

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
- ⦿ Handle and pneumatic actuator available
- ⦿ Pneumatic actuator to rotate 360° for ease of installation
- ⦿ Panel mounting and bottom mounting available
- ⦿ Indicator switch available assembled on normally closed valves, transmitting a signal to an electrical device to indicated either the open or closed position of the valves

Technical Data

Type		SM4	SM8
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	Handle	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 mbar l/s	
	External	≤ 4x10 ⁻⁹ mbar l/s	

Flow Data

Air @ 70°F (21°C)

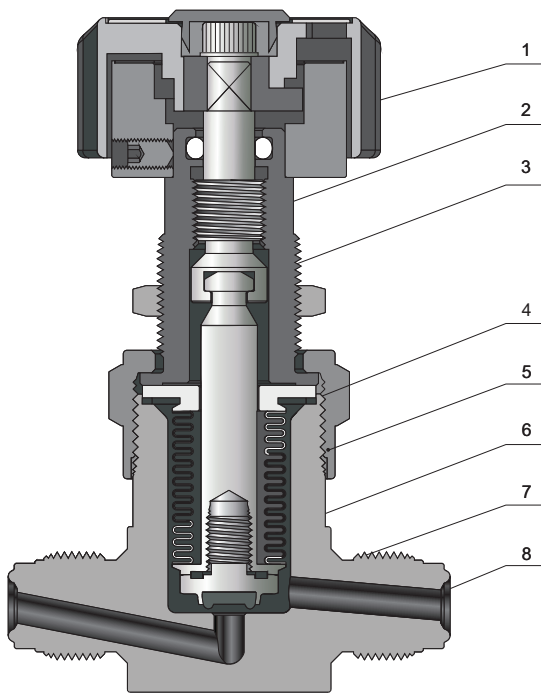
Water @ 60°F (16°C)

Pressure Drop to Atmosphere psi (bar)	Sm4: Cv 0.30		Sm8: Cv 0.80	
	Air (l/min)	Water (l/min)	Air (l/min)	Water (l/min)
10 (0.68)	96	3.6	270	9.6
50 (3.4)	250	7.9	730	21.6
100 (6.8)	450	11.0	1280	30.0

Product Technology Grade

Product Grade Technology	General Purpose	Special Cleaning and Packaging (F2)	Ultra High Purity (F3)
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
Process Specification	FC-01 Standard Cleaning and Packaging	FC-02 Special Cleaning and Packaging	FC-03 Ultra High Purity Process Specification
Cleaning	Thrice degreasing ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment	At atmosphere	In specially cleaned areas	In ISO Class 5/Federal Class 100 cleanroom
Packaging	Individually bagged	Double bagged	Double bagged and vacuum sealed in cleanroom

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
8	Body	316 SS/ASTM A479 or 316L SS/ASTM A479

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 cylinder
- ⦿ Normally closed, "N.C." marked on the top of the cylinder



