

Selection Guide

Globe Valve Assemblies

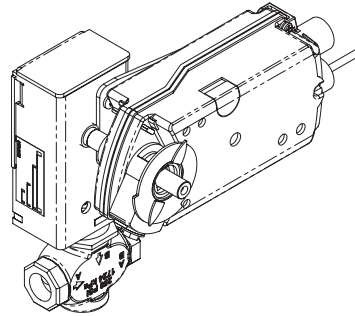
The Invensys VA, VF, and VS-7000 and -9000 series Linked Globe Valve Assemblies are complete actuator/valve assemblies that accept two position, floating, or proportional control, respectively, from a DDC system or from a thermostat, for control of hot water, chilled water and steam coils. These valve assemblies consist of linked spring return and non-spring return actuators mounted on 1/2" up to 6" (15 mm to 150 mm) 2-way and 3-way globe valve bodies, using a specially designed linkage assembly. 3-way assemblies are available for mixing (1/2" to 6") and diverting (1/2" to 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.

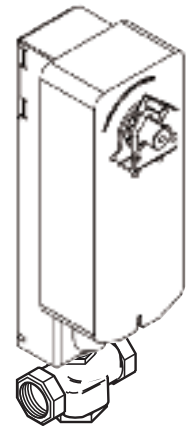
Linkage kits are available separately to allow field assembly of DuraDrive actuators to valve bodies.

Actuator/Linkage Assemblies

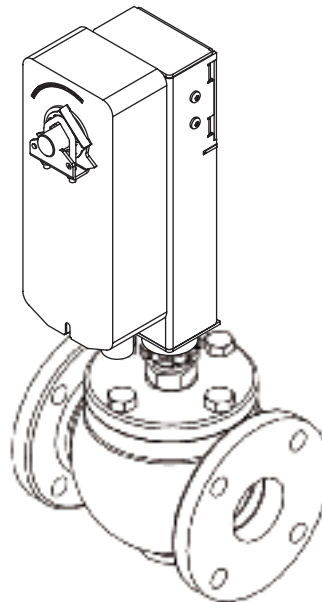
The Actuator/Linkage Assemblies consist of MA, MF, and MS actuators pre-assembled to linkages that are designed to be fitted onto 1/2" to 2" (15 mm to 50 mm metric) VB-7000 and 2-1/2" to 6" (65 mm to 80 mm metric) sizes of VB-9000 globe valve bodies.



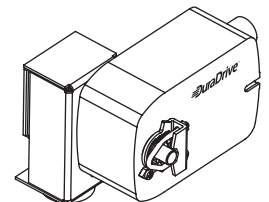
2-Way Linked Globe Valve Assembly
(Non-Spring Return Model shown)



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



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



Actuator/Linkage Assembly
(Spring Return Model shown)

Applicable Literature

F-Number	Description	Audience	Purpose
F-26642	MA40-704X Series, MA4X-707X Series, MA4X-715X Series DuraDrive Series Spring Return Two-Position Actuators General Instructions	<ul style="list-style-type: none"> – Sales Personnel – Application Engineers – Installers – Service Personnel – Start-up Technicians 	<p>Describes the actuator's features, specifications, and possible applications. Provides step-by-step mounting instructions.</p>
F-26644	MF4X-7XX3, MF4X-7XX3-50X DuraDrive Series Spring Return Floating Actuator General Instructions		
F-26645	MS4X-7XX3, MS4X-7XX3-50X DuraDrive Series Spring Return Proportional Actuator General Instructions		
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 General Instructions		
F-27214	MS41-6043/MS41-6083 Series Non-Spring Return Rotary 24 Vac Modulating Control 0 to 10 Vdc Electronic Damper Actuators General Instructions		
F-27215	MF41-6153/MS41-6153 Series Non-Spring Return Rotary Electronic Damper Actuators General Instructions		
F-26744	MF41-6343 DuraDrive Series Non-Spring Return Direct Coupled Actuator General Instructions		
F-26745	MS41-634X DuraDrive Series Non-Spring Return Direct Coupled Actuator General Instructions		
F-26749	MF40-7173 DuraDrive Series Spring Return Direct Coupled Actuator General Instructions		
F-26646	MX4X-7XXX, MX40-6XXX Series DuraDrive Actuator Selection Guide	<ul style="list-style-type: none"> – Sales Personnel – Application Engineers – Installers – Service Personnel – Start-up Technicians 	<p>Provides actuator specifications and part number cross referencing of phased out actuators with the new Invensys Building Systems direct-coupled actuators.</p>
F-27216	MF41/MS41-6043 Series 24 Vac, 35 lb-in. Non-Spring Return, Direct-Coupled Electronic Damper Actuators Submittal Sheet	<ul style="list-style-type: none"> – Sales Personnel – Application Engineers 	<p>Describes features and specifications of the MX41-6043 series actuators.</p>
F-27217	MF41/MS41-6083 Series 24 Vac, 70 lb-in., Non-Spring Return Direct-Coupled Electronic Damper Actuators Submittal Sheet	<ul style="list-style-type: none"> – Sales Personnel – Application Engineers 	<p>Describes features and specifications of the MX41-6083 series actuators.</p>
F-27218	MF41/MS41-6153 Series, 24 Vac, 133 lb-in., Non-Spring Return, Direct-Coupled Electronic Damper Actuators Submittal Sheet	<ul style="list-style-type: none"> – Sales Personnel – Application Engineers 	<p>Describes features and specifications of the MX41-6153 series actuators.</p>
F-26785	VX-2X13-5XX-9-XX, VX-7XXX-XXX-4-XX, MX4X-7XXX, and MX41-6XXX Series, DuraLynx Ball Valve Assemblies, Globe Linked Valve Assemblies, and DuraDrive Actuator/Linkage Assemblies Cross-Reference Guide	<ul style="list-style-type: none"> – Sales Personnel – Application Engineers 	<p>Provides part number cross referencing of phased-out devices with the Invensys Building Systems DuraLynx Ball Valve Assemblies, Globe Linked Valve Assemblies, and DuraDrive Actuator/Linkage Assemblies .</p>
F-11080	Valve Selection Chart Water	<ul style="list-style-type: none"> – Application Engineers – Installers – Service Personnel – Start-up Technicians 	<p>Provides charts, equations, and diagrams to assist in the configuration of valve system applications. TOOL-150, valve sizing slide rule may be purchased separately.</p>
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-Number	Description	Audience	Purpose
F-24380	VB-7211 Series 1/2" to 1-1/4" Union Straightway NPT Stem Up Open, 2-Way Valves General Instructions	<ul style="list-style-type: none"> – Sales Personnel – Application Engineers – Installers – Service Personnel – Start-up Technicians 	<p>Describes the valve's features, specifications, and possible applications. Provides step-by-step mounting, installation, and checkout instructions.</p>
F-26075	VB-7213 Series 1/2" to 2" Screwed NPT Stem Up Open, 2-Way Valves General Instructions		
F-26077	VB-7215 Series 15 mm to 50 mm Screwed Rp Stem Up Open, 2-Way Valves General Instructions		
F-24384	VB-7221 Series 1/2" to 1-1/4" Union Straightway NPT Stem Up Closed, 2-Way Valves General Instructions		
F-26073	VB-7223 Series 1/2" to 2" Screwed NPT Stem Up Closed, 2-Way Valves General Instructions		
F-26079	VB-7225 Series 15 mm to 50 mm Screwed Rp Stem Up Closed, 2-Way Valves General Instructions		
F-26074	VB-7313 Series 1/2" to 2" Screwed NPT 3-Way Mixing Valves General Instructions		
F-26078	VB-7315 Series 15 mm to 50 mm Screwed Rp 3-Way Mixing Valves General Instructions		
F-26076	VB-7323 Series 1/2" to 2" Screwed NPT 3-Way Diverting Valves General Instructions		
F-24382	VB-9213 Series 2-1/2" to 6" Screwed or Flanged Stem Up Open, 2-Way Valves General Instructions		
F-25672	VB-9215 Series 65 mm and 80 mm Screwed Stem Up Open, 2-Way Valves General Instructions		
F-24386	VB-9223 2-1/2" to 6" Screwed or Flanged Stem Up Closed, 2-Way Valves General Instructions		
F-25673	VB-9225 Series 65 mm and 80 mm Screwed Stem Up Closed, 2-Way Valves General Instructions		
F-24393	VB-9313 Series 2-1/2" to 6" Screwed or Flanged 3-Way Mixing Valves General Instructions		
F-25674	VB-9315 Series 65 mm and 80 mm Screwed 3-Way Mixing Valves General Instructions		

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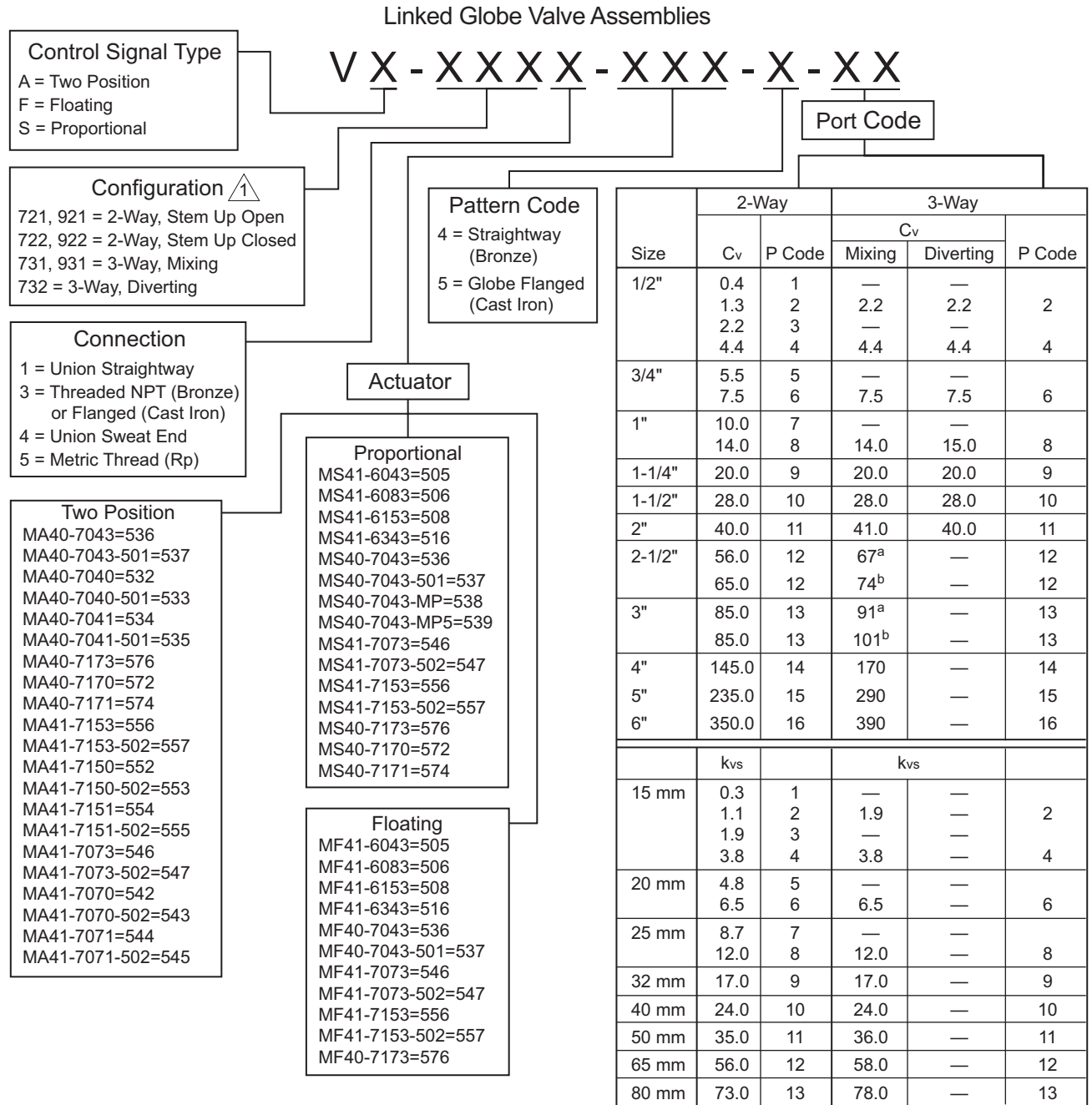
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Features and Benefits

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" to 6" and 15 mm to 150 mm (Union Straightway, NPT, Flanged, Metric) 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.
Optional built-in auxiliary switch interfacing.	Provides safety interfacing and signaling.
All models equipped with pigtail leads.	Eases installation. Reduced electrician costs.
Optional manual operating lever on many spring return and non-spring return assemblies.	Allows manual positioning of the valve.
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.
1/2" to 2" 3-way valve sizes are offered in either a mixing or diverting configuration.	Increases application flexibility.

Linked Globe Valve Assembly

Part Numbering System



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

^a Threaded valve body.

^b Flanged valves body.

Valve Assemblies	Valve Body Action	Factory Shipped Position ^c		Action ^c
		Valve Stem	Flow	
VX-721X-XXX-4-P VX-921X-XXX-X-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-X-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-X-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.

Actuator/Linkage Assemblies for Globe Valves

Models and Specifications

Spring Return Assemblies

Table-1 MX4X-7XXX Series Spring Return Actuator/Linkage Assemblies.

Actuator/ Linkage Assembly Part Numbers	Power Input							SPDT Auxiliary Switches	Approximate Timing in Seconds @ 70 °F (21 °C) with No Load		Actuator Output Torque Rating lb.-in. (N-m)	Manual Override						
	Voltage 50/60 Hz	Running				Holding			Powered	Spring Return								
		50 Hz		60 Hz		DC Amps	50 Hz						60 Hz					
VA	W	VA	W	W	W		W											
MA40-7043-200	24 Vac ± 20% 22-30 Vdc	4.4	2.9	4.4	2.9	0.11	0.8	0.8	No	<50	<26	35 (4)	No					
MA40-7043-201									One ^a				No					
MA40-7040-200	120 Vac ± 10%	6.4	3.8	4.3	3.4	—	1.6	1.2	No	<50	<26		No					
MA40-7040-201									One ^a				No					
MA40-7041-200	230 Vac ± 10%	5.8	4.1	4.6	3.9	—	1.5	1.2	No	<50	<26		No					
MA40-7041-201									One ^a				No					
MF40-7043-200 ^b	24 Vac ± 20% 22-30 Vdc	5.9	4.4	5.9	4.4	0.17	2.9	2.9	No	<130	<25		No					
MF40-7043-201 ^b									One ^a				No					
MS40-7043-200 ^b	24 Vac ± 20% 22-30 Vdc	5.6	4.2	5.6	4.2	0.15	2.4	2.4	No				<130	<25	No			
MS40-7043-201 ^b									One ^a						No			
MS40-7043-202	24 Vac ± 20% 22-30 Vdc	6.6	5.0	6.6	5.0	0.17	3.2	3.2	No				<130	<25	No			
MS40-7043-203									One						No			
MA41-7073-200	24 Vac ± 20% 22-30 Vdc	4.8	3.2	4.8	3.2	0.13	0.8	0.8	No			<80	<40	60 (7)	Yes			
MA41-7073-202									Two ^c						Yes			
MA41-7073-220									No						Yes			
MA41-7070-200	120 Vac ± 10%	10.7	4.2	5.6	3.6	—	2.0	1.2	No						<80	<40	60 (7)	Yes
MA41-7070-202									Two ^c									Yes
MA41-7070-220									No									Yes
MA41-7071-200	230 Vac ± 10%	17.0	5.1	8.0	4.0	—	2.7	1.4	No	<80	<40				60 (7)	Yes		
MA41-7071-202									Two ^c							Yes		
MA41-7071-220									No							Yes		
MF41-7073-200	24 Vac ± 20% 22-30 Vdc	6.2	4.8	6.2	4.8	0.18	2.8	2.8	No	<195	<30				60 (7)	Yes		
MF41-7073-202									Two ^c							Yes		
MF41-7073-220									No							Yes		
MS41-7073-200	24 Vac ± 20% 22-30 Vdc	5.8	4.6	5.8	4.6	0.17	2.3	2.3	No	<195	<30	60 (7)	Yes					
MS41-7073-202									Two ^c				Yes					
MS41-7073-220									No				Yes					
MA41-7153-200	24 Vac ± 20% 22-30 Vdc	9.8	7.5	9.7	7.5	0.29	2.8	2.8	No	<190	<30	133 (15)	Yes					
MA41-7153-202									Two ^c				Yes					
MA41-7153-220									No				Yes					
MA41-7150-200	120 Vac ± 10%	11.7	8.8	10.0	8.4	—	3.6	5.0	No				<190	<30	133 (15)	Yes		
MA41-7150-202									Two ^c							Yes		
MA41-7150-220									No							Yes		

Table-1 MX4X-7XXX Series Spring Return Actuator/Linkage Assemblies. (Continued)

Actuator/ Linkage Assembly Part Numbers	Power Input							SPDT Auxiliary Switches	Approximate Timing in Seconds @ 70 °F (21 °C) with No Load		Actuator Output Torque Rating lb.-in. (N-m)	Manual Override	
	Voltage 50/60 Hz	Running				Holding			Powered	Spring Return			
		50 Hz		60 Hz		50 Hz	60 Hz						
		VA	W	VA	W	DC Amps	W						W
MA41-7151-200	230 Vac ± 10%	15.5	9.5	10.6	8.5	—	4.6	3.3	No	<190	<30	133 (15)	Yes
MA41-7151-202									Two ^c				Yes
MA41-7151-220									No				Yes
MF41-7153-200	24 Vac ± 20% 22-30 Vdc	9.8	7.7	9.7	7.7	0.30	3.3	3.3	No				Yes
MF41-7153-202									Two ^c				Yes
MF41-7153-220									No				Yes
MS41-7153-200	24 Vac ± 20% 22-30 Vdc	9.8	7.4	9.7	7.4	0.28	2.9	2.9	No				Yes
MS41-7153-202									Two ^c				Yes
MS41-7153-220									No				Yes

- ^a One switch, adjustable from 0 to 95° rotation (0 to 1 scale).
- ^b With plenum-rated cable.
- ^c One switch, adjustable from 25° to 85° rotation and one set to operate @ 5° fixed.

Table-2 MX40-717X Series Spring Return Actuator/Linkage Assemblies.

Part Numbers	Power Input @ 50/60 Hz				SPDT Auxiliary Switches	Approximate Timing in Seconds @ 70 °F (21 °C) with No Load		Actuator Output Torque Rating lb.-in. (N-m)
	Voltage	VA		Watts		Powered	Spring Return	
		Running	Holding					
MA40-7173-200	24 Vac ± 20%	9.6	4.1	5.4	No	<145	<75	150 (17)
MA40-7173-220					No			
MA40-7170-200 ^a	120 Vac ± 10%	11.4	9.4	7.2	No			
MA40-7170-220 ^a					No			
MA40-7171-200	240 Vac ± 10%	11.8	9.5	7.4	No			
MA40-7171-220					No			
MF40-7173-200	24 Vac ± 20%	10.0	4.3	5.5	No			
MF40-7173-220					No			
MS40-7173-200	24 Vac ± 20%	9.4	5.4	7.1	No			
MS40-7173-220					No			
MS40-7170-200 ^a	120 Vac ± 10%	11.1	9.1	7.1	No			
MS40-7170-220 ^a					No			
MS40-7171-200	240 Vac ± 10%	11.8	10.1	7.2	No			
MS40-7171-220					No			

- ^a The CE directive is not applicable to this model.

Non-Spring Return Assemblies

Table-3 Non-Spring Return Actuator/Linkage Assemblies.

