

Powermite™ 599 Series

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.

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 line 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 Table 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.

Selection Example

Specifications

In an ANSI 250 piping system, a two-way, normally closed, female-by-female 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 three-position control signal, and provide fail-in-place 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 line size, select that valve line 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 SQS... actuator will close-off tightly against a pump head pressure of 15 psi (103 kPa, 1 bar).

Assembly (Product Number) Selection

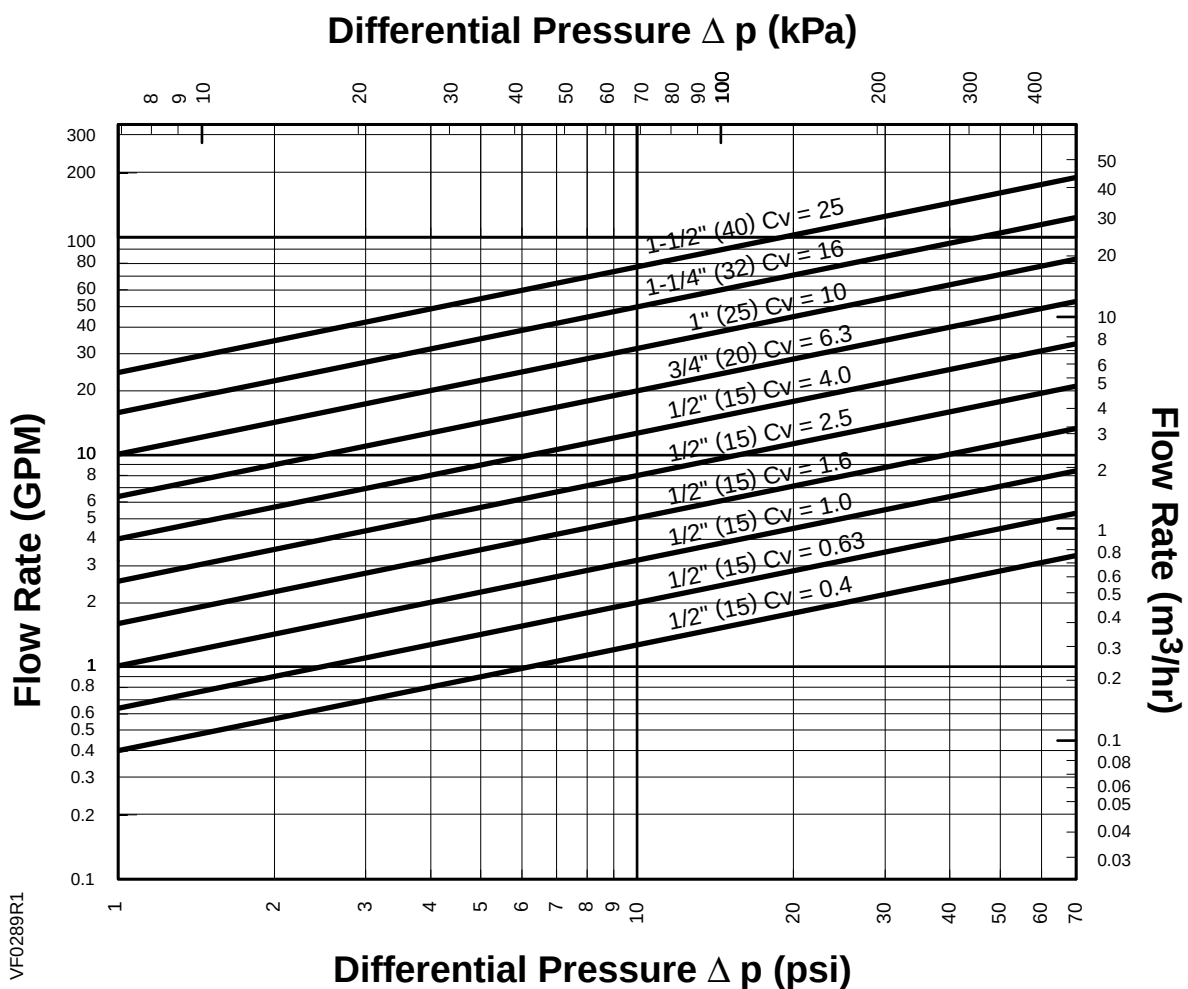
Use Table 3, two-way normally closed valve assemblies, to select a valve and actuator assembly as follows:

1. Read the table from left to right and select bronze trim for the low pressure, chilled water application and FxF for the female-by-female NPT valve threads. Select a 10 Cv (8.5 Kvs), 1-inch (25-mm) valve line 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 three-position control signal and fail-safe operation. The actuator part number is SQS85.53U. The actuator prefix code number is 266.
3. Read down the SQS85.53U actuator column and across the 599-02014 valve body row. The column/row intersection determines the appropriate valve and actuator assembly, which is 266-02014.

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		SQS... Electronic
4		SSC... Electronic
5	2-way, Normally Open	Pneumatic
6		SQS... Electronic
7		SSC... Electronic
8	3-Way, Mixing	Pneumatic
9		SQS... Electronic
10		SSC... Electronic

**Figure 1. Water Capacity Graph.**

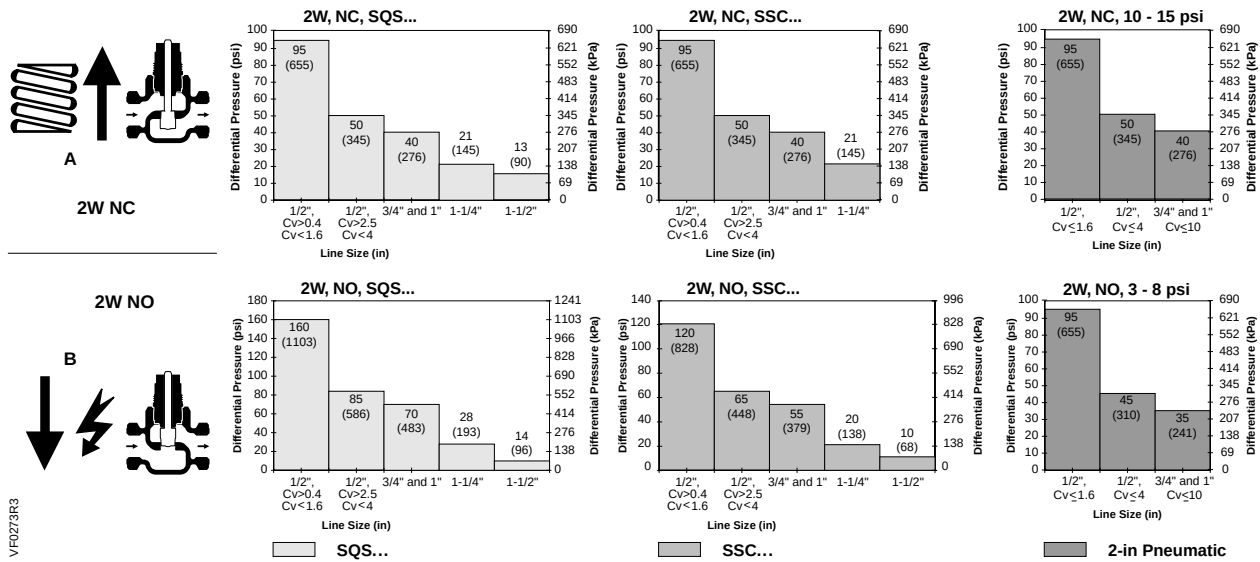


Figure 2. Maximum close-off pressure of actuators on standard 2-way valves. (Close-off pressures at 20 psi actuator pressure.)

