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01 Bellows-sealed Valve S1 Series



05 Bellows-sealed Valve S2 Series



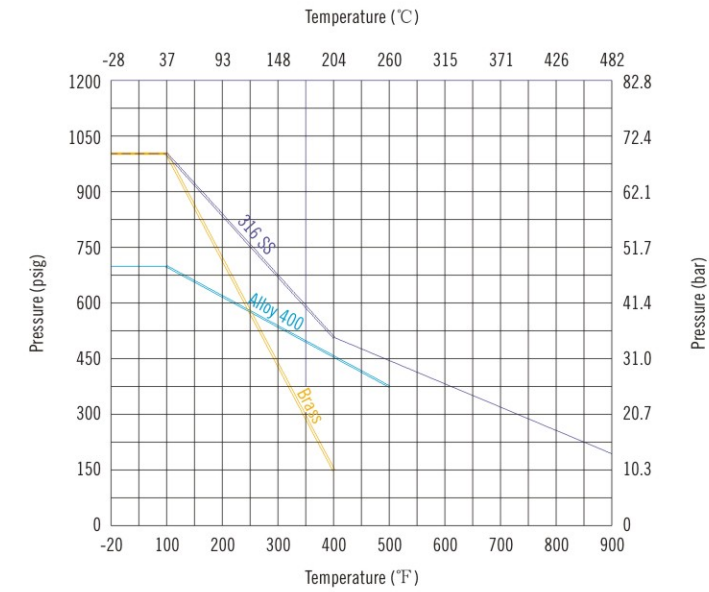
Bellows-sealed Valve S1 Series

Features

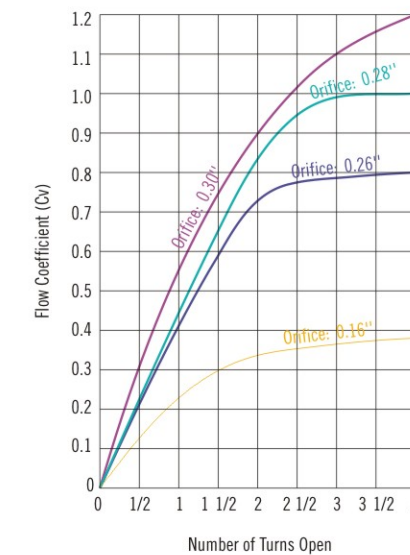
- S1 Series**
- Maximum working pressure: 1000 psig (68.9 bar)
 - Working temperature: -20°F to 900°F (-28°C to 482°C)
 - Variety of connections
 - 316SS, brass and monel body materials
 - Hydraulic-formed multilayer bellows for longer cycle life
 - Galling resistant seat area by nonrotating stem tip
 - Externally pressurized bellows design for maximum strength
 - Strictly controlled bellows stroke to improve safety and cycle life
 - Replaceable bellows and stem assembly
 - Regulating, conical and spherical stem tips available
 - Panel and bottom mounting
 - Every FD-LOK bellows-sealed valve is factory tested with helium for 5 s to a maximum leak rate of 4×10^{-9} std cm³/s at the seat, envelope, and all seals.



