

### Description and Application

These compact but powerful, direct-coupled (non-fail-safe) ControlSet® actuators provide tri-state/two-position or proportional control for small dampers or valves in HVAC systems. A minimum torque of 40 (MEP-40xx) or 80 (MEP-48xx) in.-lb. is available over the 95° angular rotation.

MEP-4xx2 **proportional** models accept a 2–10 or 0–10 VDC control signal input from a thermostat or controller. “**Anti-jitter**” circuitry significantly reduces hunting and needless wear (from unnecessary miniscule position changes caused by undamped analog input signals) on the actuator and valve packing or damper components. A user-initiated, **auto-mapping** feature provides more precise equipment control by reassigning the input signal range (and feedback signal) over a reduced rotation range (from 45° to 95°). These models also feature a switch-selectable, 1–5 or 2–10 (or 0–5 or 0–10) VDC **voltage feedback** output that is proportional to the actuator position.

MEP-4xx1/4xx3 **tri-state/two-position** (three-wire) models are designed for use with floating thermostats, controllers, or building automation systems. The MEP-4x13 models feature a 10K ohm ( $\pm 10\%$ ), three-wire **potentiometer feedback** output. (The tri-state MEP-4003/4003V do not have two-position functionality or the larger green top enclosure.)

MEP-4x21/4x22 models also have a fully adjustable, built-in SPDT **auxiliary switch**, for remote position indication or controller and equipment interface.

MEP-4001V/4002V/4003V actuators have brackets with a patented **quick-mounting** mechanism. See ([Quick-Mounting](#)) “**V**” Models [Valve Cross-Reference on page 4](#) for more information.

All other actuators mount directly to 1/4- to 5/8-inch (6 to 16 mm) round shafts or 1/4- to 7/16-inch (6 to 11 mm) square shafts, eliminating the need for expensive and complicated linkages. A non-rotation bracket, to prevent lateral movement, is included with each actuator. A gear disengagement button allows manual positioning of the actuator.

NOTE: For similar actuators with **fail-safe**, see the [MEP-4200/4500/4900 Series](#).



MEP-4002



MEP-4003 (Only)



MEP-4003V with Quick Mount



(Size Shown Relative to a Quarter)

### Features

- ◆ MEP-4xx2 proportional models include “anti-jitter” circuitry, optional auto-mapping of the full input signal range over a reduced actuator stroke, and selectable input and feedback voltage range
- ◆ MEP-4xx1/4xx3 tri-state/two-position (three-wire) models available (tri-state only on MEP-4003)
- ◆ Fully adjustable, built-in auxiliary switch on selected models
- ◆ Removable terminals and removable 1/2-inch NPS conduit fitting (except the MEP-4003)
- ◆ Direct mounting to standard shaft sizes
- ◆ Gear disengagement button and adjustable mechanical end stop
- ◆ Patented quick-mounting valve body option on MEP-4001V/4002V/4003V

## Models

Model Number	Torque		Control		Built-in Options			
	40 in.-lb. min. (4.5 N•m)	80 in.-lb. min. (9 N•m)	Tri-state (Floating) or (3-wire) 2-Position	0 to 10 or 2 to 10 VDC Proportional	Feedback: 10k ohm Potentiometer	Feedback: 0/1–5 or 0/2–10 VDC	Auxiliary Switch (Adjustable, SPDT)	
4001(V)*	✓		✓					
4002(V)*				✓		✓		
4003(V)**								
4013			✓		✓		✓	
4021								✓
4022						✓	✓	
4801	✓		✓					
4802				✓		✓		
4813			✓			✓		
4821								✓
4822					✓		✓	
4822						✓	✓	✓

\*MEP-4001V/4002V/4003V have the quick-mount option.  
\*\*MEP-4003/4003V do not have two-position functionality or the larger green top enclosure.

