

Bellows-Sealed Valves

SM, SVH Series

Fittings

Valves & Regulators

Process Specification



Bellows-Sealed Valves

SM Series Low Pressure Bellows-Sealed Valves

Features

- ⦿ Metal-to-metal gasket seal without external leakage
- ⦿ Precision-formed metal bellows to ensure reliability
- ⦿ Non-rotating stem tip to increase shutoff cycle life
- ⦿ Manual and pneumatic actuator available
- ⦿ Pneumatic actuator to rotate 360° for ease of installation
- ⦿ Panel mounting and bottom mounting available
- ⦿ Position sensors available assembled on normally closed pneumatically actuated valves

Technical Data

Ports Size		1/4" to 3/8" or 6 mm to 8 mm	3/8" to 1/2" or 10 mm to 12 mm
Flow Coefficient (Cv)		0.30	0.80
Orifice Size		0.16 in. (4.1mm)	0.31 in. (8.0 mm)
Max. Working Pressure	Manual	500 psig (34.4 bar)	
	Pneumatic	145 psig (10 bar)	
Pneumatic Actuator Operating Pressure		60 to 90 psig (4.2 to 6.2 bar)	
Temperature		PCTFE: -10 ~ 200°F (-23 ~ 93°C) PFA: -10 ~ 302°F (-23 ~ 150°C) Vespel: -10 ~ 400°F (-23 ~ 204°C)	
Leak rate (Helium)	Internal	≤ 4x10 ⁻⁹ std cm ³ /s	
	External	≤ 4x10 ⁻⁹ std cm ³ /s	

Flow Data

Air @ 70°F (21°C)

Water @ 60°F (16°C)

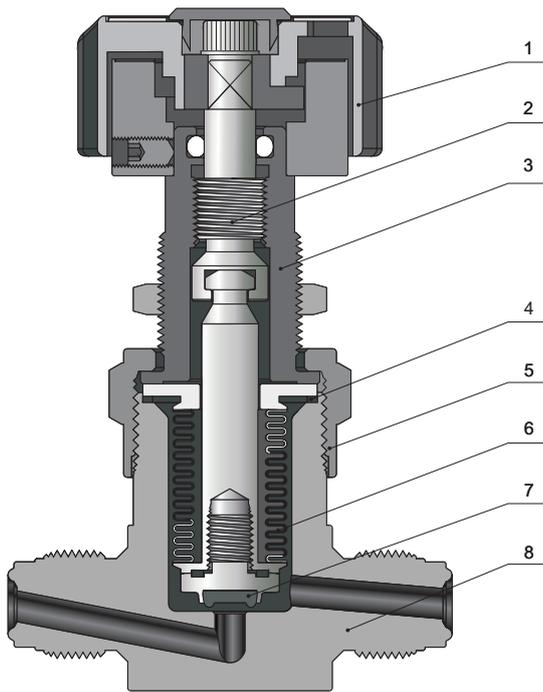
Orifice in. (mm)	Pressure Drop to Atmosphere psig (bar)	Air (l/min)	Water (l/min)
0.16 (4.1)	10 (0.68)	96	3.6
	50 (3.4)	250	7.9
	100 (6.8)	450	11.0
0.31 (8.0)	10 (0.68)	270	9.6
	50 (3.4)	730	21.6
	100 (6.8)	1280	30.0

Process Specification

Process Specification Technology	Standard Cleaning and Packaging (FC-01)	Special Cleaning and Packaging (FC-02)	Ultra High Purity (FC-03)
Material/Specification	316 SS/ASTM A479 316L SS/ASTM A479		316L VAR/SEMI F20
Wetted Surface Roughness	Ra 20 µin. (0.51 µm)		Ra 8 µin. (0.20 µm)
Polishing Process	Machine finished		Electropolished

Note: Refer to page P-01 for a detailed description of Process Specification, and to page P-01 for Process Comparison.

