Application

AV-607-1 and AV-609-1 linkages are designed to connect single or dual Schneider Electric spring return and non-spring return SmartX Actuators to 1-1/2" to 6" VB-9xxx and 2-1/2" to 6" VB-8xx3 globe valves.

Features

• Allows mounting of single or dual Schneider Electric SmartX Actuators

• AV-607-1 is compatible with Schneider Electric (Siebe, Barber-Colman, INVENSYS) 2-1/2" to 5" VB-8xx3, 1-1/2" to 4" VB-931x, and discontinued 1-1/2" to 4" VB-92xx valves and Schneider Electric SmartX actuators\(^2\)

• AV-609-1 is compatible with Schneider Electric (Siebe, Barber-Colman, INVENSYS) 6” VB-8xx3, 5” and 6” VB-931x, and discontinued 5” and 6” VB-92xx valves and Schneider Electric SmartX Actuators\(^2\)

• Maintenance-free construction

• Corrosion protected heavy-duty steel rack and pinion construction and metal housing

• Precision rack self aligns with the valve stem

\(^1\)AV-607-1 and AV-609-1 replace AV-607 and AV-609 respectively

\(^2\)Check the appropriate valve selection guide for close-offs for your application,

Note: Do not install a 300 lb-in MX41-634-x actuator on the AV-607-1 linkage as equipment damage may occur.
Applicable Literature

• EN-205 Water System Guidelines, F-26080
• AV-608 Linkage Adapter Kit General Instructions, F-27253
• MA40-704x, MA4x-707x, MA4x-715x Schneider Electric SmartX Spring Return Two-Position Actuators General Instructions, F-26642
• MA40-717x Schneider Electric SmartX Series Spring Return Two-Position Actuators General Instructions, F-26742
• MF4x-7xx3 Schneider Electric SmartX Series Spring Return Floating Actuator General Instructions, F-26644
• MF40-7173 Schneider Electric SmartX Series Spring Return Floating Actuator General Instructions, F-26749
• MF41-6153/MS41-6153 Series Non-Spring Return Rotary Electronic Damper Actuator General Instructions, F-27215
• MS4x-7xx3 Schneider Electric SmartX Series Spring Return Proportional Actuator General Instructions, F-26645
• MS40-717x Schneider Electric SmartX Series Spring Return Proportional Actuator General Instructions, F-26748
• Mx41-6xxx-220/-230 and MX4x-7xxx-220/-230 Actuator/Linkage Assemblies for 2-1/2” to 6” Globe Valves General Instructions, F-27160
• Vx-7000 Series and Vx-9000 Series Mx4x-6xxx and Mx4x-7xxx Series Linked Globe Valve Assemblies with Schneider Electric SmartX Actuators Selection Guide, F-26752
• VB-8xx3 Series Balanced Plug Valve Selection Guide, F-27199

Accessories

• PKG-1171 Replacement Hardware kit (to replace lost hardware; see Figure-1)

![Figure-1 Replacement Hardware](image)

* Clamp blocks are only required for the Mx41-634x and Mx40-717x actuators.

Inspection

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

Inspect the hardware package included with the linkage to make sure all required clamps (4), clamp blocks (4), stem lock nuts (2), and anti-rotation studs (six, two factory assembled to linkage) are included. See Figure-1. Not all parts will be needed for every installation.

Requirements

• Training: Installer must be a qualified, experienced technician.

• Tools (not provided):
  – Appropriate wrenches for anti-rotation studs, stem extensions, packing nuts, and bracket nuts
  – 10 mm socket wrench (for shaft clamp nuts on Mx40-717x, Mx41-707x, Mx41-715x)
  – 1/2” nut driver and 1/2” open end wrench (for all except Mx41-634x, Mx40-717x)
  – Measuring scale graduated in 1/32” increments
  – Torque wrench, range to include 90 to 120 lb-in. (7.5 to 10 lb-ft, 10 to 14 N-m)
  – Pipe wrenches, two
  – 11/16” open-end wrench for jam nuts, two
  – Vise grip or pliers
  – Appropriate power supply (see the applicable actuator General Instructions sheet for power requirements)

Warning: Electrical shock hazard! Contact with live circuits can result in severe injury or death.