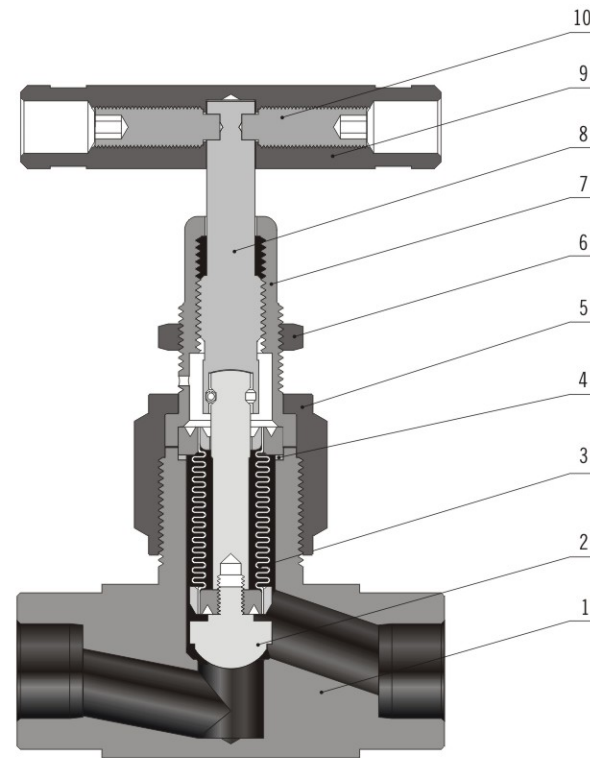
Pressure vs. Temperature



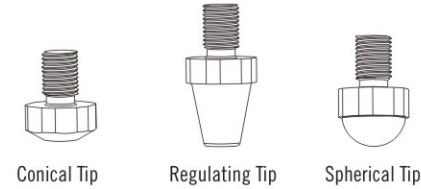
Flow Coefficient vs. Turns Open



Standard Materials of Construction



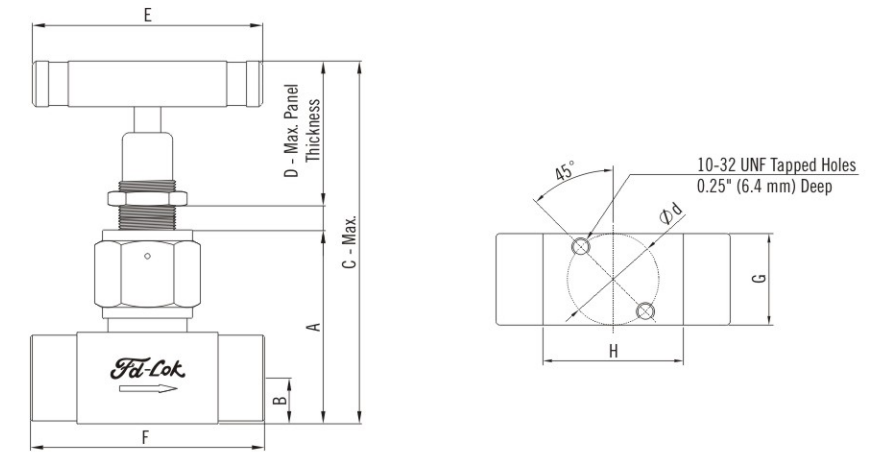
Tip Types



Component		Valve Body Material Grade/ASTM Specification		
		316 SS	Brass	Alloy 400
1	Body	316 SS/A479	Brass/B16	Alloy 400/B164
2	Stem Tip	316 SS/A479 (regulating)		Alloy k-500/AMS4676 (regulating)
		PTFE/D1430 (conical)		PTFE/D1430 (conical)
		Weld Stellite (regulating or spherical)		—
3a	Bellow	321 SS/A269 (316L SS/A269 optional)		Alloy 400/B165
3b	Stem	316 SS/A479 (316L SS optional)		Alloy 400/B164
3c	Weld Ring	316 SS/A479 (316L SS optional)		Alloy 400/B164
4	Gasket	Silver-plated 316 SS/A580		Silver-plated Alloy 400/AMS4730
		PTFE-coated- 316 SS/A580		PTFE-coated Alloy 400/AMS4730
5	Bonnet Nut	Silver-plated 316 SS/A479	Silver-plated Brass/B16	Silver-plated 316SS/A479
6	Panel Mount Nut	17-4PH powered metal	Brass/B16	17-4PH powered metal
7	Bonnet	316 SS/A479	Brass/B16	316 SS/A479
8	Actuator	416 SS/A582	416 SS/A582	416 SS/A582
9	Handle	Green anodized aluminum 2024-T4/B211 (stainless steel and phenolic optional)		
10	Set Screw	Alloy Steel/ANSI 18.3		
Wetted Lubricant		Fluorinated-based (Spherical Tip)		
Nonwetted Lubricant		Molybdenum disulfide		

Contact the authorized representative or FD-LOK for valves of other materials.

