

# Modulating & On/Off Globe Valve Actuators



MVB

## DESCRIPTION

Electronic, synchronous, motor-driven, bidirectional, noiseless, globe valve, non-spring return actuators.

## APPLICATION

Actuators with integrated coupling for 1/2" to 2 1/2", 2-way or 3-way globe valves in commercial and industrial heating, ventilation and air-conditioning systems. Can be controlled by any compatible electric or electronic analog controller, DDC/PLC control or automation system.

## FEATURES

- Easy valve-actuator coupling
- Manual override
- Overload protected
- Selectable control ranges
- Low power consumption
- Compact size
- Quiet operation
- Maintenance free
- Two-year warranty



CE  
certified  
ISO 9001

## SPECIFICATIONS

### Control

Input signal	Refer to table
- voltage	0.1 mA max.
- current	4-20 mA w/250 Ω load
- connection	3-wire or 4-wire
Feedback signal	Refer to table
- voltage	2 mA max.

### Electrical

Power supply	24 VAC, ± 10%
Frequency	50/60 Hz
Power consumption	5 VA

Manual override  
Motor type

Built-in knob  
Reversible synchronous motor  
w/built-in end switches  
< max. 30 dB(A)

Noise level

### Environmental

Permissible ambient	
- working temperature	23°F to 122°F (-5°C to 50°C)
- storage temperature	-13°F to 149°F (-25°C to 65°C)
- valve fluid temperature, and with MVBHT	248°F (120°C) max. 284°F (140°C) max.
- humidity	Max. 80% RH

Input Signal	Feedback Signal	Running Time		Part Numbers
		@ 50 Hz	@ 60 Hz	
Tri-state (3-point floating), or On/Off, 24 VAC	1K Ω pot, optional (VMBPA2)	60 sec.	50 sec.	<b>MVB46</b>
Proportional, range/action selectable: • 0-10 VDC • 1-5 VDC • 6-9 VDC • 2-10 VDC • 4-7 VDC • 8-11 VDC • 4-20 mA • Direct action • Reverse action	Selectable: • 0-10 VDC • 10-0 VDC • 0-200 μA • 200-0 μA	60 sec.	50 sec.	<b>MVB56</b>
		37 sec.	31 sec.	<b>MVB52</b>

### Performance

Positioning force	
- actuator	101.2 lbf (450 N)
Positioning stroke	0.65 in. (16.5 mm), factory set, adjustable from 0.43 to 0.79 in. (10.8 to 20.0 mm)
- mechanical stroke end	0.83 in. (21.0 mm)
Running time	Refer to table
Power failure	Stays in last position of operation
Position indicator	Markers on actuator coupling linkage indicate piston/stem position
Overload protection	Electronic throughout stroke

### Physical

Enclosure	Fire retardant, UL94-HB
- cover material	ABS
- frame/linkage material	PA66
- color	Blue and black
- protection	NEMA 1 (IP 50), conforms to IEC 730-1(93)/6.5.3
- protection class	II (CEI 107-10)
Mounting position	Horizontal or vertical; mount valve horizontally if valve media temperature is above 248°F (120°C), avoid cable outlet pointing upwards

**SPECIFICATIONS**

**Physical (cont...)**

Cable entry	2 holes, covered for 1/2" conduit connector; diameter 0.75 in. (19 mm)
Wire connection	Removable terminal block, screw type for lead wire
Wire size	Min. 16 AWG (1.5 mm <sup>2</sup> ) Max. 14 AWG (2.5 mm <sup>2</sup> )
Weight	1.8 lbs. (0.8 kg)

**Valve Body, Compatibilities**

VSB, VMB series, and other valves with stroke from 0.43 to 0.79 in (10.8 to 20.0 mm)

**Valve Coupling Manufacturing Conformity**

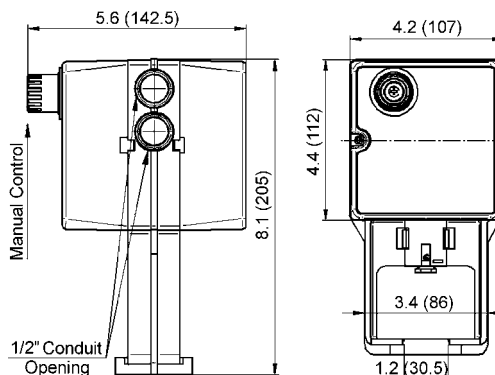
Integrated linkage  
ISO 9001 certified  
EMC 89/336 directive,  
EN 50081-1 for emission  
and EN 50082-1 for immunity  
CE

