

**Valve Linkage  
General Instructions**

**APPLICATION**

The AV-495 linkage is used to field install MK-68X1, MS-8XX1X-XXX, MSR-8801X, MSR-8601X and MSR-8701X series of actuators 2-1/2" to 4" VB-9213, VB-9223 and VB-9313 TAC valve bodies. Table-1 provides a list of actuators and valves compatible with AV-495 and details resulting close-off pressure.

**PRE-INSTALLATION**

**Inspection**

Visually inspect the package for damage. If damaged, notify the appropriate carrier immediately. If undamaged, open the package and visually inspect the device for obvious defects. Return damaged or defective products.

**Required Installation Items**

Tools (not provided):

- Appropriate wrenches for stem extensions, lock nuts and mounting bolts.

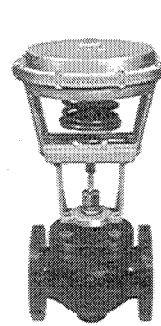
**Table-1 Restrictions on Maximum Ambient Temperature For The Valve Actuator.**

Max. Temperature in °F (°C) of Media in the Valve Body (Check Ratings of the Valve)	Max. Ambient Temperature in °F (°C) of MK-6801, MK-6811 or MK-6821	Max. Ambient Temperature in °F (°C) of MSR-8801X, MSR-8601X or MSR-8701X
281 (138)	160 (71)	140 (60) <sup>a</sup>
250 (121)	220 (104)	140 (60) <sup>a</sup>

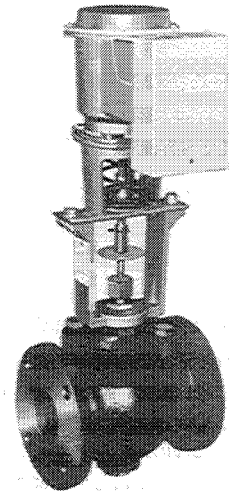
<sup>a</sup> Maximum allowable ambient temperature of the actuator.

**INSTALLATION**

Consult Table-1 to make sure the valve selected is compatible with AV-495 valve linkage and the actuator. Verify that the close-off pressure shown in Table-1 is adequate for the application. Verify that fluid temperature of the media in the valve versus the ambient temperature at the actuator do not exceed the ratings shown in Table-2.



**Typical of MK-68X1 Series Actuator Assembly**



**Typical of MS-8XX1X, MSR-8801X, MSR-8601X and MSR-8701X Series Actuator Assembly**

**Caution:**

- Installer must be a qualified, experienced technician
- Avoid locations where excessive moisture, corrosive fumes or vibration are present.
- Install all two-way valves so that they close against the flow. An arrow on the valve body or a tag indicates the proper flow direction.
- Always install three-way mixing valves with two inlets and one outlet.
- The actuators can be mounted in any position above the centerline of the valve body. When selecting a location, allow sufficient room for accessories and for service of the product.