• Disconnect the power supply (line power) at the breaker or fuse before and during installation to prevent electric shock and equipment damage.
• Make all connections in accordance with the wiring diagram and in accordance with national and local electrical codes. Use copper conductors only.

Failure to observe these warnings can result in severe injury or death and can damage the equipment.
General Installation

Schneider Electric globe valve rack and pinion linkages are provided as complete assemblies. The following pages contain instructions for installing the AV-607-1 and AV-609-1 linkages. Either a single actuator or dual actuators may be installed using these instructions.

**Note:** When installing dual actuators:
- Both actuators must be the same model.
- Actuators must be mounted and adjusted so as to rotate and spring return (if applicable) in the same direction. Refer to the mounting instructions and Table A through Table X.
- Refer to the applicable actuator literature for actuator wiring information.
- Only use the actuator and linkage combinations that are shown on Table 1. Linkage or valve damage could result if a incorrect combination is applied.
- Do not attempt to use the actuator manual override feature with two actuators clamped to the same shaft. Damage and improper operation can occur. Using manual override to set individual actuator preload before installation on the linkage is permissible.

Mounting Actuator and Linkage to Valve Body

Process Overview

This mounting procedure consists of two sections:
- Section A. Mounting Linkage to Valve
  - A2. VB-9xxx and VB-8xx3 (2-way and 3-way) valves and appropriate actuator types, follow the instructions in this section to assemble the linkage to the valve
- Section B. Actuator Mounting and Setup

In this section, choose the subsection that is appropriate for the specific actuator type and valve type, to mount the actuator and adjust the linkage:
- B3. Non-Spring Return Actuator with Manual Override VB-8213 and VB-921x 2-Way Valves (Valve Stem Up, Open) VB-8223 and VB-922x 2-Way Valves (Valve Stem Up, Closed) VB-8303 and VB-931x 3-Way Valves (Valve Stem Up, Port A Closed)

The linkage is assembled to the valve according to Section A. Refer to Table 1, below, to determine the remainder of the assembly path for a specific actuator and valve.

Table 1 Procedure for Mounting Actuator and Linkage to Valve Body.

<table>
<thead>
<tr>
<th>Actuator Type</th>
<th>Valve Type</th>
<th>Section B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Subsection B1</td>
</tr>
<tr>
<td>Spring Return</td>
<td>2-Way and 3-Way, Normal Position Valve Stem Up</td>
<td>X</td>
</tr>
<tr>
<td>Actuators with Manual Override Mx41-707x Mx41-715x</td>
<td>2-Way and 3-Way, Normal Position Valve Stem Down</td>
<td></td>
</tr>
<tr>
<td>Non-Spring Return</td>
<td>2-Way and 3-Way, Normal Position Valve Stem Up</td>
<td></td>
</tr>
<tr>
<td>Actuators with Manual Override Mx41-6153 Mx41-634x</td>
<td>2-Way and 3-Way, Normal Position Valve Stem Down</td>
<td></td>
</tr>
<tr>
<td>Spring Return</td>
<td>2-Way and 3-Way, Normal Position Valve Stem Up</td>
<td></td>
</tr>
<tr>
<td>Actuators without Manual Override Mx40-717x</td>
<td>2-Way and 3-Way, Normal Position Valve Stem Down</td>
<td></td>
</tr>
</tbody>
</table>
Section A. Mounting Linkage to Valve

A1. Select and Install Anti-Rotation Studs.

Based on the actuator(s) being used, select the appropriate anti-rotation studs using Figure-.

Two NYBA-161 anti-rotation studs (for Mx4x-707x and Mx4x-715x actuators) are shipped factory assembled to each side of the linkage. If NYBA-148 or NYBA-206 are required, remove the two factory-installed anti-rotation studs one at a time and replace them with the required studs. Hand tighten the stud in the linkage frame slot and slide down to provide clearance for actuator installation (see Figure-2 below).

