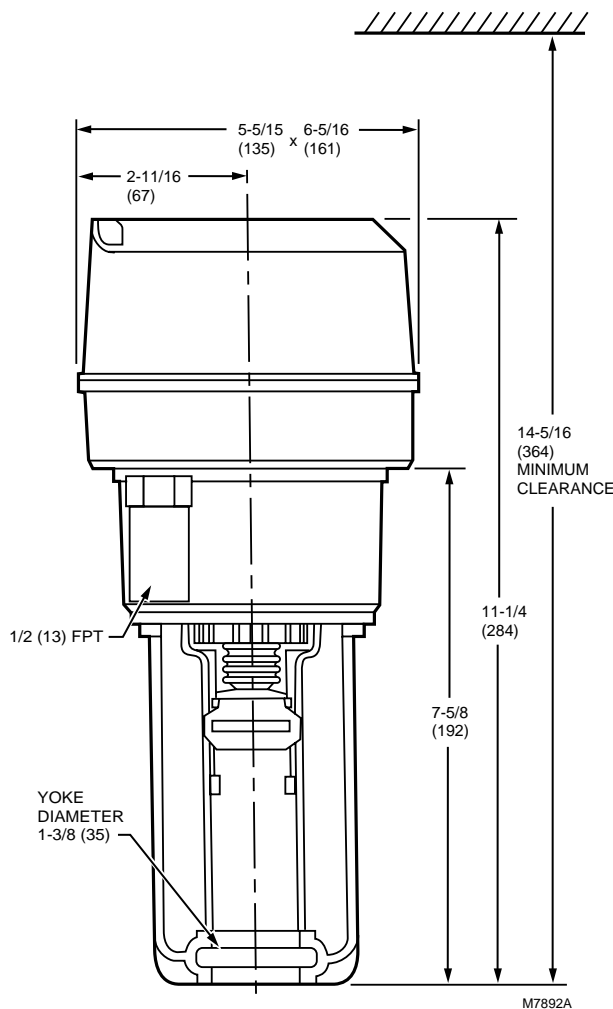


Fig. 1. Approximate dimensions of ML7425A,B Electric Linear Valve Actuator in in. (mm).

! **CAUTION**

Personal Injury Hazard.
Manual spring handle is under tension and can turn quickly when lifted, pinching fingers between the handle and plastic casing.
Use a screwdriver to lift the handle. See Fig. 5.

7. Remove manual spring handle retaining clip and lift and release the handle. See Fig. 5. The easiest way to safely perform this operation is to:
 - a. remove the retaining clip, then
 - b. wedge a small, flat-bladed screwdriver under the manual spring handle at the point marked in Fig. 5 and pry up the handle.