**Table-2 Actuators and Valve Bodies That are Compatible with AV-495 and Resulting Close-off Pressure.**

Valve Body Information					MS-8301X-XXX, MSR-8801X, MSR-8601X & MSR-8701X Series of Actuators	MK-6801	MK-6811	MK-6821						
						Close-Off Pressure (psi) <sup>a</sup>								
						Supply Air Pressure (psig)								
Valve Body Part Number	Description	Normal Position (Stem Up)	Cv	Size (in.)	Close-Off Pressure (psi) <sup>a</sup>	SU	SD		SU	SD		SU	SD	
							15	20		15	20		15	20
VB-9213-0-4-12	2-Way 250 psi Globe Screwed	Open	65	2-1/2	20	-	60	110	-	40	91	-	9	60
VB-9213-0-4-13		Open	85	3	12	-	41	75	-	27	62	-	5	41
VB-9213-0-5-12	2-Way 125 lb. Flanged	Open	56	2-1/2	20	-	60	110	-	40	91	-	9	60
VB-9213-0-5-13		Open	85	3	12	-	41	75	-	27	62	-	5	41
VB-9213-0-5-14		Open	145	4	6	-	22	41	-	14	33	-	2	22
VB-9223-0-4-12	2-Way 250 psi Globe Screwed	Closed	65	2-1/2	20	9	-	-	30	-	-	60	-	-
VB-9223-0-4-13		Closed	85	3	12	5	-	-	19	-	-	41	-	-
VB-9223-0-5-12	2-Way 125 lb. Flanged	Closed	56	2-1/2	20	9	-	-	30	-	-	60	-	-
VB-9223-0-5-13		Closed	85	3	12	5	-	-	19	-	-	41	-	-
VB-9223-0-5-14		Closed	145	4	6	2	-	-	10	-	-	22	-	-
VB-9313-0-4-12	3-Way Mixing 250 psi Globe Screwed	Flow B to AB	67	2-1/2	20	9	60	110	30	40	91	60	9	60
VB-9313-0-4-13		Flow B to AB	91	3	12	5	41	75	19	27	62	41	5	41
VB-9313-0-5-12	3-Way Mixing 125 lb. Flanged	Flow B to AB	74	2-1/2	20	9	60	110	30	40	91	60	9	60
VB-9313-0-5-13		Flow B to AB	101	3	12	5	41	75	19	27	62	41	5	41
VB-9313-0-5-14		Flow B to AB	170	4	6	2	22	41	10	14	33	22	2	22

<sup>a</sup> Close-off pressure for 3-way valves:  
 SU is "A" port close-off and is based on pressure at "A" port minus pressure at "B" port.  
 SD is "B" port close-off and is based on pressure at "B" port minus pressure at "A" port.  
 SU = Stem up position of valve.  
 SD = Stem down position of valve.

**To install AV-495 Valve Linkage on Current Style Valves (Valves that do not require removal of packing nut to mount the actuator)**

Refer to Figure-1.

1. Mount the bracket on the valve body by removing the bracket nut, placing the bracket on the valve body and replacing and tightening the valve bracket nut.

*Note:* Position the bracket so that the wiring or piping of the actuator is convenient.

2. Thread the 1/2" lock nut well down onto the valve stem. Place the indicator plate on the valve stem. Thread the stem extension well down onto the valve stem.
3. Attach the actuator to bracket:  
MS-8XX1X, MSR-8801X, MSR-8601X or MSR-8701X series actuator: Use the two (2) self-tapping screws provided to fasten the actuator to the mounting bracket.  
MK-68X1 series actuator: Use the two (2) bolts provided to fasten the actuator to the mounting bracket.
4. Stem height adjustment. See Table-3.
5. Tighten the lock nut against the stem extension to make the stem extension secure to the stem.
6. Apply the OPEN/CLOSED decal - 1" scale length.

**To Install AV-495 Valve Linkage on Obsolete Style Valves (Valves that require removal of packing nut to mount the actuator)**

Refer to Figure-2.

**Caution:** Before the packing nut is removed, the system pressure on the valve must be reduced to 0 psig. If the packing nut is removed while there is pressure on the valve, the packing can blow out of the valve.

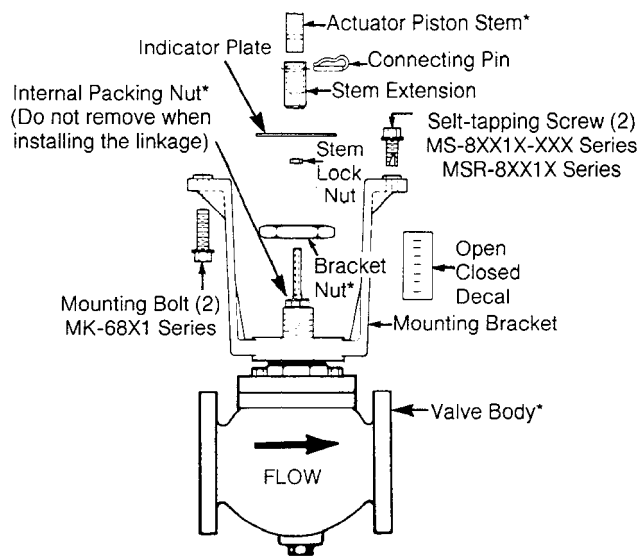
1. Mount the bracket on the valve body by removing the packing nut and the bracket nut, placing the bracket on the valve body and replacing and tightening the valve bracket nut and subsequently replacing the packing nut.

