VA/VF/VS-7000/9000 Series

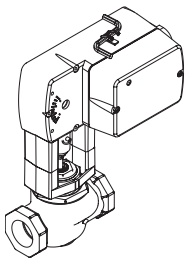
Linked Globe Valve Assemblies with Linear SmartX Actuators

Globe Valve Assemblies

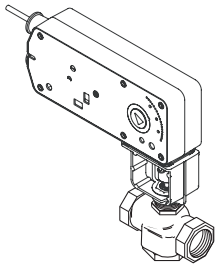
The Schneider Electric VA, VF, and VS-7000 and -9000 series Linked Globe Valve Assemblies with Schneider Electric SmartX Linear Series Actuators are complete actuator/valve assemblies that accept two position, floating, or proportional control, respectively, from a DDC system or from a thermostat, for control of hot water, chilled water, and steam.

These valve assemblies consist of Linear Series spring return Schneider Electric SmartX Actuators directly mounted on 1/2" up to 4" (15 mm to 80 mm) 2-way and 3-way globe valve bodies. 3-way assemblies are available for mixing (1/2" to 4") and diverting (1/2" to 2") applications. The Linear Series Schneider Electric SmartX Actuators feature linear travel and an integral linkage, eliminating the need for separate linkages.

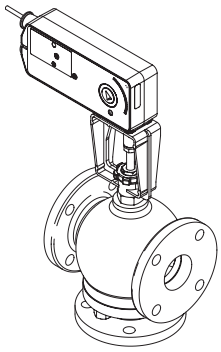
Typical applications include reheat on VAV boxes, fan coil units, hot and chilled water coils in air handling units, unit ventilators, and central system applications.



2-Way Linked Globe Valve Assembly (shown assembly uses SmartX Mx51-710x actuator)



3-Way Linked Globe Valve Assembly (shown assembly uses SmartX Mx51-720x actuator)



3-Way Linked Flanged Globe Valve Assembly (shown assembly uses SmartX Mx61-720x actuator)

Globe Valve Assembly Selection Procedure

When selecting a globe valve assembly, you must determine the applicable codes for the control signal type, valve body configuration, end connection, port size, and actuator. Select a globe valve assembly part number as follows:

1. Control Signal Type, Valve Body Configuration, and End Connection
   - Referring to "Part Numbering System" , select the appropriate codes for these part number fields.
2. Valve Size (Flow Coefficient)
   - If the required flow coefficient (C_v) has not yet been determined, do so as follows:
   - Refer to the "Sizing and Selection" to calculate the required Cv.
   - Select the nearest available C_v and corresponding valve body port code from "Part Numbering System" .
3. Actuator
   - Select the appropriate actuator and code, according to "Part Numbering System" based on the control signal type, required valve normal position, and voltage requirements. For detailed actuator information, refer to the applicable actuator specifications.

   Note: Globe Valve Assemblies are not available with Mx51-7103-0x0 actuators (equipped with appliance wire). However, if required, you may field-assemble one of these actuators to a globe valve body.
4. Close-off Pressure
   - Confirm in Table-3 or Table-4 that the selected actuator and valve body combination provides sufficient close-off pressure. If no close-off pressure is shown, the valve body/actuator combination is not valid.
5. Available Space
   - If available space is a consideration, check the appropriate dimensional figure (Figure 8 through Figure 19) and its accompanying table for any potential fit problems.

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January, 2020 tc

Linked Globe Valve Assembly Part Numbering System

Linked Globe Valve Assemblies

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

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

Configuration ⚠1
721, 725, 727, 921 = 2-Way, Stem Up Open
722, 726, 728, 922 = 2-Way, Stem Up Closed
731, 931 = 3-Way, Mixing
732 = 3-Way, Diverting

Connection
1 = Union Straightway [a]
2 = Flared End [b]
3 = Thread NPT
5 = Metric Thread (Rp) [c]

[a] 1/2" to 1-1/4" only.
[b] 1/2" only.
[c] 15 to 80 mm only.

Actuator

Two Position
MA51-7100=801
MA51-7103=N/A [d]
MA51-7103-100=804
MA51-7101=802
MA51-7200=592
MA51-7201=591
MA51-7203=593
MA61-7200=595
MA61-7201=594

Proportional
MS51-7103-100=804
MS51-7103-120=806
MS51-7103-130=808
MS51-7103-140=810
MS51-7103-150=812
MS51-7103-160=814
MS51-7203=593
MS61-7203=596

Floating
MF51-7103=N/A [d]
MF51-7103-100=804
MF51-7203=593
MF61-7203=596

[d] Factory assemblies not available. Purchase actuator and valve body separately and field assemble.

Pattern Code
4 = Straightway
5 = Globe Flanged

Port Code

Size	2-Way Cv	2-Way P Code	3-Way Cv Mixing	3-Way Cv Diverting	3-Way P Code
1/2"	0.4	1	—	—	
	1.3	2	2.2	2.2	2
	2.2	3	—	—	
	4.4	4	4.4	4.4	4
3/4"	5.5	5	—	—	
	7.5	6	7.5	7.5	6
1"	10.0	7	—	—	
	14.0	8	14.0	15.0	8
1-1/4"	20.0	9	20.0	20.0	9
1-1/2"	28.0	10	28.0	28.0	10
2"	40.0	11	41.0	40.0	11
2-1/2"	56.0	12	67[e]	—	12
	65.0	12	74[f]	—	12
3"	85.0	13	91[e]	—	13
	85.0	13	101[f]	—	13
4"	145.0	14	170	—	14

Size	Kvs	P Code	Kvs Mixing	Kvs Diverting	P Code
15 mm	0.3	1	—	—	
	1.1	2	1.9	—	2
	1.9	3	—	—	
	3.8	4	3.8	—	4
20 mm	4.8	5	—	—	
	6.5	6	6.5	—	6
25 mm	8.7	7	—	—	
	12.0	8	12.0	—	8
32 mm	17.0	9	17.0	—	9
40 mm	24.0	10	24.0	—	10
50 mm	35.0	11	36.0	—	11
65 mm	56.0	12	58.0	—	12
80 mm	73.0	13	78.0	—	13

[e] Threaded valve body.
[f] Flanged valve body.

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

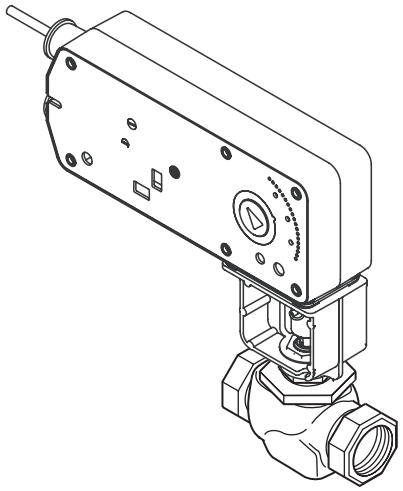
Valve Assemblies	Valve Body Action	Factory Shipped Position		Action
		Valve Stem	Flow	
VX-721X-XXX-4-P VX-725X-XXX-4-P VX-727X-XXX-4-P VX-921X-XXX-X-P	2-Way Stem Up Open	Up	Open	A to AB Flow decreases as actuator extends
VX-722X-XXX-4-P VX-726X-XXX-4-P VX-728X-XXX-4-P VX-922X-XXX-X-P	2-Way Stem Up Closed	Up	Closed	A to AB Flow increases as actuator extends
VX-731X-XXX-4-P VX-931X-XXX-X-P	3-Way Mixing	Up	B to AB	A to AB Flow increases as actuator extends B to AB Flow decreases as actuator extends
VX-732X-XXX-4-P	3-Way Diverting	Up	B to AB	B to A Flow increases as actuator extends

Valve/Actuator Combinations

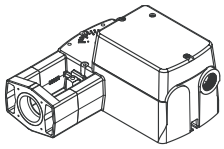
2-Way Linked Globe Valve Assemblies with Linear Series Actuators

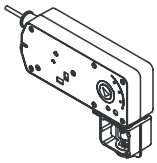
Note: Choose a valve assembly having a close-off pressure capability sufficient for the application. Not all valve body and actuator combinations are available factory-assembled. Some combinations must be field-assembled.

