Vx-7000/9000 Series
Mx4x-6xxx/7xxx Series

Linked Globe Valve Assemblies
SmartX Actuator/Linkage Assemblies

Globe Valve Assemblies

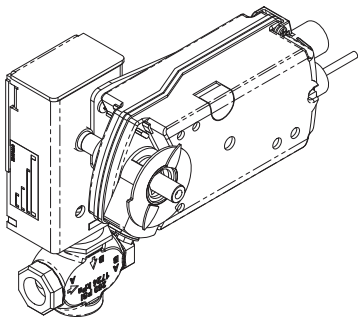
The Schneider Electric VA, VF, and Vx-7000 and 9000 series Linked Globe Valve Assemblies are complete actuator/valve assemblies that accept two position, floating, or proportional control respectively, from a DDC system or from a thermostat for control of hot water, chilled water and steam coils. These valve assemblies consist of linked spring return and non-spring return actuators mounted on ½"…6" (15 mm…150 mm) 2-way and 3-way globe valve bodies using a specially designed linkage assembly. 3-way assemblies are available for mixing (½"…6") and diverting (½"…2") applications. This linkage uses a rack and pinion mechanism to translate the rotary motion of the direct-linked actuator into the linear motion necessary to lift or lower the valve stem.

Typical applications include reheat on VAV boxes, fan coil units, hot and chilled water coils in air handling units, unit ventilators, and central system applications.

Linkage kits are available separately to allow field assembly of SmartX actuators to valve bodies.

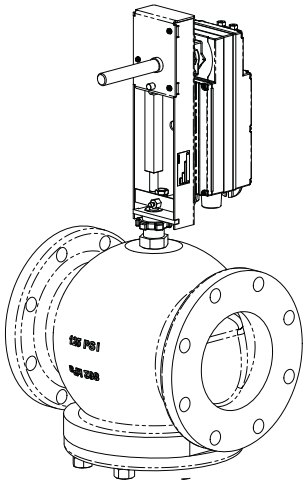
SmartX Actuator/Linkage Assemblies

The Actuator/Linkage Assemblies consist of MA, MF and MS actuators pre-assembled to linkages are designed to be fitted onto ½"…2" (15 mm…50 mm) VB-7000 and 2½"…6" (65mm...150mm) sizes of VB-9000 globe valve bodies.

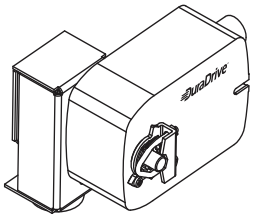


2-Way Linked Globe Valve Assembly (SmartX Non-Spring Return Model shown)

3-Way Linked Globe Valve Assembly (SmartX Spring Return Model shown)



2-Way Linked Flanged Globe Valve Assembly (SmartX Spring Return Model shown)



Actuator/Linkage Assembly (SmartX Spring Return Model shown)

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Contents

Features and Benefits

Features	Benefits
Thermal isolation.	Protects the actuator from cold or excess heat generated by chilled water, hot water, or steam passing through the valve. Discourages condensation.
Valve sizes 1/2"...6" (15...150mm) Union Straightway, NPT, Flanged 2-Way and 3-Way.	Satisfies a wide range of application requirements.
Brushless DC motors used in all floating and proportional spring return actuators, in floating and proportional 300 lb-in. non-spring return actuators, and in two-position 133 and 150 lb-in. spring return actuators.	Provides better accuracy with longer actuator service life.
All models equipped with pigtail leads.	Eases installation. Reduced electrician costs.
NEMA 4 (IEC IP56) actuator enclosure for some actuators.	Mx40-717x series actuators with customer supplied conduit connectors provide water tight security.
Linkage kits are available separately.	Easy field assembly of actuator to valve body.
Spring-loaded TFE valve packing.	Self adjusting. No tightening required.
250 psig valve body static pressure rating per ANSI Standards (B16.15—1985) for screwed cast bronze bodies. 125 psig valve body static pressure rating for cast iron flanged bodies.	Meets most demanding pressure requirements.
Robust structural steel linkage.	Ensures precise alignment of the shaft to the valve stem for extended life of the assembly.
Up to 250 psig (1724 kPa) close-off.	Meets variety of close-off requirements.
Overload protection on actuator.	Eliminates excessive stem force and over heating of actuator.
Position indicator.	Allows for quick check of valve position.
Spring return models with normally open or normally closed configurations.	Meets all fail safe mode applications.
½"…2" 3-way valve sizes are offered in either a mixing or diverting configuration.	Increases application flexibility.

Document Number: F-26752-18

Related Documentation

F-Number	Description
F-26642	MA40-704x Series, MA4x-707x Series, MA4x-715x Series SmartX Spring Return Two-Position Actuators Installation Instructions
F-26644	MF4x-7xx3, MF4x-7xx3-50x SmartX Series Spring Return Floating Actuator Installation Instructions
F-26645	MS4x-7xx3, MS4x-7xx3-50x SmartX Series Spring Return Proportional Actuator Installation Instructions
F-26750	MXx4x-6/7xxx-20x Series SmartX Actuator/Linkage Assemblies for Globe Valves
F-27211	MF41-6043/MS41-6043 Series, MF41-6083/ MS41-6083 Series Non-Spring Return Direct Coupled Actuator Installation Instructions
F-27212	MF41-6153, MS41-6153 Non-Spring Return Direct Coupled Actuator Installation Instructions
F-27213	MF41-6043/MF41-6083 Series Non-Spring Return Rotary 24 Vac Three-Position Control Electronic Damper Actuators Installation Instructions
F-27214	MS41-6043/MS41-6083 Series Non-Spring Return Rotary 24 Vac Modulating Control 0…10 Vdc Electronic Damper Actuators Installation Instructions
F-27215	MF41-6153/MS41-6153 Series Non-Spring Return Rotary Electronic Damper Actuators Installation Instructions
F-26744	MF41-6343 SmartX Series Non-Spring Return Direct Coupled Actuator Installation Instructions
F-26745	MS41-634x SmartX Series Non-Spring Return Direct Coupled Actuator Installation Instructions
F-26749	MF40-7173 SmartX Series Spring Return Direct Coupled Actuator Installation Instructions
F-26646	Mx4x-7xxx, Mx40-6xxx Series Schneider Electric SmartX Actuator Selection Guide
F-26785	Vx-2x13-5xx-9-xx, Vx-7xxx-xxx-4-xx, Mx4x-7xxx, and Mx41-6xxx Series, Ball Valve Assemblies, Globe Linked Valve Assemblies, and Schneider Electric SmartX Actuator/Linkage Assemblies Cross-Reference Guide
F-11080	Valve Selection Chart Water
F-11366	Valve Selection Chart Steam (2-way valves only)
F-13755	CA-28 Control Valve Sizing
F-26080	EN-205 Water System Guidelines
F-24380	VB-7211 Series ½”…1¼” Union Straightway NPT Stem Up Open, 2-Way Valves Installation Instructions
F-26075	VB-7213 Series ½”…2” Screwed NPT Stem Up Open, 2-Way Valves Installation Instructions
F-24384	VB-7221 Series ½”…1¼” Union Straightway NPT Stem Up Closed, 2-Way Valves Installation Instructions
F-26073	VB-7223 Series ½”…2” Screwed NPT Stem Up Closed, 2-Way Valves Installation Instructions
F-26074	VB-7313 Series ½”…2” Screwed NPT 3-Way Mixing Valves Installation Instructions
F-26076	VB-7323 Series ½”…2” Screwed NPT 3-Way Diverting Valves Installation Instructions
F-24382	VB-9213 Series 2½”…6” Flanged Stem Up Open, 2-Way Valves Installation Instructions
F-24386	VB-9223 2½”…6” Flanged Stem Up Closed, 2-Way Valves Installation Instructions
F-24393	VB-9313 Series 2½”…6” Flanged 3-Way Mixing Valves Installation Instructions

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Linked Glove Valve Assembly Part Numbering System

V X - X X X X - X X X - X - X X

Control Signal Type
A = Two Position
F = Floating
S = Proportional

Configuration [1]
721, 921 = 2-Way, Stem Up Open
722, 922 = 2-Way, Stem Up Closed
731, 931 = 3-Way, Mixing
732 = 3-Way, Diverting

Connection
1 = Union Straightway
3 = Threaded NPT (Bronze) or Flanged (Cast Iron)
4 = Union Sweat End

Actuator

Two Position
MA40-7043=536
MA40-7043-501=537
MA40-7040=532
MA40-7040-501=533
MA40-7041=534
MA40-7041-501=535
MA40-7173=576
MA40-7170=572
MA40-7171=574
MA41-7153=556
MA41-7153-502=557
MA41-7150=552
MA41-7150-502=553
MA41-7151=554
MA41-7151-502=555
MA41-7073=546
MA41-7073-502=547
MA41-7070=542
MA41-7070-502=543
MA41-7071=544
MA41-7071-502=545

Proportional
MS41-6043=505
MS41-6083=506
MS41-6153=508
MS41-6343=516
MS40-7043=536
MS40-7043-501=537
MS40-7043-MP=538
MS40-7043-MP5=539
MS41-7073=546
MS41-7073-502=547
MS41-7153=556
MS41-7153-502=557
MS40-7173=576
MS40-7170=572
MS40-7171=574

Floating
MF41-6043=505
MF41-6083=506
MF41-6153=508
MF41-6343=516
MF40-7043=536
MF40-7043-501=537
MF41-7073=546
MF41-7073-502=547
MF41-7153=556
MF41-7153-502=557
MF40-7173=576

Pattern Code
4 = Straightway (Bronze)
5 = Globe Flanged (Cast Iron)

Port Code

Size	2-Way Cv	2-Way P Code	3-Way Cv Mixing	3-Way Cv Diverting	3-Way P Code
1/2"	0.4	01	—	—	
	1.3	02	2.2	2.2	02
	2.2	03	—	—	
	4.4	04	4.4	4.4	04
3/4"	5.5	05	—	—	
	7.5	06	7.5	7.5	06
1"	10.0	07	—	—	
	14.0	08	14.0	15.0	08
1-1/4"	20.0	09	20.0	20.0	09
1-1/2"	28.0	10	28.0	28.0	10
2"	40.0	11	41.0	40.0	11
2-1/2"	65.0	12	74	—	12
3"	85.0	13	101	—	13
4"	145.0	14	170	—	14
5"	235.0	15	290	—	15
6"	350.0	16	390	—	16
	kvs		**kvs**		
15 mm	0.3	01	—	—	
	1.1	02	1.9	—	02
	1.9	03	—	—	
	3.8	04	3.8	—	04
20 mm	4.8	05	—	—	
	6.5	06	6.5	—	06
25 mm	8.7	07	—	—	
	12.0	08	12.0	—	08
32 mm	17.0	09	17.0	—	09
40 mm	24.0	10	24.0	—	10
50 mm	35.0	11	36.0	—	11
65 mm	56.0	12	58.0	—	12
80 mm	73.0	13	78.0	—	13

[1] The configuration of the valve assembly determines the valve stem position and flow, as shipped from the factory. See the table below.

Valve Assemblies	Valve Body Action	Factory Shipped Position[c]		Action[c]
		Valve Stem	Flow	
VX-721X-XXX-4-P VX-921X-XXX-5-P	2-Way Stem Up Open	Up	Open	A to AB Flow decreases as actuator rotates CW
VX-722X-XXX-4-P VX-922X-XXX-5-P	2-Way Stem Up Closed	Up	Closed	A to AB Flow increases as actuator rotates CW
VX-731X-XXX-4-P VX-931X-XXX-5-P	3-Way Mixing	Up	Flow B to AB	A to AB Flow increases as actuator rotates CW B to AB Flow decreases as actuator rotates CW
VX-732X-XXX-4-P	3-Way Diverting	Up	Flow B to AB	B to A Flow increases as actuator rotates CW B to AB Flow decreases as actuator rotates CW

[c] The actuator is factory mounted with the "L" side facing up and the actuator rotation switch (if present) set to "L." The actuator rotates CW as the control signal increases. For spring return models, the factory-shipped position is the normal position.

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System Design Considerations

Linked Globe Valve Assemblies

This section describes characteristics of the VB-7xxx and VB-9xxx valve bodies used in Vx-7xxx and Vx-9xxx valve assemblies. This information is also useful when installing the Mx4x-xxxx-2xx series actuator/linkage assemblies onto these valve bodies.

2-Way Valves

All valves have modified equal percentage flow characteristics. That is, for equal increments of valve stem stroke, the change in flow rate with respect to valve stroke may be expressed as a constant percent of the flow rate at the time of the change. The change of flow rate with respect to valve stroke is relatively small when the valve plug is near the valve seat and relatively high when the valve plug is nearly wide open. See Figure1 for typical modified equal percentage flow characteristics of VB-72xx and VB-92xx series valves.

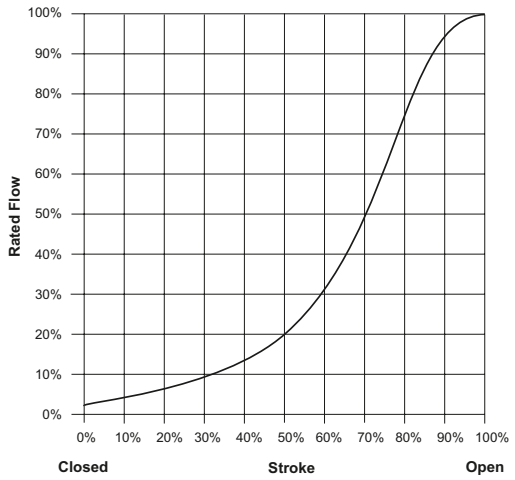

Figure 1. Typical Modified Equal Percentage Flow Characteristics

3-Way Valves

3-way mixing valves are designed so the flow from either of the inlet ports to the outlet is approximately linear, which means the total flow from the outlet is almost constant over the stroke of the valve stem. See Figure 2 for typical flow characteristics of the VB-731x and VB-931x series valve bodies.

For mixing valves, control begins as soon as plug displacement allows flow. Thus the rangeability of 3-way valves normally exceeds 500:1 which is the reciprocal of 0.2% nominal leakage.

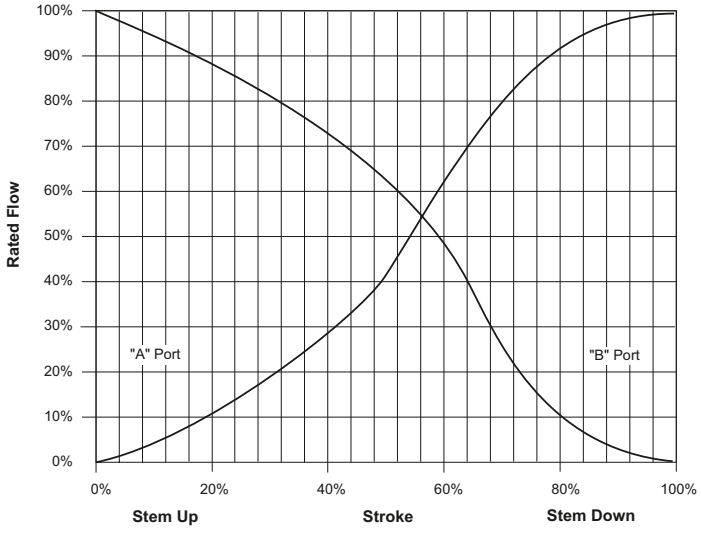

Figure 2. Typical Flow Characteristics

Linkage Kits

Linkage Kit	Actuator	Factory Assembled Valve Sizes	Field-Assembled to VB Valve Bodies
		2-way & 3-way	2-way & 3-way
AV-602	Mx41-707x	1"…2"	1"…2"
	Mx41-715x	1¼"…2"	
	Mx40-717x	1½"…2"	
AV-611	Mx41-6043	½"…2"	½"…2"
	Mx41-6083	1"…2"	
	Mx41-6153	1½"…2"	
	MA40-704x	½"…2"	
	MF40-7043		
	MS40-7043		
AV-607-1	Mx41-6153	2½"…4"	2½"…4"
	Mx41-707x		
	Mx41-715x		
	Mx40-717x		
AV-609-1	Mx41-6343	5"…6"	2½"…6"

Rangeability

Nominal Valve Size		Port Code (P)	Nominal Rangeability
Standard	Metric		
½"	15 mm	01	5:1
		02	15:1
		03	25:1
		04	40:1
3/4"	20 mm	05	50:1
		06	60:1
1"	25 mm	07	
		08	75:1
1¼"	32 mm	09	
1½"	40 mm	10	
2"	50 mm	11	
2½"	65 mm	12	
3"	80 mm	13	
4"	100 mm	14	
5"	125 mm	15	
6"	150 mm	16	

Temperature/Pressure Ratings

See Figure 3 for temperature and pressure ratings of 2-way and 3-way valves. Ratings conform with published values and disclaimer.

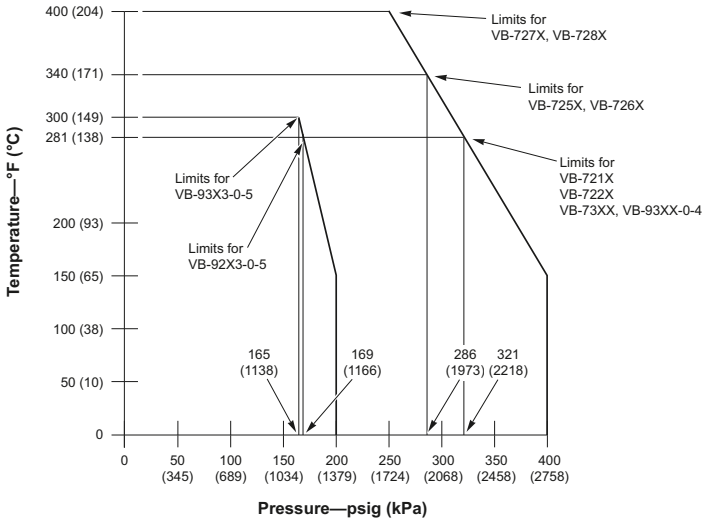

Figure 3. Temperature and Pressure Ratings for VB-7xxx and VB-9xxx Series G

VB-7xxx-0-x-P (Cast Bronze Body)

Standards: Pressure to ANSI B16.15, Class 250, with 400 psi (2758 kPa) up to 150°F (65 °C), decreasing to 346 psi (2386 kPa) at 281°F (138 °C).

Materials: Valve body is made of bronze, ASTM B584. Valve trim is 316 stainless steel stem, brass plug, metal-to-metal or EPDM disc with PTFE packing parts and silicone packing grease.

