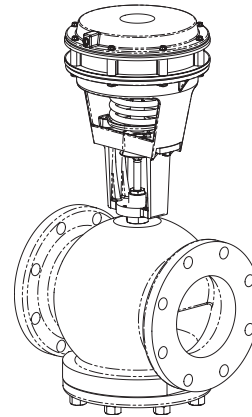


Selection Guide

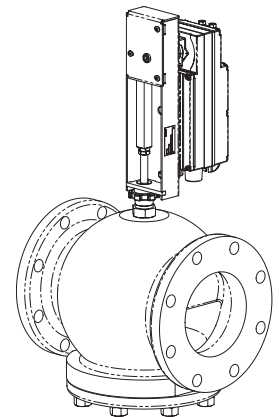
Pneumatic and Electric/Electronic Globe Valve Assemblies

Vx-8xx3 Series Balanced Plug Valve Assemblies

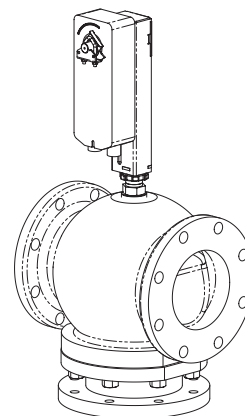
Invensys VA, VF, VK, VK4, and VS-8xx3-xxx-5-P series valve assemblies are complete actuator/valve assemblies that accept two-position, floating, and proportional electric/electronic and proportional pneumatic control signals, for control of chilled water, hot water, or low pressure steam. These valve assemblies consist of pneumatic, electric, or electronic valve actuators either direct-coupled or linked to a 2-1/2" to 6" 2-way or 3-way valve body with ASA flanged end connections.



VK-82x3 with MK-6911



Vx-82x3 with Mx4x-6343



Vx-8303 with Mx4x-7xxx

VB-8xx3 Series Valve Bodies

VB-8xx3-0-5-P valve bodies are also available separately to allow field mounting of a variety of DuraDrive® or pneumatic actuators using the appropriate linkage.

Features

- Balanced plug design provides high close-offs using economical actuation
- Up to 125 psi (856 kPa) close-off on 2-way models, 35 psi (240 kPa) on 3-way models
- Universal 3-way valve can be piped in either mixing or diverting configurations
- Valve sizes 2-1/2" to 6", ASA 125 flanged
- A variety of DuraDrive and pneumatic actuators are available, either as factory assemblies or for field assembly
- ANSI IV shutoff (0.01% of Cv) on 2-way models, ANSI III (0.1% of Cv) on 3-way models
- Self-adjusting spring loaded TFE/EPDM packing
- Normally open, normally closed, and non-spring return models available
- Expanded temperatures 20° to 281°F
- ISO 9001:2000 Certified Quality Management System

Applicable Literature

F-Number	Description	Audience	Purpose
F-26642	MA40-704x Series, MA4x-707x Series, MA4x-715x Series, DuraDrive 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 actuators' features, specifications, wiring information and possible applications. Provides step-by-step mounting instructions.</p>
F-26644	MF40-7043, MF4x-7073 Series and MF4x-7153 Series General Instructions		
F-26742	MA40-717x DuraDrive Spring Return Two-Position Actuators General Instructions		
F-27120	MAx1-720x Two Position Series, MFx1-7103 Floating Series, MSx1-7103 Proportional Series Linear DuraDrive General Instructions		
F-26744	MF41-6343 DuraDrive Non-Spring Return Floating Actuators General Instructions		
F-24732	MF-631x3 Floating Valve Actuator General Instructions		
F-26745	MS41-6343 DuraDrive Non-Spring Return Proportional Actuators General Instructions		
F-26749	MF40-7173 DuraDrive Spring Return Floating Actuators General Instructions		
F-13895	MK-6600 Series, MK-6800 Series, and MK-6911 General Instructions		
F-26645	MS40-7043, MS41-7073, MS41-7153 DuraDrive Spring Return Proportional Actuators General Instructions		
F-26748	MS40-7173 DuraDrive Spring Return Proportional Actuators General Instructions		
F-27082	AV-607, AV-609 Linkage General Instructions		<p>Describes the linkage's features, specifications, and possible applications. Provides step-by-step mounting instructions.</p>
F-27193	VB-8213 Series Valve Body General Instructions		<p>Describes the valve body's features, specifications, and possible applications. Provides step-by-step mounting instructions.</p>
F-27194	VB-8223 Series Valve Body General Instructions		
F-27197	VB-8303 Series Valve Body General Instruction		
F-26080	EN-205 Water System Guidelines	<ul style="list-style-type: none"> – Sales Personnel – Application Engineers – Service Personnel 	<p>Describes Invensys Building Systems' approved water treatment practices</p>

Product Guide Contents

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Globe Valve Assembly Part Numbering System and Selection Procedure

To select a globe valve assembly, choose the following:

V x - 8 x x 3 - x x x - 5 - x x

Step 1
Control Signal Type
A = 2-Position (SPST)
B = Valve Body
F = Floating (SPDT)
K = Pneumatic
K4 = Pneumatic w/ Positive Positioner
S = Proportional (Vdc, mAdc)

Step 3
End Connection
3 = ASA Flanged

Step 5
Pattern
5 = ASA Flanged

Step 2

Valve Body Configuration

821 = 2-Way Stem Up Open, Brass Trim
822 = 2-Way Stem Up Closed, Brass Trim
830 = 3-Way Mixing/Diverting, Brass Trim

Valve Assemblies	Valve Body Action	Factory Shipped Position		Action (As actuator strokes & valve stem goes down)
		Valve Stem	Flow	
Vx-8213-xxx-5-P	2-Way Stem Up Open (Normally open if spring return actuator)	Up	Open	A to AB flow decreases
Vx-8223-xxx-5-P	2-Way Stem Up Closed (Normally Closed if spring return actuator)	Up	Closed	A to AB flow increases
Vx-8303-xxx-5-P	3-Way Mixing ^a (Normally stem up if spring return actuator)	Up	Flow B to AB	AB to B flow decreases AB to A flow increases
	3-Way Diverting ^a (Normally stem up if spring return actuator)	Up	Flow AB to B	B to AB flow decreases A to AB flow increases

^a May be piped as mixing (two inlets, one outlet) or diverting (one inlet, two outlets)

Step 4

Actuator Code

DuraDrive Electric Actuators

Code	Model	Spring Return	Code	Model	Spring Return
<i>Two-Position</i>			<i>Proportional</i>		
552	MA41-7150	Yes	512	MS41-6340	No
554	MA41-7151	Yes	514	MS41-7341	No
554	MA41-7153	Yes	516	MS41-6343	No
572	MA40-7170	Yes	556	MS41-7153	Yes
574	MA40-7171	Yes	572	MS40-7170	Yes
576	MA40-7173	Yes	573	MS40-7171	Yes
595	MA61-7200	Yes	576	MS40-7173	Yes
594	MA61-7201	Yes	596	MS61-7203	Yes
596	MA61-7203	Yes	Electric Actuators		
<i>Floating</i>			<i>Floating</i>		
516	MF41-6343	No	301	MF-63103	No
556	MF41-7153	Yes	303	MF-63123 ^b	No
576	MF40-7173	Yes	<i>Proportional</i>		
596	MF61-7203	Yes	423	MF-63123-211	No
			422	MF-63123-411	No
			Pneumatic Actuators		
			602 ^c	MK-6811	Yes
			652 ^d	MK-6911	Yes

^b Install MFC-8000 Control Module for Vdc or MFC-421 Control Module for mAdc proportional control.

^c AK-42309-500 positive positioner recommended

^d AK-42309-500 positive positioner required

Step 6

Port Code

Size	2-Way		3-Way	
	Cv	P Code	Cv	P Code
2-1/2"	56	12	80 ^e	12
			95 ^f	
			115 ^g	
3"	85	13	110 ^e	13
			120 ^f	
			120 ^g	
4"	145	14	190 ^h	14
5"	240	15	290 ^h	15
6"	370	16	500 ^h	16

^e Mixing configuration, flow from either A or B to AB.

^f Diverting configuration, flow AB to A.

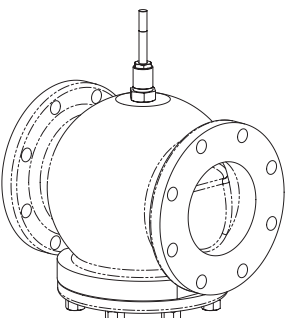
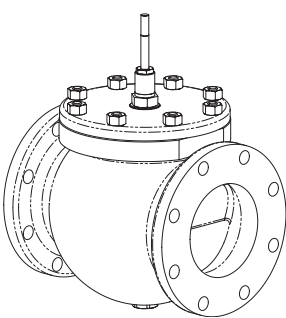
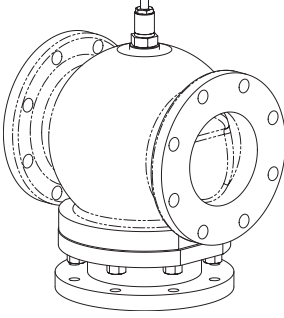
^g Diverting configuration, flow AB to B.

^h All flow configurations.

Note: Consult Table 1 and Tables 7 to 13 to confirm that the actuator/valve combination is feasible and that close-off and maximum differential pressures are suitable for the application.

Globe Valve Bodies

Table-1 Specifications for Globe Valve Bodies

		Application			
		Chilled or Hot Water, Steam		Chilled or Hot Water	
		Flanged			
					
		VB-8213	VB-8223	VB-8303	
Size		2-1/2" to 6"		2-1/2" to 6"	
Valve Body		VB-8213-0-5-P		VB-8223-0-5-P	
Valve Body Action		2-Way Stem Open (Normally open if spring return actuator)		2-Way Stem Up Closed (Normally closed if spring return actuator)	
Material	Flow Type	Equal %		Modifier Linear	
	Body	Cast Iron		Cast Iron	
	Seat	Forged Brass		Forged Brass	
	Stem	Stainless Steel		Stainless Steel	
	Plug	Forged Brass		Forged Brass	
	Packing	Spring Loaded TFE/EPDM		Spring Loaded TFE/EPDM	
	Seat Ring	EPDM		None	
ANSI Pressure Class, psig		125			
Maximum Inlet Pressure Steam psig (kPa)		35 (240)		—	
Allowable Control Media Temperature, °F (°C)^b		20°F to 281°F (-7°C 138°C)			
Close-Off Pressure, psi (kPa)		125 (856) ^c		35 (240) ^c	
P Code	Valve Size, In.	C_v (k_{vs})		C_v (k_{vs}) Mixing^d	C_v (k_{vs}) Diverting^d
12	2-1/2	56 (48)	56 (48)	80 (69)	95 (82) ^e 115 (99) ^f
13	3	85 (74)	85 (74)	110 (95)	120 (104) ^g
14	4	145 (125)	145 (125)	190 (164)	190 (164) ^g
15	5	240 (208)	240 (208)	290 (251)	290 (251) ^g
16	6	370 (320)	370 (320)	500 (433)	500 (433) ^g

^a VB-8303 valves will also operate satisfactorily as two-way angle valves if either end (side) port is closed off.

^b CAUTION: Freeze protection required for temperatures below 32°F (0 °C). Avoid ice formation on stems.

^c Valve in closed position. See Table-8 to Table-13 for maximum allowable differential pressure for valve in any open position.

^d VB-8303 may be piped as either mixing or diverting, bottom (AB) port common.

^e Diverting configuration, flow AB to A ports.

^f Diverting configuration, flow AB to B ports.

^g All diverting flow configurations, flow AB to either A or B ports.

Electric and Pneumatic Actuators and Linkages

Table-2 Floating and Proportional Non-Spring Return Electric Jackscrew and DuraDrive Actuators

Actuator Part Number	Actuator Code	Control Signal	Power Input @ 50/60 Hz				Timing, sec. ^a		Output Force or Torque	Manual Override
			Voltage	VA		Watts	50 HZ	60 HZ		
				Running	Holding					
MF-63103	301	Floating (SPDT)	24 Vac +10%/-15%	6.7	—	6.4	<120	<144	210 lbf (935 N)	Yes
MF-63123	303									
MF-63123-211	423	Proportional (Vdc)								
MF-63123-411	422	Proportional (mAdc)								
MF41-6343 ^b	516	Floating (SPDT)	24 Vac ±20%	7.1	3.6	3.8	<145	<145	300 lb-in (34 N-m)	Yes
MS41-6341 ^b	514	Proportional (Vdc or mAdc)	240 Vac ±10%	7.1	5.0	4.8	<145	<145	300 lb-in (34 N-m)	
MS41-6340 ^b	512	Proportional (Vdc or mAdc)	120 Vac ±10%	7.1	5.0	4.8	<145	<145	300 lb-in (34 N-m)	
MS41-6343 ^b	516	Proportional (Vdc or mAdc)	24 Vac ±10%	7.1	5.0	4.8	<145	<145	300 lb-in (34 N-m)	

^a Approximate timing @ 70°F (21°C) with no load

^b Actuator plus linkage is available as an assembly by adding -220 (AV-607 linkage) or -230 (AV-609 linkage) after the actuator number. Refer to Table 7 for a complete offering. Mx41-634x is not compatible with the AV-607 linkage.