Figure-2 Anti-Rotation Studs

A2. Mounting Linkage to Valve — VB-9xxx, VB-8xxx, and Appropriate1 Actuator Models
1. Assemble the linkage to the valve, according to Figure-3.
2. Continue the assembly process according to the following section, “Section B. Actuator Mounting and Setup.”

1See Table-1 on page 3
Section B. Actuator Mounting and Setup

To mount the actuator and set up the assembly, refer to the subsection that applies to the specific actuator type and valve type.


Mx41-707x (VB-9xxx only with AV-607-1) and Mx41-715x (AV-607-1 and AV-609-1)

a. Install the actuator (or actuators if using dual actuators) onto the linkage and valve, and set up the assembly, according to Table-3 on page 10 or Table-3 on page 11.

Note: If using dual actuators, make sure both rotate and spring return in the same direction. Do not use manual override on installed actuators if using dual actuators. See “General Installation” on page 3.

1. **Normal Position - Valve Stem Up**
   - VB-8213 & VB-921x 2-Way, Stem Up Open
     - Set the actuator preload to an indicator reading of 80° (i.e. 10° from the end of stroke).
     - VB-8223 & VB-922x 2-Way, Stem Up Closed
     - Set the actuator preload to an indicator reading of 5°.
   - Remove anti-rotation stud if assembled on linkage.

2. Slide the actuator, "L" side facing out, onto the linkage’s pinion shaft.

3. Align the actuator with the linkage.

4. Slide anti-rotation stud(s) NYBA-161 half way into the slot on the bottom of the actuator, and then tighten the the anti-rotation stud.

5. Make sure the actuator is in full contact with the plastic stand-offs on the linkage.

6. Ensure the valve is in the closed position (see Table-6; port A closed for 3-way). Use a 10 mm wrench or socket to tighten the two nuts equally on the shaft clamp, 8 to 10 lb-ft (11 to 14 N-m).

Note: The manual override disengages when the actuator is powered. The manual override may also be manually disengaged using the supplied hex wrench. To do this, turn, then release, the hex wrench approximately 5° CW, to "jog" the mechanism and release the manual override preset. Note that 1 to 1-1/2 turns of the manual override crank is approximately 10°.

7. Refer to the applicable table in "Setting Actuator/Valve Action" and, using a screwdriver, turn the L/R selector to choose "direct acting" or "reverse acting."

8. Wire the actuator in accordance with the job wiring diagrams and the wiring information contained in the applicable actuator General Instructions (see "Applicable Literature").

9. Optional: Affix the Open and Closed labels to the angle of rotation indicator, in positions to match the actual valve stroke.

The Mx41-707x and Mx41-715x actuators feature a manual override mechanism that may be used to reposition the actuator’s output shaft. Both actuators have 95° of stroke (from indicator reading -5° to 90°).

Caution: Do not use manual override if using dual actuators!

Figure-4 Mounting Mx41-707x or Mx41-715x and Setting Up Actuator/Linkage/Valve

b. Refer to the appropriate actuator General Instructions sheet for actuator wiring and application information (see “Applicable Literature” on page 2). For valve body installation and application information, refer to the appropriate valve body General Instructions sheet.

c. Power the actuator(s) and check the system’s operation for heating or cooling output, in response to the control signal. See “Setting Actuator/Valve Action” on page 10.

Mx41-707x (VB-9xxx only with AV-607-1) and Mx41-715x (AV-607-1 and AV-609-1)

a. Install the actuator (or actuators if using dual actuators) onto the linkage and valve, and set up the assembly, according to Table-2 on page 10 or Table-3 on page 11.

Note: If using dual actuators, make sure both rotate and spring return in the same direction. Do not use manual override on installed actuators if using dual actuators. See "General Installation" on page 3.

1. Normal Position - Valve Stem Down
   VB-8213 & VB-921x 2-Way, Stem Up Open
   Set the actuator preload to an indicator reading of 5°.

   VB-8223 & VB-922x 2-Way, Stem Up Closed
   VB-8303 & VB-931x 3-Way, Port B Closed
   Set the actuator preload to an indicator reading of 80° (i.e. 10° from the end of stroke).