Major Materials of Construction



Round Handle Model

Item	Component	Material/Specification
1	Handle	ABS
2	Actuator	416 SS/ASTM A582
3	Bonnet	316 SS/ASTM A479
4	Bonnet Gasket	316L SS/ASTM A269
5	Bonnet nut	316 SS/ASTM A479
6	Bellows	316L SS/ASTM A269
7	Seat	PCTFE/ASTM D1430 or PFA/ASTM D3307 or Vespel
8	Body	316 SS/ASTM A479 or 316L SS/ASTM A479 or 316L VAR/SEMI F20

Actuators

Manual - Round Handle

- ⦿ Half turn to operate from fully open to closed
- ⦿ Handle with window to visually indicate open and closed states



Pneumatic

- ⦿ Normally open, "N.O." marked on the top of the actuator
- ⦿ Normally closed, "N.C." marked on the top of the actuator



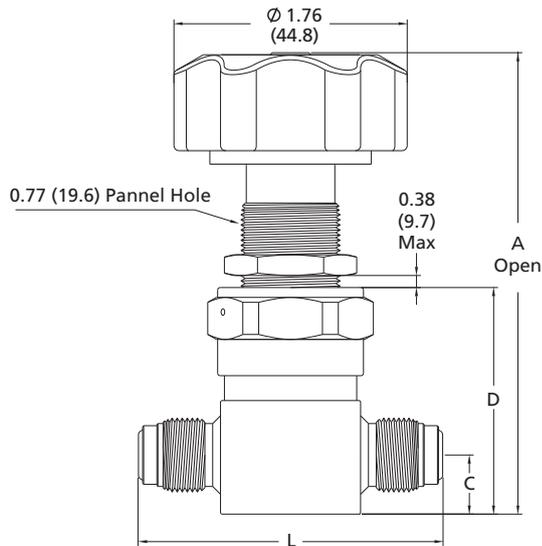
Dimensions and Ordering Information

Straight Type

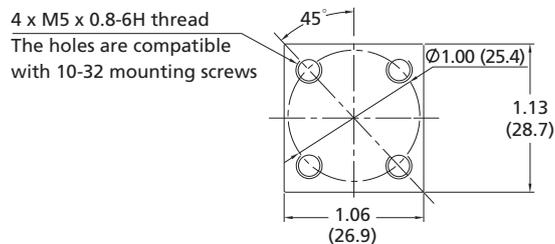
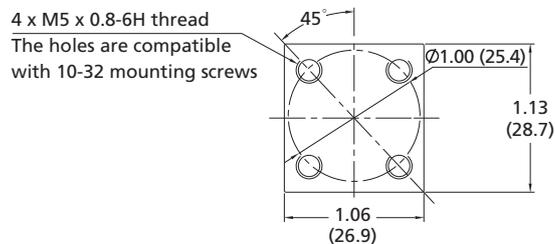
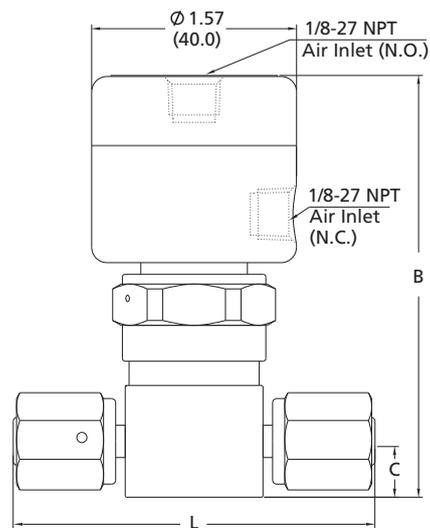
Dimensions

Dimensions, in inches (millimeters), are for reference only.