Part Numbers	Power Input @ 50/60 Hz				SPDT Auxiliary Switches ^a	Approximate Timing in Seconds @ 70 °F (21 °C) with No Load	Actuator Output Torque Rating lb.-in. (N-m)	
	Voltage	VA		Watts				
		Running	Holding					
MF41-6043-200 ^b	24 Vac +20/-15%	2.3	—	2.0	No	90 @ 60 Hz	35 (4)	
MS41-6043-200 ^a	24 Vac +20/-15%	3.3	1.2	3.0	No	108 @ 50 Hz		
MF41-6083-200	24 Vac +20/-15% ^c	2.3	—	2.0	No	125 @ 60 Hz 150 @ 50 Hz	70 (8)	
MS41-6083-200	24 Vac +20/-15% ^c	3.3	1.2	3.0	No			
MF41-6153-200	24 Vac +20/-15% ^d	3.0	—	3.0	No			
MF41-6153-220	24 Vac +20/-15% ^d	3.0	—	3.0	No			
MS41-6153-200	24 Vac +20/-15% ^d	5.0	1.2	4.0	No			
MS41-6153-220	24 Vac +20/-15% ^d	5.0	1.2	4.0	No			
MF41-6343-230	24 Vac ± 20%	7.0	3.6	3.8	No		<145	300 (34)
MS41-6343-230	24 Vac ± 20%	7.1	5.0	4.8	No			

^a Auxiliary switch ratings are as follows:

Auxiliary Switch Ratings		
	MX41-6043, MX41-6083	MX41-6153
AC Rating	24 Vac, 4 A resistive, 2 A inductive	24 Vac, 6 A resistive, 2 A inductive
DC Rating	12 to 30 Vdc, DC 2 A	

^b With plenum-rated cable.

^c Minimum voltage at high temperatures: 24 Vac, +20%, -10% at 90 to 130 °F ambient.

^d Minimum voltage at high temperatures: 24 Vac, +20%, -5% (MF models) and 24 Vac, +20%, -10% (MS models) at 85 to 130 °F ambient.

Linkage Kits for Field Mounting Globe Valves and Actuators

Models and Specifications

Table-4 Linkage Kits.

Linkage Kit ^a	Actuator	Factory-Assembled Valve Sizes 2-way & 3-way	Field-Assembled to VB Valve Bodies 2-way & 3-way
AV-602	MX41-707X MX41-715X MX40-717X	1" to 2" 1-1/4" to 2" 1-1/2" to 2"	1" to 2"
AV-603	MX41-6043 MX41-6083	1/2" to 2" 1" to 2"	1/2" to 2"
AV-605	MX41-6153 MA40-704X MF40-7043 MS40-7043	1-1/2" to 2" 1/2" to 2" 1/2" to 2" 1/2" to 2"	1/2" to 2"
AV-607	MX41-6153 MX41-707X MX41-715X MX40-717X	2-1/2" to 4"	2-1/2" to 4"
AV-609	MX41-6343	5" to 6"	5" to 6"

^a Refer to Table-7, Table-8, Table-9, and Table-10 for complete details.

System Design Considerations

Linked Globe Valve Assemblies

Note: The information in this section describes characteristics of the VB-7XXX and VB-9XXX valve bodies, which are used in the 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.

Control Precision

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 Figure-1 for typical modified equal percentage flow characteristics of VB-72XX and VB-92XX series valves.

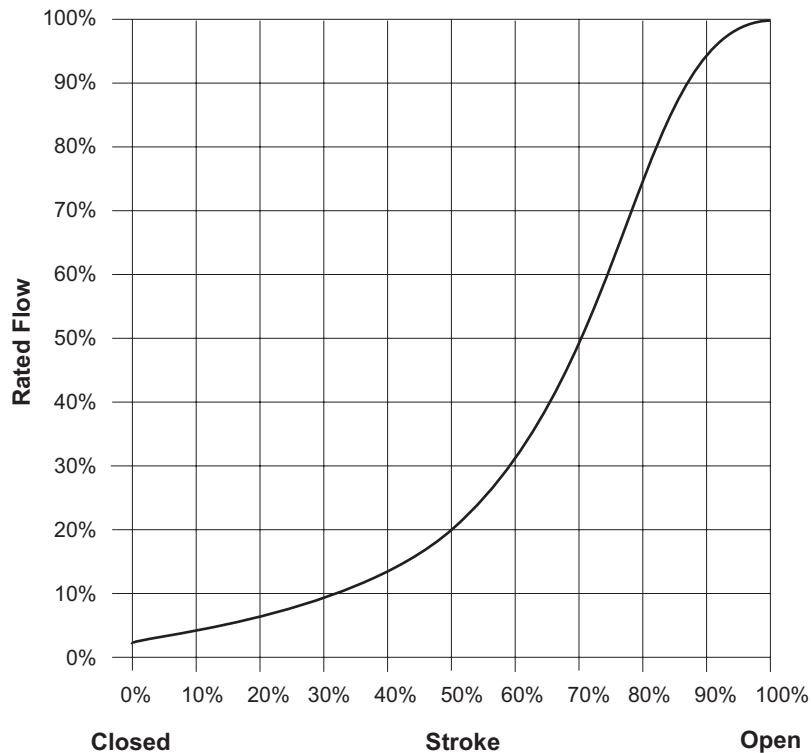


Figure-1 Typical Modified Equal Percentage Flow Characteristics.

3-Way Valves: 3-way mixing valves are designed so that 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.

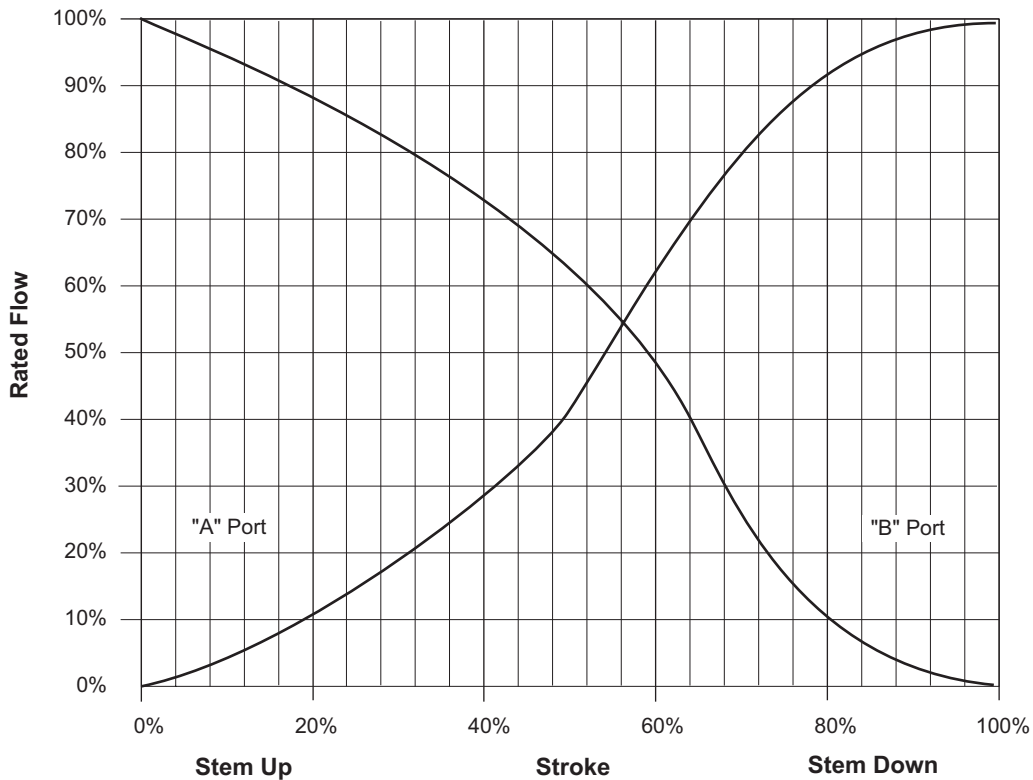


Figure-2 Typical Flow Characteristics.

Rangeability

Rangeability is the ratio of rated flow to the minimum controllable flow through a valve.

2-Way Valves: Table-5 lists the rangeability for VB-72XX and VB-92XX series globe valves. Refer to the model charts on the following pages for detailed valve information.

Table-5 Rangeability.

Nominal Valve Size		Port Code (P)	Nominal Rangeability
Standard	Metric		
1/2"	15 mm	1	5:1
		2	15:1
		3	25:1
		4	40:1
3/4"	20 mm	5	50:1
		6	60:1
1"	25 mm	7	60:1
		8	75:1
1-1/4"	32 mm	9	75:1
1-1/2"	40 mm	10	75:1
2"	50 mm	11	75:1
2-1/2"	65 mm	12	75:1
3"	80 mm	13	75:1
4"	—	14	75:1
5"	—	15	75:1
6"	—	16	75:1

3-Way Valves: 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.

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.

VB-7XXX-0-X-P and VB-9XXX-0-4-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.

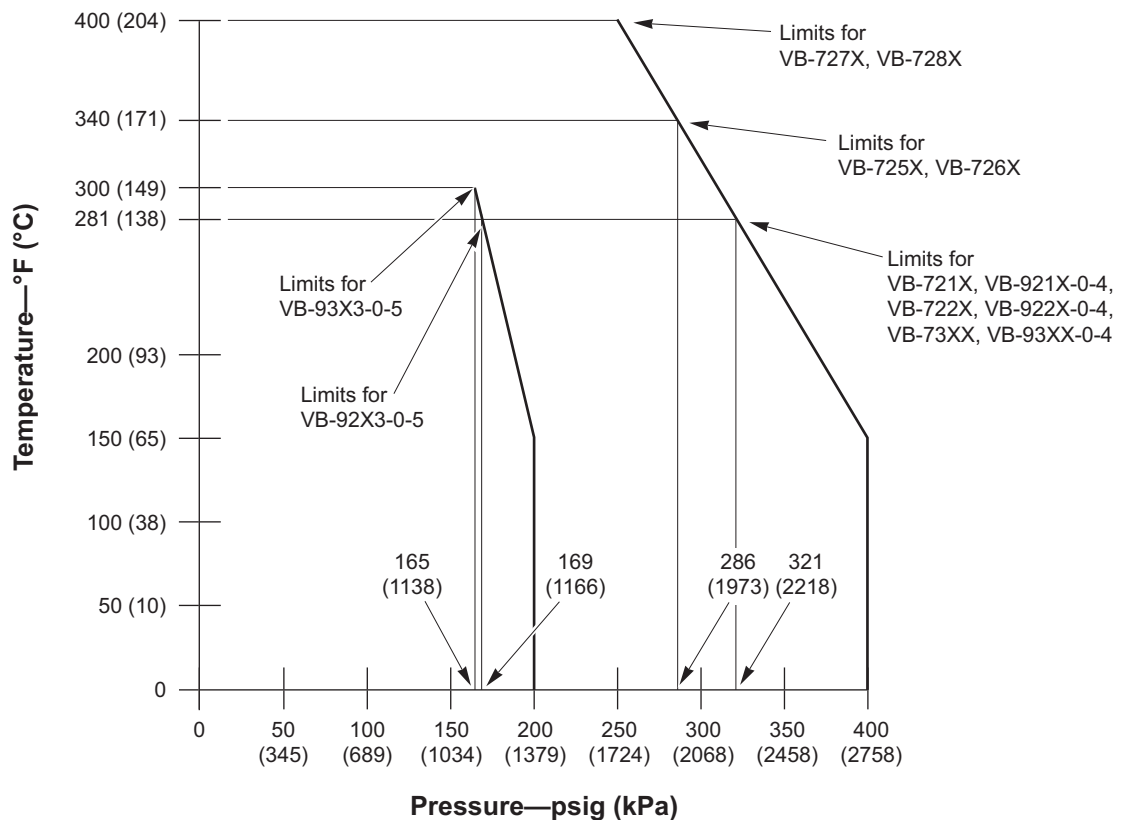


Figure-3 Temperature and Pressure Ratings for VB-7XXX and VB-9XXX Series Globe Valves.

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 that 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. See *Actuator/Linkage Assemblies General Instructions, F-26635* for details.

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 Valve Assembly Mounting Dimensions* section 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 (Table-6).

Table-6 Conventional Heating System.

Design Temperature Load Drop °F (°C)	Recommended Pressure Drop ^a (% 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

^a Recommended minimum pressure drop = 5 psi (34 kPa).

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).

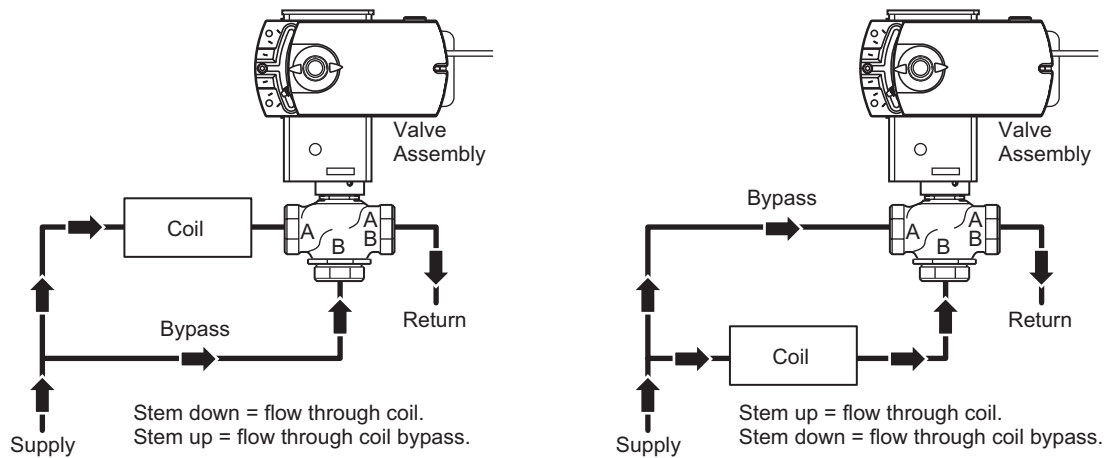


Figure-4 Typical Piping of 3-Way Mixing Valve for Control of Heating or Cooling Coil.

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.

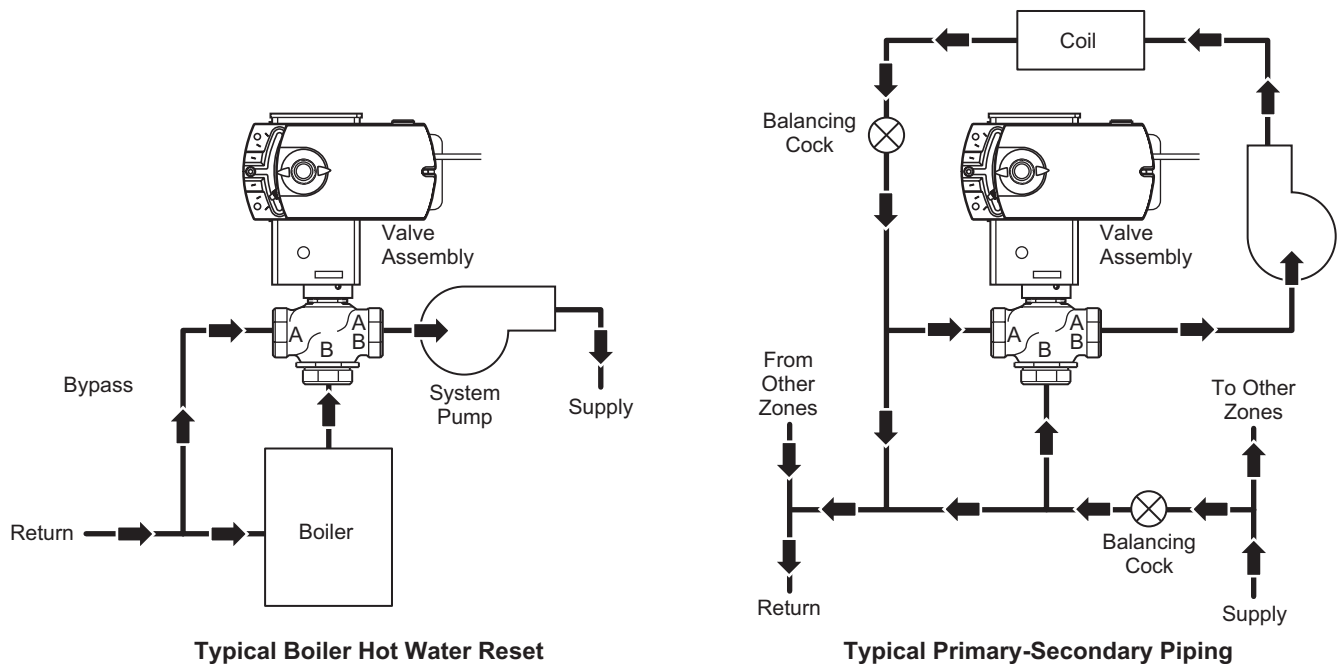


Figure-5 Typical 3-Way Mixing Valve Piping for Proportional Control Used to Blend Two Water Flows.

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).

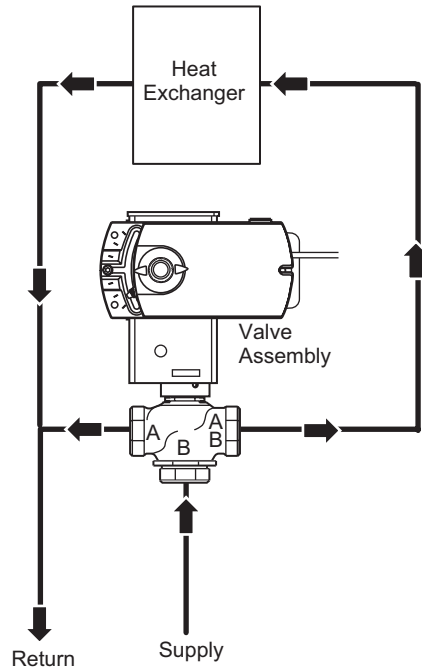


Figure-6 Typical 3-Way Diverting Valve Piping.

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.

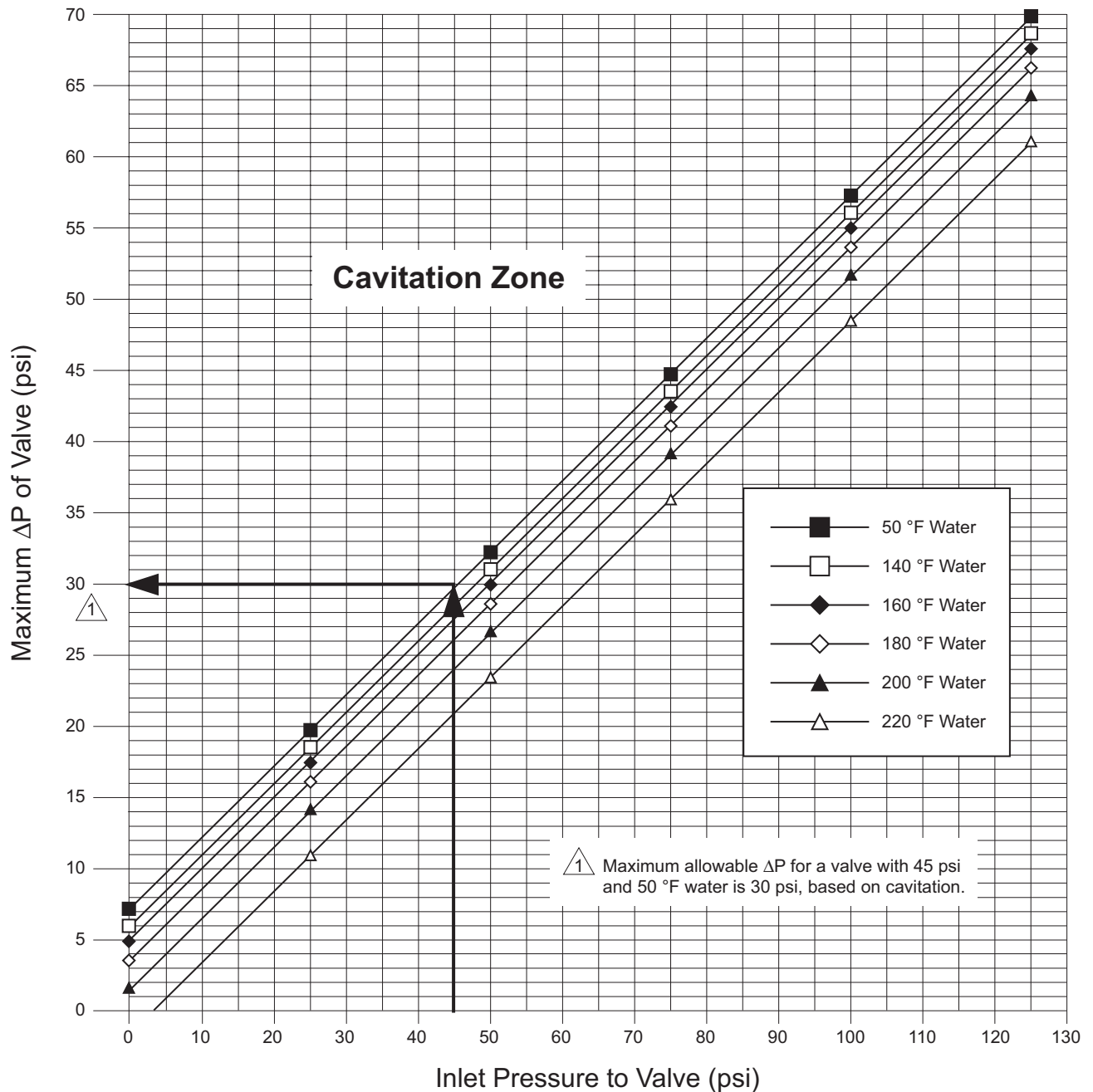


Figure-7 Maximum Allowable Differential Pressure (DP) for Water Valves.