2. Slide the actuator, "R" side facing out, onto the linkage’s pinion shaft. Relocate the actuator clamp to the outboard side if necessary.

3. Align the actuator with the linkage.

4. Slide anti-rotation stud(s) NYBA-161 half way into the slot on the bottom of the actuator, and then tighten the nut on the anti-rotation stud.

5. Make sure the actuator is in full contact with the plastic stand-offs on the linkage.

6. Ensure the valve is in the closed position (see Table-6; port A closed for 3-way). Use a 10 mm wrench or socket to tighten the two nuts equally on the shaft clamp, 8 to 10 lb-ft (11 to 14 N·m).

Note: The manual override disengages when the actuator is powered. The manual override may also be manually disengaged using the supplied hex wrench. To do this, turn, then release, the hex wrench approximately 5° CW, to "jog" the mechanism and release the manual override preset. Note that 1 to 1-1/2 turns of the manual override crank is approximately 10°.

7. Refer to the applicable table in "Setting Actuator/Valve Action" and, using a screwdriver, turn the L/R selector to choose "direct acting" or "reverse acting."

8. Wire the actuator in accordance with the job wiring diagrams and the wiring information contained in the applicable actuator General Instructions (see "Applicable Literature").

9. Optional: Affix the Open and Closed labels to the angle of rotation indicator, in positions to match the actual valve stroke.

Figure-5 Mounting Mx41-707x or M41-715x and Setting Up Actuator/Linkage/Valve

b. Refer to the appropriate actuator General Instructions sheet for actuator wiring and application information (see "Applicable Literature" on page 2). For valve body installation and application information, refer to the appropriate valve body General Instructions sheet.

c. Power the actuator(s) and check the system’s operation for heating or cooling output, in response to the control signal. See "Setting Actuator/Valve Action" on page 10.
B3. Non-Spring Return Actuator with Manual Override

VB-8213 and VB-921x 2-Way Valves (Valve Stem Up, Open)
VB-8223 and VB-922x 2-Way Valves (Valve Stem Up, Closed)
VB-8303 and VB-931x 3-Way Valves (Valve Stem Up, Port A Closed)
Mx41-6153 Series (VB-9xxx only) Actuator with AV-607-1 Linkage, Mx41-634x Actuator with AV-609-1 Linkage Only

a. Install the actuator (or actuators if using dual Mx41-6153 actuators) onto the linkage and valve, and set up the assembly, according to Figure-7 on page 8 and Table-4 on page 11 or Table-5 on page 12.

Note: If using dual actuators, make sure both rotate in the same direction. Do not use manual override on installed actuators if using dual actuators. See “General Installation” on page 3.

1. Rotate the linkage’s pinion shaft to the valve closed position:
   - Stem Up Closed VB-922x Series and VB-931x Series Valves - Rotate the pinion shaft CCW to retract the linkage rack to the up position.
   - Stem Up Open VB-921x Series Rotate the pinion shaft CW to extend the linkage rack to the down position.

2. Slide the actuator onto the linkage’s pinion shaft.
   - Mx41-6343 Series - Install with the “L” side facing out.

3. Align the actuator with the linkage.

4. Slide the anti-rotation stud half way into the slot on the bottom of the actuator, and then tighten the nut on the anti-rotation stud.

5. Position the actuator’s output shaft as follows:
   - Mx41-6153 Series
     a. Press and hold down the manual override button.
     b. Position the actuator output shaft, 10° stem up open or 10° stem up closed (note that each increment is 5°).
     c. When finished, release the manual override button.
   - Mx41-6343 Series
     a. Using the supplied hex wrench, position the actuator’s output shaft at 10° stem up open or 10° stem up closed (note that each increment is 5°).

6. Verify that the actuator is in full contact with the plastic stand-offs on the linkage. Once the valve is in the closed position, proceed as follows:
   - Mx41-6153 Series
     Using a 10 mm wrench or socket, tighten the shaft clamp nut 7.5 to 9 lb-ft (10 to 12 N-m). Do not overtighten.
   - Mx41-6343 Series
     Using a 1/2” wrench or socket, tighten the shaft clamp nut.