Dimension



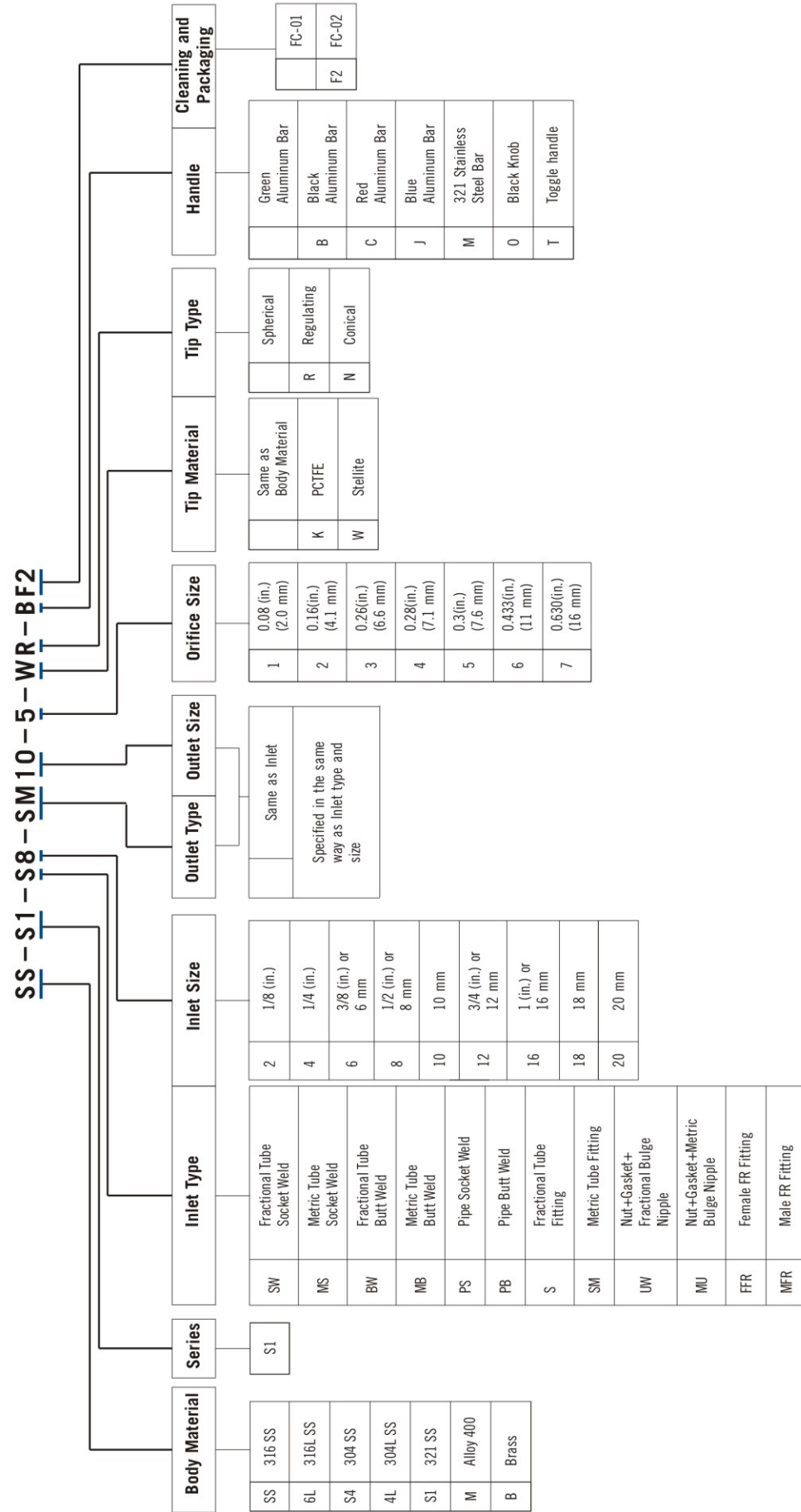
Basic Ordering Number	Connection Type and Size		Orifice in. (mm)	Cv	Dimension, in. (mm)								
	Inlet	Outlet			A	B	C	D	E	F	G	H	Φd
-S1-S4-2-	1/4" FD-LOK	1/4" FD-LOK	0.16 (4.1)	0.36	1.45 (36.8)	0.56 (14.2)	3.64 (92.5)	0.38 (9.7)	1.88 (47.8)	2.46 (62.5)	1.00 (25.4)	1.06 (26.9)	1.00 (25.4)
-S1-S6-3-	3/8" FD-LOK	3/8" FD-LOK	0.26 (6.6)	0.80	1.57 (39.9)	0.50 (12.7)	4.19 (106.0)	0.38 (9.7)	2.50 (63.5)	3.09 (78.5)	1.13 (28.7)	1.57 (39.9)	1.00 (25.4)
-S1-S8-5-	1/2" FD-LOK	1/2" FD-LOK	0.30 (7.6)	1.20	1.57 (39.9)	0.50 (12.7)	4.19 (106.0)	0.38 (9.7)	2.50 (63.5)	3.30 (83.8)	1.13 (28.7)	1.57 (39.9)	1.00 (25.4)
-S1-SM6-2-	6 mm FD-LOK	6 mm FD-LOK	0.16 (4.1)	0.36	1.45 (36.8)	0.56 (14.2)	3.64 (92.5)	0.38 (9.7)	1.88 (47.8)	2.46 (62.5)	1.00 (25.4)	1.06 (26.9)	1.00 (25.4)
-S1-SM10-4-	10 mm FD-LOK	10 mm FD-LOK	0.28 (7.1)	1.00	1.57 (39.9)	0.50 (12.7)	4.19 (106.0)	0.38 (9.7)	2.50 (63.5)	3.11 (79.0)	1.13 (28.7)	1.57 (39.9)	1.00 (25.4)
-S1-SM12-5-	12 mm FD-LOK	12 mm FD-LOK	0.30 (7.6)	1.20	1.57 (39.9)	0.50 (12.7)	4.19 (106.0)	0.38 (9.7)	2.50 (63.5)	3.30 (83.8)	1.13 (28.7)	1.57 (39.9)	1.00 (25.4)
-S1-SW4-2-	1/4" SW	1/4" SW	0.16 (4.1)	0.36	1.45 (36.8)	0.56 (14.2)	3.64 (92.5)	0.38 (9.7)	1.88 (47.8)	1.68 (42.7)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
-S1-SW6-4-	3/8" SW	3/8" SW	0.28 (7.1)	1.00	1.57 (39.9)	0.50 (12.7)	4.19 (106.0)	0.38 (9.7)	2.50 (63.5)	2.27 (57.7)	1.13 (28.7)	1.52 (38.6)	1.00 (25.4)