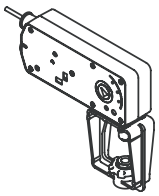
Table 3 2-Way Linked Globe Valve Assemblies with Linear Series Spring Return Actuators — Selection Chart.



2-Way Linked Globe Valve Assemblies







Valve Assembly Part Number[b]	P Code	Valve Size in. (mm)	C_v[c]	k_{vs}[c]	Actuator Close-off Pressure psi[de]			
					N.O.[f]	N.C.[g]		
					Actuator Force Rating			
					105 lbf (467 N)		220 lbf (979 N)	
					Actuator Model (Actuator Code)			
					Two-Position MA51-7100 (801) MA51-7101 MA51-7103-100 (804) Floating MF51-7103-100 (804) Proportional MS51-7103-100 (804) MS51-7103-130 MS51-7103-140 MS51-7103-150 (812) MS51-7103-160 (814)		Two-Position MA51-7200 MA51-7203 (593) Floating MF51-7203 (593) Proportional MS51-7203 (593) MS51-7203-040 MS51-7203-050	Two-Position MA61-7200 MA61-7203 (596) Floating MF61-7203 (596) Proportional MS61-7203 (596) MS61-7203-040 MS61-7203-050
Vx-72x1-xxx-4-P Vx-72x2-xxx-4-P Vx-72x3-xxx-4-P Vx-72x5-xxx-4-P[h]	1	1/2 (15)	0.4	0.3	250	250	—	—
	2		1.3	1.1				
	3		2.2	1.9				
	4		4.4	3.8				
	5	3/4 (20)	5.5	4.8	200	200		
	6		7.5	6.5				
	7	1 (25)	10.0	8.7	150	90		
	8		14.0	12				
	9	1¼ (32)	20.0	17	90	60	150	
Vx-72x3-xxx-4-P Vx-72x5-xxx-4-P[h]	10	1½ (40)	28.0	24	60	35	100	—
	11	2 (50)	40.0	35	32	20	65	
Vx-92x3-xxx-4-P[i] Vx-92x3-xxx-5-P[i] Vx-92x5-xxx-4-P[h]	12	2½ (65)	56.0[i]	48[i]	—	—	—	33
			65.0[i]	56[i]				
	13	3 (80)	85.0	73				22
Vx-9213-xxx-5-P[i] Vx-9223-xxx-5-P[i]	14	4 (N/A)	145.0	125	—	—	—	12

b - To determine a specific part number, see “Part Numbering System” .

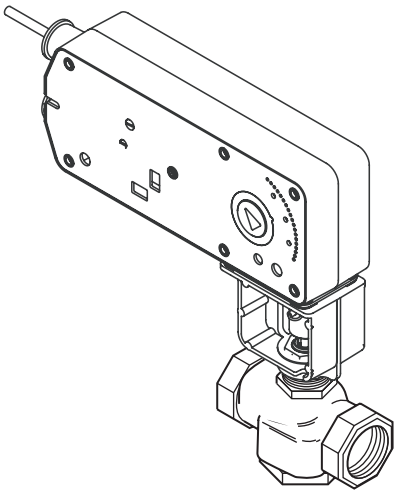
c - $Cv = \frac{GPM}{\sqrt{\Delta P}}$ Where ΔP is measured in psi $k_{vs} = \frac{Cv}{1.156}$ $k_{vs} = \frac{m3/h}{\sqrt{\Delta P}}$ Where ΔP is measured in bar = 100 kPa

d - Close-off ANSI IV (.01%) for soft seats. For seat leakage ratings of specific valve bodies, see Table 5 and Table 6.
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 - Normally open (N.O.) assembly using stem up open valve body. See “Part Numbering System” .
g - Normally closed (N.C.) assembly using stem up closed valve body. See “Part Numbering System”.
h - Metric thread 15 to 80 mm (Rp 1/2 to Rp 3).
i - Threaded valve body.
j - Flanged valve body.

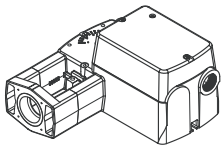
3-Way Linked Globe Valve Assemblies with Linear Series Actuators

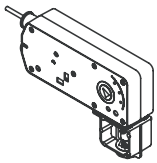
Note: Choose a valve assembly having a close-off pressure capability sufficient for the application. Not all valve body and actuator combinations are available factory-assembled. Some combinations must be field-assembled.

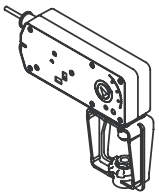
Table 4 3-Way Linked Globe Valve Assemblies with Linear Series Spring Return Actuators — Selection Chart.



3-Way Linked Globe Valve Assemblies







Actuator Force Rating		
105 lbf (467 N)	220 lbf (979 N)	
Actuator Model (Actuator Code)		
Two-Position MA51-7100 MA51-7101 Floating MF51-7103-100 (804) Proportional MS51-7103-100 (804) MS51-7103-130 MS51-7103-140 MS51-7103-150 (812) MS51-7103-160 (814)	Two-Position MA51-7200 MA51-7201 MA51-7203 (593) Floating MF51-7203 Proportional MS51-7203 (593) MS51-7203-040 MS51-7203-050	Two-Position MA61-7200 MA61-7203 (596) Floating MF61-7203 (596) Proportional MS61-7203 (596) MS61-7203-040 MS61-7203-050

Valve Assembly Part Number[b]	P Code	Valve Size in. (mm)	Cv[c]	kvs[c]	Actuator Close-off Pressure psi[de]		
Mixing Vx-7313-xxx-4-P Vx-7315-xxx-4-P	2	1/2 (15)	2.2	1.9	250	—	—
	4		4.4	3.8			
	6	3/4 (20)	7.5	6.5	200		
	8	1 (25)	14.0	12.0	90		
	9	1¼ (32)	20.0	17	60	150	
	10	1½ (40)	28	24	35	100	
	11	2 (50)	41	36	20	65	
Diverting Vx-7323-xxx-4-P	4	1/2 (15)	4.4	3.8	250	—	—
	6	3/4 (20)	7.5	6.5			
	8	1 (25)	15.0	13.0			
	9	1¼ (32)	20.0	17.3		250	
	10	1½ (40)	28	24.2			
	11	2 (50)	40	34.6			
Vx-9313-xxx-4-P[g] Vx-9313-xxx-5-P[h] Vx-9315-xxx-4-P[f]	12	2½ (65)	67.0[g]	58[g]	—	—	33
			74.0[h]	64[h]			
	13	3 (80)	91.0[g]	79[g]			22
			101.0[h]	87[h]			
Vx-9313-xxx-5-P[h]	14	4 (N/A)	145.0	125	—	—	12