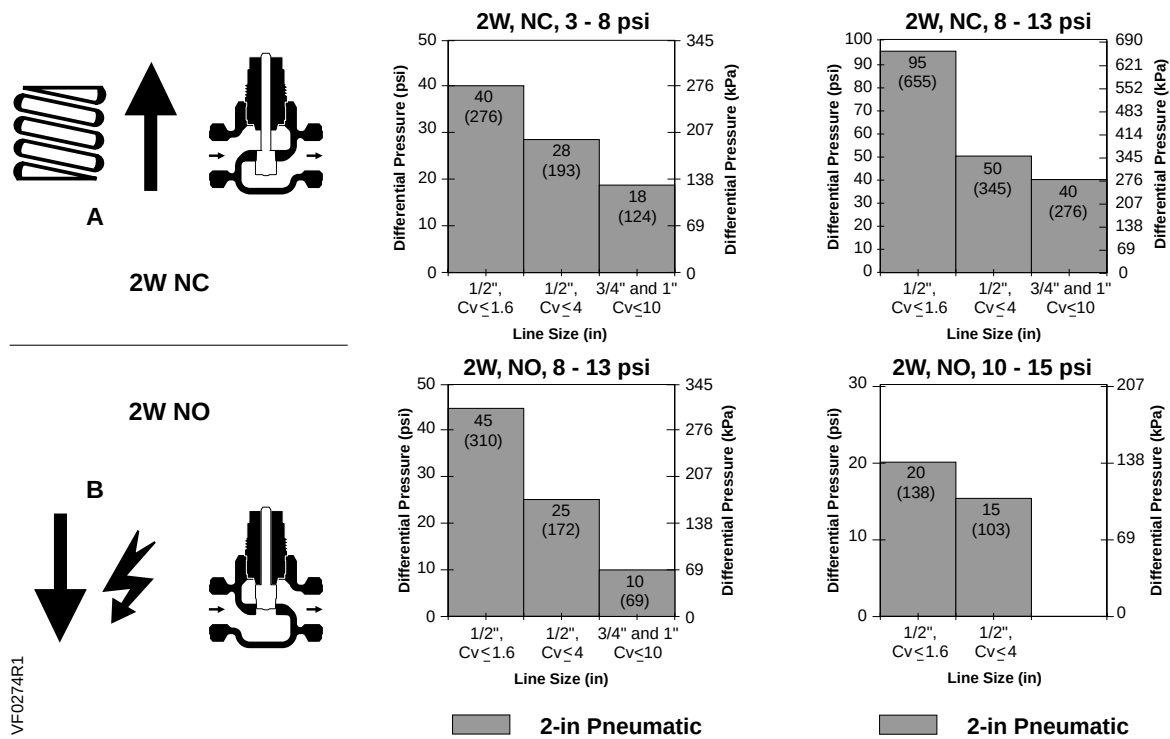


Figure 3. Maximum close-off pressure of 2-Inch pneumatic actuator on 2-way valve with alternate spring ranges. (Close-off pressures at 20 psi actuator pressure.)

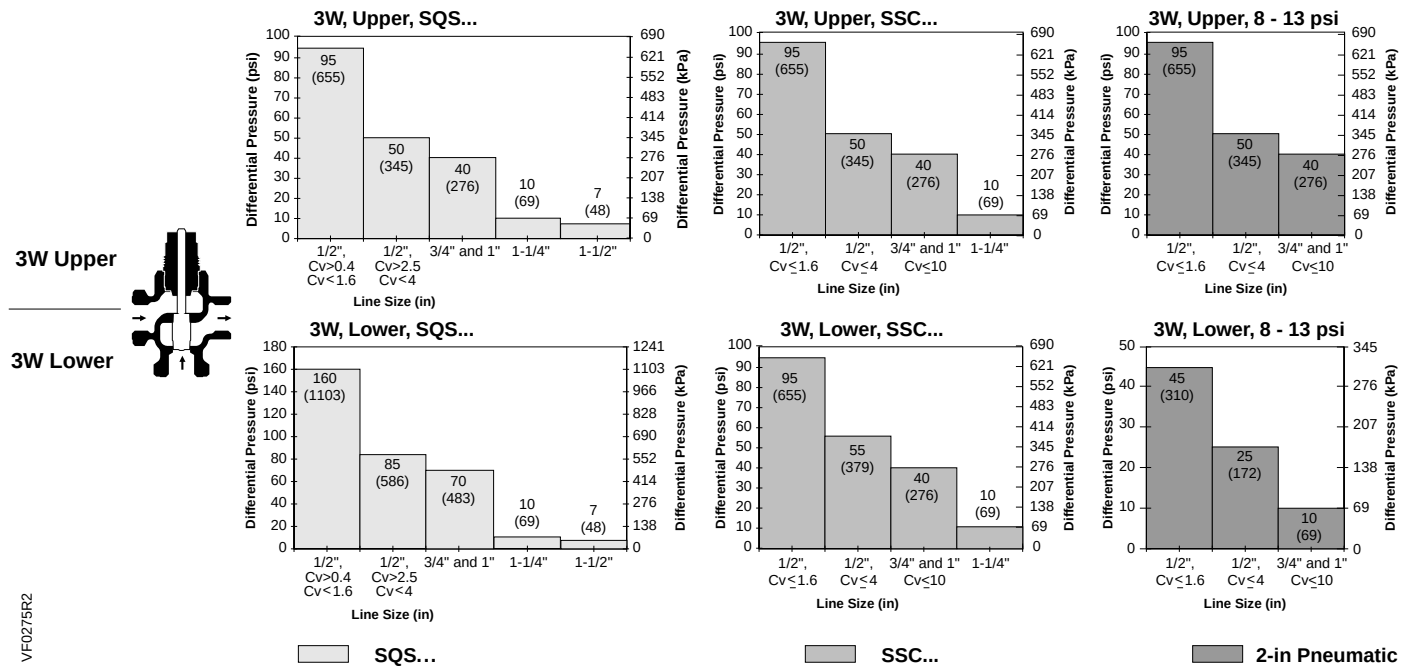


Figure 4. Maximum close-off pressure of actuators on standard 3-way valves.
(Close-off pressures at 20 psi actuator pressure.)

