

Powermite 599

MT Series Terminal Unit Valve and Actuator Assembly Selection

Description

This Technical Bulletin aids in selecting a Powermite 599 Series MT Series terminal unit valve and actuator assembly. Figure 1 provides a graph of water capacity for selecting the proper valve size. Figures 2 through 5 show close-off pressures for selecting an actuator according to specifications.

Tables 2 through 10 identify the product numbers. Table 1 provides a guide to these tables. The tables show all possible combinations of Powermite 599 Series valves and compatible actuators that can be ordered as complete valve assemblies from the factory.

Tables 11 through 13 provide the dimensions of all valves and the service envelope required for each actuator.

Using the Valve and Actuator Selection Graphs

Use Figure 1, the water capacity graph, to select a valve size as follows:

1. Locate the specified flow rate on the vertical axis.
 2. Follow across on the horizontal axis to the point of intersection with the specified pressure drop.
 3. Choose the valve size from the heavy diagonal lines across the graph.
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Use Figures 2 through 5, the close-off pressure graphs, to select an actuator as follows:

1. Choose the graph for the valve action (normally open or closed) and actuator power source (electronic or pneumatic) specified.
2. Locate the bar that represents the valve size. The top of the bar indicates the maximum close-off pressure for tight close off.

Use the legend at the bottom of the graph to identify the actuator.

Using the Valve and Actuator Assembly Tables

Use Tables 2 through 10 to select a valve and actuator assembly as follows:

1. Locate the appropriate table based on the required valve type, valve action, and actuator type per Table 1.
 2. Read Tables 2 through 10 from left to right and select the appropriate valve specifications to identify the row with the required valve body.
 3. Read across the top of the table and select the appropriate actuator specifications to identify the column with the required actuator.
 4. Read down the actuator column and read across the valve body row. The column/row intersection determines the appropriate valve and actuator assembly. The valve and actuator assembly product number is the actuator prefix code added to the valve body suffix.
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Selection Example

Specifications

In an ANSI 250 piping system, a two-way, normally closed (NC), female-by-female (F×F) NPT threaded valve is to deliver 20 gpm (4.5 m³/h) chilled water with no more than 5 psi (35 kPa) pressure drop across the fully open valve.

The actuator is to receive 24 Vac power, supply a floating control signal, and provide spring return (SR) operation. The actuator is to close off tightly against a pump head pressure of 15 psi (103 kPa, 1 bar).

Valve Sizing

Use Figure 1, the water capacity graph, to select the valve size as follows:

1. Locate the required flow rate by finding 20 gpm (4.5 m³/h) on the vertical axis.
2. Follow across the horizontal axis to find the 5 psi (35 kPa) maximum allowable pressure drop across the open valve.
3. Since the point of intersection is near a 1-inch (25-mm), 10 Cv (8.5 Kvs) valve size, select that valve size to ensure proper flow.

Actuator Selection

Use Figure 2, the maximum close-off pressure graph for actuators on two-way valves, to select an actuator as follows:

1. For NC valves with electronic actuators, choose the upper left graph.
2. Locate the 3/4-inch to 1-inch bar to correspond to the 1-inch (25-mm) valve size. Note that the top of the bar or the maximum close-off pressure is 40 psi (276 kPa).
3. The 40 psi (276 kPa) close-off rating of the SAS Series actuator will close-off tightly against a pump head pressure of 15 psi (103 kPa, 1 bar).

Assembly (Product Number) Selection

Use Table 3, two-way normally-closed valve assemblies, to select a valve and actuator assembly as follows:

1. Read the table from left to right and select bronze trim for the low pressure, chilled water application; and F×F for NPT valve threads. Select a 10 Cv (8.5 Kvs), 1-inch (25-mm) valve size, determined from the preceding valve sizing example. The valve body part number is 599-02014.
2. Read across the top of the table and select a 24 Vac actuator with floating control signal and spring return (SR) operation. The actuator part number is SAS81.33U. The actuator prefix code number is 366.
3. Read down the SAS81.33U actuator column and across the 599-02014 valve body row. The column/row intersection determines the appropriate valve and actuator assembly, which is 366-02014.

The valve and actuator can be ordered separately by using the part numbers from steps 2 and 3.

Table 1. Guide to Valve/Actuator Tables.

Table No.	Valve Type and Action	Actuator Type
2	2-Way, Normally Closed	Pneumatic
3		SAS Electronic
4		SSC Electronic
5	2-Way, Normally Open	Pneumatic
6		SAS Electronic
7		SSC Electronic
8	3-Way, Mixing	Pneumatic
9		SAS Electronic
10		SSC Electronic

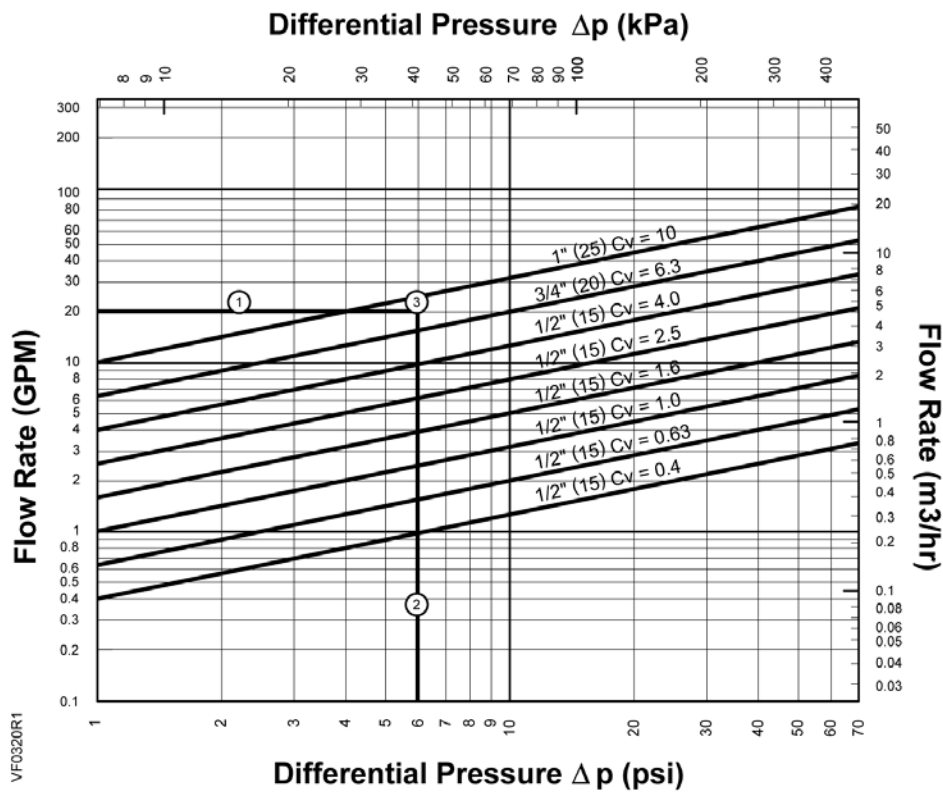


Figure 1. Water Capacity Graph.