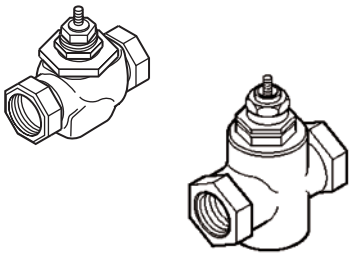
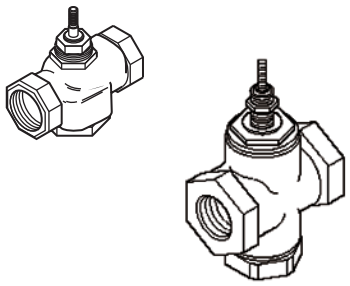
b - To determine a specific part number, see “Part Numbering System” .

c - $Cv = \frac{GPM}{\sqrt{\Delta P}}$ Where ΔP is measured in psi $k_{vs} = \frac{Cv}{1.156}$ $k_{vs} = \frac{m3/h}{\sqrt{\Delta P}}$ Where ΔP is measured in bar = 100 kPa

d - Close-off ANSI IV (.01%) for soft seats. For seat leakage ratings of specific valve bodies, see Table 5 and Table 6.
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 - Normally open (N.O.) assembly using stem up open valve body. See “Part Numbering System” .
g - Normally closed (N.C.) assembly using stem up closed valve body. See “Part Numbering System” .
h - Metric thread 15 to 80 mm (Rp 1/2 to Rp 3).
i - Threaded valve body.
j - Flanged valve body.

Globe Valve Body Specifications

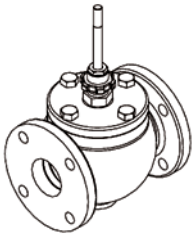
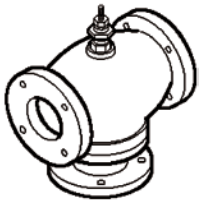
Table 5 Specifications for 1/2" to 2" VB-7xxx Series and 2½" and 3" VB-9xxx Series Globe Valve Bodies.

Specifications NPT, Rp Screwed Valve Bodies		2-Way	3-Way
			
Applications		Chilled or Hot Water, or Steam	Chilled or Hot Water
Type of End Fitting		NPT, Rp Screwed, Flared, Union Straightway	NPT, Rp Screwed, Flared
Size		**VB-7xxx Series** 1/2" through 2" (15 mm through 50 mm) **VB-9xxx Series** 2½" and 3" (65 mm and 80 mm)	
Action		Stem Up Open or Stem Up Closed	Mixing or Diverting
Valve Body Series[a]		Vx-72xx-0-4-P Vx-92xx-0-4-P	Vx-73xx-0-4-P Vx-93xx-0-4-P
Flow Type		Equal Percentage[b]	Linear[b]
Valve Body Materials	Body	Bronze	Bronze
	Seat	Bronze (VB-721x, VB-722x)	Bronze
		Stainless Steel (VB-725x, VB-726x, VB-727x, VB-728x)	
	Stem	Stainless Steel	Stainless Steel
	Plug	Brass (VB-721x, VB-722x)	Brass (VB-73xx)
		Stainless Steel (VB-725x, VB-726x, VB-727x, VB-728x)	Bronze (VB-931x)
	Packing	Spring-loaded PTFE	Spring-loaded PTFE
	Disc	EPDM (VB-721x, VB-722x)	—
		PTFE (VB-725x, VB-726x)	
		None (VB-727x, VB-728x)	
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)[b]
Pressure Class (VB-7xx5)		PN16	PN16
Rangeability		See Table-1	500:1
Seat Leakage		ANSI Class IV (.01%) (VB-721x, VB-722x, VB-725x, VB-727x)	ANSI Class III (0.1%)
		ANSI Class III (0.1%) (VB-727x, VB-728x)	
STEAM			
Inlet Pressure — Maximum		35 psig (241 kPa)	—
Fluid Temperature — Maximum		281 °F (138 °C) (VB-721x)	—
		340 °F (171 °C) (VB-725x, VB-726x)	
		400 °F (205 °C) (VB-727x, VB-728x)	
Allowable Differential Pressure		20 psi (138 kPa)	—
WATER			
Fluid Temperature — Minimum		**1/2" through 2"** 20 °F (-7 °C) **2½" and 3"** 40 °F (4 °C)	**1/2" through 2"** 20 °F (-7 °C) **2½" 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	35 psi (241 kPa) Max. for Normal Lifespan

a - To determine a specific part number, see the Linked Globe Valve Assembly Part Numbering System.
b - See "2-Way Valves" or "3-Way Valves" for a detailed description of the flow.
c - See "2-Way Valves" or "3-Way Valves" for a detailed description of the flow.
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.

Globe Valve Body Specifications

Table 6 Specifications for Flanged 2½" to 4" Vx-9xxx Series Globe Valve Bodies.

Specifications Flanged Valve Bodies		2-Way	3-Way
			
Applications		Chilled or Hot Water, or Steam	Chilled or Hot Water
Type of End Fitting		Flanged	Flanged
Size		2½ in. through 4 in.	2½ in. through 4 in.
Action		Stem Up Open or Stem Up Closed	Mixing
Valve Assembly Series		Vx-92xx-0-5-P	Vx-931x-0-5-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 PTFE	Spring-loaded PTFE
	Disc	Composite	—
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	35 psi (241 kPa) Max. for Normal Lifespan

a - See "2-Way Valves" or "3-Way Valves" for a detailed description of the flow.
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 MA51-710x, MF51-7103, and MS51-7103
1/2” (13 mm) Stroke 105 lbf (467 N) Linear Series Schneider Electric SmartX Actuators

Actuator Specifications

Inputs	
Control Signal and Power Requirements (see table)	All 24 Vac circuits are Class 2. All circuits 30 Vac and above are Class 1
Connections	
Connecting wiring	
Mx51-710x-0x0	Appliance wire, 3 ft. (0.9 m) long
Mx51-710x-1x0	Plenum cable, 3 ft. (0.9 m) long
Conduit connectors	Enclosure accepts 1/2” (13 mm) conduit connectors. For M20 metric connector, use AM-756 adaptor
Motor Type	Brush DC motor
Outputs	
Electrical: Position feedback voltage	
MF51-7103-xxx and MS51-7103-xxx	For voltage ranges, the feedback signal is the same range as the input signal. The 0…20 mAdc current range and floating actuators have a 2…10 Vdc position feedback signal. The position feedback signal can supply up to 0.5 mA to operate up to four additional slave actuators MS51-7103-140 has no feedback output.
Mechanical	
Output force rating	105 lbf (467 N)
Linear stroke	1/2” (13 mm) nominal
Timing	
Manual override	Allows valve positioning and preload adjustment, using manual crank
Reverse acting/direct acting jumper	
MS51-7103-xxx	Permits reverse acting or direct acting linear motion