Table-3 Two-Position, Floating, and Proportional Spring Return Electric 220 lbf DuraDrive Linear Actuators

Actuator Part Number	Actuator Code	Control Signal Type	Power Input								Timing, Seconds ^a		Output Force, lbf (N)	Manual Override
			Voltage 50/60 Hz	Running				DC Amp	Holding		Powered	Spring Return		
				50 Hz		60 Hz			50 Hz	60 Hz				
				VA	W	VA	W		W	W				
MA61-7200	595	2-Position (SPST or Triac)	120 Vac ±10%	11.7	8.8	10.0	8.4	-	3.6	5.0	<190	<40	220 (979) minimum 495 (2202) max. stall	Yes
MA61-7201	594		230 Vac ±10%	15.5	9.5	10.6	8.5	-	4.6	3.3				
MA61-7203	596		24 Vac ±20% 22-30 Vdc	9.8	7.5	9.7	7.5	0.29	2.8	2.8				
MF61-7203	596	Floating (SPDT)	24 Vac ±20% 22-30 Vdc	9.8	7.7	9.7	7.7	0.3	3.3	3.3				
MS61-7203	596	Proportional (Vdc or mAdc)	24 Vac ±20% 22-30 Vdc	9.8	7.4	9.7	7.4	0.28	2.9	2.9				

^a Approximate timing @ 70°F (21°C) with no load

Table-4 Two-Position, Floating and Proportional Spring Return Electric 133 lb-in DuraDrive Actuators

Actuator Part Number	Actuator Code	Control Signal Type	Power Input								Timing, Seconds ^a		Torque, lb-in (N-m) ^b	Manual Override
			Voltage 50/60 Hz	Running				DC Amp	Holding		Powered	Spring Return		
				50 Hz		60 Hz			50 Hz	60 Hz				
				VA	W	VA	W		W	W				
MA41-7150 ^{c,d}	552	2-Position (SPST)	120 Vac ±10%	11.7	8.8	10.0	8.4	-	3.6	5.0	<190	<30	133 (15)	Yes
MA41-7151 ^c	554		230 Vac ±10%	15.5	9.5	10.6	8.5	-	4.6	3.3				
MA41-7153 ^c	556		24 Vac ±20% 22-30 Vdc	9.8	7.5	9.7	7.5	0.29	2.8	2.8				
MF41-7153 ^c	556	Floating (SPDT)	24 Vac ±20% 22-30 Vdc	9.8	7.7	9.7	7.7	0.3	3.3	3.3				
MS41-7153 ^c	556	Proportional (Vdc or mAdc)	24 Vac ±20% 22-30 Vdc	9.8	7.4	9.7	7.4	0.3	2.9	2.9				

^a Approximate timing @ 70°F (21°C) with no load

^b De-rating required for spring return actuators at low temperatures

^c Actuator plus linkage is available as an assembly by adding -220 (AV-607 linkage) or -230 (AV-609 linkage) after the actuator number. Refer to Table 7 for a complete offering.

^d The CE Directive is not applicable to this model

Table-5 Two Position, Floating, and Proportional Spring Return Electric 150 lb-in DuraDrive Actuators

Actuator Part Number	Actuator Code	Control Signal Type	Power Input				Approximate Timing, Seconds @ 70°F (21°C) with no Load		Actuator Output Torque Rating, lb-in (N-m) ^a	Manual Override
			Voltage	Running		Watts	Powered	Spring Return		
				Running	Holding					
MA40-7170 ^b	572	2-Position (SPST)	120 Vac ±10%	11.4	9.4	7.2	<145	<75	150 (17)	No
MA40-7171	574		240 Vac ±10%	11.8	9.5	7.4				
MA40-7173	576		24 Vac ±20%	9.6	4.1	5.4				
MF40-7173	576	Floating	24 Vac ±20%	10.0	4.3	5.5				
MS40-7170	572	Proportional (Vdc or mA _{dc})	120 Vac ±10%	11.1	9.1	7.1				
MS40-7171	574		240 Vac ±10%	11.8	10.1	7.2				
MS40-7173	576		24 Vac ±20%	9.4	5.4	7.1				

^a De-rating required for spring return actuators at low temperatures

^b The CE Directive is not applicable to this model

Table-6 Proportional Spring Return Pneumatic Actuators

Actuator Part Number ^a	Actuator Code	Nominal Spring Range, psig (kPa) ^b	Effective Area, in ² (cm ²)
MK-6811	602	5 to 10 (34 to 69)	50 (323)
MK-6911 w/AK-42309-500	652	5 to 10 (34 to 69)	50 (323)

^a AK-42309-500 Positive Positioner (order separately) optional for 2-1/2" to 5" valves, required for 6" valves. VK4 factory valve assemblies include positive positioner.

^b Field adjustable with positive positioner.

Table-7 Linkage Kits and Actuator/Linkage Assemblies for Field Assembly

Application	Actuator	Linkage Kit ^a	Actuator/Linkage Assembly
2-1/2" to 5" 2-Way & 3-Way	MK-6811 ^b	AV-497	—
6" 2-Way & 3-Way	MK-6911 ^b		—
2-1/2" to 5" 2-Way and 3-Way (1" nominal stroke)	MA41-7150	AV-607	MA41-7150-220
	MA41-7151		MA41-7151-220
	MA41-7153		MA41-7153-220
	MA40-7170		MA40-7170-220
	MA40-7171		MA40-7171-220
	MA40-7173		MA40-7173-220
	MF41-7153		MF41-7153-220
	MS41-7153		MS41-7153-220
6" 2-Way & 3-Way (1-3/4" nominal stroke)	MA40-7170	AV-609	MS40-7170-220
	MA40-7171		MS40-7171-220
	MA40-7173		MS40-7173-220
	MF41-6343 ^a		MA41-7150-230
	MF41-7153		MA41-7151-230
	MF40-7173		MA41-7153-230
	MS41-6340 ^a		MA40-7170-230
	MS41-6341 ^a		MA40-7171-230
	MS41-6343 ^a		MA40-7173-230
	MS41-7153		MA41-6343-230
	MS40-7170		MF41-7153-230
MS40-7171	MF40-7173-230		
MS40-7173	MS41-6340-230		
MS41-6341-230	MS41-6343-230		
MS41-7153-230	MS40-7170-230		
MS40-7171-230	MS40-7173-230		
MS40-7173-230			
2-1/2" to 5" 2-Way & 3-Way (1" nominal stroke)	MF-63103 MF-63123 MF-63123-211 MF-63123-411	AV-672	—

^a Mx61-720x Actuators require no separate linkage. Mx41-634x is not compatible with AV-607.

^b AK-42309-500 (order separately) optional for 2-1/2" to 5" valve, required for 6" valve. VK4 factory valve assemblies include positive positioner.

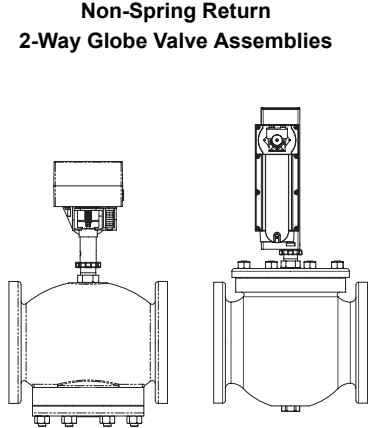
Valve/Actuator Combinations and Operating Pressure Differentials

2-Way and 3-Way Globe Valve Assemblies

Note: Choose a valve assembly with a maximum operating differential pressure capability sufficient for the application. Consult Table-1 on page 5 for close-off pressure ratings. Not all actuator and valve body combinations are offered as factory assemblies.

Two-Way Electric Non-Spring Return Models

Table-8 2-Way Globe Valve Assemblies with Electric Non-Spring Return Actuators

 <p>Non-Spring Return 2-Way Globe Valve Assemblies</p>					Mx-631x3		Mx41-634x		
					Actuator Output Rating (Minimum)		Actuator Model (Actuator Code)		
					210 lbf (935 N)	300 lb-in (34 N-m)			
					Floating MF-63103 (301) MF-63123 (303) Proportional MF-63123-211 (423) ^a MF-63123-411 (422) ^b		Floating MF41-6343 (516) Proportional MS41-6340 (512) MS41-6341 (514) MS41-6343 (516)		
					Linkage Kit Part Number				
					AV-672 (2-1/2" to 5")		AV-609 (6")		
Valve Assembly Part Number ^c	P Code	Valve Size in.	C _v ^d	k _{vs} ^d	Maximum Allowable Operating Differential Pressure ^e , psi (kPa)				
Vx-8213-xxx-5-P Vx-8223-xxx-5-P	12	2-1/2	56	48	35 (240)	—			
	13	3	85	74		—			
	14	4	145	125		—			
	15	5	240	208		—			
	16	6	370	320	—	35 (240)			

^a MF-63123-211 includes MFC-8000 control module factory set for 6-9 Vdc control signal. May be field adjusted for other ranges. Actuator, control module, linkage, and valve body included with factory valve assembly. Components may be purchased separately for field assembly.

^b MF-63123-411 includes MFC-420 control module factory set for 4-20 mAdc control signal. May be field adjusted for other ranges. Actuator, control module, linkage, and valve body included with factory valve assembly. Components may be purchased separately for field assembly.

^c See Globe Valve Assembly Part Numbering System and Selection Procedure to determine a specific part number.

^d $k_{vs} = m^3/h$ ($\Delta P = 100$ kPa) $k_{vs} = C_v / 1.156$ $C_v = gpm / \sqrt{\Delta P}$ (in psi).

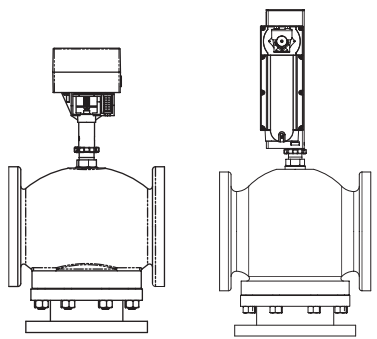
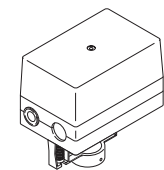
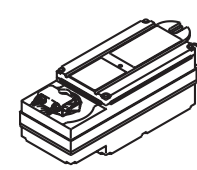
^e Maximum allowable differential across the valve in any open position. Less than 20 psi recommended for quieter service. Consult Table-1 on page 5 for close-off pressure ratings.

2-Way and 3-Way Globe Valve Assemblies

Note: Choose a valve assembly with a maximum operating differential pressure capability sufficient for the application. Consult Table-1 on page 5 for close-off pressure ratings. Not all actuator and valve body combinations are offered as factory assemblies.

Three-Way Electric Non-Spring Return Models

Table-9 3-Way Globe Valve Assemblies with Electric Non-Spring Return Actuators

Non-Spring Return 3-Way Globe Valve Assemblies 					Mx-631x3		Mx41-634x	
								
					Actuator Output Rating (minimum)			
					210 lbf (935N)		300 lb-in (34 N-m)	
					Actuator Models (Actuator Codes)			
					Floating MF-63103 (301) MF-63123 (303) Proportional MF-63123-211 (423) ^a MF-63123-411 (422) ^b		Floating MF41-6343 (516) Proportional MS41-6340 (512) MS41-6341 (514) MS41-6343 (516)	
					Linkage Kit Part Number			
					AV-672 (2-1/2" to 5")		AV-609 (6")	
Valve Assembly Part Number^c	P Code	Valve Size in.	C_v^d	k_{vs}^d	Maximum Allowable Operating Differential Pressure^e, psi (kPa) (Mixing/Diverting)			
Vx-8303-xxx-5-P	12	2-1/2	80 ^f	69 ^f	35 (240) / 35 (240)	—		
			95 ^g	82 ^g		—		
			115 ^h	99 ^h		—		
	13	3	110 ^f	95 ^f		—		
			120 ^g	104 ^g		—		
			120 ^h	104 ^h		—		
	14	4	190 ⁱ	164 ⁱ		—		
	15	5	290 ⁱ	251 ⁱ		—		
	16	6	500 ⁱ	433 ⁱ		—		
						—		32 (219) / 28 (192)

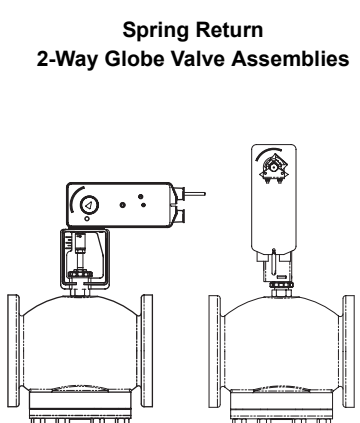
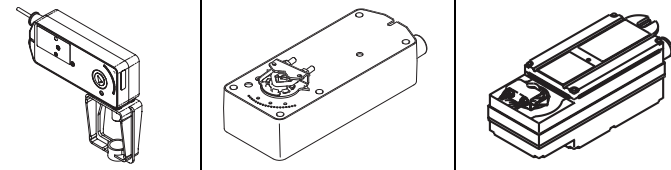
- ^a MF-63123-211 includes MFC-8000 control module factory set for 6-9 Vdc control signal. May be field adjusted for other ranges. Actuator, control module, linkage, and valve body included with factory valve assembly. Components may be purchased separately for field assembly.
- ^b MF-63123-411 includes MFC-420 control module factory set for 4-20 mAdc control signal. May be field adjusted for other ranges. Actuator, control module, linkage, and valve body included with factory valve assembly. Components may be purchased separately for field assembly.
- ^c See Globe Valve Assembly Part Numbering System and Selection Procedure to determine a specific part number.
- ^d $k_{vs} = m^3/h (\Delta P = 100 \text{ kPa})$ $k_{vs} = C_v / 1.156$ $C_v = \text{gpm} / \sqrt{\Delta P}$ (in psi).
- ^e Maximum allowable differential across the valve in any open position. Less than 20 psi recommended for quieter service. Consult Table-1 on page 5 for close-off pressure ratings.
- ^f Mixing configuration, ports A and B are inlets, AB port is outlet.
- ^g Diverting configuration, flow AB to A port.
- ^h Diverting configuration, flow AB to B port.
- ⁱ All flow configurations, mixing or diverting.