Additional Valve Sizing Information

For additional valve sizing information, refer to the "Applicable Literature" section for a list of documents pertaining to valve sizing.

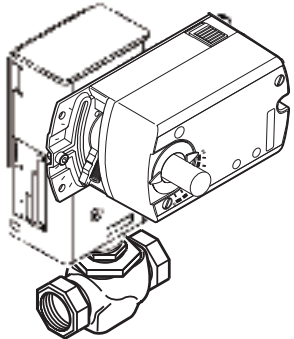
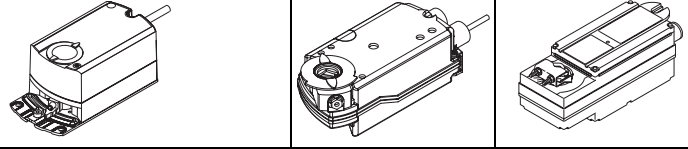
Valve/Actuator Combinations

2-Way Linked Globe Valve Assemblies

Non-Spring Return Models

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

Table-7 2-Way Linked Globe Valve Assemblies with Non-Spring Return Actuators — Selection Chart.

 <p>Non-Spring Return 2-Way Linked Globe Valve Assemblies</p>								
					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-603 (1/2" to 2")	AV-603 (1" to 2")	AV-605 (1-1/2" to 2") AV-607 (2-1/2" to 4")	AV-609 (5" and 6")
Valve Assembly Part Number^a	P Code	Valve Size in. (mm)	Cv^b	kvs^b	Actuator Close-off Pressure psi^{cd}			
VX-7211-XXX-4-P VX-7213-XXX-4-P VX-7215-XXX-4-P ^e VX-7221-XXX-4-P VX-7223-XXX-4-P VX-7225-XXX-4-P ^e	1	1/2 (15)	0.4	0.3	225	—	—	—
	2		1.3	1.1				
	3		2.2	1.9				
	4	3/4 (20)	4.4	3.8	100	130	—	—
	5		5.5	4.8				
	6		7.5	6.5				
	7	1 (25)	10.0	8.7	60	100	—	—
	8		14.0	12				
	9	1-1/4 (32)	20.0	17	40	70	140	—
VX-7213-XXX-4-P VX-7215-XXX-4-P ^e VX-7223-XXX-4-P VX-7225-XXX-4-P ^e	10	1-1/2 (40)	28.0	24	20	40	80	—
	11	2 (50)	40.0	35	—	—	25	—
VX-9213-XXX-4-P ^f VX-9213-XXX-5-P ^g VX-9215-XXX-4-P ^e VX-9223-XXX-4-P ^f VX-9223-XXX-5-P ^g VX-9225-XXX-4-P ^e	12	2-1/2 (65)	56.0 ^f	48 ^f	—	—	17	—
			65.0 ^g	56 ^g				
	13	3 (80)	85.0	73	—	—	9	—
	14	4 (N/A)	145.0	125	—	—	—	11
	15	5 (N/A)	235.0	203	—	—	—	8
16	6 (N/A)	350.0	303	—	—	—	—	

^a To determine a specific part number, see the "Linked Globe Valve Assembly Part Numbering System".

^b $kvs = m^3/h$ (DP = 100 kPa) $kvs = Cv / 1.156$ $Cv = kvs \times 1.156$

^c Close-off ANSI IV (.01%) for soft seats. For seat leakage ratings see "Applicable 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 Metric thread 15 to 80 mm (Rp 1/2 to Rp 3).

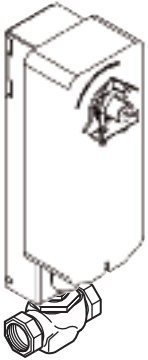
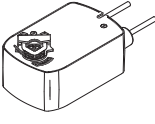
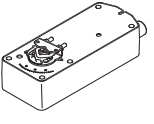
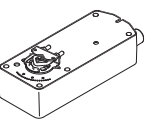
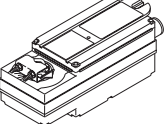
^f Threaded valve body.

^g Flanged valve body.

Spring Return Models

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

Table-8 2-Way Linked Globe Valve Assemblies with Spring Return Actuators — Selection Chart.

 <p>Spring Return 2-Way Linked Globe Valve Assemblies^a</p>					   			
					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-605 (1/2" to 2")		AV-602 (1" to 2") AV-607 (2-1/2" to 4")		AV-602 (1-1/4" to 2") AV-607 (2-1/2" to 4")				
Valve Assembly Part Number ^b	P Code	Valve Size in. (mm)	Cv ^c	kvs ^c	Actuator Close-off Pressure psi^{de}			
VX-7211-XXX-4-P VX-7213-XXX-4-P VX-7215-XXX-4-P ^f VX-7221-XXX-4-P VX-7223-XXX-4-P VX-7225-XXX-4-P ^f	1	1/2 (15)	0.4	0.3	250	—	—	—
	2		1.3	1.1	250	—	—	—
	3		2.2	1.9	250	—	—	—
	4		4.4	3.8	250	—	—	—
	5	3/4 (20)	5.5	4.8	250	—	—	—
	6		7.5	6.5	250	—	—	—
	7	1 (25)	10.0	8.7	125	180	—	—
	8		14.0	12	125	180	—	—
	9	1-1/4 (32)	20.0	17	75	120	200	—
VX-7213-XXX-4-P VX-7215-XXX-4-P ^f VX-7223-XXX-4-P VX-7225-XXX-4-P ^f	10	1-1/2 (40)	28.0	24	50	80	140	160
	11	2 (50)	40.0	35	25	40	80	120
VX-9213-XXX-4-P ^g VX-9213-XXX-5-P ^h VX-9215-XXX-4-P ^f VX-9223-XXX-4-P ^g VX-9223-XXX-5-P ^h VX-9225-XXX-4-P ^f	12	2-1/2 (65)	56.0 ^g	48 ^g	—	15	33	31
			65.0 ^h	56 ^h				
	13	3 (80)	85.0	73	—	10	22	21
	14	4 (N/A)	145.0	125	—	5	12	11
	15	5 (N/A)	235.0	203	—	—	—	—
	16	6 (N/A)	350.0	303	—	—	—	—

^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) $kvs = Cv / 1.156$ $Cv = kvs \times 1.156$

^d Close-off ANSI IV (.01%) for soft seats. For seat leakage ratings see "Applicable 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 Metric thread 15 to 80 mm (Rp 1/2 to Rp 3).

^g Threaded valve body.

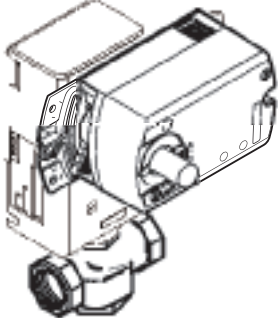
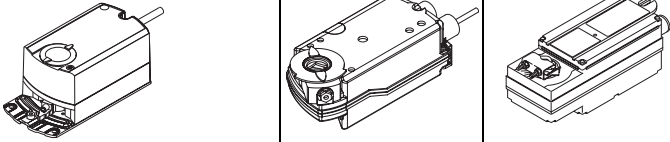
^h Flanged valve body.

3-Way Linked Globe Valve Assemblies

Non-Spring Return Models

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

Table-9 3-Way Linked Globe Valve Assemblies with Non-Spring Return Actuators — Selection Chart.

												
					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-603 (1/2" to 2")	AV-603 (1" to 2")	AV-605 (1-1/2" to 2") AV-607 (2-1/2" to 4")	AV-609 (5" and 6")				
Valve Assembly Part Number ^b	P Code	Valve Size in. (mm)	Cv ^c	kvs ^c	Actuator Close-off Pressure psi ^{ad}							
VX-7313-XXX-4-P VX-7315-XXX-4-P ^e	2	1/2 (15)	2.2	1.9	225	—	—	—				
	4		4.4	3.8								
	6	3/4 (20)	7.5	6.5								
	8	1 (25)	14.0	12.0					100	180	—	—
	9	1-1/4 (32)	20.0	17					60	120	—	—
	10	1-1/2 (40)	28	24					40	75	140	—
	11	2 (50)	41	36					20	40	80	—
VX-7323-505-4-P	2	1/2 (15)	2.2	1.9	250	—	—	—				
	4		4.4	3.8								
	6	3/4 (20)	7.5	6.5								
	8	1 (25)	15.0	13.0								
	9	1-1/4 (32)	20.0	17.3								
	10	1-1/2 (40)	28	24.2								
	11	2 (50)	40	34.6								
VX-9313-XXX-4-P ^f VX-9313-XXX-5-P ^g VX-9315-XXX-4-P ^e	12	2-1/2 (65)	67.0 ^f	58 ^f	—	—	25	—				
			74.0 ^g	64 ^g								
	13	3 (80)	91.0 ^f	79 ^f	—	—	17	—				
			101.0 ^g	87 ^g								
	14	4 (N/A)	145.0	125	—	—	9	—				
	15	5 (N/A)	235.0	203	—	—	—	11				
	16	6 (N/A)	350.0	303	—	—	—	8				

^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 = m³/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 Metric thread 15 to 80 mm (Rp 1/2 to Rp 3).

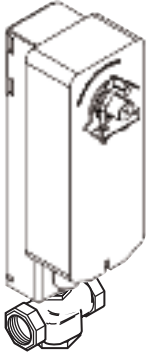
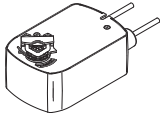
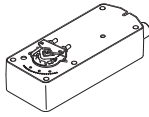
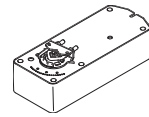
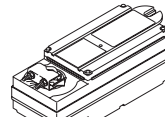
^f Threaded valve body.

^g Flanged valve body.

Spring Return Models

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

Table-10 3-Way Linked Globe Valve Assemblies with Spring Return Actuators — Selection Chart.

 <p>Spring Return 3-Way Linked Globe Valve Assemblies^a</p>					   			
					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-605 (1/2" to 2")		AV-602 (1" to 2") AV-607 (2-1/2" to 4")		AV-602 (1-1/2" to 2") AV-607 (2-1/2" to 4")				
Valve Assembly Part Number ^c	P Code	Valve Size in. (mm)	Cv ^d	kvs ^d	Actuator Close-off Pressure psig ^{be}			
VX-7313-2XX-4-P VX-7315-XXX-4-P ^f	2	1/2 (15)	2.2	1.9	250	—	—	—
	4		4.4	3.8	250	—	—	—
	6	3/4 (20)	7.5	6.5	250	—	—	—
	8	1 (25)	14.0	12.0	125	180	—	—
	9	1-1/4 (32)	20.0	17	75	100	—	—
	10	1-1/2 (40)	28	24	50	70	140	160
	11	2 (50)	41	36	25	40	80	120
VX-7323-XXX-4-P	2	1/2 (15)	2.2	1.9	250	—	—	—
	4		4.4	3.8	250	—	—	—
	6	3/4 (20)	7.5	6.5	250	—	—	—
	8	1 (25)	15	13.0	250	—	—	—
	9	1-1/4 (32)	20	17.3	250	—	—	—
	10	1-1/2 (40)	28	24.2	250	—	—	—
	11	2 (50)	40	34.6	250	—	—	—
VX-9313-XXX-4-P ^g VX-9313-XXX-5-P ^h VX-9315-XXX-4-P ^f	12	2-1/2 (65)	67.0 ^g	58 ^g	—	15	33	31
			74.0 ^h	64 ^h				
	13	3 (80)	91.0 ^g	79 ^g	—	10	22	21
			101.0 ^h	87 ^h				
	14	4 (N/A)	145.0	125	—	5	12	11
	15	5 (N/A)	235.0	203	—	—	—	—
16	6 (N/A)	350.0	303	—	—	—	—	

^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 1/2" through 1-1/4" (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) $kvs = Cv / 1.156$ $Cv = kvs \times 1.156$

^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.

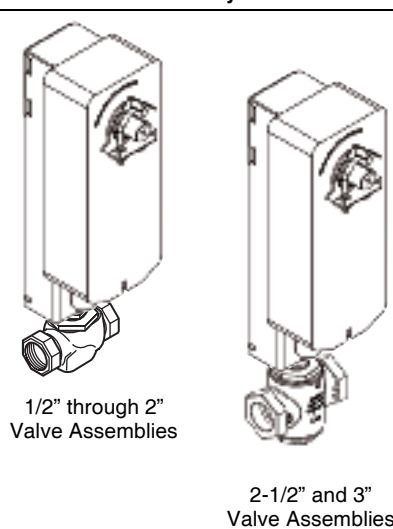
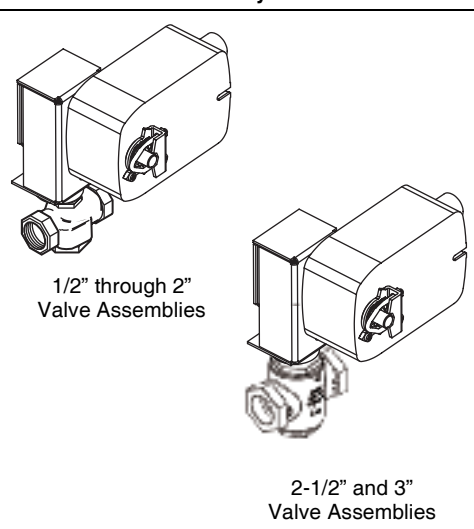
^f Metric thread 15 to 80 mm (Rp 1/2 to Rp 3).

^g Threaded valve body.

^h Flanged valve body.

Linked Globe Valve Assemblies Specifications

Table-11 Specifications for 1/2" to 2" VX-7XXX-5XX-4-P Series and 2-1/2" and 3" VX-9XXX-5XX-4-P Series Linked Globe Valve Assemblies.

Linked Globe Valve Assemblies		2-Way	3-Way
			
Applications		Chilled or Hot Water, or Steam	Chilled or Hot Water
Type of End Fitting		NPT, Rp Screwed Union Straightway (up to 1-1/4")	NPT, Rp Screwed
Size		VX-7XXX-5XX-4-P 1/2" through 2" (15 mm through 50 mm) VX-9XXX-5XX-4-P 2-1/2" and 3" (65 mm and 80 mm)	
Action		Stem Up Open or Stem Up Closed	Mixing or Diverting
Valve Assembly Series ^a		VX-72XX-5XX-4-P VX-92XX-5XX-4-P	VX-73XX-5XX-4-P VX-93XX-5XX-4-P
Flow Type		Equal Percentage ^b	Linear ^b
Valve Body Materials	Body	Bronze	Bronze
	Seat	Bronze	Bronze
	Stem	Stainless Steel	Stainless Steel
	Plug	Brass	Brass
	Packing	Spring-loaded TFE	Spring-loaded TFE
	Disc	EPDM	—
Linkage Materials	Housing	Corrosion-Resistant Steel	Corrosion-Resistant Steel
	Rack & Pinion	Steel	Steel
ANSI Pressure Class (Figure-3)		250 psig (1724 kPa), up to 400 psig (2758 kPa) below 150 °F (66 °C) ^c	250 psig (1724 kPa), up to 400 psig (2758 kPa) below 150 °F (66 °C) ^c
Pressure Class (VB-7XX5)		PN16	PN16
Rangeability		See Table-5	500:1
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		1/2" through 2" 20 °F (-7 °C) 2-1/2" and 3" 40 °F (4 °C)	1/2" through 2" 20 °F (-7 °C) 2-1/2" and 3" 40 °F (4 °C)
Fluid Temperature — Maximum		1/2" through 3" 281 °F (138 °C)	1/2" through 3" 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 15)	35 psi (241 kPa) Max. for Normal Lifespan (refer to "Cavitation Limitations on Valve Pressure Drop" on page 15)

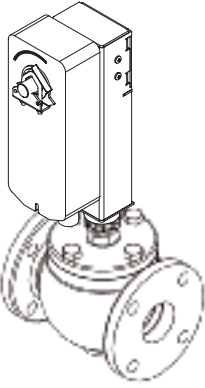
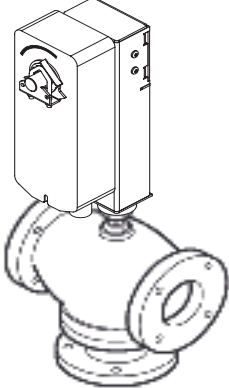
^a To determine a specific part number, see the Linked Globe Valve Assembly Part Numbering System.

^b For a detailed description of the flow, see page 9 (2-way valves) or page 10 (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-12 Specifications for 2-1/2" to 6" VX-9XXX Linked Globe Valve Assemblies.

Linked Globe Valve Assemblies		2-Way	3-Way
			
Applications		Chilled or Hot Water, or Steam	Chilled or Hot Water
Type of End Fitting		Flanged	Flanged
Size		2-1/2 in. through 6 in. 65 mm through 150 mm	2-1/2 in. through 6 in. 65 mm through 150 mm
Action		Stem Up Open or Stem Up Closed	Mixing
Valve Assembly Series		VX-92XX-5XX-5-P	VX-931X-5XX-5-P
Flow Type		Equal Percentage ^a	Linear ^a
Valve Body Materials	Body	Cast Iron	Cast Iron
	Seat	Bronze	Bronze
	Stem	Stainless Steel	Stainless Steel
	Plug	Bronze	Bronze
	Packing	Spring-loaded TFE	Spring-loaded TFE
	Disc	Composite	—
Linkage Materials	Housing	Corrosion-Resistant Steel	Corrosion-Resistant Steel
	Rack & Pinion	Steel	Steel
ANSI Pressure Class (Figure-3)		125 psig (862 kPa), 200 psig (1379 kPa) below 150 °F (66 °C) ^b	125 psig (862 kPa), 200 psig (1379 kPa) below 150 °F (66 °C) ^b
Rangeability		75:1	Exceeds 500:1
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^c		20 psi (138 kPa)	—
WATER			
Fluid Temperature — Minimum		40 °F (4 °C)	40 °F (4 °C)
Fluid Temperature — Maximum		281 °F (138 °C)	300 °F (149 °C)
Allowable Differential Pressure^c		35 psi (241 kPa) Max. for Normal Lifespan (refer to "Cavitation Limitations on Valve Pressure Drop" on page 15)	35 psi (241 kPa) Max. for Normal Lifespan (refer to "Cavitation Limitations on Valve Pressure Drop" on page 15)

^a For a detailed description of the flow, see page 9 (2-way valves) or page 10 (3-way valves).

^b Do not apply the above pressure rating to the piping system.

^c 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.

Actuator Specifications and Valve Assembly Mounting Dimensions

Valve Assemblies with MF41-6043, MS41-6043, MF41-6083, and MS41-6083 Actuators

Note: Standard Linked Valve Assemblies use the basic MF41-6043, MS41-6043, MF41-6083, and MS41-6083 actuators. Specifications for the non-standard MX41-6043/6083-502, -510, -520, -522 actuators are provided here for reference. Linked Valve Assemblies using these non-standard actuators may be special-ordered by contacting the factory or field-mounted using the AV-60X linkage kit for globe valve assemblies.

