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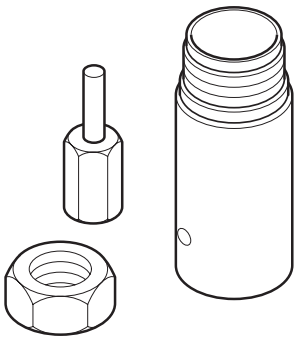
AV-672

Valve Linkage General Instructions

Application

For mounting MF-631x3 and MF-631x3-xxx series actuators onto 2-1/2" to 4" VB-92xx series 2-way and VB-931x series 3-way mixing globe valves. This linkage is also used on 2-1/2" to 5" VB-82x3 series 2-way and VB-8303 3-way diverting/mixing balanced plug valves.



Features

- Provides connection between the MF-631x3 Series actuator and the valve body.

Applicable Literature

- Invensys Building Systems Components Catalog, F-25683
- MF-631x3 Series MF-63123-xxx Series Floating and Proportional Valve Actuators General Instructions, F-24732
- MFC-420 Control Module Card General Instructions, F-25125
- MFC-8000 Control Module Card General Instructions, F-25124
- Vx-8xxx Selection Guide, F-27199
- VB-8213 Series General Instructions, F-27193
- VB-8223 Series General Instructions, F-27194
- VB-8303 Series General Instructions, F-27197
- VB-9213 Series General Instructions, F-24382
- VB-9215 Series General Instructions, F-25672
- VB-9313 Series General Instructions, F-24393
- VB-9315 Series General Instructions, F-25674
- Invensys Building Systems Reference Manual, F-21683
- Invensys Building Systems Application Manual, F-21335

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SPECIFICATIONS

Temperature Restrictions

Table-1 Valve Compatibility and Maximum Ambient Temperature Chart

Valve Series	Description	Size Range	Maximum Ambient Temperature Rating (Max Ambient @ Max Allowable Fluid)
VB-8213-0-5-P	2-Way Stem Up Open	2-1/2" to 5"	125°F (51°C) @ 281°F (138°C)
VB-8223-0-5-P	2-Way Stem Up Closed		
VB-8303-0-5-15	3-Way Diverting/Mixing		
VB-921x-0-x-P[a]	2-Way Stem Up Open	2-1/2" to 4" (65 mm to 80 mm)	125°F (51°C) @ 281°F (138°C)
VB-931x-0-x-P	3-Way Mixing		100°F (38°C) @ 300°F (149°C)

[a] 2-1/2" to 4" VB-92xx-0-5-P (ASA flanged) discontinued.

INSTALLATION

Inspection

Inspect the package for damage. If damaged, notify the appropriate carrier immediately. If undamaged, open the package and inspect the device for obvious damage. Return damaged products.

Requirements

- Tools (not provided):

  Wrenches for stem extensions, locknuts, packing nuts and bracket nuts

  Screwdriver for actuator cover screw
- Training: Installer must be a qualified, experienced technician.

CAUTION

- Avoid locations where excessive moisture, corrosive fumes, or vibration are present.
- The actuators can be mounted in any position above the centerline of the valve body. For steam applications only, mount the actuator above the valve body at 45° from vertical. When selecting a location, allow sufficient room for accessories and for service of the product.

Mounting

Allow 3" (76 mm) above the actuator valve assembly for removal and reattachment of actuator to installed valve.

1. Install VB-8213 and VB-921x two-way valves so that the arrow on the valve body or tag indicates proper flow direction.
2. Always install VB-931x three-way mixing valves with two inlets and one outlet (AB port). VB-8303 may be piped as either mixing (2 inlets, one outlet) or diverting (one inlet, 2 outlets) with the AB port as the common port.

CAUTION

- VB-8303 piping differs from VB-931x piping. The common port on VB-8303 is the bottom port (AB port). Consult VB-931x General Instructions and VB-8303 General Instructions for details.

3. Valve actuators are to be mounted in any upright position above the centerline of the valve body. For steam applications only, position the valve body so the valve stem and actuator are at least 45° from vertical.

ASSEMBLY INSTRUCTIONS

1. Screw the 1/2" (13 mm) locknut (provided with the linkage kit) onto the valve stem at least 1/2" (13 mm).

   Screw both 1/4" (6 mm) locknuts (provided with the actuator) finger-tight to the bottom of the threads on the valve stem extension (provided with the linkage kit).

Push the valve stem all the way down, and screw the stem extension onto the valve stem so that the dimension from the top of the 1/4" (6 mm) upper stem locknut to the top of the valve packing nut is 2-9/16" (65 mm). Lock with the 1/2" (13 mm) locknut, using 5/8" and 3/4" wrenches.

Screw the adaptor (provided with the linkage kit) into the actuator mounting bracket, and tighten with a screwdriver through the cross-holes. Avoid product damage. Do not use wrenches.

2. Press the manual override button, and turn the manual adjustment wheel until the indicator disc is between 1/8" (3 mm) and 3/8" (10 mm) from the full extended position.
3. Screw the valve bonnet nut (provided with the valve) to the top of the bonnet threads.
4. Pull the valve stem up. Set the actuator and adaptor on top of the stem. Hold the valve bonnet nut to prevent the adaptor from prematurely threading to the bonnet. Screw the actuator shaft to the valve stem extension by turning the actuator until the 1/4" (6 mm) upper stem locknut touches the actuator shaft.
5. Lock the stem to the output shaft by tightening the top locknut and then the bottom nut, using 5/16" open-end wrenches.
6. Lower the valve bonnet nut about 1/2" (13 mm) below the adaptor. Screw the adaptor along with actuator all the way onto the valve bonnet. Then back off part of a turn until the actuator is aligned in the correct position for field wiring. Lock with the valve bonnet nut while holding the actuator in place.
7. Press the manual override button, and turn the manual adjustment wheel to lower the stem down until the valve seats. The space between the indicator disc and bracket must be 1/16" (2 mm) to 1/8" (3 mm). If okay, go to Step 9.

