

Description and Application

These compact but powerful direct-coupled ControlSet® actuators provide two-position, tri-state, or proportional control for dampers or valves in HVAC systems. Efficient, durable, capacitor-driven fail-safe with switch-selectable direction provides consistent torque in both powered and fail-safe modes. A patent-pending noise reducer provides whisper-quiet operation in both modes. A minimum torque of 25 (MEP-42xx), 45 (MEP-45xx), or 90 (MEP-49xx) in.-lb. is available over the 95° angular rotation.

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

MEP-4xx1 **tri-state/two-position** (four-wire) models are designed for use with floating thermostats or controllers. MEP-4xx4/4xx5 **two-position** (two-wire) models are available in 24 VAC/VDC or 100–240 VAC models.

MEP-4x7x models also have one fully adjustable, built-in SPDT **auxiliary switch** for remote position indication or equipment interface. MEP-497x models include a second fixed switch at 10° from full CW direction. A three-foot cable is included with the switch(es).

MEP-4xxxV actuators have brackets with a patent-pending quick-mounting mechanism. See ([Quick-Mounting](#)) “V” Models [Valve Cross-Reference on page 5](#) for more information.

All 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 easy manual positioning of the actuator.

(Size Shown Relative to a Quarter)



Features

- ◆ Efficient, durable, capacitor-driven fail-safe option with switch-selectable direction provides consistent torque in both powered and fail-safe modes
- ◆ The fail-safe option, on proportional and tri-state models, can be turned off temporarily for testing purposes or permanently if desired
- ◆ Proportional models include “anti-jitter” circuitry, optional auto-mapping of the full input signal range over a reduced actuator stroke, and switch-selectable 1–5 or 2–10 VDC feedback
- ◆ MEP-4x7x models have one fully adjustable, built-in SPDT auxiliary switches, and MEP-497x models include a second fixed switch at 10° from full CW direction
- ◆ Connections are made on either fixed terminals that accept 12–26 AWG wiring or prewired 3-foot, 18 AWG cable(s)
- ◆ Direct mounting to standard shaft sizes, gear disengagement button, and adjustable mechanical end stop
- ◆ Patent-pending valve body quick-mount option on MEP-4xxxV models

NOTE: For similar actuators without fail-safe, see the [MEP-4000/4800 Series Data Sheet](#) and the [MEP-4201/4501/4901 Data Sheet](#).