Actuator Specifications																				
Inputs																				
Control Signal	MF41-6043 and MF41-6083 — Floating three-position control, 24 Vac. MS41-6043 and MS41-6083 — Proportional, 0 to 10 Vdc; input resistance 100 kΩ. Control signal adjustment available with MS41-6043/6083-520 and MS41-6043/6083-522: Start point (offset) — Between 0 and 5 Vdc (factory setting = 0 Vdc) Span — 2 to 30 Vdc																			
Power Requirements	All 24 Vac circuits are Class 2.																			
	<table border="1"> <thead> <tr> <th rowspan="2">Part Number</th> <th colspan="4">Power Input @ 50/60 Hz</th> </tr> <tr> <th>Voltage^a</th> <th>Running VA</th> <th>Holding VA</th> <th>Watts</th> </tr> </thead> <tbody> <tr> <td>MF41-6043 and MF41-6083</td> <td>24 Vac +20/-15%</td> <td>2.3</td> <td>—</td> <td>2.0</td> </tr> <tr> <td>MS41-6043 and MS41-6083</td> <td>24 Vac +20/-15%</td> <td>3.3</td> <td>1.2</td> <td>3.0</td> </tr> </tbody> </table> <p>^a 24 Vac +20/-10% for ambient temperatures 90 to 130 °F (MX41-6083 only).</p>	Part Number	Power Input @ 50/60 Hz				Voltage ^a	Running VA	Holding VA	Watts	MF41-6043 and MF41-6083	24 Vac +20/-15%	2.3	—	2.0	MS41-6043 and MS41-6083	24 Vac +20/-15%	3.3	1.2	3.0
Part Number	Power Input @ 50/60 Hz																			
	Voltage ^a	Running VA	Holding VA	Watts																
MF41-6043 and MF41-6083	24 Vac +20/-15%	2.3	—	2.0																
MS41-6043 and MS41-6083	24 Vac +20/-15%	3.3	1.2	3.0																
Connections	3 ft. (0.9 m) long, 18 AWG leads, plenum-rated.																			
Motor Type	Synchronous																			
Outputs																				
Electrical	<p>Feedback potentiometer available for MF41-6043/6083-510: 0 to 1000 Ω < 10 mA</p> <p>Position feedback voltage for MS41-6043/6083: 0 to 10 Vdc, 1 mA</p> <p>Auxiliary Switches: Dual auxiliary switches available with MF41-6043/6083-502, MS41-6043/6083-502, MF41-6043/6083-522 and MS41-6043/6083-522:</p> <p>AC Rating: 24 Vac, 4 A resistive, 2 A inductive Switching hysteresis: 3°</p> <p>DC Rating: 12 to 30 Vdc, DC 2 A</p> <p>Timing:</p> <table border="1"> <thead> <tr> <th rowspan="2">Part Number</th> <th colspan="2">Timing in Sec.</th> </tr> <tr> <th>At 60 Hz</th> <th>At 50 Hz</th> </tr> </thead> <tbody> <tr> <td>MF41-6043 MS41-6043</td> <td>90</td> <td>108</td> </tr> <tr> <td>MF41-6083 MS41-6083</td> <td>125</td> <td>150</td> </tr> </tbody> </table> <p>Switch Range: Switch A — 0 to 90° range in 5° intervals Recommended range usage — 0 to 45° Factory setting — 5° Switch B — 0 to 90° range in 5° intervals Recommended range usage — 45 to 90° Factory setting — 85°</p>	Part Number	Timing in Sec.		At 60 Hz	At 50 Hz	MF41-6043 MS41-6043	90	108	MF41-6083 MS41-6083	125	150								
Part Number	Timing in Sec.																			
	At 60 Hz	At 50 Hz																		
MF41-6043 MS41-6043	90	108																		
MF41-6083 MS41-6083	125	150																		
Mechanical	<p>Output torque rating: 35 lb-in. (4 N-m) for MX41-6043; 70 lb-in. (8 N-m) for MX41-6083</p> <p>Stroke: Normal angle of rotation is 90°, limited to a maximum of 95°. Field adjustable to limit travel on either end of stroke.</p> <p>Position indicator: Adjustable pointer is provided for position indication.</p> <p>Output shaft setscrew: Tightening torque 55 to 60 lb-in. (6.3 to 6.8 N-m).</p>																			
Environment																				
Temperature Limits	<p>Shipping and storage: -40 to 158 °F (-40 to 70 °C) ambient.</p> <p>Operating: Minimum allowable valve fluid temperature: 20 °F (-7 °C). Maximum allowable ambient: -25 to 130 °F (-32 to 55 °C) maximum ambient at maximum valve fluid temperature of 250 °F (121 °C).</p>																			
Humidity	5 to 95% RH, non-condensing.																			
Locations	NEMA Type 2 (IEC IP54).																			
Agency Listings (Actuator)																				
UL	UL-873, Underwriters Laboratories.																			
cUL	Canadian Standards C22.2 No. 24-93.																			
European Community	EMC Directive (89/336/EEC). Emissions (EN50081-1). Immunity (EN50081-2).																			

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/Metric Thread 2-Way (N.C.) VF-7223-50X-4-P VF-7225-50X-4-P VS-7223-50X-4-P VS-7225-50X-4-P 3-Way VF-7313-50X-4-P VF-7315-50X-4-P VF-7323-50X-4-P VF-7325-50X-4-P VS-7313-50X-4-P VS-7315-50X-4-P VS-7323-50X-4-P VS-7325-50X-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/Metric Thread 2-Way (N.O.) VF-7213-50X-4-P VF-7215-50X-4-P VS-7213-50X-4-P VS-7215-50X-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)				

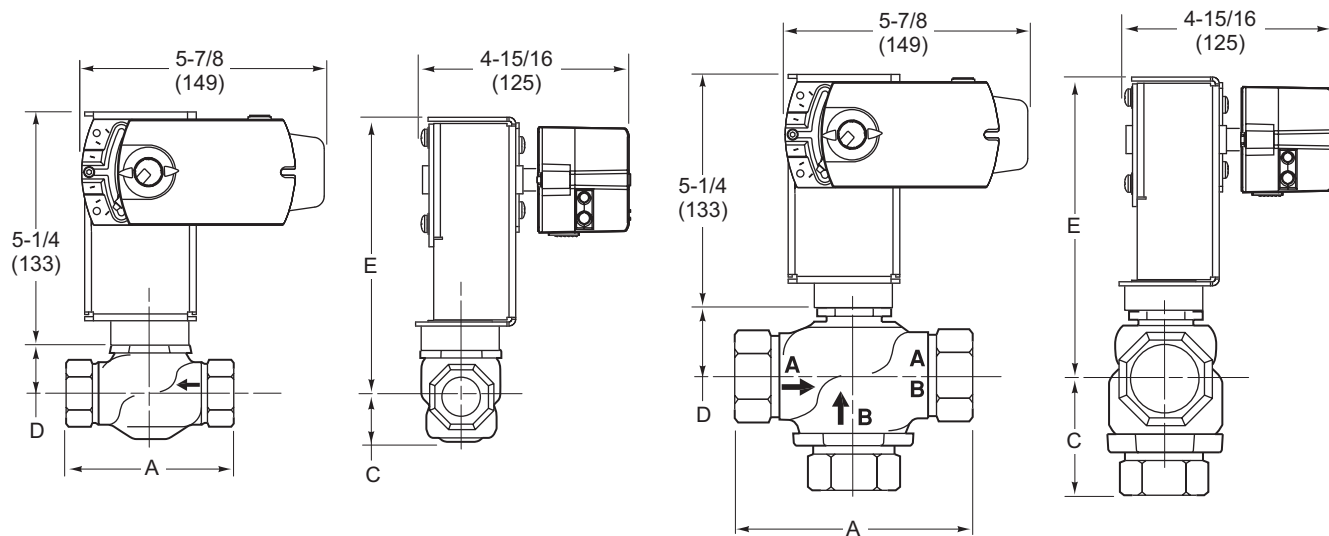


Figure-8 MX41-6043 or MX41-6083 with 2-Way Globe Valve. Figure-9 MX41-6043 or MX41-6083 with 3-Way Globe Valve.

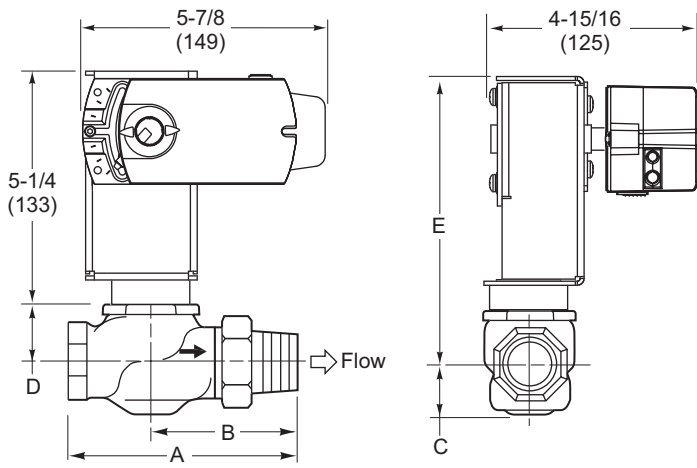


Figure-10 MX41-6043 or MX41-6083 with 2-Way Union
Straightway Globe Valve.

Valve Assemblies with MX41-6153 Non-Spring Return Actuators

Actuator Specifications																				
Inputs																				
Control Signal	MF41-6153— Three-position. MS41-6153— Proportional, 0 to 10 Vdc or 2 to 10 Vdc selectable.																			
Power Requirements	All 24 Vac circuits are Class 2.																			
	<table border="1"> <thead> <tr> <th rowspan="2">Part Number</th> <th colspan="4">Power Input @ 50/60 Hz</th> </tr> <tr> <th>Voltage^a</th> <th>Running VA</th> <th>Holding VA</th> <th>Watts</th> </tr> </thead> <tbody> <tr> <td>MF41-6153</td> <td>24 Vac +20/-15%</td> <td>3.0</td> <td>—</td> <td>3.0</td> </tr> <tr> <td>MS41-6153</td> <td>24 Vac +20/-15%</td> <td>5.0</td> <td>1.2</td> <td>4.0</td> </tr> </tbody> </table>	Part Number	Power Input @ 50/60 Hz				Voltage ^a	Running VA	Holding VA	Watts	MF41-6153	24 Vac +20/-15%	3.0	—	3.0	MS41-6153	24 Vac +20/-15%	5.0	1.2	4.0
Part Number	Power Input @ 50/60 Hz																			
	Voltage ^a	Running VA	Holding VA	Watts																
MF41-6153	24 Vac +20/-15%	3.0	—	3.0																
MS41-6153	24 Vac +20/-15%	5.0	1.2	4.0																
	^a 24 Vac, +20%, -5% (MF models) and 24 Vac, +20%, -10% (MS models) for ambient temperatures 85 to 130 °F.																			
Connections	3 ft. (0.9 m) long plenum-rated cable, 18 AWG color coded leads.																			
Motor Type	Brushless motor technology with stall protection.																			
Outputs																				
Electrical	Position feedback voltage for MS41-6153: 0 to 10 Vdc, 1 mA max. Timing: Approx. 125 sec. at 60 Hz; 150 sec. at 50 Hz.																			
Mechanical	Output torque rating: 133 lb-in (15 N-m). Stroke: Angle of rotation is limited to a nominal 90° (maximum 95°), field adjustable to limit travel on either end of stroke. Position indicator: Adjustable pointer is provided for position indication.																			
Environment																				
Temperature Limits	Shipping and storage: -40 to 158 °F (-40 to 70 °C) ambient. Operating: -25 to 130 °F (32 to 55 °C)																			
Humidity	5 to 95% RH, non-condensing.																			
Locations	NEMA 1 (IEC IP10).																			
Agency Listings (Actuator)																				
UL	UL-873, Underwriters Laboratories.																			
European Community	EMC Directive (89/336/EEC). Low Voltage Directive (72/23/EEC).																			
cUL	Canadian Standards C22.2 No. 24-93.																			

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/Metric Thread 2-Way (N.C.) VX-7223-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)
VX-7225-XXX-4-P	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)
VX-7225-XXX-4-P	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)
VX-733X-XXX-4-P	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/Metric 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)	—			
VX-7215-XXX-4-P	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)	—			

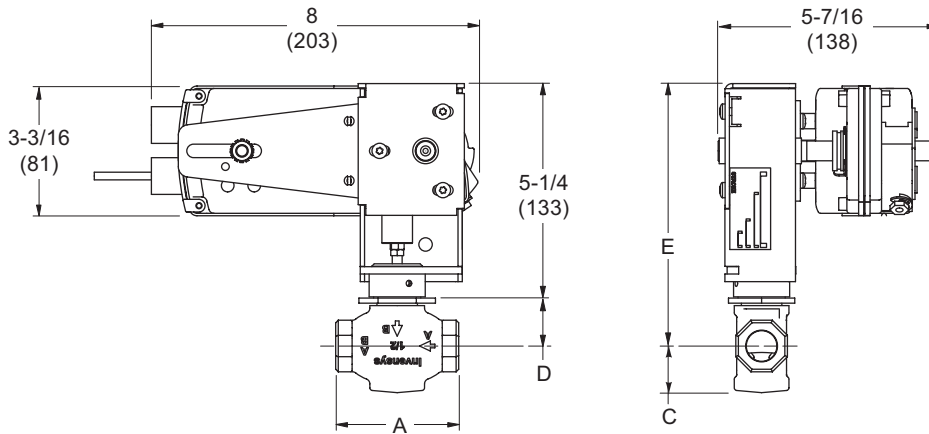


Figure-11 MX41-6153 with 1/2" to 2" 2-Way Globe Valve.

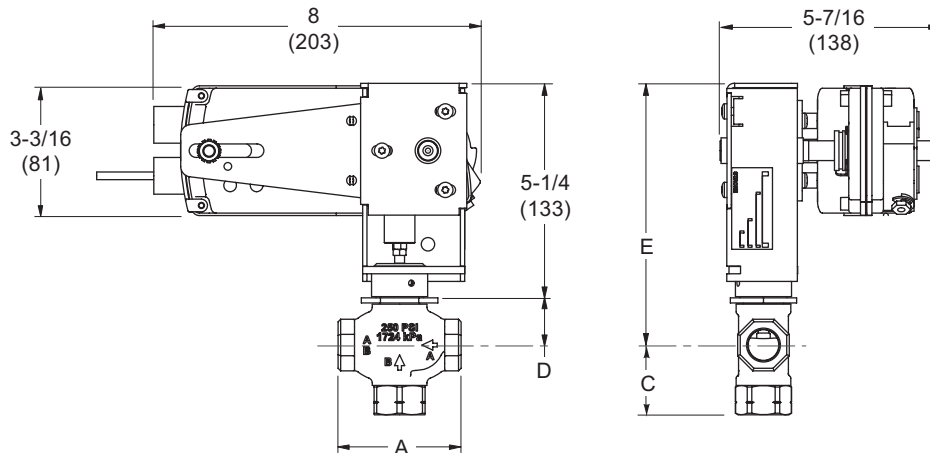


Figure-12 MX41-6153 with 1/2" to 2" 3-Way Globe Valve.

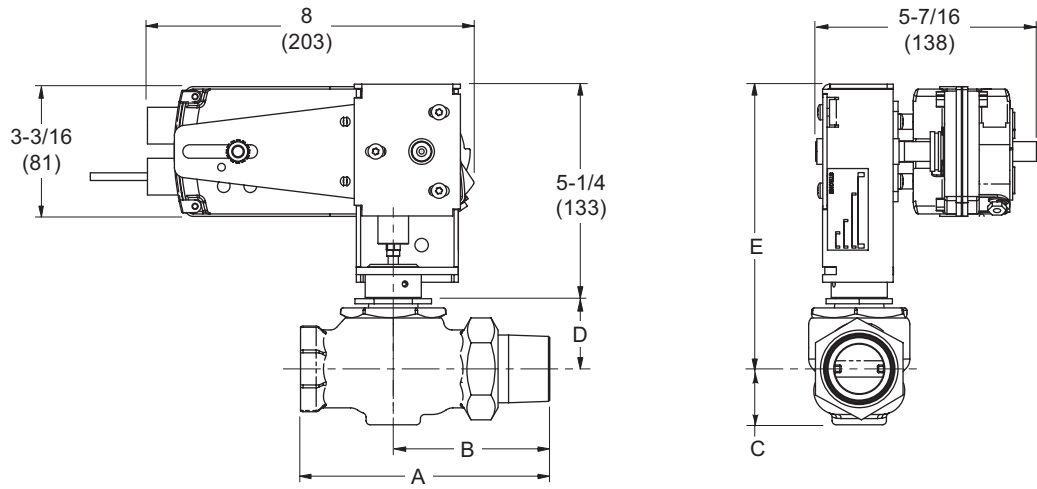


Figure-13 MX41-6153 with 1" or 1-1/4" Union Straightway Globe Valve.

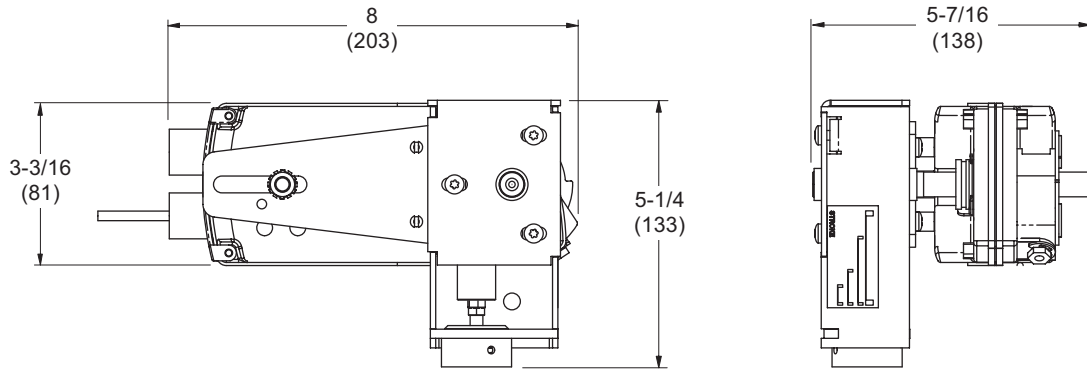


Figure-14 MX41-6153 Actuator/Linkage Assembly.