-S1-SW8-5-	1/2" SW	1/2" SW	0.30 (7.6)	1.20	1.57 (39.9)	0.50 (12.7)	4.19 (106.0)	0.38 (9.7)	2.50 (63.5)	2.27 (57.7)	1.13 (28.7)	1.52 (38.6)	1.00 (25.4)
-S1-BW4-2-	1/4" BW	1/4" BW	0.16 (4.1)	0.36	1.45 (36.8)	0.56 (14.2)	3.64 (92.5)	0.38 (9.7)	1.88 (47.8)	1.68 (42.7)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
-S1-BW6-4-	3/8" BW	3/8" BW	0.28 (7.1)	1.00	1.57 (39.9)	0.50 (12.7)	4.19 (106.0)	0.38 (9.7)	2.50 (63.5)	2.27 (57.7)	1.13 (28.7)	1.52 (38.6)	1.00 (25.4)
-S1-BW8-5-	1/2" BW	1/2" BW	0.30 (7.6)	1.20	1.57 (39.9)	0.50 (12.7)	4.19 (106.0)	0.38 (9.7)	2.50 (63.5)	2.27 (57.7)	1.13 (28.7)	1.52 (38.6)	1.00 (25.4)
-S1-FFR4-2-	1/4" Female FR	1/4" Female FR	0.16 (4.1)	0.36	1.45 (36.8)	0.56 (14.2)	3.64 (92.5)	0.38 (9.7)	1.88 (47.8)	2.76 (70.1)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
-S1-FFR8-5-	1/2" Female FR	1/2" Female FR	0.30 (7.6)	1.20	1.57 (39.9)	0.50 (12.7)	4.19 (106.0)	0.38 (9.7)	2.50 (63.5)	3.09 (78.5)	1.13 (28.7)	1.52 (38.6)	1.00 (25.4)
-S1-MFR4-2-	1/4" Male FR	1/4" Male FR	0.16 (4.1)	0.36	1.45 (36.8)	0.44 (11.2)	3.64 (92.5)	0.38 (9.7)	1.88 (47.8)	2.24 (56.9)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
-S1-MFR8-5-	1/2" Male FR	1/2" Male FR	0.30 (7.6)	1.20	1.57 (39.9)	0.44 (11.2)	4.19 (106.0)	0.38 (9.7)	2.50 (63.5)	3.00 (76.2)	1.13 (28.7)	1.52 (38.6)	1.00 (25.4)