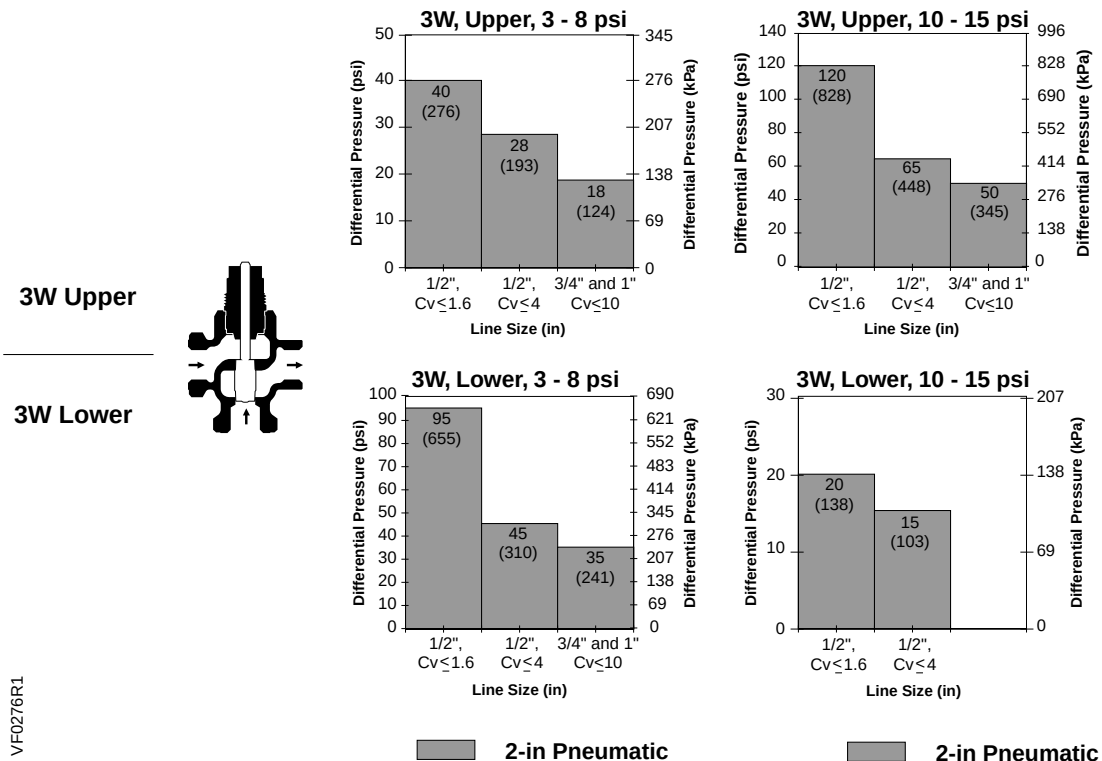


Figure 5. Maximum close-off pressure of 2-Inch pneumatic actuator on 3-way valve with alternate spring ranges. (Close-off pressures at 20 psi actuator pressure.)

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

Port, Action, and Characteristic	Trim	Connection	Flow Rate		Line Size		Valve Body Assembly	Actuator Assembly		
								Spring Range *		
			C _V	K _{VS}	In.	mm		10-15 psi (69-103 kPa)	3-8 psi (21-55 kPa)	8-13 psi (55-90 kPa)
								Actuator Code 256	Actuator Code 257	Actuator Code 258
2-Way, Normally Closed, Modified Equal Percentage, Technical Instructions 155-196P25	Bronze	FxF	0.4	0.34	0.5	15	599-02000	256-02000	257-02000B	258-02000C
			0.63	0.54	0.5	15	599-02002	256-02002	257-02002B	258-02002C
			1	0.85	0.5	15	599-02004	256-02004	257-02004B	258-02004C
			1.6	1.37	0.5	15	599-02006	256-02006	257-02006B	258-02006C
			2.5	2.14	0.5	15	599-02008	256-02008	257-02008B	258-02008C
			4	3.42	0.5	15	599-02010	256-02010	257-02010B	258-02010C
			6.3	5.38	0.75	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	0.5	15	599-02001	256-02001	257-02001B	258-02001C
			0.63	0.54	0.5	15	599-02003	256-02003	257-02003B	258-02003C
			1	0.85	0.5	15	599-02005	256-02005	257-02005B	258-02005C
			1.6	1.37	0.5	15	599-02007	256-02007	257-02007B	258-02007C
			2.5	2.14	0.5	15	599-02009	256-02009	257-02009B	258-02009C
			4	3.42	0.5	15	599-02011	256-02011	257-02011B	258-02011C
			6.3	5.38	0.75	20	599-02013	256-02013	257-02013B	258-02013C
	Stainless Steel	FxF	0.4	0.34	0.5	15	599-02015	256-02015	257-02015B	258-02015C
			0.63	0.54	0.5	15	599-02017	256-02017	257-02017B	258-02017C
			1	0.85	0.5	15	599-02019	256-02019	257-02019B	258-02019C
			1.6	1.37	0.5	15	599-02021	256-02021	257-02021B	258-02021C
			2.5	2.14	0.5	15	599-02023	256-02023	257-02023B	258-02023C
			4	3.42	0.5	15	599-02025	256-02025	257-02025B	258-02025C
			6.3	5.38	0.75	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	0.5	15	599-02016	256-02016	257-02016B	258-02016C
			0.63	0.54	0.5	15	599-02018	256-02018	257-02018B	258-02018C
			1	0.85	0.5	15	599-02020	256-02020	257-02020B	258-02020C
			1.6	1.37	0.5	15	599-02022	256-02022	257-02022B	258-02022C
			2.5	2.14	0.5	15	599-02024	256-02024	257-02024B	258-02024C
			4	3.42	0.5	15	599-02026	256-02026	257-02026B	258-02026C
			6.3	5.38	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 to 1-1/2 Inch, MT Series 2-Way, Normally Closed Valves with Powermite 599 Series MT Series SQS Electronic Valve Actuators.