Dimensions — 2-1/2" and 3" Screwed Globe Valve Assemblies

Valve Assembly Part Number	Valve Size in.	Valve Dimensions in inches (millimetres)							
		2-Way (Refer to Figure-15)				3-Way (Refer to Figure-16)			
		A	C	E	H	A	C	E	H
NPT/Metric Thread 2-Way (N.O.) VX-9213-508-4-P VX-9215-508-4-P 2-Way (N.C.) VX-9223-508-4-P VX-9225-508-4-P	2-1/2	8-1/2 (216)	3-13/16 (97)	16-3/4 (425)	6-5/8 (168)	8-1/2 (216)	4-5/8 (117)	16-3/4 (425)	6-5/8 (168)
	3	9-1/2 (241)	4-1/4 (108)	17-1/4 (438)	7-1/4 (184)	9-1/2 (241)	5 (127)	17-1/4 (438)	7-1/4 (184)

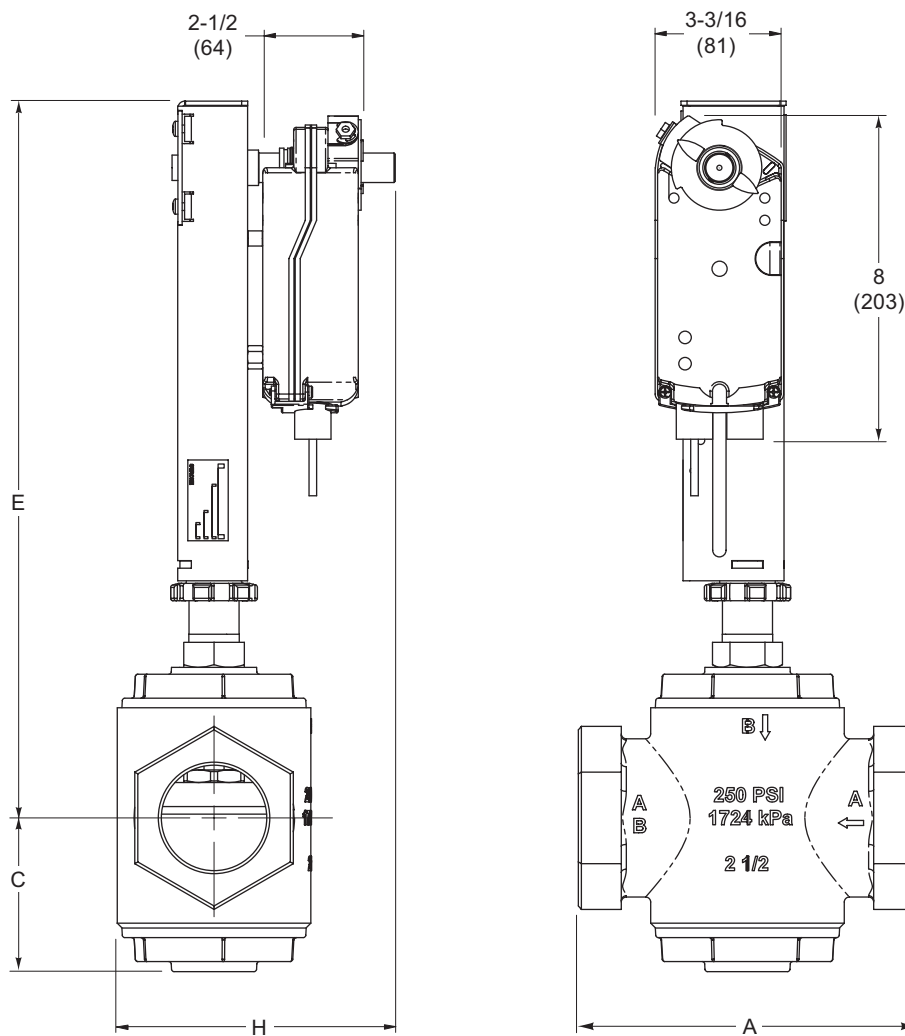


Figure-15 MX41-6153 with 2-1/2" or 3" Screwed 2-Way Globe Valve.

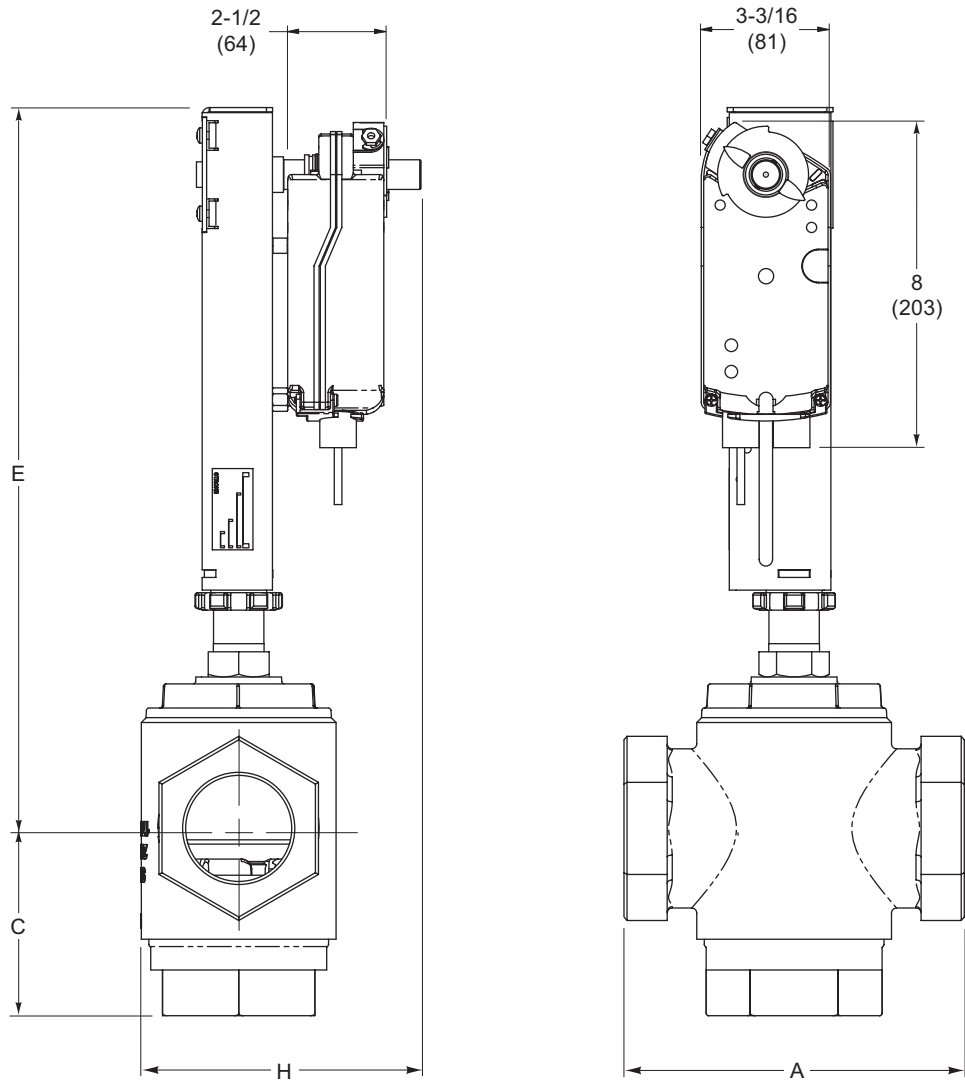


Figure-16 MX41-6153 with 2-1/2" or 3" Screwed 3-Way Globe Valve.

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)						

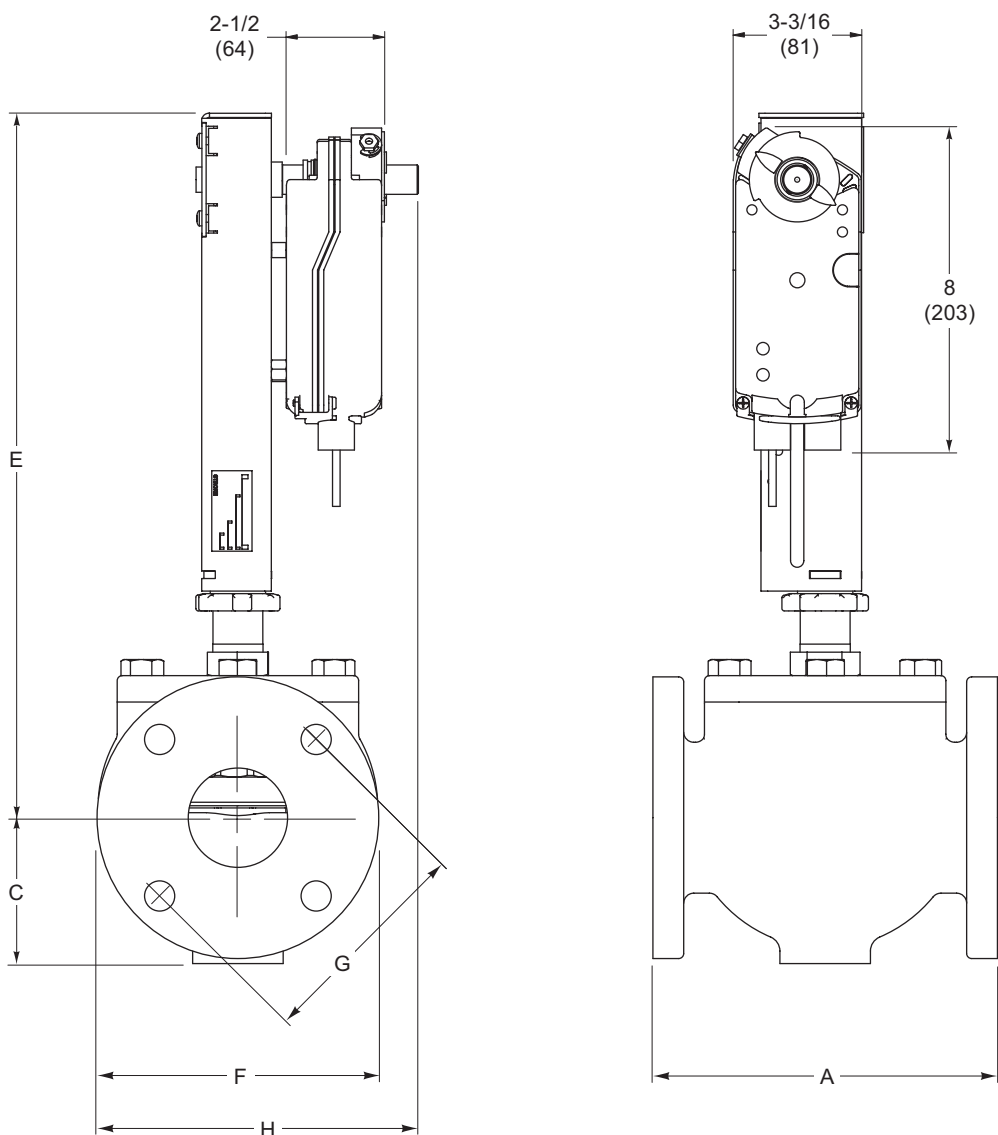


Figure-17 MX41-6153 with 2-1/2" to 4" Flanged 2-Way Globe Valve.

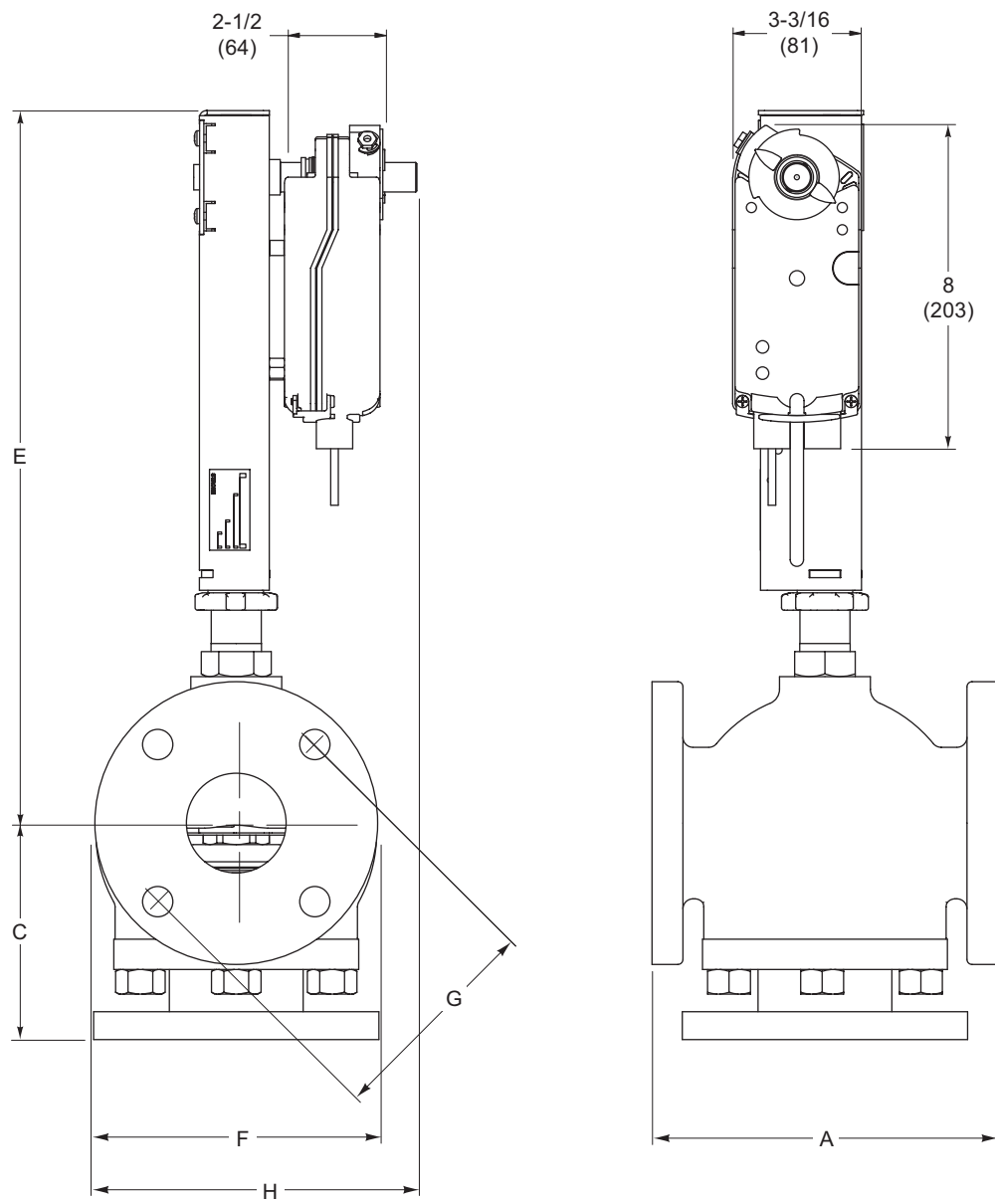


Figure-18 MX41-6153 with 2-1/2" to 4" Flanged 3-Way Globe Valve.

Valve Assemblies with MX41-6343 Non-Spring Return Actuators

Actuator Specifications																							
Inputs																							
Control Signal	MF41-6343 —SPDT floating control output, Triacs (500 mA rated), or 2 SPST contacts. MS41-6343 —Proportional, 2 to 10 Vdc or 4 to 20 mAdc with integral 500 Ω resistor.																						
Power Requirements	All 24 Vac circuits are Class 2. All circuits 30 Vac and above are Class 1.																						
	<table border="1"> <thead> <tr> <th rowspan="2">Part Number</th> <th colspan="4">Power Input @ 50/60 Hz</th> </tr> <tr> <th>Voltage</th> <th>Running VA</th> <th>Holding VA</th> <th>Watts</th> </tr> </thead> <tbody> <tr> <td>MF41-6343</td> <td>24 Vac ± 20%</td> <td>7.0</td> <td>3.6</td> <td>3.8</td> </tr> <tr> <td>MS41-6343</td> <td>24 Vac ± 20%</td> <td>7.1</td> <td>5.0</td> <td>4.8</td> </tr> </tbody> </table>				Part Number	Power Input @ 50/60 Hz				Voltage	Running VA	Holding VA	Watts	MF41-6343	24 Vac ± 20%	7.0	3.6	3.8	MS41-6343	24 Vac ± 20%	7.1	5.0	4.8
Part Number	Power Input @ 50/60 Hz																						
	Voltage	Running VA	Holding VA	Watts																			
MF41-6343	24 Vac ± 20%	7.0	3.6	3.8																			
MS41-6343	24 Vac ± 20%	7.1	5.0	4.8																			
Connections	24" (61 cm) long appliance cables, 1/2" conduit connector. For M20 Metric conduit, use AM-756 adaptor.																						
Motor Type	Brushless DC.																						
Outputs																							
Electrical	Stroke: Electronically limited to 93° ±1°. Timing: Approx. 145 sec.																						
Mechanical	Output torque rating: 300 lb-in (34 N-m) minimum, 600 lb-in (64 N-m) maximum. Position indicator: Pointer and scale are provided for position indication. Direction of rotation: CW or CCW rotation is available through reversible mounting. Manual override: Activated by the manual override crank.																						
Environment																							
Temperature Limits	Shipping and storage: -40 to 160 °F (-40 to 71 °C) ambient. Operating: -25 to 140 °F (-32 to 60 °C).																						
Humidity	5 to 95% RH, non-condensing.																						
Locations	NEMA 1 (IEC IP10), NEMA 4 (IEC IP56) with customer supplied water tight conduit connectors.																						
Agency Listings (Actuator)																							
UL	UL 873, Underwriters Laboratories (File #9429 Category Temperature-Indicating and Regulating Equipment).																						
European Community	EMC Directive (89/336/EEC). Low Voltage Directive (72/23/EEC). Machinery Directive (89/1392 EEC). Safety Directive (92/59 EEC).																						
cUL	Canadian Standards C22.2 No. 4-93.																						
Australia	This product meets requirements to bear the C-Tick Mark according to the terms specified by the Communications Authority under the Radiocommunications Act 1992.																						

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.

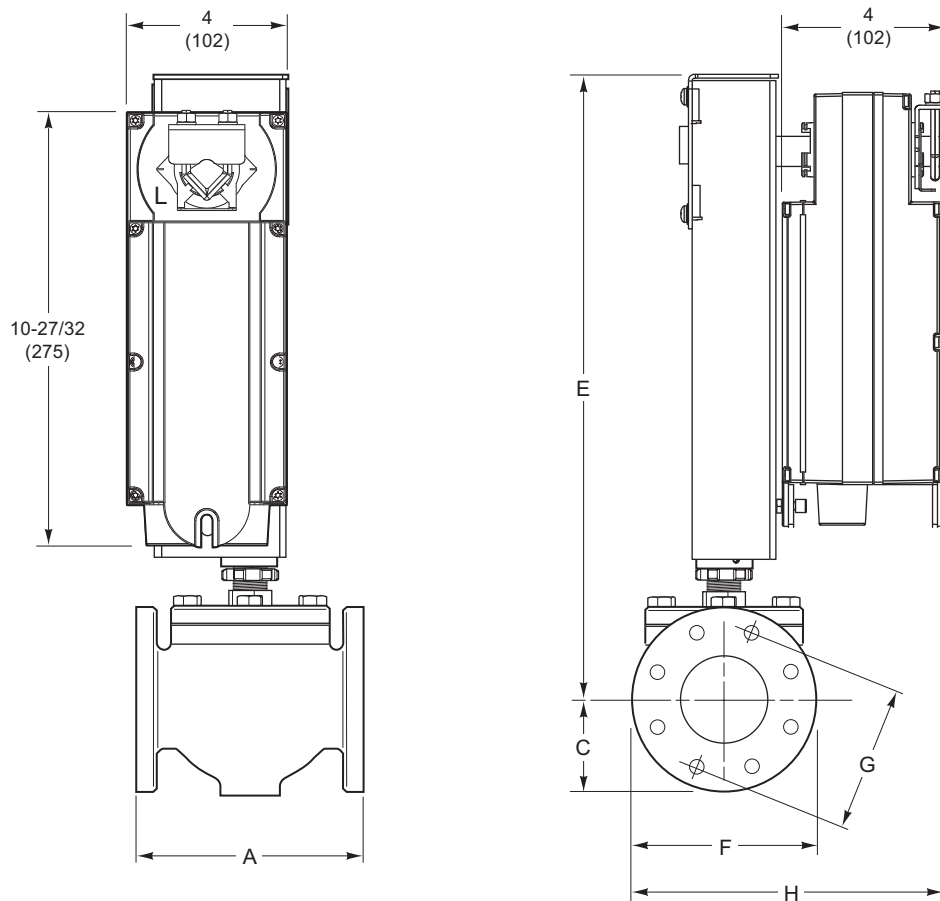


Figure-19 MX41-6343-2XX with Flanged 2-Way Globe Valve.