VB-9xxx-0-5-P (Cast Iron Body with Flanged End Fittings)

Standards: Pressure to ANSI B16.1, Class 125, with 200 psi (1379 kPa) up to 150 °F (65 °C), decreasing to 169 psi (1165 kPa) at 281°F (138 °C).

Materials: Valve body is made of cast iron, ASTM A126 Class B. Valve trim is 316 stainless steel stem, brass plug, metal-to-metal or EPDM disc with PTFE packing parts and silicone packing grease.

Close-off Ratings

Nominal actuator close-off ratings are based on ANSI IV (0.01% leakage) with EPDM discs and PTFE discs in steam applications. Metal-to-metal trim such as brass 3-way and high temperature stainless are designed for ANSI III (0.1% leakage). Seat leakage for reduced port versions of metal-to-metal seats may match the full port versions allowing up to 1% on the 0.4 Cv plugs.

Installation Considerations

Mounting Angle of Valve Assembly

Be sure to allow the necessary clearance around the valve assembly. The valve assembly must be mounted so the valve stem is at least 5° above the horizontal. This ensures that any condensate that forms on the valve body will not travel into the linkage or actuator where it may cause corrosion. On steam applications where the ambient temperature approaches the limit of the actuator the valve assembly must be mounted 45° from vertical. Refer to MXx4x-6/7xxx-20x Series SmartX Actuator/Linkage Assemblies for Globe Valves, F-26750

Insulation of Linked Globe Valve Assembly

The globe valve should be completely insulated to minimize the effect of heat transfer and condensation at the actuator.

Caution: The actuator/linkage must not be insulated. Doing so will result in excess heat or condensation within the actuator.

Temperature Limits for Globe Valve Assembly

When installing the globe valve assembly observe the minimum and maximum temperature limits given in the Actuator Specifications and Dimensions sections of this document.

Sizing and Selection

Two-position Control

Two-position control valves are normally selected “line size” to keep pressure drop at a minimum. If it is desirable to reduce the valve below line size, then 10% of “available pressure” (that is, the pump pressure differential available between supply and return mains with design flow at the valve location) is normally used to select the valve.

Proportional Control

Proportional control valves are usually selected to take a pressure drop equal to at least 50% of the “available pressure.” As “available pressure” is often difficult to calculate, the normal procedure is to select the valve using a pressure drop at least equal to the drop in the coil or other load being controlled (except where small booster pumps are used) with a minimum recommended pressure drop of 5 psi (34 kPa). When the design temperature drop is less than 60 °F (33°C) for conventional heating systems, higher pressure drops across the valve are needed for good results.

Conventional Heating System		
Design Temperature Load Drop °F (°C)	**Recommended Pressure Drop (% of Available Pressure)**	**Multiplier on Load Drop**
60 (33) or More	50%	1 x Load Drop
40 (22)	66%	2 x Load Drop
20 (11)	75%	3 x Load Drop

Secondary Circuits with Small Booster Pumps

50% of available pressure difference (equal to the drop through load or 50% of booster pump head).

3-Way Proportional Mixing Valves Used to Bypass Flow

When 3-way proportional linked globe valve assemblies are used to control flow through a heating or cooling coil, the valve assembly is piped on the outlet side of the load to throttle the water flow through the load, and therefore control the heat output of the load (Figure 4).

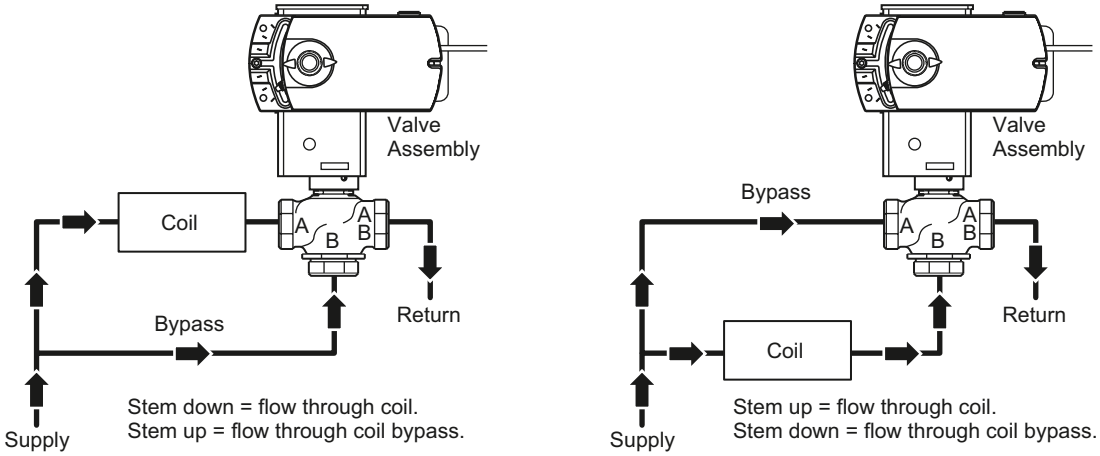

Figure 4. Typical piping of 3-Way mixing Valve for Control of Heating or Cooling Coil

3-Way Proportional Mixing Valves Used to Blend Water Flows

Proportional 3-way mixing valves used to blend two water flows (Figure 5) control the heat output by varying the water temperature to the load at constant flow. These valves do not require high pressure drops for good control results. They can be sized for a pressure drop of 20% of the "available pressure" or equal to 25% of the pressure drop through the load at full flow.

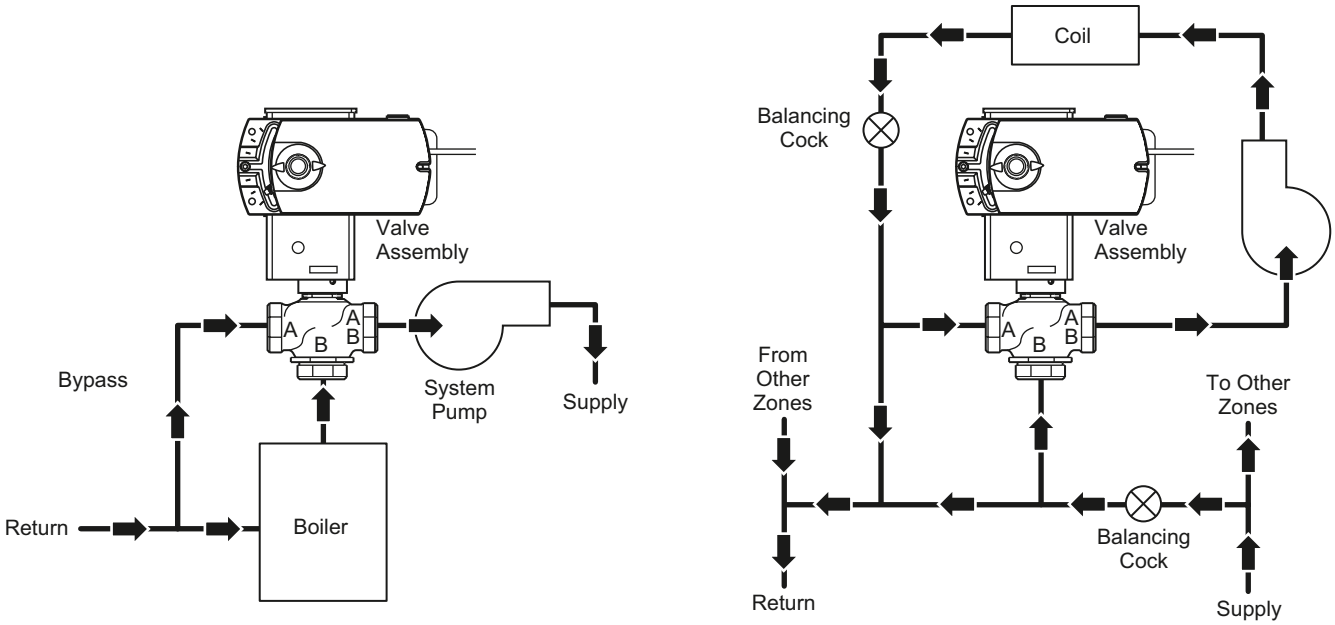

Figure 5. Typical 3-Way Mixing Valve for Proportional Control Used to Blend Two Water Flows

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3-Way Diverting Valves

Proportional and two-position 3-way diverting linked globe valve assemblies are used to control the flow of hot or chilled fluids in heating systems, cooling coils, or other load by diverting the flow to either the load or a bypass. The valve must be piped with one inlet and two outlets. (Figure 6).

Cavitation Limitations on Valve Pressure Drop

A valve selected with too high a pressure drop can cause erosion of discs and/or wire drawing of the seat. In addition cavitation can cause noise, damage to the valve trim (and possibly the body), and choke the flow through the valve.

Do not exceed the maximum differential pressure (pressure drop) for the valve selected. Refer to the chart in Figure 7.

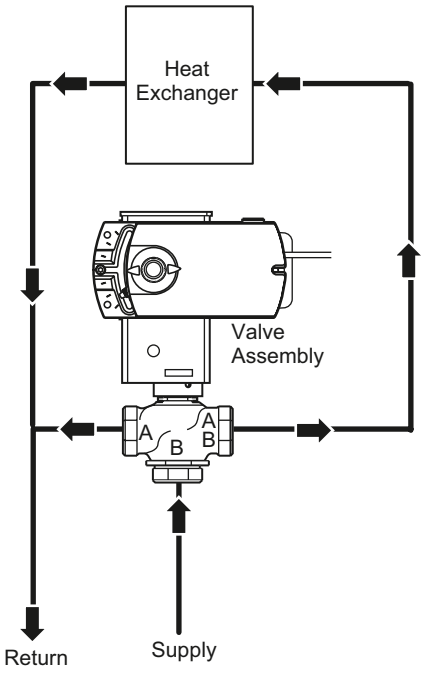

Figure 6. Typical 3-Way Diverting Valve Piping

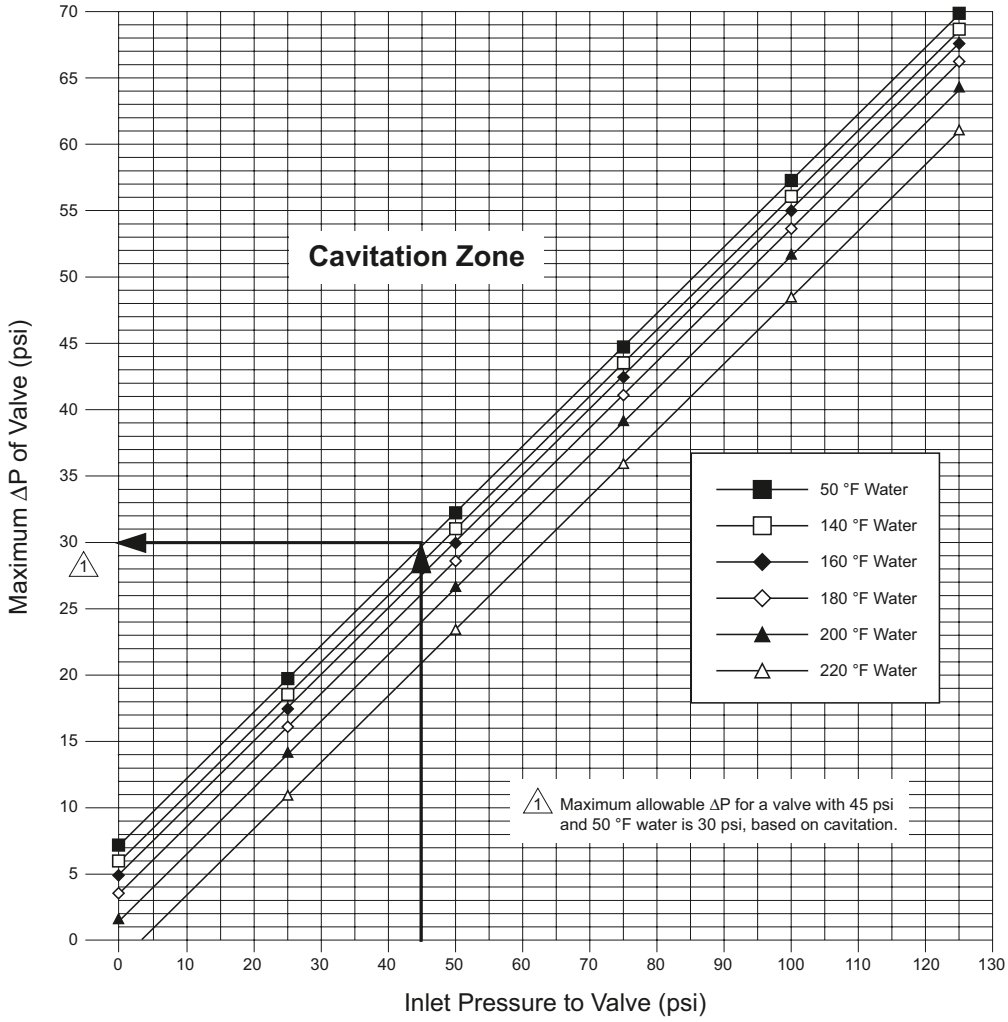

Figure 7. Maximum Allowable Differential Pressure (DP) for Water Valves

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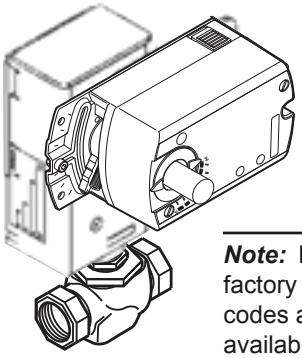
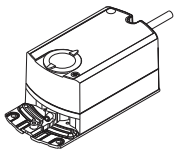
Note: Choose a valve assembly having a close-off pressure capability sufficient for the application.

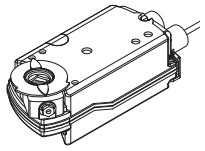
Table 1. 2-Way Linked Globe Valve Assemblies with NSR Actuators Performance Chart

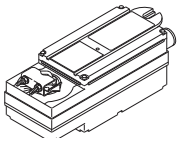
Non-Spring Return 2-Way Linked Globe Valve Assemblies



Note: Not all factory actuator codes are available.







Valve Assembly Part Number[a]	P Code	Valve Size in. (mm)	Cv[b]	kvs[b]	Actuator Close-off Pressure psi[c d]					
							Single Actuator	Dual Actuator[e]	Single Actuator	Dual Actuator[e]
					Actuator Torque Rating (minimum)					
					35 lb-in. (4 N-m)	70 lb-in. (8 N-m)	133 lb-in. (15 N-m)		300 lb-in. (34 N-m)	
					Actuator Model (Actuator Code)					
					Floating MF41-6043 (505) Proportional MS41-6043 (505)	Floating MF41-6083 (506) Proportional MS41-6083 (506)	Floating MF41-6153 (508)	Proportional MS41-6153 (508)	Floating MF41-6343 (516)	Proportional MS41-6343 (516)
					Linkage Kit Part Number					
					AV-611 (½"…2")	AV-611 (1"…2")	AV-611 (1½"…2") AV-607-1 (2½"…4")		AV-609-1 (5" and 6")	
Vx-7211-xxx-4-P Vx-7213-xxx-4-P Vx-7221-xxx-4-P Vx-7223-xxx-4-P	01	1/2 (15)	0.4	0.3	225	—	—	—	—	—
	02		1.3	1.1						
	03		2.2	1.9						
	04		4.4	3.8						
	05	3/4 (20)	5.5	4.8						
	06		7.5	6.5						
	07	1 (25)	10	8.7	100	130				
	08		14	12						
	09	1¼ (32)	20	17	60	100				
Vx-7213-xxx-4-P Vx-7223-xxx-4-P	10	1½ (40)	28	24	40	70	140			
	11	2 (50)	40	35	20	40	80			
Vx-9213-xxx-5-P[h] Vx-9223-xxx-5-P[h]	12	2½ (65)	56.0[g]	48[g]	—	—	33	70	46	96
			65.0[h]	56[h]						
	13	3 (80)	85	73			22	48	31	66
	14	4 (N/A)	145	125			12	27	18	38
	15	5 (N/A)	235	203			—	—	11	24
	16	6 (N/A)	350	303					8	17

a - To determine a specific part number, see the "Linked Globe Valve Assembly Part Numbering System."
b - kvs = m^3/h (DP = 100 kPa) kvs = Cv / 1.156 Cv = kvs x 1.156
c - Close-off ANSI IV (.01%) for soft seats. For seat leakage ratings see "Related Literature" section for the list of literature on specific valve bodies.
d - Close-off pressure ratings describe only the differential pressure which the actuator can close-off with adequate seating force. Consult valve body specifications for other limitations. The rating value is the pressure difference between the inlet and outlet ports.
e - Dual actuators are not available as factory assemblies
h - Flanged valve body.

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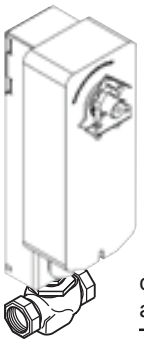
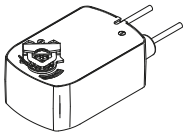
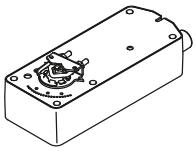
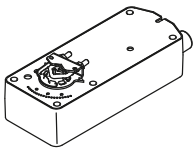
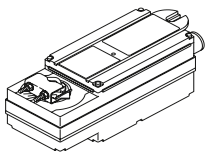
Note: Choose a valve assembly having a close-off pressure capability sufficient for the application.

Table 2. 2-Way Linked Globe Valve Assemblies with SR Actuators Performance Chart

Spring Return
2-Way Linked Globe Valve Assemblies[a]



Note: Not all factory actuator codes are available.