Environmental	
Temperature Limits	
Shipping and storage	-40…160 °F (-40…71 °C) ambient
Operating	-22…140 °F (-30…60 °C) ambient
Temperature restrictions	For maximum ambient of 140 °F (60 °C), maximum fluid temperature must not exceed 366 °F (186 °C)
Humidity	5…95% RH, non-condensing
Enclosure Rating	NEMA 2, UL Type 2 (IEC IP54) with customer-supplied watertight conduit connectors
Agency Listings (Actuator)	
UL	UL-873, Underwriters Laboratories File #E9429 Category Temperature-indicating and Regulating Equipment)
cUL	UL Listed for use in Canada by Underwriters Laboratories Canadian Standards C22.2 No. 24-93
European Community	EMC Directive (89/336/EEC) Low Voltage DIrective (72/23/EEC)
Australia	This product meets requirements to bear the RSM Mark according to the terms specified by the Communications Authority under the Radiocommunications Act 1992

Part Number	Approximate Stroke Timing in Seconds @ 70 °F (21 °C)	
	Powered	Spring Return
MA51-710x-xxx	27	19
MF51-710x-xxx	60	16
MS51-710x-xxx		

Part Number	Control Signal	Power Input				
		Voltage	Running 50/60 Hz		DC Amps	Holding 50/60 Hz
			VA	W		W
MA51-7100-000	Two-position SPST	120 Vac ±10% 50/60 Hz	7.9	6.2	—	2.1
MA51-7101-000		230 Vac ±10% 50/60 Hz	7.4	5.4		2.1
MA51-7103-000, MA51-7103-100		24 Vac ±20% 20 to 30 Vdc	5.3	4.1	0.15	1.2
MF51-7103-000, MF51-7103-100	Floating SPST		6.9	4.7	0.16	2.1
MS51-7103-000, MS51-7103-100	2…10 Vdc Proportional		6.6	4.2	0.14	1.5
MS51-7103-020, MS51-7103-120	0…3 Vdc Proportional					
MS51-7103-030, MS51-7103-130	6…9 Vdc Proportional					
MS51-7103-040, MS51-7103-140			7.8	4.9	0.16	3.4
MS51-7103-050, MS51-7103-150	0…10 Vdc Proportional		6.6	4.2	0.14	1.5
MS51-7103-060, MS51-7103-160	2…20 mAdc Proportional					

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

Valve Assembly Part Number	Valve Size in.	Valve Dimensions in inches (mm)								
		2-Way (Refer to Figure-8, Figure-10, and Figure-11)					3-Way (Refer to Figure-9 and Figure-12)			
		A	B	C	E	J	A	C	E	J
Union Straightway 2-Way (N.C.) Vx-7221-8xx-4-P	1/2	4-3/16 (106)	2-11/16 (68)	1-3/16 (30)	7-7/16 (189)	6-5/8 (168)	—			
	3/4	4-15/16 (125)	3-3/16 (81)	1-3/16 (30)	7-7/16 (189)	6-7/8 (175)				
	1	6 (152)	3-5/8 (92)	1-3/4 (44)	7½ (190)	7-3/8 (187)				
	1¼	6¼ (159)	3-15/16 (100)	1-3/4 (44)	7-3/4 (197)	7-3/8 (187)				
Union Straightway 2-Way (N.O.) Vx-7211-8xx-4-P	1/2	4-3/16 (106)	2-11/16 (68)	1-3/16 (30)	7-7/16 (189)	6-5/8 (168)				
	3/4	4-15/16 (125)	3-3/16 (81)	1-1/16 (27)	7-7/16 (189)	6-7/8 (175)				
	1	6 (152)	3-5/8 (92)	1-3/16 (30)	8-1/8 (206)	7-3/8 (187)				
	1¼	6¼ (159)	3-15/16 (100)	1-3/8 (35)	8-1/8 (206)	7-3/8 (187)				
Flared 2-Way Vx-7212-8xx-4-P Vx-7222-8xx-4-P 3-Way Vx-7312-8xx-4-P	1/2	4 (102)	—	1-3/16 (30)	7-7/16 (189)	7-3/32 (180)	4 (102)	2¼ (57)	7-7/16 (189)	7-3/32 (180)
NPT/Metric Thread 2-Way (N.C.) Vx-722x-8xx-4-P Vx-726x-8xx-4-P Vx-728x-8xx-4-P 3-Way Vx-731x-8xx-4-P Vx-732x-8xx-4-P	1/2	3-1/16 (78)		1-3/16 (30)	7-7/16 (189)	6-5/8 (168)	3-1/16 (78)	1-3/4 (44)	7-7/16 (189)	6-5/8 (168)
	3/4	3-5/8 (92)		1-3/16 (30)	7-7/16 (189)	6-7/8 (175)	3-5/8 (92)	1-13/16 (46)	7-7/16 (189)	6-7/8 (175)
	1	4-5/8 (118)		1-3/4 (44)	7½ (190)	7-3/8 (187)	4-5/8 (118)	1-3/4 (44)	7½ (191)	7-3/8 (187)
	1¼	4-5/8 (118)		1-3/4 (44)	7-3/4 (197)	7-3/8 (187)	4-5/8 (118)	1-3/4 (44)	7-3/4 (197)	7-3/8 (187)
	1½	5-3/8 (137)		1-13/16 (46)	7-7/8 (200)	7-13/16 (198)	5-3/8 (137)	1-13/16 (46)	7-7/8 (200)	7-13/16 (198)
	2	6-1/8 (156)		2¼ (57)	8-9/16 (217)	8-5/32 (208)	6-1/8 (156)	2¼ (57)	8-9/16 (217)	8-5/32 (208)
NPT/Metric Thread 2-Way (N.O.) Vx-721x-8xx-4-P Vx-725x-8xx-4-P Vx-727x-8xx-4-P	1/2	3-1/16 (78)		1-3/16 (30)	7-7/16 (189)	6-5/8 (168)	—			
	3/4	3-5/8 (92)		1-1/16 (27)	7-7/16 (189)	6-7/8 (175)				
	1	4-5/8 (118)		1-3/16 (30)	8-1/8 (206)	7-3/8 (187)				
	1¼	4-5/8 (118)		1-3/8 (35)	8-1/8 (206)	7-3/8 (187)				
	1½	5-3/8 (137)		1½ (38)	8-3/16 (208)	7-13/16 (198)				
	2	6-1/8 (156)		1-9/16 (40)	8-7/16 (214)	8-5/32 (208)				

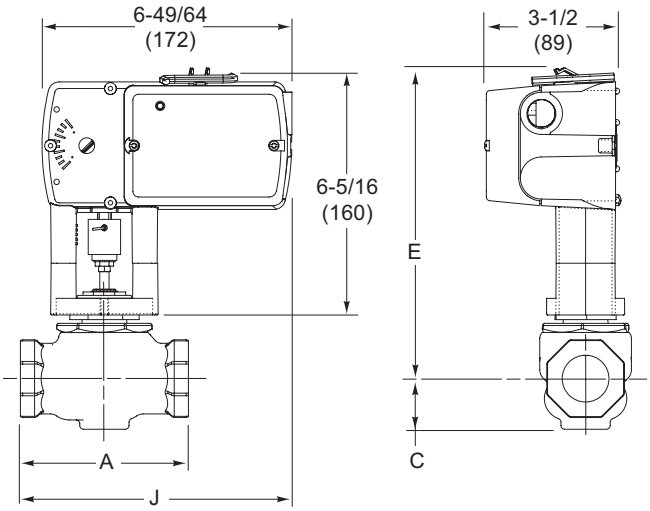


Figure 8 Mx51-710x with 2-Way Globe Valve.