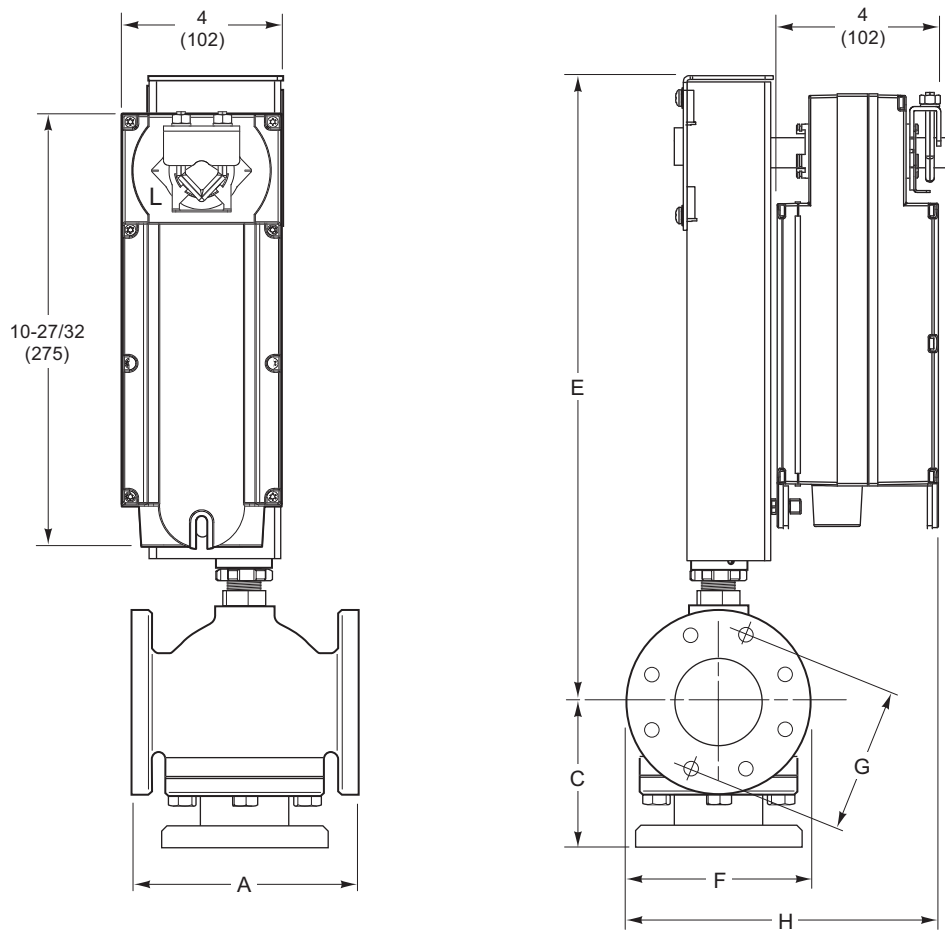


Figure-20 MX41-6343-2XX with Flanged 3-Way Globe Valve.

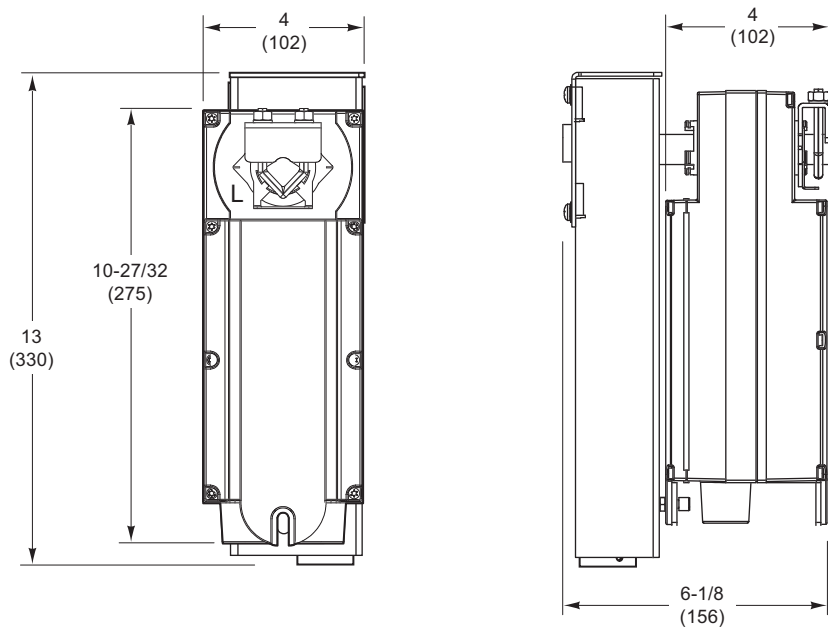


Figure-21 MX41-6343-230 Actuator/Linkage Assembly.

Valve Assemblies with MX40-704X Spring Return Actuators

Actuator Specifications								
Inputs								
Control Signal	MA40-704X—ON/OFF SPST control contacts or Triacs (500 mA rated) MS40-7043—Proportional, 2 to 10Vdc or 4 to 20 mAdc with 500 Ω resistor. MS40-7043 MP/MP5—Proportional 6 to 9 Vdc. MF40-7043—Floating point control, 24 Vac.							
Power Requirements	All 24 Vac circuits are Class 2.							
			Running				Holding	
	Part Number	Voltage 50/60 Hz	50 Hz		60 Hz		50 Hz	60 Hz
			VA	W	VA	W	W	W
	MA40-7043	24 Vac ± 20%	4.4	2.9	4.4	2.9	0.8	0.8
	MS40-7043	24 Vac ± 20%	5.6	4.2	5.6	4.2	2.4	2.4
	MF40-7043	24 Vac ± 20%	5.9	4.4	5.9	4.4	2.9	2.9
	MS40-7043-MP	24 Vac ± 20%	6.9	5.0	6.6	5.0	3.2	3.2
	MS40-7043-MP5	24 Vac ± 20%						
	MA40-7040	120 Vac ± 10%	6.4	3.8	4.3	3.4	1.6	1.2
	MA40-7041	230 Vac ± 10%	5.8	4.1	4.6	3.9	1.5	1.2
Connections	MA40-704X and MA40-704X-501—3 ft. (0.9 m) long, appliance cables, 1/2" conduit connector. For M20 Metric conduit, use AM-756 adaptor. MF40-7043 and MF40-7043-501, MS40-7043 and MS40-7043-501—3 ft. (0.9 m) long, plenum rated cables, 1/2" conduit connector. For M20 Metric conduit, use AM-756 adaptor.							
Motor Type	MA40-704X — Brush. MF40-7043, MS40-7043 — Brushless DC.							
Outputs								
Electrical	Auxiliary Switches: One auxiliary switch available with MX40-7043-501 and MS40-7043-MP5, SPDT 6A resistive @ 24 Vac, adjustable 0 to 95° (0 to 1 scale). Switch meets VDE requirements for 6 (1.5)A, 24Vac. One auxiliary switch available with MA40-7040-501 or MA40-7041-501, SPDT 6A resistive @ 250 Vac, adjustable 0 to 95° (0 to 1 scale). Switch meets VDE requirements for 6 (1.5)A, 250 Vac. Position Feedback Voltage "AO": 2 to 10 Vdc (maximum 0.7 mA) output signal for position feedback or operation of up to four slave actuators. Control Mode: Switch provided for selection of direct acting or reverse acting control mode on proportional models. Timing: MA-704X - Approx. 50 sec. MF- and MS-7043 - Approx. 130 sec. Auxiliary Power Supply: MS40-7043-MP and MS40-7043-MP5—+20 Vdc @ 25 mA (max.)							
Mechanical	Stroke: Angle of rotation is limited to a maximum of 95°, with mechanical stop. Output torque rating: MX40-704X—35 lb-in (4 N-m) Position indicator: Visual indicator with a scale numbered from 0 to 90°, provided for position indication.							
Environment								
Temperature Limits	Shipping and storage: -40 to 160 °F (-40 to 71 °C) ambient. Operating: Minimum allowable valve fluid temperature: 20 °F (-7 °C). Maximum allowable ambient: 115 °F (46 °C) maximum ambient at maximum valve fluid temperature.							
Humidity	5 to 95% RH, non-condensing.							
Locations	NEMA Type 2 (IEC IP54)							

Actuator Specifications (Continued)

Agency Listings (Actuator)

UL	UL 873, Underwriters Laboratories (File #9429 Category Temperature-Indicating and Regulating Equipment).
European Community	EMC Directive (89/336/EEC). Low Voltage Directive (72/23/EEC).
CUL	Canadian Standards C22.2 No. 24.
Australia	This product meets requirements to bear the C-Tick Mark according to the terms specified by the Communications Authority under the Radiocommunications Act 1992.

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/Metric Thread 2-Way (N.C.) VX-7223-XXX-4-P VX-7225-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/Metric Thread 2-Way (N.O.) VX-7213-XXX-4-P VX-7215-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)				

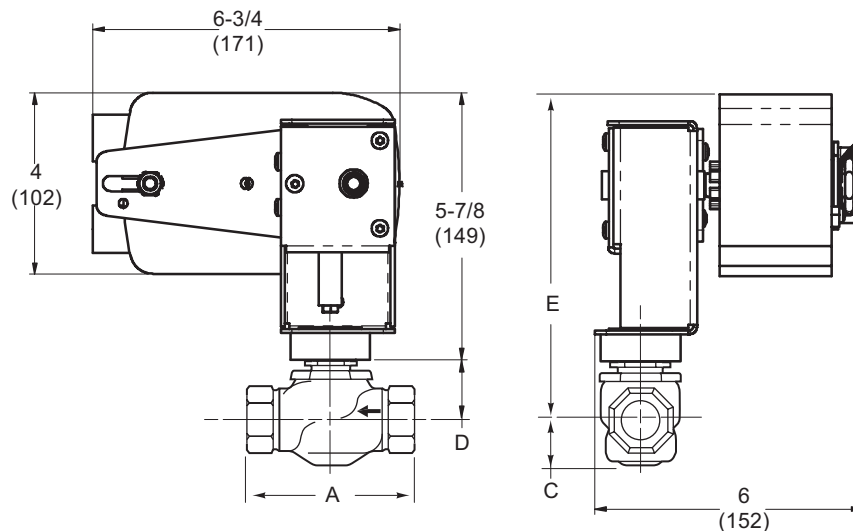


Figure-22 MX40-704X-2XX with 1/2" to 2" 2-Way Globe Valve.

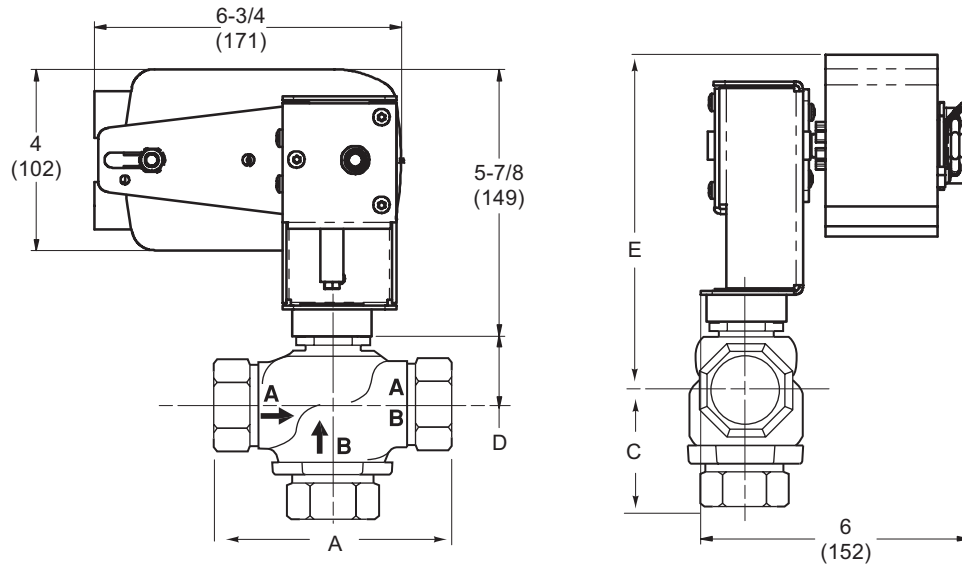


Figure-23 MX40-704X-2XX with 1/2" to 2" 3-Way Globe Valve.

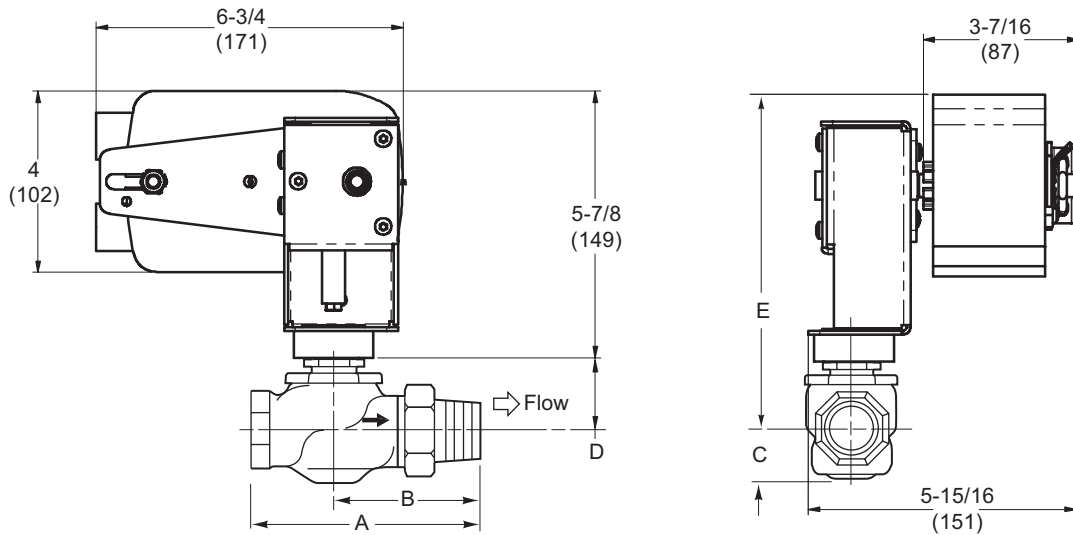


Figure-24 MX40-704X-2XX with 1/2" to 1-1/4" Union Straightway Globe Valve.

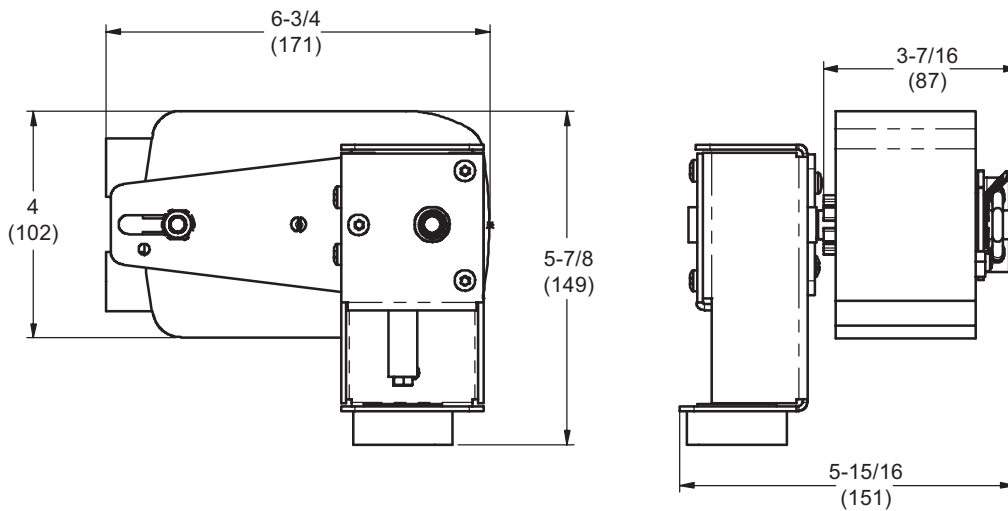


Figure-25 MX40-704X-2XX Linked Actuator Assembly.

Valve Assemblies with MX41-707X and MX41-715X Spring Return Actuators

Actuator Specifications							
Inputs							
Control Signal	MA41-707X, MA41-715X—ON/OFF SPST control contacts or Triacs (500 mA rated). MF41-7073, MF41-7153—Floating point control, 24 Vac. MS41-7073, MS41-7153—Proportional, 2 to 10 Vdc or 4 to 20 mAdc with 500 Ω resistor.						
Power Requirements	All 24 Vac circuits are Class 2.						
		Running				Holding	
Part Number	Voltage 50/60 Hz	50 Hz		60 Hz		50 Hz	60 Hz
		VA	W	VA	W	W	W
MA41-7153-XXX	24 Vac ± 20%	9.8	7.5	9.7	7.5	2.8	2.8
MS41-7153-XXX	24 Vac ± 20%	9.8	7.4	9.7	7.4	2.9	2.9
MF41-7153-XXX	24 Vac ± 20%	9.8	7.7	9.7	7.7	3.3	3.3
MA41-7150-XXX	120 Vac ± 10%	11.7	8.8	10.0	8.4	3.6	5.0
MA41-7151-XXX	230 Vac ± 10%	15.5	9.5	10.6	8.5	4.6	3.3
MA41-7073-XXX	24 Vac ± 20%	4.8	3.2	4.8	3.2	0.8	0.8
MS41-7073-XXX	24 Vac ± 20%	5.8	4.6	5.8	4.6	2.3	2.3
MF41-7073-XXX	24 Vac ± 20%	6.2	4.8	6.2	4.8	2.8	2.8
MA41-7070-XXX	120 Vac ± 10%	10.7	4.2	5.6	3.6	2.0	1.2
MA41-7071-XXX	230 Vac ± 10%	17.0	5.1	8.0	4.0	2.7	1.4
Connections	3 ft. (0.9 m) long, appliance cable, 1/2" conduit connectors. For M20 metric conduit, use AM-756 adapter.						
Motor Type	MA41-707X — Brush. MA41-715X, MF41-7073, MF41-7153, MS41-7073, MS41-7153 — Brushless DC.						
Outputs							
Electrical	Two auxiliary switches available with MX41-715X-502, and MX41-707X-502, SPDT 7A resistive @ 250 Vac, one fixed @ 5° and one adjustable 25 to 85°. Switches meet VDE requirements for 7 (2.5)A, 250 Vac. Position Feedback Voltage "AO": 2 to 10 Vdc (maximum 0.5 mA) output signal for position feedback or operation of up to four slave actuators. Control Mode: Switch provided for selection of direct acting or reverse acting control mode on proportional models. Timing: MA41-707X - Approx. 80 sec. MF41 and MS41-7073 - Approx. 195 sec. MX41-715X - Approx. 190 sec.						
Mechanical	Stroke: Angle of rotation is limited to a maximum of 95°, with mechanical stop. Output torque rating: MX41-707X—60 lb-in (7 N-m). MX41-715X—133 lb in (15 N-m). Position indicator: Visual indicator with a scale numbered from 0 to 90°, provided for position indication. Manual override: Rotation is adjustable from -5o to 85o by using manual override crank.						
Environment							
Temperature Limits	Shipping and storage: -40 to 160 °F (-40 to 71 °C) ambient. Operating: Minimum allowable valve fluid temperature: 20 °F (-7 °C). Maximum allowable ambient: 115 °F (46 °C) maximum ambient at maximum valve fluid temperature.						
Humidity	5 to 95% RH, non-condensing.						
Locations	NEMA 2 (IEC IP54) with conduit connector in the down position.						

Actuator Specifications (Continued)

Agency Listings (Actuator)

UL	UL 873, Underwriters Laboratories (File #9429 Category Temperature-Indicating and Regulating Equipment).
European Community	EMC Directive (89/336/EEC). Low Voltage Directive (72/23/EEC).
CUL	Canadian Standards C22.2 No. 24.
Australia	This product meets requirements to bear the C-Tick Mark according to the terms specified by the Communications Authority under the Radiocommunications Act 1992.