Actuator Torque Rating (minimum)			
35 lb-in (4 N-m)	60 lb-in (7 N-m)	133 lb-in (15 N-m)	150 lb-in (17 N-m)
Actuator Model (Actuator Code)			
Two-Position MA40-704x(532) (533) (534) (535) (536) (537) Floating MF40-7043 (536) (537) Proportional MS40-7043 (536) (537) (538) (539)	Two-Position MA41-707x (542) (543) (544) (545) (546) (547) Floating MF41-7073 (546) (547) Proportional MS41-7073 (546) (547)	Two-Position MA41-715x (552) (553) (554) (555) (556) (557) Floating MF41-7153 (556) (557) Proportional MS41-7153 (556) (557)	Two-Position MA40-717x (572) (574) (576) Floating MF40-7173 (576) Proportional MS40-717x (572) (574) (576)
Linkage Kit Part Number			
AV-611 (½"…2")	AV-602 (1"…2") AV-607-1 (2½"…4")	AV-602 (1¼"…2") AV-607-1 (2½"…4") AV-609-1 (5"…6")	

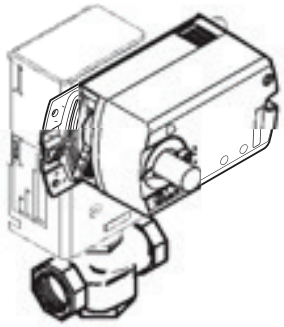
Valve Assembly Part Number[b]	P Code	Valve Size in. (mm)	Cv[c]	kvs[c]	Actuator Close-off Pressure psi[d, e]	Single Actuator	Dual Actuator[f]	Single Actuator	Dual Actuator[f]	Single Actuator	Dual Actuator[f]
Vx-7211-xxx-4-P Vx-7213-xxx-4-P Vx-7221-xxx-4-P Vx-7223-xxx-4-P	01	1/2 (15)	0.4	0.3	250	—	—	—	—	250	—
	02		1.3	1.1							
	03		2.2	1.9							
	04		4.4	3.8							
	05	3/4 (20)	5.5	4.8							
	06		7.5	6.5							
	07	1 (25)	10	8.7	125	180					
	08		14	12	125	180					
	09	1¼(32)	20	17	75	120		200			
Vx-7213-xxx-4-P Vx-7223-xxx-4-P	10	1½(40)	28	24	50	80		140		160	
	11	2 (50)	40	35	25	40		80		120	
Vx-9213-xxx-5-P[i] Vx-9223-xxx-5-P[i]	12	2½ (65)	56.0[h]	48[h]	—	24	52	33	70	40	84
			65.0[i]	56[i]							
	13	3 (80)	85	73		16	35	22	48	27	57
	14	4 (N/A)	145	125		9	20	12	27	15	33
	15	5 (N/A)	235	203		—	—	—	9	—	10
	16	6 (N/A)	350	303					6		7

a - For field assembly only. Factory actuator/linkage/valve assemblies are not offered.
b - To determine a specific part number, see the "Linked Globe Valve Assembly Part Numbering System."
c - kvs = m^3/h (DP = 100 kPa) kvs = Cv / 1.156 Cv = kvs x 1.156
d - Close-off ANSI IV (.01%) for soft seats. For seat leakage ratings see "Related Literature" section for the list of literature on specific valve bodies.
e - Close-off pressure ratings describe only the differential pressure which the actuator can close-off with adequate seating force. Consult valve body specifications for other limitations. The rating value is the pressure difference between the inlet and outlet ports.
f - Dual actuators are not available as factory assemblies.
i - Flanged valve body.

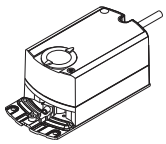
Note: Choose a valve assembly having a close-off pressure capability sufficient for the application.

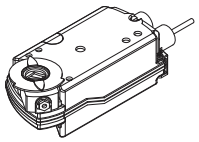
Table 3. 3-Way Linked Globe Valve Assemblies with Non-Spring Return Actuators Performance Chart

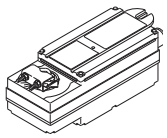
Non-Spring Return 3-Way Linked Globe Valve Assemblies[a]



Note: Not all factory actuator codes are available.







Valve Assembly Part Number[b]	P Code	Valve Size in. (mm)	Cv[c]	kvs[c]	Actuator Torque Rating (minimum)					
					35 lb-in (4 N-m)	70 lb-in (8 N-m)	133 lb-in (15 N-m)		300 lb-in. (34 N-m)	
					Actuator Model (Actuator Code)					
					Floating MF41-6043 (505) Proportional MS41-6043 (505)	Floating MF41-6083 (506) Proportional MS41-6083 (506)	Floating MF41-6153 (508) Proportional MS41-6153 (508)		Floating MF41-6343 (516) Proportional MS41-6343 (516)	
					Linkage Kit Part Number					
					AV-611 (½"…2")	AV-611 (1"…2")	AV-611 (1½"…2") AV-607-1 (2½"…4")		AV-609-1 (2½"…6")	
					Actuator Close-off Pressure psi[ad]					
							Single Actuator	Dual Actuator[e]	Single Actuator	Dual Actuator[e]
Vx-7313-xxx-4-P	02	1/2 (15)	2.2	1.9	225	—	—	—	—	—
	04		4.4	3.8						
	06	3/4 (20)	7.5	6.5						
	08	1 (25)	14	12	100	180	—	—	—	—
	09	1¼ (32)	20	17	60	120	—	—	—	—
	10	1½ (40)	28	24	40	75	140	—	—	—
	11	2 (50)	41	36	20	40	80	—	—	—
Vx-7323-505-4-P	02	1/2 (15)	2.2	1.9	250	—	—	—	—	—
	04		4.4	3.8						
	06	3/4 (20)	7.5	6.5						
	08	1 (25)	15	13						
	09	1¼ (32)	20	17.3						
	10	1½ (40)	28	24.2						
	11	2 (50)	40	34.6						

a - Refer to Figure 5 and Figure 6 for typical piping diagram for 3-way linked globe valve assemblies.
b - To determine a specific part number, see the Linked Globe Valve Assembly Part Numbering System.
c - kvs = m^3/h (DP = 100 kPa) kvs = Cv / 1.156 Cv = kvs x 1.156
d - Close-off ANSI III (0.1%) for metal-to-metal seats with pressure at inlet (port A). For seat leakage ratings see "Applicable Literature" section for the list of literature on specific valve bodies.
e - Dual actuators are not available as factory assemblies.

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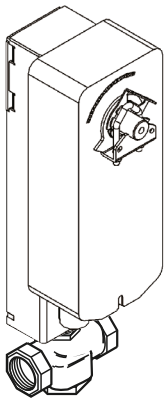
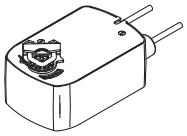
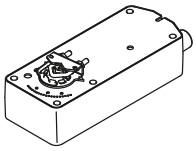
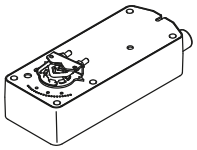
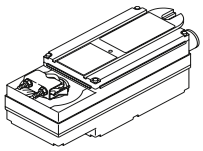
Note: Choose a valve assembly having a close-off pressure capability sufficient for the application.

Table 4. 3-Way Linked Globe Valve Assemblies with Spring Return Actuators Performance Chart

Spring Return
3-Way Linked Globe Valve Assemblies [a]



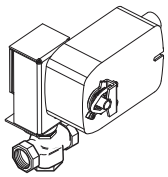
Note: Not all factory actuator codes are available.

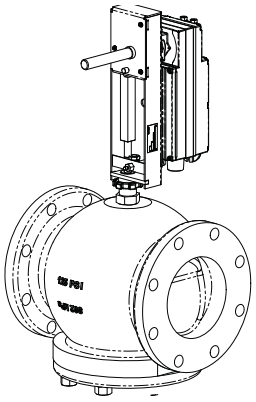
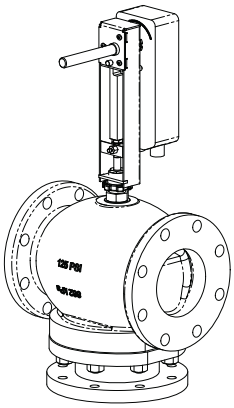
Actuator Torque Rating (minimum)			
35 lb-in [b] (4 N-m)	60 lb-in (7 N-m)	133 lb-in (15 N-m)	150 lb-in (17 N-m)
Actuator Model (Actuator Code)			
Two-Position MA40-704x (532) (533) (534) (535) (536) (537) Floating MF40-7043 (536) (537) Proportional MS40-7043 (536) (537) (538) (539)	Two-Position MA41-707x (542) (543) (544) (545) (546) (547) Floating MF41-7073 (546) (547) Proportional MS41-7073 (546) (547)	Two-Position MA41-715x (552) (553) (554) (555) (556) (557) Floating MF41-7153 (556) (557) Proportional MS41-7153 (556) (557)	Two-Position MA40-717x (572) (574) (576) Floating MF40-7173 (576) Proportional MS40-717x (572) (574) (576)
Linkage Kit Part Number			
AV-611 (½"…2")	AV-602 (1"…2") AV-607-1 (2½"…4")	AV-602 (1½"…2") AV-607-1 (2½"…4") AV-609-1 (5" and 6")	AV-602 (1½"…2") AV-607-1 (2½"…4") AV-609-1 (5" and 6")

Valve Assembly Part Number [c]	P Code	Valve Size in. (mm)	Cv [d]	kvs [d]	Actuator Close-off Pressure psig [b e]						
					Single Actuator	Single Actuator	Dual Actuator [f]	Single Actuator	Dual Actuator [f]	Single Actuator	Dual Actuator [f]
VX-7313-XXX-4-P	02	1/2 (15)	2.2	1.9	250	—	—	—	—	250	—
	04		4.4	3.8							
	06	3/4 (20)	7.5	6.5							
	08	1 (25)	14	12	125	180					
	09	1¼ (32)	20	17	75	100					
	10	1½ (40)	28	24	50	70		140		160	
	11	2 (50)	41	36	25	40		80		120	
Vx-7323-xxx-4-P	02	1/2 (15)	2.2	1.9	250	—		—		—	
	04		4.4	3.8							
	06	3/4 (20)	7.5	6.5							
	08	1 (25)	15	13							
	09	1¼ (32)	20	17.3							
	10	1½ (40)	28	24.2							
	11	2 (50)	40	34.6							
Vx-9313-xxx-5-P [i]	12	2½ (65)	74.0 [i]	64 [i]	—	24	52	33	70	40	84
	13	3 (80)	101.0 [i]	87 [i]		16	35	22	48	27	57
	14	4 (N/A)	145	125		9	20	12	27	15	33
	15	5 (N/A)	235	203		—	—	—	9	—	10
	16	6 (N/A)	350	303					6		7

a - Refer to Figure 5 and Figure 6 for typical piping diagram for 3-way linked globe valve assemblies.
b - Only the 35 lb-in actuators are applicable for retrofit on VB-9000 and older valves ½" through 1¼" (32 mm). Actuator mounting is compatible with any valve which can accept an AV-400 or AV-600 linkage.
c - To determine a specific part number, see the Linked Globe Valve Assembly Part Numbering System.
d - kvs = m^3/h (DP = 100 kPa) kvs = Cv / 1.156 Cv = kvs x 1.156
e - Close-off ANSI III (0.1%) for metal-to-metal seats with pressure at inlet (port A). For seat leakage ratings see "Applicable Literature" section for the list of literature on specific valve bodies.
f - Dual actuators are not available as factory assemblies.
i - Flanged valve body.

Table 5. Specifications for ½"…2" Vx-7xxx-5xx-4-P Series Linked Globe Valve Assemblies			
Linked Globe Valve Assemblies		2-Way  1/2" through 2" Valve Assemblies	3-Way  1/2" through 2" Valve Assemblies
Applications		Chilled or Hot Water, or Steam	Chilled or Hot Water
Type of End Fitting		NPT, Rp Screwed Union Straightway (up to 1¼")	NPT, Rp Screwed
Size		Vx-7xxx-5xx-4-P ½"…2" (15 mm…50 mm) Vx-9xxx-5xx-4-P 2½" and 3" (65 mm…80 mm)	
Action		Stem Up Open or Stem Up Closed	Mixing or Diverting
Valve Assembly Series[a]		Vx-72xx-5xx-4-P	Vx-73xx-5xx-4-P
Flow Type		Equal Percentage[b]	Linear[b]
Valve Body Materials	Body	Bronze	
	Seat	Bronze	
	Stem	Stainless Steel	
	Plug	Brass	
	Packing	Spring-loaded TFE	
	Disc	EPDM	—
Linkage	Housing	Corrosion-Resistant Steel	
Materials	Rack & Pinion	Steel	
ANSI Pressure Class (Figure 3)		250 psig (1724 kPa), up to 400 psig (2758 kPa) below 150 °F (66 °C)[c]	
Pressure Class (VB-7xx5)		PN16	
Rangeability		See Rangeability, Page 6.	500:01:00
Seat Leakage		ANSI Class IV (.01%)	ANSI Class III (0.1%)
STEAM			
Inlet Pressure — Maximum		35 psig (241 kPa)	—
Fluid Temperature — Maximum		281 °F (138 °C)	
Allowable Differential Pressure[d]		20 psi (138 kPa)	
WATER			
Fluid Temperature — Minimum		½"… 2" 20 °F (7 °C)	
Fluid Temperature — Maximum		½"…2" 281 °F (138 °C)	½"…2" 300 °F (149 °C)
Allowable Differential Pressure [d]		35 psi (241 kPa) Max. for Normal Lifespan (refer to "Cavitation Limitations on Valve Pressure Drop" on page 9)	

a - To determine a specific part number, see the Linked Globe Valve Assembly Part Numbering System.
b - For a detailed description of the flow, see page 5, 2-way valves and 3-way valves.
c - Do not apply the above pressure rating to the piping system.
d - Maximum recommended differential pressure. Do not exceed the recommended differential pressure (pressure drop) or the integrity of valve parts may be affected. Exceeding the maximum recommended differential pressure voids the product warranty.

Table 6. Specifications for 2½"…6" Vx-9xxx Linked Globe Valve Assemblies			
		2-Way	3-Way
Linked Globe Valve Assemblies			
Applications		Chilled or Hot Water, or Steam	Chilled or Hot Water
Type of End Fitting		NPT, Rp Screwed	NPT, Rp Screwed
		Union Straightway (up to 1¼")	
Size		Vx-9xxx-5xx-5-P 2-1/2" to 6" (65mm to 150mm)	
Action		Stem Up Open or Stem Up Closed	Mixing or Diverting
		Vx-92xx-5xx-5-P	Vx-93xx-5xx-5-P
Flow Type		Equal Percentage[b]	Linear [b]
Valve Body Materials	Body	Bronze	
	Seat	Bronze	
	Stem	Stainless Steel	
	Plug	Brass	
	Packing	Spring-loaded TFE	
	Disc	EPDM	—
Linkage Materials	Housing	Corrosion-Resistant Steel	
	Rack & Pinion	Steel	
ANSI Pressure Class (Figure 3)		250 psig (1724 kPa), up to 400 psig (2758 kPa) below 150 °F (66 °C) [c]	
Pressure Class (VB-7xx5)		PN16	
Rangeability		See Rangeability, Page 6.	500:01:00
Seat Leakage		ANSI Class IV (.01%)	ANSI Class III (0.1%)
STEAM			
Inlet Pressure — Maximum		35 psig (241 kPa)	—
Fluid Temperature — Maximum		281 °F (138 °C)	
Allowable Differential Pressure[d]		20 psi (138 kPa)	
WATER			
Fluid Temperature — Minimum		2-1/2" through 6" 40 °F (4 °C)	
Fluid Temperature — Maximum		2½" through 6" 281 °F (138 °C)	2½" through 6" values 300 °F (149 °C)
Allowable Differential Pressure [d]		35 psi (241 kPa) Max. for Normal Lifespan (refer to "Cavitation Limitations on Valve Pressure Drop" on page 9)	

a - To determine a specific part number, see the Linked Globe Valve Assembly Part Numbering System.
b - For a detailed description of the flow, see page 5, 2-way valves and 3-way valves.
c - Do not apply the above pressure rating to the piping system.
d - Maximum recommended differential pressure. Do not exceed the recommended differential pressure (pressure drop) or the integrity of valve parts may be affected. Exceeding the maximum recommended differential pressure voids the product warranty.

Mx41-60x3 Series

44 lb-in and 88 lb-in Direct Coupled Damper Actuators

CE c UL us LISTED

Product Description

These direct coupled 24 Vac Non-Spring Return rotary electric SmartX Actuators are designed for three position (floating) control of dampers.

Features

- Compact, lightweight design.
- Easy-to-see position indicator.
- Self-adapting capability for maximum flexibility in damper positioning.
- Quiet, low-power operation.
- Manual Override.
- Plenum cable standard.
- Independently adjustable dual auxiliary switches option available (Mx41-6083-502).
- Feedback position output signal available (MS41-6043/6083 series).

Specifications	
Control Signal	MF41-60x3 — Floating three-position control, 24 Vac. MS41-60x3 — Proportional, 0 to 10 Vdc; input resistance 100 kW.
Power Inputs	See Table.
Connections	3 ft. (0.9 m) appliance cable, 18 AWG plenum-rated leads
Electrical Outputs	Position feedback voltage for MS41-6043/6083: 0…10 Vdc, 1 mA. Auxiliary Switches: Dual auxiliary switches available with MF41-6083-502, MS41-6083-502 when these actuators are ordered as separate units. Auxiliary switches are not offered with factory ball valve assemblies.
Mechanical Outputs	Travel: Normal angle of rotation is 90°, limited to a maximum of 95°. Field adjustable to limit travel on either end of stroke.
Ambient Temperature Limits	Shipping and storage: -40…158 °F (-40…70 °C) Operating: -25…130 °F (-32…55 °C) ambient. NOTE: Check the valve operating temperature limit. The minimum valve temperature limit is 20 °F (6.7 °C) 5…95% RH, non-condensing.
Location	NEMA Type 2 (IEC IP54)
Agency Listings	c-UL-us LISTED per UL 873 and CAN C22.2 No.24-93. CE compliant to directives LVD, EMC, and RoHS2.