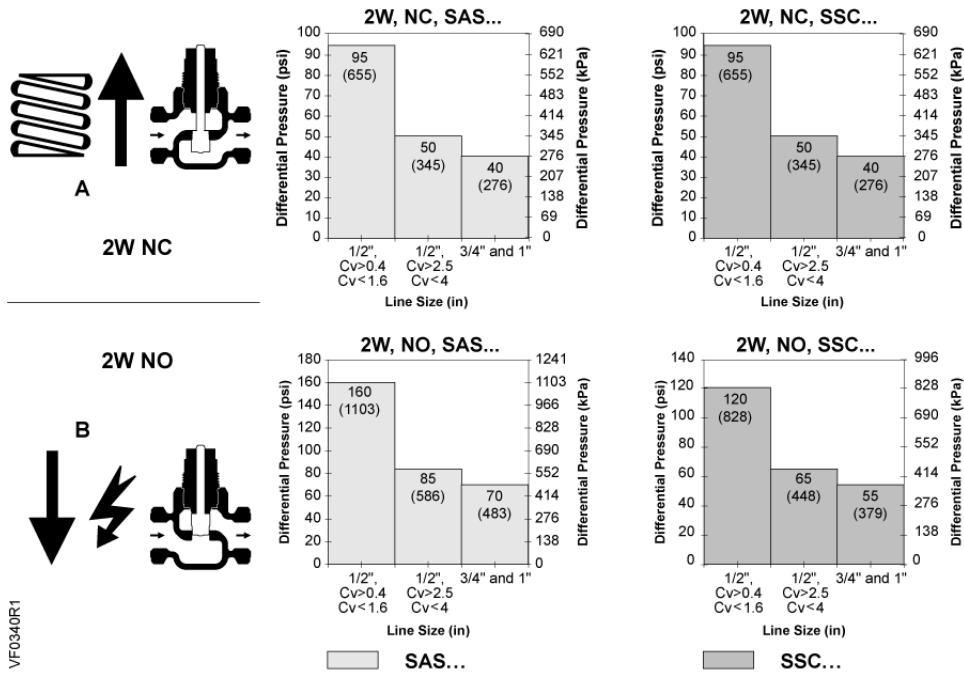


Figure 2. Maximum Close-off Pressure of Electronic Actuators on 2-Way Valves.

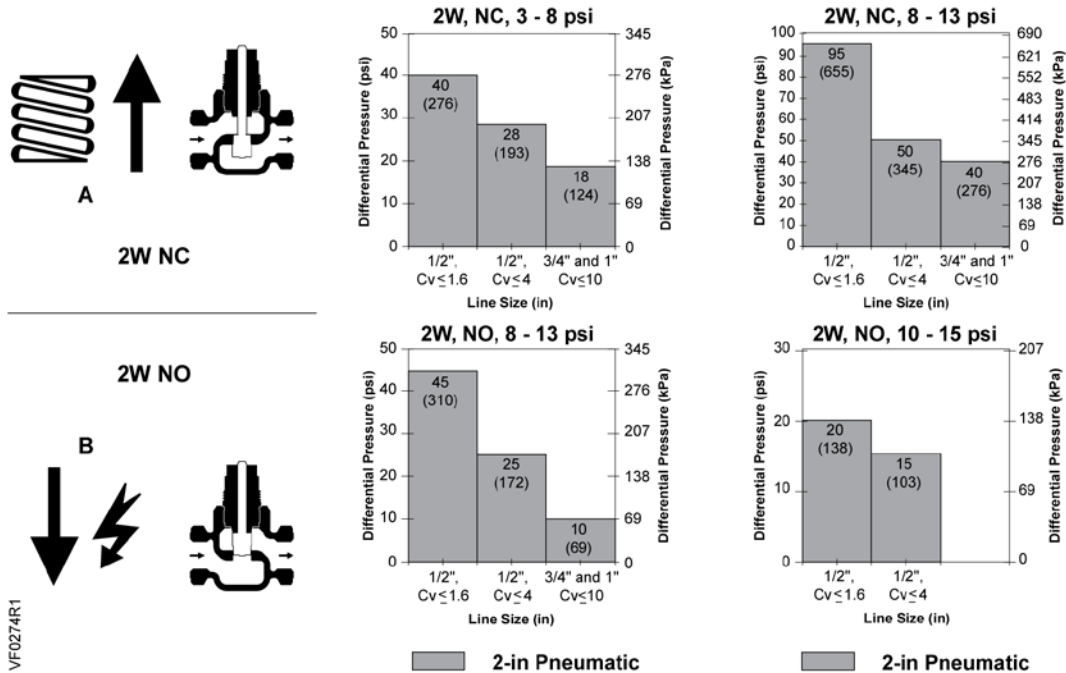


Figure 3. Maximum Close-off Pressure of 2-Inch Pneumatic Actuator on 2-Way Valve with Alternate Spring Ranges. (NO at 20 PSI Actuator Pressure, NC at 0 PSI, Actuator Pressure.)