Optional: Affix the Open and Closed labels to the indicator in the appropriate positions.

Figure-6 Mounting Mx41-6153 Series or Mx41-634x Series Actuator and Setting Up Actuator/Linkage/Valve

b. Refer to the appropriate actuator General Instructions sheet for actuator wiring and application information (see “Applicable Literature” on page 2). For valve body installation and application information, refer to the appropriate valve body General Instructions sheet.

c. Power the actuator(s) and check the system’s operation for heating or cooling output, in response to the control signal. See “Setting Actuator/Valve Action” on page 10.
B4. Spring Return Actuators without Manual Override

VB-8223, VB-922x 2-Way Valves (Normal Position — Valve Stem Up, Closed)
VB-8303, VB-931x 3-Way Valves (Normal Position — Valve Stem Up, Port A Closed)
Mx40-717x (AV-607-1 and AV-609-1)

a. Install the actuator (or actuators if using dual actuators) onto the linkage and valve, and set up the assembly, according to Table-3 on page 11. Use the two clamps supplied with the linkage.

Note: If using dual actuators, make sure both rotate and spring return in the same direction.

b. Refer to the appropriate actuator General Instructions sheet for actuator wiring and application information (see "Applicable Literature" on page 2). For valve body installation and application information, refer to the appropriate valve body General Instructions sheet.

c. Power the actuator(s) and check the system’s operation for heating or cooling output, in response to the control signal. See "Setting Actuator/Valve Action" on page 10.
B5. Spring-Return Actuators without Manual Override

VB-8213, VB-921x 2-Way Valves (Normal Position — Valve Stem Down, Closed)
VB-8303, VB-931x 3-Way Valves (Normal Position — Valve Stem Down, Port B Closed)
Mx40-717x (AV-607-1 and AV-609-1)

a. Install the actuator (or actuators if using dual actuators) onto the linkage and valve, and set up the assembly, according to and Table-3 on page 11. Use the two clamps supplied with the linkage.

Note: If using dual actuators, make sure both rotate and spring return in the same direction.

![Diagram of actuator installation]

1. With clamp blocks in place, hold the actuator at the 10° position. Use a 1/2" wrench or socket to tighten the two nuts equally on each shaft clamp, 4 to 6 lb-ft (5 to 8 N-m).

2. **Tip:** A 1-5/8" open-end wrench (TOOL-37) can be used to measure the amount of rotation (measured between opposite sides of the slot).

3. Slide the actuator, "R" side facing out, onto the linkage's pinion shaft. Make sure clamp blocks are inserted between pinion shaft and each clamp.

4. Align the actuator with the linkage, then rotate it 10° CCW. Note that 1-3/8" movement at the anti-rotation slot (measured at the slot's centerline) is sufficiently equal to 10°.

5. Make sure the actuator is in full contact with the plastic stand-offs on the linkage, and that the valve is in the full down position.

6. **Tip:**
   - Mx40-717x Two-Position - When power is applied to L1, L2 (Red / Black 24V) (White / Black 120v) the actuator will travel CW (As viewed from the "R" side).
   - MF40-717x Floating Control - the Yellow/Black lead drives the actuator CW and the Blue lead drives the actuator CCW (as viewed from the "R" side). The Red lead is 24 hot and the Black is 24 Ground. Making the Red lead to the Blue lead will drive the actuator CCW.
   - MS40-717x Proportional Control - Apply 10Vdc to the Gray (COM) and Yellow/Black (+) Leads, and then apply power to L1 and L2 (Brown / Light Blue 240v) or (Red / Black 24v) to drive the actuator full CW (As viewed from the "R" side).

7. Optional: Affix the Open and Closed labels to the indicator, in positions to match the actual valve stroke.

b. Refer to the appropriate actuator General Instructions sheet for actuator wiring and application information (see “Applicable Literature” on page 2). For valve body installation and application information, refer to the appropriate valve body General Instructions sheet.

c. Power the actuator(s) and check the system’s operation for heating or cooling output, in response to the control signal. See “Setting Actuator/Valve Action” on page 10.
## Setting Actuator/Valve Action

Set the actuator/valve action according to Table-2, Table-3, Table-4, or Table-6.