Part Number	Torque lb-in (N-m)	Actuator Inputs			Outputs		Approximate Timing in sec. @ 70°F
		Control	Voltage	VA @ 60Hz	Feedback	Auxiliary Switch	Powered
MF41-6043	44 (5)	Floating	24 Vac	2.3	—	—	90
MF41-6083	88 (10)					2-SPDT	125
MF41-6083-502							
MS41-6043	44 (5)	0…10 vdc		3.3	0…10 vdc	—	90
MS41-6083	88 (10)					2-SPDT	125
MS41-6083-502							

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Dimensions — 1/2” to 2” Globe Valve Assemblies

Valve Assembly Part Number	Valve Size in.	Valve Dimensions in inches (millimetres)								
		2-Way (Refer to Figure-8 and Figure-10)					3-Way (Refer to Figure-9)			
		A	B	C	D	E	A	C	D	E
Union Straightway (N.C.) VF-7221-50x-4-P VS-7221-50x-4-P	1/2	4-3/16 (106)	2-11/16 (68)	1-3/16 (30)	1-1/8 (29)	6-3/8 (162)	—			
	3/4	4-15/16 (125)	3-3/16 (81)	1-3/16 (30)	1-1/8 (29)	6-3/8 (162)				
	1	6 (152)	3-5/8 (92)	1-3/4 (44)	1-3/16 (30)	6-7/16 (164)				
	1-1/4	6-1/4 (159)	3-15/16 (100)	1-3/4 (44)	1-7/16 (37)	6-11/16 (170)				
Union Straightway (N.O.) VF-7211-50x-4-P VS-7211-50x-4-P	1/2	4-3/16 (106)	2-7/16 (62)	1-3/16 (30)	1-1/8 (29)	6-3/8 (162)	—			
	3/4	4-15/16 (125)	2-13/16 (72)	1-1/16 (27)	1-1/8 (29)	6-3/8 (162)				
	1	6 (152)	3-1/8 (79)	1-3/16 (30)	1-13/16 (46)	7-1/16 (179)				
	1-1/4	6-1/4 (159)	3-5/16 (84)	1-3/8 (35)	1-13/16 (46)	7-1/16 (179)				
NPT Thread 2-Way (N.C.) VF-7223-50x-4-P VS-7223-50x-4-P 3-Way VF-7313-50x-4-P VF-7323-50x-4-P VS-7313-50x-4-P VS-7323-50x-4-P	1/2	3-1/16 (78)	—	1-3/16 (30)	1-1/8 (29)	6-3/8 (162)	3-1/16 (78)	1-3/16 (30)	1-1/8 (29)	6-3/8 (162)
	3/4	3-5/8 (92)		1-3/16 (30)	1-1/8 (29)	6-3/8 (162)	3-5/8 (92)	1-3/16 (30)	1-1/8 (29)	6-3/8 (162)
	1	4-5/8 (117)		1-3/4 (44)	1-3/16 (30)	6-7/16 (164)	4-5/8 (118)	1-3/4 (44)	1-3/16 (30)	6-7/16 (164)
	1-1/4	4-5/8 (117)		1-3/4 (44)	1-7/16 (37)	6-11/16 (170)	4-5/8 (118)	1-3/4 (44)	1-7/16 (37)	6-11/16 (170)
	1-1/2	5-3/8 (136)		1-13/16 (46)	1-9/16 (40)	6-13/16 (173)	5-3/8 (137)	1-13/16 (46)	1-9/16 (40)	6-13/16 (173)
	2	6-1/8 (156)		2-1/4 (57)	2-1/4 (57)	7-1/2 (190)	6-1/8 (156)	2-1/4 (57)	2-1/4 (57)	7-1/2 (190)
NPT Thread 2-Way (N.O.) VF-7213-50x-4-P VS-7213-50x-4-P	1/2	3-1/16 (78)	—	1-3/16 (30)	1-1/8 (29)	6-3/8 (162)	—			
	3/4	3-5/8 (92)		1-1/16 (27)	1-1/8 (29)	6-3/8 (162)				
	1	4-5/8 (117)		1-3/16 (30)	1-13/16 (46)	7-1/16 (179)				
	1-1/4	4-5/8 (117)		1-3/8 (35)	1-13/16 (46)	7-1/16 (179)				
	1-1/2	5-3/8 (136)		1-1/2 (38)	1-7/8 (48)	7-1/8 (181)				
	2	6-1/8 (156)		1-9/16 (40)	2-1/8 (54)	7-3/8 (187)				

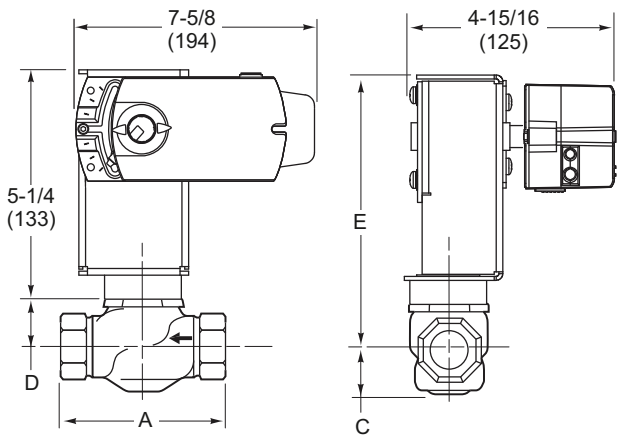

Figure-8 Mx41-6043 or Mx41-6083 with 2-Way Globe Valve with AV-611 Linkage.

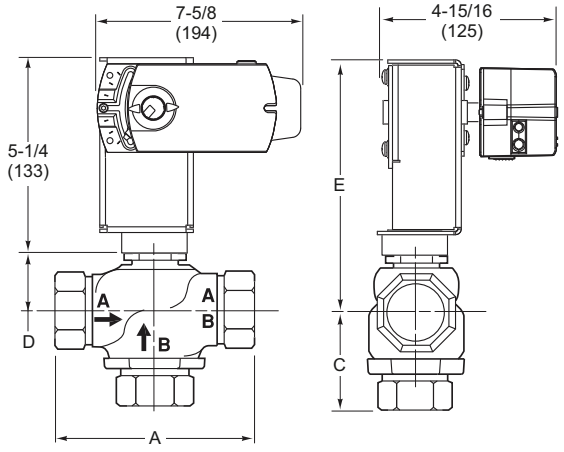

Figure-9 Mx41-6043 or Mx41-6083 with 3-Way Globe Valve with AV-611 Linkage.

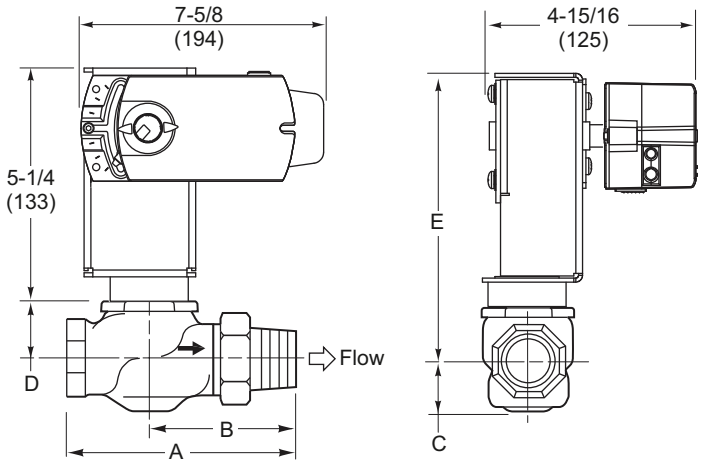

Figure-10 Mx41-6043 or Mx41-6083 with 2-Way Union Straightway Globe Valve with AV-611 Linkage.

Mx41-6153 Series
133 lb-in Direct Coupled Damper Actuators

Product Description

The direct-coupled, 24 Vac, non-spring return electronic SmartX actuator is designed for modulating and three-position control of building HVAC dampers requiring up to 133 lb-in (15 N-m) torque.

Features

- Synchronous motor technology with stall protection
- Unique self-centering shaft coupling
- Manual override
- 133 lb-in (15 N-m) torque
- 5° preload as shipped from factory
- Mechanical range adjustment capabilities
- Independently adjustable dual auxiliary switches option available (MS41-6053-502).
- Built-in ½" conduit connection
- UL and cUL LISTED, CE certified

Specifications	
Control Signal	MF41-6153 — Floating three-position control, 24 Vac. MS41-6153, MS41-6153-502 — Proportional, 0 to 10 Vdc; input resistance 100 kW.
Power Inputs	See Table.
Connections	3 ft. (0.9 m) long, 18 AWG leads
Electrical Outputs	Position output signal (wires 9-2) MS41-6153 Series Voltage-output 0…10 Vdc Maximum output current ±1 mA

Mechanical Outputs	Nominal angle of rotation 90° Maximum angular rotation 95°
Ambient Temperature Limits	Operating: –25°F…130°F (–32°C…55°C) Storage: –40°F…158°F (–40°C…70°C) Ambient humidity: 95% rh (non-condensing)
Location	NEMA 1/IP54 according to EN 60 529
Agency Listings	c-UL-us LISTED per UL 873 and CAN C22.2 No.24-93. CE compliant to directives LVD, EMC, and RoHS2.

Part Number	Torque lb-in (N-m)	Actuator Inputs			Outputs		Approximate Timing in sec. @ 70°F
		Control	Voltage	VA @ 60Hz	Feedback	Auxiliary Switch	Powered
MF41-6153	133 (15)	Floating	24 Vac	3	—	—	125
MS41-6153		0…10 vdc		5	0…10 vdc		
MS41-6153-502						2-SPDT	

Dimensions — 1/2” to 2” Globe Valve Assemblies

Valve Assembly Part Number	Valve Size in.	Valve Dimensions in inches (millimetres)								
		2-Way (Refer to Figure-11 and Figure-13)					3-Way (Refer to Figure-12)			
		A	B	C	D	E	A	C	D	E
Union Straightway (N.C.) Vx-7221-xxx-4-P	1	6 (152)	3-5/8 (92)	1-3/4 (44)	1-3/16 (30)	6-7/16 (164)	—			
	1-1/4	6-1/4 (159)	3-15/16 (100)	1-3/4 (44)	1-7/16 (37)	6-11/16 (170)				
Union Straightway (N.O.) Vx-7211-xxx-4-P	1	6 (152)	3-1/8 (79)	1-3/16 (30)	1-13/16 (46)	7-1/16 (179)	—			
	1-1/4	6-1/4 (159)	3-5/16 (84)	1-3/8 (35)	1-13/16 (46)	7-1/16 (179)				
NPT Thread 2-Way (N.C.) Vx-7223-xxx-4-P 3-Way Vx-73xx-xxx-4-P	1	4-5/8 (117)	—	1-3/4 (44)	1-3/16 (30)	6-7/16 (164)	4-5/8 (118)	1-3/4 (44)	1-3/16 (30)	6-7/16 (164)
	1-1/4	4-5/8 (117)		1-3/4 (44)	1-7/16 (37)	6-11/16 (170)	4-5/8 (118)	1-3/4 (44)	1-7/16 (37)	6-11/16 (170)
	1-1/2	5-3/8 (137)		1-13/16 (46)	1-9/16 (40)	6-13/16 (173)	5-3/8 (137)	1-13/16 (46)	1-9/16 (40)	6-13/16 (173)
	2	6-1/8 (156)		2-1/4 (57)	2-1/4 (57)	7-1/2 (190)	6-1/8 (156)	2-1/4 (57)	2-1/4 (57)	7-1/2 (190)
NPT Thread 2-Way (N.O.) Vx-7213-xxx-4-P	1	4-5/8 (117)	—	1-3/16 (30)	1-13/16 (46)	7-1/16 (179)	—			
	1-1/4	4-5/8 (117)		1-3/8 (35)	1-13/16 (46)	7-1/16 (179)				
	1-1/2	5-3/8 (137)		1-1/2 (38)	1-7/8 (48)	7-1/8 (181)				
	2	6-1/8 (156)		1-9/16 (40)	2-1/8 (54)	7-3/8 (187)				

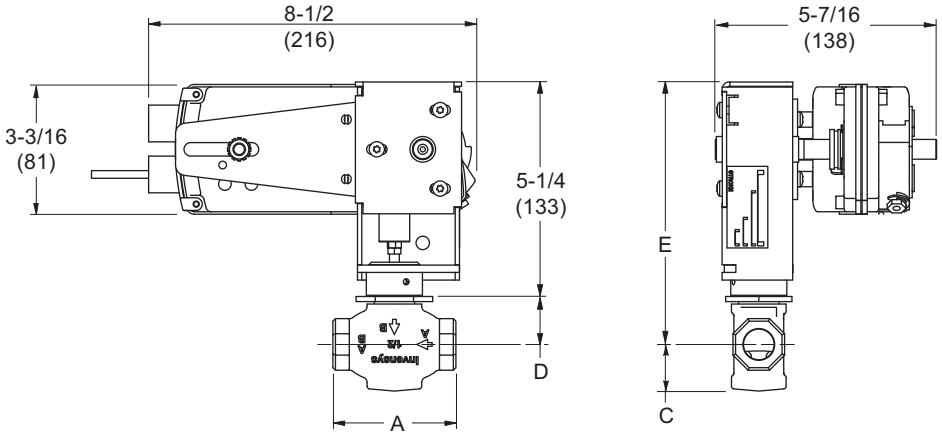

Figure-11 Mx41-6153 with 1/2” to 2” 2-Way Globe Valve with AV-611 Linkage.

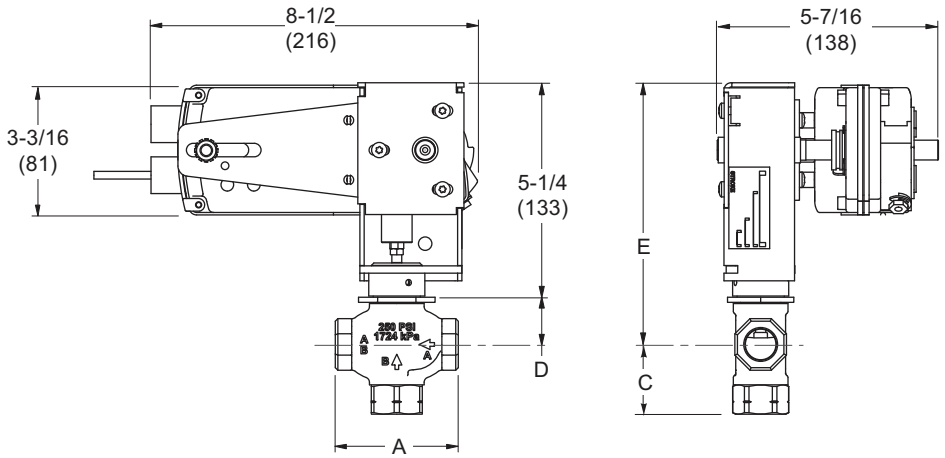

Figure-12 Mx41-6153 with 1/2” to 2” 3-Way Globe Valve with AV-611 Linkage.

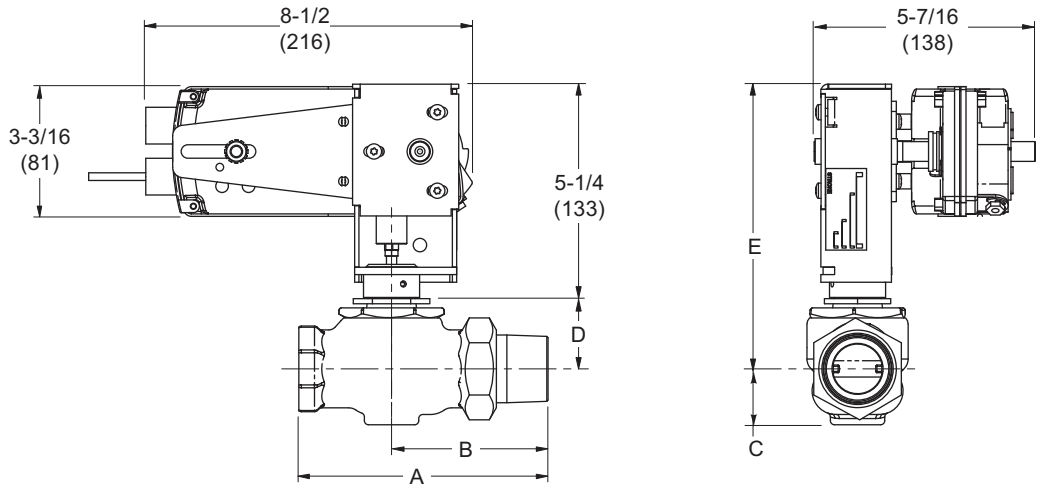

Figure-13 Mx41-6153 with 1” or 1-1/4” Union Straightway Globe Valve with AV-611 Linkage.

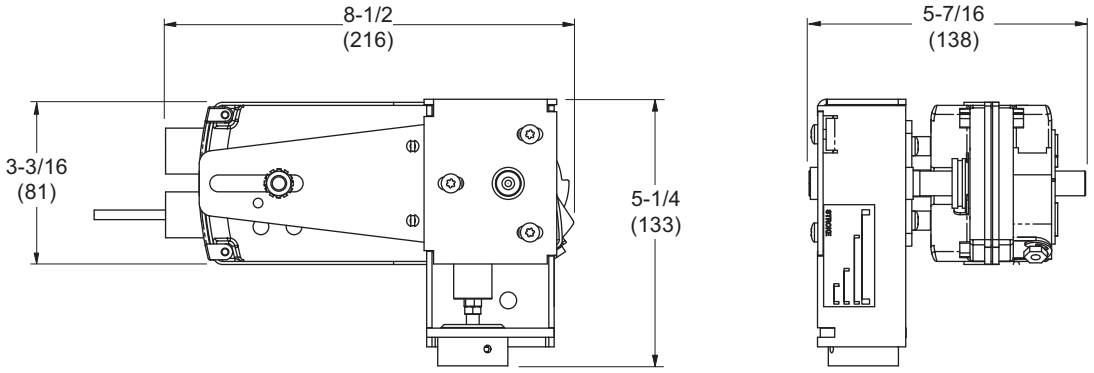

Figure-14 Mx41-6153 Actuator/Linkage Assembly with AV-611 Linkage.