**Listings/Approvals Warranty**

Two-year material and workmanship

**DIMENSIONS**

inches (mm)



**OPTIONS**

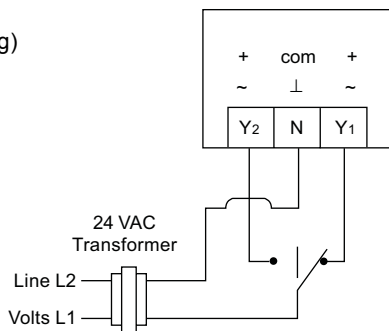
- **D36**  
Aux. micro switch built-in or separate for retrofit  
SPDT 250 VAC, 10(3) A, w/adjustable cam, 0-100% of stroke, terminal block, screw type for lead wire
- **MVBD**  
Status switch of manual override, built-in or separate for retrofit  
SPDT 250 VAC, 5(0.5) A, manual or automatic position, terminal block, screw type for lead wire
- **MVBPA2**  
Aux. feedback pot built-on PC board, only for MVB46  
1K Ω, 0-100% of stroke, terminal block, screw type for lead wire

- **MVBC**  
Weatherproof cover  
Tight slip-over enclosure, ABS material
- **AG40**  
Linkage kit  
For coupling MVB to Invensys VB7000 valve series
- **AG23**  
Linkage kit  
For coupling MVB to Cazzaniga globe valve series
- **MVBHT**  
Actuator valve mount spacer  
To reduce direct exposure of valves high temperature fluids
- **244**  
Stem heater for VSB, VMB valves, 3/4" to 2"  
For media temperature below 14°F (-10°C) to avoid freeze-up of actuator/valve stem, 24 VAC, 25 VA

**WIRING CONFIGURATION**

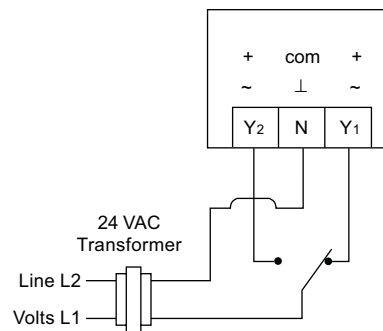
**MVB46**

Tri-state (3-point floating) control



**MVB46**

On/Off control

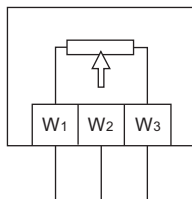


**WIRING CONFIGURATION (Cont...)**

**MVBPA2**

Option for MVB46

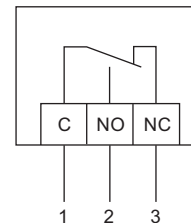
(1) Feedback pot 1K  $\Omega$   
 Actuator stem up:  
 W2 - W3 = 0K  $\Omega$   
 W2 - W1 = 1K  $\Omega$   
 50  $\Omega$  change with each  
 1 mm stem stroke



**MVBD**

Option for MVB46/56/52

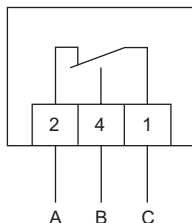
(1) Manual override status switch,  
 SPDT, 250 VAC, 5(0.5) A  
 Manual override knob position:  
 - Auto: C - NC(1-3) connect  
 - Manual: C - NO(1-2) connect



**D36**

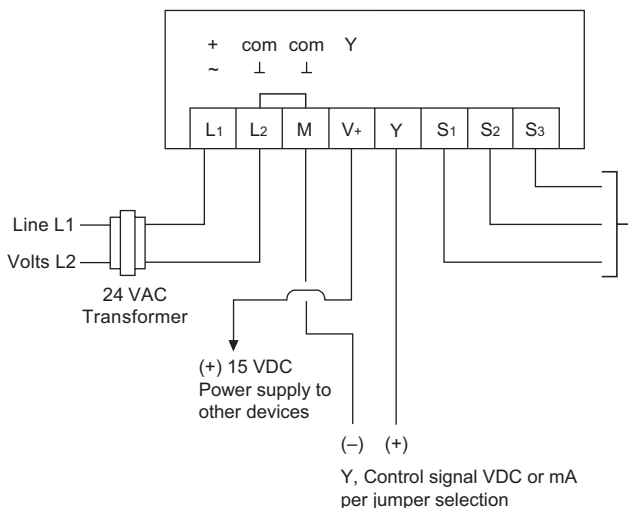
Option for MVB46/56/52

(1) Auxiliary switch,  
 SPDT, 250 VAC, 10(3) A,  
 w/adjustable cam for  
 setting between 0-100%  
 of stroke