Model Number*	Torque, in-lbs. (N•m)	Control Type	Operating Voltage	Auxiliary Switches***	Voltage Feedback	Electrical Connections****	FCC and ICES-003	Powered and Fail-Safe Running Time (seconds/90°)	
MEP-4254 (V)*	25 (2.82)	Two-Position (2-wire) [†]	24 VAC/ VDC**	0	None	Terminals	Class A	<35 and <30	
MEP-4274				1 Adjustable		2 Cables			
MEP-4255 (V)*			100–240 VAC	0		1 Cable	Class B	<25 and <30	
MEP-4275				1 Adjustable		2 Cables			
MEP-4251 (V)*		Tri-state/ 2-Position (4-wire) [†]	24 VAC/ VDC	0		Terminals			<35 and <30
MEP-4252 (V)*		Proportional 2–10 VDC		1–5 or 2–10 VDC		1 Adjustable		2 Cables	<50 and <30*
MEP-4272									
MEP-4554 (V)*	45 (5)	Two-Position (2-wire) [†]	24 VAC/ VDC**	0	None	Terminals		Class A	<35 and <30
MEP-4574				1 Adjustable		2 Cables			
MEP-4555 (V)*			100–240 VAC	0		1 Cable	Class B	<25 and <30	
MEP-4575				1 Adjustable		2 Cables			
MEP-4551 (V)*		Tri-state/ 2-Position (4-wire) [†]	24 VAC/ VDC	0		Terminals			<35 and <30
MEP-4552 (V)*		Proportional 2–10 VDC		1–5 or 2–10 VDC		1 Adjustable		2 Cables	<50 and <30*
MEP-4572									
MEP-4954	90 (10)	Two-Position (2-wire)	24 VAC/ VDC**	0	None	Terminals		Class A	<45 and <40
MEP-4974				1 Adj., 1 Fixed		2 Cables			
MEP-4955			100–240 VAC	0		1 Cable	Class B	<30 and <40	
MEP-4975				1 Adj., 1 Fixed		2 Cables			
MEP-4951		Tri-state/ 2-Position (4-wire) [†]	24 VAC/ VDC	0		Terminals			<45 and <40
MEP-4952		Proportional 2–10 VDC [†]		1–5 or 2–10 VDC		1 Adj., 1 Fixed		2 Cables	<80 and <40*
MEP-4972									
*MEP-4xxxV models (e.g., MEP-4254V or MEP-4552V) have the quick-mount option. MEP-42xxV are for use on 1/2" and 3/4" ball valves; MEP-45xxV are for use on 1" to 3" ball valves. Only some models have the “V” option. **Two-position 24 VAC/VDC MEP-4xx4 models are FCC Class A, Part 15, Subpart B and complies with Canadian ICES-003 Class A. All other models are Class B. For other approvals, which apply to all models, see Specifications on page 3. ***One auxiliary switch is adjustable 0–90°. On MEP-497x models, the second switch is fixed at 10° from full CW direction (Blue is connected to Orange in the 0–10° range, and Blue is connected to Green 11–90°). ****Connections are made on either fixed terminals that accept 12–26 AWG wiring or (for line-voltage models and/or models with an auxiliary switch) prewired 3-foot, 18 AWG cable(s). [†]For two-position and tri-state, the “control signal” is the same as the operating voltage. [†]After initial power-up, proportional models delay enabling motor operation approximately 30 seconds until the capacitors are charged. No actuator rotation will take place for at least the first 30 seconds.									

NOTE: The above chart lists the differences among models. Supply power, supply frequency, transformer sizing, fail-safe, angular rotation, noise level, mounting, dimensions, weight, enclosure material, position indication, servicing, quality standard, warranty, and environmental limits are the same for all models. See [Specifications on page 3](#).

Specifications

Control Signal

Proportional	2 to 10 VDC (MEP-4xx2)
Tri-state/2-Pos.	See Supply Voltage
Two-position	See Supply Voltage

Supply Voltage

Low Voltage	24 VDC/VAC (+20%/–15%), Class 2 only (MEP-4xx1/ 4xx2/4xx4)
Line Voltage	100–240 VAC (MEP-4xx5)

Supply Frequency 50/60 Hz for VAC operation

Supply Power 6 VA normal operation, 19 VA peak initializing

Transformer Sizing 20 VA

Initialization Time 30 seconds (on power-up) for proportional models only

Feedback Output 1 to 5 VDC or 2 to 10 VDC (switch selectable, proportional models only)

Auxiliary Switches

Rating	SPDT 6 A resistive load (3 A motor load) @ 250 VAC
MEP-427x/457x	1 switch, adjustable 0 to 90°
MEP-497x	2 switches; 1 adjustable 0 to 90° and 1 fixed at 10° from full CW direction

Fail-Safe Control Switch selectable, CW/OFF/CCW on proportional and tri-state models, CW/CCW on 2-position models

Fail-Safe Type (Electronic) capacitor driven

Angular Rotation 0 to 95°, fully adjustable with mechanical stop

Running Time See [Models on page 2](#)

Torque

MEP-42xx	25 in-lbs. (2.82 N•m)
MEP-45xx	45 in-lbs. (5 N•m)
MEP-49xx	90 in-lbs. (10 N•m)

Noise Level < 45 dBA max. at 1 meter

Mounting Direct to 1/4 to 5/8 inches (6 to 16 mm) round or 1/4 to 7/16 inches (6 to 11 mm) square shaft by adjustable “V” bolt and supplied non-rotation bracket; minimum recommended damper shaft length is 1-5/8 inches

Brackets

Non-rotation bracket HMO-4001 (supplied with MEP-4x7x and all MEP-49xx models) or HMO-4002 (supplied with MEP-425x and MEP-455x); HPO-5073 or HPO-5074 required for mounting to valves