Manual - Handle



Pneumatic



V-61 Bellows-Sealed Valves

Fittings

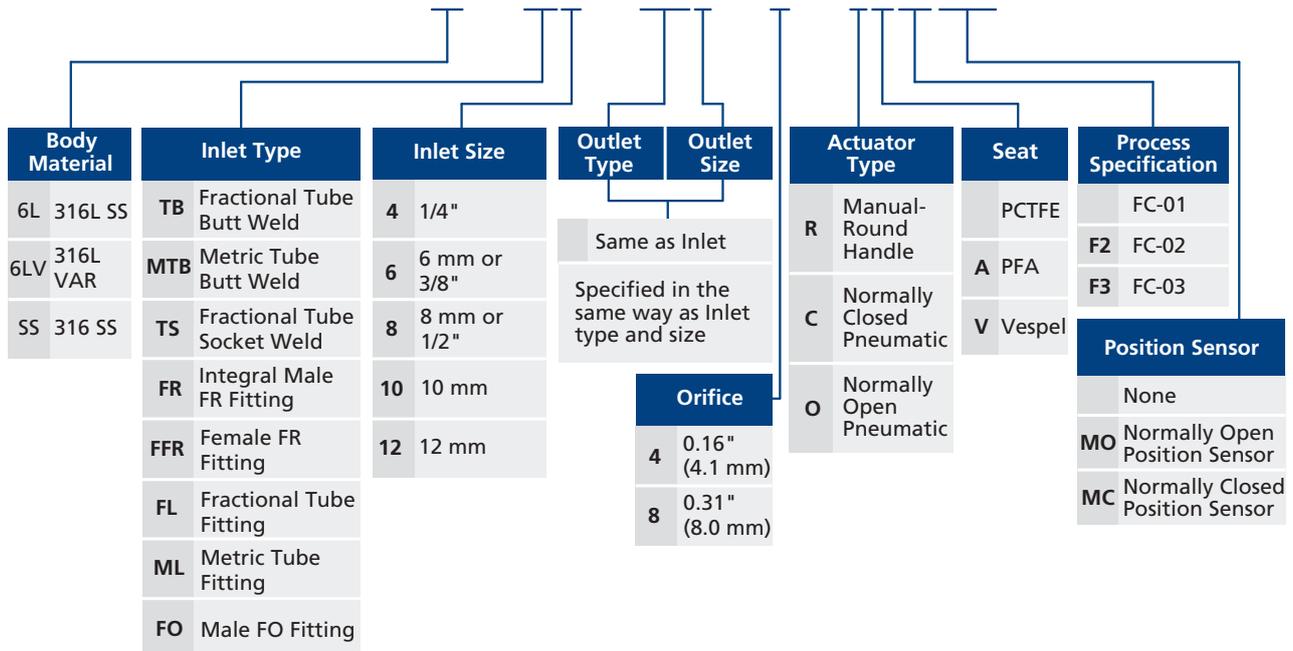
Valves & Regulators

Process Specification

Orifice in. (mm)	Basic Ordering Number	Connection Type and Size	Dimensions, in. (mm)				
			A	B	C	D	L
0.16 (4.1)	SM□□-FL4-4-	1/4" FITOK Tube Fitting	3.51 (89.4)	3.31 (84.0)	0.45 (11.4)	1.78 (45.2)	2.44(62.1)
	SM□□-FL6-4-	3/8" FITOK Tube Fitting					2.58(65.5)
	SM□□-ML6-4-	6 mm FITOK Tube Fitting					2.47(62.8)
	SM□□-ML8-4-	8 mm FITOK Tube Fitting					2.53(64.3)
	SM□□-TB4-4-	1/4" Tube Butt Weld					1.74(44.2)
	SM□□-TB6-4-	3/8" Tube Butt Weld					
	SM□□-MTB6-4-	6 mm Tube Butt Weld					
	SM□□-TS4-4-	1/4" Tube Socket Weld					
	SM□□-FR4-4-	1/4" Integral Male FR					
	SM□□-FFR4-4-	1/4" Female FR					
	SM□□-FO4-4-	1/4" Male FO					
SM□□-FL6-8-	3/8" FITOK Tube Fitting	3.77 (95.7)	3.76 (95.5)	0.53 (13.5)	2.02 (51.3)	2.58(65.5)	
SM□□-FL8-8-	1/2" FITOK Tube Fitting					2.80(71.1)	
SM□□-ML10-8-	10 mm FITOK Tube Fitting					2.60(66.0)	
SM□□-ML12-8-	12 mm FITOK Tube Fitting					2.80(71.1)	
SM□□-TB6-8-	3/8" Tube Butt Weld					1.74(44.2)	
SM□□-TB8-8-	1/2" Tube Butt Weld						
SM□□-FR8-8-	1/2" Integral Male FR						
SM□□-FFR8-8-	1/2" Female FR						
			3.87 (98.2)	3.86 (98.0)	0.63 (16.0)	2.12 (53.8)	2.58(65.5)
							3.15(80.0)