2-Way and 3-Way Globe Valve Assemblies

Note: Choose a valve assembly with a maximum operating differential pressure capability sufficient for the application. Consult Table-1 on page 5 for close-off pressure ratings. Not all actuator and valve body combinations are offered as factory assemblies.

Two-Way Electric Spring Return Models

Table-10 2-Way Globe Valve Assemblies with Electric Spring Return Actuators

 <p>Spring Return 2-Way Globe Valve Assemblies</p>					Mx61-720x	Mx41-715x	Mx40-717x
							
Actuator Output Rating (minimum)							
220 lbf (979 N) 133 lb-in (15 N-m) 150 lb-in (17 N-m)							
Actuator Models (Actuator Codes)							
<table border="1"> <tr> <td> Two-Position MA61-7200 (595) MA61-7201 (594) MA61-7203 (596) Floating MF61-7203 (596) Proportional MS61-7203 (596) </td> <td> Two-Position MA41-7150 (552) MA41-7151 (554) MA41-7153 (556) Floating MF41-7153 (556) Proportional MS41-7153 (556) </td> <td> Two-Position MA40-7170 (572) MA40-7171 (574) MA40-7173 (576) Floating MF40-7173 (576) Proportional MS40-7170 (572) MS40-7171 (574) MS40-7173 (576) </td> </tr> </table>					Two-Position MA61-7200 (595) MA61-7201 (594) MA61-7203 (596) Floating MF61-7203 (596) Proportional MS61-7203 (596)	Two-Position MA41-7150 (552) MA41-7151 (554) MA41-7153 (556) Floating MF41-7153 (556) Proportional MS41-7153 (556)	Two-Position MA40-7170 (572) MA40-7171 (574) MA40-7173 (576) Floating MF40-7173 (576) Proportional MS40-7170 (572) MS40-7171 (574) MS40-7173 (576)
Two-Position MA61-7200 (595) MA61-7201 (594) MA61-7203 (596) Floating MF61-7203 (596) Proportional MS61-7203 (596)	Two-Position MA41-7150 (552) MA41-7151 (554) MA41-7153 (556) Floating MF41-7153 (556) Proportional MS41-7153 (556)	Two-Position MA40-7170 (572) MA40-7171 (574) MA40-7173 (576) Floating MF40-7173 (576) Proportional MS40-7170 (572) MS40-7171 (574) MS40-7173 (576)					
Linkage Kit Part Number							
None (Part of Actuator) AV-607 (2-1/2" to 5") AV-609 (6") AV-607 (2-1/2" to 5") AV-609 (6")							
Valve Assembly Part Number ^a	P Code	Valve Size in.	C _v ^b	k _{vs} ^d	Maximum Allowable Operating Differential Pressure^c, psi (kPa)		
Vx-8213-5xx-5-P Vx-8223-5xx-5-P	12	2-1/2	56	48	35 (240)	35 (240)	35 (240)
	13	3	85	74			
	14	4	145	125			
	15	5	240	208			
	16	6	370	320	—	22 (151)	25 (171)

^a See Globe Valve Assembly Part Numbering System and Selection Procedure to determine a specific part number

^b $k_{vs} = m^3/h (\Delta P = 100 \text{ kPa})$ $k_{vs} = C_v / 1.156$ $C_v = \text{gpm} / \sqrt{\Delta P}$ (in psi).

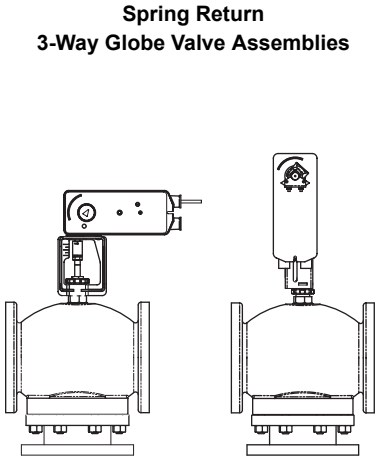
^c Maximum allowable differential across the valve in any open position. Less than 20 psi recommended for quieter service. Consult Table-1 on page 5 for close-off pressure ratings.

2-Way and 3-Way Globe Valve Assemblies

Note: Choose a valve assembly with a maximum operating differential pressure capability sufficient for the application. Consult Table-1 on page 5 for close-off pressure ratings. Not all actuator and valve body combinations are offered as factory assemblies.

Three-Way Electric Spring Return Models

Table-11 3-Way Globe Valve Assemblies with Electric Spring Return Actuators

 <p>Spring Return 3-Way Globe Valve Assemblies</p>					Mx61-720x	Mx41-715x	Mx40-717x			
					Actuator Output Rating (minimum)					
					220 lbf (979 N)	133 lb-in (15 N-m)	150 lb-in (17 N-m)			
					Actuator Models (Actuator Codes)					
					Two-Position MA61-7200 (595) MA61-7201 (594) MA61-7203 (596) Floating MF61-7203 (596) Proportional MS61-7203 (596)	Two-Position MA41-7150 (552) MA41-7151 (554) MA41-7153 (556) Floating MF41-7153 (556) Proportional MS41-7153 (556)	Two-Position MA40-7170 (572) MA40-7171 (574) MA40-7173 (576) Floating MF40-7173 (576) Proportional MS40-7170 (572) MS40-7171 (574) MS40-7173 (576)			
					Linkage Kit Part Number					
					None (Part of Actuator)	AV-607 (2-1/2" to 5") AV-609 (6")	AV-607 (2-1/2" to 5") AV-609 (6")			
Valve Assembly Part Number ^a	P Code	Valve Size in.	C _v ^b	k _{vs} ^b	Maximum Allowable Operating Differential Pressure ^c , psi (kPa) (Mixing/Diverting)					
Vx-8303-5xx-5-P	12	2-1/2	80 ^d	69 ^d	35 (240) / 35 (240)	35 (240) / 35 (240)	35 (240) / 35 (240)			
			95 ^e	82 ^e						
			115 ^f	99 ^f						
	13	3	110 ^d	95 ^d						
			120 ^e	104 ^e						
			120 ^f	104 ^f						
	14	4	190 ^g	164 ^g						
	15	5	290 ^g	251 ^g						
	16	6	500 ^g	433 ^g				—	15 (103) / 11 (75)	16 (110) / 12 (82)

^a See Globe Valve Assembly Part Numbering System and Selection Procedure to determine a specific part number.

^b $k_{vs} = m^3/h (\Delta P = 100 \text{ kPa})$ $k_{vs} = C_v / 1.156$ $C_v = \text{gpm} / \sqrt{\Delta P}$ (in psi).

^c Maximum allowable differential across the valve in any open position. Less than 20 psi recommended for quieter service. Consult Table-1 on page 5 for close-off pressure ratings.

^d Mixing configuration, ports A and B are inlets, AB port is outlet.

^e Diverting configuration, flow AB to A port.

^f Diverting configuration, flow AB to B port.

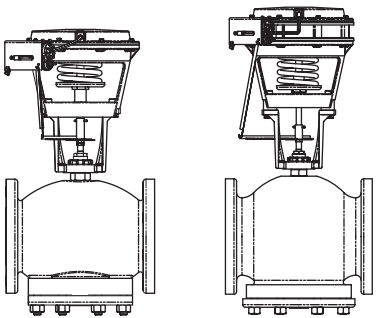
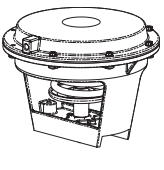
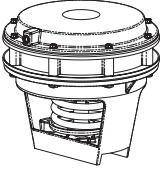
^g All flow configurations, mixing or diverting.

2-Way and 3-Way Globe Valve Assemblies

Note: Choose a valve assembly with a maximum operating differential pressure capability sufficient for the application. Consult Table-1 on page 5 for close-off pressure ratings. Not all actuator and valve body combinations are offered as factory assemblies.

Two-Way Pneumatic Spring Return Models

Table-12 2-Way Globe Valve Assemblies with Pneumatic Spring Return Actuators

Spring Return					MK-6811 ^b	MK-6911 ^b		
2-Way Globe Valve Assemblies 								
					Actuator Models (Actuator Codes)			
					MK-6811 (602)	MK-6911 (652)		
					Linkage Kit Part Number			
					AV-497	AV-497		
					Spring Range, psig (kPa)			
					5 to 10 (34 to 69) ^a	5 to 10 (34 to 69) ^a		
Valve Assembly Part Number ^b	P Code	Valve Size in.	C _v ^c	k _{vs} ^c	Maximum Allowable Operating Differential Pressure^d, psi (kPa)			
VK-8213-602-5-12 VK-8223-602-5-12 VK4-8213-602-5-12 VK4-8223-602-5-12	12	2-1/2	56	48	35 (240)	—		
VK-8213-602-5-13 VK-8223-602-5-13 VK4-8213-602-5-13 VK4-8223-602-5-13	13	3	85	74		—		
VK-8213-602-5-14 VK-8223-602-5-14 VK4-8213-602-5-14 VK4-8223-602-5-14	14	4	145	125		—		
VK-8213-602-5-15 VK-8223-602-5-15 VK4-8213-602-5-15 VK4-8223-602-5-15	15	5	240	208		—		
VK4-8213-652-5-16 VK4-8223-652-5-16	16	6	370	320	—	35 (240)		

^a Spring range field adjustable with positive positioner.

^b AK-42309-500 positive positioner optional for 2-1/2" to 5" valve, required for 6" valve. Supplied as standard on VK4 factory valve assemblies. See Globe Valve Assembly Part Numbering System and Selection Procedure to determine a specific part number.

^c $k_{vs} = m^3/h$ ($\Delta P = 100$ kPa) $k_{vs} = C_v / 1.156$ $C_v = gpm / \sqrt{\Delta P}$ (in psi).

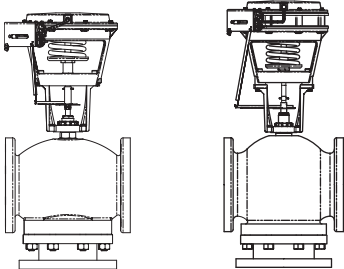
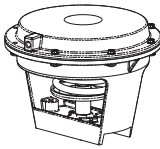
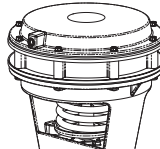
^d Maximum allowable differential across the valve in any open position. Less than 20 psi recommended for quieter service. Consult Table-1 on page 5 for close-off pressure ratings.

2-Way and 3-Way Globe Valve Assemblies

Note: Choose a valve assembly with a maximum operating differential pressure capability sufficient for the application. Consult Table-1 on page 5 for close-off pressure ratings. Not all actuator and valve body combinations are offered as factory assemblies.

Three-Way Pneumatic Spring Return Models

Table-13 3-Way Globe Valve Assemblies with Pneumatic Spring Return Actuators

					MK-6811 ^b		MK-6911 ^b	
								
					Actuator Models (Actuator Codes)			
					MK-6811 (602)		MK-6911 (652)	
					Linkage Kit Part Number			
					AV-497		AV-497	
					Spring Range, psig (kPa)			
					5 to 10 (34 to 69) ^a		5 to 10 (34 to 69) ^a	
Valve Assembly Part Number ^b	P Code	Valve Size in.	C _v ^c	k _{vs} ^c	Maximum Allowable Operating Differential Pressure ^d , psi (kPa) (Mixing/Diverting)			
VK-8303-602-5-12	12	2-1/2	80 ^e	69 ^e	35 (240) / 35 (240)	—		
			95 ^f	82 ^f				
			115 ^g	99 ^g				
VK-8303-602-5-13	13	3	110 ^e	95 ^e				
			120 ^f	104 ^f				
			120 ^g	104 ^g				
VK-8303-602-5-14	14	4	190 ^h	164 ^h				
VK-8303-602-5-15	15	5	290 ^h	251 ^h	—			
VK4-8303-602-5-15								
VK4-8303-652-5-16	16	6	500 ^h	433 ^h	—	35 (240) / 35 (240)		

^a Spring range field adjustable with positive positioner.

^b AK-42309-500 positive positioner optional for 2-1/2" to 5" valve, required for 6" valve. Supplied as standard on VK4 factory valve assemblies. See Globe Valve Assembly Part Numbering System and Selection Procedure to determine a specific part number.

^c $k_{vs} = m^3/h (\Delta P = 100 \text{ kPa})$ $k_{vs} = C_v / 1.156$ $C_v = \text{gpm} / \sqrt{\Delta P}$ (in psi).fx

^d Maximum allowable differential across the valve in any open position. Less than 20 psi recommended for quieter service. Consult Table-1 on page 5 for close-off pressure ratings.

^e Mixing configuration, ports A and B are inlets, AB port is outlet.

^f Diverting configuration, flow AB to A port.

^g Diverting configuration, flow AB to B port.

^h All flow configurations, mixing or diverting.