These tables may also be used to check the action of the completed actuator/linkage/valve assembly.

### Table-2 Mx41-707x Mx41-715x Series Spring Return Actuators

<table>
<thead>
<tr>
<th>Valve Part Number</th>
<th>Primary Actuator</th>
<th>Secondary Actuator</th>
<th>Control Signal Increase</th>
<th>Spring Return</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Facing Side</td>
<td>Facing Side</td>
<td>Primary Actuator Rotation</td>
<td>Secondary Actuator Rotation</td>
</tr>
<tr>
<td>VB-921x</td>
<td>L L R R</td>
<td>CCW</td>
<td>Down</td>
<td>Closes</td>
</tr>
<tr>
<td>VB-8213</td>
<td>L R R L</td>
<td>CCW</td>
<td>Up</td>
<td>Opens</td>
</tr>
<tr>
<td>VB-922x</td>
<td>L L R R</td>
<td>CCW</td>
<td>Down</td>
<td>Opens</td>
</tr>
<tr>
<td>VB-8223</td>
<td>L R R L</td>
<td>CCW</td>
<td>Down</td>
<td>Closes</td>
</tr>
<tr>
<td>VB-931x</td>
<td>L L R R</td>
<td>CCW</td>
<td>Down</td>
<td>“A” Opens</td>
</tr>
<tr>
<td>VB-8303</td>
<td>L L R R</td>
<td>CCW</td>
<td>Down</td>
<td>“B” Closes</td>
</tr>
<tr>
<td></td>
<td>L R R L</td>
<td>CCW</td>
<td>Up</td>
<td>“A” Closes</td>
</tr>
<tr>
<td></td>
<td>R L L R</td>
<td>CCW</td>
<td>Down</td>
<td>“A” Opens</td>
</tr>
<tr>
<td></td>
<td>R R L L</td>
<td>CCW</td>
<td>Up</td>
<td>“B” Closes</td>
</tr>
</tbody>
</table>

*aPrimary actuator is mounted on side of linkage with rack not visible

*bSecondary actuator is mounted on side of linkage with rack visible.

*cAs viewed facing actuator.
### Table-3 MA40-717x Spring Return Actuators.

<table>
<thead>
<tr>
<th>Valve Part Number</th>
<th>Primary Actuator</th>
<th>Secondary Actuator</th>
<th>Control Signal Increase</th>
<th>Spring Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>VB-921x VB-8213</td>
<td>L R CW CCW</td>
<td>Down Closes CCW CW</td>
<td>Open (Stem Up)</td>
<td></td>
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<tr>
<td></td>
<td>R L CCW CW</td>
<td>Up Opens CW CCW</td>
<td>Closed (Stem Down)</td>
<td></td>
</tr>
<tr>
<td>VB-922x VB-8223</td>
<td>L R CW CCW</td>
<td>Down Opens CCW CW</td>
<td>Closed (Stem Up)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>R L CCW CW</td>
<td>Up Closes CCW CW</td>
<td>Open (Stem Down)</td>
<td></td>
</tr>
<tr>
<td>VB-931x</td>
<td>L R CW CCW</td>
<td>Down “A” Opens “B” Closes CCW CW “B” Open, “A” Closed (Stem Up)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R L CCW CW</td>
<td>Up “A” Opens “B” Closes CCW CW “A” Open, “B” Closed (Stem Down)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VB-8303</td>
<td>L R CW CCW</td>
<td>Down “A” Opens “B” Closes CCW CW “A” Open, “B” Closed (Stem Down)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R L CCW CW</td>
<td>Up “A” Closes “B” Opens CCW CW “A” Open, “B” Closed (Stem Down)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Primary actuator is mounted on side of linkage with rack not visible
- Secondary actuator is mounted on side of linkage with rack visible.
- As viewed facing actuator.