**MVB56/MVB52**

Proportional control



**MVB56/MVB52**

Signal selection

Jumper 2-pin selection of  
 VDC or mA signal (Y) and  
 control action (located on  
 PC board above wire  
 connection terminal block)

- 8-11 VDC
- 6-9 VDC
- 4-7 VDC
- 0-10 VDC
- 2- 10 VDC
- 1-5 VDC
- 4-20 mA

- C "Stem moves down\*" (factory set)
- A "Stem moves up\*\*" \* with increased signal

(3) jumpers supplied (factory set):  
 - over 0-10 VDC pins  
 - over C pin and middle pin  
 - over one pin of 1-5 VDC (spare jumper)  
 4-20 mA signal (Y) selection:  
 One jumper must be placed over 4-20 mA pins, and a second jumper must be placed over 1-5 VDC pins!

Actuator stroke direction, valve position			
Actuator / Valve stem stroke direction (A to AB)	MVB46 Tri-state or On/Off	MVB56, MVB52 VAC or mA	
		Jumper "C"	Jumper "A"
Downwards, VSB, VMB valve opens	N - Y <sub>2</sub> connect	w/increased signal	w/decreased signal
Upwards, VSB, VMB valve closes	N - Y <sub>1</sub> connect	w/decreased signal	w/increased signal

## WIRING CONFIGURATION (Cont...)

- Notes:
- Wire connection location is below back cover, opposite site of the manual override knob.
  - Actuator will be damaged if power of 26.5 VAC or higher is applied to the 24 VAC actuators.
  - Observe polarity on secondary of transformers. All common and signal (–) must be connected in line. Incorrect polarity can cause controller damage or operation error.
  - Provide overload protection for line voltage and disconnect as required.

*Additionally, for MVB56, MVB52*

- Always use a separate transformer when controller power is full-wave rectified.

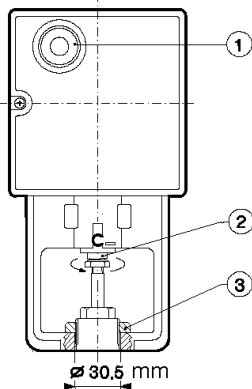
## COUPLING TO VALVE BODY

### Compatibility:

- VSB/VMB globe valve series, standard stroke 0.65 in. (16.5 mm)
- Other globe valves with strokes from 0.43 to 0.79 in. (10.8 to 20.0 mm), and accepting system connection head (M8 x 1.25) and distance of 2.8 in (71 mm) between connection head and top of valve body linkage support plane, and linkage/valve connect pass-through hole 1.2 in. (30.5 mm).

### Actuator - VSB/VMB Valve Coupling:

A flat 7 mm wrench and an open-end 13 mm wrench, along with the supplied valve coupling wrench, are required for operation.



- Pull out and turn knob ① in counter-clockwise direction until mechanical end stroke is in upper position. Turn knob clockwise until it rest in the first notch.
- Fit actuator on valve body and lock the locking nut ③ tied with supplied coupling wrench.
- Screw valve stem into joint (connection head) until stem is just snug but not tight. Hold stem with 7 mm wrench in place, and turn nut on joint ② clockwise with 13 mm wrench until the nut breaks loose and locks the valve stem in place.

## MANUAL OVERRIDE

Manual override knob can be operated with or without power on. Pull out knob and turn into appropriate stem/valve position.

The manual override knob will stay in this position until snapped back into auto position.



### Actuator - Control Voltage Zero Calibration:

The self-adjusting MVB46 tri-state actuator does not require calibration.

MVB56/MVB52 - VSB/VMB calibration steps:

- Jumper on PC board is in A position (stem moves up with increased signal).
- Provide/switch-on 24 VAC power.
- Control signal Y is disconnected.
- Wait until actuator stroke reaches lower stroke end (down position).
- Connect voltmeters positive to S<sub>2</sub>, and negative to M of terminal connection.
- Rotate white trimmer pot, located right-hand side of terminal block, until voltmeter reads 0 VDC.

### Actuator - Valve Installation:

Actuator can be mounted in any position. Avoid conduit/cable outlet pointing upward. For field access to inside of actuator it is required to leave 4 in. (100 mm) open space around the actuator.

**Install actuator/valve horizontally only if valve media temperature is above 248°F (120°C).**