Ordering Number Description

SMSS - FL4 - ML6 - 4 - RAF2MO

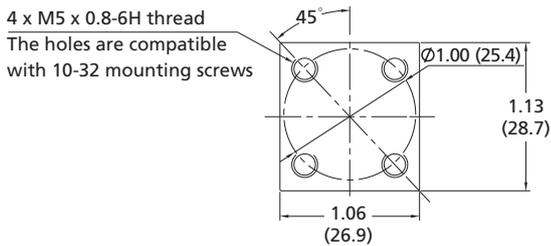
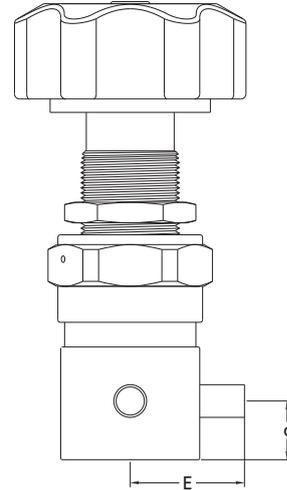
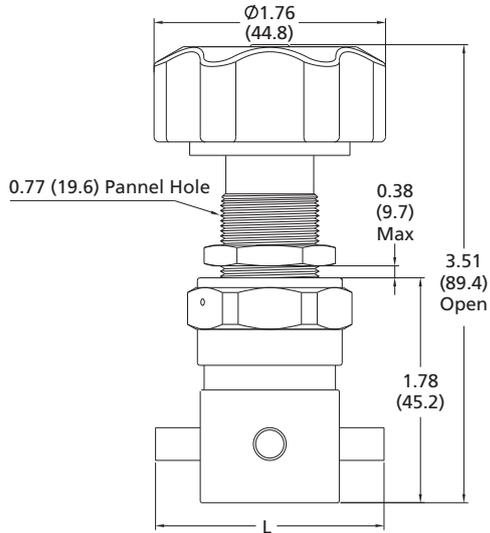


Branch Type

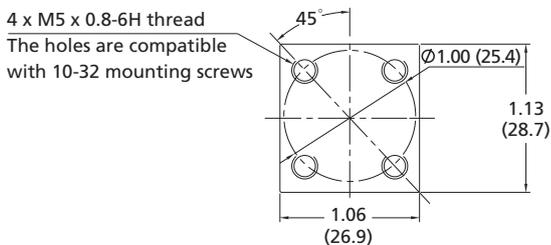
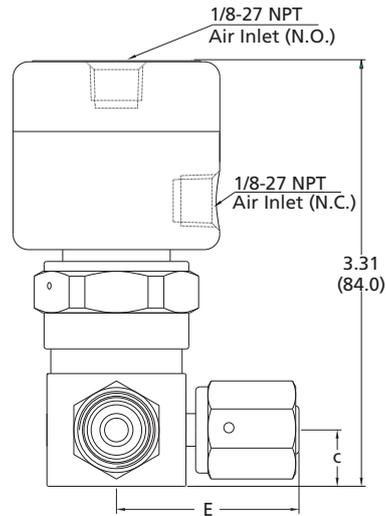
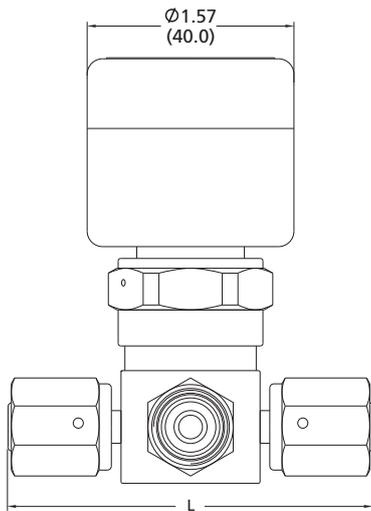
Dimensions

Dimensions, in inches (millimeters), are for reference only.

Manual - Handle



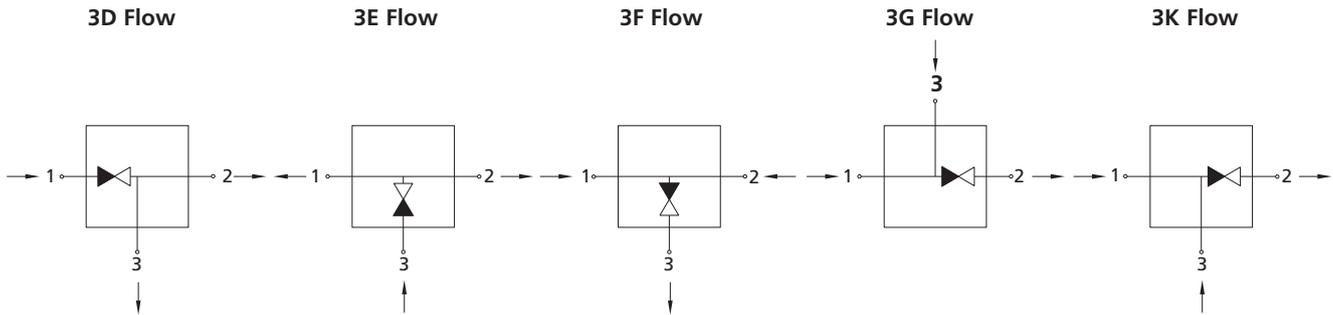
Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions, in. (mm)		
		C	E	L
SM□□-TB4-4-	1/4" Tube Butt Weld	0.45 (11.4)	0.87 (22.1)	1.74 (44.2)
SM□□-MTB6-4-	6 mm Tube Butt Weld			
SM□□-FFR4-4-	1/4" Female FR		1.38 (35.1)	2.76 (70.1)
SM□□-RFR4-4-	1/4" Rotatable Male FR		1.74 (44.2)	3.48 (88.4)