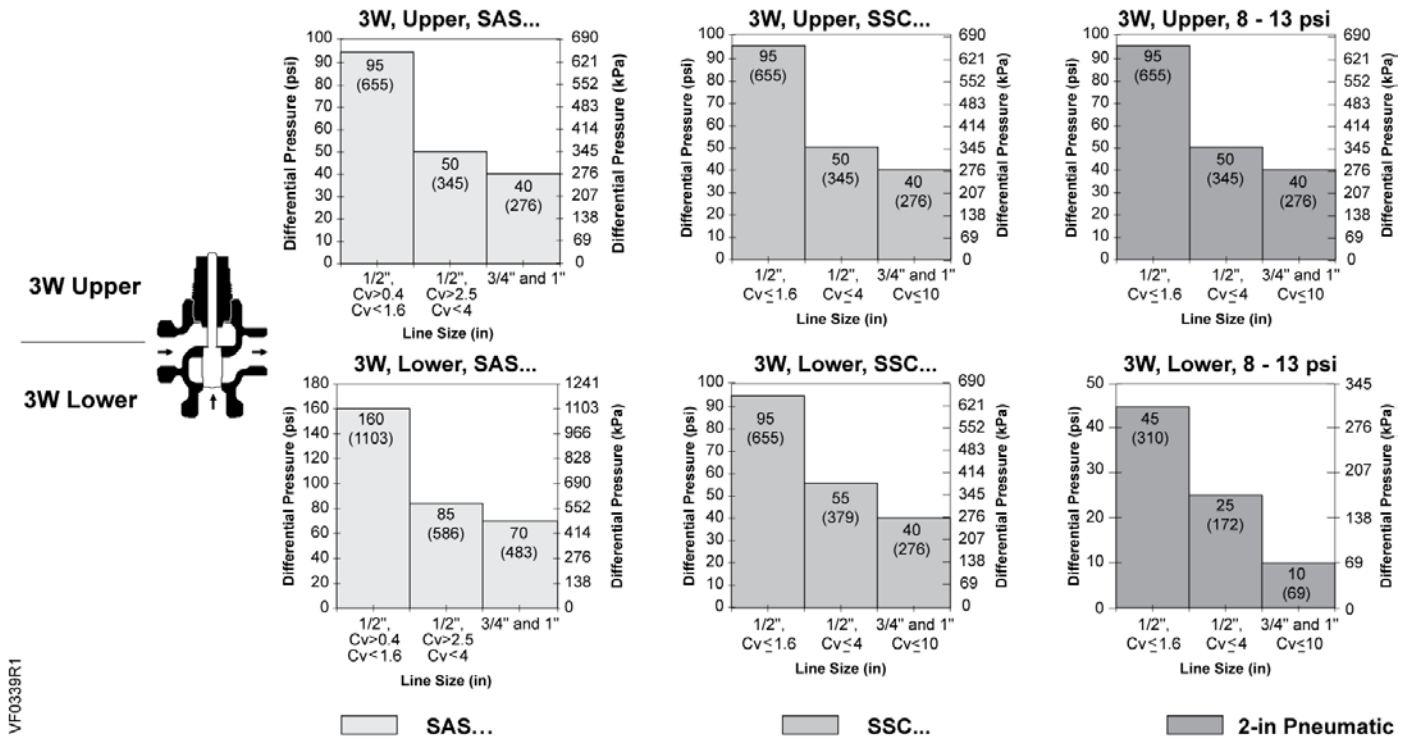


Figure 4. Maximum Close-off Pressure of Electronic Actuators on 3-Way Valves.

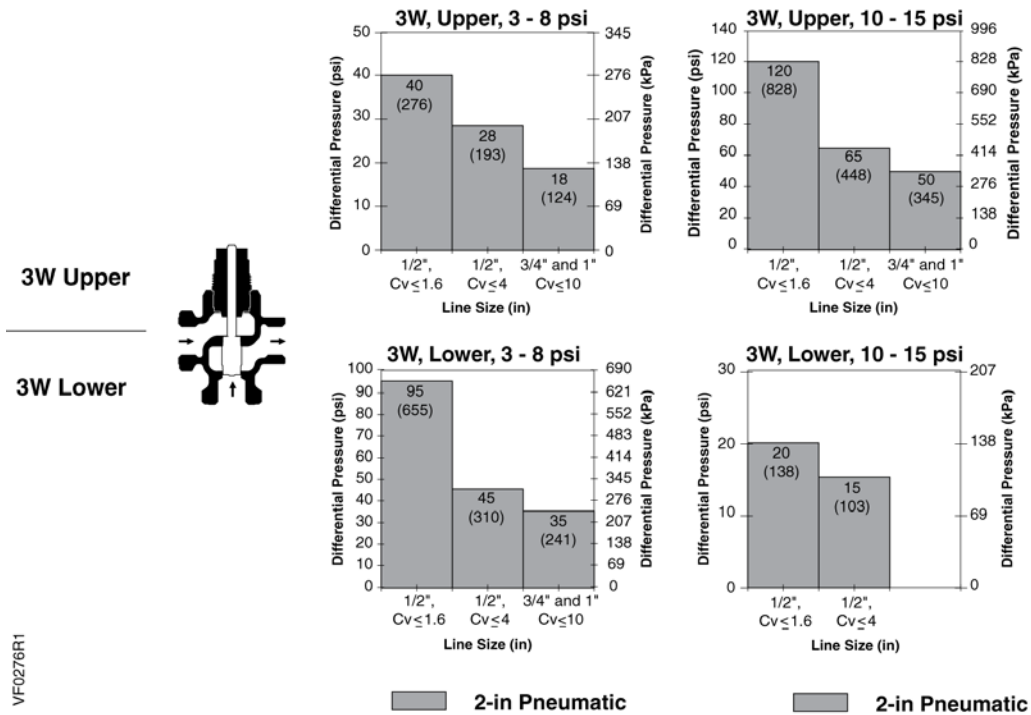


Figure 5. Maximum Close-off Pressure of 2-Inch Pneumatic Actuator on 3-Way Valve with Alternate Spring Ranges. (Lower Port Close-off at 20 PSI Actuator Pressure, Port Close-off Pressures at 0 PSI Actuator Pressure.)

Table 2. 1/2-Inch to 1-Inch, MT Series 2-Way, Normally Closed Valves with Powermite 599 MT Series 2-Inch Valve Actuator (599-01088).

Port, Action, & Characteristic	Trim	Connection	Flow Rate		Valve Size	Valve Body Assembly	Pneumatic Actuator Assembly		
			C _V	K _{VS}	Inch		Spring Range *		
							10-15 psi (69-103 kPa)	3-8 psi (21-55 kPa)	8-13 psi (55-90 kPa)
							Actuator Prefix Code		
							256	257	258
2-Way, Normally Closed, Modified Equal Percentage, Technical Instructions 155-196P25	Brass	FxF	0.4	0.34	1/2 (15)	599-02000	256-02000	257-02000B	258-02000C
			0.63	0.54	1/2 (15)	599-02002	256-02002	257-02002B	258-02002C
			1	0.85	1/2 (15)	599-02004	256-02004	257-02004B	258-02004C
			1.6	1.37	1/2 (15)	599-02006	256-02006	257-02006B	258-02006C
			2.5	2.14	1/2 (15)	599-02008	256-02008	257-02008B	258-02008C
			4	3.42	1/2 (15)	599-02010	256-02010	257-02010B	258-02010C
			6.3	5.38	3/4 (20)	599-02012	256-02012	257-02012B	258-02012C
		10	8.55	1 (25)	599-02014	256-02014	257-02014B	258-02014C	
		FxUM	0.4	0.34	1/2 (15)	599-02001	256-02001	257-02001B	258-02001C
			0.63	0.54	1/2 (15)	599-02003	256-02003	257-02003B	258-02003C
			1	0.85	1/2 (15)	599-02005	256-02005	257-02005B	258-02005C
			1.6	1.37	1/2 (15)	599-02007	256-02007	257-02007B	258-02007C
			2.5	2.14	1/2 (15)	599-02009	256-02009	257-02009B	258-02009C
			4	3.42	1/2 (15)	599-02011	256-02011	257-02011B	258-02011C
	6.3		5.38	3/4 (20)	599-02013	256-02013	257-02013B	258-02013C	
	Stainless Steel	FxF	0.4	0.34	1/2 (15)	599-02015	256-02015	257-02015B	258-02015C
			0.63	0.54	1/2 (15)	599-02017	256-02017	257-02017B	258-02017C
			1	0.85	1/2 (15)	599-02019	256-02019	257-02019B	258-02019C
			1.6	1.37	1/2 (15)	599-02021	256-02021	257-02021B	258-02021C
			2.5	2.14	1/2 (15)	599-02023	256-02023	257-02023B	258-02023C
			4	3.42	1/2 (15)	599-02025	256-02025	257-02025B	258-02025C
			6.3	5.38	3/4 (20)	599-02027	256-02027	257-02027B	258-02027C
		10	8.55	1 (25)	599-02029	256-02029	257-02029B	258-02029C	
		FxUM	0.4	0.34	1/2 (15)	599-02016	256-02016	257-02016B	258-02016C
			0.63	0.54	1/2 (15)	599-02018	256-02018	257-02018B	258-02018C
			1	0.85	1/2 (15)	599-02020	256-02020	257-02020B	258-02020C
			1.6	1.37	1/2 (15)	599-02022	256-02022	257-02022B	258-02022C
			2.5	2.14	1/2 (15)	599-02024	256-02024	257-02024B	258-02024C
4			3.42	1/2 (15)	599-02026	256-02026	257-02026B	258-02026C	
6.3	3/4		0.75 (20)	599-02028	256-02028	257-02028B	258-02028C		

* The standard Normally Closed valves contain a 10 to 15 psi (69 to 103 kPa) spring range.
 - For an alternate spring range of 3 to 8 psi (21 to 55 kPa), add a "B" to the end of the part number.
 - For an alternate spring range of 8 to 13 psi (55 to 90 kPa), add a "C" to the end of the part number.

