# 2-Way/3-Way, NPT, Zone Control Valves (½ to 1")

**VEZ-4x Series**

# Installation Guide

## Mounting Valve Body

1. Clean the lines upstream from the valve. Remove any debris larger than 0.06" (0.015 mm).
2. Align the valve's flow indicator with the system flow (see page 4 for 3-way **mixing or diverting** applications).
3. Mount the valve so the actuator is positioned over valve.

### ⚠ CAUTION

**To prevent condensation from dripping onto the actuator housing, mount the valve with the actuator in the upright position or, at most, at a 45° angle.**

4. Seal valves with approved pipe sealant.
5. Using two wrenches, secure the valve to the pipe. Torque should not exceed 75 ft-lbs. (102 N•m).
6. Eliminate air from the system to keep the valves full of fluid during operation.

NOTE: If the system experiences large amounts of debris, steps should be taken to keep the system clean.

3-Way with 2-Position Fail-Safe Actuator


2-Way with Tri-State or Proportional Actuator

### ⚠ CAUTION

**Using mineral oil lubricants or other incompatible substances in system fluids may damage EPDM rubber seals in valves. Before using any lubricant or additive in a water or ethylene glycol base, consult the substance manufacturer for compatibility with EPDM (Ethylene Propylene Diene Monomer).**

## Mounting Actuator on Valve Body

### ⚠ CAUTION

**If mounting the actuator to a valve already in-line, close the shut-off valves in the piping (upstream first, then downstream) or switch off the pump to allow the differential pressure in the valve to drop.**

1. To remove an existing actuator, disconnect the wiring, turn the ring nut (coupling piece) counterclockwise until it is loose, and pull off the actuator.

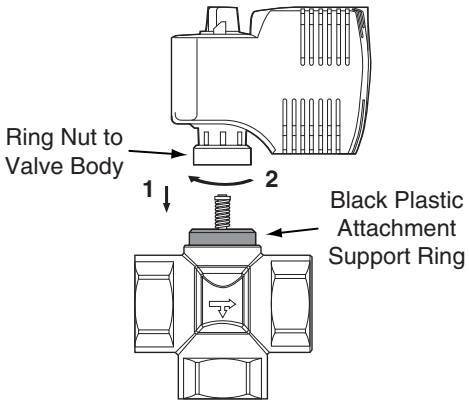
### ⚠ CAUTION

**The black plastic actuator attachment support ring must be in place on top of the valve bonnet before mounting the actuator or damage to the actuator connection may result.**

2a. For NO actuators ("A,""M," and "P"), place the actuator on top of the valve body and firmly hand-tighten (only) the ring nut.

NOTE: The last digit of valve model number represents the type of actuator.

2b. **For NC actuators ("B,""F," "N," and "Q"), manually rotate and latch open the actuator** (or proper valve close-off may be affected). See the Manual Override section on page 3. Then place the actuator on top of the valve body, firmly hand-tighten (only) the ring nut, and return the actuator to its normal position.




**Mounting Actuator on Valve Body**

# Wiring

See the appropriate diagram.

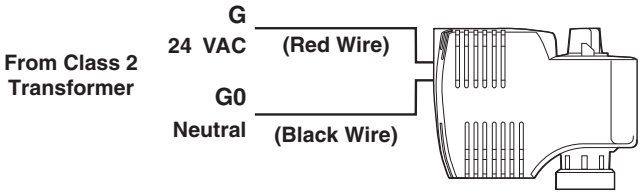
NOTE: All wiring must conform to NEC and local codes and regulations.

**NOTE: For 120 VAC spring return actuators, the wiring connection requires a junction box and flex conduit.**

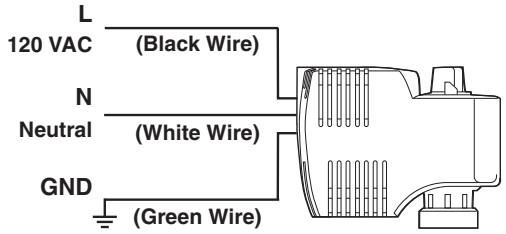
NOTE: For 24 VAC actuators, use Class 2 transformers. For 24 VAC spring return actuators, connections to the wire leads can be made inside the housing (remove the two screws and pull the housing off to access the interior).