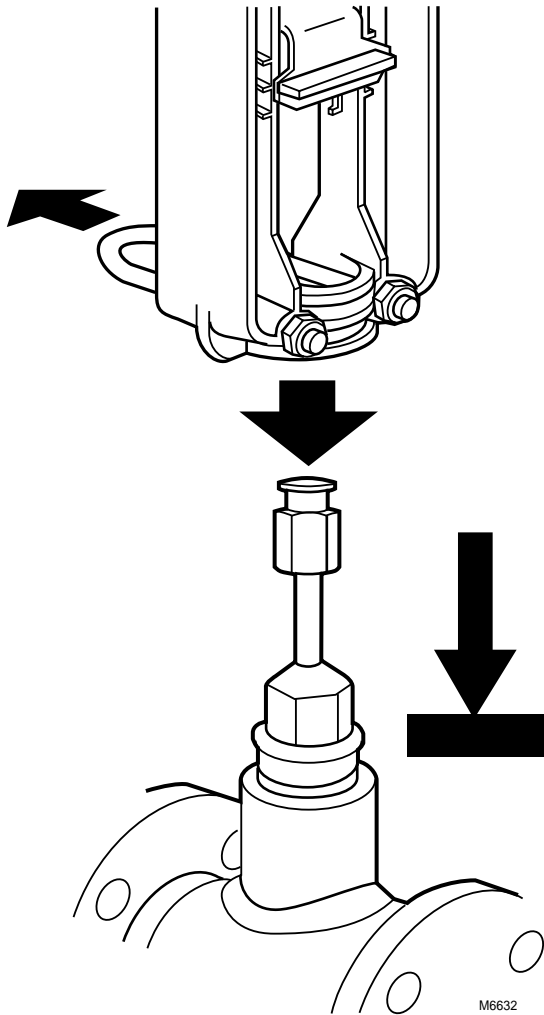


Fig. 2. Attaching the actuator to the valve collar.

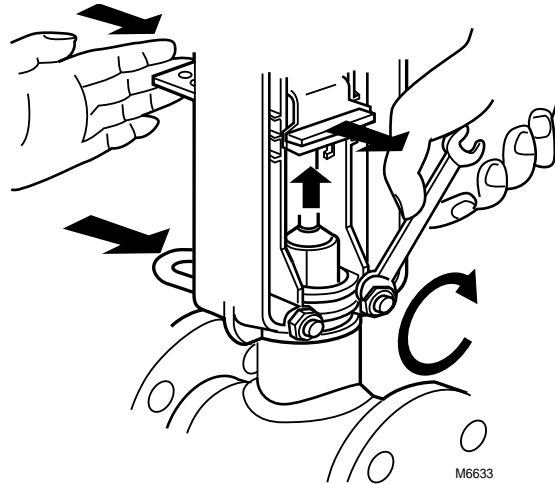


Fig. 3. Securing ML7425 to valve.

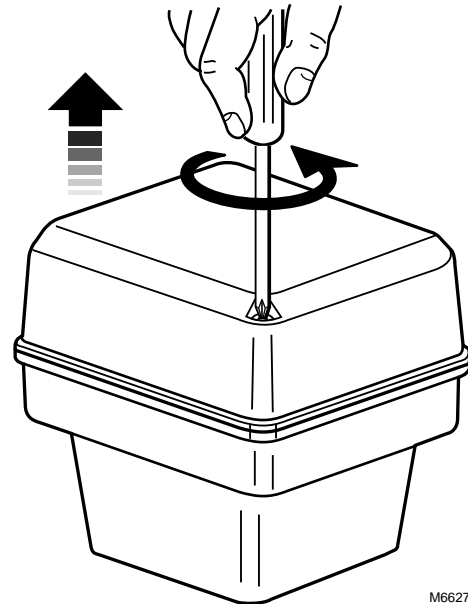


Fig. 4. Removing ML7425 cover.

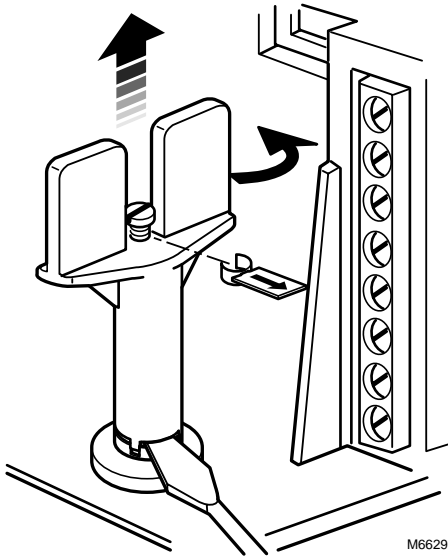


Fig. 5. Removing spring retaining clip and releasing manual spring handle.

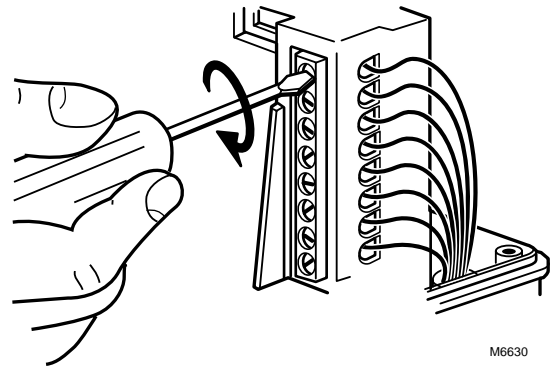


Fig. 6. Connecting power and control wiring to ML7425.