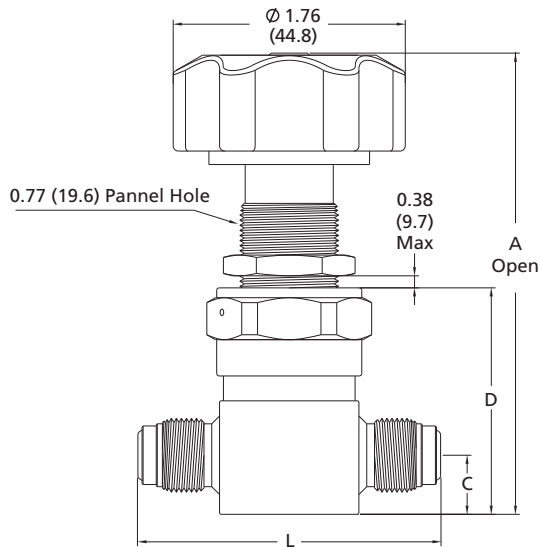
Dimensions and Ordering Information

Straight Type

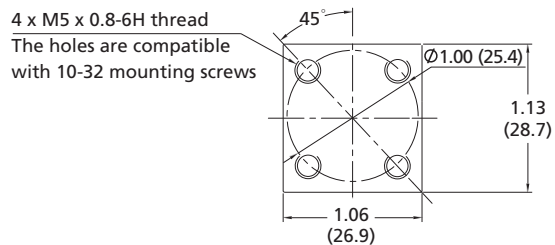
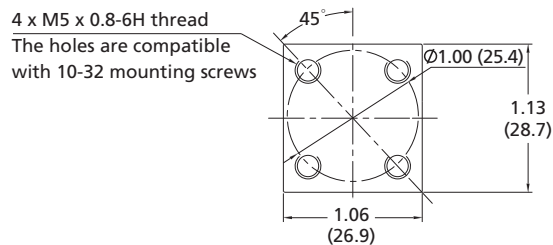
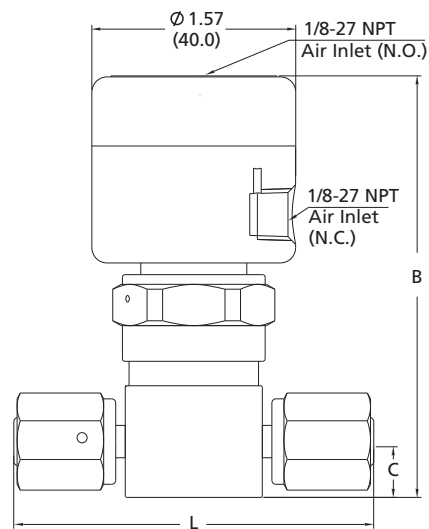
Dimensions