- See *Powermite 599 Series MT Series 2-Inch Pneumatic Valve Actuator Technical Instructions (155-189P25)* for details on the valve actuator.

Table 3. 1/2-Inch to 1-Inch, MT Series 2-Way, Normally Closed Valves with Powermite 599 MT Series SAS Electronic Valve Actuators.

Port, Action, & Characteristic	Trim	Connection	Flow Rate		Valve Size	Valve Body Assembly	24 Vac Actuator Assembly				
			C _v	K _{vs}	Inch		NSR	SR	NSR	SR	
							Floating		0-10V/4-20 mA		
							SAS81.03U	SAS81.33U	SAS61.03U	SAS61.33U	
							Actuator Prefix Code				
							363	366	364	365	
2-Way, Normally Closed, Modified Equal Percentage, Technical Instructions 155-196P25	Brass	FxF	0.4	0.34	0.5	599-02000	363-02000	366-02000	364-02000	365-02000	
			0.63	0.54	0.5	599-02002	363-02002	366-02002	364-02002	365-02002	
			1	0.85	0.5	599-02004	363-02004	366-02004	364-02004	365-02004	
			1.6	1.37	0.5	599-02006	363-02006	366-02006	364-02006	365-02006	
			2.5	2.14	0.5	599-02008	363-02008	366-02008	364-02008	365-02008	
			4	3.42	0.5	599-02010	363-02010	366-02010	364-02010	365-02010	
			6.3	5.38	0.75	599-02012	363-02012	366-02012	364-02012	365-02012	
		10	8.55	1.0	599-02014	363-02014	366-02014	364-02014	365-02014		
		FxUM	0.4	0.34	0.5	599-02001	363-02001	366-02001	364-02001	365-02001	
			0.63	0.54	0.5	599-02003	363-02003	366-02003	364-02003	365-02003	
			1	0.85	0.5	599-02005	363-02005	366-02005	364-02005	365-02005	
			1.6	1.37	0.5	599-02007	363-02007	366-02007	364-02007	365-02007	
			2.5	2.14	0.5	599-02009	363-02009	366-02009	364-02009	365-02009	
			4	3.42	0.5	599-02011	363-02011	366-02011	364-02011	365-02011	
	6.3		5.38	0.75	599-02013	363-02013	366-02013	364-02013	365-02013		
	Stainless Steel	FxF	0.4	0.34	0.5	599-02015	363-02015	366-02015	364-02015	365-02015	
			0.63	0.54	0.5	599-02017	363-02017	366-02017	364-02017	365-02017	
			1	0.85	0.5	599-02019	363-02019	366-02019	364-02019	365-02019	
			1.6	1.37	0.5	599-02021	363-02021	366-02021	364-02021	365-02021	
			2.5	2.14	0.5	599-02023	363-02023	366-02023	364-02023	365-02023	
			4	3.42	0.5	599-02025	363-02025	366-02025	364-02025	365-02025	
			6.3	5.38	0.75	599-02027	363-02027	366-02027	364-02027	365-02027	
		10	8.55	1.0	599-02029	363-02029	366-02029	364-02029	365-02029		
		FxUM	0.4	0.34	0.5	599-02016	363-02016	366-02016	364-02016	365-02016	
			0.63	0.54	0.5	599-02018	363-02018	366-02018	364-02018	365-02018	
			1	0.85	0.5	599-02020	363-02020	366-02020	364-02020	365-02020	
			1.6	1.37	0.5	599-02022	363-02022	366-02022	364-02022	365-02022	
			2.5	2.14	0.5	599-02024	363-02024	366-02024	364-02024	365-02024	
4			3.42	0.5	599-02026	363-02026	366-02026	364-02026	365-02026		
6.3	5.38		0.75	599-02028	363-02028	366-02028	364-02028	365-02028			

- For details on the SAS61.03U and SAS61.33U Actuators, see *Powermite 599 Series MT Series SAS Electronic Valve Actuator Technical Instructions (155-682)*.
- For details on the SAS81.03U and SAS81.33U Actuators, see *Powermite 599 Series MT Series SAS Electronic Valve Actuator Technical Instructions (155-681)*.

Table 4. 1/2-Inch to 1-Inch, MT Series 2-Way, Normally Closed, Valves with Powermite 599 MT Series SSC Electronic Valve Actuators.

Port, Action, Characteristic	Trim	Connection	Flow Rate		Valve Size	Spring Range	Valve Body Assembly	24 Vac Actuator Assembly				
			C _v	K _{vs}	Inches			0 to 10 Vdc		Floating		
								NSR	SR	NSR	SR	
			SSC61U	SSC61.5U	SSC81U			SSC81.5U	Actuator Prefix Code			
			261	262	259			260				
2-Way Normally Closed, Modified Equal Percentage, Technical Instructions 155-196P25	Brass	FxF	0.4	0.34	0.5	10 to 15 psi (69 to 103 kPa)	599-02000	261-02000	262-02000	259-02000	260-02000	
			0.63	0.54	0.5		599-02002	261-02002	262-02002	259-02002	260-02002	
			1	0.85	0.5		599-02004	261-02004	262-02004	259-02004	260-02004	
			1.6	1.37	0.5		599-02006	261-02006	262-02006	259-02006	260-02006	
			2.5	2.14	0.5		599-02008	261-02008	262-02008	259-02008	260-02008	
			4	3.42	0.5		599-02010	261-02010	262-02010	259-02010	260-02010	
			6.3	5.38	0.75		599-02012	261-02012	262-02012	259-02012	260-02012	
			10	8.55	1.0		599-02014	261-02014	262-02014	259-02014	260-02014	
		Stainless Steel	FxF	0.4	0.34		0.5	599-02001	261-02001	262-02001	259-02001	260-02001
				0.63	0.54		0.5	599-02003	261-02003	262-02003	259-02003	260-02003
				1	0.85		0.5	599-02005	261-02005	262-02005	259-02005	260-02005
				1.6	1.37		0.5	599-02007	261-02007	262-02007	259-02007	260-02007
				2.5	2.14		0.5	599-02009	261-02009	262-02009	259-02009	260-02009
				4	3.42		0.5	599-02011	261-02011	262-02011	259-02011	260-02011
	6.3			5.38	0.75		599-02013	261-02013	262-02013	259-02013	260-02013	
	10			8.55	1.0		599-02015	261-02015	262-02015	259-02015	260-02015	
	FxF		0.63	0.54	0.5		599-02017	261-02017	262-02017	259-02017	260-02017	
			1	0.85	0.5		599-02019	261-02019	262-02019	259-02019	260-02019	
			1.6	1.37	0.5		599-02021	261-02021	262-02021	259-02021	260-02021	
			2.5	2.14	0.5		599-02023	261-02023	262-02023	259-02023	260-02023	
			4	3.42	0.5		599-02025	261-02025	262-02025	259-02025	260-02025	
			6.3	5.38	0.75		599-02027	261-02027	262-02027	259-02027	260-02027	
	FxF	10	8.55	1.0	599-02029		261-02029	262-02029	259-02029	260-02029		
		FxUM	0.4	0.34	0.5		599-02016	261-02016	262-02016	259-02016	260-02016	
			0.63	0.54	0.5		599-02018	261-02018	262-02018	259-02018	260-02018	
			1	0.85	0.5		599-02020	261-02020	262-02020	259-02020	260-02020	
			1.6	1.37	0.5		599-02022	261-02022	262-02022	259-02022	260-02022	
			2.5	2.14	0.5		599-02024	261-02024	262-02024	259-02024	260-02024	
			4	3.42	0.5		599-02026	261-02026	262-02026	259-02026	260-02026	
		6.3	5.38	0.75	599-02028		261-02028	262-02028	259-02028	260-02028		