Flow Paths

☉ Flow paths as viewed from the top



Ordering Number Description

SMSS - TB4 - FR4 - FFR4 - 4 - 3G - RAF2MO

Body Material	Port 1 Type	Port 1 Size	Port 2/3 Type	Port 2/3 Size	Flow Path	Actuator Type	Seat	Position Sensor
6L 316L SS	TB Fractional Tube Butt Weld	4 1/4"	Same as Port 1	Specified in the same way as Port 1 type and size	3D	R Manual-Round Handle	PCTFE	None
6LV 316L VAR	MTB Metric Tube Butt Weld	6 6 mm or 3/8"			3E		A PFA	MO Normally Open Position Sensor
SS 316 SS	TS Fractional Tube Socket Weld	8 8 mm	Orifice 4 0.16" (4.1 mm)	Specified in the same way as Port 1 type and size	3F	C Normally Closed Pneumatic	V Vespel	MC Normally Closed Position Sensor
	FR Integral Male FR Fitting				3G		Process Specification FC-01 FC-02 FC-03	
	FFR Female FR Fitting				3K			
	FL Fractional Tube Fitting							
	ML Metric Tube Fitting							
	FO Male FO Fitting							

Bellows-Sealed Valves

SVH Series High Pressure Bellows-Sealed Valves

Features

- ⦿ Packless valves with all-metal seal to atmosphere
- ⦿ Compact designed body with minimal dead space
- ⦿ 316L SS precision-formed bellows for long cycle life
- ⦿ PCTFE stem tip material with remarkable chemical and thermal resistance
- ⦿ Normally closed and normally open pneumatic actuator optional
- ⦿ Bottom mounting
- ⦿ Normally open and normally closed position sensors optional

Technical Data

Ports Size	1/4" to 3/8" or 6 mm to 8 mm	
Flow Coefficient (Cv)	0.30	
Orifice Size	0.15 in. (3.8 mm)	
Max. Working Pressure	3500 psig (241 bar)	
Pneumatic Actuator Operating Pressure	60 to 90 psig (4.2 to 6.2 bar)	
Temperature	PCTFE: -40~150°F (-40~65°C) VespeI: -40~400°F (-40~204°C)	
Leak Rate (Helium)	Internal	≤4x10 ⁻⁹ std cm ³ /s
	External	≤4x10 ⁻⁹ std cm ³ /s

Flow Data

Air @ 70°F (21°C)
Water @ 60°F (16°C)

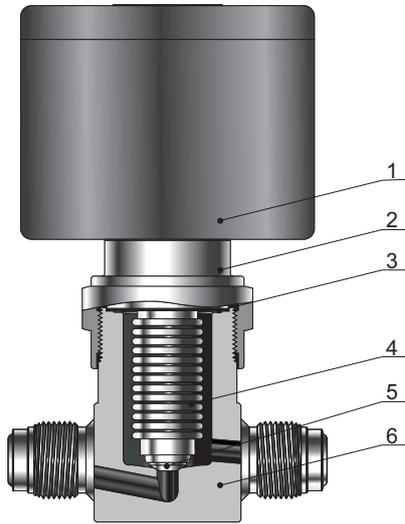
Pressure Drop to Atmosphere psi (bar)	Air (l/min)	Water (l/min)
10 (0.68)	96	3.6
50 (3.4)	250	7.9
100 (6.8)	450	11.0

Process Specification

Technology	Standard Cleaning and Packaging (FC-01)	Special Cleaning and Packaging (FC-02)	Ultra High Purity (FC-03)
Material/Specification	316 SS/ASTM A479 316L SS/ASTM A479		316L SS/ASTM A479
Wetted Surface Roughness	Ra 20 μin. (0.51 μm)		Ra 10 μin. (0.25 μm)
Polishing Process	Machine finished		Electropolished

Note: Refer to page P-01 for a detailed description of Process Specification, and to page P-01 for Process Comparison.