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 ML7425 must correspond with the characteristics of the power supply and those of the actuator. See Fig. 7 through 11 for typical wiring hookups.



CAUTION

Equipment Damage Hazard.
Conduit connection or removal can break an unsupported connector.

When removing or attaching conduit, use a wrench to support the metal connector.

1. Feed power and control wires through the conduit connector located on the bottom of the actuator case. See Fig. 6.
2. Using the wiring diagrams in Fig. 7 through 11, connect power and control wires to the ML7425. Make sure that all wiring is correct.

NOTE: Make the selector plug changes, if required, before replacing the cover. See Fig. 12.

3. When wiring is complete, replace the cover on the ML7425. See Fig. 13.
4. Apply power and control signals to the ML7425.

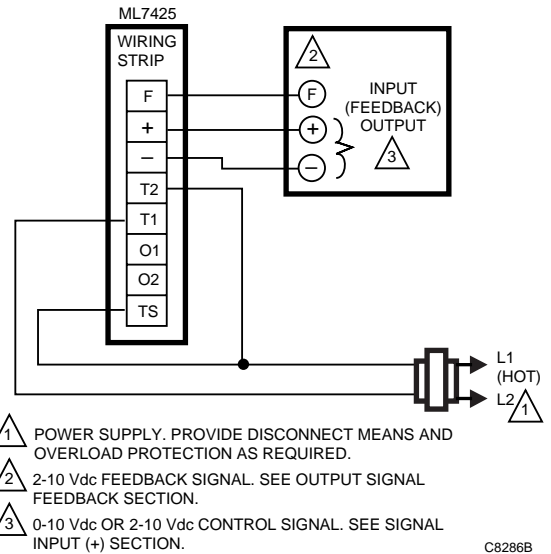


Fig. 7. ML7425 wiring diagram using feedback output from another controller with one transformer.

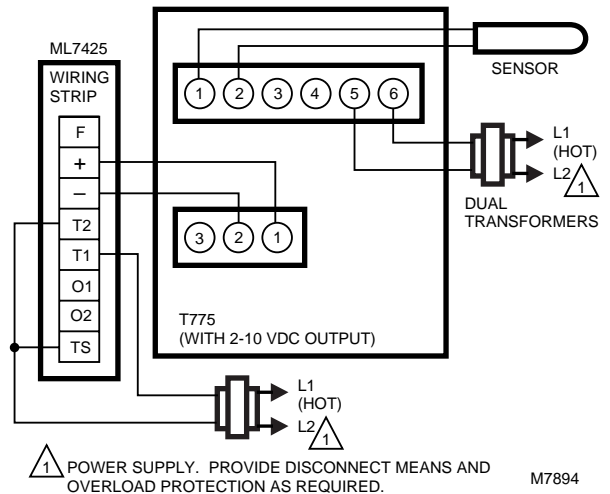
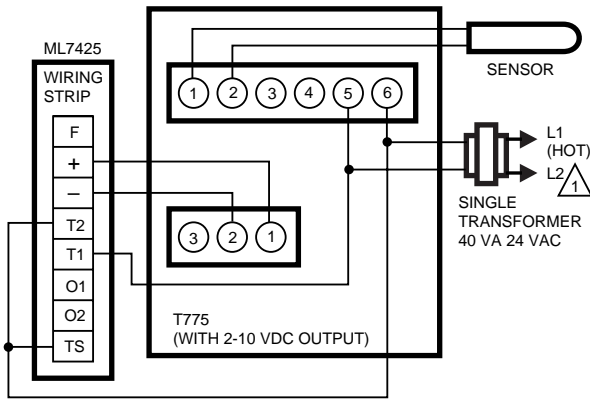
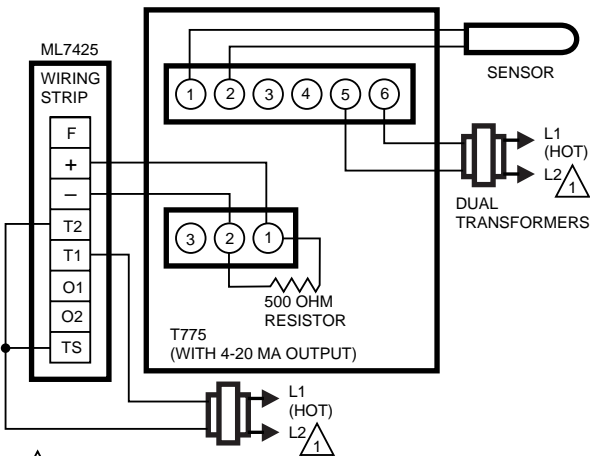