Connections

Power/Signal Fixed wire clamp type terminal block, 12–26 AWG, copper, or prewired 3-foot, 18 AWG cable (see [Models on page 2](#))

Aux. Switch(es) 3-foot 18 AWG cable

Dimensions 6.000 x 2.812 x 3.406 inches (152.4 x 71.4 x 86.5 mm)—see also [Dimensions on page 4](#)

Weight 1.5 lb. (0.68 kg)

Enclosure UL94-5VA Flame-retardant plastic

Position Indication Visual indicator, 0° to 95°

Servicing Maintenance free

Quality Standard ISO 9001

Warranty 5 years (from mfg. date code)

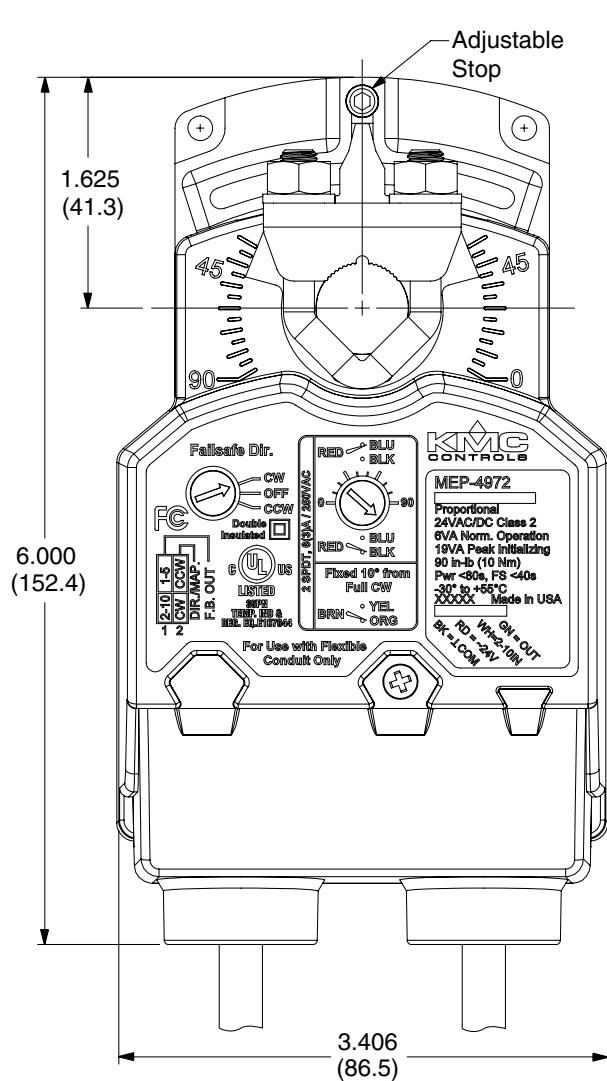
Approvals UL 873 Temperature Indicating and Regulating Equipment; FCC Class B, Part 15, Subpart B and complies with Canadian ICES-003 Class B (**except for MEP-4xx4 models, which are Class A**); SASO PCP Registration KSA R-103260