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

Manual - Handle



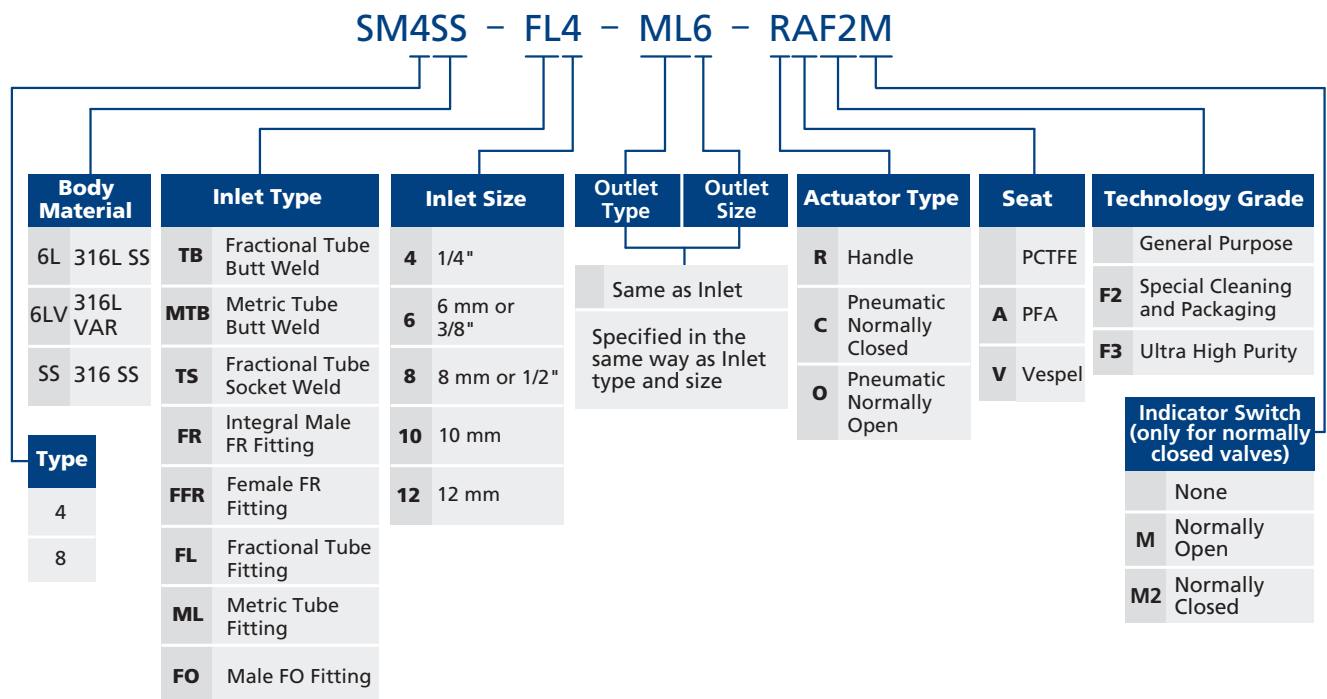
Pneumatic



V-61 Bellows-sealed Valves

Basic Ordering Number	Connection Type and Size	Dimensions, in. (mm)				
		A	B	C	D	L
SM4 Series						
SM4□□-FL4-	1/4" FITOK Tube Fitting	3.51 (89.4)	3.31 (84.0)	0.45 (11.4)	1.78 (45.2)	2.46(62.5)
SM4□□-FL6-	3/8" FITOK Tube Fitting					2.58(65.5)
SM4□□-ML6-	6 mm FITOK Tube Fitting					2.46(62.5)
SM4□□-ML8-	8 mm FITOK Tube Fitting					2.53(64.3)
SM4□□-TB4-	1/4" Tube Butt Weld					1.74(44.2)
SM4□□-TB6-	3/8" Tube Butt Weld					
SM4□□-MTB6-	6 mm Tube Butt Weld					
SM4□□-TS4-	1/4" Tube Socket Weld					
SM4□□-FR4-	1/4" Integral Male FR					
SM4□□-FFR4-	1/4" Female FR					
SM4□□-FO4-	1/4" Male FO					
SM8 Series						
SM8□□-FL6-	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)
SM8□□-FL8-	1/2" FITOK Tube Fitting					2.80(71.1)
SM8□□-ML10-	10 mm FITOK Tube Fitting					2.60(66.0)
SM8□□-ML12-	12 mm FITOK Tube Fitting					2.80(71.1)
SM8□□-TB6-	3/8" Tube Butt Weld					1.74(44.2)
SM8□□-TB8-	1/2" Tube Butt Weld					
SM8□□-FR8-	1/2" Integral Male FR	3.87 (98.2)	3.86 (98.0)	0.63 (16.0)	2.12 (53.8)	2.58(65.5)
SM8□□-FFR8-	1/2" Female FR					3.15(80.0)

Ordering Number Description

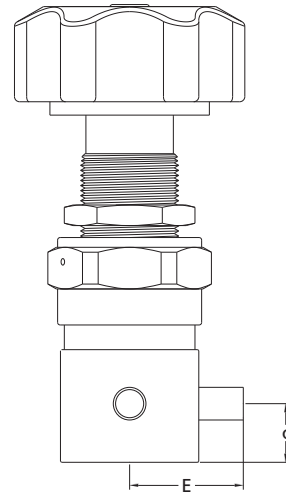
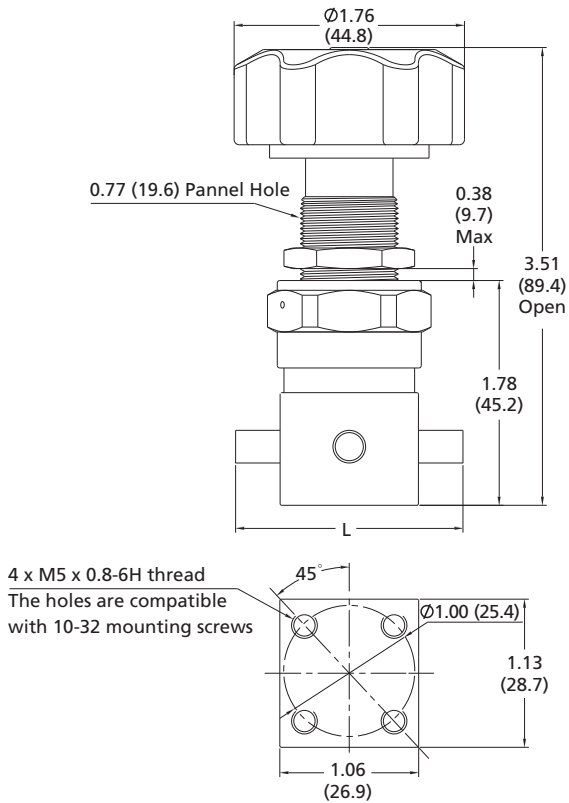