*Note:* Position the bracket so that the wiring or piping of the actuator is convenient.

2. Thread the 1/2" lock nut well down onto the valve stem. Place the indicator plate on the valve stem. Thread the stem extension well down onto the valve stem.
3. Attach the actuator to the bracket:  
MS-8XX1X, MSR-8801X, MSR-8601X or MSR-8701X series actuator: Use the two (2) self-tapping screws provided to fasten the actuator to the mounting bracket.  
MK-68X1 series actuator: Use the two (2) bolts provided to fasten the actuator to the mounting bracket.
4. Stem height adjustment: See Table-3.
5. Tighten the lock nut against the stem extension to make the stem extension secure to the stem.
6. Apply the OPEN/CLOSED decal - 1" scale length.

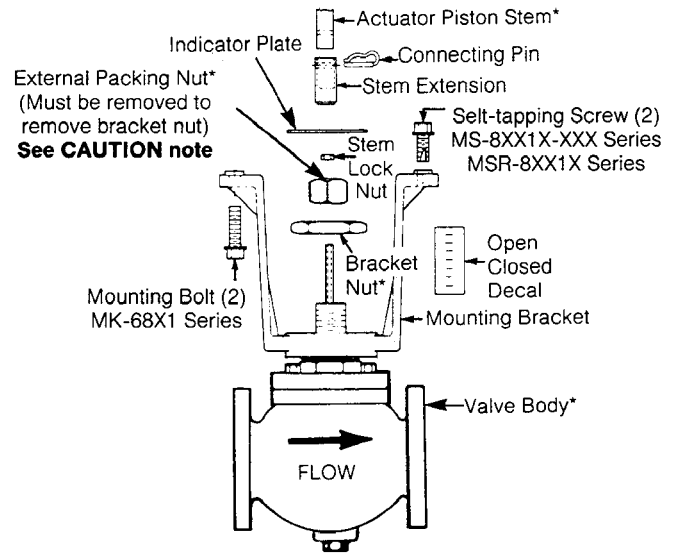
**Table-3 Stem Height Adjustment.**

Valve Type	Valve Body Part Number Series	Procedure to Adjust Stem Extension and Insert Connecting Pin
2-Way Normally Open	VB-9213	<ol style="list-style-type: none"> <li>1. The actuator should be powered and manually positioned so that actuator piston shaft is fully extended.</li> <li>2. The valve stem should be pushed completely down with the valve disc against the valve seat.</li> <li>3. The stem extension should be turned until the hole in the stem extension aligns with hole in the actuator piston.</li> <li>4. Turn the stem extension two full turns up into the actuator piston.</li> <li>5. Manually position the actuator toward the retract position and insert connecting pin.</li> </ol>
2-Way Normally Closed, 3-Way	VB-9233 VB-9313	<ol style="list-style-type: none"> <li>1. The actuator should be in its fully retract position (no power).</li> <li>2. The valve stem should be pulled completely up with the valve disc against the top valve seat.</li> <li>3. The stem extension should be turned until the hole in the stem extension aligns with hole in the actuator piston.</li> <li>4. Turn the stem extension down two full turns away from the actuator piston.</li> <li>5. Manually position the actuator toward the extend position and insert connecting pin.</li> </ol>



\* Not included with AV-495

Figure-1 Valve Linkage Assembly for MK-68X1, MS-8XX1X-XXX and MSR-8XX1X Series of Actuators with **Current** 2-1/2" to 4" VB-9XXX Valve Bodies.



\* Not included with AV-495

Figure-2 Valve Linkage Assembly for MK-68X1, MS-8XX1X-XXX and MSR-8XX1X Series of Actuators with **Obsolete** 2-1/2" to 4" VB-9XXX Valve Bodies.

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**Caution:** Before the packing nut is removed, the system pressure on the valve must be reduced to 0 psig. If the packing nut is removed while there is pressure on the valve, the packing can blow out of the valve.

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