Port, Action, and Characteristic	Trim	Connection	Flow Rate		Line Size		Valve Body Assembly	Actuator Assembly		
								SQS65U	SQS65.5U	SQS85.53U
								24V, 0-10V, Fail-in-Place	24V, 0-10V, Fail-Safe	24V, 3-Pos., Fail-Safe
			C _v	K _{vs}	In.	mm		Actuator Code 264	Actuator Code 265	Actuator Code 266
2-Way, Normally Closed, Modified Equal Percentage, Technical Instructions 155-196P25	Bronze	FxF	0.4	0.34	0.5	15	599-02000	264-02000	265-02000	266-02000
			0.63	0.54	0.5	15	599-02002	264-02002	265-02002	266-02002
			1	0.85	0.5	15	599-02004	264-02004	265-02004	266-02004
			1.6	1.37	0.5	15	599-02006	264-02006	265-02006	266-02006
			2.5	2.14	0.5	15	599-02008	264-02008	265-02008	266-02008
			4	3.42	0.5	15	599-02010	264-02010	265-02010	266-02010
			6.3	5.38	0.75	20	599-02012	264-02012	265-02012	266-02012
			10	8.55	1	25	599-02014	264-02014	265-02014	266-02014
			16	13.8	1.25	32	599-02085	264-02085	265-02085	266-02085
			25	21.5	1.50	40	599-02088	264-02088	265-02088	266-02088
		FxUM	0.4	0.34	0.5	15	599-02001	264-02001	265-02001	266-02001
			0.63	0.54	0.5	15	599-02003	264-02003	265-02003	266-02003
			1	0.85	0.5	15	599-02005	264-02005	265-02005	266-02005
			1.6	1.37	0.5	15	599-02007	264-02007	265-02007	266-02007
			2.5	2.14	0.5	15	599-02009	264-02009	265-02009	266-02009
			4	3.42	0.5	15	599-02011	264-02011	265-02011	266-02011
			6.3	5.38	0.75	20	599-02013	264-02013	265-02013	266-02013
			10	8.55	1	25	599-02015	264-02015	265-02015	266-02015
	Stainless Steel	FxF	0.63	0.54	0.5	15	599-02017	264-02017	265-02017	266-02017
			1	0.85	0.5	15	599-02019	264-02019	265-02019	266-02019
			1.6	1.37	0.5	15	599-02021	264-02021	265-02021	266-02021
			2.5	2.14	0.5	15	599-02023	264-02023	265-02023	266-02023
			4	3.42	0.5	15	599-02025	264-02025	265-02025	266-02025
			6.3	5.38	0.75	20	599-02027	264-02027	265-02027	266-02027
			10	8.55	1	25	599-02029	264-02029	265-02029	266-02029
			0.4	0.34	0.5	15	599-02016	264-02016	265-02016	266-02016
		FxUM	0.63	0.54	0.5	15	599-02018	264-02018	265-02018	266-02018
			1	0.85	0.5	15	599-02020	264-02020	265-02020	266-02020
			1.6	1.37	0.5	15	599-02022	264-02022	265-02022	266-02022
			2.5	2.14	0.5	15	599-02024	264-02024	265-02024	266-02024
			4	3.42	0.5	15	599-02026	264-02026	265-02026	266-02026
			6.3	5.38	0.75	20	599-02028	264-02028	265-02028	266-02028

- For details on the SQS65U and SQS65.5U Actuator, see Powermite 599 Series MT Series SQS... Electronic Valve Actuator Technical Instructions (155-190P25).
- For details on the SQS85.53U Actuator, see Powermite 599 Series MT Series SQS... Electronic Valve Actuator Technical Instructions (155-308P25).

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

Port, Action, and Characteristic	Trim	Connection	Flow Rate		Line Size		Spring Range	Valve Body Assembly	Actuator Assembly			
									SSC61U	SSC61.5U	SSC81U	SSC81.5U
			C _V	K _{VS}	In.	mm			24V, 0-10V, Fail-in-Place	24V, 0-10V, Fail-Safe	24V, 3 Pos., Fail-in-Place	24V, 3 Pos., Fail-Safe
									Actuator Code 261	Actuator Code 262	Actuator Code 259	Actuator Code 260
2-Way, Normally Closed, Modified Equal Percentage, Technical Instructions 155-196P25	Bronze	FxF	0.4	0.34	0.5	15	10 to 15 psi (69 to 103 kPa)	599-02000	261-02000	262-02000	259-02000	260-02000
			0.63	0.54	0.5	15		599-02002	261-02002	262-02002	259-02002	260-02002
			1	0.85	0.5	15		599-02004	261-02004	262-02004	259-02004	260-02004
			1.6	1.37	0.5	15		599-02006	261-02006	262-02006	259-02006	260-02006
			2.5	2.14	0.5	15		599-02008	261-02008	262-02008	259-02008	260-02008
			4	3.42	0.5	15		599-02010	261-02010	262-02010	259-02010	260-02010
			6.3	5.38	0.75	20		599-02012	261-02012	262-02012	259-02012	260-02012
			10	8.55	1	25		599-02014	261-02014	262-02014	259-02014	260-02014
			16	13.8	1.25	32		599-02085	261-02085	262-02085	259-02085	260-02085
		FxUM	0.4	0.34	0.5	15		599-02001	261-02001	262-02001	259-02001	260-02001
			0.63	0.54	0.5	15		599-02003	261-02003	262-02003	259-02003	260-02003
			1	0.85	0.5	15		599-02005	261-02005	262-02005	259-02005	260-02005
			1.6	1.37	0.5	15		599-02007	261-02007	262-02007	259-02007	260-02007
			2.5	2.14	0.5	15		599-02009	261-02009	262-02009	259-02009	260-02009
			4	3.42	0.5	15		599-02011	261-02011	262-02011	259-02011	260-02011
			6.3	5.38	0.75	20		599-02013	261-02013	262-02013	259-02013	260-02013
	Stainless Steel	FxF	0.4	0.34	0.5	15		599-02015	261-02015	262-02015	259-02015	260-02015
			0.63	0.54	0.5	15		599-02017	261-02017	262-02017	259-02017	260-02017
			1	0.85	0.5	15		599-02019	261-02019	262-02019	259-02019	260-02019
			1.6	1.37	0.5	15		599-02021	261-02021	262-02021	259-02021	260-02021
			2.5	2.14	0.5	15		599-02023	261-02023	262-02023	259-02023	260-02023
			4	3.42	0.5	15		599-02025	261-02025	262-02025	259-02025	260-02025
			6.3	5.38	0.75	20		599-02027	261-02027	262-02027	259-02027	260-02027
			10	8.55	1	25		599-02029	261-02029	262-02029	259-02029	260-02029
			FxUM	0.4	0.34	0.5		15	599-02016	261-02016	262-02016	259-02016
		0.63		0.54	0.5	15		599-02018	261-02018	262-02018	259-02018	260-02018
		1		0.85	0.5	15		599-02020	261-02020	262-02020	259-02020	260-02020
		1.6		1.37	0.5	15		599-02022	261-02022	262-02022	259-02022	260-02022
		2.5		2.14	0.5	15		599-02024	261-02024	262-02024	259-02024	260-02024
		4		3.42	0.5	15		599-02026	261-02026	262-02026	259-02026	260-02026
		6.3		5.38	0.75	20		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 Instruction (155-313P25).
- For details on the SSC81U and SSC81.5U, see Powermite 599 Series MT Series SSC Electronic Valve Actuator 24 Vac 3-Position (Floating) Control Technical Instruction (155-314P25).