Actuator Specifications and Valve Assembly Mounting Dimensions

Valve Assemblies with MF41-6343 and MS41-6340, MS41-6341, and MS41-6343 Non-Spring Return DuraDrive Electric Actuators

Actuator Specifications																																							
Inputs																																							
Control Signal	MF41-6343: SPDT Floating Control, Triacs (500 mA rated) , or 2 SPST contacts.																																						
	MS41-634x: Proportional, 2 to 10 Vdc or 4 to 20 mAdc with an integral 500Ω 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">Actuator Code</th> <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>516</td> <td>MF41-6343</td> <td>24 Vac ±20%</td> <td>7.1</td> <td>3.6</td> <td>3.8</td> </tr> <tr> <td>512</td> <td>MS41-6340</td> <td>120 Vac ±10%</td> <td>9.6</td> <td>8.8</td> <td>5.0</td> </tr> <tr> <td>514</td> <td>MS41-6341</td> <td>240 Vac ±10%</td> <td>10.1</td> <td>9.2</td> <td>5.2</td> </tr> <tr> <td>516</td> <td>MS41-6343</td> <td>24 Vac ±20%</td> <td>7.1</td> <td>5.0</td> <td>4.8</td> </tr> </tbody> </table>					Actuator Code	Part Number	Power Input @ 50/60 Hz				Voltage	Running VA	Holding VA	Watts	516	MF41-6343	24 Vac ±20%	7.1	3.6	3.8	512	MS41-6340	120 Vac ±10%	9.6	8.8	5.0	514	MS41-6341	240 Vac ±10%	10.1	9.2	5.2	516	MS41-6343	24 Vac ±20%	7.1	5.0	4.8
Actuator Code	Part Number	Power Input @ 50/60 Hz																																					
		Voltage	Running VA	Holding VA	Watts																																		
516	MF41-6343	24 Vac ±20%	7.1	3.6	3.8																																		
512	MS41-6340	120 Vac ±10%	9.6	8.8	5.0																																		
514	MS41-6341	240 Vac ±10%	10.1	9.2	5.2																																		
516	MS41-6343	24 Vac ±20%	7.1	5.0	4.8																																		
Connections	24 inch (61 cm) long appliance cables; 18 AWG color coded leads, 1/2" conduit connector. For M20 metric conduit, use AM-756 Adapter.																																						
Motor Type	Brushless DC																																						
Outputs																																							
Electrical	Stroke: Electronically limited to a maximum of 93±1°; field adjustable to limit travel at either end of stroke.																																						
Mechanical	Timing: Approximate timing is 145 seconds.																																						
	Manual Override: Activated by the manual override crank.																																						
	Output torque rating: 300 lb-in (34 N-m) minimum.																																						
	Position indicator: Pointer and scale are provided for position indicator.																																						
Environment																																							
Temperature Limits	Shipping and storage: -40 to 160 °F (-40 to 71 °C) ambient. Operating: -25° to 140 °F (-32° to 60°C) ambient temperature. Maximum allowable ambient: 124°F (51°C) at maximum valve fluid temperature of 281°F (138°C). Minimum allowable valve fluid temperature 20°F (-7°C).																																						
Humidity	5 to 95% RH, non-condensing.																																						
Locations	NEMA Type 1 (IEC IP30), NEMA Type 4 (IEC IP56) with customer-supplied water tight conduit connectors.																																						
Agency Listings (Actuator)																																							
UL	UL 873, Underwriters Laboratories (File # E9429 Category Temperature-Indicating and Regulating Equipment).																																						
European Community	EMC Directive (89/336 EEC). Low Voltage Directive (72/23/EEC) Machinery Directive (891392 EEC). Safety Directive (92/59 EEC).																																						
c-UL	Canadian Standards C22.2 No. 24-93.																																						
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.																																						

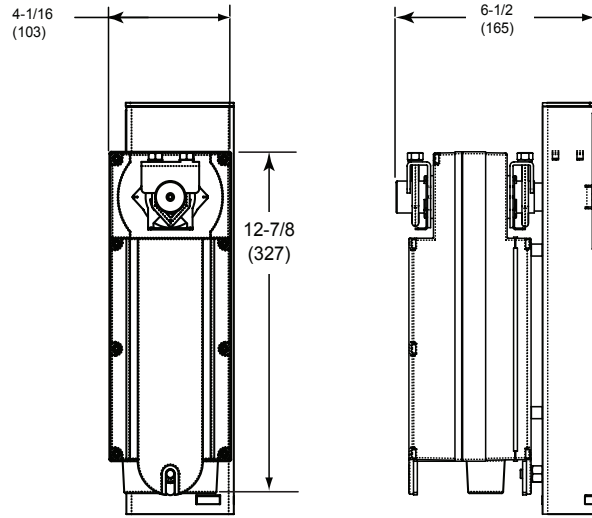


Figure-1 Mx41-634x-230 Actuator/Linkage Assembly

Dimensions - 6" Flanged Globe Valve Assemblies

Valve Assembly Part Number	Valve Size	Valve Dimensions in inches (millimeters)											
		2-Way (Refer to Figure-2)						3-Way (Refer to Figure-3)					
		A	C	E	F	G	H	A	C	E	F	G	H
2-Way Vx-8213-51x-5-16 3-Way Vx-8303-51x-5-16	6"	14 (356)	7-1/2 (190)	19-15/16 (507)	11 (280)	9-1/2 (241)	12 (305)	14 (356)	9-3/4 (248)	20-1/4 (515)	11 (280)	9-1/2 (241)	12 (305)
2-Way Vx-8223-516-5-16	6"	14 (356)	6-1/4 (159)	21-3/8 (543)	11 (280)	9-1/2 (241)	12 (305)	—	—	—	—	—	—

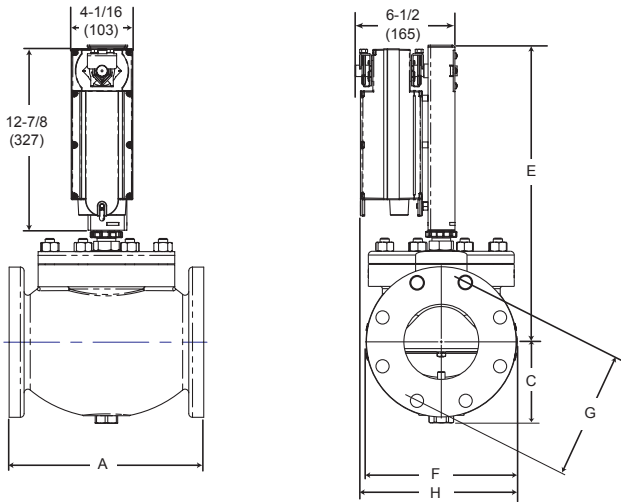


Figure-2 Mx41-634x with 6" Flanged 2-Way Globe Valves

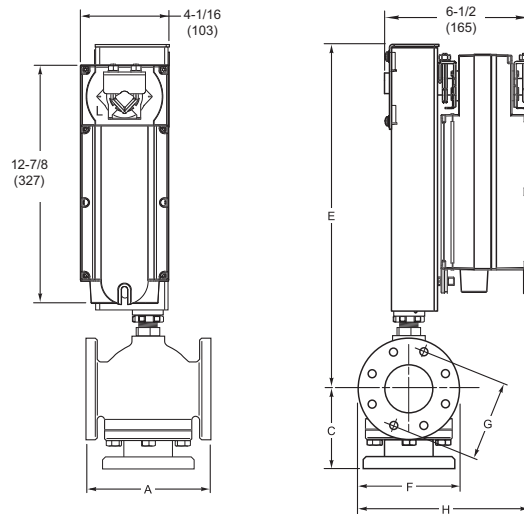


Figure-3 Mx41-634x with 6" Flanged 3-Way Globe Valves

Valve Assemblies with MF-631x3 and MF-63123 Series Non-Spring Return 210 lbf Electric Linear Actuators

Actuator Specifications	
Inputs	
Control Signal	<p>MF-63103 and MF-63123^a: SPDT Floating Control, Triacs (1 A rated) or 2 SPST contacts.</p> <p>MF-63123-211: includes MFC-8000 control module set for 6 to 9 Vdc control signal; actuator extend point adjustable 0 to 12 Vdc; span adjustable 2 to 10 Vdc.</p> <p>MF-63123-411: includes MFC-420 control module set for 4 to 20 mAdc control signal; actuator extend point adjustable 2 to 16 mAdc; span adjustable 4 to 16 mAdc.</p>
Power Requirements	<p>Voltage: 24 Vac +10%/-15% @ 50/60 Hz.</p> <p>Power Input: 6.7 VA; 6.4 W running. 0 VA, 0 W holding.</p> <p>All 24 Vac circuits are Class 2.</p>
Connections	Screw terminals; conduit knockout. MFC control modules plug into actuator circuit board.
Motor Type	Synchronous.
Outputs	
Electrical	<p>MF-63123: 15k Ω feedback potentiometer^b.</p> <p>Auxiliary switch: Available on MF-631x3-500 models. SPDT adjustable over actuator stroke. Rated 1A @ 24 Vac 50/60 Hz, 24 VA @ 24 Vac pilot duty rating.</p>
Mechanical	<p>Output force rating: 210 lbf (935 N) minimum.</p> <p>Timing: 120 seconds at 60 Hz, 144 seconds at 50 Hz.</p> <p>Position indicator: Provided.</p> <p>Manual override: Activated by the manual override crank.</p> <p>Linear stroke: Up to maximum of 1" (25 mm) nominal, self adjusting.</p>
Environment	
Temperature Limits	<p>Shipping and storage: -40° to 160°F (-40° to 71°C) ambient.</p> <p>Operating: 0° to 140°F (-18° to 60°C) ambient temperature. Maximum allowable ambient 125°F (52°C) at maximum valve fluid temperature of 281°F (138°C). Minimum allowable valve fluid temperature 20°F (-7°C).</p>
Humidity	5 to 95% RH, non-condensing.
Locations	NEMA Type 1
Agency Listings (Actuator)	
UL	UL 873, Underwriters Laboratories (File # E9429 Category Temperature-Indicating and Regulating Equipment).
European Community	EMC Directive (89/336/EEC).
c-UL	Canadian Standards C22.2 No. 24-93.

^a MFC-8000 control module may be installed for Vdc control or MFC-420 control module may be installed for mAdc control.

^b Not available when MFC control modules are used.

Dimensions - 2-1/2" to 5" Flanged Globe Valve Assemblies

Valve Assembly Part Number	Valve Size	p Code	Valve Dimensions in inches (millimeters)									
			2-Way (Refer to Figure-4)					3-Way (Refer to Figure-5)				
			A	C	E	F	G	A	C	E	F	G
2-Way Vx-8213-30x-5-P Vx-8213-42x-5-P	2-1/2"	12	8-9/16 (217)	4 (102)	13-5/16 (338)	7 (178)	5-1/2 (140)	8-9/16 (217)	5-7/16 (138)	10-1/4 (260)	7 (178)	5-1/2 (140)
	3"	13	9-1/2 (241)	4-5/8 (117)	12-5/8 (320)	7-1/2 (191)	6 (152)	9-1/2 (241)	6-3/8 (162)	10-1/2 (267)	7-1/2 (191)	6 (152)
3-Way Vx-8303-30x-5-P Vx-8303-42x-5-P	4"	14	11-1/2 (292)	5-1/12 (140)	12-3/8 (315)	9 (229)	7-1/2 (191)	11-1/2 (292)	8-7/16 (214)	11-1/4 (286)	9 (229)	7-1/2 (191)
	5"	15	13 (330)	6-15/16 (176)	14-15/16 (379)	10 (254)	8-1/2 (216)	13 (330)	8-13/16 (224)	14-15/16 (379)	10 (254)	8-1/2 (216)
2-Way Vx-8223-30x-5-P Vx-8223-42x-5-P	2-1/2"	12	8-9/16 (217)	4 (102)	9-9/16 (243)	7 (178)	5-1/2 (140)	—	—	—	—	—
	3"	13	9-1/2 (241)	4-1/4 (108)	11-1/16 (281)	7-1/2 (191)	6 (152)	—	—	—	—	—
	4"	14	11-1/2 (292)	4-15/16 (125)	13-3/4 (349)	9 (229)	7-1/2 (191)	—	—	—	—	—
	5"	15	13 (330)	5-7/16 (138)	16-1/16 (408)	10 (254)	8-1/2 (216)	—	—	—	—	—

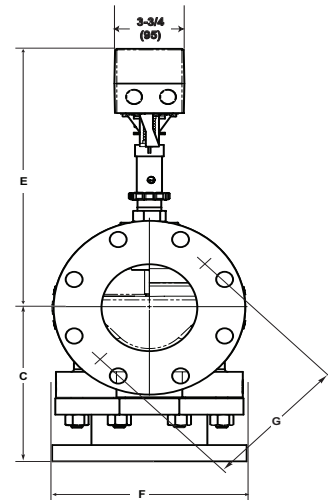
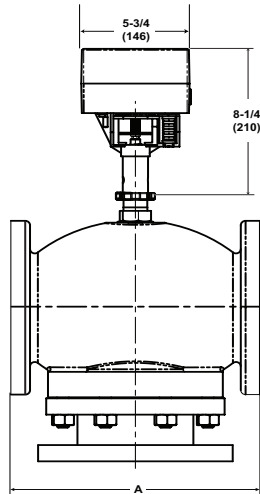
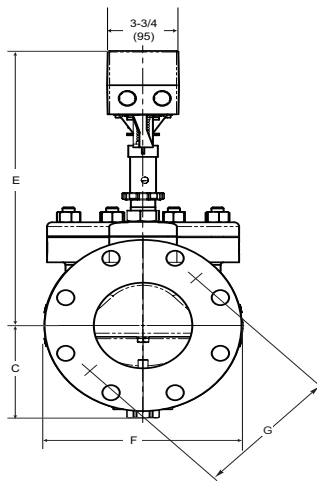
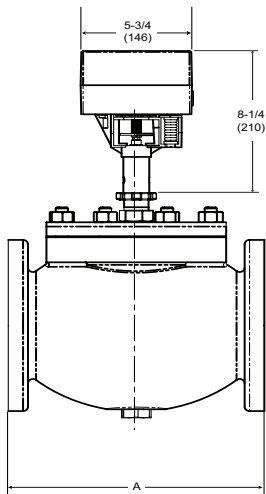