Environmental Limits

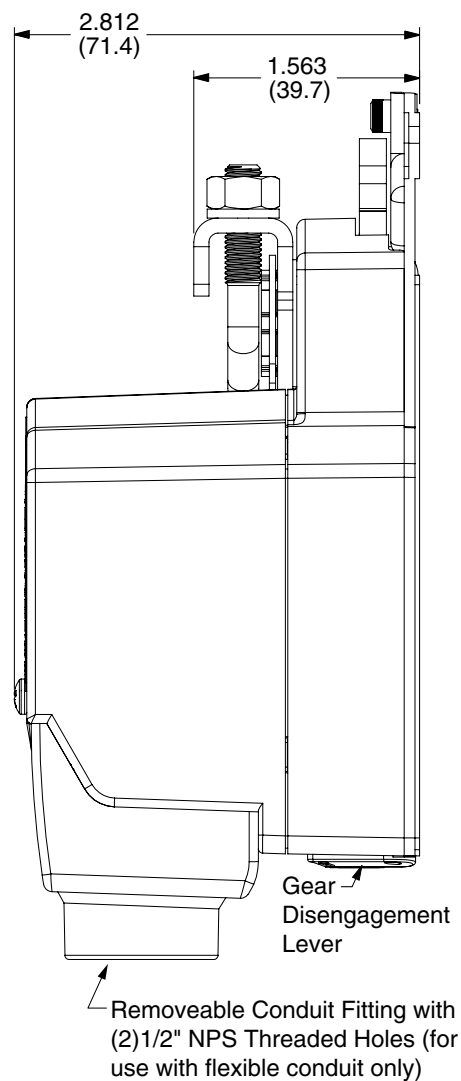
Operating	–22 to 131° F (–30 to 55° C)
Shipping	–40 to 176° F (–40 to 80° C)
Humidity	5 to 95% RH (non-condensing)

NOTE: See also [Dimensions on page 4](#).

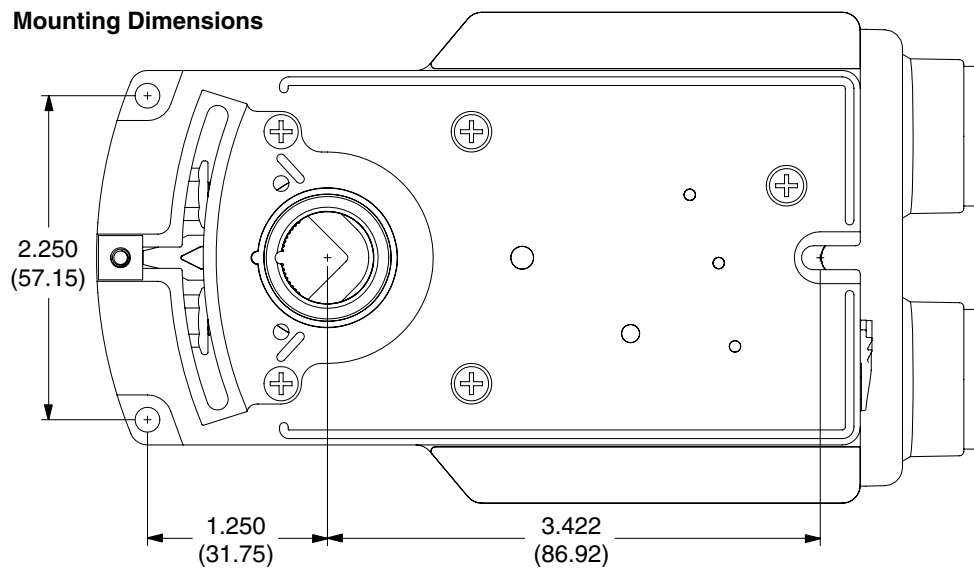
Dimensions



Dimensions are in inches (mm)



Mounting Dimensions



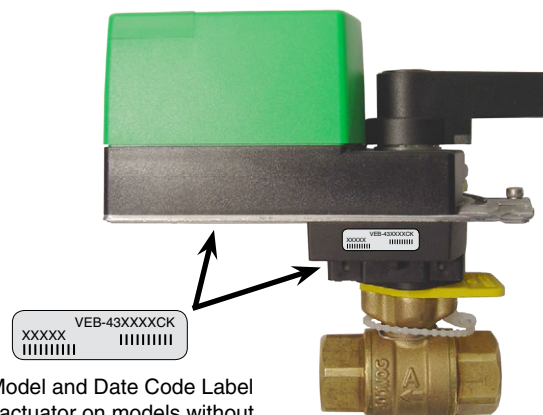
(Quick-Mounting) “V” Models Valve Cross-Reference

MEP-4xxxV actuators have brackets with a patent-pending, **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:

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



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

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 **mounting, wiring, auxiliary switches, feed-back/direction selectors, actuator/signal range reset (auto-mapping)**, and other information, see the [MEP-4200/4500/4900 Series Installation Guide](#).

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

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

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