Dimensions — 2-1/2” to 4” Flanged Globe Valve Assemblies

Valve Assembly Part Number	Valve Size in.	Valve Dimensions in inches (millimetres)											
		2-Way (Refer to Figure-17)						3-Way (Refer to Figure-18)					
		A	C	E	F	G	H	A	C	E	F	G	H
ASA Flanged 2-Way (N.O.) Vx-9213-508-5-P 3-Way Vx-9313-508-5-P	2-1/2	8-1/2 (216)	3-1/2 (89)	16-5/8 (422)	7 (178)	5-1/2 (140)	8-1/8 (206)	8-1/2 (216)	5-3/8 (136)	17-1/4 (438)	7 (178)	5-1/2 (140)	8-1/8 (206)
	3	9-1/2 (241)	3-3/4 (95)	17-1/4 (438)	7-1/2 (190)	6 (152)	8-1/2 (216)	9-1/2 (241)	6-3/8 (162)	16-3/4 (426)	7-1/2 (190)	6 (152)	8-1/2 (216)
	4	11-1/2 (292)	4-1/2 (114)	18-1/8 (460)	9 (229)	7-1/2 (190)	9-1/8 (232)	11-1/2 (292)	8-1/2 (276)	18-1/4 (464)	9 (229)	7-1/2 (190)	9-1/8 (232)
ASA Flanged 2-Way (N.C.) Vx-9223-508-5-P	2-1/2	8-1/2 (216)	4 (107)	17-1/4 (438)	7 (178)	5-1/2 (140)	8-1/8 (206)	—					
	3	9-1/2 (241)	5 (127)	16-3/4 (426)	7-1/2 (190)	6 (152)	8-1/2 (216)						
	4	11-1/2 (292)	7-1/8 (181)	18-1/4 (464)	9 (229)	7-1/2 (190)	9-1/8 (232)						

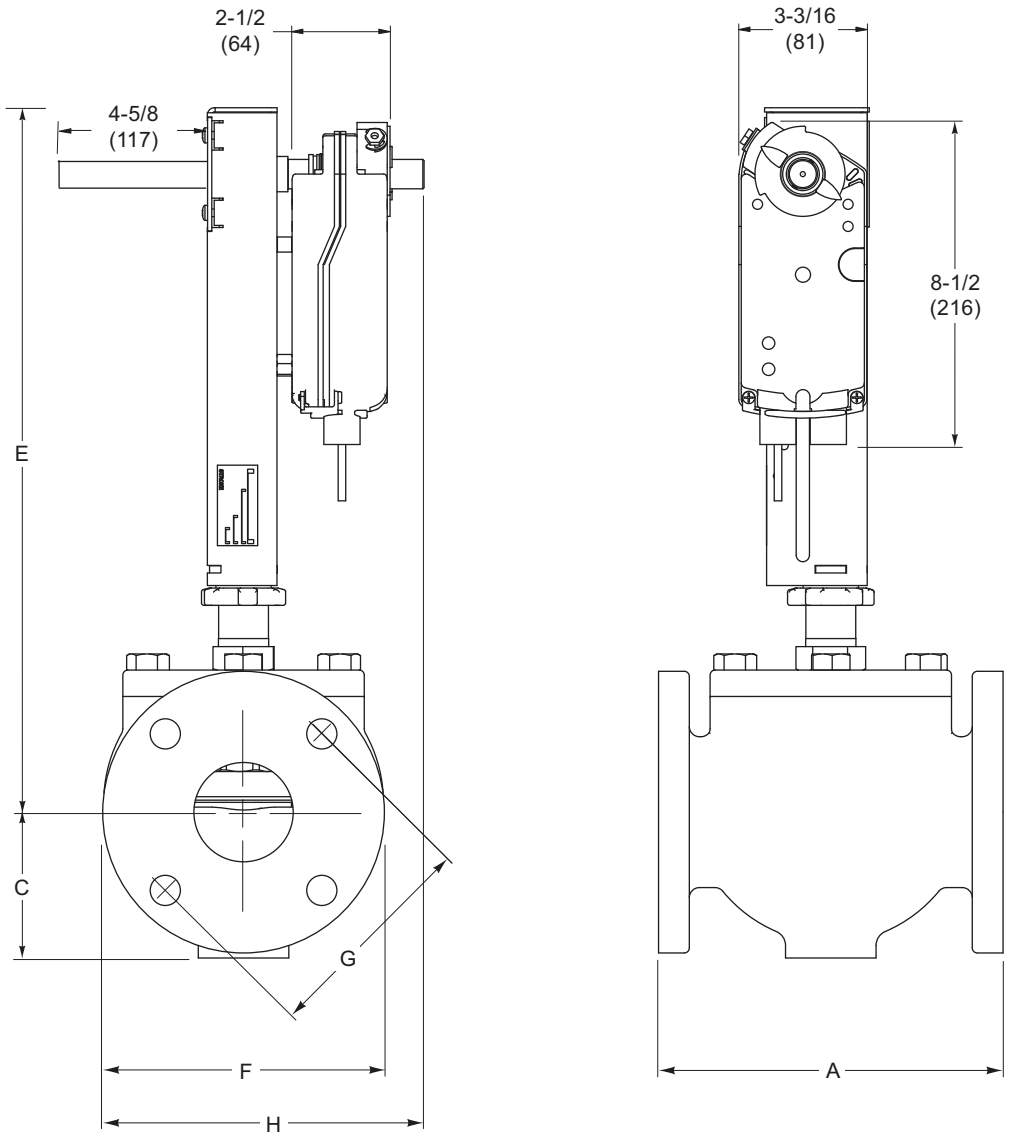

Figure-17 Mx41-6153 with 2-1/2” to 4” Flanged 2-Way Globe Valve With AV-607-1 Linkage.

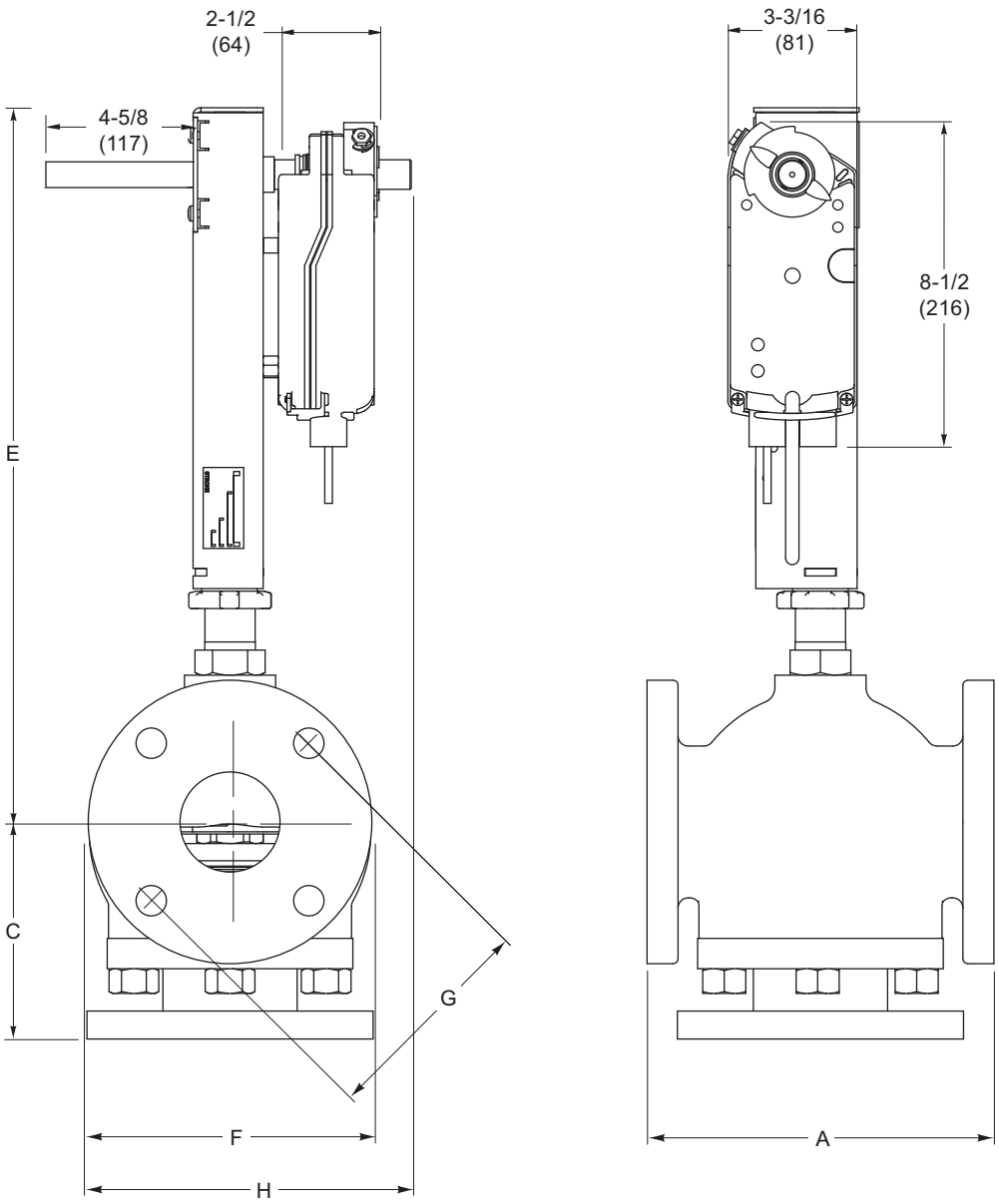

Figure-18 Mx41-6153 with 2-1/2” to 4” Flanged 3-Way Globe Valve With AV-607-1 Linkage.

Mx41-634x Series

300 lb-in Direct Coupled Damper Actuators

Product Description

Direct Coupled SmartX Actuators are designed to be used in both damper and valve control applications. The MS41-634x series actuators are over the shaft non-spring return actuators compatible with 2…10 Vdc or 4…20 mA dc[1] control signals.

Features

- 300 lb-in (34 N-m) rated torque
- NEMA Type 4 housing (IEC IP56)
- Custom automatic current sensing motor control provides extended reliability and repeatable timing
- Direct coupled to the damper shaft with dual industrial hardened universal mounting clamps
- Integral wiring for proportional control by 2…10 Vdc or 4…20 mA dc[1]
- Clockwise or counterclockwise rotation is determined by actuator mounting position
- Manual override for ease of installation and manual operation of damper
- Accurate 92° travel digitally controlled
- Integral position indication scale
- Rugged die-cast housing
- Oil immersed gear train provides continuous lubrication
- Rated for operating temperatures up to 140 °F (60 °C)
- Five year warranty
- MS41-634x SmartX Actuators can be double mounted (gang mounting) to accommodate high torque application requirements (2 to 4 actuators)
- Position feedback signal

Specifications	
Control Signal	SPDT floating control input; Triacs (500 mA rated) or 2 SPST contacts Floating: 24 Vac ± 20% Proportional: 2-10 Vdc 4-20 mAdc[a]
Power Inputs	See table.
Connections	3 ft. (91 cm) Appliance cable, ½" conduit connectors
Electrical Outputs	Travel: Mechanically limited to 101° ±1°
Mechanical Outputs	Overload Protection: Throughout rotation. Angle of Rotation: 93° nominal. Position Indication: Scale numbered from 0…95° Manual Override: Allows manual positioning.
Ambient Temperature Limits	Shipping & Storage: -40…160°F (-40…71°C). Operating: -25…140°F (-32…60°C). Humidity 5…95% non-condensing
Location	NEMA Type 1. NEMA Type 4 (IEC IP56) with customer supplied water tight conduit connectors
Agency Listings	c-UL-us LISTED per UL 873 and CAN C22.2 No.24-93. CE compliant to directives LVD, EMC, and RoHS2.

a - With the addition of a 500 ohm resistor (AM-708).

Part Number	Torque lb-in (N-m)	Actuator Inputs			Outputs		Approximate Timing in sec. @ 70°F
		Control	Voltage	VA @ 60Hz	Feedback	Auxiliary Switch	Powered
MF41-6343	300 (34)	Floating	24 Vac/dc	5.7	—	No	162
MS41-6343		2…10 vdc		5.6	2…10 vdc		148
MS41-6340			120 Vac	7.5			

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Dimensions — 5” and 6” Flanged Globe Valve Assemblies

Valve Assembly Part Number[a]	Valve Size in.	Valve Dimensions in inches (millimetres)											
		2-Way (Refer to Figure-19)						3-Way (Refer to Figure-20)					
		A	C	E	F	G	H	A	C	E	F	G	H
ASA Flanged 2-Way Vx-9213-516-5-P 3-Way Vx-9313-516-5-P	5	13 (330)	5 (127)	20-1/4 (514)	10 (254)	8-1/2 (216)	10-1/4 (260)	13 (330)	8-3/4 (222)	20 (508)	10 (254)	8-1/2 (216)	10-1/4 (260)
	6	14 (356)	5-1/2 (140)	21 (533)	11 (280)	9-1/2 (241)	10-3/4 (273)	14 (356)	9-3/4 (248)	20-7/8 (530)	11 (280)	9-1/2 (241)	10-3/4 (273)
ASA Flanged 2-Way Vx-9223-516-5-P	5	13 (330)	6-3/4 (171)	20 (508)	10 (254)	8-1/2 (216)	10-1/4 (260)	—					
	6	14 (356)	7-3/8 (187)	20-7/8 (530)	11 (280)	9-1/2 (241)	10-3/4 (273)						

[a] Mx41-6343 actuators (actuator code 516) for 5” and 6” valves only.

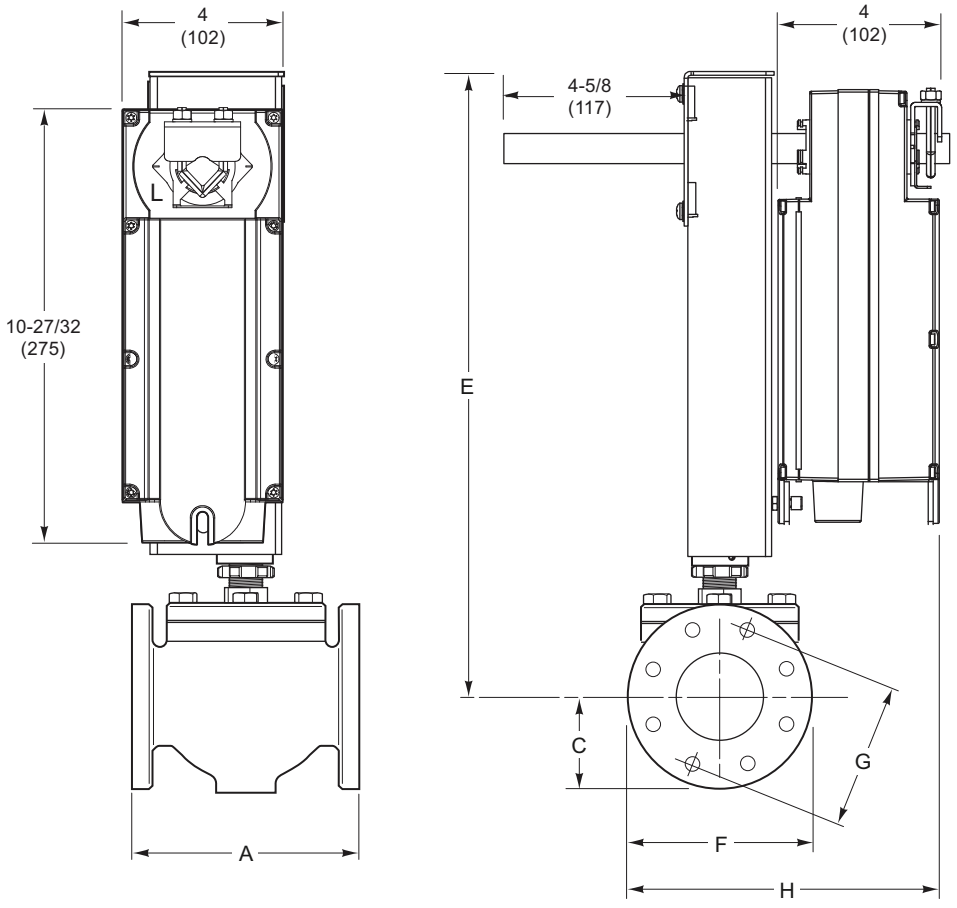

Figure-19 Mx41-6343 with Flanged 2-Way Globe Valve With AV-609-1 Linkage.

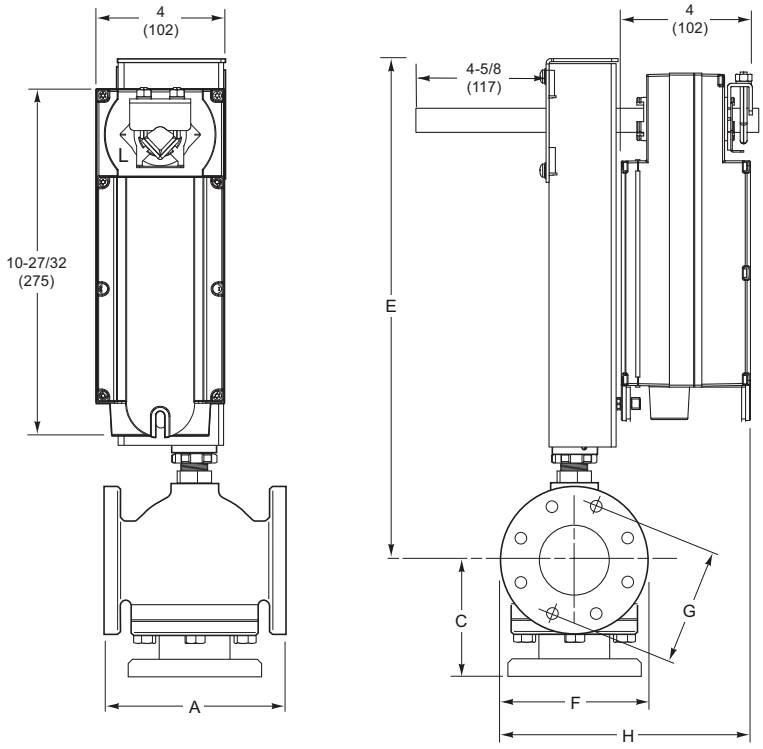

Figure-20 Mx41-6343 with Flanged 3-Way Globe Valve With AV-609-1 Linkage.

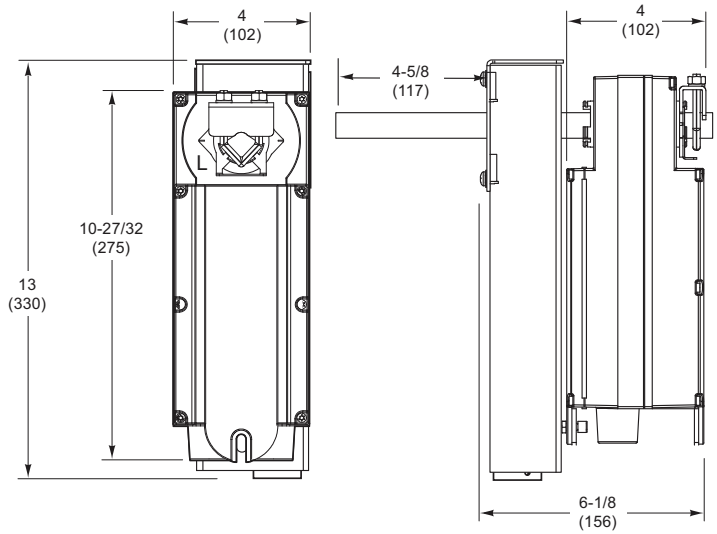

Figure-21 Mx41-6343 Actuator/Linkage Assembly With AV-609-1 Linkage.