   If the space is less than 1/16" (2 mm):

   a. Raise the valve stem at least 1/4" (6 mm) with the manual override.
   b. Back the valve stem extension out 1/16" (2 mm) from the output shaft by turning the upper stem locknut with a 5/16" open-end wrench.
   c. Unlock the two stem locknuts from each other with two 5/16" wrenches, and relock them in the new position by tightening the upper nut against the shaft. Then tighten the lower nut against the upper nut.

   If the space is more than 1/8" (3 mm):

   a. Measure the excess amount and record.
   b. Remove actuator from valve body. (see Disassembly Instructions, page 4.)
   c. Unlock valve stem extension, and screw down recorded amount.
   d. Reassemble starting at Step 2 above.
8. Recheck 1/16" (2 mm) to 1/8" (3 mm) spacing per Step 7 above.
9. On models with potentiometers, remove the cover. Reposition the potentiometer by sliding the potentiometer board up until it stops. Replace the cover. The potentiometer will automatically adjust on the first full extend stroke.
10. Adjust the valve manually to the desired start-up position.

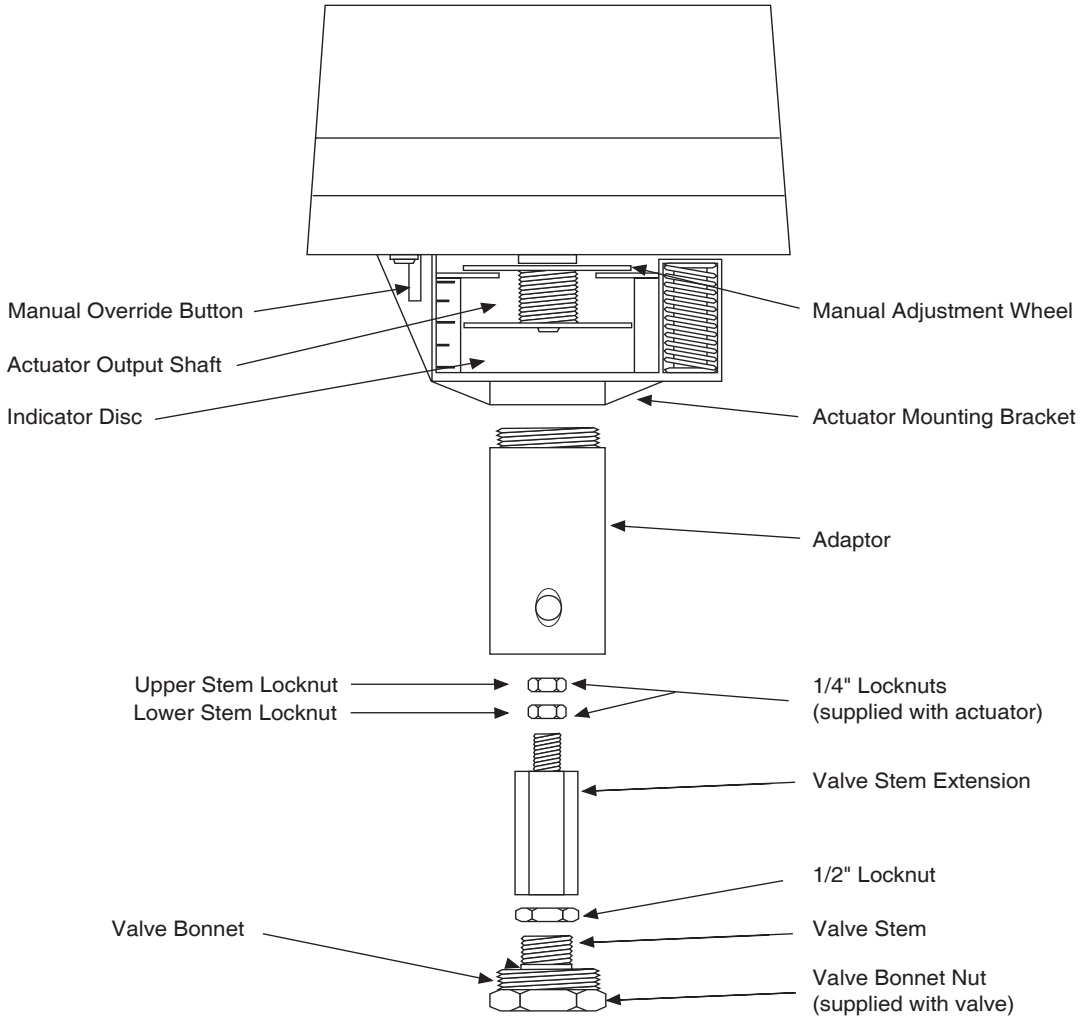

Figure-1 Assembled Linkage.

DISASSEMBLY INSTRUCTIONS

Actuator Removal from Valve Body

After electrical disconnection:

1. Manually adjust actuator until both stem locknuts are accessible, and loosen with a 5/16" open-end wrench.
2. Loosen bonnet nut.
3. Disconnect from the bonnet and the stem by rotating the actuator and adaptor counterclockwise until free of the stem and bonnet.