## Two-Position Spring Return

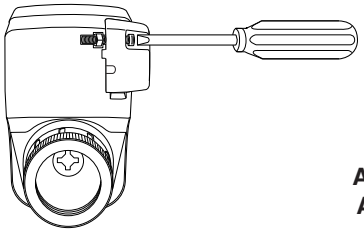
**24 VAC Fail-Safe (Spring Return)**
**Actuator "M" MEP-3503 (NO or Fail AB-A)**
**Actuator "N" MEP-3501 (NC or Fail AB-B)**

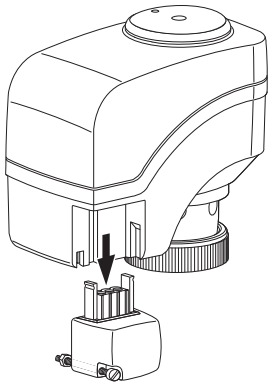


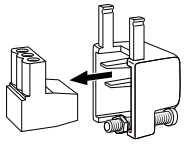

**120 VAC Fail-Safe (Spring Return)**
**Actuator "P" MEP-3504 (NO or Fail AB-A)**
**Actuator "Q" MEP-3502 (NC or Fail AB-B)**




## Proportional and Tri-State

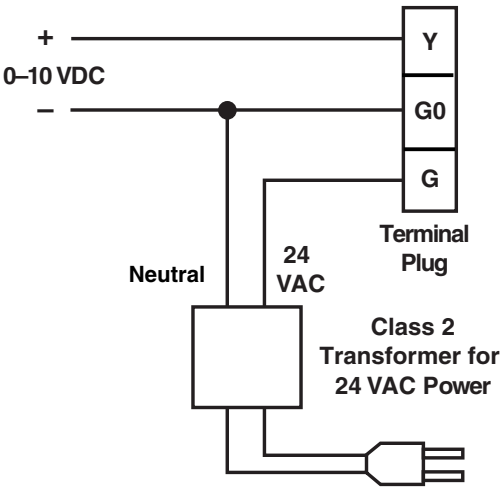




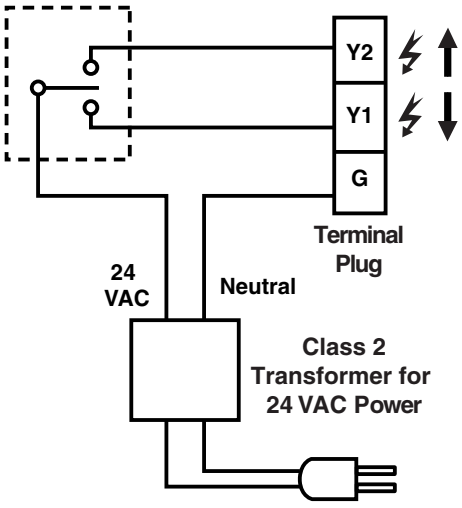


Terminal Plug — Block Cover

**Proportional (Fail-In-Place)**
**Actuator "A" MEP-3516 (NO or 0 VDC = AB-A)**
**Actuator "B" MEP-3511 (NC or 0 VDC = AB-B)**




**Tri-State (Fail-In-Place)**
**Actuator "F" MEP-3510**




### ⚠ CAUTION

**For proportional actuators, wire connection on G is 24 VAC HOT, not ground! G0 and G must be properly wired for correct function and full life of the actuator.**

# Manual Override

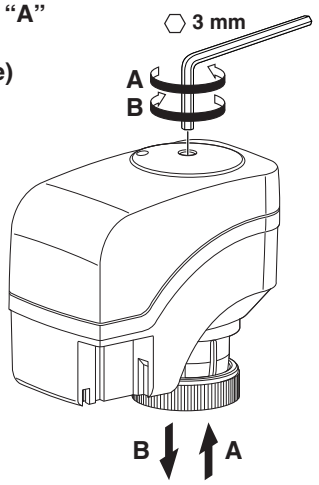
## Proportional and Tri-State

For manual positioning, **turn off power to the actuator** and use a 3 mm hex wrench to rotate the actuator. The actuator will maintain its position until power is restored and a control signal is applied.

Cycling the power off and then back on recalibrates the actuator.

The "0" and "1" positions on the housing are for reference only and are not for stroke measurement.

**Proportional Actuator "A"**
**MEP-3516**
**(NO or Fail-in-Place)**

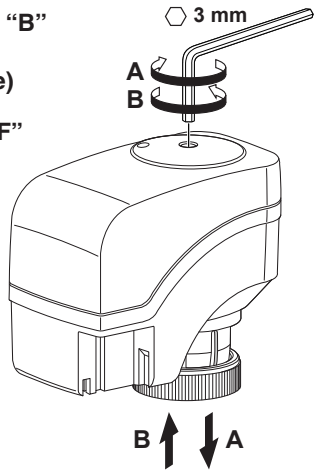



(A) Turn the hex wrench **counterclockwise** and the spindle retracts (2-way valve opens).