Fig. 8. ML7425 wiring diagram using a 2 to 10 Vdc output control (e.g., T775) with two transformers.



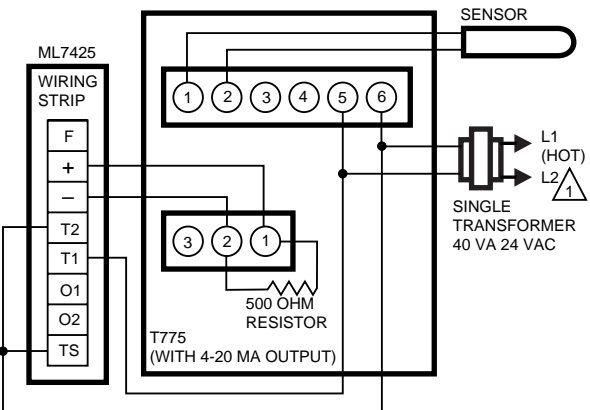
⚠ POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED. M7895

Fig. 9. ML7425 wiring diagram using a 2 to 10 Vdc output control (e.g., T775) with one transformer.



⚠ POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED. M7896

Fig. 10. ML7425 wiring diagram using a 4 to 20 mA output control (e.g., T775) with two transformers.



⚠ POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED. M7897

Fig. 11. ML7425 wiring diagram using a 4 to 20 mA output control (e.g., T775) with one transformer.

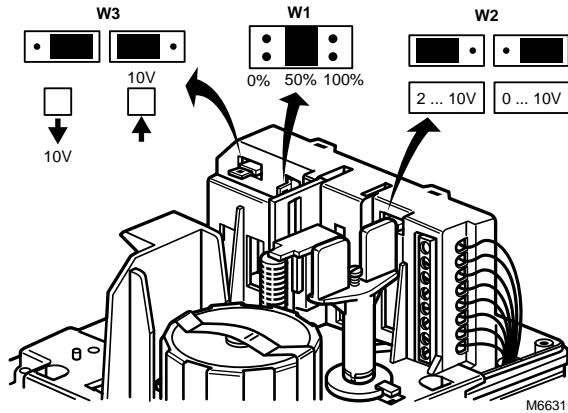


Fig. 12. Location of W1, W2 and W3 selector plugs.