Major Materials of Construction



Normally Closed Model

Item	Component	Material/Specification
1	Pneumatic Actuator	Aluminum
2	Bonnet Nut	304 SS/ASTM A479
3	Gasket	PTFE-coated 316L SS/A240
4	Bellows	316L SS/ASTM A269
5	Seat	PCTFE/ASTM D1430 or Vsepel
6	Body	316 SS/ASTM A479 or 316L SS/ASTM A479

Pneumatic Actuators

- ⊙ Normally open, "N.O." marked on the top of the actuator
- ⊙ Normally closed, "N.C." marked on the top of the actuator

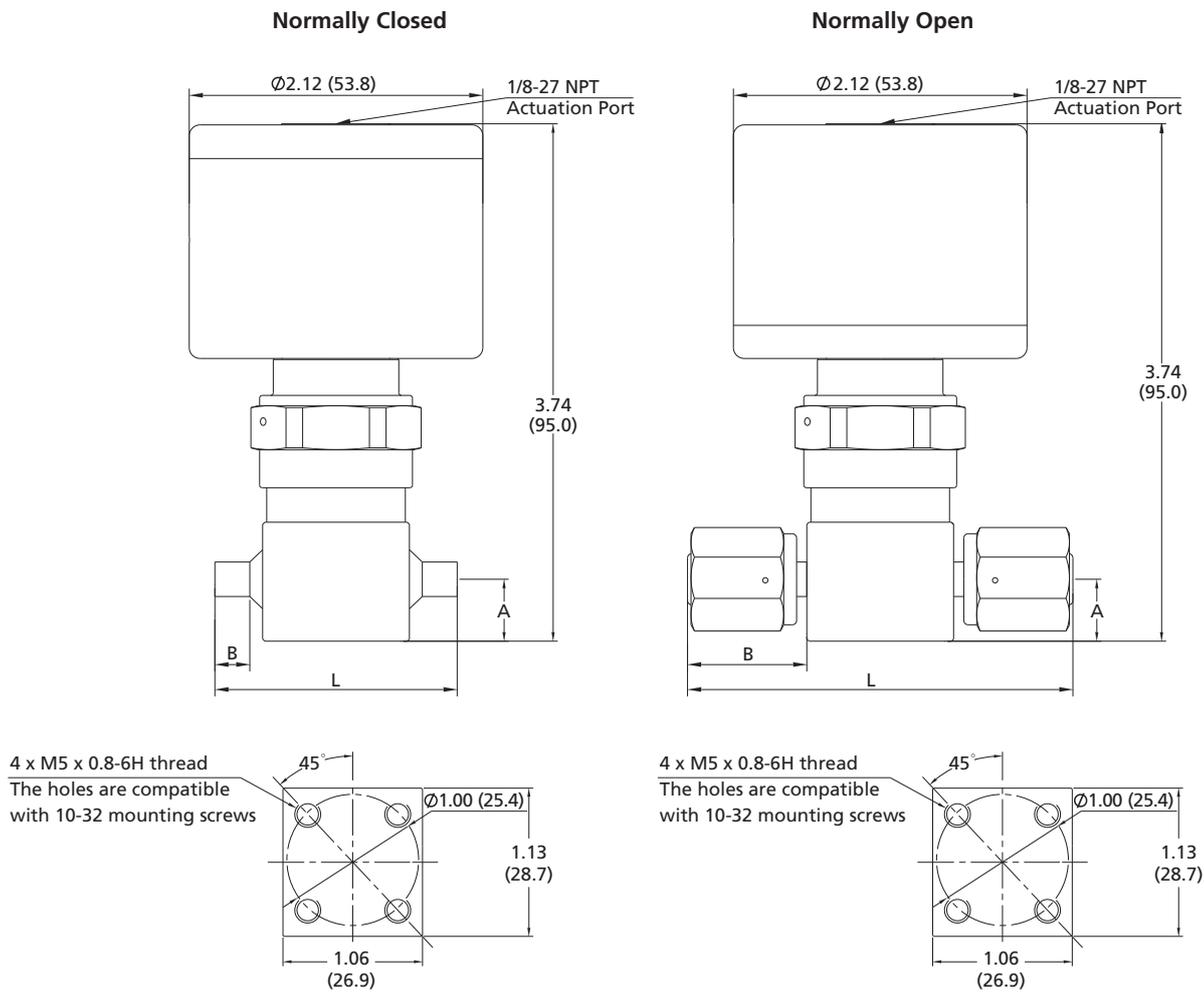


Dimensions and Ordering Information

Straight Type

Dimensions

Dimensions, in inches (millimeters), are for reference only.