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/Metric Thread 2-Way (N.C.) VX-7223-XXX-4-P VX-7225-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/Metric Thread 2-Way (N.O.) VX-7213-XXX-4-P VX-7215-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)	—				

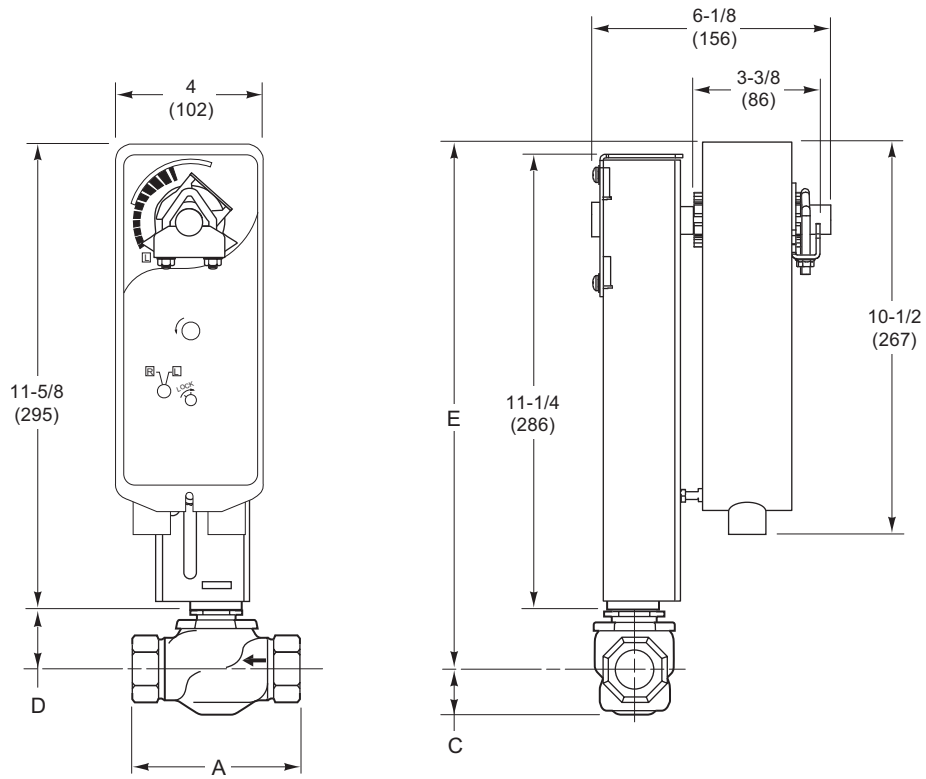


Figure-26 MX41-715X-2XX or MX41-707X-2XX with 1" to 2" 2-Way Globe Valve.

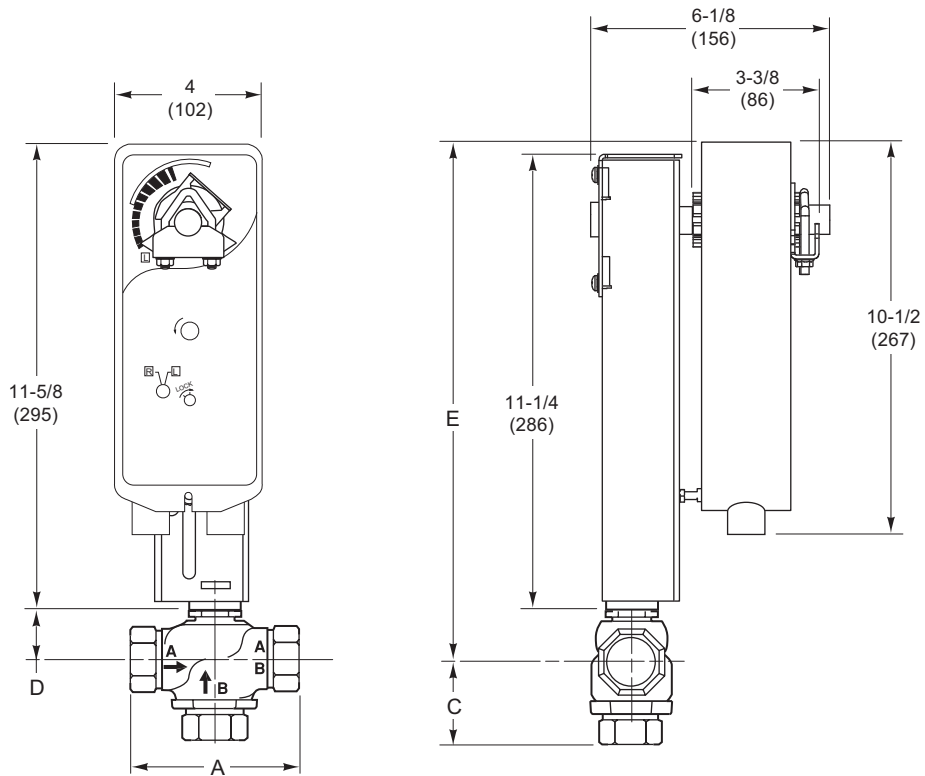


Figure-27 MX41-715X-2XX or MX41-707X-2XX with 1" to 2" 3-Way Globe Valve.

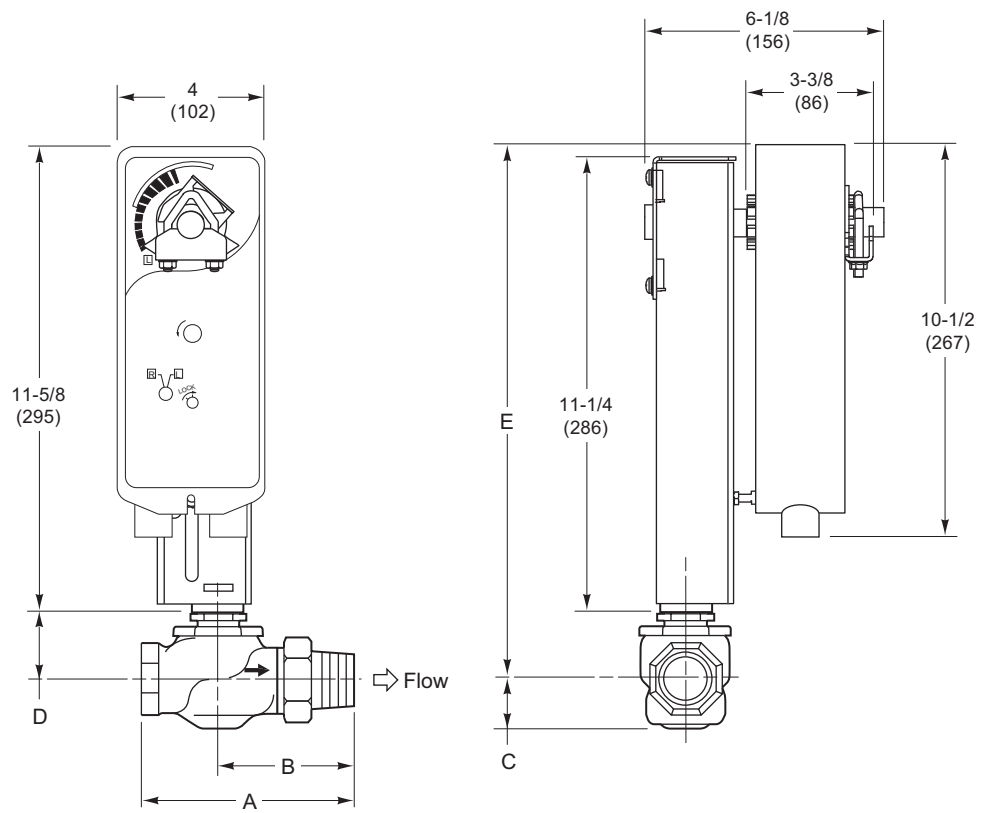


Figure-28 MX41-715X-2XX or MX41-707X-2XX with 1" or 1-1/4" Union Straightway Globe Valve.

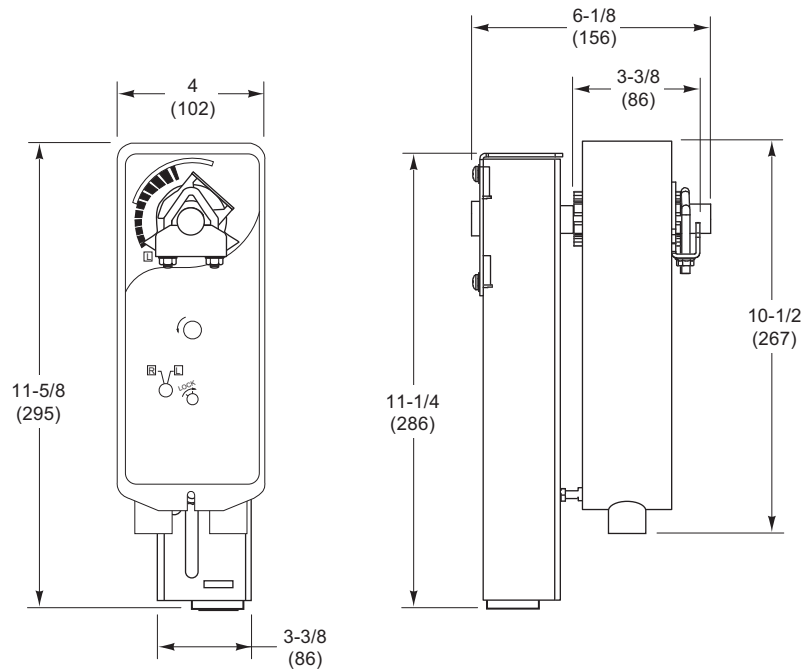


Figure-29 MX41-715X-2XX or MX41-707X-2XX Linked Actuator Assembly.

Dimensions — 2-1/2" and 3" Screwed Globe Valve Assemblies

Valve Assembly Part Number	Valve Size in.	Valve Dimensions in inches (millimetres)							
		2-Way (Refer to Figure-30)				3-Way (Refer to Figure-31)			
		A	C	E	H	A	C	E	H
NPT/Metric Thread 2-Way (N.O.) VX-9213-XXX-4-P VX-9215-XXX-4-P 2-Way (N.C.) VX-9223-XXX-4-P VX-9225-XXX-4-P	2-1/2	8-1/2 (216)	3-13/16 (97)	17-1/8 (435)	7-1/4 (184)	8-1/2 (216)	4-5/8 (117)	17-1/8 (435)	7-1/4 (184)
	3	9-1/2 (241)	4-1/4 (108)	17-5/8 (448)	7-1/2 (191)	9-1/2 (241)	5 (127)	17-5/8 (448)	7-1/2 (191)

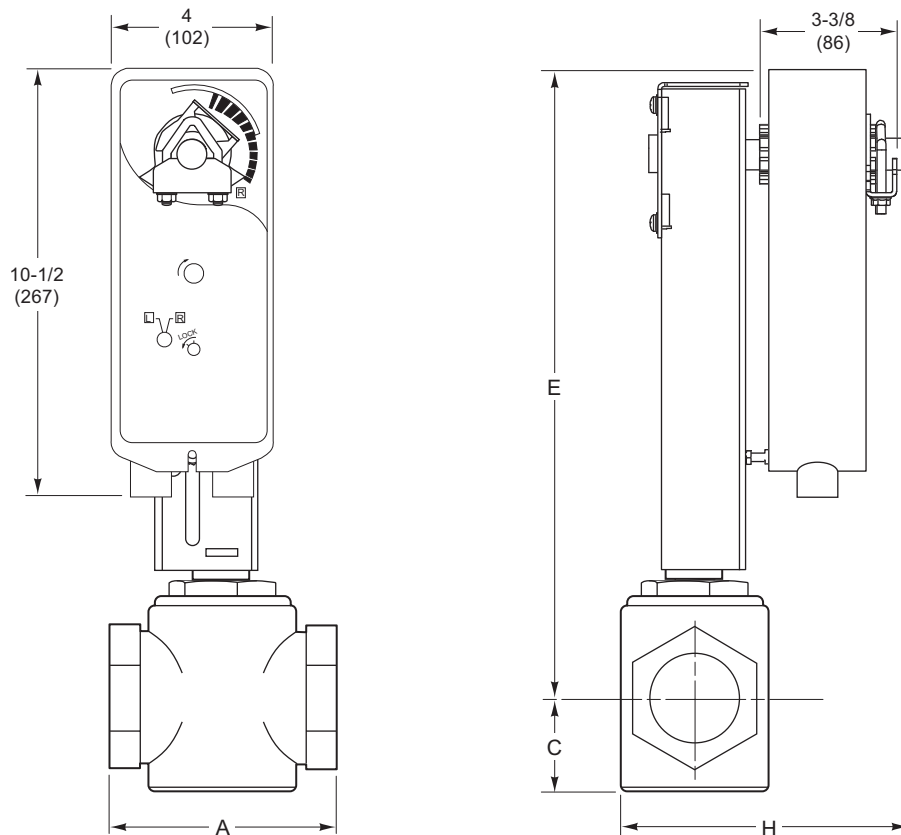


Figure-30 MX41-715X-2XX or MX41-707X-2XX with 2-1/2" or 3" 2-Way Screwed Globe Valve.

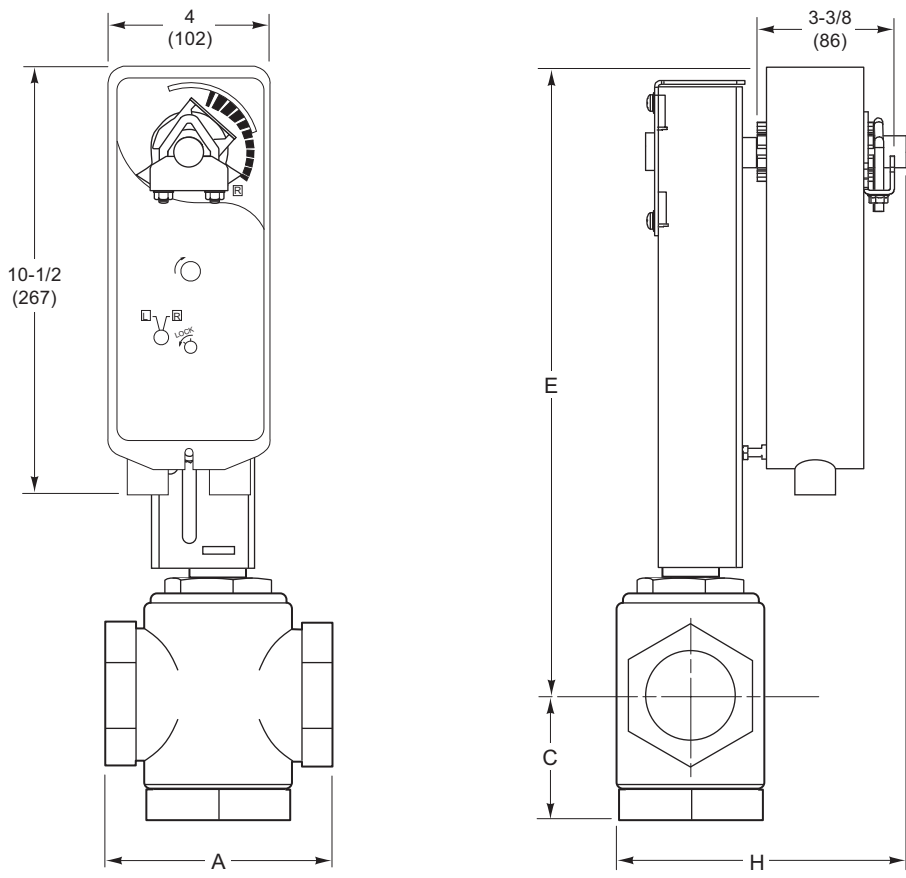


Figure-31 MX41-715X-2XX or MX41-707X-2XX with 2-1/2" or 3" 3-Way Screwed Globe Valve.

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.

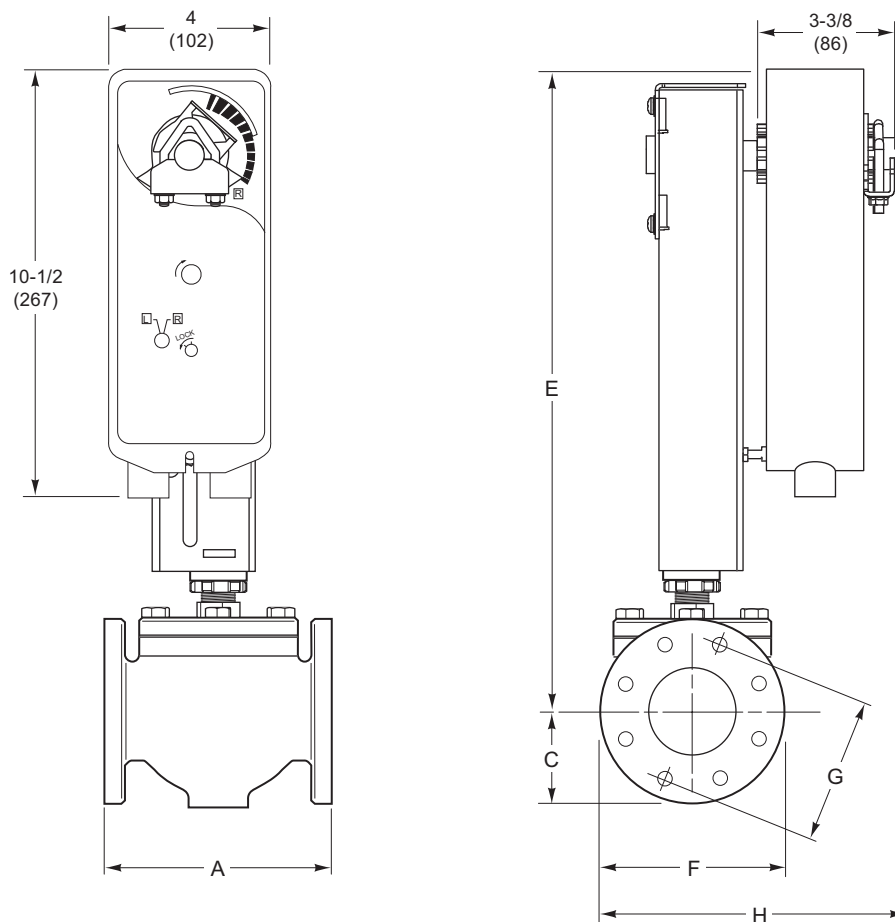


Figure-32 MX41-715X-2XX or MX41-707X-2XX with 2-1/2" to 4" 2-Way Flanged Globe Valve.

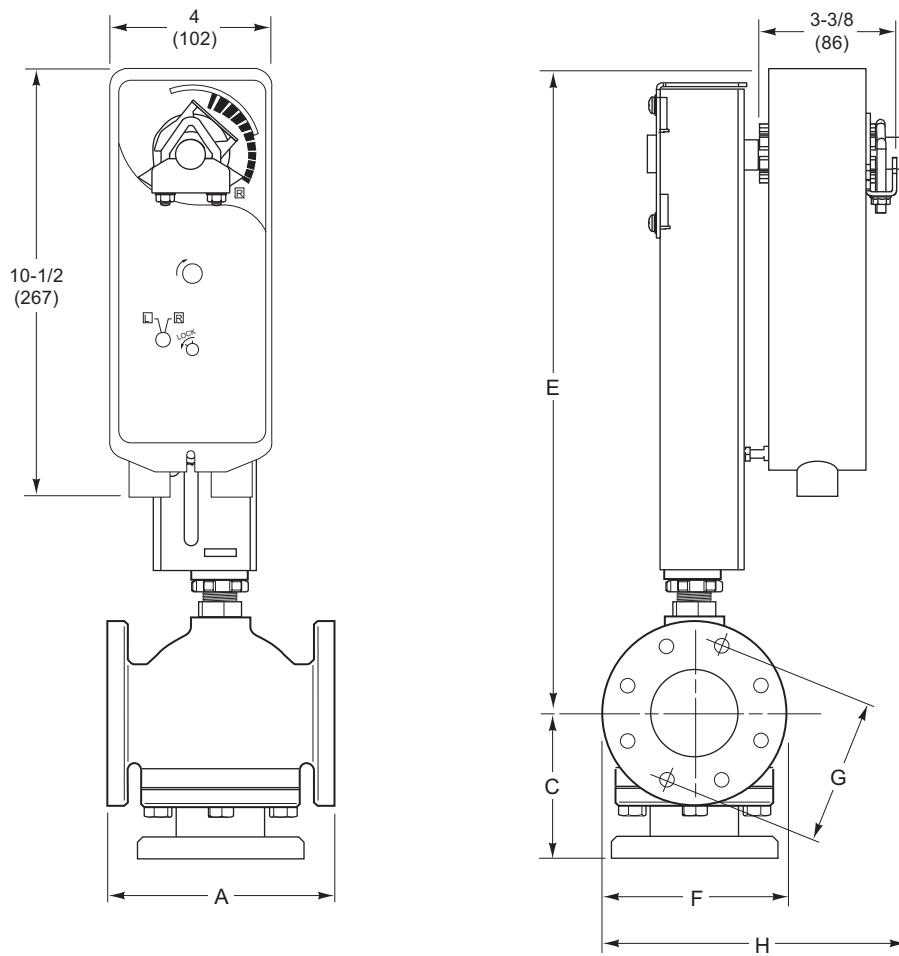


Figure-33 MX41-715X-2XX or MX41-707X-2XX with 2-1/2" to 4" 3-Way Flanged Globe Valve.