Mx40-704x Series
35 lb-in Direct Coupled Actuators

CE c UL us LISTED

Product Description

For spring return applications requiring floating, two-position, or proportional modulation control of dampers and valves in HVAC systems. Directly mounts to ½"…3" Schneider Electric ball valves.

Features

- Direct mount to round or square damper shaft
- 35 lb-in (4 N-m) torque rating
- Overload protection throughout rotation
- Optional built-in auxiliary switches
- True mechanical clockwise or counterclockwise spring return operation for reliable, positive close-off in airtight applications
- Visual position indicator
- Direct acting or reverse acting control mode available on proportional models
- Rotation limiting available
- Rugged die-cast housing for NEMA 2/IP54 rating

Specifications	
Control Signal	On-off, SPST control contacts or Triacs (500 mA rated). Floating point control, 24 Vac. Proportional, 2…10 Vdc or 4 to 20 mA dc with a 500 W resistor.
Power Inputs	See table.
Connections	MA40-704x and MA40-704x-501 — 3 ft. (91 cm) long, appliance cables, 1/2 in. conduit connector. MF40-7043 and MF40-7043-501, MS40-7043 and MS40-7043-501 — 3 ft. (91 cm) long, plenum-rated cables, 1/2 in. conduit connector.
Electrical Outputs	Position Feedback Voltage "AO": 2…10 Vdc (maximum 0.5 mA) output signal for position feedback or operation of up to four slave actuators. One auxiliary switch available (select models). SPDT 6a resistive @24 Vac or 250 Vac.
Mechanical Outputs	Travel Rotation is limited to 95° ± 5° maximum, adjustable from 40…95 ° with a mechanical stop. RA/DA Switch: selects direct acting or reverse acting for proportional models. Position Indicator: Visual indicator, 0…1 (0 is the spring-return position).

Ambient Temperature Limits	Shipping & Storage: -40 F…160°F (-40…71°C). Operating: -22…140°F (-30…60°C). Humidity: 5…95% RH, non-condensing.
Location	NEMA 2 (IEC IP54)
Agency Listings	UL 873: Underwriters Laboratories (File # E9429 Category Temperature-Indicating and Regulating Equipment). CUL: UL LISTED for use in Canada by Underwriters Laboratories. Canadian Standards C22.2 No. 24.

Part Number	Torque lb-in (N-m)	Spring Return	Actuator Inputs			Outputs		Approximate Timing in seconds @ 70°F	
			Control	Voltage	VA @ 60Hz	Feedback	Auxiliary Switch	Powered	Spring Return
MA40-7040	35 (4)	CW/CCW	2 Position	120 Vac	4.3	—	—	<50	<28
MA40-7040-501							1-SPDT (250 Vac)		
MA40-7041				230 Vac	4.6		—		
MA40-7041-501							1-SPDT (250 Vac)		
MA40-7043				24 Vac/dc	4.4		—		
MA40-7043-501							1-SPDT (24 Vac)		
MF40-7043			Floating		5.9		—	<130	<25
MF40-7043-501							1-SPDT (24 Vac)		
MS40-7043			2…10 vdc			2…10 vdc	—		
MS40-7043-501							1-SPDT (24 Vac)		

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Dimensions — 1/2” to 2” Globe Valve Assemblies

Valve Assembly Part Number	Valve Size in.	Valve Dimensions in inches (millimetres)								
		2-Way (Refer to Figure-22 and Figure-24)					3-Way (Refer to Figure-23)			
		A	B	C	D	E	A	C	D	E
Union Straightway (N.C.) Vx-7221-xxx-4-P	1/2	4-3/16 (106)	2-11/16 (68)	1-3/16 (30)	1-1/8 (29)	7 (178)	—			
	3/4	4-15/16 (125)	3-3/16 (81)	1-3/16 (30)	1-1/8 (29)	7 (178)				
	1	6 (152)	3-5/8 (92)	1-3/4 (44)	1-3/16 (30)	7-1/16 (179)				
	1-1/4	6-1/4 (159)	3-15/16 (100)	1-3/4 (44)	1-7/16 (37)	7-5/16 (186)				
Union Straightway (N.O.) Vx-7211-xxx-4-P	1/2	4-3/16 (106)	2-7/16 (62)	1-3/16 (30)	1-1/8 (29)	7 (178)	—			
	3/4	4-15/16 (125)	2-13/16 (72)	1-1/16 (27)	1-1/8 (29)	7 (178)				
	1	6 (152)	3-1/8 (79)	1-3/16 (30)	1-13/16 (46)	7-11/16 (195)				
	1-1/4	6-1/4 (159)	3-5/16 (84)	1-3/8 (35)	1-13/16 (46)	7-11/16 (195)				
NPT Thread 2-Way (N.C.) Vx-7223-xxx-4-P 3-Way Vx-73xx-xxx-4-P	1/2	3-1/16 (78)	—	1-3/16 (30)	1-1/8 (29)	7 (178)	3-1/16 (78)	1-3/16 (30)	1-1/8 (29)	7 (178)
	3/4	3-5/8 (92)		1-3/16 (30)	1-1/8 (29)	7 (178)	3-5/8 (92)	1-3/16 (30)	1-1/8 (29)	7 (178)
	1	4-5/8 (118)		1-3/4 (44)	1-3/16 (30)	7-1/16 (179)	4-5/8 (117)	1-3/4 (44)	1-3/16 (30)	7-1/16 (179)
	1-1/4	4-5/8 (118)		1-3/4 (44)	1-7/16 (37)	7-5/16 (186)	4-5/8 (117)	1-3/4 (44)	1-7/16 (37)	7-5/16 (186)
	1-1/2	5-3/8 (137)		1-13/16 (46)	1-9/16 (40)	7-7/16 (189)	5-3/8 (137)	1-13/16 (46)	1-9/16 (40)	7-7/16 (189)
	2	6-1/8 (156)		2-1/4 (57)	2-1/4 (57)	8-1/8 (206)	6-1/8 (156)	2-1/4 (57)	2-1/4 (57)	8-1/8 (206)
NPT Thread 2-Way (N.O.) Vx-7213-xxx-4-P	1/2	3-1/16 (78)	—	1-3/16 (30)	1-1/8 (29)	7 (178)	—			
	3/4	3-5/8 (92)		1-1/16 (27)	1-1/8 (29)	7 (178)				
	1	4-5/8 (118)		1-3/16 (30)	1-13/16 (46)	7-11/16 (195)				
	1-1/4	4-5/8 (118)		1-3/8 (35)	1-13/16 (46)	7-11/16 (195)				
	1-1/2	5-3/8 (137)		1-1/2 (38)	1-7/8 (48)	7-3/4 (197)				
	2	6-1/8 (156)		1-9/16 (40)	2-1/8 (54)	8 (203)				

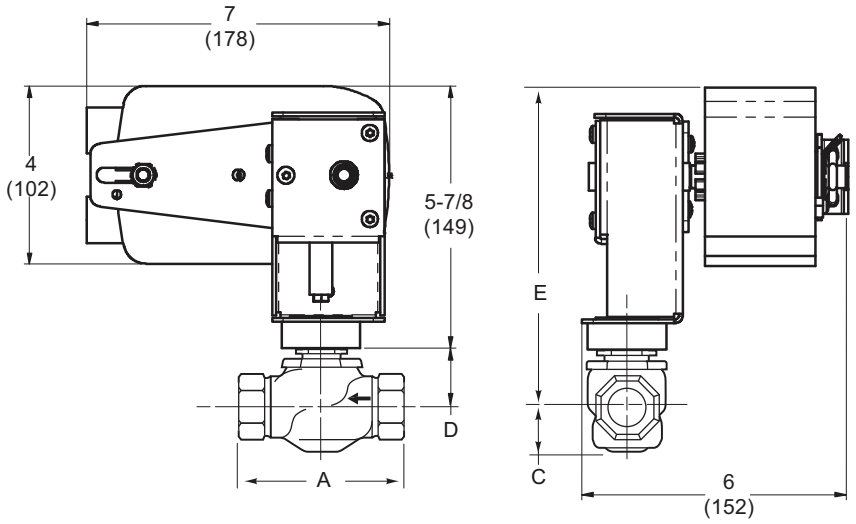

Figure-22 Mx40-704x with 1/2” to 2” 2-Way Globe Valve With AV-611 Linkage.

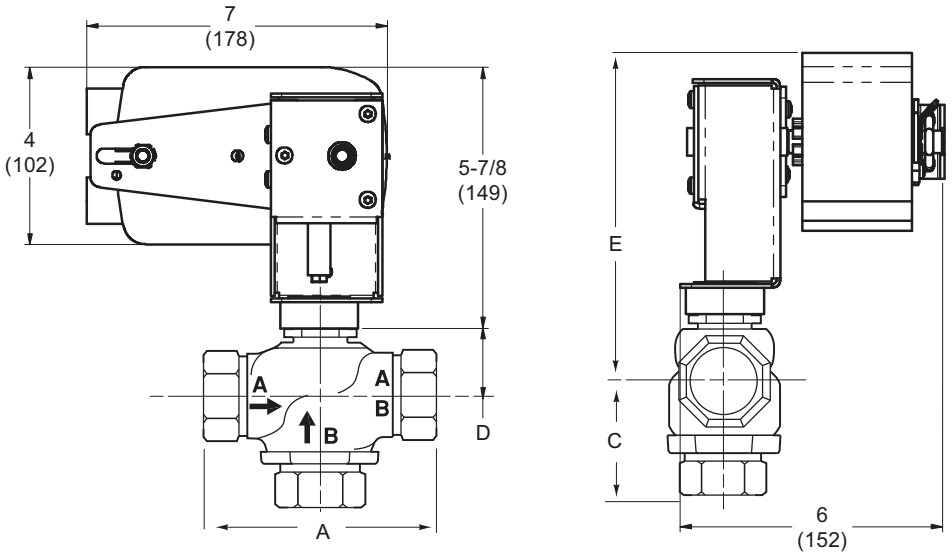

Figure-23 Mx40-704x with 1/2” to 2” 3-Way Globe Valve With AV-611 Linkage.

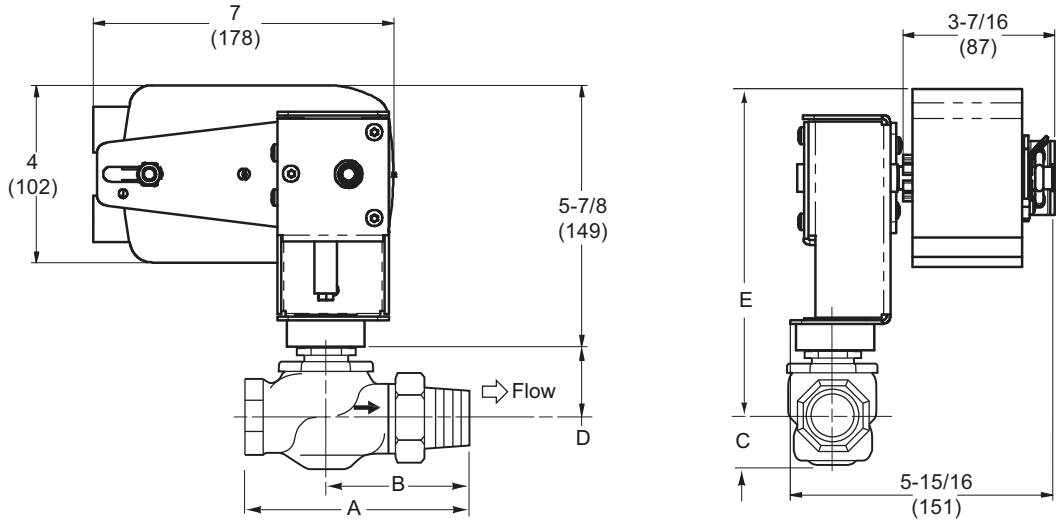

Figure-24 Mx40-704x with 1/2” to 1-1/4” Union Straightway Globe Valve With AV-611 Linkage.

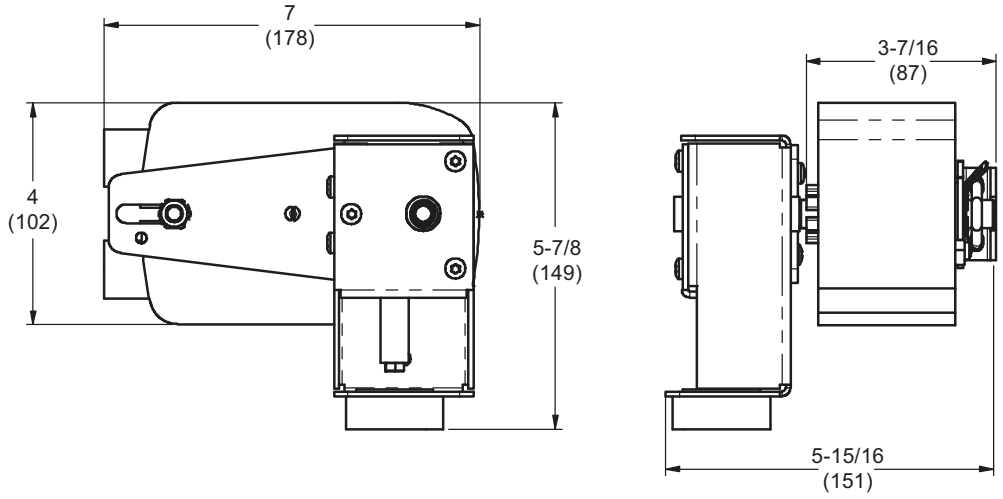

Figure-25 Mx40-704x Linked Actuator Assembly With AV-611 Linkage.

Mx41-7xxx Series

60 lb-in and 133 lb-in Direct Coupled Damper Actuators

CE c UL us LISTED

Product Description

Designed for controlling air dampers in building systems that require fail safe return, with two position, floating or proportional control.

Features

- Direct mount to round or square damper shaft
- 60 lb-in (7 N-m) and 133 lb-in (15 N-m) torque rating
- Overload protection throughout rotation
- Optional built-in auxiliary switches
- Provides true mechanical clockwise or counterclockwise spring return operation for reliable positive close-off in airtight applications
- Direct acting or reverse acting control mode available on proportional models
- Rotation limiting available
- Rugged die-cast housing for NEMA 2/IP54 rating
- Manual override
- 5-year warranty

Specifications	
Control Signal	On-off, SPST control contacts or Triacs (500 mA rated). Floating point control, 24 Vac. Proportional, 2…10 Vdc or 4 to 20 mA dc with a 500 W resistor.
Power Inputs	See table.
Connections	3 ft. appliance cables, 1/2 in. conduit connector.
Electrical Outputs	Position Feedback Voltage "AO": 2…10 Vdc (maximum 0.5 mA) output signal for position feedback or operation of up to four slave actuators. Two auxiliary switches available (select models). SPDT 7a resistive @24 Vac or 250 Vac.

Mechanical Outputs	Travel Rotation is limited to 95° ± 5° maximum, adjustable from 30…95 ° with a mechanical stop. Position Indicator: Pointer and scale are provided. Manual Override: manual adjustable rotation -5°…85°.
Ambient Temperature Limits	Shipping & Storage: -40 F…160°F (-40…71°C). Operating: -22…140°F (-30…60°C). Humidity: 5…95% RH, non-condensing.
Location	NEMA 1, NEMA 2 (IEC IP54) with conduit connector in down position.
Agency Listings	UL 873: Underwriters Laboratories (File # E9429 Category Temperature-Indicating and Regulating Equipment). CUL: UL LISTED for use in Canada by Underwriters Laboratories. Canadian Standards C22.2 No. 24.

Part Number	Torque lb-in (N-m)	Spring Return	Actuator Inputs			Outputs		Approximate Timing in seconds @ 70°F	
			Control	Voltage	VA @ 60Hz	Feedback	Auxiliary Switch	Powered	Spring Return
MA41-7070	60 (7)	CW/CCW	2 Position	120 Vac	5.6	—	—	<80	<40
MA41-7070-502							2-SPDT (250 Vac)		
MA41-7071				230 Vac	8.0		—		
MA41-7071-502							2-SPDT (250 Vac)		
MA41-7073				24 Vac/dc	4.8		—		
MA41-7073-502							2-SPDT (24 Vac)		
MA41-7150	133 (15)			120 Vac	10.0		—	<190	<30
MA41-7150-502							2-SPDT (250 Vac)		
MA41-7151				230 Vac	10.6		—		
MA41-7151-502							2-SPDT (250 Vac)		
MA41-7153				24 Vac/dc	9.7		—		
MA41-7153-502							2-SPDT (24 Vac)		
MF41-7073	60 (7)		Floating		6.2		—	<195	
MF41-7073-502							2-SPDT (24 Vac)		
MF41-7153	133 (15)				9.7		—	<190	
MF41-7153-502							2-SPDT (24 Vac)		
MS41-7073	60 (7)		2…10vdc		5.8	2…10 vdc	—	<195	
MS41-7073-502							2-SPDT (24 Vac)		
MS41-7153	133 (15)				9.7			<190	
MS41-7153-502							2-SPDT (24 Vac)		

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Dimensions — 1/2” to 2” Globe Valve Assemblies

Valve Assembly Part Number	Valve Size in.	Valve Dimensions in inches (millimetres)								
		2-Way (Refer to Figure-26 and Figure-28)					3-Way (Refer to Figure-27)			
		A	B	C	D	E	A	C	D	E
Union Straightway (N.C.) Vx-7221-xxx-4-P	1	6 (152)	3-5/8 (92)	1-3/4 (44)	1-3/16 (30)	12-13/16 (325)	—			
	1-1/4	6-1/4 (159)	3-15/16 (100)	1-3/4 (44)	1-7/16 (37)	13-1/16 (332)				
Union Straightway (N.O.) Vx-7211-xxx-4-P	1	6 (152)	3-1/8 (79)	1-3/16 (30)	1-13/16 (46)	13-7/16 (341)	—			
	1-1/4	6-1/4 (159)	3-5/16 (84)	1-3/8 (35)	1-13/16 (46)	13-7/16 (341)				
NPT Thread 2-Way (N.C.) Vx-7223-xxx-4-P 3-Way Vx-73xx-xxx-4-P	1	4-5/8 (118)	—	1-3/4 (44)	1-3/16 (30)	12-13/16 (325)	4-5/8 (118)	1-3/4 (44)	1-3/16 (30)	12-13/16 (325)
	1-1/4	4-5/8 (118)		1-3/4 (44)	1-7/16 (37)	13-1/16 (332)	4-5/8 (118)	1-3/4 (44)	1-7/16 (37)	13-1/16 (332)
	1-1/2	5-3/8 (137)		1-13/16 (46)	1-9/16 (40)	13-3/16 (335)	5-3/8 (137)	1-13/16 (46)	1-9/16 (40)	13-3/16 (335)
	2	6-1/8 (156)		2-1/4 (57)	2-1/4 (57)	13-7/8 (352)	6-1/8 (156)	2-1/4 (57)	2-1/4 (57)	13-7/8 (352)
NPT Thread 2-Way (N.O.) Vx-7213-xxx-4-P	1	4-5/8 (118)	—	1-3/16 (30)	1-13/16 (46)	13-7/16 (341)	—			
	1-1/4	4-5/8 (118)		1-3/8 (35)	1-13/16 (46)	13-7/16 (341)				
	1-1/2	5-3/8 (137)		1-1/2 (38)	1-7/8 (48)	13-1/2 (343)				
	2	6-1/8 (156)		1-9/16 (40)	2-1/8 (54)	13-3/4 (349)				