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)		
		A	B	L
SVH□□-TB4-	1/4" Tube Butt Weld	0.44 (11.2)	0.25 (6.4)	1.75 (44.4)
SVH□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.85 (21.6)	2.76 (70.1)
SVH□□-FR4-	1/4" Integral Male FR	0.44 (11.2)	0.62 (15.7)	2.30 (58.4)
SVH□□-FL4-	1/4" FITOK Tube Fitting	0.44 (11.2)	0.70 (17.8)	2.46 (62.5)
SVH□□-FL6-	3/8" FITOK Tube Fitting	0.44 (11.2)	0.76 (19.3)	2.58 (65.5)
SVH□□-ML6-	6 mm FITOK Tube Fitting	0.44 (11.2)	0.70 (17.9)	2.47 (62.8)

Ordering Number Description

SVHSS – FL4 – ML6 – CVF2MO

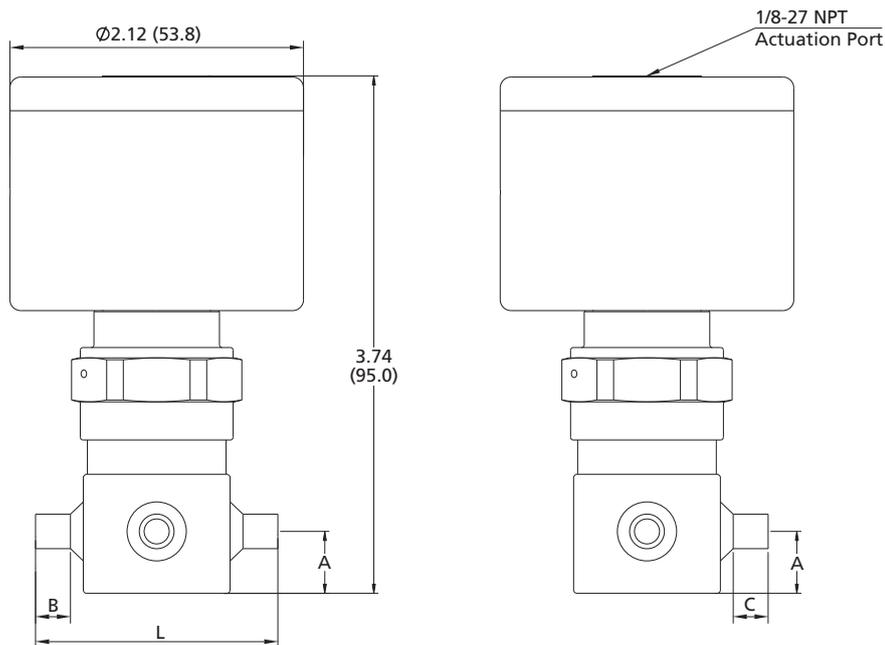
Body Material		Inlet Type		Inlet Size		Outlet Type	Outlet Size	Actuator Type		Process Specification	
6L	316L SS	TB	Fractional Tube Butt Weld	4	1/4"	Same as Inlet	Specified in the same way as Inlet type and size	C	Normally Closed Pneumatic	FC-01	
SS	316 SS			6	6 mm or 3/8"					F2 FC-02	
				8	8 mm					F3 FC-03	
		MTB	Metric Tube Butt Weld					O	Normally Open Pneumatic	Position Sensor	
		FR	Integral Male FR Fitting							None	
		FFR	Female FR Fitting					Seat		MO Normally Open Position Sensor	
		FL	Fractional Tube Fitting					PCTFE		MC Normally Closed Position Sensor	
		ML	Metric Tube Fitting					V Vespel			