Figure-4 Mx-631x3 Series with Flanged 2-Way Globe Valves

Figure-5 Mx-631x3 Series with Flanged 3-Way Globe Valves

Valve Assemblies with Mx61-720x Spring Return Linear DuraDrive Electric Actuators

Inputs									
Control Signal		MA61-720x: SPST Two-position Control, Triacs (500 mA rated)							
		MF61-7203: SPDT Floating Point Control, 24 Vac Triacs (500 mA rated), or 2 SPST contacts.							
		MS61-7203: Proportional, 2 to 10 Vdc or 4 to 20 mAdc with an external 500 ohm resistor.							
Power Requirements		All 24 Vac circuits are Class 2.							
Power Input @ 50/60 Hz									
Actuator Code	Part Number	Voltage 50/60 Hz	Running				DC Amps	Holding	
			50 Hz		60 Hz			50 Hz	60 Hz
			VA	W	VA	W		W	W
595	MA61-7200	120 Vac ±10%	11.7	8.8	10.0	8.4	—	3.6	5.0
594	MA61-7201	230 Vac ±10%	15.5	9.5	10.6	8.5	—	4.6	3.3
596	MA61-7203	24 Vac ±20% 22-30 Vdc	9.8	7.5	9.7	7.5	0.29	2.8	2.8
596	MF61-7203		9.8	7.7	9.7	7.7	0.30	3.3	3.3
596	MS61-7203								
590	MS61-7203-40								
597	MS61-7203-50		9.8	7.4	9.7	7.4	0.28	2.9	2.9
Connections		3 ft. (91 cm) long appliance cables; 1/2" conduit connectors. For metric conduit use AM-756 adapter.							
Motor Type		Brushless DC							
Outputs									
Electrical		Control mode switch: Provided for selection of direct acting or reverse acting control mode on MS61-7203 proportional models.							
		Position feedback voltage: 2 to 10 Vdc (max. 0.5 mA) position feedback signal (MS61-7203).							
Mechanical		Output force rating: 220 lbf (979 N) minimum, 495 lbf (2202 N) maximum stall.							
		Timing: Approximate timing is 190 seconds.							
		Position indicator: Provided on actuator and linkage for position indication.							
		Manual override: Activated by the manual override crank.							
		Linear Stroke: 1" (25 mm) nominal.							
Environment									
Temperature Limits		Shipping and storage: -40 to 160°F (-40 to 71°C) ambient.							
		Operating: 0°F to 140°F (-18°C to 60°C) ambient temperature. Maximum allowable ambient 140°F (60°C) at maximum fluid temperature of 281°F (138°C). Minimum allowable valve fluid temperature: 20°F (-7°C).							
Humidity		5 to 95% RH, non-condensing.							
Locations		NEMA 2, UL Type 2, IEC IP54, with customer-supplied water tight conduit connectors.							
Agency Listings (Actuator)									
UL		UL 873, Underwriters Laboratories (File #E9429 Category Temperature-Indicating and Regulating Equipment).							
European Community		EMC Directive (89/336 EEC). Low Voltage Directive (72/23/EEC).							
c-UL		Canadian Standards C22.2 No. 24-93.							
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 - 2-1/2" to 5" Flanged Globe Valve Assemblies

Valve Assembly Part Number	Valve Size	P Code	Valve Dimensions in inches (millimeters)									
			2-Way (Refer to Figure-6)					3-Way (Refer to Figure-7)				
			A	C	E	F	G	A	C	E	F	G
2-Way Vx-8213-59x-5-P 3-Way Vx-8303-59x-5-P	2-1/2"	12	8-9/16 (217)	4 (102)	12-3/8 (314)	7 (178)	5-1/2 (140)	8-9/16 (217)	5-7/16 (138)	13-3/4 (349)	7 (178)	5-1/2 (140)
	3"	13	9-1/2 (241)	4-5/8 (117)	12-5/8 (320)	7-1/2 (191)	6 (152)	9-1/2 (241)	6-3/8 (162)	14 (356)	7-1/2 (191)	6 (152)
	4"	14	11-1/2 (292)	5-1/2 (140)	13-3/8 (340)	9 (229)	7-1/2 (191)	11-1/2 (292)	8-7/16 (214)	14-3/4 (375)	9 (229)	7-1/2 (191)
	5"	15	13 (330)	6-15/16 (176)	15-1/8 (384)	10 (254)	8-1/2 (216)	13 (330)	8-13/16 (224)	15-1/8 (384)	10 (254)	8-1/2 (216)
2-Way Vx-8223-59x-5-P	2-1/2"	12	8-9/16 (217)	4 (102)	13 (330)	7 (178)	5-1/2 (140)	—	—	—	—	—
	3"	13	9-1/2 (241)	4-1/4 (108)	14-1/2 (368)	7-1/2 (191)	6 (152)	—	—	—	—	—
	4"	14	11-1/2 (292)	4-15/16 (125)	15-3/8 (391)	9 (229)	7-1/2 (191)	—	—	—	—	—
	5"	15	13 (330)	5-7/16 (138)	16-5/16 (415)	10 (254)	8-1/2 (216)	—	—	—	—	—

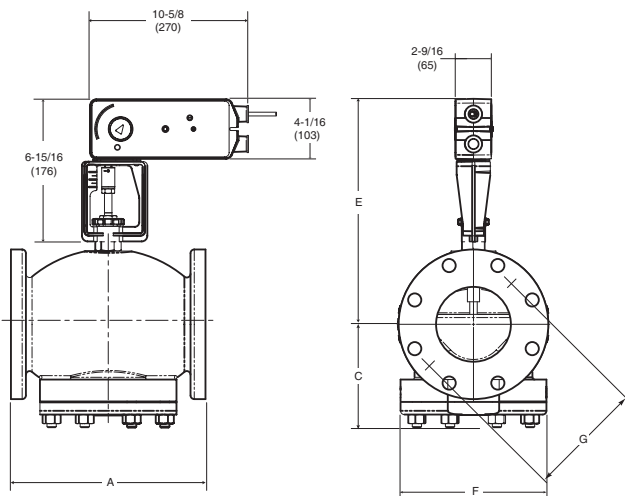


Figure-6 Mx61-720x with
2-1/2" to 5" Flanged 2-Way Globe Valves

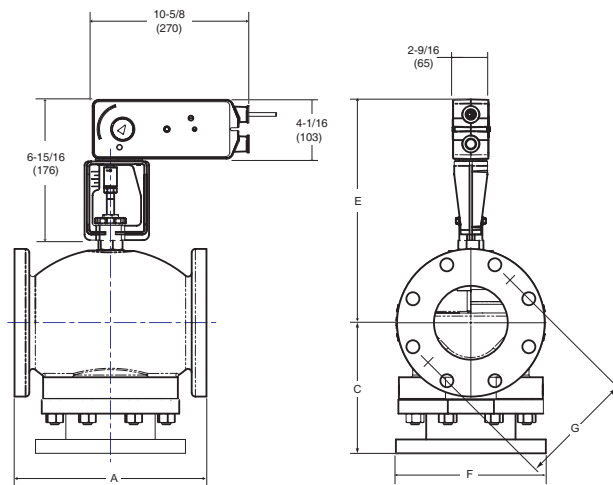


Figure-7 Mx41-720x with
2-1/2" to 5" Flanged 3-Way Globe Valves

Valve Assemblies with Mx41-715x Spring Return DuraDrive Electric Actuators

Inputs								
Control Signal		MA41-715x: SPST Two-position Control, Triacs (500 mA rated)						
		MF41-7153: SPDT Floating Point Control, 24 Vac, Triacs (500 mA rated) , or 2 SPST contacts.						
		MS41-7153: Proportional, 2 to 10 Vdc or 4 to 20 mAdc with an external 500Ω resistor.						
Power Requirements		All 24 Vac circuits are Class 2.						
Actuator Code	Part Number	Power Input @ 50/60 Hz						
		Voltage 50/60 Hz	Running				Holding	
			50 Hz		60 Hz		50 Hz	60 Hz
			VA	W	VA	W	W	W
552	MA41-7150	120 Vac ±10%	11.7	8.8	10.0	8.4	3.6	5.0
554	MA41-7151	230 Vac ±10%	15.5	9.5	10.6	8.5	4.6	3.3
556	MA41-7153	24 Vac ±20% 22-30 Vdc	9.8	7.5	9.7	7.5	2.8	2.8
556	MF41-7153		9.8	7.7	9.7	7.7	3.3	3.3
556	MS41-7153		9.8	7.4	9.7	7.4	2.9	2.9
Connections		3 ft. (91 cm) long appliance cables; 1/2" conduit connectors. For metric conduit use AM-756 adapter.						
Motor Type		Brushless DC						
Outputs								
Electrical		Control mode switch: Provided for selection of direct acting or reverse acting control mode on MS41-7153 proportional models.						
		Auxiliary switches: Two auxiliary switches available with Mx41-715x-502, SPDT 7A resistive @ 250 Vac, one fixed @ 5° and one adjustable 25° to 85°. Switches meet VDE requirements for 7A (2.5A) @ 250 Vac						
		Position feedback voltage: 2 to 10 Vdc (maximum 0.5 mA) output signal for position feedback or operation of up to four slave actuators (MS41-7153 only).						
Mechanical		Output torque rating: 133 lb-in (15 N-m) minimum.						
		Timing: Approximate timing is 190 seconds.						
		Position indicator: Pointer and scale are provided for position indication.						
		Manual override: Activated by the manual override crank.						
		Stroke: Electronically limited to a maximum of 95°; with mechanical stop.						
Environment								
Temperature Limits		Shipping and storage: -40 to 160°F (-40 to 71°C) ambient.						
		Operating: -22 to 140°F (-30 to 60°C) ambient temperature. Maximum allowable ambient: 115°F (46°C) at maximum valve fluid temperature of 281°F (138°C). Minimum allowable valve fluid temperature: 20°F (-7°C).						
Humidity		5 to 95% RH, non-condensing.						
Locations		NEMA Type 2, UL Type 2, IEC IP54.						
Agency Listings (Actuator)								
UL		UL 873, Underwriters Laboratories (File #E9429 Category Temperature-Indicating and Regulating Equipment).						
European Community		EMC Directive (89/336 EEC). Low Voltage Directive (72/23/EEC).						
c-UL		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.						

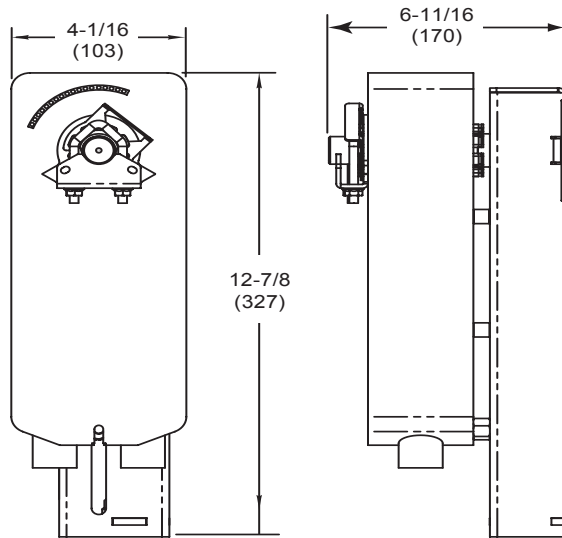


Figure-8 Mx41-715x-220 Actuator/Linkage Assembly

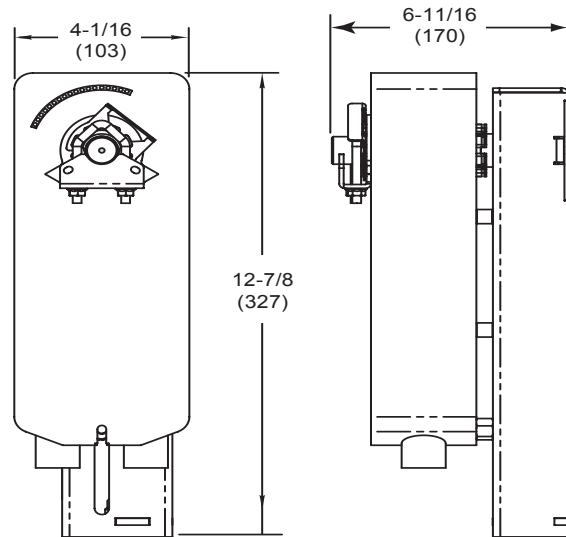


Figure-9 Mx41-715x-230 Actuator/Linkage Assembly

Dimensions - 2-1/2" to 6" Flanged Globe Valve Assemblies

Valve Assembly Part Number	Valve Size	P Code	Valve Dimensions in inches (millimeters)											
			2-Way (Refer to Figure-10)						3-Way (Refer to Figure-11)					
			A	C	E	F	G	H	A	C	E	F	G	H
2-Way Vx-8213-55x-5-P 3-Way Vx-8303-55x-5-P	2-1/2"	12	8-9/16 (217)	4 (102)	17-5/8 (448)	7 (178)	5-1/2 (140)	8-3/8 (213)	8-9/16 (217)	5-7/16 (138)	17-5/8 (448)	7 (178)	5-1/2 (140)	8-3/8 (213)
	3"	13	9-1/2 (241)	4-5/8 (117)	17-1/2 (444)	7-1/2 (191)	6 (152)	8-3/4 (222)	9-1/2 (241)	6-3/8 (162)	17-1/2 (444)	7-1/2 (191)	6 (152)	8-3/4 (222)
	4"	14	11-1/2 (292)	5-1/2 (140)	18-5/8 (473)	9 (229)	7-1/2 (191)	9-3/8 (238)	11-1/2 (292)	8-7/16 (214)	18-5/8 (473)	9 (229)	7-1/2 (191)	9-3/8 (238)
	5"	15	13 (330)	6-15/16 (176)	18-9/16 (472)	10 (254)	8-1/2 (216)	10-1/16 (256)	13 (330)	8-13/16 (224)	18-5/8 (473)	10 (254)	8-1/2 (216)	10-1/16 (256)
	6"	16	14 (356)	7-1/2 (190)	19-15/16 (507)	11 (280)	9-1/2 (241)	12 (305)	14 (356)	9-3/4 (248)	20-9/16 (522)	11 (280)	9-1/2 (241)	12 (305)
2-Way Vx-8223-55x-5-P	2-1/2"	12	8-9/16 (217)	4 (102)	16-1/2 (419)	7 (178)	5-1/2 (140)	8-3/8 (213)	—	—	—	—	—	—
	3"	13	9-1/2 (241)	4-1/4 (108)	17-5/8 (448)	7-1/2 (191)	6 (152)	8-3/4 (222)	—	—	—	—	—	—
	4"	14	11-1/2 (292)	4-15/16 (125)	18-1/2 (470)	9 (229)	7-1/2 (191)	9-3/8 (238)	—	—	—	—	—	—
	5"	15	13 (330)	5-7/16 (138)	19-3/4 (502)	10 (254)	8-1/2 (216)	10-1/16 (256)	—	—	—	—	—	—
	6"	16	14 (356)	6-1/4 (159)	21-3/8 (543)	11 (280)	9-1/2 (241)	12 (305)	—	—	—	—	—	—