- For details on the SSC61U and SSC61.5U, see *Powermite 599 Series MT Series SSC Electronic Valve Actuator 24 Vac Proportional Control Technical Instructions (155-313P25)*.
- For details on the SSC81U and SSC81.5U, see *Powermite 599 Series MT Series SSC Electronic Valve Actuator 24 Vac Floating Control Technical Instructions (155-314P25)*.

Table 5. 1/2-Inch to 1-Inch, MT Series Valves with Powermite 599 MT Series 2-Inch Pneumatic Valve Actuator (599-01088).

Port, Action, & Characteristic	Trim	Connection	Flow Rate		Valve Size	Valve Body Assembly	Actuator Assembly					
			C _v	K _{vS}	Inch		Spring Range *					
							10-15 psi (69-103 kPa)	3-8 psi (21-55 kPa)	8-13 psi (55-90 kPa)			
			Actuator Prefix Code						256	257	258	
									256	257	258	
2-Way, Normally Open, Modified Equal Percentage, Technical Instructions 155-196P25	Brass	FxF	0.4	0.34	1/2 (15)	599-02030	256-02030A	257-02030	258-02030C			
			0.63	0.54	1/2 (15)	599-02032	256-02032A	257-02032	258-02032C			
			1	0.85	1/2 (15)	599-02034	256-02034A	257-02034	258-02034C			
			1.6	1.37	1/2 (15)	599-02036	256-02036A	257-02036	258-02036C			
			2.5	2.14	1/2 (15)	599-02038	256-02038A	257-02038	258-02038C			
			4	3.42	1/2 (15)	599-02041	256-02041A	257-02041	258-02041C			
			6.3	5.38	3/4 (20)	599-02044	256-02044A	257-02044	258-02044C			
		10	8.55	1 (25)	599-02046	256-02046A	257-02046	258-02046C				
		FxUM	0.4	0.34	1/2 (15)	599-02031	256-02031A	257-02031	258-02031C			
			0.63	0.54	1/2 (15)	599-02033	256-02033A	257-02033	258-02033C			
			1	0.85	1/2 (15)	599-02035	256-02035A	257-02035	258-02035C			
			1.6	1.37	1/2 (15)	599-02037	256-02037A	257-02037	258-02037C			
			2.5	2.14	1/2 (15)	599-02039	256-02039A	257-02039	258-02039C			
			4	3.42	1/2 (15)	599-02042	256-02042A	257-02042	258-02042C			
	6.3		5.38	3/4 (20)	599-02045	256-02045A	257-02045	258-02045C				
	AF x UM	2.5	2.14	1/2 (15)	599-02040	256-02040A	257-02040	258-02040C				
		4	3.42	1/2 (15)	599-02043	256-02043A	257-02043	258-02043C				
	Stainless Steel	FxF	0.4	0.34	1/2 (15)	599-02047	256-02047A	257-02047	258-02047C			
			0.63	0.54	1/2 (15)	599-02049	256-02049A	257-02049	258-02049C			
			1	0.85	1/2 (15)	599-02051	256-02051A	257-02051	258-02051C			
			1.6	1.37	1/2 (15)	599-02053	256-02053A	257-02053	258-02053C			
			2.5	2.14	1/2 (15)	599-02055	256-02055A	257-02055	258-02055C			
			4	3.42	1/2 (15)	599-02058	256-02058A	257-02058	258-02058C			
			6.3	5.38	3/4 (20)	599-02061	256-02061A	257-02061	258-02061C			
		10	8.55	1 (25)	599-02063	256-02063A	257-02063	258-02063C				
		FxUM	0.4	0.34	1/2 (15)	599-02048	256-02048A	257-02048	258-02048C			
			0.63	0.54	1/2 (15)	599-02050	256-02050A	257-02050	258-02050C			
			1	0.85	1/2 (15)	599-02052	256-02052A	257-02052	258-02052C			
1.6			1.37	1/2 (15)	599-02054	256-02054A	257-02054	258-02054C				
2.5			2.14	1/2 (15)	599-02056	256-02056A	257-02056	258-02056C				
4			3.42	1/2 (15)	599-02059	256-02059A	257-02059	258-02059C				
6.3	5.38		3/4 (20)	599-02062	256-02062A	257-02062	258-02062C					
AF x UM	2.5	2.14	1/2 (15)	599-02057	256-02057A	257-02057	258-02057C					
	4	3.42	1/2 (15)	599-02060	256-02060A	257-02060	258-02060C					

- See *Powermite 599 Series MT Series 2-Inch Pneumatic Valve Actuator Technical Instructions (155-189P25)* for details on the valve actuator.

* The standard Normally Open valves contain a 3 to 8 psi (21 to 55 kPa) spring range.
 - For an alternate spring range of 10 to 15 psi (69 to 103 kPa), add an "A" to the end of the part number.
 - For an alternate spring range of 8 to 13 psi (55 to 90 kPa), add a "C" to the end of the part number.

Table 6. 1/2-Inch to 1-Inch, MT Series 2-Way, Normally Open Valves with Powermite 599 MT Series SAS Electronic Valve Actuators.