Valve Assemblies with MX40-717X Series Spring Return Actuators

Actuator Specifications				
Inputs				
Control Signal	MA40-717X—Two wire, SPST or Triacs. MF40-7173—SPDT floating control output, Triacs (500 mA rated), or 2 SPST contacts. MS40-717X—Proportional, 2 to 10 Vdc or 4 to 20 mAdc with integral 500 Ω resistor.			
Power Requirements	All 24 Vac circuits are Class 2.			
	Part Numbers	Power Input @ 50/60 Hz		
		Voltage	Running VA	Holding VA
	MA40-7173	24 Vac ±20%	9.6	4.1
	MS40-7173	24 Vac ±20%	9.4	5.4
	MF40-7173	24 Vac ±20%	10.0	4.3
	MA40-7170	120 Vac ±10%	11.4	9.4
	MS40-7170	120 Vac ±10%	11.1	9.1
	MA40-7171	240 Vac ±10%	11.8	9.5
	MS40-7171	240 Vac ±10%	11.8	10.1
Impedance	2 to 10 Vdc, 80 KΩ. 4 to 20 mAdc, 500 Ω. (MS40-717X models only)			
Connections	2 ft. (60 cm) long appliance cable, 1/2" conduit connector.			
Motor Type	Brushless DC.			
Outputs				
Electrical	Stroke: Rotation is electronically limited to a maximum of 93° ± 1°.			
	Output torque rating: MX40-717X—150 lb-in (17 N-m).			
	Timing: Approx. 145 sec.			
Mechanical	Position indicator: Pointer and scale are provided from 0 to 95°, provided for position indication.			
	Direction of rotation: Cw or ccw rotation is available through reverse mounting.			
Environment				
Temperature Limits	Shipping and storage: -40 to 160 °F (-40 to 71 °C) ambient. Operating: Minimum allowable valve fluid temperature: 20 °F (-7 °C). Maximum allowable ambient: 133 °F (56 °C) maximum ambient at maximum valve fluid temperature.			
Humidity	5 to 95% RH, non-condensing.			
Locations	NEMA 1 (IEC IP10), NEMA 4 (IEC IP56) with customer supplied water tight conduit connectors.			
Agency Listings (Actuator)				
UL	UL 873, Underwriters Laboratories (File #9429 Category Temperature-Indicating and Regulating Equipment).			
European Community	EMC Directive (89/336/EEC). Low Voltage Directive (72/23/EEC).			
CUL	Canadian Standards C22.2 No. 24.			
Australia	This product meets requirements to bear the C-Tick Mark according to the terms specified by the Communications Authority under the Radiocommunications Act 1992.			

Dimensions — 1-1/2" and 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/Metric Thread 2-Way (N.C.) VX-7223-XXX-4-P VX-7225-XXX-4-P 3-Way VX-73XX-XXX-4-P	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/Metric Thread 2-Way (N.O.) VX-7213-XXX-4-P VX7215-XXX-4-P	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)				

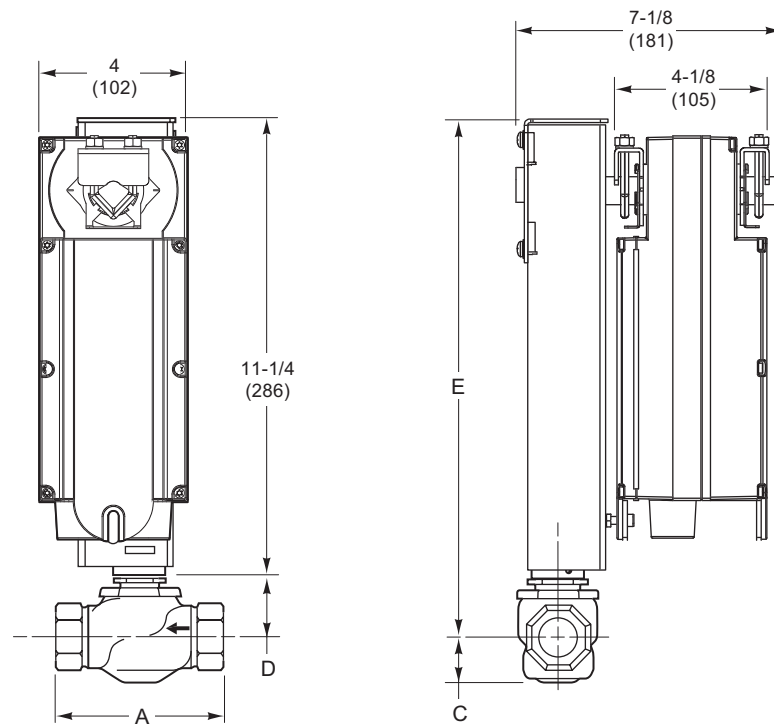


Figure-34 MX40-717X with 1-1/2" or 2" 2-Way Globe Valve.

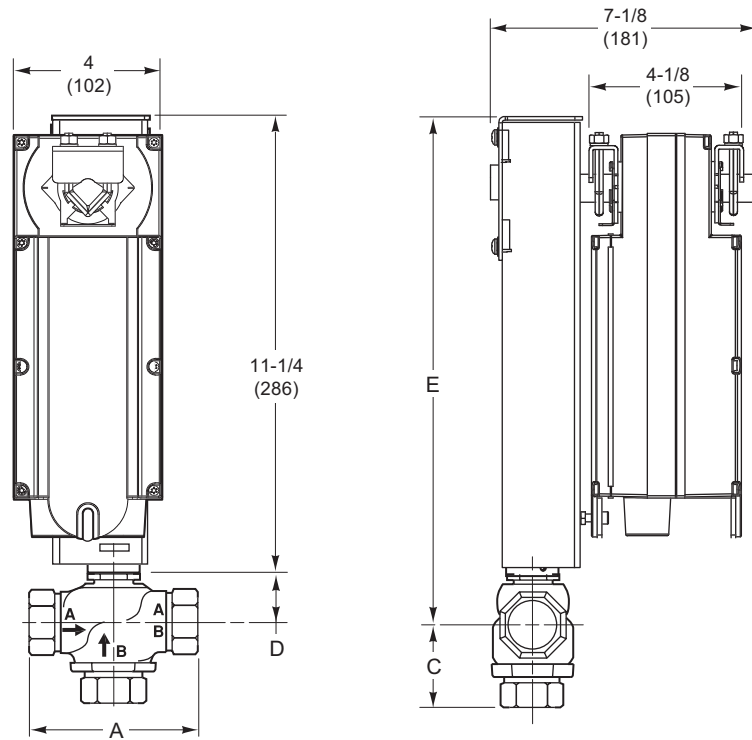


Figure-35 MX40-717X with 1-1/2" or 2" 3-Way Globe Valve.

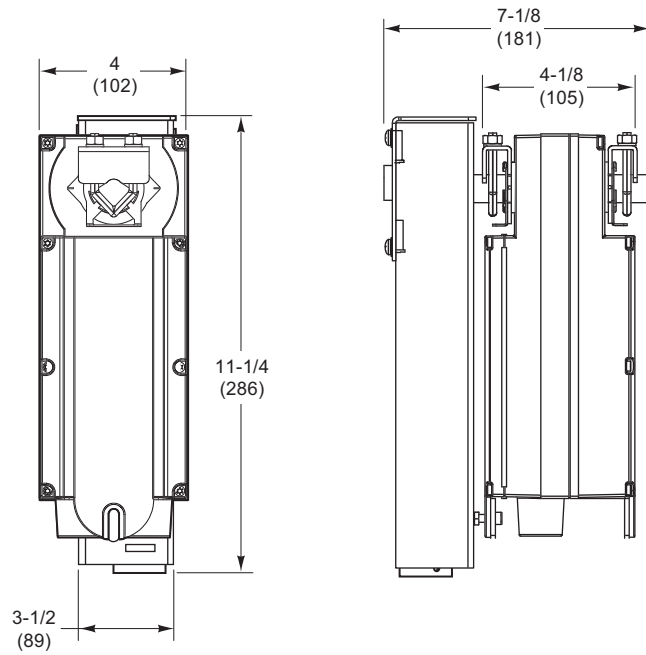


Figure-36 MX40-717X with Linked Actuator Assembly.

Dimensions — 2-1/2" and 3" Screwed Globe Valve Assemblies

Valve Assembly Part Number	Valve Size in.	Valve Dimensions in inches (millimetres)							
		2-Way (Refer to Figure-37)				3-Way (Refer to Figure-38)			
		A	C	E	H	A	C	E	H
NPT/Metric Thread 2-Way (N.O.) VX-9213-XXX-4-P VX-9215-XXX-4-P 3-Way VX-9313-XXX-4-P VX-9315-XXX-4-P	2-1/2	8-1/2 (216)	3-13/16 (97)	16-3/4 (425)	7-5/8 (194)	8-1/2 (216)	4-5/8 (117)	16-3/4 (425)	7-5/8 (194)
	3	9-1/2 (241)	4-1/4 (108)	17-1/4 (438)	7-7/8 (200)	9-1/2 (241)	5 (127)	17-1/4 (438)	7-7/8 (200)

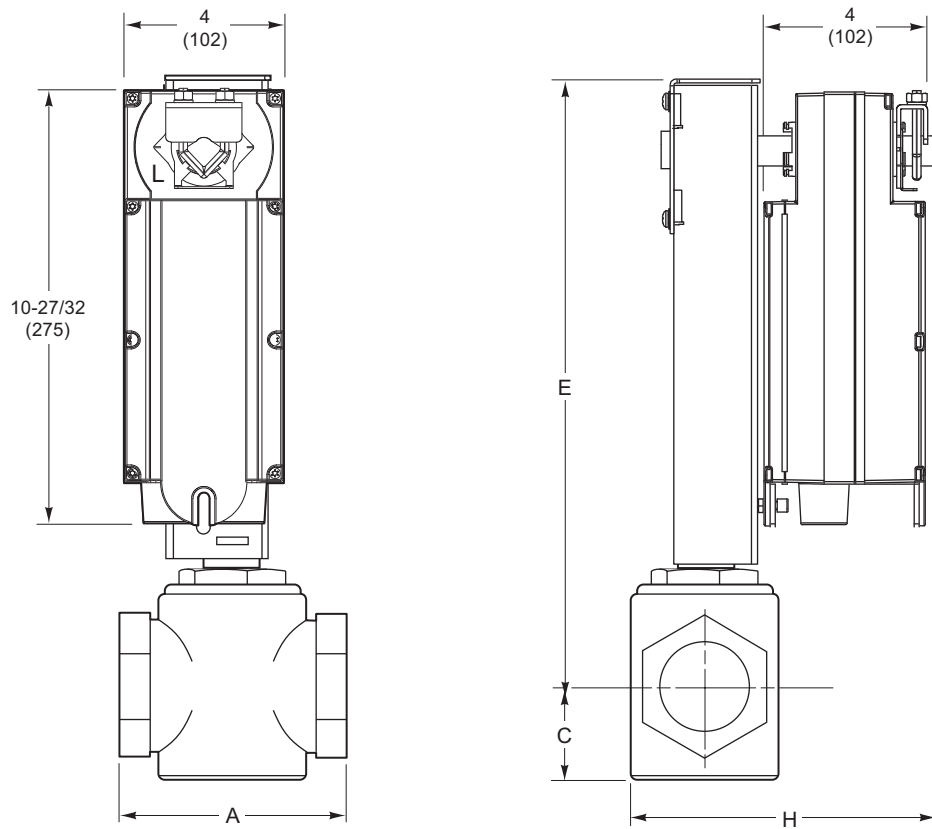


Figure-37 MX40-717X-2XX with 2-1/2" or 3" 2-Way Screwed Globe Valve.

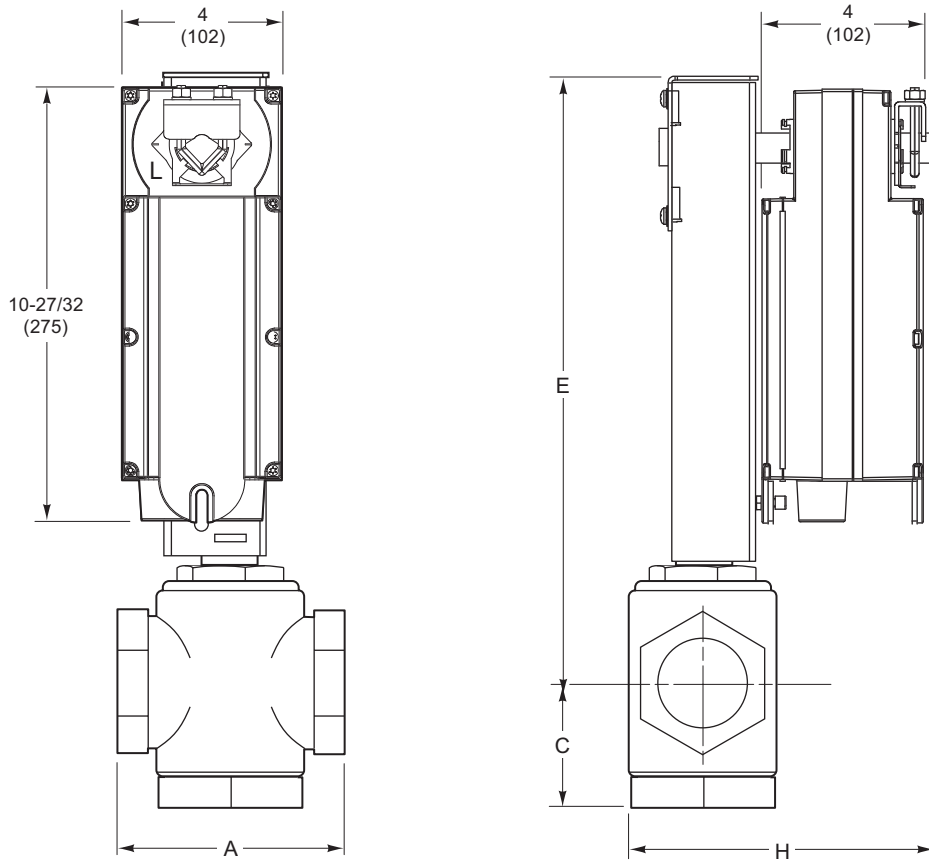


Figure-38 MX40-717X-2XX with 2-1/2" or 3" 3-Way Screwed Globe Valve.

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 (216)	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)						

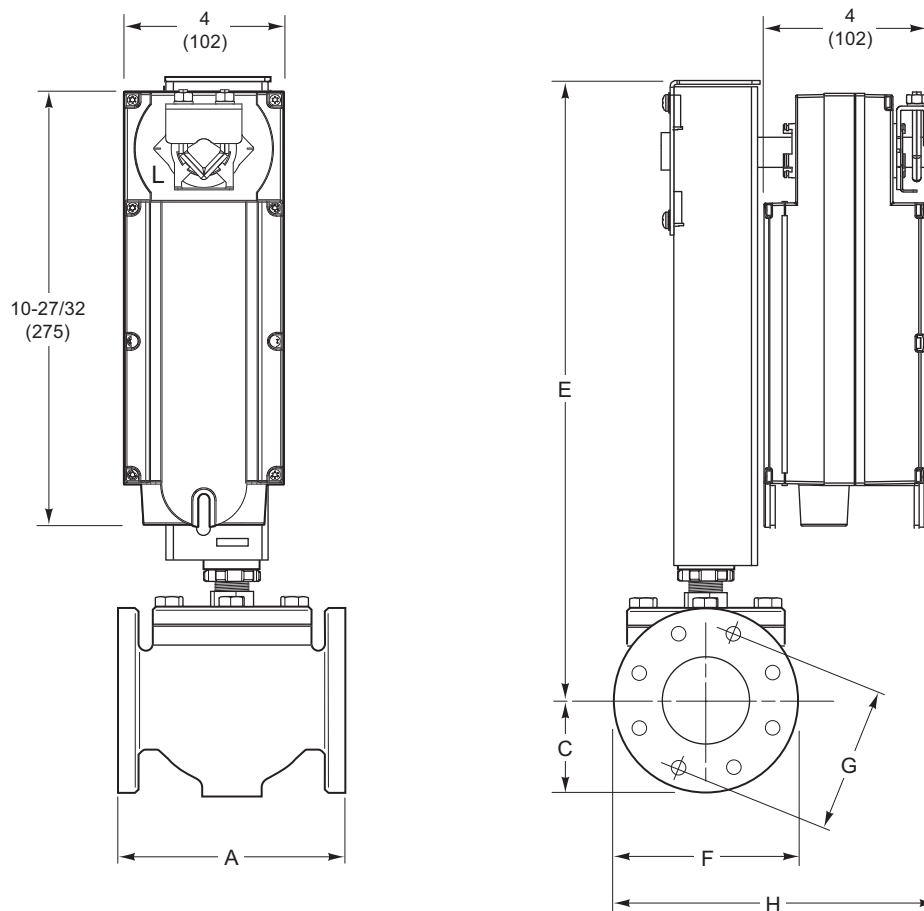


Figure-39 MX40-717X-2XX with 2-1/2" to 4" 2-Way Flanged Globe Valve.

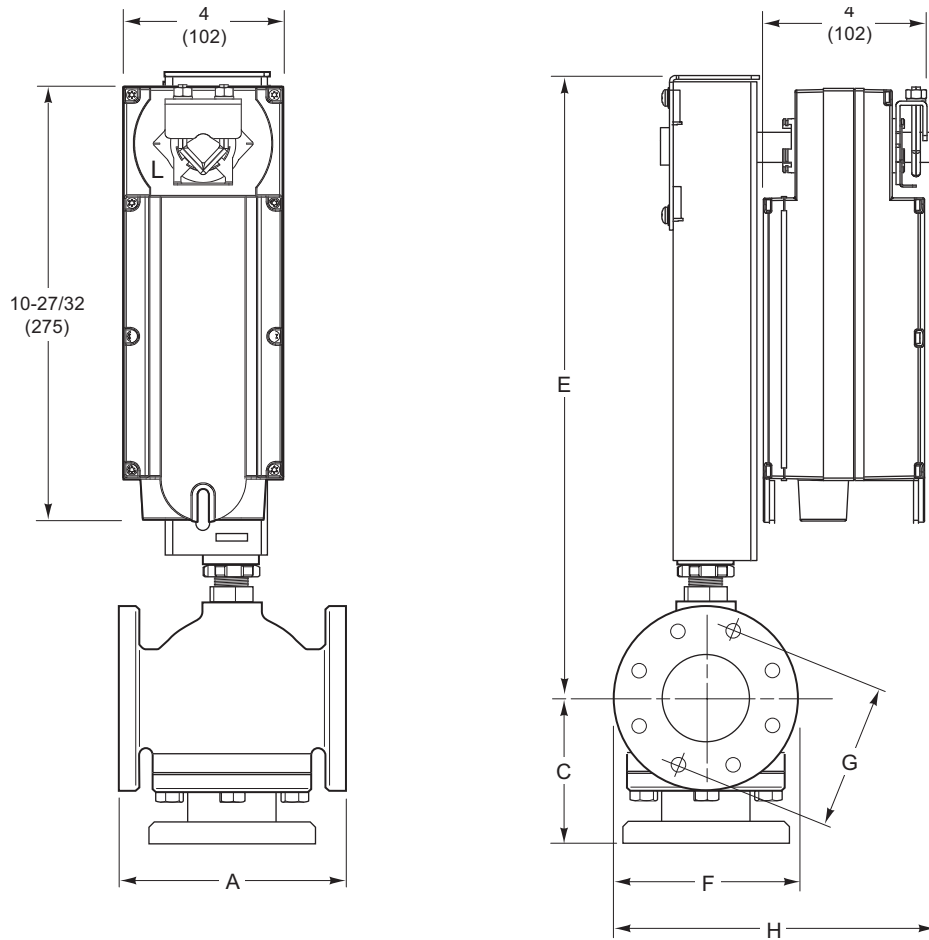


Figure-40 MX40-717X-2XX with 2-1/2" to 4" 3-Way Flanged Globe Valve.