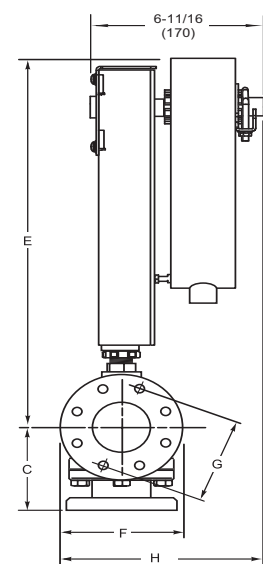
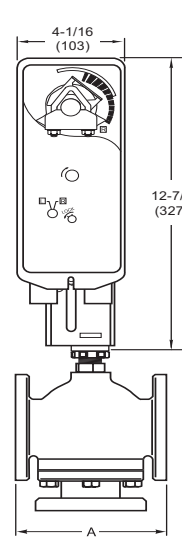
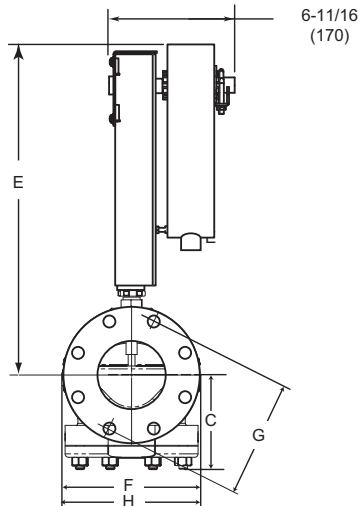
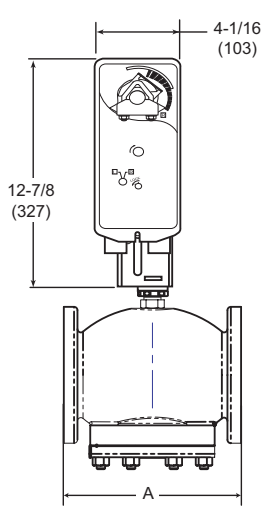


Figure-10 Mx41-715x with Flanged 2-Way Globe Valves

Figure-11 Mx41-715x with Flanged 3-Way Globe Valves

Valve Assemblies with Mx40-717x Spring Return DuraDrive Electric Actuators

Actuator Specifications																																																								
Inputs																																																								
Control Signal	MA40-717x: SPST Two-position Control, Triacs (500 mA rated)																																																							
	MF40-7173: SPDT Floating Point Control, 24 Vac, Triacs (500 mA rated), or 2 SPST contacts.																																																							
	MS40-7173: Proportional, 2 to 10 Vdc or 4 to 20 mAdc with an external 500 ohm resistor.																																																							
Power Requirements	All 24 Vac circuits are Class 2.																																																							
	<table border="1"> <thead> <tr> <th rowspan="2">Actuator Code</th> <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>572</td> <td>MA40-7170</td> <td>120 Vac \pm10%</td> <td>11.4</td> <td>9.4</td> <td>7.2</td> </tr> <tr> <td>574</td> <td>MA40-7171</td> <td>240 Vac \pm10%</td> <td>11.8</td> <td>9.5</td> <td>7.4</td> </tr> <tr> <td>576</td> <td>MA40-7173</td> <td rowspan="2">24 Vac \pm20%</td> <td>9.6</td> <td>4.1</td> <td>5.4</td> </tr> <tr> <td>576</td> <td>MF40-7173</td> <td>10.0</td> <td>4.3</td> <td>5.5</td> </tr> <tr> <td>572</td> <td>MS40-7170</td> <td>120 Vac \pm10%</td> <td>11.1</td> <td>9.1</td> <td>7.1</td> </tr> <tr> <td>574</td> <td>MS40-7171</td> <td>240 Vac \pm10%</td> <td>11.8</td> <td>10.1</td> <td>7.4</td> </tr> <tr> <td>576</td> <td>MS40-7173</td> <td>24 Vac \pm20%</td> <td>9.4</td> <td>5.4</td> <td>7.1</td> </tr> </tbody> </table>					Actuator Code	Part Number	Power Input @ 50/60 Hz				Voltage	Running VA	Holding VA	Watts	572	MA40-7170	120 Vac \pm 10%	11.4	9.4	7.2	574	MA40-7171	240 Vac \pm 10%	11.8	9.5	7.4	576	MA40-7173	24 Vac \pm 20%	9.6	4.1	5.4	576	MF40-7173	10.0	4.3	5.5	572	MS40-7170	120 Vac \pm 10%	11.1	9.1	7.1	574	MS40-7171	240 Vac \pm 10%	11.8	10.1	7.4	576	MS40-7173	24 Vac \pm 20%	9.4	5.4	7.1
Actuator Code	Part Number	Power Input @ 50/60 Hz																																																						
		Voltage	Running VA	Holding VA	Watts																																																			
572	MA40-7170	120 Vac \pm 10%	11.4	9.4	7.2																																																			
574	MA40-7171	240 Vac \pm 10%	11.8	9.5	7.4																																																			
576	MA40-7173	24 Vac \pm 20%	9.6	4.1	5.4																																																			
576	MF40-7173		10.0	4.3	5.5																																																			
572	MS40-7170	120 Vac \pm 10%	11.1	9.1	7.1																																																			
574	MS40-7171	240 Vac \pm 10%	11.8	10.1	7.4																																																			
576	MS40-7173	24 Vac \pm 20%	9.4	5.4	7.1																																																			
Connections	2 ft. (61 cm) long appliance cables; 1/2" conduit connectors. For metric conduit use AM-756 adapter.																																																							
Motor Type	Brushless DC																																																							
Outputs																																																								
Mechanical	Output torque rating: 150 lb-in (17 N-m).																																																							
	Timing: Approximate timing is 145 seconds.																																																							
	Position Indicator: Pointer and scale are provided for position indication.																																																							
	Stroke: Electronically limited to a maximum of 93° \pm 1°.																																																							
Environment																																																								
Temperature Limits	Shipping and storage: -40 to 160 °F (-40 to 71 °C) ambient.																																																							
	Operating: -25 to 140 °F (-32 to 60 °C) ambient temperature. Maximum allowable ambient: 133°F (56°C) at maximum valve fluid temperature of 281°F (138°C). Minimum allowable valve fluid temperature: 20°F (-7°C).																																																							
Humidity	5 to 95% RH, non-condensing.																																																							
Locations	NEMA Type 1, NEMA Type 4; UL Type 4 (IEC IP56), with customer supplied water tight conduit connectors.																																																							
Agency Listings (Actuator)																																																								
UL	UL 873, Underwriters Laboratories (File #E9429 Category Temperature-Indicating and Regulating Equipment).																																																							
European Community	EMC Directive (89/336 EEC). Low Voltage Directive (72/23/EEC).																																																							
c-UL	Canadian Standards C22.2 No. 24-93.																																																							
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.																																																							

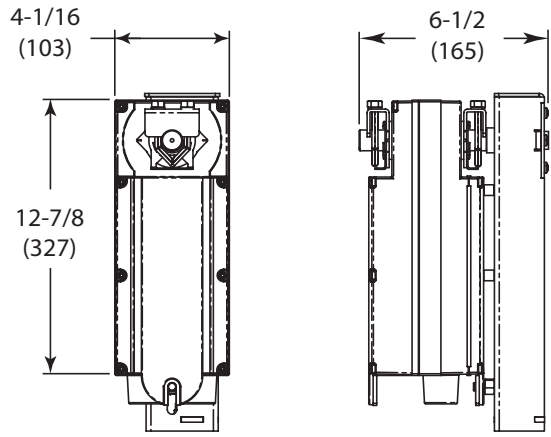


Figure-12 Mx40-717x-220 Actuator/Linkage Assembly

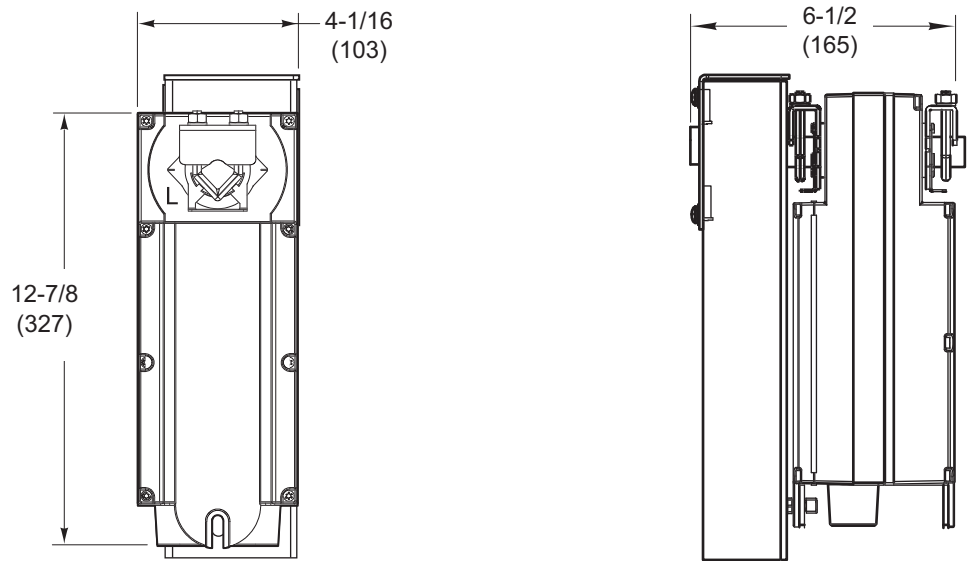


Figure-13 Mx40-717x-230 Actuator/Linkage Assembly

Dimensions - 2-1/2" to 6" Flanged Globe Valve Assemblies

Valve Assembly Part Number	Valve Size	P Code	Valve Dimensions in inches (millimeters)											
			2-Way (Refer to Figure-14)						3-Way (Refer to Figure-15)					
			A	C	E	F	G	H	A	C	E	F	G	H
2-Way Vx-8213-57x-5-P 3-Way Vx-8303-57x-5-P	2-1/2"	12	8-9/16 (217)	4 (102)	17-1/4 (438)	7 (178)	5-1/2 (140)	8-3/4 (222)	8-9/16 (217)	5-7/16 (138)	17-1/4 (438)	7 (178)	5-1/2 (140)	8-3/4 (222)
	3"	13	9-1/2 (241)	4-5/8 (117)	17 (432)	7-1/2 (191)	6 (152)	9 (229)	9-1/2 (241)	6-3/8 (162)	17 (432)	7-1/2 (191)	6 (152)	9 (229)
	4"	14	11-1/2 (292)	5-1/2 (140)	18-1/4 (464)	9 (229)	7-1/2 (191)	9-3/4 (248)	11-1/2 (292)	8-7/16 (214)	18-1/4 (464)	9 (229)	7-1/2 (191)	9-3/4 (248)
	5"	15	13 (330)	6-15/16 (176)	18-3/16 (462)	10 (254)	8-1/2 (216)	10-1/16 (256)	13 (330)	8-13/16 (224)	17-1/4 (464)	10 (254)	8-1/2 (216)	10-1/16 (256)
	6"	16	14 (356)	7-1/2 (190)	19-15/16 (507)	11 (280)	9-1/2 (241)	12 (305)	14 (356)	9-3/4 (248)	20-1/4 (515)	11 (280)	9-1/2 (241)	12 (305)
2-Way Vx-8223-57x-5-P	2-1/2"	12	8-9/16 (217)	4 (102)	16-5/8 (422)	7 (178)	5-1/2 (140)	8-3/4 (222)	—	—	—	—	—	—
	3"	13	9-1/2 (241)	4-1/4 (108)	17-1/4 (438)	7-1/2 (191)	6 (152)	9 (229)	—	—	—	—	—	—
	4"	14	11-1/2 (292)	4-15/16 (125)	18-1/4 (464)	9 (229)	7-1/2 (191)	9-3/4 (248)	—	—	—	—	—	—
	5"	15	13 (330)	5-7/16 (138)	19-3/8 (492)	10 (254)	8-1/2 (216)	10-1/16 (256)	—	—	—	—	—	—
	6"	16	14 (356)	6-1/4 (159)	21-3/8 (543)	11 (280)	9-1/2 (241)	12 (305)	—	—	—	—	—	—