Port, Action, & Characteristic	Trim	Connection	Flow Rate		Valve Size Inch (mm)	Valve Body Assembly	24 Vac Actuator Assembly							
			C _v	K _{vs}			NSR	SR	NSR	SR				
							Floating		0-10V/4-20 mA					
							SAS81.03	SAS81.33U	SAS61.03U	SAS61.33U				
									Actuator Prefix Code					
							363	366	364	365				
2-Way, Normally Open, Modified Equal Percentage, Technical Instructions 155-196P25	Brass	FxF	0.4	0.34	1/2 (15)	599-02030	363-02030	366-02030	364-02030	365-02030				
			0.63	0.54	1/2 (15)	599-02032	363-02032	366-02032	364-02032	365-02032				
			1	0.85	1/2 (15)	599-02034	363-02034	366-02034	364-02034	365-02034				
			1.6	1.37	1/2 (15)	599-02036	363-02036	366-02036	364-02036	365-02036				
			2.5	2.14	1/2 (15)	599-02038	363-02038	366-02038	364-02038	365-02038				
			4	3.42	1/2 (15)	599-02041	363-02041	366-02041	364-02041	365-02041				
			6.3	5.38	3/4 (20)	599-02044	363-02044	366-02044	364-02044	365-02044				
		10	8.55	1 (25)	599-02046	363-02046	366-02046	364-02046	365-02046					
		FxUM	0.4	0.34	1/2 (15)	599-02031	363-02031	366-02031	364-02031	365-02031				
			0.63	0.54	1/2 (15)	599-02033	363-02033	366-02033	364-02033	365-02033				
			1	0.85	1/2 (15)	599-02035	363-02035	366-02035	364-02035	365-02035				
			1.6	1.37	1/2 (15)	599-02037	363-02037	366-02037	364-02037	365-02037				
			2.5	2.14	1/2 (15)	599-02039	363-02039	366-02039	364-02039	365-02039				
			4	3.42	1/2 (15)	599-02042	363-02042	366-02042	364-02042	365-02042				
	AF x UM	2.5	2.14	1/2 (15)	599-02040	363-02040	366-02040	364-02040	365-02040					
		4	3.42	1/2 (15)	599-02043	363-02043	366-02043	364-02043	365-02043					
	Stainless Steel	FxF	0.4	0.34	1/2 (15)	599-02047	363-02047	366-02047	364-02047	365-02047				
			0.63	0.54	1/2 (15)	599-02049	363-02049	366-02049	364-02049	365-02049				
			1	0.85	1/2 (15)	599-02051	363-02051	366-02051	364-02051	365-02051				
			1.6	1.37	1/2 (15)	599-02053	363-02053	366-02053	364-02053	365-02053				
			2.5	2.14	1/2 (15)	599-02055	363-02055	366-02055	364-02055	365-02055				
			4	3.42	1/2 (15)	599-02058	363-02058	366-02058	364-02058	365-02058				
			6.3	5.38	3/4 (20)	599-02061	363-02061	366-02061	364-02061	365-02061				
		10	8.55	1 (25)	599-02063	363-02063	366-02063	364-02063	365-02063					
		FxUM	0.4	0.34	1/2 (15)	599-02048	363-02048	366-02048	364-02048	365-02048				
			0.63	0.54	1/2 (15)	599-02050	363-02050	366-02050	364-02050	365-02050				
			1	0.85	1/2 (15)	599-02052	363-02052	366-02052	364-02052	365-02052				
			1.6	1.37	1/2 (15)	599-02054	363-02054	366-02054	364-02054	365-02054				
2.5			2.14	1/2 (15)	599-02056	363-02056	366-02056	364-02056	365-02056					
4			3.42	1/2 (15)	599-02059	363-02059	366-02059	364-02059	365-02059					
AF x UM	2.5	2.14	1/2 (15)	599-02057	363-02057	366-02057	364-02057	365-02057						
	4	3.42	1/2 (15)	599-02060	363-02060	366-02060	364-02060	365-02060						

- For details on the SAS61.03U and SAS61.33U Actuator, see Powermite 599 Series MT Series SAS Electronic Valve Actuator Technical Instructions (155-682).
- For details on the SAS81.03U and SAS81.33U Actuator, see Powermite 599 Series MT Series SAS Electronic Valve Actuator Technical Instructions (155-681).

Table 7. 1/2-Inch to 1-Inch, MT Series 2-Way, Normally Open Valves with Powermite 599 MT Series SSC Electronic Valve Actuators.

Port, Action, & Characteristic	Trim	Connection	Flow Rate		Valve Size	Spring Range	Valve Body Assembly	24 Vac Actuator Assembly				
			C _v	K _{vs}	Inches			0 to 10 Vdc		Floating		
								NSR	SR	NSR	SR	
			Actuator Prefix Code					SSC61U	SSC61.5U	SSC81U	SSC81.5U	
			261	262	259			260				
2-Way, Normally Open, Modified Equal Percentage, Technical Instructions 155-196P25	Brass	FxF	0.4	0.34	1/2 (15)	3 to 8 psi (21 to 55 kPa)	599-02030	261-02030	262-02030	259-02030	260-02030	
			0.63	0.54	1/2 (15)		599-02032	261-02032	262-02032	259-02032	260-02032	
			1	0.85	1/2 (15)		599-02034	261-02034	262-02034	259-02034	260-02034	
			1.6	1.37	1/2 (15)		599-02036	261-02036	262-02036	259-02036	260-02036	
			2.5	2.14	1/2 (15)		599-02038	261-02038	262-02038	259-02038	260-02038	
			4	3.42	1/2 (15)		599-02041	261-02041	262-02041	259-02041	260-02041	
			6.3	5.38	3/4 (20)		599-02044	261-02044	262-02044	259-02044	260-02044	
			10	8.55	1 (25)		599-02046	261-02046	262-02046	259-02046	260-02046	
		FxUM	0.4	0.34	1/2 (15)		599-02031	261-02031	262-02031	259-02031	260-02031	
			0.63	0.54	1/2 (15)		599-02033	261-02033	262-02033	259-02033	260-02033	
			1	0.85	1/2 (15)		599-02035	261-02035	262-02035	259-02035	260-02035	
			1.6	1.37	1/2 (15)		599-02037	261-02037	262-02037	259-02037	260-02037	
			2.5	2.14	1/2 (15)		599-02039	261-02039	262-02039	259-02039	260-02039	
			4	3.42	1/2 (15)		599-02042	261-02042	262-02042	259-02042	260-02042	
			6.3	5.38	3/4 (20)		599-02045	261-02045	262-02045	259-02045	260-02045	
			AF x UM	2.5	2.14		1/2 (15)	599-02040	261-02040	262-02040	259-02040	260-02040
		4		3.42	1/2 (15)		599-02043	261-02043	262-02043	259-02043	260-02043	
		Stainless Steel	FxF	0.4	0.34		1/2 (15)	599-02047	261-02047	262-02047	259-02047	260-02047
				0.63	0.54		1/2 (15)	599-02049	261-02049	262-02049	259-02049	260-02049
				1	0.85		1/2 (15)	599-02051	261-02051	262-02051	259-02051	260-02051
				1.6	1.37		1/2 (15)	599-02053	261-02053	262-02053	259-02053	260-02053
				2.5	2.14		1/2 (15)	599-02055	261-02055	262-02055	259-02055	260-02055
				4	3.42		1/2 (15)	599-02058	261-02058	262-02058	259-02058	260-02058
				6.3	5.38		3/4 (20)	599-02061	261-02061	262-02061	259-02061	260-02061
	10			8.55	1 (25)		599-02063	261-02063	262-02063	259-02063	260-02063	
	FxUM		0.4	0.34	1/2 (15)		599-02048	261-02048	262-02048	259-02048	260-02048	
			0.63	0.54	1/2 (15)		599-02050	261-02050	262-02050	259-02050	260-02050	
			1	0.85	1/2 (15)		599-02052	261-02052	262-02052	259-02052	260-02052	
			1.6	1.37	1/2 (15)		599-02054	261-02054	262-02054	259-02054	260-02054	
			2.5	2.14	1/2 (15)		599-02056	261-02056	262-02056	259-02056	260-02056	
			4	3.42	1/2 (15)		599-02059	261-02059	262-02059	259-02059	260-02059	
			6.3	5.38	3/4 (20)		599-02062	261-02062	262-02062	259-02062	260-02062	
			AF x UM	2.5	2.14		1/2 (15)	599-02057	261-02057	262-02057	259-02057	260-02057
	4			3.42	1/2 (15)		599-02060	261-02060	262-02060	259-02060	260-02060	