## Specifications

<b>Supply Voltage</b>	24 VAC (+20%/–15%), Class 2 only
<b>Supply Power</b>	Tri-state/two-position, 2 VA; proportional, 4 VA
<b>Control Signal</b>	Tri-state/two-position, 24 VAC; proportional, 0/2 to 10 VDC
<b>Frequency</b>	50/60 Hz
<b>Feedback Output</b>	
Tri-state/2-Position	10K ohm ±10% (on select models)
Proportional	0/1 to 5 VDC or 0/2 to 10 VDC (switch selectable)
<b>Auxiliary Switch</b>	Adjustable 0 to 95°, SPDT 6 A resistive load (3 A motor load) @ 24 VAC (on select models)
<b>Angular Rotation</b>	0 to 95°, fully adjustable with mechanical stop
<b>Motor Timing</b>	90 seconds for 90° @ 60 Hz; 108 seconds for 90° @ 50 Hz
<b>Torque</b>	(MEP-40xx) 40 in.-lb. (4.5 N•m); (MEP-48xx) 80 in.-lb. (9 N•m)
<b>Mounting</b>	Direct to 1/4 to 5/8 inches (6–16 mm) round or 1/4 to 7/16 inches (6–11 mm) square shaft by adjustable “V” bolt and non-rotational bracket HMO-4002 (supplied); minimum recommended damper shaft length is 1-5/8 inches; HPO-

5074 required for mounting “V” actuators to valves

### Connections

Wire clamp type; 14 to 22 AWG, copper

### Dimensions

MEP-4003	5.3 x 2.6 x 1.8" (135 x 66 x 46 mm)
MEP-4003V	5.3 (w/o handle extended) x 2.6 x 2.59 inches (135 x 66 x 66 mm)
MEP-4001V/4002V	5.3 (w/o handle extended) x 2.6 x 3.28 inches (135 x 66 x 83.2 mm)
All others	5.3 x 2.6 x 2.5" (135 x 66 x 63.5 mm)

### Weight

1.1 lb. (0.50 kg) or less

### Enclosure Material

Flame retardant polymer

### Enclosure Ratings

NEMA 1 and IP40 on MEP-4003; NEMA 2 and IP54 on all others—to guarantee the IP54 rating, install an **HMO-4521** liquid-tight cord grip (on all models except MEP-4003) or an **HPO-4001** assembled wiring kit (on models MEP-4x01/4x02 only)

### Noise Level

< 35 dBA max. at 1 meter

### Approvals

UL 873 Temperature Indicating and Regulating Equipment; FCC Class B, Part 15, Subpart B; Complies with Canadian ICES-003; CE compliant

### Environmental Limits

Operating	–22 to 131° F (–30 to 55° C)
Shipping	–40 to 176° F (–40 to 80° C)
Humidity	5 to 95% RH (non-condensing)

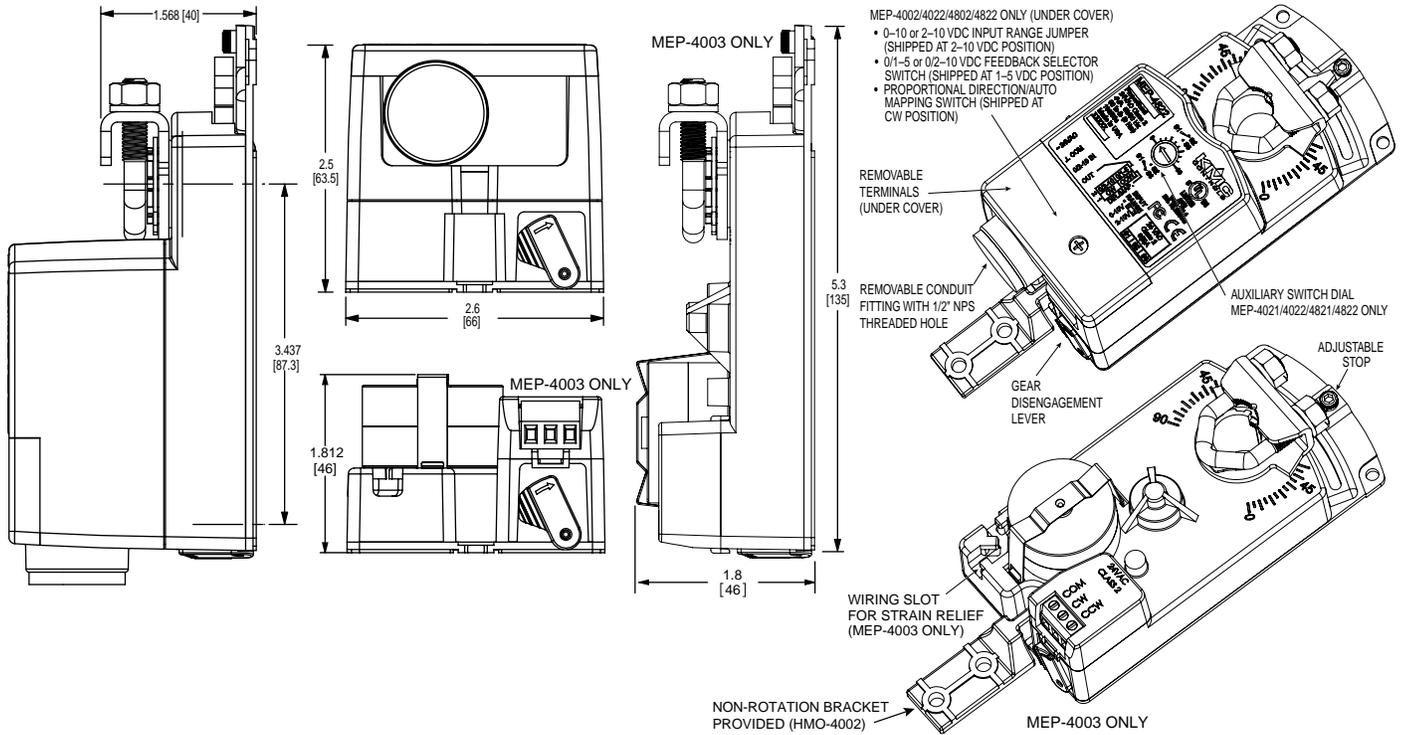
**NOTE:** Before Jan. 2014, **MEP-40x2/48x2 proportional** models had **0–10 VDC inputs** and **0–5 or 0–10 VDC feedback**. From 2014 through July 2015, they had **2–10 VDC inputs** and **1–5 or 2–10 VDC feedback** instead. Starting in August 2015, **all** these options were available and selectable via a jumper and slide switch.