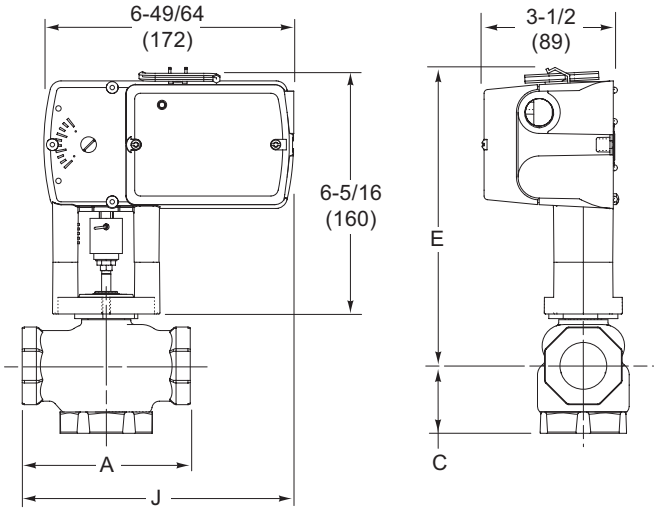


Figure 9 Mx51-710x with 3-Way Globe Valve.

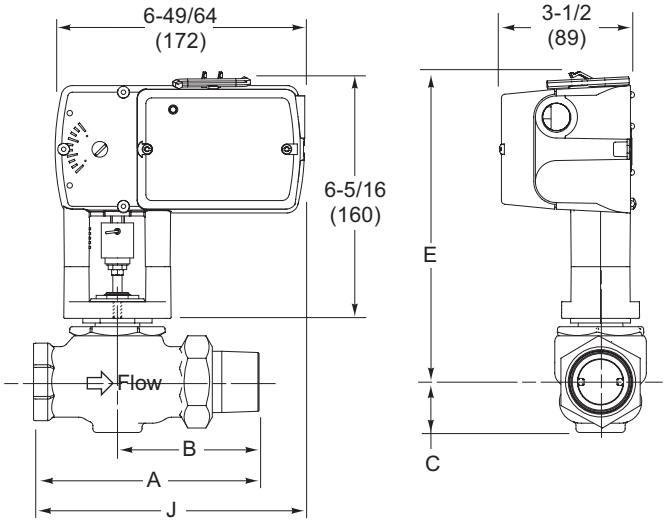


Figure 10 Mx51-710x with 2-Way Union Straightway Globe Valve.

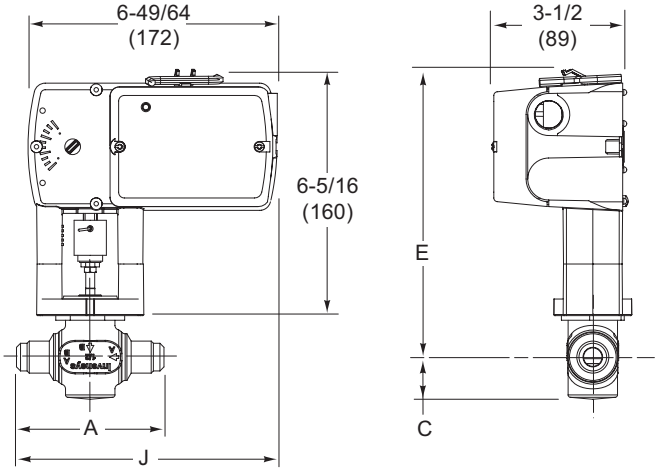


Figure 11 Mx51-710x with 2-Way Flared Globe Valve.

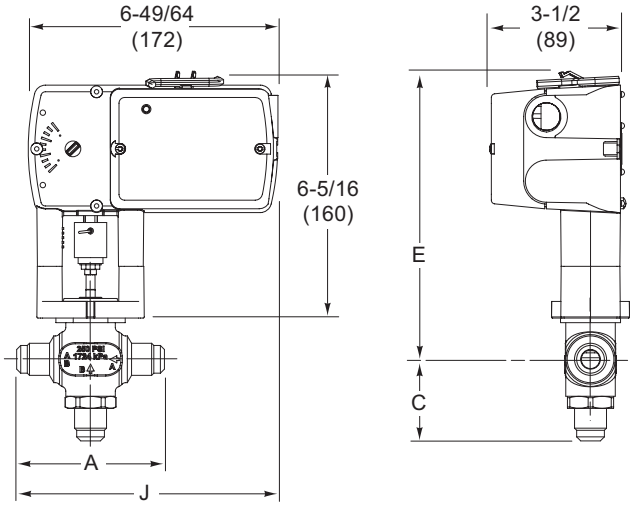


Figure 12 Mx51-710x with 3-Way Flared Globe Valve.

Valve Assemblies with MA51-720x, MF51-7203, and MS51-7203
1/2” (13 mm) Nominal Stroke 220 lbf (979 N) Linear Series SmartX Actuators

Actuator Specifications

Inputs	
Control SIgnal and Power Requirements (see table)	All 24 Vac circuits are Class 2 All circuits 30 Vac and above are Class 1
Connections	
Connecting wiring	Appliance cable, 3 ft. (91 cm) long
Conduit connectors	Enclosure accepts 1/2” (13 mm) conduit connectors. For M20 metric connector, use AM-756 adaptor
Motor Type	Brushless DC
Outputs	
Electrical	
Position feedback voltage: MS51-7203	2…10 Vdc (max. 0.5 mA) output signal for position feedback or to operate up to four additional slave actuators.

Part Number	Control Signal	Power Input						
		Voltage	Running				DC Amps	Holding
			50 Hz		60 Hz			50 / 60 Hz
			VA	W	VA	W		W
MA51-7200	Two-position SPST or Triacs	120 Vac ±10% 50/60 Hz	11.7	8.8	10.0	8.4	—	3.6/5.0
MA51-7201		230 Vac ±10% 50/60 Hz	15.5	9.5	10.6	8.5	—	4.6/3.3
MA51-7203		24 Vac ±20% 22…30 Vdc	9.8	7.5	9.7	7.5	0.29	2.8
MF51-7203	Floating Point SPDT or Triacs	24 Vac ±20% 22 to 30 Vdc	9.8	7.7	9.7	7.7	0.30	3.3
MS51-7203	Proportional 2…10 Vdc or 4-20 Vdc		9.8	7.4	9.7	7.4	0.28	2.9