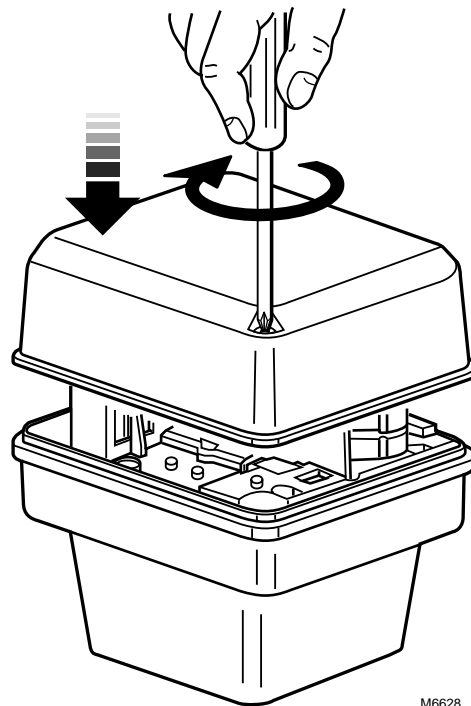


Fig. 13. Replacing cover on ML7425.

Auxiliary Potentiometers

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

Auxiliary Switches

The 43191680 Dual Auxiliary Switch can be used on both the ML7425A and ML7425B 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 through the 43191680 Dual Auxiliary Switch will damage the switch beyond repair.

Use the 43191680 Dual Auxiliary Switch with 24 Vac applications *only*.

OPERATION

General

In the ML7425, 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.

An integrated spring package limits the stem force to a factory-adjusted value in either direction. Installed microswitches turn off the actuator when the specified stem force is reached.

The ML7425A,B Spring Return Valve Actuators provide a safety valve position in event of power failure. On power failure, the ML7425A returns the stem to the bottom position. On power failure, ML7425B returns the stem fully upward.

The ML7425 actuators are shipped from the factory with a spring handle retaining clip installed, so that the actuator can be connected to the valve without applying power. This clip is removed after the actuator is installed on the valve. See Installation section.

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 PCB protection sheet. 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:

1. 0% — Actuator position corresponds with 0 or 2 Vdc signal
2. 50% — Actuator stem in mid-position
3. 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 extended, the output signal is 10 Vdc.

When the actuator 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

The output signal override function can be used for freeze protection or similar applications. It forces the actuator into an end position, overriding the control signal. To exercise this function, connect the 24 Vac common (or 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. 14.

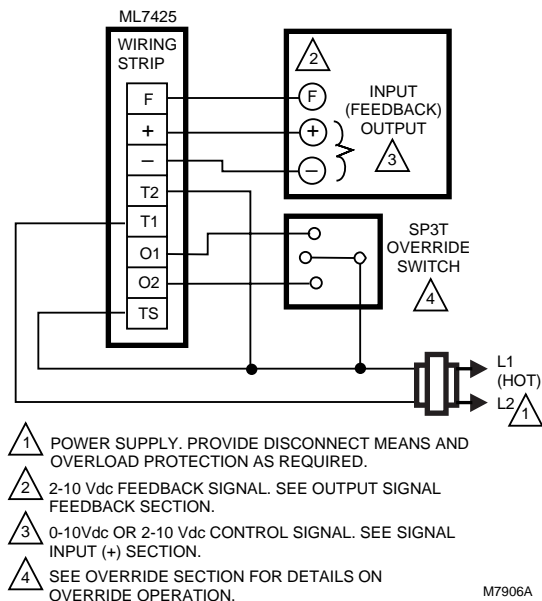


Fig. 14. Connections for overriding control signal to drive actuator to a specific position.

Direction of Action

The direction of the actuator action can be changed by repositioning selector plug W3, which is factory set so that the stem extends on increasing signal and retracts on decreasing signal. When the actuator stem is fully extended, the output signal from the feedback (F) function is 10 Vdc. The output of the signal does not change when W3 is used to reverse the action of the actuator, see Fig. 12.

CHECKOUT

The ML7425 Electric Linear Valve 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 control signal to the appropriate leadwires to move the valve in the opposite direction.
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.

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 Home and Building Control Sales Office (check white pages of your phone directory).
2. Home and Building Control Customer Logistics
Honeywell Inc., 1885 Douglas Drive North
Minneapolis, Minnesota 55422-4386 (612) 951-1000

In Canada—Honeywell Limited/Honeywell Limitée, 155 Gordon Baker Road, North York, Ontario M2H 3N7.
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