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

Port, Action, and Characteristic	Trim	Connection	Flow Rate		Line Size		Valve Body Assembly	Actuator Assembly		
								Spring Range *		
			C _V	K _{VS}	In.	mm		10-15 psi (69-103 kPa)	3-8 psi (21-55 kPa)	8-13 psi (55-90 kPa)
								Actuator Code 256	Actuator Code 257	Actuator Code 258
2-Way, Normally Open, Modified Equal Percentage, Technical Instructions 155-196P25	Bronze	FxF	0.4	0.34	0.5	15	599-02030	256-02030A	257-02030	258-02030C
			0.63	0.54	0.5	15	599-02032	256-02032A	257-02032	258-02032C
			1	0.85	0.5	15	599-02034	256-02034A	257-02034	258-02034C
			1.6	1.37	0.5	15	599-02036	256-02036A	257-02036	258-02036C
			2.5	2.14	0.5	15	599-02038	256-02038A	257-02038	258-02038C
			4	3.42	0.5	15	599-02041	256-02041A	257-02041	258-02041C
			6.3	5.38	0.75	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	0.5	15	599-02031	256-02031A	257-02031	258-02031C
			0.63	0.54	0.5	15	599-02033	256-02033A	257-02033	258-02033C
			1	0.85	0.5	15	599-02035	256-02035A	257-02035	258-02035C
			1.6	1.37	0.5	15	599-02037	256-02037A	257-02037	258-02037C
			2.5	2.14	0.5	15	599-02039	256-02039A	257-02039	258-02039C
			4	3.42	0.5	15	599-02042	256-02042A	257-02042	258-02042C
			6.3	5.38	0.75	20	599-02045	256-02045A	257-02045	258-02045C
		AF x UM	2.5	2.14	0.5	15	599-02040	256-02040A	257-02040	258-02040C
			4	3.42	0.5	15	599-02043	256-02043A	257-02043	258-02043C
	Stainless Steel	FxF	0.4	0.34	0.5	15	599-02047	256-02047A	257-02047	258-02047C
			0.63	0.54	0.5	15	599-02049	256-02049A	257-02049	258-02049C
			1	0.85	0.5	15	599-02051	256-02051A	257-02051	258-02051C
			1.6	1.37	0.5	15	599-02053	256-02053A	257-02053	258-02053C
			2.5	2.14	0.5	15	599-02055	256-02055A	257-02055	258-02055C
			4	3.42	0.5	15	599-02058	256-02058A	257-02058	258-02058C
			6.3	5.38	0.75	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	0.5	15	599-02048	256-02048A	257-02048	258-02048C
			0.63	0.54	0.5	15	599-02050	256-02050A	257-02050	258-02050C
			1	0.85	0.5	15	599-02052	256-02052A	257-02052	258-02052C
			1.6	1.37	0.5	15	599-02054	256-02054A	257-02054	258-02054C
			2.5	2.14	0.5	15	599-02056	256-02056A	257-02056	258-02056C
			4	3.42	0.5	15	599-02059	256-02059A	257-02059	258-02059C
			6.3	5.38	0.75	20	599-02062	256-02062A	257-02062	258-02062C
		AF x UM	2.5	2.14	0.5	15	599-02057	256-02057A	257-02057	258-02057C
			4	3.42	0.5	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 to 1-1/2 Inch, MT Series 2-Way, Normally Open Valves
with Powermite 599 Series MT Series SQS... Electronic Valve Actuators.**

Port, Action, and Characteristic	Trim	Connection	Flow Rate		Line Size		Valve Body Assembly	Actuator Assembly		
								SQS65U	SQS65.5U	SQS85.53U
								24V, 0-10V, Fail-in-Place	24V, 0-10V, Fail-Safe	24V, 3-Pos., Fail-Safe
			C _V	K _{VS}	In.	mm		Actuator Code 264	Actuator Code 265	Actuator Code 266
2-Way, Normally Open, Modified Equal Percentage, Technical Instructions 155-196P25	Bronze	FxF	0.4	0.34	0.5	15	599-02030	264-02030	265-02030	266-02030
			0.63	0.54	0.5	15	599-02032	264-02032	265-02032	266-02032
			1	0.85	0.5	15	599-02034	264-02034	265-02034	266-02034
			1.6	1.37	0.5	15	599-02036	264-02036	265-02036	266-02036
			2.5	2.14	0.5	15	599-02038	264-02038	265-02038	266-02038
			4	3.42	0.5	15	599-02041	264-02041	265-02041	266-02041
			6.3	5.38	0.75	20	599-02044	264-02044	265-02044	266-02044
			10	8.55	1	25	599-02046	264-02046	265-02046	266-02046
			16	13.8	1.25	33	599-02084	264-02084	265-02084	266-02084
			25	21.5	1.50	40	599-02087	264-02087	265-02087	266-02087
		FxUM	0.4	0.34	0.5	15	599-02031	264-02031	265-02031	266-02031
			0.63	0.54	0.5	15	599-02033	264-02033	265-02033	266-02033
			1	0.85	0.5	15	599-02035	264-02035	265-02035	266-02035
			1.6	1.37	0.5	15	599-02037	264-02037	265-02037	266-02037
			2.5	2.14	0.5	15	599-02039	264-02039	265-02039	266-02039
			4	3.42	0.5	15	599-02042	264-02042	265-02042	266-02042
			6.3	5.38	0.75	20	599-02045	264-02045	265-02045	266-02045
		AF x UM	2.5	2.14	0.5	15	599-02040	264-02040	265-02040	266-02040
			4	3.42	0.5	15	599-02043	264-02043	265-02043	266-02043
	Stainless Steel	FxF	0.4	0.34	0.5	15	599-02047	264-02047	265-02047	266-02047
			0.63	0.54	0.5	15	599-02049	264-02049	265-02049	266-02049
			1	0.85	0.5	15	599-02051	264-02051	265-02051	266-02051
			1.6	1.37	0.5	15	599-02053	264-02053	265-02053	266-02053
			2.5	2.14	0.5	15	599-02055	264-02055	265-02055	266-02055
			4	3.42	0.5	15	599-02058	264-02058	265-02058	266-02058
			6.3	5.38	0.75	20	599-02061	264-02061	265-02061	266-02061
			10	8.55	1	25	599-02063	264-02063	265-02063	266-02063
		FxUM	0.4	0.34	0.5	15	599-02048	264-02048	265-02048	266-02048
			0.63	0.54	0.5	15	599-02050	264-02050	265-02050	266-02050
			1	0.85	0.5	15	599-02052	264-02052	265-02052	266-02052
			1.6	1.37	0.5	15	599-02054	264-02054	265-02054	266-02054
			2.5	2.14	0.5	15	599-02056	264-02056	265-02056	266-02056
			4	3.42	0.5	15	599-02059	264-02059	265-02059	266-02059
			6.3	5.38	0.75	20	599-02062	264-02062	265-02062	266-02062
		AF x UM	2.5	2.14	0.5	15	599-02057	264-02057	265-02057	266-02057
			4	3.42	0.5	15	599-02060	264-02060	265-02060	266-02060

- For details on the SQS65U and SQS65.5U Actuator, see Powermite 599 Series MT Series SQS... Electronic Valve Actuator Technical Instructions (155-190P25).
- For details on the SQS85.53U Actuator, see Powermite 599 Series MT Series SQS... Electronic Valve Actuator Technical Instructions (155-308P25).