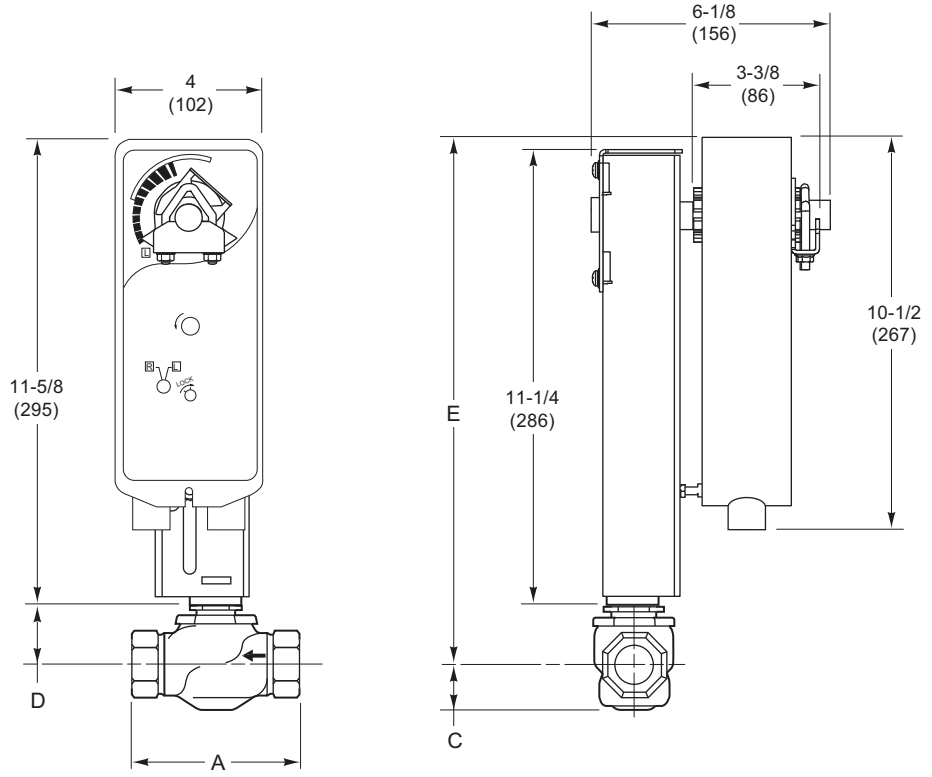

Figure-26 Mx41-715x or Mx41-707x with 1” to 2” 2-Way Globe Valve With AV-602 Linkage.

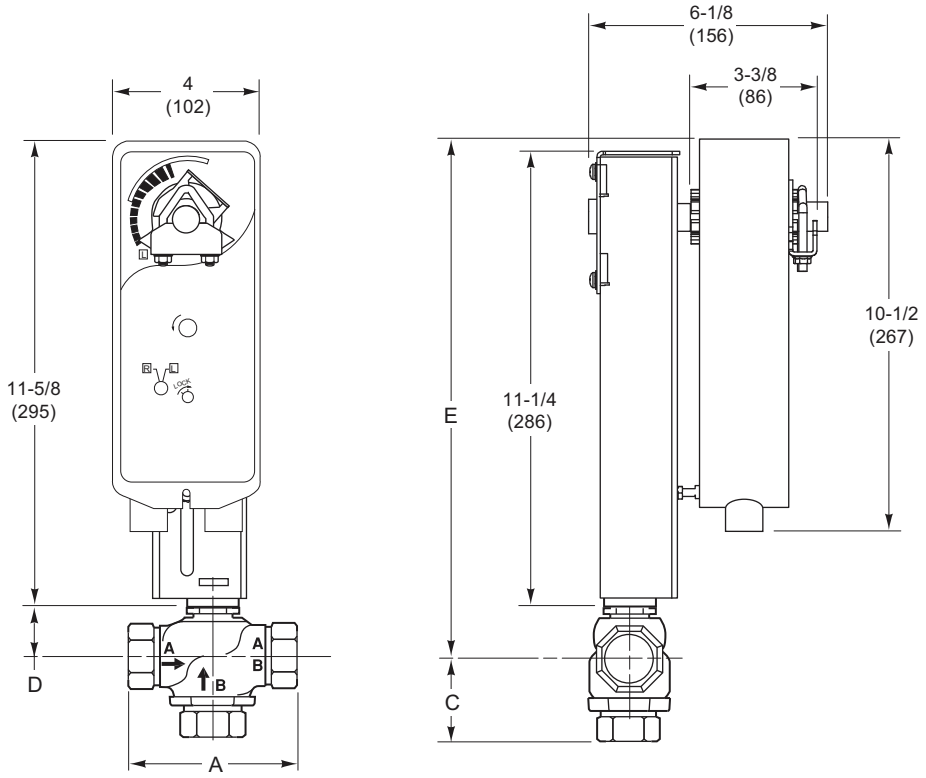

Figure-27 Mx41-715x or Mx41-707x with 1” to 2” 3-Way Globe Valve With AV-602 Linkage.

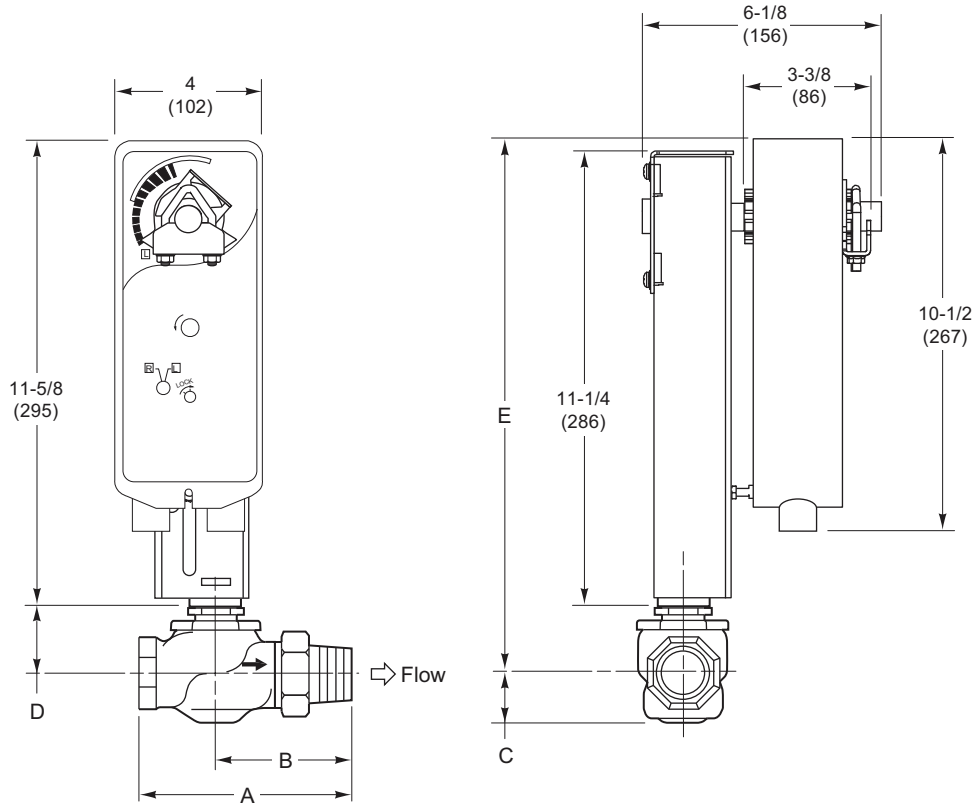

Figure-28 Mx41-715x or Mx41-707x with 1” or 1-1/4” Union Straightway Globe Valve With AV-602 Linkage.

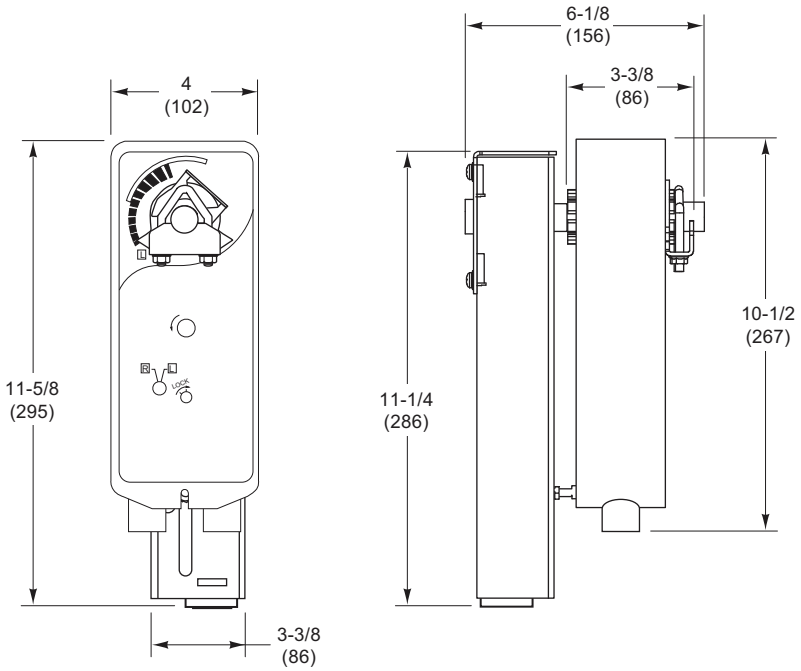

Figure-29 Mx41-715x or Mx41-707x Linked Actuator Assembly With AV-602 Linkage.

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Dimensions — 2-1/2” to 6” Flanged Globe Valve Assemblies

Valve Assembly Part Number	Valve Size in.	Valve Dimensions in inches (millimetres)											
		2-Way (Refer to Figure-32)						3-Way (Refer to Figure-33)					
		A	C	E	F	G	H	A	C	E	F	G	H
ASA Flanged 2-Way (N.O.) Vx-9213-xxx-5-P 3-Way Vx-9313-xxx-5-P	2-1/2	8-1/2 (216)	3-1/2 (89)	16-1/2 (419)	7 (178)	5-1/2 (140)	8-3/8 (213)	8-1/2 (216)	5-3/8 (136)	17-5/8 (448)	7 (178)	5-1/2 (140)	8-3/8 (213)
	3	9-1/2 (241)	3-3/4 (95)	17-5/8 (448)	7-1/2 (190)	6 (152)	8-3/4 (222)	9-1/2 (241)	6-3/8 (162)	17-1/2 (444)	7-1/2 (190)	6 (152)	8-3/4 (222)
	4	11-1/2 (292)	4-1/2 (114)	18-1/2 (470)	9 (229)	7-1/2 (190)	9-3/8 (238)	11-1/2 (292)	8-1/2 (276)	18-5/8 (473)	9 (229)	7-1/2 (190)	9-3/8 (238)
	5[a]	13 (330)	6-3/4 (171)	19-5/8 (498)	10 (254)	8-1/2 (216)	9-5/8 (244)	13 (330)	8-3/4 (222)	19-1/2 (445)	10 (254)	8-1/2 (216)	9-5/8 (244)
	6[a]	14 (356)	7-3/8 (187)	20-1/2 (521)	11 (280)	9-1/2 (241)	10-1/8 (257)	14 (356)	9-3/4 (248)	20-1/4 (514)	11 (280)	9-1/2 (241)	10-1/8 (257)
ASA Flanged 2-Way (N.C.) Vx-9223-xxx-5-P	2-1/2	8-1/2 (216)	4 (107)	17-5/8 (448)	7 (178)	5-1/2 (140)	8-3/8 (213)	—					
	3	9-1/2 (241)	5 (127)	17-1/2 (444)	7-1/2 (190)	6 (152)	8-3/4 (222)						
	4	11-1/2 (292)	7-1/8 (181)	18-5/8 (473)	9 (229)	7-1/2 (190)	9-3/8 (238)						

[a] Mx41-707x actuators are not used with 5” and 6” valves.

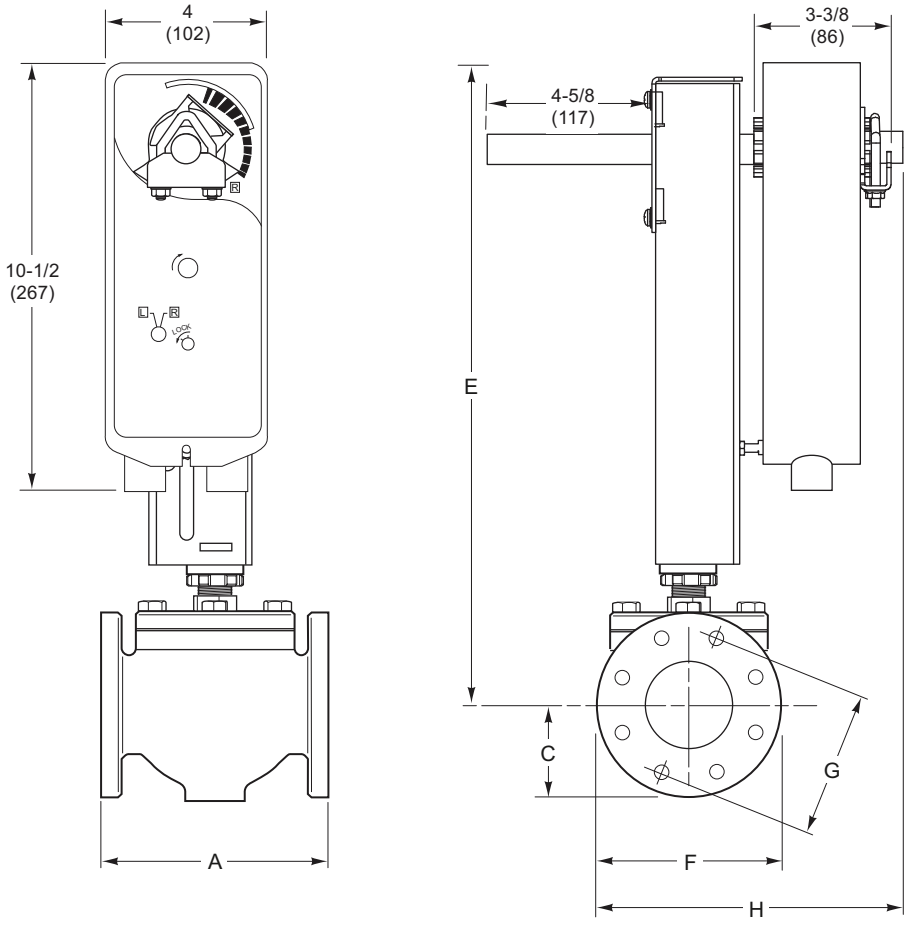

Figure-32 Mx41-715x or Mx41-707x with 2-1/2” to 4” 2-Way Flanged Globe Valve with AV-607-1 Linkage. Mx40-715X with 5" and 6" 2-Way flanged Globe Valve with AV-609-1 linkage

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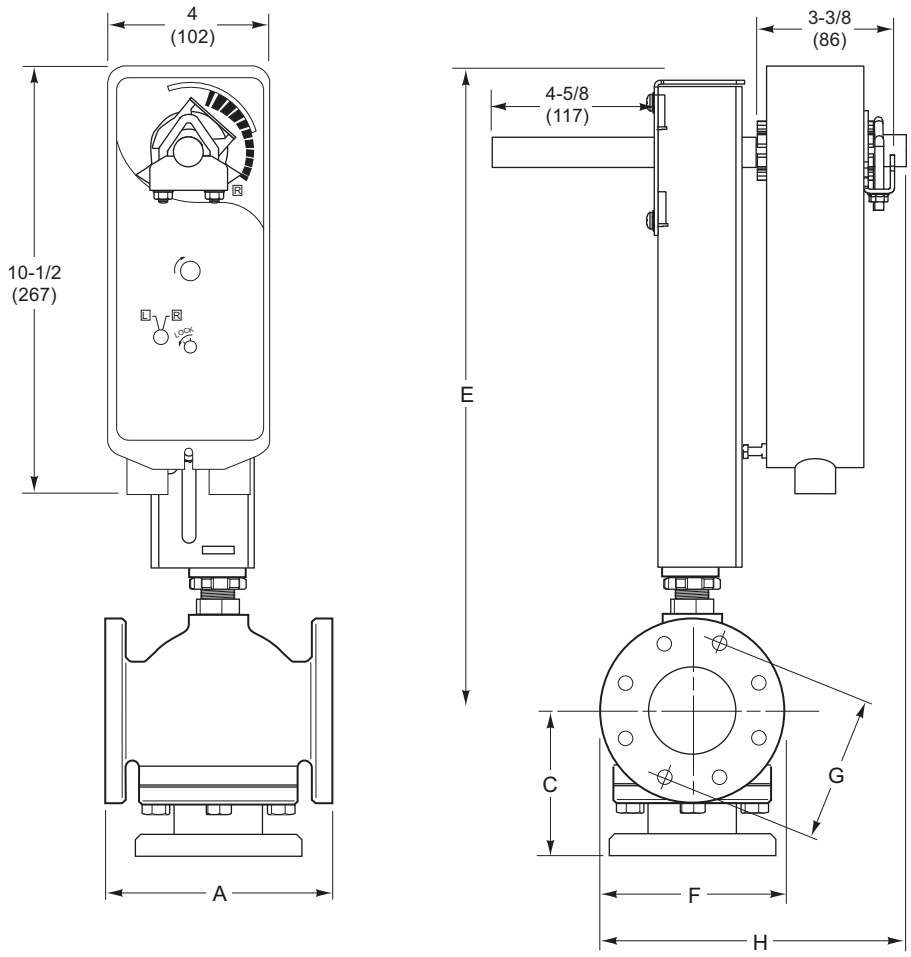

Figure-33 Mx41-715x or Mx41-707x with 2-1/2” to 4” 3-Way Flanged Globe Valve With AV-607-1 Linkage.