**NOTE:** When the **0–10 VDC** input is selected (with the jumper), selectable (with a switch) feedback options are **0–5** or **0–10 VDC**. When the **2–10 VDC** input is selected, feedback options are **1–5** or **2–10 VDC**.

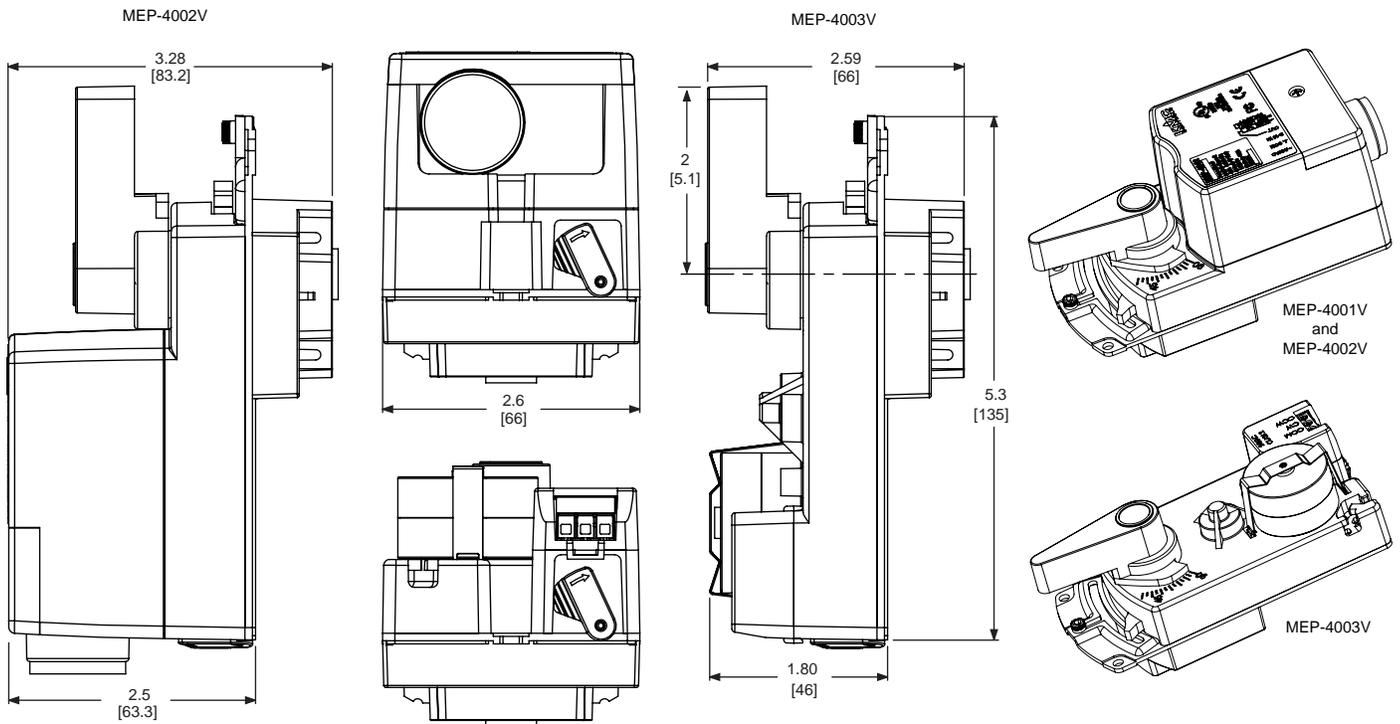
**NOTE:** When replacing a KMC MEP-5xxx actuator with an MEP-4xxx actuator:

- If on a **damper**, use a non-V model of the MEP-4xxx.
- If on a **ball valve**, two options for replacement are: (1) the MEP-4xxxV with an **HPO-5074** kit OR (2) the MEP-4xxx (non-V models) with an **HMO-4004** kit.

All dimensions are in inches (mm)



(Standard) MEP-4xxx and MEP-4003



MEP-4001V, MEP-4002V, and MEP-4003V with Quick Mount

## (Quick-Mounting) “V” Models Valve Cross-Reference

MEP-4xxxV actuators have brackets with a patented\* **quick-mounting** mechanism that mounts directly on VFB-43...BC and VFB-46...BC series valve bodies. See the [HPO-5074 installation guide](#) and the [VEB-43](#) and [VEB-46](#) series data sheets for additional information.

NOTE: “V” actuators were installed in VEB-43...CF, VEB-43...CK, VEB-46...CF, and VEB-46...CK valves starting in mid-June 2011 (date codes 11166 and later). Replacement (non-fail-safe) actuators for valves before this date code would be MEP-4002/4003.

With the **HPO-5074 kit**, MEP-4xxxV actuators can be mounted on the following KMC and other valve bodies:

Typical Application	3-Way H/C Water	2-Way H/C Water	2-Way PIC-V H/C Water
KMC Valve Body	VFB-46__BC*	VFB-43__BC*	N/A
KMC Valve	VEB-46__B__	VEB-43__B__	
Valve Solutions (VSI)	UR3 Series	UR2 Series	SPV Series
Griswold	UR3 Series	UR2 Series	SPV Series
Delta Control Products	ST Series	ST Series	ATI Series
Honeywell	VBN3 Series	VBN2 Series	N/A
Siemens	599 Series	599 Series	

\*VFB-4\_\_BC valve bodies come with the HPO-5074 already installed.

## Accessories and More Information

For torque selection, accessories, troubleshooting, and other information, see the [MEP-4xxx Applications Guide](#).

For more information on mounting, wiring, auxiliary switches, feedback/direction selectors, and actuator/signal range reset (auto-mapping), see the [MEP-4000/4800 Series Installation Guide](#).

For sample proportional single-zone heating/cooling and pressure-dependent VAV applications using the **CTE-5202 thermostat**, see the [CTE-5202 Applications Guide](#).

For similar actuators with fail-safe, see the [MEP-4200/4500/4900 Series Data Sheet](#).

“V” Actuator Installed on VEB-43 Series Valve Body with HPO-5074 Quick-Mount Adapter Kit



Valve Model and Date Label (below actuator on models without “V” actuators or on the side of the valve on models with “V” Actuators)

NOTE: When replacing a KMC MEP-5xxx actuator with an MEP-4xxx actuator on a ball valve, two options are:

- Using an MEP-4xxxV with an **HPO-5074** kit.
- Using an MEP-4xxx (non-V models) with an **HMO-4004** kit.

\*NOTE: The quick-mounting mechanism is protected under United States Patent Number 8,789,807 B2.