Mechanical	
Output force rating	220 lbf (979 N)
Linear stroke	1/2” (13 mm) nominal
Timing @ 70 °F (21 °C)	Approximately 100 seconds powered; 35 seconds spring return Measured with no load applied to actuator
Manual override	Allows valve positioning and preload adjustment, using manual crank
Right/left switch: MS51-7203	Permits reverse acting or direct acting linear motion
Environmental	
Temperature Limits	
Shipping and storage	-40…160 °F (-40…71 °C) ambient
Operating	0 °F (-18 °C) to maximum ambient shown in table below
Temperature restrictions	
Humidity	15…95% RH, non-condensing
Enclosure Rating	NEMA 2, UL Type 2 (IEC IP54) with customer-supplied watertight conduit connectors.
Agency Listings (Actuator)	
UL	UL-873, Underwriters Laboratories File #E9429 Category Temperature-indicating and Regulating Equipment
cUL	UL Listed for use in Canada by Underwriters Laboratories Canadian Standards C22.2 No. 24-93
European Community	EMC Directive (89/336/EEC) Low Voltage DIrective (72/23/EEC)
Australia	This product meets requirements to bear the RSM Mark according to the terms specified by the Communications Authority under the Radiocommunications Act 1992

Part Number		Max. Allowable Ambient @ Max. Fluid Temperatures
Actuator	Valve Assembly	
Mx51-720x	Vx-721x-59x-4-P, Vx-722x-59x-4-P	140 °F (60 °C) @ 281 °F (138 °C)
	Vx-73xx-59x-4-P	120 °F (49 °C) @ 300 °F (149 °C)
	Vx-725x-59x-4-P, Vx-726x-59x-4-P	100 °F (38 °C) @ 340 °F (171 °C)
	Vx-727x-59x-4-P, Vx-728x-59x-4-P	90 °F (32 °C) @ 366 °F (186 °C)

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

Valve Assembly Part Number	Valve Size in.	Valve Dimensions in inches (mm)							
		2-Way (Refer to Figure 13)				3-Way (Refer to Figure 14)			
		A	C	E	J	A	C	E	J
NPT/Metric Thread 2-Way (N.C.) Vx-722x-59x-4-P Vx-725x-59x-4-P Vx-726x-59x-4-P Vx-727x-59x-4-P Vx-728x-59x-4-P 3-Way Vx-73xx-59x-4-P	1¼	4-5/8 (117)	1-3/4 (44)	8-3/8 (213)	11-11/16 (297)	4-5/8 (117)	1-3/4 (44)	8-3/8 (213)	11-11/16 (297)
	1½	5-3/8 (137)	1-13/16 (46)	8½ (216)	12-1/16 (306)	5-3/8 (137)	1-13/16 (46)	8½ (216)	12-1/16 (306)
	2	6-1/8 (156)	2¼ (57)	9-3/16 (233)	12-7/16 (316)	6-1/8 (156)	2¼ (57)	9-3/16 (233)	12-7/16 (316)
NPT/Metric Thread 2-Way (N.O.) Vx-721x-59x-4-P	1¼	4-5/8 (117)	1-3/8 (35)	8-3/4 (222)	11-11/16 (297)	—			
	1½	5-3/8 (137)	1½ (38)	8-13/16 (224)	12-1/16 (306)				
	2	6-1/8 (156)	1-9/16 (40)	9-1/16 (230)	12-7/16 (316)				

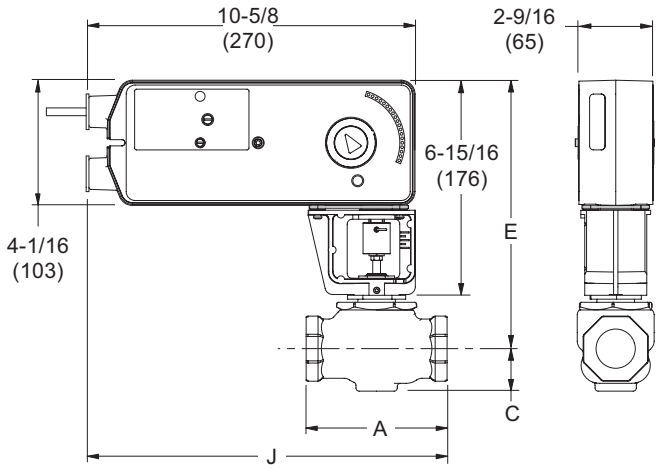


Figure 13 Mx51-720x with 1/2” to 2” 2-Way Globe Valve.

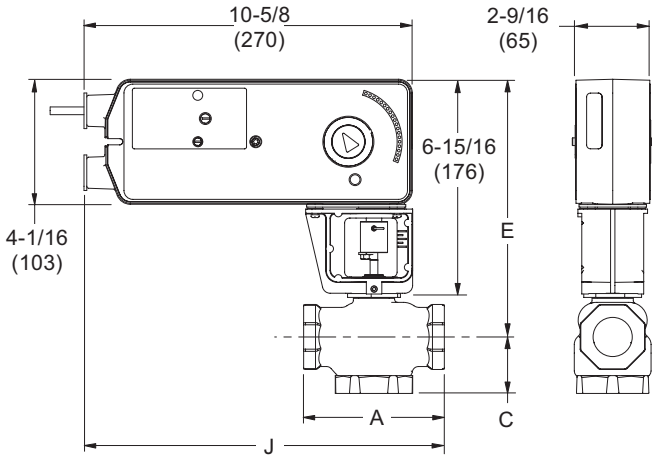


Figure 14 Mx51-720x with 1/2” to 2” 3-Way Globe Valve.

Valve Assemblies with MA61-720x, MF61-7203, and MS61-7203
1” (25 mm) Nominal Stroke 220 lbf (979 N) Linear Series SmartX Actuators

Actuator Specifications

Inputs	
Control Signal and Power Requirements(see table)	All 24 Vac circuits are Class 2 All circuits 30 Vac and above are Class 1
Connections	
Connecting wiring	Appliance cable, 3 ft. (91 cm) long
Conduit connectors	Enclosure accepts 1/2” (13 mm) conduit connectors. For M20 metric connector, use AM-756 adaptor
Motor Type	Brushless DC.
Outputs	
Electrical Position feedback voltage	
MS61-7203	2…10 Vdc (max. 0.5 mA) output signal for position feedback or to operate up to four additional slave actuators. MS61-7203-040 does not have feedback.
Mechanical	
Output force rating	220 lbf (979 N) minimum; 495 lbf (2202 N) maximum stall
Linear stroke	1” (25 mm) nominal
Timing @ 70 °F (21 °C)	Approximately 190 seconds powered; 40 seconds spring return Measured with no load applied to actuator
Manual override	Allows valve positioning and preload adjustment, using manual crank
Right/left switch	
MS61-7203	Permits reverse acting or direct acting linear motion.

Environmental	
Temperature Limits	
Shipping and storage	-40…160 °F (-40…71 °C) ambient
Operating	0 °F (-18 °C) to maximum ambient shown in table below
Temperature restrictions	
Humidity	15…95% RH, non-condensing
Enclosure Rating	NEMA 2, UL Type 2 (IEC IP54) with customer-supplied watertight conduit connectors.
Agency Listings (Actuator)	
UL	UL-873, Underwriters Laboratories File #E9429 Category Temperature-indicating and Regulating Equipment
cUL	UL Listed for use in Canada by Underwriters Laboratories. Canadian Standards C22.2 No. 24-93
European Community	EMC Directive (89/336/EEC) Low Voltage DIrective (72/23/EEC
Australia	This product meets requirements to bear the RSM Mark according to the terms specified by the Communications Authority under the Radiocommunications Act 1992.