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

Port, Action, and Characteristic	Trim	Connection	Flow Rate		Line Size		Spring Range	Valve Body Assembly	Actuator Assembly			
									SSC61U	SSC61.5U	SSC81U	SSC81.5U
			C _V	K _{VS}	In.	mm			24V, 0-10V, Fail-in-Place	24V, 0-10V, Fail-Safe	24V, 3 Pos., Fail-in-Place	24V, 3 Pos., Fail-Safe
									Actuator Code 261	Actuator Code 262	Actuator Code 259	Actuator Code 260
2-Way, Normally Open, Modified Equal Percentage, Technical Instructions 155-196P25	Bronze	FxF	0.4	0.34	0.5	15	3 to 8 psi (21 to 55 kPa)	599-02030	261-02030	262-02030	259-02030	260-02030
			0.63	0.54	0.5	15		599-02032	261-02032	262-02032	259-02032	260-02032
			1	0.85	0.5	15		599-02034	261-02034	262-02034	259-02034	260-02034
			1.6	1.37	0.5	15		599-02036	261-02036	262-02036	259-02036	260-02036
			2.5	2.14	0.5	15		599-02038	261-02038	262-02038	259-02038	260-02038
			4	3.42	0.5	15		599-02041	261-02041	262-02041	259-02041	260-02041
			6.3	5.38	0.75	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
			16	13.8	1.25	32		599-02084	261-02084	262-02084	259-02084	260-02084
			25	21.5	1.50	40		599-02087	261-02087	262-02087	259-02087	260-02087
		FxUM	0.4	0.34	0.5	15		599-02031	261-02031	262-02031	259-02031	260-02031
			0.63	0.54	0.5	15		599-02033	261-02033	262-02033	259-02033	260-02033
			1	0.85	0.5	15		599-02035	261-02035	262-02035	259-02035	260-02035
			1.6	1.37	0.5	15		599-02037	261-02037	262-02037	259-02037	260-02037
			2.5	2.14	0.5	15		599-02039	261-02039	262-02039	259-02039	260-02039
			4	3.42	0.5	15		599-02042	261-02042	262-02042	259-02042	260-02042
			6.3	5.38	0.75	20		599-02045	261-02045	262-02045	259-02045	260-02045
			2.5	2.14	0.5	15		599-02040	261-02040	262-02040	259-02040	260-02040
			4	3.42	0.5	15		599-02043	261-02043	262-02043	259-02043	260-02043
			AF x UM	2.5	2.14	0.5		15	599-02047	261-02047	262-02047	259-02047
	4	3.42		0.5	15	599-02049		261-02049	262-02049	259-02049	260-02049	
	FxF	0.4		0.34	0.5	15		599-02051	261-02051	262-02051	259-02051	260-02051
		0.63		0.54	0.5	15		599-02053	261-02053	262-02053	259-02053	260-02053
		1		0.85	0.5	15		599-02055	261-02055	262-02055	259-02055	260-02055
		1.6		1.37	0.5	15		599-02058	261-02058	262-02058	259-02058	260-02058
		2.5		2.14	0.5	15		599-02061	261-02061	262-02061	259-02061	260-02061
		4		3.42	0.5	15		599-02063	261-02063	262-02063	259-02063	260-02063
		6.3		5.38	0.75	20		599-02048	261-02048	262-02048	259-02048	260-02048
		10		8.55	1	25		599-02050	261-02050	262-02050	259-02050	260-02050
	FxUM	0.4	0.34	0.5	15	599-02052		261-02052	262-02052	259-02052	260-02052	
		0.63	0.54	0.5	15	599-02054		261-02054	262-02054	259-02054	260-02054	
		1	0.85	0.5	15	599-02056		261-02056	262-02056	259-02056	260-02056	
		1.6	1.37	0.5	15	599-02059		261-02059	262-02059	259-02059	260-02059	
		2.5	2.14	0.5	15	599-02062		261-02062	262-02062	259-02062	260-02062	
		4	3.42	0.5	15	599-02057		261-02057	262-02057	259-02057	260-02057	
		6.3	5.38	0.75	20	599-02060		261-02060	262-02060	259-02060	260-02060	
		2.5	2.14	0.5	15							
	4	3.42	0.5	15								

- For details on the SSC61U and SSC61.5U, see Powermite 599 Series MT Series SSC Electronic Valve Actuator 24 Vac Proportional Control Technical Instruction (155-313P25).
- For details on the SSC81U and SSC81.5U, see Powermite 599 Series MT Series SSC Electronic Valve Actuator 24 Vac 3-Position (Floating) Control Technical Instruction (155-314P25).

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

Port, Action, and Characteristic	Trim	Flow Rate		Line Size		Valve Body Assembly	Actuator Assembly		
							Spring Range *		
		C _V	K _{VS}	In.	mm		10-15 psi (69-103 kPa)	3-8 psi (21-55 kPa)	8-13 psi (55-90 kPa)
							Actuator Code 256	Actuator Code 257	Actuator Code 258
3-Way, Mixing, Linear, Technical Instructions 155-197P25	Bronze	0.4	0.34	0.5	15	599-02064	256-02064A	257-02064B	258-02064
		0.63	0.54	0.5	15	599-02065	256-02065A	257-02065B	258-02065
		1	0.85	0.5	15	599-02066	256-02066A	257-02066B	258-02066
		1.6	1.37	0.5	15	599-02067	256-02067A	257-02067B	258-02067
		2.5	2.14	0.5	15	599-02068	256-02068A	257-02068B	258-02068
		4	3.42	0.5	15	599-02069	256-02069A	257-02069B	258-02069
		6.3	5.38	0.75	20	599-02070	256-02070A	257-02070B	258-02070
		10	8.55	1	25	599-02071	256-02071A	257-02071B	258-02071
	Stainless Steel	0.4	0.34	0.5	15	599-02072	256-02072A	257-02072B	258-02072
		0.63	0.54	0.5	15	599-02073	256-02073A	257-02073B	258-02073
		1	0.85	0.5	15	599-02074	256-02074A	257-02074B	258-02074
		1.6	1.37	0.5	15	599-02075	256-02075A	257-02075B	258-02075
		2.5	2.14	0.5	15	599-02076	256-02076A	257-02076B	258-02076
		4	3.42	0.5	15	599-02077	256-02077A	257-02077B	258-02077
		6.3	5.38	0.75	20	599-02078	256-02078A	257-02078B	258-02078
		10	2.14	0.5	15	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 to 1-1/2-inch, MT Series 3-Way Valves with
Powermite 599 Series MT Series SQS–Electronic Valve Actuators.**