Mx40-715X with 5" and 6" 3 way flanged Globe Valve with AV-609-1 linkage

Mx40-717x Series
150 lb-in Direct Coupled Actuators

Product Description

Designed for controlling air dampers in building systems that require fail safe return, with two position, floating or proportional control.

Features

- Direct mount to round or square damper shaft
- 150 lb-in (17 N-m) torque rating, overload protection throughout rotation
- Oil immersed gear train provides continuous lubrication
- Automatic current sensing motor control provides extended reliability and repeatable timing
- Provides true mechanical clockwise or counterclockwise spring return operation for reliable positive close-off in airtight applications
- NEMA 4 housing (IEC IP56)
- Can be double mounted (gang mounting) to accommodate high torque application requirements (2 to 4 actuators)
- MS40-717x models provide position feedback signal
- Linkage required for Globe Valve Assembly.

Specifications	
Control Signal	Two wire, SPST or Triacs. SPDT floating control output, Triacs (500 mA rated), or 2 SPST contacts. Proportional, 2…10 Vdc or 4…20 mA dc with the addition of a 500 ohm resistor (not included).
Power Inputs	See table.
Connections	Class 1: 24 inch (61 cm) long appliance cables, 18 AWG color coded leads. 1/2 in. conduit connector. Class 2 Power and Control: 36 inch (91 cm) Long, 22 AWG color coded appliance cable pigtail leads. 1/2 in. conduit connector.
Electrical Outputs	Travel: Electronically limited to 92° ±1° (MS). MF-MA Mechanically limited To 101° ±1°.
Mechanical Outputs	Position Indicator: Pointer and scale are provided.
Ambient Temperature Limits	Shipping & Storage: -40 F…160°F (-40…71°C). Operating: -25…140 °F (-32…60 °C). Humidity: 5…95% RH, non-condensing.
Location	NEMA 1 (IEC IP10). NEMA 4 (IEC IP 56) with customer supplied water tight conduit connectors.
Agency Listings	UL 873, Underwriters Laboratories (File #9429 Category Temperature-Indicating and Regulating Equipment). Canadian Standards C22.2 No. 24-93.
Applicable Literature	

Part Number	Torque lb-in (N-m)	Spring Return	Actuator Inputs			Outputs		Approximate Timing in seconds @ 70°F	
			Control	Voltage	VA @ 60Hz	Feedback	Auxiliary Switch	Powered	Spring Return
MA40-7170	150 (17)	CW/CCW	2-Position	120 Vac	8.4	—	No	162	82
MA40-7173				24 Vac/dc	7.4				
MF40-7173			Floating		8.1				
MS40-7170			2…10 vdc	120 Vac	8.5	2…10 vdc		147	65
MS40-7171				240 Vac	10.8				
MS40-7173				24 Vac/dc	7.8				

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Dimensions — 1/2” to 2” Globe Valve Assemblies

Valve Assembly Part Number	Valve Size in.	Valve Dimensions in inches (millimetres)							
		2-Way (Refer to Figure-34)				3-Way (Refer to Figure-35)			
		A	C	D	E	A	C	D	E
NPT NC Vx-722x/Vx-73x3	1/2”	3-1/16 (78)	1-3/16 (30)	1-1/8 (29)	12-3/8 (314)	3-1/16 (78)	1-3/16 (30)	1-1/8 (29)	12-3/8 (314)
	3/4”	3-5/8 (92)	1-3/16 (30)	1-1/8 (29)	12-3/8 (314)	3-5/8 (92)	1-3/16 (30)	1-1/8 (29)	12-3/8 (314)
	1”	4-5/8 (117)	1-3/4 (44)	1-3/16 (30)	12-7/16 (316)	4-5/8 (117)	1-3/4 (44)	1-3/16 (30)	12-7/16 (316)
	1-1/4”	4-5/8 (117)	1-3/4 (44)	1-7/16 (37)	12-11/16 (322)	4-5/8 (117)	1-3/4 (44)	1-7/16 (37)	12-11/16 (322)
	1-1/2	5-3/8 (137)	1-13/16 (46)	1-9/16 (40)	12-13/16 (325)	5-3/8 (137)	1-13/16 (46)	1-9/16 (40)	12-13/16 (325)
	2	6-1/8 (156)	2-1/4 (57)	2-1/4 (57)	13-1/2 (343)	6-1/8 (156)	2-1/4 (57)	2-1/4 (57)	13-1/2 (343)
NPT NO Vx-7213	1/2”	3-1/16 (78)	1-3/16 (30)	1-1/8 (29)	12-3/8 (314)				
	3/4”	3-5/8 (92)	1-1/16 (27)	1-1/8 (29)	12-3/8 (314)				
	1”	4-5/8 (117)	1-3/16 (30)	1-13/16 (46)	12-7/16 (316)				
	1-1/4”	4-5/8 (117)	1-3/8 (35)	1-13/16 (46)	13-1/16 (346)				
	1-1/2	5-3/8 (137)	1-1/2 (38)	1-7/8 (48)	13-1/8 (333)	—			
	2	6-1/8 (156)	1-9/16 (40)	2-1/8 (54)	13-3/8 (340)				

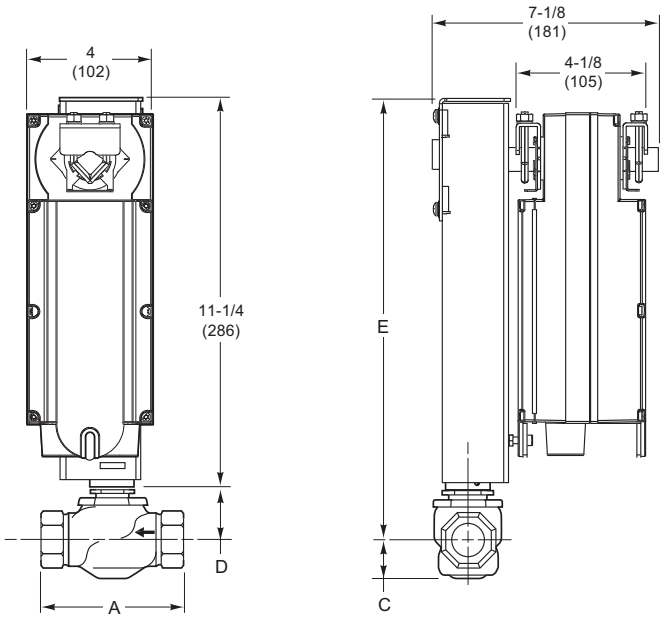

Figure-34 Mx40-717x with 1-1/2” or 2” 2-Way Globe Valve With AV-602 Linkage.

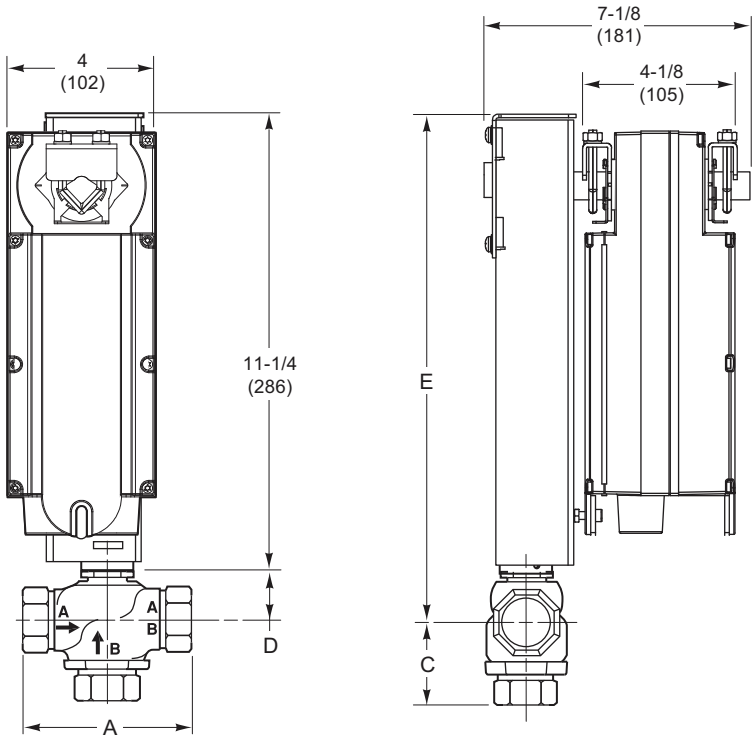

Figure-35 Mx40-717x with 1/2” or 2” 3-Way Globe Valve With AV-602 Linkage.

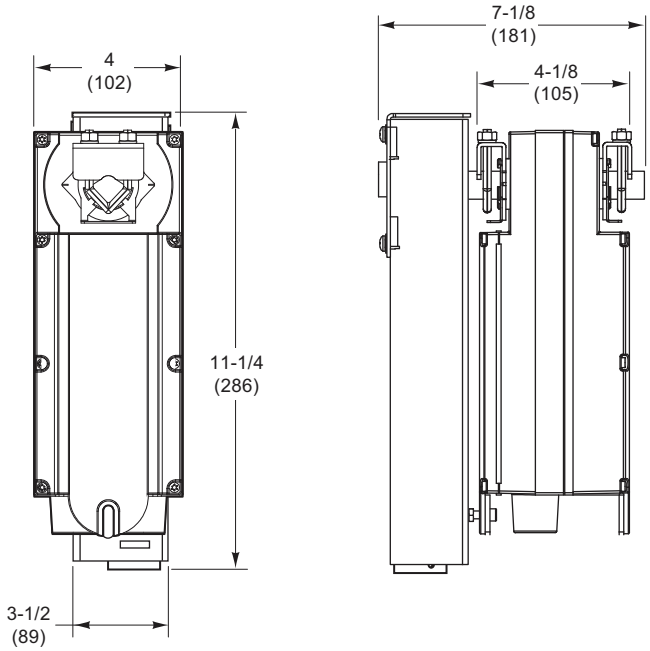

Figure-36 Mx40-717x with Linked Actuator Assembly With AV-602 Linkage.

Dimensions — 2-1/2” to 6” Flanged Globe Valve Assemblies

Valve Assembly Part Number	Valve Size in.	Valve Dimensions in inches (millimetres)											
		2-Way (Refer to Figure-39)						3-Way (Refer to Figure-40)					
		A	C	E	F	G	H	A	C	E	F	G	H
ASA Flanged 2-Way (N.O.) Vx-9213-xxx-5-P 3-Way Vx-9313-xxx-5-P	2-1/2	8-1/2 (216)	3-1/2 (89)	16-5/8 (422)	7 (178)	5-1/2 (140)	8-3/4 (222)	8-1/2 (216)	5-3/8 (136)	17-1/4 (438)	7 (178)	5-1/2 (140)	8-3/4 (222)
	3	9-1/2 (241)	3-3/4 (95)	17-1/4 (438)	7-1/2 (190)	6 (152)	9 (229)	9-1/2 (241)	6-3/8 (162)	17 (432)	7-1/2 (190)	6 (152)	9 (229)
	4	11-1/2 (292)	4-1/2 (114)	18-1/4 (464)	9 (229)	7-1/2 (190)	9-3/4 (248)	11-1/2 (292)	8-1/2 (276)	18-1/4 (464)	9 (229)	7-1/2 (190)	9-3/4 (248)
	5	13 (330)	6-3/4 (171)	19-1/4 (489)	10 (254)	8-1/2 (216)	10-1/4 (260)	13 (330)	8-3/4 (222)	19 (485)	10 (254)	8-1/2 (216)	10-1/4 (260)
	6	14 (356)	7-3/8 (187)	20 (508)	11 (280)	9-1/2 (241)	10-3/4 (273)	14 (356)	9-3/4 (248)	19-7/8 (505)	11 (280)	9-1/2 (241)	10-3/4 (273)
ASA Flanged 2-Way (N.C.) Vx-9223-xxx-5-P	2-1/2	8-1/2 (216)	4 (107)	17-1/4 (438)	7 (178)	5-1/2 (140)	8-3/4 (222)	—					
	3	9-1/2 (241)	5 (127)	17 (432)	7-1/2 (190)	6 (152)	9 (229)						
	4	11-1/2 (292)	7-1/8 (181)	18-1/4 (464)	9 (229)	7-1/2 (190)	9-3/4 (248)						

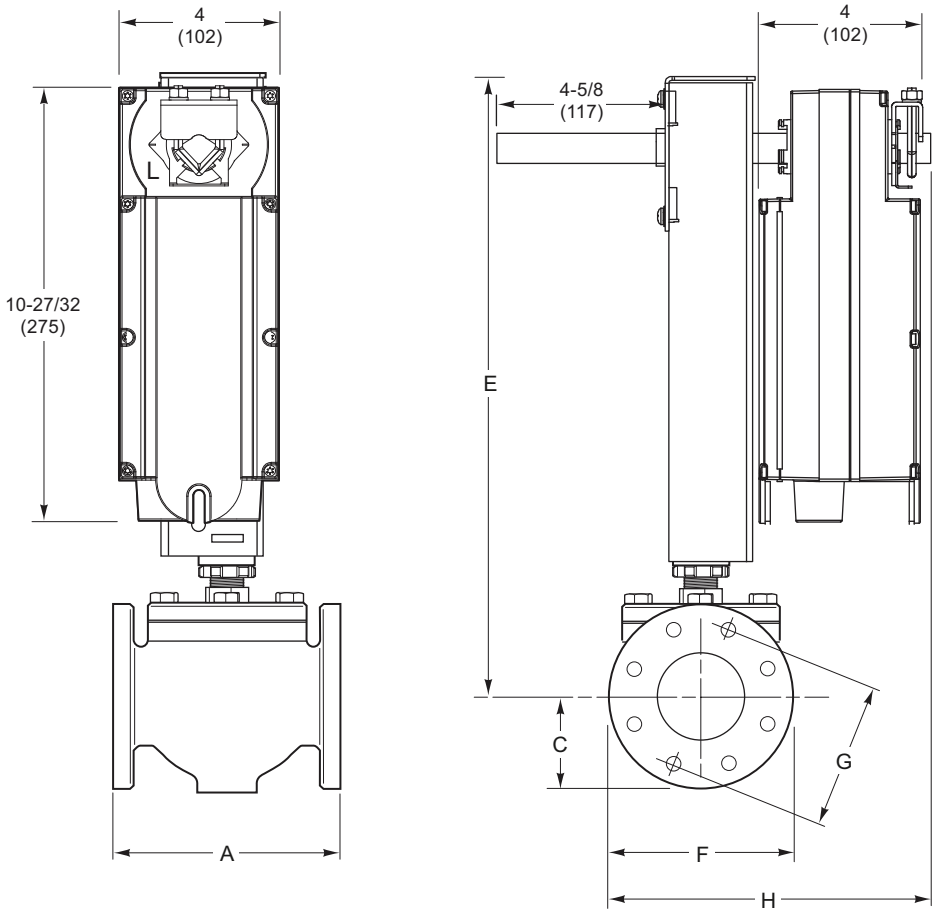

Figure-39 Mx40-717x with 2-1/2” to 4” 2-Way Flanged Globe Valve With AV-607-1

Linkage. Mx40-717X with 5" and 6" 2-Way flanged Globe Valve with AV-609-1 linkage

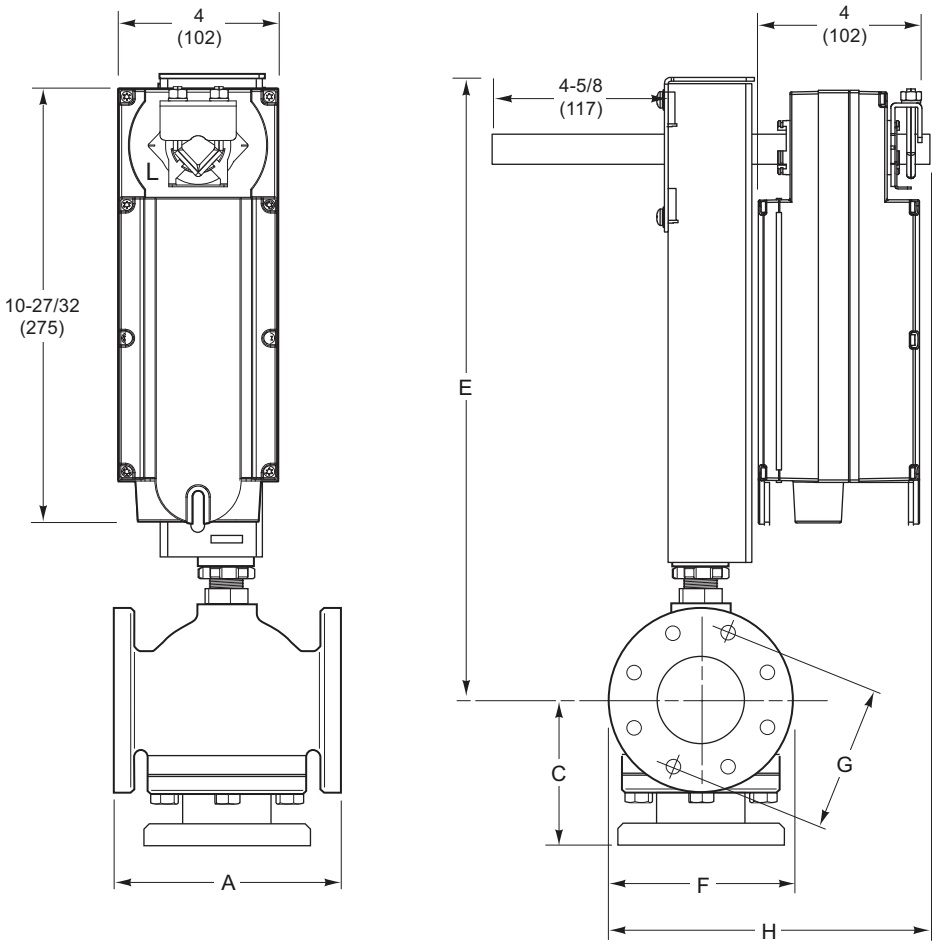

Figure-40 Mx40-717x with 2-1/2” to 4” 3-Way Flanged Globe Valve With AV-607-1 Linkage. Mx40-717X with 5" and 6" 2-Way flanged Globe Valve with AV-609-1 linkage