Part Number		Max. Allowable Ambient @ Max. Fluid Temperatures
Actuator	Valve Assembly	
Mx61-720x	Vx-9xxx-59x-4-P Vx-9xxx-59x-5-P	140 °F (60 °C) @ 300 °F (149 °C)

Part Number	Control Signal	Power Input						
		Voltage	Running				DC Amps	Holding
			50 Hz		60 Hz			50/60 Hz
			VA	W	VA	W		W
MA61-7200	Two-position SPST or Triacs	120 Vac ±10% 50/60 Hz	11.7	8.8	10.0	8.4	—	3.6/5.0
MA61-7201		230 Vac ±10% 50/60 Hz	15.5	9.5	10.6	8.5	—	4.6/3.3
MA61-7203		24 Vac ±20% 22 to 30 Vdc	9.8	7.5	9.7	7.5	0.29	2.8
MF61-7203	Floating Point SPDT or Triacs	24 Vac ±20% 22 to 30 Vdc	9.8	7.7	9.7	7.7	0.30	3.3
MS61-7203	Proportional 2…10 Vdc or 4-20 Vdc		9.8	7.4	9.7	7.4	0.28	2.9

Dimensions — 2½" and 3" Screwed Globe Valve Assemblies

Valve Assembly Part Number	Valve Size in.	Valve Dimensions in inches (mm)							
		2-Way (Refer to Figure-15)				3-Way (Refer to Figure-16)			
		A	C	E	J	A	C	E	J
NPT/Metric Thread 2-Way (N.O.) Vx-9213-59x-4-P, Vx-9215-59x-4-P 2-Way (N.C.) Vx-9223-59x-4-P, Vx-9225-59x-4-P 3-Way Vx-9313-59x-4-P, Vx-9315-59x-4-P	2½	8½ (216)	3-13/16 (97)	13-15/16 (354)	13-9/16 (344)	8½ (216)	4-5/8 (117)	13-15/16 (354)	13-9/16 (344)
	3	9½ (241)	4¼ (108)	14¼ (362)	13-5/8 (346)	9½ (241)	5 (127)	14¼ (362)	13-5/8 (348)

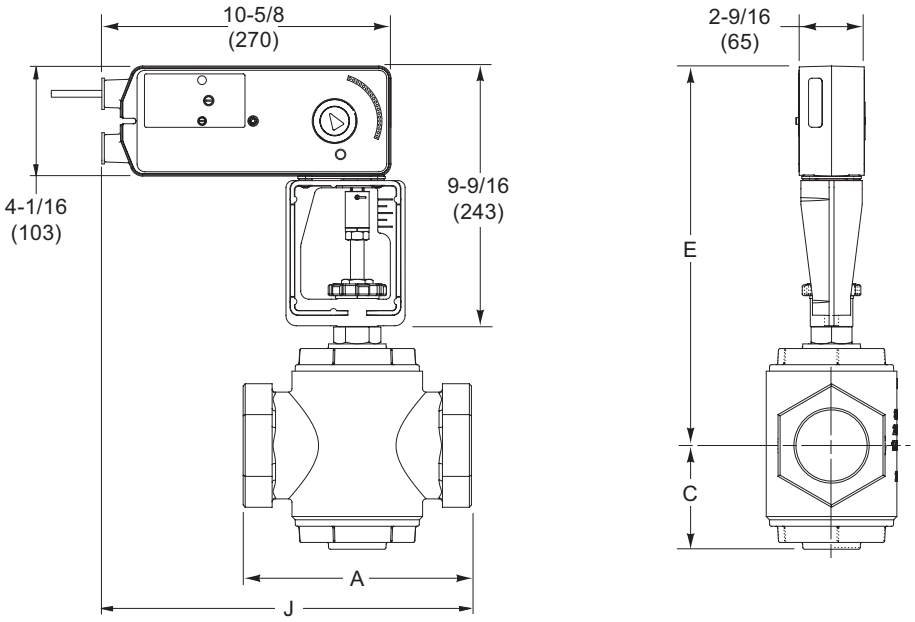


Figure 15 Mx61-720x with 2½" or 3" 2-Way Screwed Globe Valve.

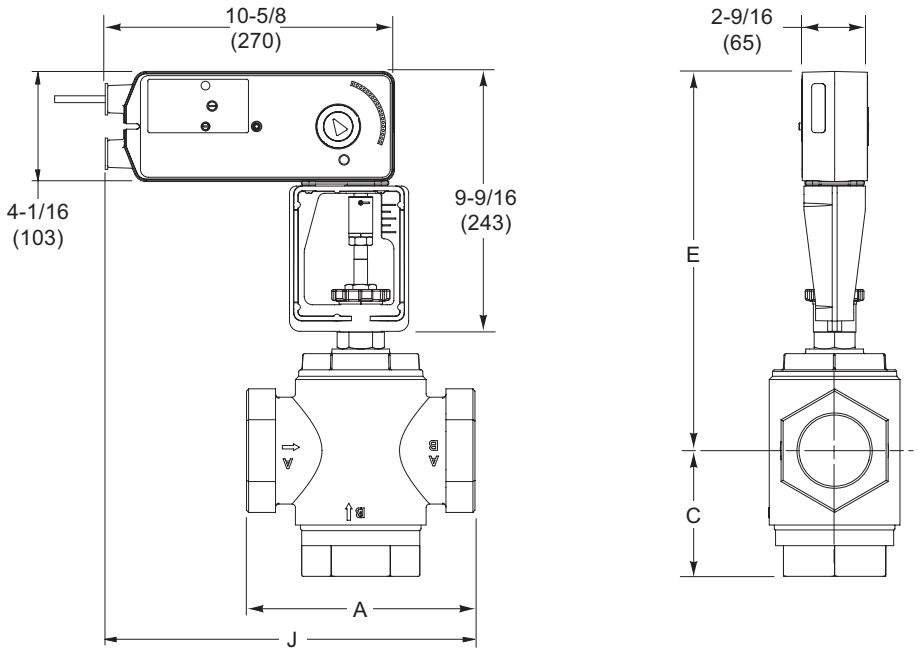


Figure 16 Mx61-720x with 2½" or 3" 3-Way Screwed Globe Valve.