- For details on the SSC61U and SSC61.5U, see *Powermite 599 Series MT Series SSC Electronic Valve Actuator 24 Vac Proportional Control Technical Instructions (155-313P25)*.
- For details on the SSC81U and SSC81.5U, see *Powermite 599 Series MT Series SSC Electronic Valve Actuator 24 Vac Floating Control Technical Instructions (155-314P25)*.

Table 8. 1/2-Inch to 1-Inch, MT Series 3-Way Valves with Powermite MT Series 2-Inch Pneumatic Valve Actuator (599-01088).

Port, Action, & Characteristic	Trim	Flow Rate		Valve Size Inches (mm)	Valve Body Assembly	Actuator Assembly		
						Spring Range *		
		C _v	K _{vS}	10-15 psi (69-103 kPa)	3-8 psi (21-55 kPa)	8-13 psi (55-90 kPa)		
				Actuator Prefix Code				
		256	257	258				
3-Way, Mixing, Linear, Technical Instructions 155-197P25	Brass	0.4	0.34	1/2 (15)	599-02064	256-02064A	257-02064B	258-02064
		0.63	0.54	1/2 (15)	599-02065	256-02065A	257-02065B	258-02065
		1.0	0.85	1/2 (15)	599-02066	256-02066A	257-02066B	258-02066
		1.6	1.37	1/2 (15)	599-02067	256-02067A	257-02067B	258-02067
		2.5	2.14	1/2 (15)	599-02068	256-02068A	257-02068B	258-02068
		4.0	3.42	1/2 (15)	599-02069	256-02069A	257-02069B	258-02069
		6.3	5.38	3/4 (20)	599-02070	256-02070A	257-02070B	258-02070
		10.0	8.55	1 (25)	599-02071	256-02071A	257-02071B	258-02071
	Stainless Steel	0.4	0.34	1/2 (15)	599-02072	256-02072A	257-02072B	258-02072
		0.63	0.54	1/2 (15)	599-02073	256-02073A	257-02073B	258-02073
		1.0	0.85	1/2 (15)	599-02074	256-02074A	257-02074B	258-02074
		1.6	1.37	1/2 (15)	599-02075	256-02075A	257-02075B	258-02075
		2.5	2.14	1/2 (15)	599-02076	256-02076A	257-02076B	258-02076
		4.0	3.42	1/2 (15)	599-02077	256-02077A	257-02077B	258-02077
		6.3	5.38	3/4 (20)	599-02078	256-02078A	257-02078B	258-02078
		10.0	2.14	1 (25)	599-02079	256-02079A	257-02079B	258-02079

- See *Powermite 599 Series MT Series 2-Inch Pneumatic Valve Actuator Technical Instructions (155-189P25)* for details on the valve actuator.
- * The standard three-way valves contain a 8 to 13 psi (55 to 90 kPa) spring range.
 - For an alternate spring range of 10 to 15 psi (69 to 103 kPa), add an "A" to the end of the part number.
 - For an alternate spring range of 3 to 8 psi (21 to 55 kPa), add a "B" to the end of the part number.

Table 9. 1/2-Inch to 1-Inch, MT Series 3-Way Valves with Powermite 599 MT Series SAS–Electronic Valve Actuators.

Port, Action, & Characteristic	Trim	Flow Rate		Valve Size	Valve Body Assembly	24 Vac Actuator Assembly				
		C _v	K _{vs}	Inches		NSR	SR	NSR	SR	
						Floating		0-10V/4-20 mA		
						SAS81.03U	SAS81.33U	SAS61.03U	SAS61.33U	
						Actuator Prefix Code				
				363		366	364	365		
3-Way, Mixing, Linear, Technical Instructions 155-197P25	Brass	0.4	0.34	1/2 (15)	599-02064	363-02064	366-02064	364-02064	365-02064	
		0.63	0.54	1/2 (15)	599-02065	363-02065	366-02065	364-02065	365-02065	
		1.0	0.85	1/2 (15)	599-02066	363-02066	366-02066	364-02066	365-02066	
		1.6	1.37	1/2 (15)	599-02067	363-02067	366-02067	364-02067	365-02067	
		2.5	2.14	1/2 (15)	599-02068	363-02068	363-02068	364-02068	365-02068	
		4.0	3.42	1/2 (15)	599-02069	363-02069	366-02069	364-02069	365-02069	
		6.3	5.38	0.75 (20)	599-02070	363-02070	366-02070	364-02070	365-02070	
		10.0	8.55	1.0 (25)	599-02071	363-02071	366-02071	364-02071	365-02071	
	Stainless Steel	0.4	0.34	1/2 (15)	599-02072	363-02072	366-02072	364-02072	365-02072	
		0.63	0.54	1/2 (15)	599-02073	363-02073	366-02073	364-02073	365-02073	
		1.0	0.85	1/2 (15)	599-02074	363-02074	366-02074	364-02074	365-02074	
		1.6	1.37	1/2 (15)	599-02075	363-02075	366-02075	364-02075	365-02075	
		2.5	2.14	1/2 (15)	599-02076	363-02076	363-02076	364-02076	365-02076	
		4.0	3.42	1/2 (15)	599-02077	363-02077	363-02077	364-02077	365-02077	
		6.3	5.38	0.75 (25)	599-02078	363-02078	363-02078	364-02078	365-02078	
		10.0	2.14	1.0 (25)	599-02079	363-02079	363-02079	364-02079	365-02079	

- For details on the SAS61.03U and SAS61.33U Actuator, see *Powermite 599 Series MT Series SAS Electronic Valve Actuator Technical Instructions (155-682)*.
- For details on the SAS81.03U and SAS81.33U Actuator, see *Powermite 599 Series MT Series SAS Electronic Valve Actuator Technical Instructions (155-681)*.

Table 10. 1/2-Inch to 1-Inch, MT Series 3-Way Valves with Powermite 599 MT Series SSC–Electronic Valve Actuators.