(B) Turn the hex wrench **clockwise** and the spindle extends (2-way valve closes).

**Proportional Actuator "B"**
**MEP-3511**
**(NC or Fail-in-Place)**

**Tri-State Actuator "F"**
**MEP-3510**




(A) Turn the hex wrench **clockwise** and the spindle extends (2-way valve closes).

(B) Turn the hex wrench **counterclockwise** and the spindle retracts (2-way valve opens).

## Two-Position Spring Return

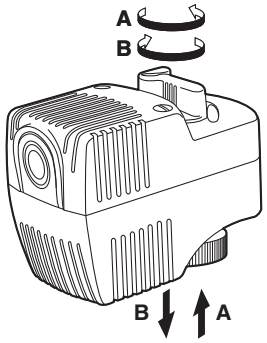
For manual positioning, **turn off power to the actuator**, rotate the manual override handle clockwise 180°, and squeeze the handle to latch it around the protruding stop. (The actuator will automatically unlatch when power is applied.)

The "0" and "1" positions on the housing are for reference only and are not for stroke measurement.

### ⚠ CAUTION

**To avoid damaging the actuator, do not manually assist the spring return as it returns to its home position.**

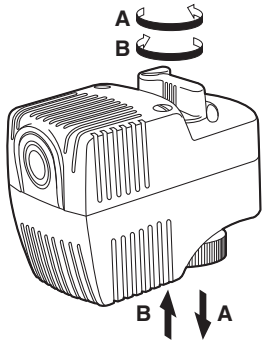
**Fail-Safe (Spring Return)**
**Actuator "M" MEP-3503 (NO or Fail AB-A)**
**Actuator "P" MEP-3504 (NO or Fail AB-A)**




(A) Allow handle to turn counterclockwise to retract spindle and open valve (AB-A).

(B) Turn handle clockwise to extend spindle and close valve (AB-B).

**Fail-Safe (Spring Return)**
**Actuator "N" MEP-3501 (NC or Fail AB-B)**
**Actuator "Q" MEP-3502 (NC or Fail AB-B)**




(A) Allow handle to turn counterclockwise to extend spindle and close valve (AB-B).

(B) Turn handle clockwise to retract spindle and open valve (AB-A).

## Operation

After the mechanical and electrical installations have been completed, cycle the actuator to verify the direction of rotation for normal operation and fail-safe if so equipped.

## Maintenance

No routine maintenance is required. Each component is designed for dependable, long-term reliability, and performance. Careful installation will also ensure long-term reliability and performance.

## Select Specifications

(See the data sheets for additional specifications.)

*Valve Body*

| | |
|---|---|
| **Service** | Hot or chilled water, up to 50% glycol |
| **Connections** | Female NPT |
| **Seat Style** | Metal to metal |
| **Valve Body Rating** | ANSI Class 125 |
| **Max. Inlet Pressure** | 125 psig (862 kPa) |
| **Max. Close-Off** | (AB-A) 1/2 to 3/4" = 44 psi (303 kPa); 1" = 22 psi (152 kPa) |
| **Close-Off Ratings** | According to ANSI/FCI 70-2 (AB-A) |
| **Leakage Rating** | ANSI Class III (AB-A) |
| **Flow Characteristics** | Linear |

*Actuators*

| | |
|---|---|
| All | 24 in-lbs. (105 N•m) torque |
| Proportional | 24 VAC Power, 50/60 Hz, 2.5 VA, 34 sec. running time, 9 oz. (0.25 kg) |
| Tri-State | 24 VAC, 50/60 Hz, 0.8 VA, 150 sec. running time, 9 oz. (0.25 kg) |
| 2-Position | 24 VAC or 120 VAC, 60 Hz, 9.8 VA, 35 sec. running time, 1.18 lb. (0.54 kg) |

*General*

| | |
|---|---|
| **Mounting Location** | NEMA 1 (interior only) |
| **Temperature Limits** | |
| Medium | 34 to 230° F (1 to 110° C) |
| Ambient | 41 to 122° F (5 to 50° C) @ 0 to 90% RH (non-condensing) |

## More Information

For **application information, accessories, complete specifications, and other information**, see on the KMC web site (**www.kmccontrols.com**):

- (Two-way) **VEZ-41/42/43 Series Data Sheet**
- (Three-way) **VEZ-44 Series Data Sheet**

## Important Notices



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