Dimensions — 2½" 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-19)					
		A	C	E	F	G	J	A	C	E	F	G	J
ASA Flanged 2-Way (N.O.) Vx-9213-59x-5-P 3-Way Vx-9313-59x-5-P	2½	8½ (216)	3½ (89)	13 (330)	7 (178)	5½ (140)	13-5/8 (346)	8½ (216)	5-3/8 (137)	13-3/4 (349)	7 (178)	5½ (140)	13-5/8 (346)
	3	9½ (241)	3-3/4 (95)	14½ (368)	7½ (191)	6 (152)	14-1/8 (359)	9½ (241)	6-3/8 (162)	14 (356)	7½ (191)	6 (152)	14-1/8 (359)
	4	11½ (292)	4½ (114)	15-3/8 (391)	9 (229)	7½ (191)	15-1/8 (384)	11½ (292)	8½ (216)	14-3/4 (375)	9 (229)	7½ (191)	15-1/8 (384)
ASA Flanged 2-Way (N.C.) Vx-9223-59x-5-P	2½	8½ (216)	4 (107)	12-3/8 (314)	7 (178)	5½ (140)	13-5/8 (346)	—					
	3	9½ (241)	5 (127)	12-5/8 (320)	7½ (191)	6 (152)	14-1/8 (359)						
	4	11½ (292)	7-1/8 (181)	13-3/8 (340)	9 (229)	7½ (191)	15-1/8 (384)						

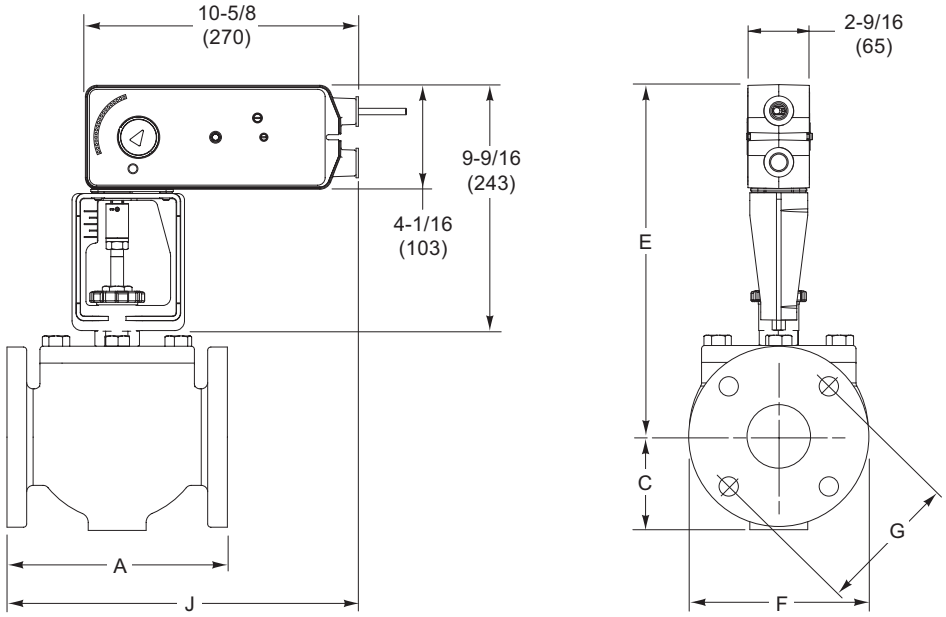


Figure 17 Mx61-720x with 2½" to 4" N.O. 2-Way Flanged Globe Valve.

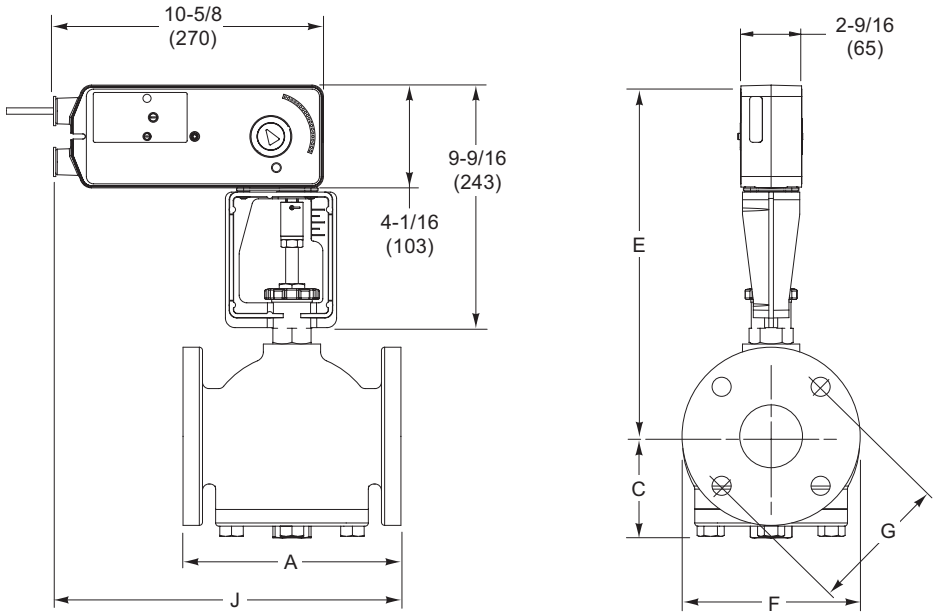


Figure-18 Mx61-720x with 2-1/2” to 4” N.C. 2-Way Flanged Globe Valve.

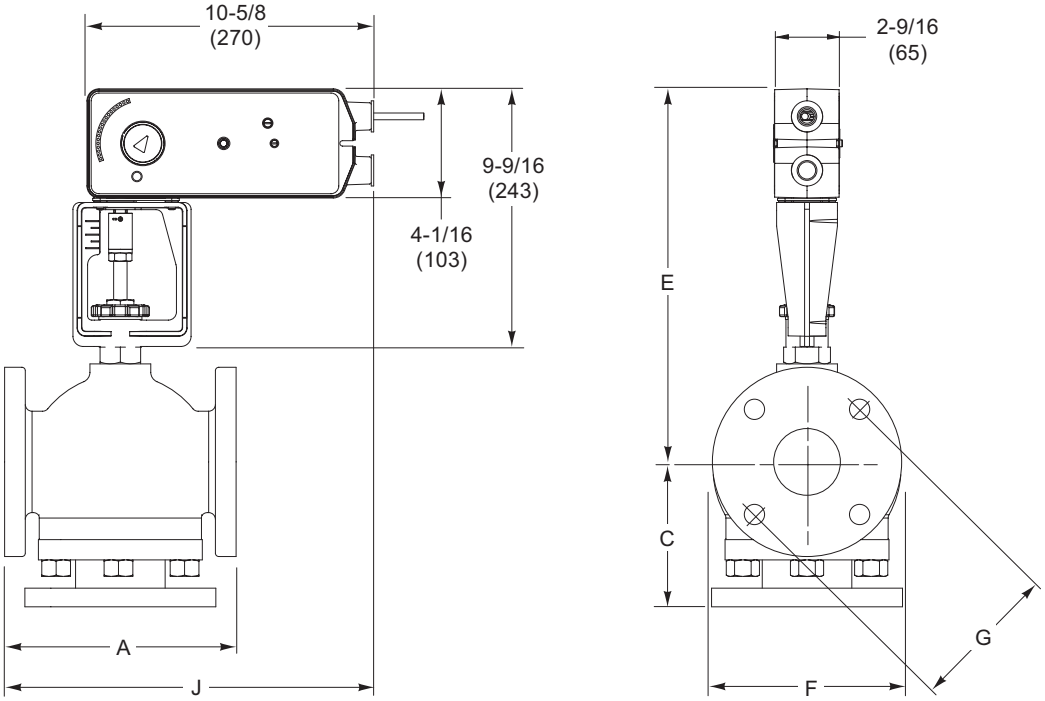


Figure-19 Mx61-720x with 2-1/2” to 4” 3-Way Flanged Globe Valve.