Port, Action, & Characteristic	Trim	Flow Rate		Valve Size	Valve Body Assembly	24 Vac Actuator Assembly			
						0 to 10 Vdc		Floating	
		C _v	K _{vs}	Inches (mm)		NSR	SR	NSR	SR
						SSC61U	SSC61.5U	SSC81U	SSC81.5U
						Actuator Prefix Code			
				261	262	259	260		
3-Way, Mixing, Linear, Technical Instructions 155-197P25	Brass	0.4	0.34	1/2 (15)	599-02064	261-02064	262-02064	259-02064	260-02064
		0.63	0.54	1/2 (15)	599-02065	261-02065	262-02065	259-02065	260-02065
		1	0.85	1/2 (15)	599-02066	261-02066	262-02066	259-02066	260-02066
		1.6	1.37	1/2 (15)	599-02067	261-02067	262-02067	259-02067	260-02067
		2.5	2.14	1/2 (15)	599-02068	261-02068	262-02068	259-02068	260-02068
		4	3.42	1/2 (15)	599-02069	261-02069	262-02069	259-02069	260-02069
		6.3	5.38	3/4 (20)	599-02070	261-02070	262-02070	259-02070	260-02070
		10	8.55	1.0 (25)	599-02071	261-02071	262-02071	259-02071	260-02071
	Stainless Steel	0.4	0.34	1/2 (15)	599-02072	261-02072	262-02072	259-02072	260-02072
		0.63	0.54	1/2 (15)	599-02073	261-02073	262-02073	259-02073	260-02073
		1	0.85	1/2 (15)	599-02074	261-02074	262-02074	259-02074	260-02074
		1.6	1.37	1/2 (15)	599-02075	261-02075	262-02075	259-02075	260-02075
		2.5	2.14	1/2 (15)	599-02076	261-02076	262-02076	259-02076	260-02076
		4	3.42	1/2 (15)	599-02077	261-02077	262-02077	259-02077	260-02077
		6.3	5.38	3/4 (20)	599-02078	261-02078	262-02078	259-02078	260-02078
		10	2.14	1.0 (25)	599-02079	261-02079	262-02079	259-02079	260-02079

- For details on the SSC61U and SSC61.5U, see *Powermite 599 Series MT Series SSC Electronic Valve Actuator 24 Vac Proportional Control Technical Instructions (155-313P25)*.
- For details on the SSC81U and SSC81.5U, see *Powermite 599 Series MT Series SSC Electronic Valve Actuator 24 Vac Floating Control Technical Instructions (155-314P25)*.

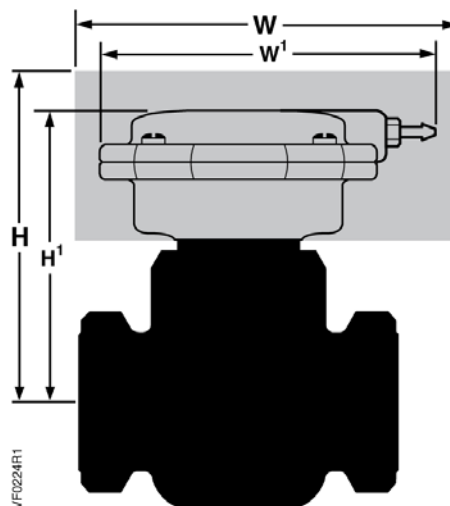


Figure 5. Service Envelope

**Table 11. Actuator Dimensions and Recommended Service Envelope.
 Dimensions in Inches (Millimeters).**

Actuator	Actuator Prefix Code	Valve Size	Center line to Top of Actuator, H1	Service Height, H	Width or Diameter of Actuator, W1	Service Width W
599-01088 2-Inch Pneumatic	256 257 258	1/2 (15)	3-1/16 (78)	11 (280)	4 (100)	10 (250)
		3/4 (20)	3-1/16 (78)	11 (280)	4 (100)	10 (250)
		1 (25)	3-5/16 (84)	11-1/4 (285)	4 (100)	10 (250)
SAS NSR	363 364	1/2 (15)	7-1/2 (191)	15-1/2 (394)	3-1/2 (89)	7-1/2 (191)
		3/4 (20)	7-1/2 (191)	15-1/2 (394)	3-1/2 (89)	7-1/2 (191)
		1 (25)	7-3/4 (197)	15-3/4 (400)	3-1/2 (89)	7-1/2 (191)
SAS SR	365 366	1/2 (15)	7-1/2 (191)	15-1/2 (394)	4 (100)	8 (203)
		3/4 (20)	7-1/2 (191)	15-1/2 (394)	4 (100)	8 (203)
		1 (25)	7-3/4 (197)	15-3/4 (400)	4 (100)	8 (203)
SSC	259 260 261 262	1/2 (15)	5-1/2 (140)	13-1/2 (343)	4-3/4 (121)	12-3/4 (324)
		3/4 (20)	5-1/2 (140)	13-1/2 (343)	4-3/4 (121)	12-3/4 (324)
		1 (25)	5-3/4 (146)	13-3/4 (349)	4-3/4 (121)	12-3/4 (324)

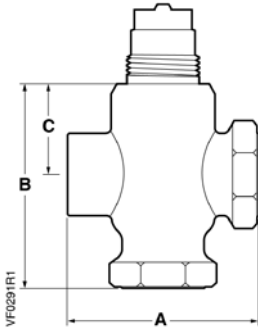
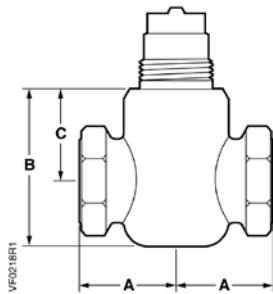
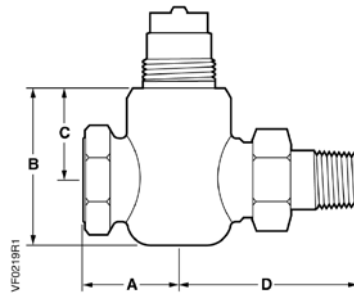


Table 12. 3-Way Valve Dimensions.

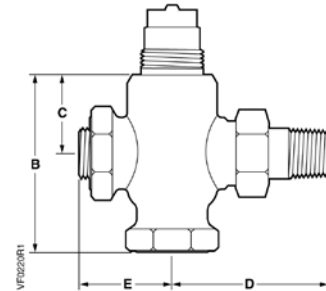
Valve Size inch (mm)	A	B	C	Weight lb (kg)
1/2 (15)	2-3/4 (70)	2-15/16 (74)	1-5/16 (33)	1.10 (0.5)
3/4 (20)	3-1/4 (83)	3-9/16 (90)	1-5/16 (33)	1.44 (.65)
1 (25)	3-7/8 (98)	3-15/16 (99)	1-9/16 (39)	2.20 (1.0)



**Female NPT x Female NPT
FxF**



**Female NPT x Union Male
FxUM**



**Angle Female x Union Male
AFxUM**

Table 13. 2-Way Valve Dimensions.

Valve size Inches	A	B		C	D	E	Weight lb (kg)		
			AFxUM				FxF	FxUM	AFxUM
1/2	1-3/8 (35)	2-1/4 (57)	2-15/16 (74) NO Only	1-5/16 (33)	2-5/8 (67)	1-1/2 (38) NO only	0.96 (0.44)	1.14 (0.5)	1.4 (0.6)
3/4	1-5/8 (41)	2-3/8 (59)	—	1-5/16 (33)	3-1/8 (79)	—	1.13 (.51)	1.45 (.66)	—
1	1-15/16 (49)	2-3/4 (69)	—	1-9/16 (39)	—	—	1.7 (.77)	—	—

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