### Table-4 MF41-6153 Floating, MS41-6153 Proportional Non-Spring Return Actuators (AV-607-1 Only)

<table>
<thead>
<tr>
<th>Valve Part Number</th>
<th>Primary Actuator Rotation</th>
<th>Secondary Actuator Rotation</th>
<th>Valve Stem Moves</th>
<th>Valve Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>VB-921x VB-8213</td>
<td>CW</td>
<td>CCW</td>
<td>Down</td>
<td>Closes</td>
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<tr>
<td></td>
<td>CCW</td>
<td>CW</td>
<td>Up</td>
<td>Opens</td>
</tr>
<tr>
<td>VB-922x VB-8223</td>
<td>CW</td>
<td>CCW</td>
<td>Down</td>
<td>Opens</td>
</tr>
<tr>
<td></td>
<td>CCW</td>
<td>CW</td>
<td>Up</td>
<td>Closes</td>
</tr>
<tr>
<td>VB-931x</td>
<td>CW</td>
<td>CCW</td>
<td>Down</td>
<td>“A” Opens, “B” Closes</td>
</tr>
<tr>
<td></td>
<td>CCW</td>
<td>CW</td>
<td>Up</td>
<td>“A” Closes, “A” Opens</td>
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<tr>
<td>VB-8303</td>
<td>CW</td>
<td>CCW</td>
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<td>“A” Opens, “B” Closes</td>
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<tr>
<td></td>
<td>CCW</td>
<td>CW</td>
<td>Up</td>
<td>“A” Closes, “A” Opens</td>
</tr>
</tbody>
</table>

- Primary actuator is mounted on side of linkage with rack not visible
- Secondary actuator is mounted on side of linkage with rack visible.
- As viewed facing actuator. MF models: control signal applied to Wire 6 (Y1).
- MF models: control signal applied to Wire 6 (Y1). MS models: DIP switch set to “CW”.
- MF models: control signal applied to Wire 7 (Y2). MS models: DIP switch set to “CCW”.

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Table-5 Mx41-6343 Floating and Mx41-634x Proportional Non-Spring Return Actuator (AV-609-1 Only)

<table>
<thead>
<tr>
<th>Valve Part Number</th>
<th>Primary Actuator</th>
<th>Secondary Actuator</th>
<th>Control Signal Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Facing Side</td>
<td>Facing Side</td>
<td>Primary Actuator Rotation</td>
</tr>
<tr>
<td>VB-921x</td>
<td>L</td>
<td>R</td>
<td>CW</td>
</tr>
<tr>
<td>VB-8213</td>
<td>R</td>
<td>L</td>
<td>CCW</td>
</tr>
<tr>
<td>VB-922x</td>
<td>L</td>
<td>R</td>
<td>CW</td>
</tr>
<tr>
<td>VB-8223</td>
<td>R</td>
<td>L</td>
<td>CCW</td>
</tr>
<tr>
<td>VB-931x</td>
<td>L</td>
<td>R</td>
<td>CW</td>
</tr>
<tr>
<td>VB-8303</td>
<td>R</td>
<td>L</td>
<td>CCW</td>
</tr>
</tbody>
</table>

*aPrimary actuator is mounted on side of linkage with rack not visible
*bSecondary actuator is mounted on side of linkage with rack visible.
*cAs viewed facing actuator.

Valve Body Action

Table-6 Valve Body Action

<table>
<thead>
<tr>
<th>Valve Body Part Number</th>
<th>Description</th>
<th>Valve Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Stem Up</td>
</tr>
<tr>
<td>VB-8213</td>
<td>Two-way stem up open</td>
<td>Open</td>
</tr>
<tr>
<td>VB-8223</td>
<td>Two-way stem up closed</td>
<td>Closed</td>
</tr>
<tr>
<td>VB-8303</td>
<td>Three-way diverting / mixing*a</td>
<td>Port A Closed Port B Open*a</td>
</tr>
<tr>
<td>VB-921x</td>
<td>Two-way stem up open</td>
<td>Open</td>
</tr>
<tr>
<td>VB-922x</td>
<td>Two-way stem up closed</td>
<td>Closed</td>
</tr>
<tr>
<td>VB-931x</td>
<td>Three-way mixing*a</td>
<td>Port A Closed Port B Open*a</td>
</tr>
</tbody>
</table>

*aAB port is the common port on 3-way valves