

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 (MVBPA2)	60 sec.	50 sec.	MVB46
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.	MVB56
		37 sec.	31 sec.	MVB52

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 (IP50), 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

MVB

SPECIFICATIONS

Physical (cont...)

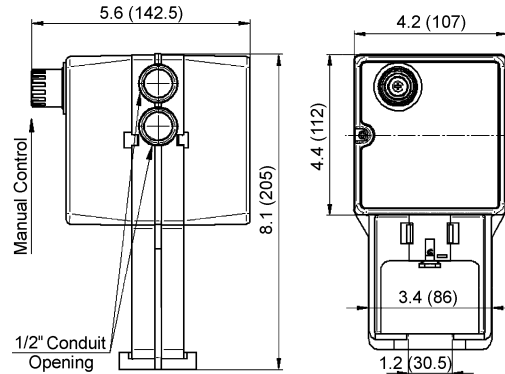
Cable entry	2 holes, covered for 1/2" conduit connector; diameter 0.75 in. (19 mm)
Wire connection	Removable terminal block, screw type for lead wire
Wire size	Min. 16 AWG (1.5 mm ²) Max. 14 AWG (2.5 mm ²)
Weight	1.8 lbs. (0.8 kg)
Valve Body, Compatibilities	VSB, VMB series, and other valves with stroke 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

SPECIFICATIONS

- 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

DIMENSIONS

inches (mm)

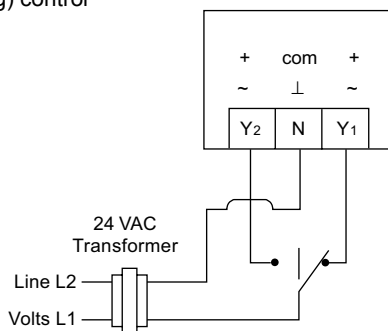


- MVBC Weatherproof cover	Tight slip-over enclosure, ABS material
- AG40 Linkage kit	For coupling MVB to Invensys VB7000 valve series
- AG23 Linkage kit	For coupling MVB to Cazzaniga globe valve series
- MVBHT Actuator valve mount spacer	To reduce direct exposure of valves high temperature fluids
- 244 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

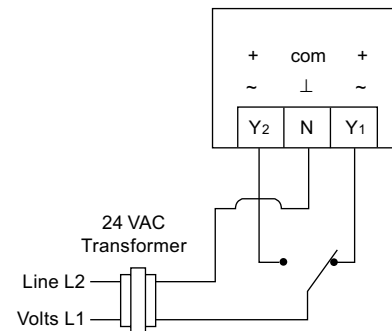
MVB46

Tri-state
(3-point floating) control



MVB46

On/Off control



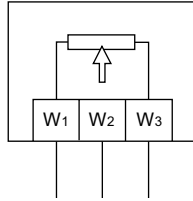
MVB

WIRING CONFIGURATION (Cont...)

MVBPA2

Option for MVB46

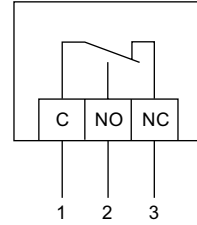
- (1) Feedback pot 1K Ω
- Actuator stem up:
- W2 - W3 = 0K Ω
- W2 - W1 = 1K Ω
- 50 Ω change with each 1 mm stem stroke



MVBD

Option for MVB46/56/52

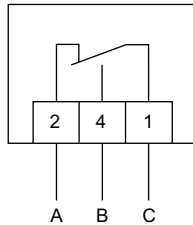
- (1) Manual override status switch, SPDT, 250 VAC, 5(0.5) A
- Manual override knob position:
- Auto: C - NC(1-3) connect
- Manual: C - NO(1-2) connect



D36

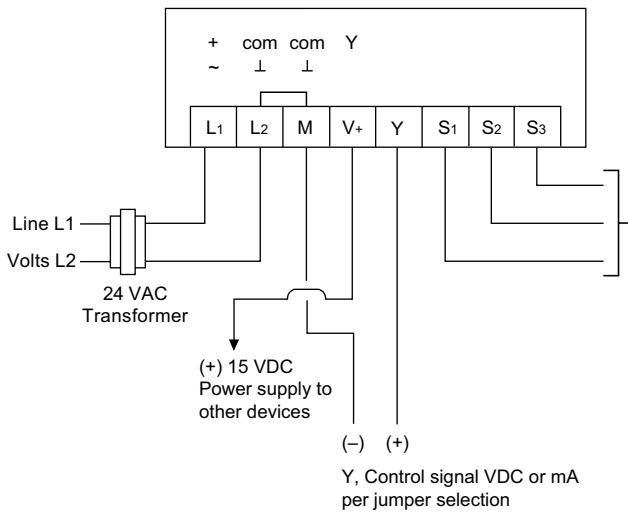
Option for MVB46/56/52

- (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

U, Feedback signal to controller or indicator.

Voltage:
M and S2 = 0-10 VDC
M and S3 = 10-0 VDC

Current:
S1 and S2 = 0-200 μ A
S1 and S3 = 200-0 μ A

(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 ₂ connect	w/increased signal	w/decreased signal
Upwards, VSB, VMB valve closes	N - Y ₁ 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.

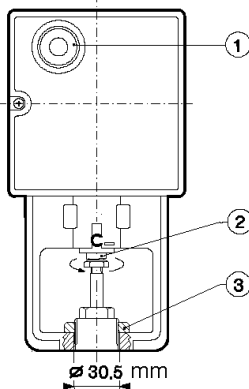
COUPLING TO VALVE BODY

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 S₂, 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).