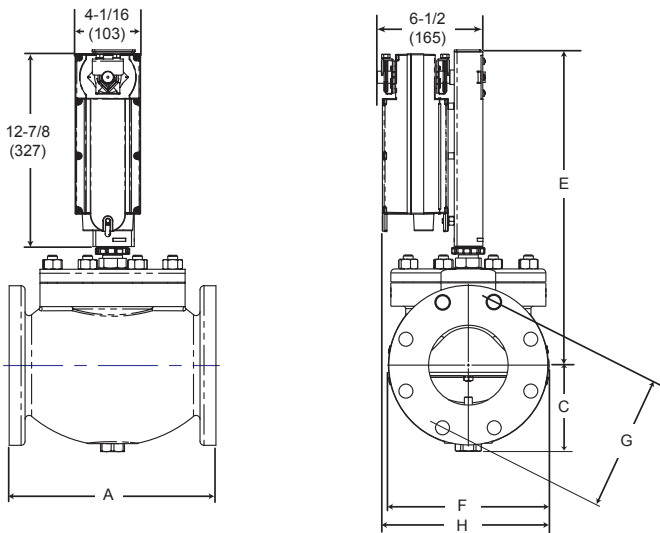


Figure-14 Mx40-717x with Flanged 2-Way Globe Valves

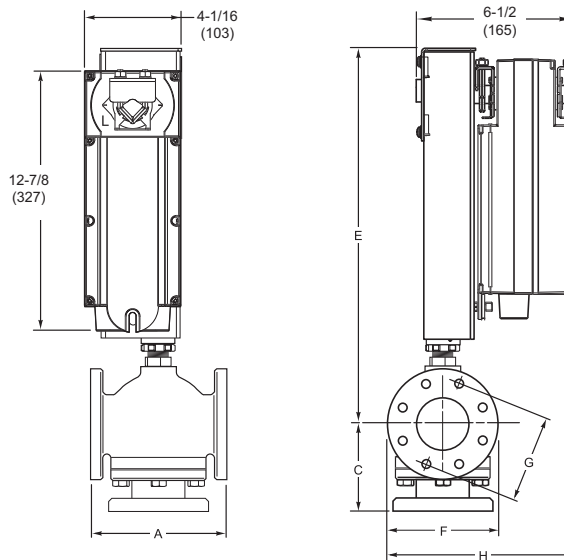


Figure-15 Mx40-717x with Flanged 3-Way Globe Valves

Actuator Specifications and Valve Assembly Mounting Dimensions

Valve Assemblies with MK-6811 and MK-6911 Spring Return Pneumatic Actuators

Actuator Specifications	
Inputs	
Control Signal	5 to 10 psig (34 to 69 kPa). Positive positioner start point adjustable 1 to 12 psi (7 to 83 kPa). Positive positioner span adjustable 2 to 13 psi (14 to 89 kPa).
Supply Pressure	15 to 20 psig (103 to 137 kPa) nominal, 30 psig (205 kPa) maximum.
Air Connections	1/8 in FNPT
Effective Area	50 sq. in. (323 cm ²)
Outputs	
	MK-6811: 1" (25 mm) nominal stroke. MK-6911: 1-3/4" (45 mm) nominal stroke.
Environment	
Temperature Limits	Shipping and storage: -40 to 220°F (-40 to 104°C) ambient. Operating: -20°F to 220°F (-29°C to 104°C). Maximum allowable ambient: 220°F (104°C) at maximum valve fluid temperature of 281°F (138°C). Minimum allowable valve fluid temperature: 20°F (-7°C).
Positive Positioner	AK-42309-500 recommended for 5" valve, required for 6" valve. Order separately. Supplied as standard on VK4 factory valve assemblies.

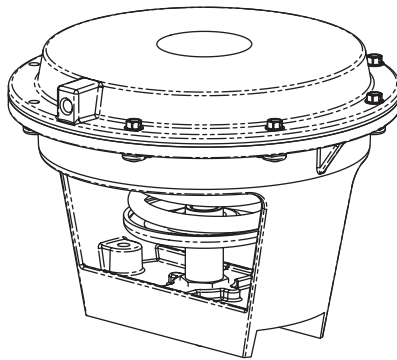


Figure-16 MK-6811 Actuator

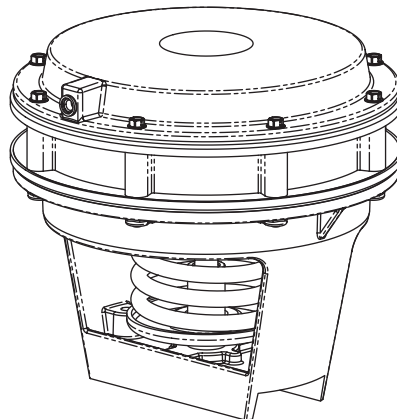


Figure-17 MK-6911 Actuator

Dimensions - 2-1/2" to 6" Flanged Globe Valve Assemblies

Valve Assembly Part Number ^a	Valve Size	P Code	Valve Dimensions in inches (millimeters)									
			2-Way (Refer to Figure-18 and Figure-20)					3-Way (Refer to Figure-19 and Figure-21)				
			A	C	E	F	G	A	C	E	F	G
	2-1/2"	12	8-9/16 (217)	4 (102)	15-7/8 (403)	7 (178)	5-1/2 (140)	8-9/16 (217)	5-7/16 (138)	15-5/8 (397)	7 (178)	5-1/2 (140)
2-Way VK-8213-602-5-P VK4-8213-6x2-5-P 3-Way VK-8303-602-5-15 VK4-8303-6x2-5-P	3"	13	9-1/2 (241)	4-5/8 (117)	16-1/4 (413)	7-1/2 (191)	6 (152)	9-1/2 (241)	6-3/8 (162)	16-1/4 (413)	7-1/2 (191)	6 (152)
	4"	14	11-1/2 (292)	5-1/2 (140)	16-7/8 (429)	9 (229)	7-1/2 (191)	11-1/2 (292)	8-7/16 (214)	16-7/8 (429)	9 (229)	7-1/2 (191)
	5"	15	13 (330)	6-15/16 (176)	18-3/16 (462)	10 (254)	8-1/2 (216)	13 (330)	8-13/16 6 (224)	18-3/16 (462)	10 (254)	8-1/2 (216)
	6"	16	14 (356)	7-1/2 (190)	21-9/16 (548)	11 (280)	9-1/2 (241)	14 (356)	9-3/4 (248)	21-9/16 (548)	11 (280)	9-1/2 (241)
2-Way VK-8223-602-5-P VK4-8223-6x2-5-P	2-1/2"	12	8-9/16 (217)	4 (102)	16-1/4 (413)	7 (178)	5-1/2 (140)	—	—	—	—	—
	3"	13	9-1/2 (241)	4-1/4 (108)	16-5/8 (422)	7-1/2 (191)	6 (152)	—	—	—	—	—
	4"	14	11-1/2 (292)	4-15/16 (125)	17-7/8 (454)	9 (229)	7-1/2 (191)	—	—	—	—	—
	5"	15	13 (330)	5-7/16 (138)	19-3/8 (492)	10 (254)	8-1/2 (216)	—	—	—	—	—
	6"	16	14 (356)	6-1/4 (159)	22-15/16 (583)	11 (280)	9-1/2 (241)	—	—	—	—	—

^a VK4 factory assemblies include AK-42309-500 positive positioner. Positive positioner optional for 2-1/2" to 5", required for 6".

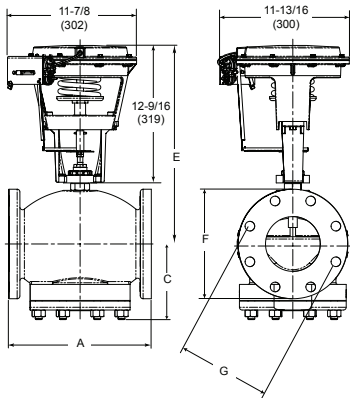


Figure-18 MK-6811 with Flanged 2-Way Globe Valves

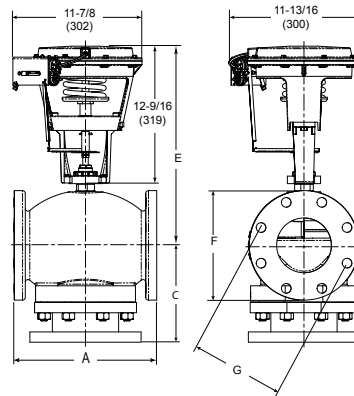


Figure-19 MK-6811 with Flanged 3-Way Globe Valves

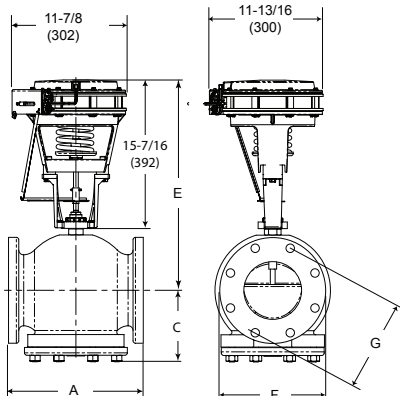


Figure-20 MK-6911 with Flanged 2-Way Globe Valves

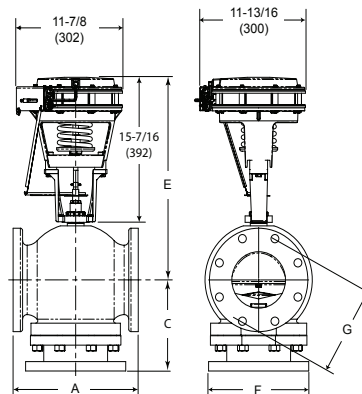


Figure-21 MK-6911 with Flanged 3-Way Globe Valves

System Design Considerations

Linked Globe Valve Assemblies

Note: The information in this section describes characteristics of the VB-8xx3 valve bodies, which are used in the Vx-8xx3 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: The flow curve shown in Figure-22 is representative of all sizes. All valve plugs have lower gain when nearly closed to enhance control at low demand. Two-way valves are nominally equal percentage and normally used for water and low pressure steam.

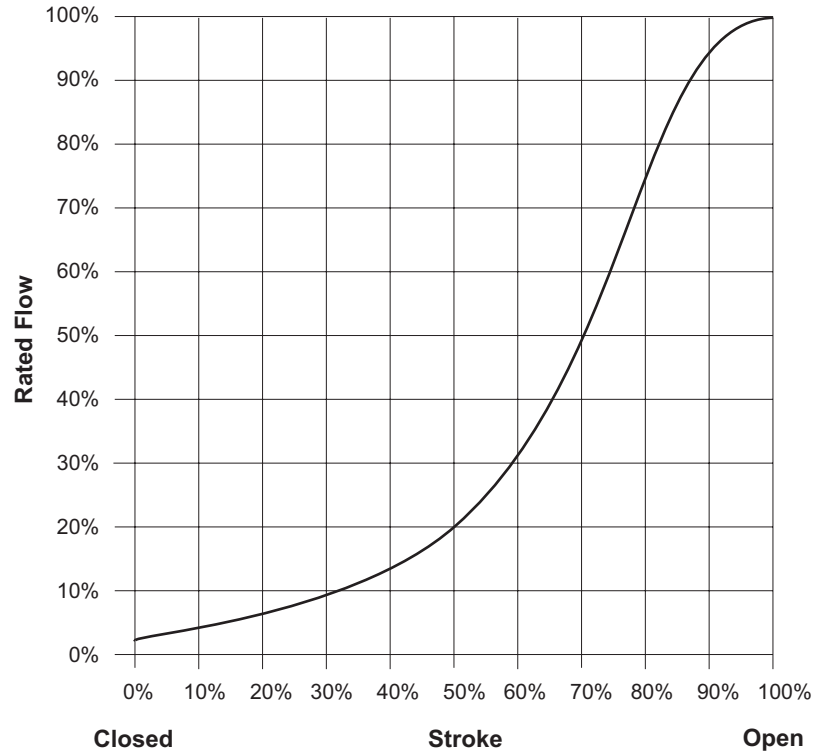


Figure-22 Typical Modified Equal Percentage Flow Characteristics

3-Way Valves: 3-way mixing valves are designed so that the flow from either of the inlet ports to the outlet is nominally linear, which means the total flow from the outlet is almost constant over the stroke of the valve stem. The flow is limited at the initial opening similar to an equal percentage curve to enhance system stability. See Figure-23 for typical flow characteristics of the VB-8303 series valve bodies.

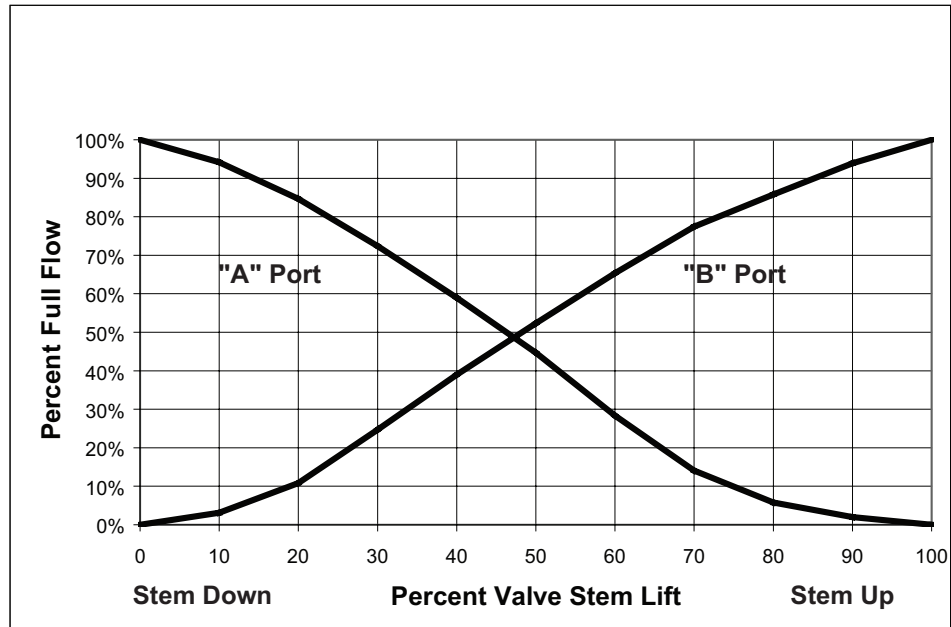


Figure-23 Typical Flow Characteristics

Rangeability

Rangeability is the ratio of rated flow to the minimum controllable flow through a valve. The nominal rangeability of the VB-8xx3 Series is greater than 100:1.