Port, Action, and Characteristic	Trim	Flow Rate		Line Size		Valve Body Assembly	Actuator Assembly		
							SQS65U	SQS65.5U	SQS85.53 U
							24V, 0-10V, Fail-in-Place	24V, 0-10V, Fail-Safe	24V, 3- Pos., Fail-Safe
		C _V	K _{VS}	In.	mm		Actuator Code 264	Actuator Code 265	Actuator Code 266
3-Way, Mixing, Linear, Technical Instructions 155-197P25	Bronze	0.4	0.34	0.5	15	599-02064	264-02064	265-02064	266-02064
		0.63	0.54	0.5	15	599-02065	264-02065	265-02065	266-02065
		1	0.85	0.5	15	599-02066	264-02066	265-02066	266-02066
		1.6	1.37	0.5	15	599-02067	264-02067	265-02067	266-02067
		2.5	2.14	0.5	15	599-02068	264-02068	265-02068	266-02068
		4	3.42	0.5	15	599-02069	264-02069	265-02069	266-02069
		6.3	5.38	0.75	20	599-02070	264-02070	265-02070	266-02070
		10	8.55	1	25	599-02071	264-02071	265-02071	266-02071
		16	13.8	1.25	32	599-02086	264-02086	265-02086	266-02086
		25	21.5	1.50	40	599-02089	264-02089	265-02089	266-02089
	Stainless Steel	0.4	0.34	0.5	15	599-02072	264-02072	265-02072	266-02072
		0.63	0.54	0.5	15	599-02073	264-02073	265-02073	266-02073
		1	0.85	0.5	15	599-02074	264-02074	265-02074	266-02074
		1.6	1.37	0.5	15	599-02075	264-02075	265-02075	266-02075
		2.5	2.14	0.5	15	599-02076	264-02076	265-02076	266-02076
		4	3.42	0.5	15	599-02077	264-02077	265-02077	266-02077
		6.3	5.38	0.75	20	599-02078	264-02078	265-02078	266-02078
		10	2.14	0.5	15	599-02079	264-02079	265-02079	266-02079

- For details on the SQS65U and SQS65.5U Actuator, see Powermite 599 Series MT Series SQS... Electronic Valve Actuator Technical Instructions (155-190P25).
- For details on the SQS85.53U Actuator, see Powermite 599 Series MT Series SQS... Electronic Valve Actuator Technical Instructions (155-308P25).

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

Port, Action, and Characteristic	Trim	Flow Rate		Line Size		Spring Range	Valve Body Assembly	Actuator Assembly			
								SSC61U	SSC61.5U	SSC81U	SSC81.5U
		24V, 0-10V, Fail-in-Place	24V, 0-10V, Fail-Safe	24V, 3 Pos., Fail-in-Place	24V, 3 Pos., Fail-Safe						
	Actuator Code 261	Actuator Code 262	Actuator Code 259	Actuator Code 260							
3-Way, Mixing, Linear, Technical Instructions 155-197P25	Bronze	0.4	0.34	0.5	15	8 to 13 psi (55 to 90 kPa)	599-02064	261-02064	262-02064	259-02064	260-02064
		0.63	0.54	0.5	15		599-02065	261-02065	262-02065	259-02065	260-02065
		1	0.85	0.5	15		599-02066	261-02066	262-02066	259-02066	260-02066
		1.6	1.37	0.5	15		599-02067	261-02067	262-02067	259-02067	260-02067
		2.5	2.14	0.5	15		599-02068	261-02068	262-02068	259-02068	260-02068
		4	3.42	0.5	15		599-02069	261-02069	262-02069	259-02069	260-02069
		6.3	5.38	0.75	20		599-02070	261-02070	262-02070	259-02070	260-02070
		10	8.55	1	25		599-02071	261-02071	262-02071	259-02071	260-02071
		16	13.8	1.25	32		599-02086	261-02086	262-02086	259-02086	260-02086
	Stainless Steel	0.4	0.34	0.5	15		599-02072	261-02072	262-02072	259-02072	260-02072
		0.63	0.54	0.5	15		599-02073	261-02073	262-02073	259-02073	260-02073
		1	0.85	0.5	15		599-02074	261-02074	262-02074	259-02074	260-02074
		1.6	1.37	0.5	15		599-02075	261-02075	262-02075	259-02075	260-02075
		2.5	2.14	0.5	15		599-02076	261-02076	262-02076	259-02076	260-02076
		4	3.42	0.5	15		599-02077	261-02077	262-02077	259-02077	260-02077
		6.3	5.38	0.75	20		599-02078	261-02078	262-02078	259-02078	260-02078
		10	2.14	0.5	15		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 Instruction (155-313P25).
- For details on the SSC81U and SSC81.5U, see Powermite 599 Series MT Series SSC Electronic Valve Actuator 24 Vac 3-Position (Floating) Control Technical Instruction (155-314P25).