1. FD-LOK means FD-LOK double ferrule tube fittings, FR means metal gasket seal fittings, TS means fractional tube socket weld, TB means fractional tube butt weld.

2. Dimensions are shown with FD-LOK nuts finger-tightened. All dimensions are for reference only and are subject to change. For dimensions not shown above, please contact the authorized representative or FD-LOK.

3. Sizes and types listed are standard. Other sizes and types are available upon request. For special sizes and types, please refer to the ordering information.

Bellows-sealed Valve S1 Series



- Standard thread pitch for metric threads are as follows:
M10 and below: 1 mm
M12 to M20: 1.5 mm
Standard thread pitch should be ignored in the ordering number, others should be specified.
- Cleaning and Packaging
FC-01: Standard cleaning and packaging for general industrial procedures.
FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleanliness requirement as stated in ASTM G93 Level C.

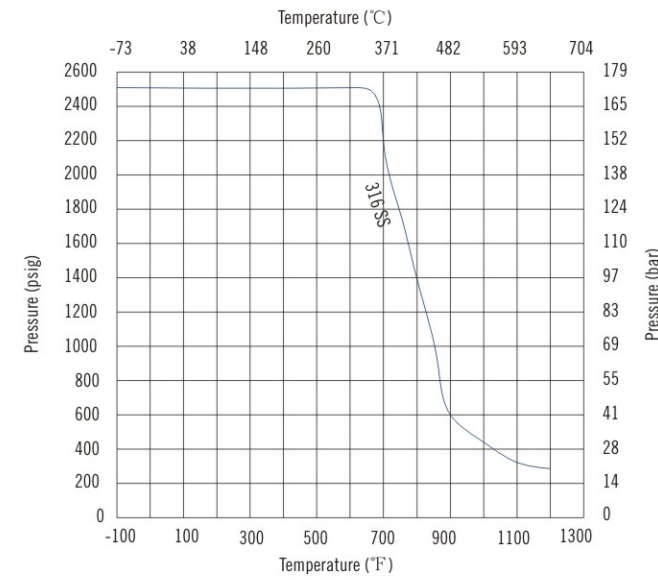
Bellows-sealed Valve S2 Series

Features

- S2 Series**
- Working pressure up to 2500 psig (172 bar)
 - Working temperatures from -20°F to 1200°F (-28°C to 649°C)
 - Wide variety options of end connections
 - 316 SS body materials
 - Upper packing provides secondary containment system above the bellows
 - Hydraulic-formed multilayer bellows enhanced cycle life
 - Nonrotating stem tip eliminates galling within the seat area
 - Strictly controlled bellows stroke to improve safety and cycle life
 - Replaceable bellows and stem assembly
 - Regulating, conical, and spherical stem tips available
 - Panel, bottom, and side mounting available
 - Double lock-pins enable steady and durable fastening of the handle.
 - Optional handle colors are available
 - Every FD-LOK bellows-sealed valve is factory tested with helium to a maximum leak rate of 4×10^{-5} std cm³/s at the seat, envelope and all seals