Branch Type

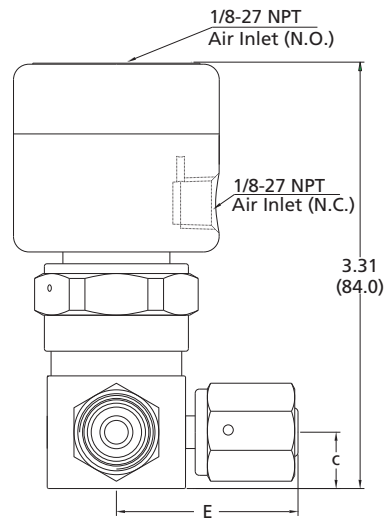
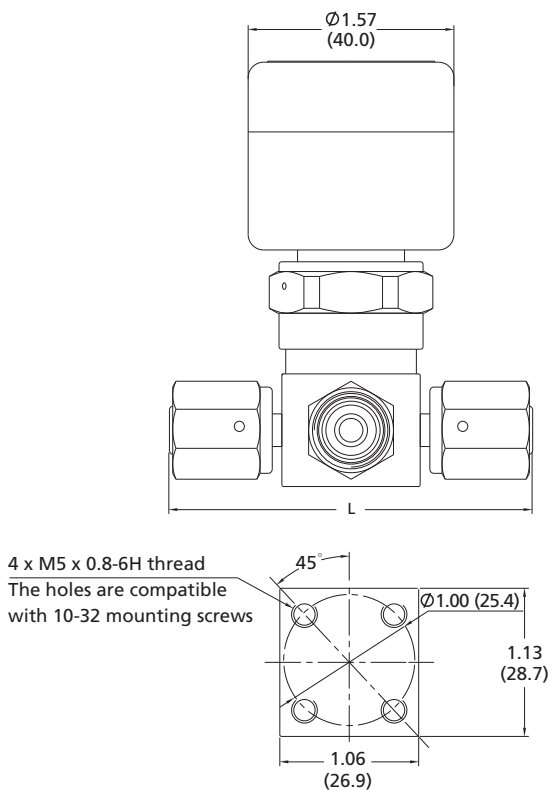
Dimensions

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Manual - Handle



Pneumatic

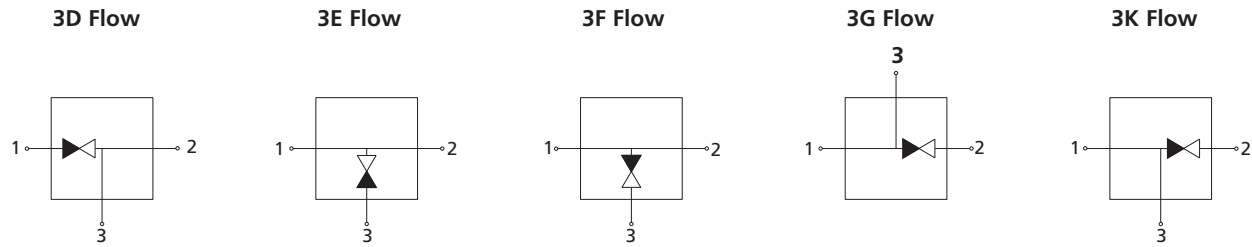


V-63 Bellows-sealed Valves

Basic Ordering Number	Connection Type and Size	Dimensions, in. (mm)		
		C	E	L
SM4□□-TB4-	1/4" Tube Butt Weld	0.45 (11.4)	0.87 (22.1)	1.74 (44.2)
SM4□□-MTB6-	6 mm Tube Butt Weld		1.38 (35.1)	2.76 (70.1)
SM4□□-FFR4-	1/4" Female FR		1.74 (44.2)	3.48 (88.4)
SM4□□-RFR4-	1/4" Rotatable Male FR			

Flow Paths

☉ Flow paths as viewed from the top



Ordering Number Description

SM4SS - TB4 - FR4 - FFR4 - 3G - RAF2M

Type	Body Material	Port 1 Type	Port 1 Size	Port 2/3 Type	Port 2/3 Size	Actuator Type	Seat	Indicator Switch (only for normally closed valves)
4	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	R Handle	PCTFE	None
6LV	316L VAR	MTB Metric Tube Butt Weld	6 6 mm or 3/8"			C Pneumatic Normally Closed	A PFA	M Normally Open
SS	316 SS	TS Fractional Tube Socket Weld	8 8 mm			O Pneumatic Normally Open	V Vespel	M2 Normally Closed
		FR Integral Male FR Fitting				Flow Path	Technology Grade	
		FFR Female FR Fitting				3D	General Purpose	
		FL Fractional Tube Fitting				3E	F2 Special Cleaning and Packaging	
		ML Metric Tube Fitting				3F	F3 Ultra High Purity	
		FO Male FO Fitting				3G		
				3K				