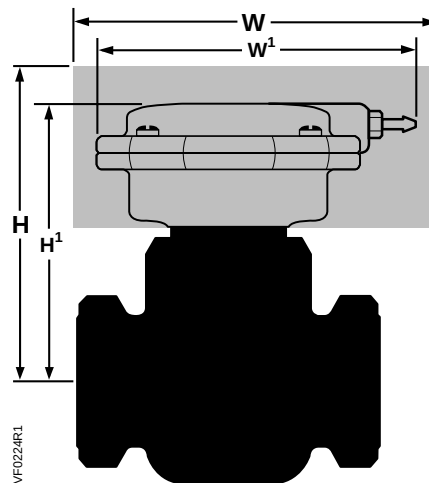


Figure 5. Service Envelope

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

Actuator	Actuator Prefix Code	Valve Line Size	Center line to Top of Actuator, H1		Service Height, H		Width or Diameter Of Actuator, W1	Service Width W
			NO	NC	NO	NC		
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)
SQS65U 0 – 10V Fail-in-Place	264	1/2 (15)	6-5/8 (167)		14-1/2 (370)		5-1/16 (128)	9 (225)
		3/4 (20)	6-5/8 (167)		14-1/2 (370)		5-1/16 (128)	9 (225)
		1 (25)	6-7/8 (173)		15 (380)		5-1/16 (128)	9 (225)
		1-1/4 (32)	8-1/4 (210)	7-3/4 (197)	16 (406)	15-3/4 (400)	5-1/16 (128)	9 (225)
		1-1/2 (38)	8-3/16 (208)	7-9/16 (192)	16 (406)	15-9/16 (400)	5-1/16 (128)	9 (225)
SQS65.5U 0 – 10V Fail-Safe	265	1/2 (15)	6-1/16 (153)		14 (355)		5-1/16 (128)	9 (225)
		3/4 (20)	6-1/16 (153)		14 (355)		5-1/16 (128)	9 (225)
		1 (25)	6-5/16 (159)		14-1/2 (370)		5-1/16 (128)	9 (225)
		1-1/4 (32)	7-11/16 (195)	7-3/16 (183)	15-1/2 (394)	15 3/16 (387)	5-1/16 (128)	9 (225)
		1-1/2 (38)	7-3/4 (197)	7-1/8 (181)	16 (406)	15 (380)	5-1/16 (128)	9 (225)
SQS85.53U 3-Position Fail-Safe	266	1/2 (15)	6-1/16 (153)		14 (355)		5-1/16 (128)	9 (225)
		3/4 (20)	6-1/16 (153)		14 (355)		5-1/16 (128)	9 (225)
		1 (25)	6-5/16 (159)		14-1/2 (370)		5-1/16 (128)	9 (225)
		1-1/4 (32)	7-11/16 (195)	7-3/16 (183)	15-1/2 (394)	15 3/16 (387)	5-1/16 (128)	9 (225)
		1-1/2 (38)	7-3/4 (197)	7-1/8 (181)	16 (406)	15 (380)	5-1/16 (128)	9 (225)
SSC61U 0 – 10V Fail-in-Place	261	1/2 (15)	5-1/8 (130)		13-1/8 (333)		4-3/4 (121)	12-3/4 (324)
		3/4 (20)	5-1/8 (130)		13-1/8 (333)		4-3/4 (121)	12-3/4 (324)
		1 (25)	5-3/8 (137)		13-3/8 (340)		4-3/4 (121)	12-3/4 (324)
		1-1/4 (32)	6-7/8 (175)	6-3/8 (162)	15 (380)	14-1/2 (368)	4-3/4 (121)	12-3/4 (324)
		1-1/2 (38)	6-15/16 (176)	-	15 (380)	-	4-3/4 (121)	12-3/4 (324)
SSC61.5U 0 – 10V Fail-Safe	262	1/2 (15)	5-1/8 (130)		13-1/8 (333)		4-3/4 (121)	12-3/4 (324)
		3/4 (20)	5-1/8 (130)		13-1/8 (333)		4-3/4 (121)	12-3/4 (324)
		1 (25)	5-3/8 (137)		13-3/8 (340)		4-3/4 (121)	12-3/4 (324)
		1-1/4 (32)	6-7/8 (175)	6-3/8 (162)	15 (380)	14-1/2 (370)	4-3/4 (121)	12-3/4 (324)
		1-1/2 (38)	6-15/16 (176)	-	15 (380)	-	4-3/4 (121)	12-3/4 (324)
SSC81U 3-Position Fail-in-Place	259	1/2 (15)	5-1/8 (130)		13-1/8 (333)		4-3/4 (121)	12-3/4 (324)
		3/4 (20)	5-1/8 (130)		13-1/8 (333)		4-3/4 (121)	12-3/4 (324)
		1 (25)	5-3/8 (137)		13-3/8 (340)		4-3/4 (121)	12-3/4 (324)
		1-1/4 (32)	6-7/8 (175)	6-3/8 (162)	15 (380)	14-1/2 (370)	4-3/4 (121)	12-3/4 (324)
		1-1/2 (38)	6-15/16 (176)	-	15 (381)	-	4-3/4 (121)	12-3/4 (324)
SSC81.5U 3-Position Fail-Safe	260	1/2 (15)	5-1/8 (130)		13-1/8 (333)		4-3/4 (121)	12-3/4 (324)
		3/4 (20)	5-1/8 (130)		13-1/8 (333)		4-3/4 (121)	12-3/4 (324)
		1 (25)	5-3/8 (137)		13-3/8 (340)		4-3/4 (121)	12-3/4 (324)
		1-1/4 (32)	6-7/8 (175)	6-3/8 (162)	15 (380)	15 (380)	4-3/4 (121)	12-3/4 (324)
		1-1/2 (38)	6-15/16 (176)	-	15 (380)	-	4-3/4 (121)	12-3/4 (324)

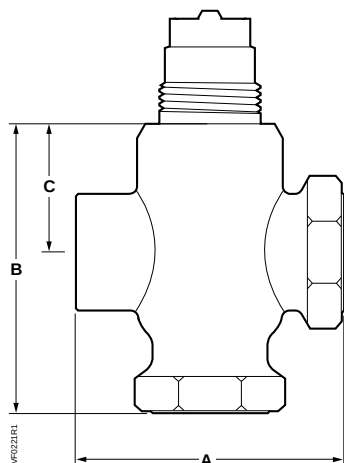
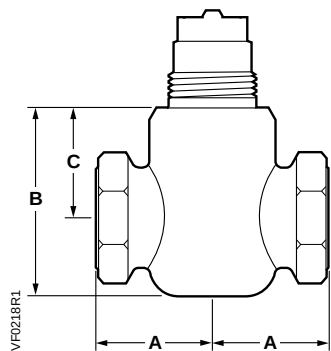
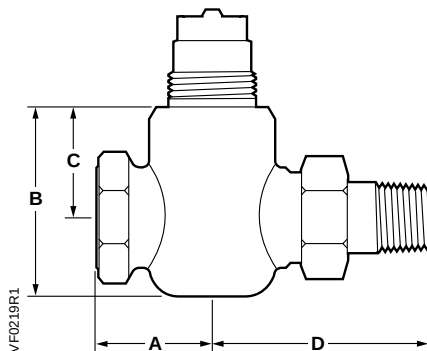


Table 12. 3-Way Valve Dimensions.

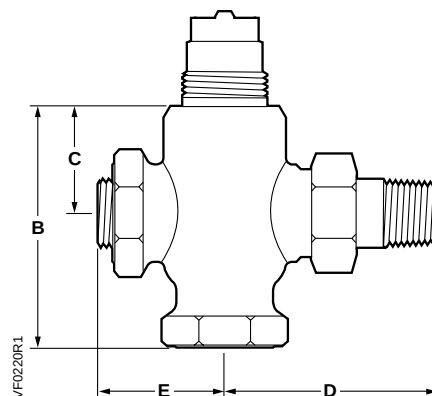
Valve Size inch (mm)	A	B	C	Weight lb (kg)
1/2 (15)	2-3/4 (70)	2-15/16 (74)	1-5/16 (33)	1.5 (0.7)
3/4 (20)	3-1/4 (83)	3-9/16 (90)	1-5/16 (33)	2.3 (1.05)
1 (25)	3-7/8 (98)	3-15/16 (99)	1-9/16 (39)	3.3 (1.5)
1-1/4 (32)	4-15/16 (125)	4-1/4 (108)	1-11/16 (42.9)	4 (1.8)
1-1/2 (40)	5-1/8 (130)	4-1/2 (114)	1-5/8 (41.3)	5 (2.3)



**Female NPT x Female NPT
Fx F**



**Female NPT x Union Male
FxUM**



**Angle Female x Union Male
AFxUM**

Table 13. 2-Way Valve Dimensions.

Valve Size inch (mm)	A	B		C	D	E	Weight lb (kg)		
		Fx F & FxUM	AFxUM				Fx F	FxUM	AFxUM
1/2 (15)	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	1.3 (0.6)	1.5 (0.7)	1.8 (0.8)
3/4 (20)	1-5/8 (41)	2-3/8 (59)	—	1-5/16 (33)	3-1/8 (79)	—	1.8 (0.8)	2.2 (1)	—
1 (25)	1-15/16 (49)	2-3/4 (69)	—	1-9/16 (39)	—	—	2.6 (1.2)	—	—

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