Branch Type

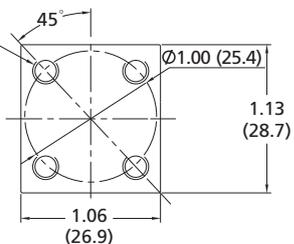
Dimensions

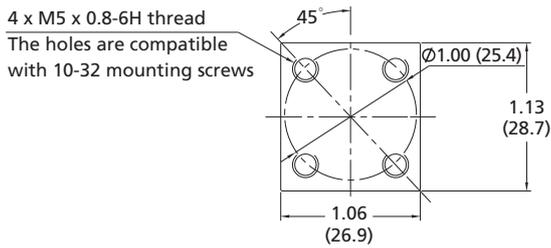
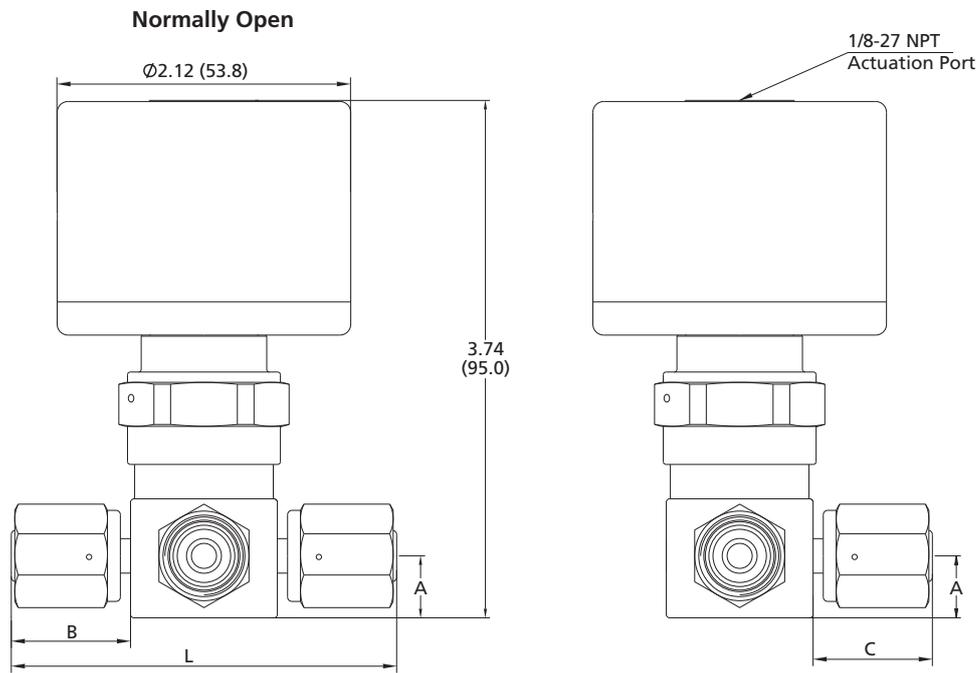
Dimensions, in inches (millimeters), are for reference only.

Normally Closed



4 x M5 x 0.8-6H thread
The holes are compatible with 10-32 mounting screws

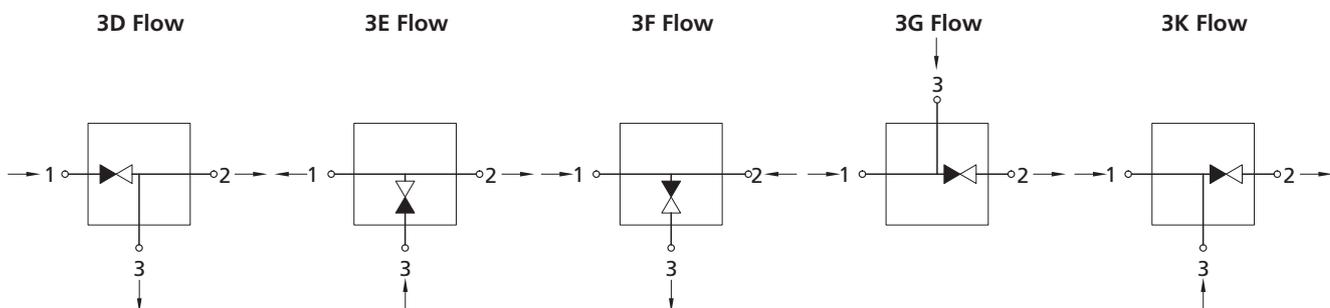




Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
SVH□□-TB4-	1/4" Tube Butt Weld	0.44 (11.2)	0.25 (6.4)	0.25 (6.4)	1.75 (44.4)
SVH□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.85 (21.6)	0.85 (21.6)	2.76 (70.1)
SVH□□-FR4-	1/4" Integral Male FR	0.44 (11.2)	0.62 (15.7)	0.62 (15.7)	2.30 (58.4)
SVH□□-FL4-	1/4" FITOK Tube Fitting	0.44 (11.2)	0.70 (17.8)	0.70 (17.8)	2.46 (62.5)
SVH□□-FL6-	3/8" FITOK Tube Fitting	0.44 (11.2)	0.76 (19.3)	0.76 (19.3)	2.58 (65.5)
SVH□□-ML6-	6 mm FITOK Tube Fitting	0.44 (11.2)	0.70 (17.8)	0.70 (17.9)	2.47 (62.8)

Flow Paths

☉ Flow paths as viewed from the top



Ordering Number Description

SVHSS – TB4 – FR4 – FFR4 – 3G – C VF2MO

Fittings

Valves & Regulators

Process Specification