Temperature/Pressure Ratings

See Figure-24 for temperature and pressure ratings of 2-way and 3-way valves. Ratings conform with published values and disclaimer.

VB-8xx3-0-5-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: Cast iron, ASTM A126 Class B.

Trim: Stainless steel stem, forged brass plug, metal-to-metal or EPDM seat ring with TFE/EPDM packing parts and silicone packing grease.

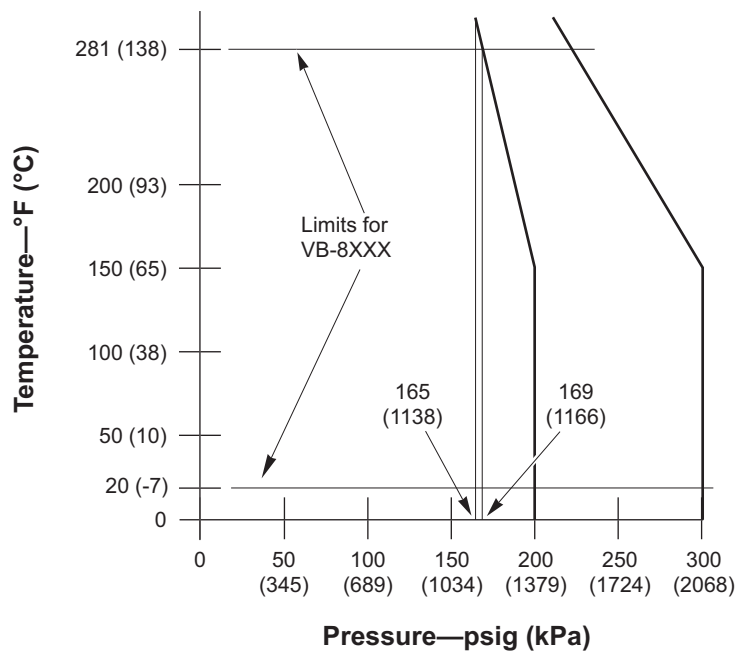


Figure-24 Temperature and Pressure Ratings for VB-8xx3 Series Globe Valves

Close-off Ratings

Nominal actuator close-off ratings are based on ANSI IV (0.01% leakage) for valves with EPDM seat rings such as VB-8213 and VB-8223. Metal-to-metal trim valves such as VB-8303 are designed for ANSI III (0.1% leakage).

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.

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

Flow Coefficient (C_v)

Sizing a valve requires selecting a flow coefficient (C_v), which is defined as the flow rate in gallons per minute (GPM) of 60°F water that will pass through the fully open valve with a 1 psi pressure drop (Δp). It is calculated according to the formula:

$$C_v = \frac{\text{GPM}}{\sqrt{\Delta P}}$$

Since the flow rate and resultant pressure drop through the heat exchanger is usually specified, the only variable normally available in sizing a valve is the valve pressure drop. The following information can be used to determine what pressure drop to use in calculating a valve C_v. Using the calculated C_v, refer to Step 6 on page 4 to select the valve body with the nearest available C_v.

Caution: Be sure to check that the anticipated pressure drop across the valve will not exceed the close-off pressure ratings in Table-1 and the maximum pressure differential ratings listed in Table-8 to Table-13.

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-14).

Table-14 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 Mixing Valves Used to Bypass Flow

When 3-way linked globe valve assemblies are used to control flow through a heating or cooling coil, the valve assembly is piped as a mixing valve on the outlet side of the coil to throttle the water flow through the load, and therefore control the heat output of the coil (Figure-25).

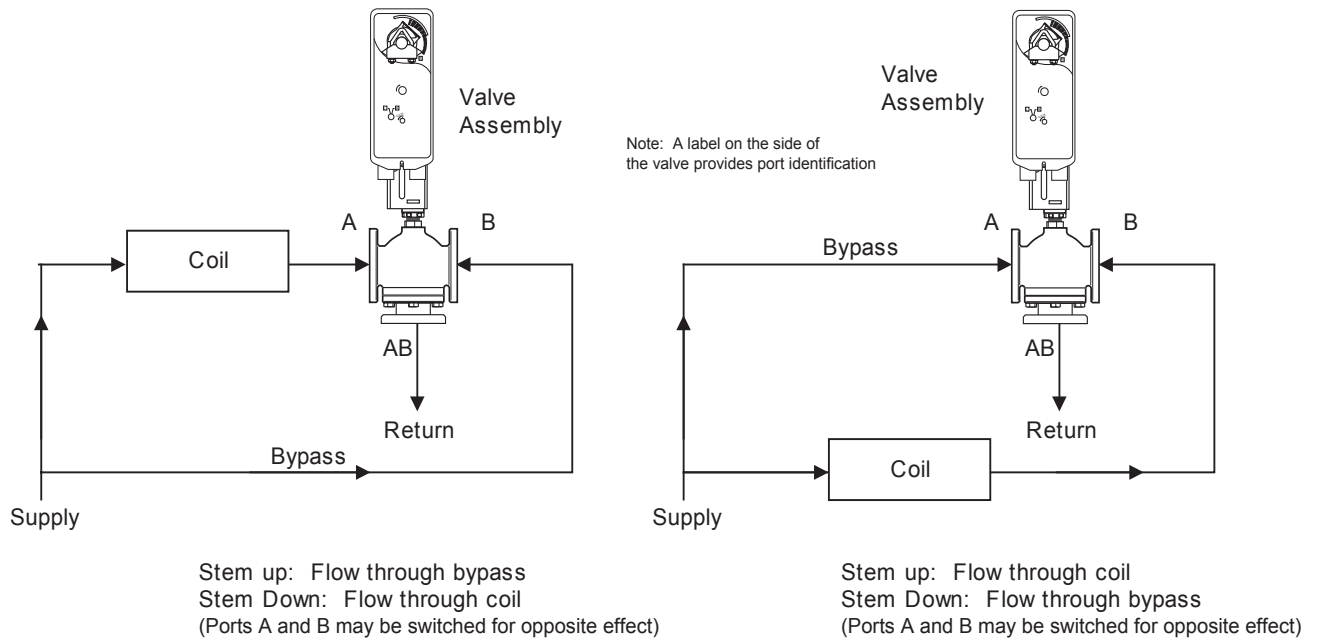


Figure-25 Typical Piping Choices for VB-8303 as 3-Way Mixing Valve for Control of Heating or Cooling Coil

3-Way Mixing Valves Used to Blend Water Flows

Three-way mixing valves used to blend two water flows (Figure-26) 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.

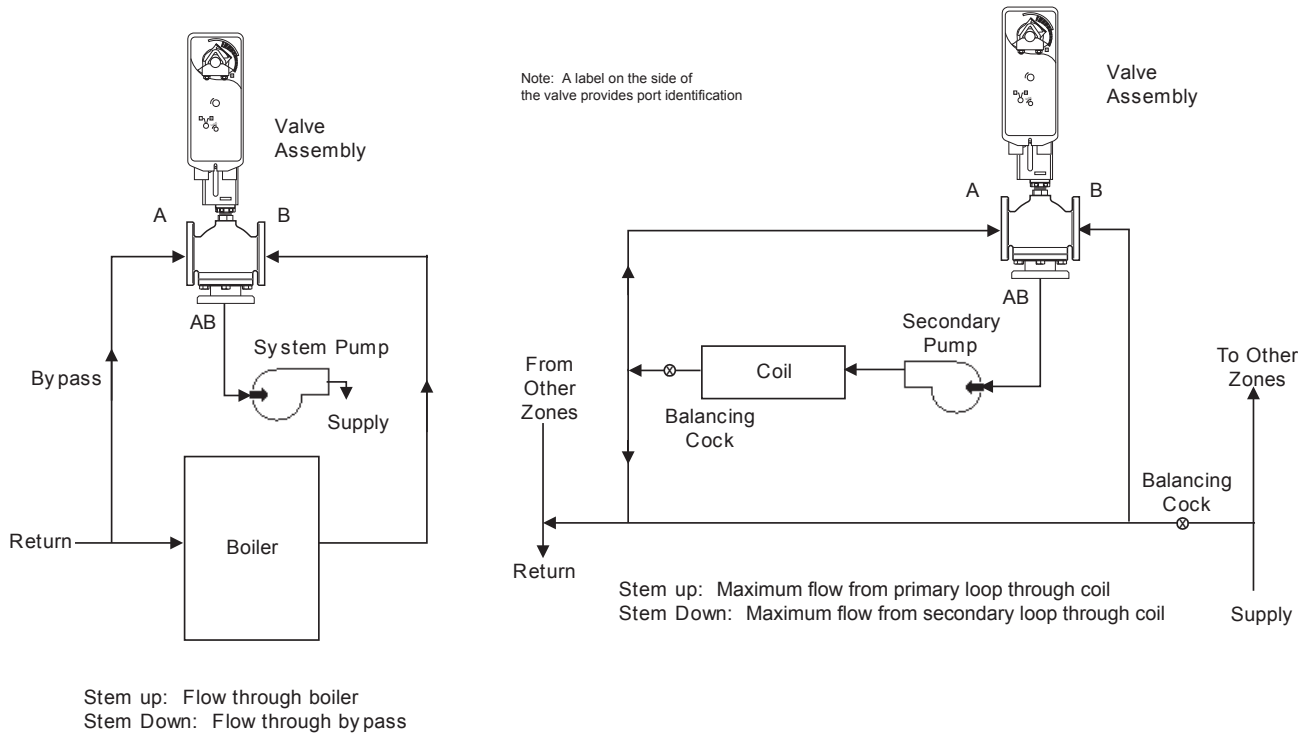


Figure-26 Typical Piping Choices for VB-8303 as 3-Way Mixing Valve for Proportional Control Used to Blend Two Water Flows

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-27).

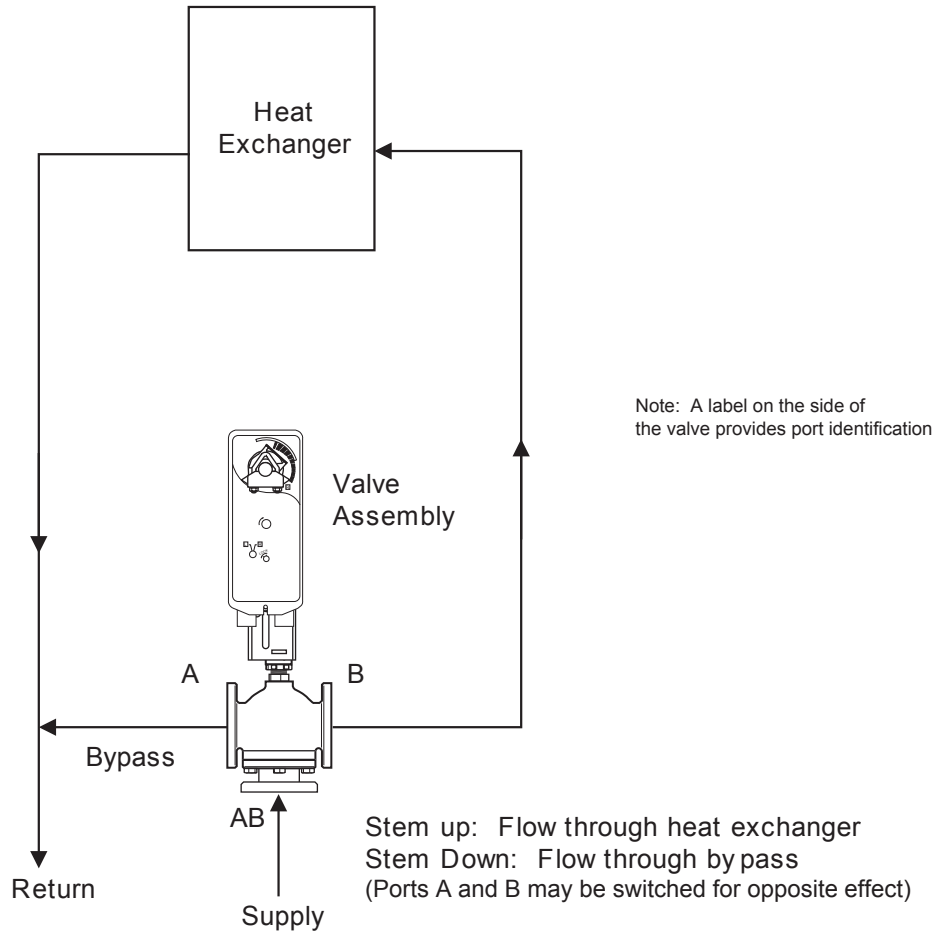


Figure-27 Typical Piping of VB-8303 as 3-Way Diverting Valve

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