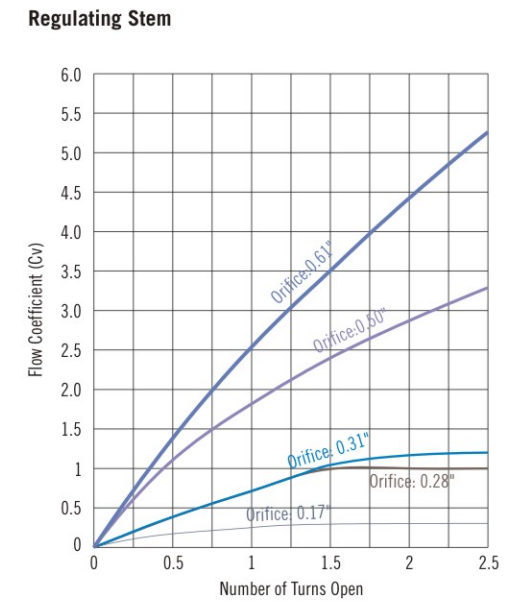


Pressure vs. Temperature

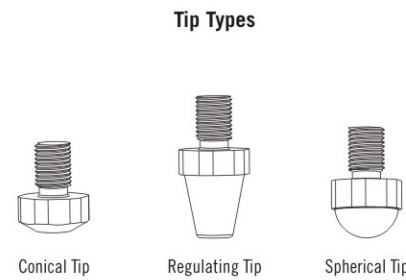
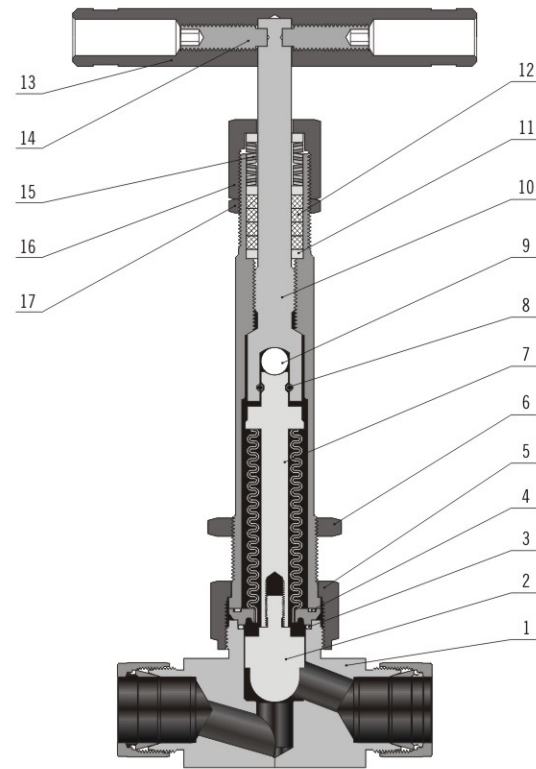


200°F (93°C) max. with PCTFE stem tip (soft tip).

Flow Coefficient vs. Turns Open



Standard Materials of Construction

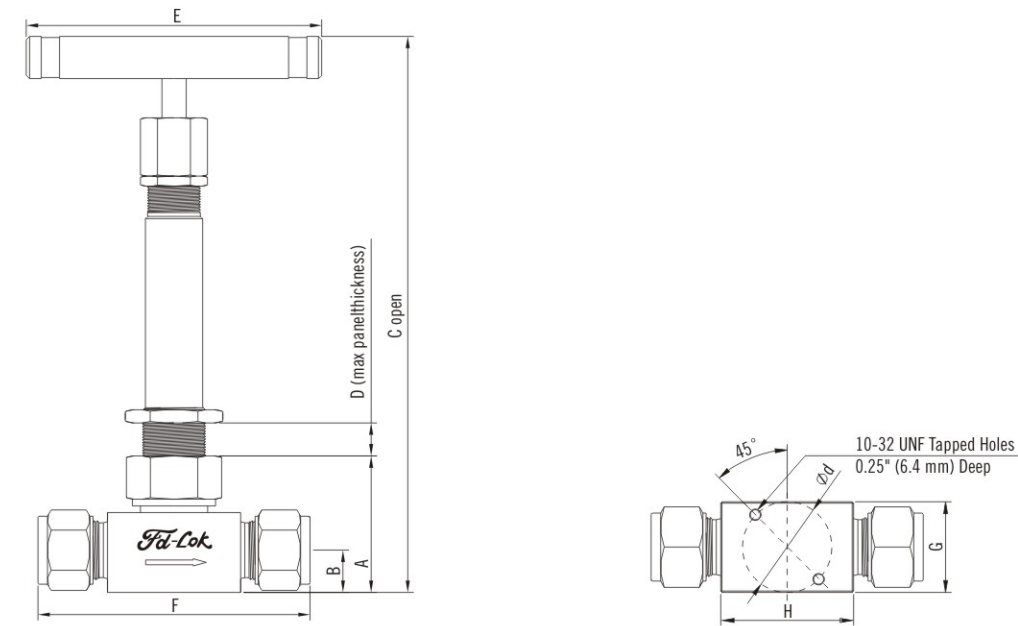


Component		Valve Body Material Grade/ASTM Specification
		316 SS
1	Body	316 SS/A479
2	Stem Tip	316 SS/A479 (regulating)
		PCTFE/D1430 (conical)
		Weld Stellite (regulating or spherical)
3	Gasket	Silver-plated 316 SS/A580
4		PTFE-coated 316 SS/A580
5	Bonnet Nut	Silver-plated B16 SS/A479
6	Panel Mount Nut	17-4PH powdered metal
7a	Bellows	321 SS/A269 (316L SS/A269 optional)
7b	Stem	316 SS/A479 (316L SS optional)
7c	Weld Ring	316 SS/A479 (316L SS optional)
8	Pin	416 SS
9	Ball Bearing	440C SS
10	Actuator	416 SS/A582
11	Spacer	316 SS/A240
12	Packing	PTFE or Graphite
13	Handle	Green anodized aluminum 2024-T4/B211 (stainless steel and phenolic optional)
14	Set Screws	Alloy Steel/ANSI 18.3
15	Packing Springs	S17700/A693
16	Packing Nut	316 SS/A276
17	Jam Nut	316 SS/A276

Contact the authorized representative or FD-LOK for valves of other materials.

Dimensions

Orifice: 0.17", 0.26", 0.31"



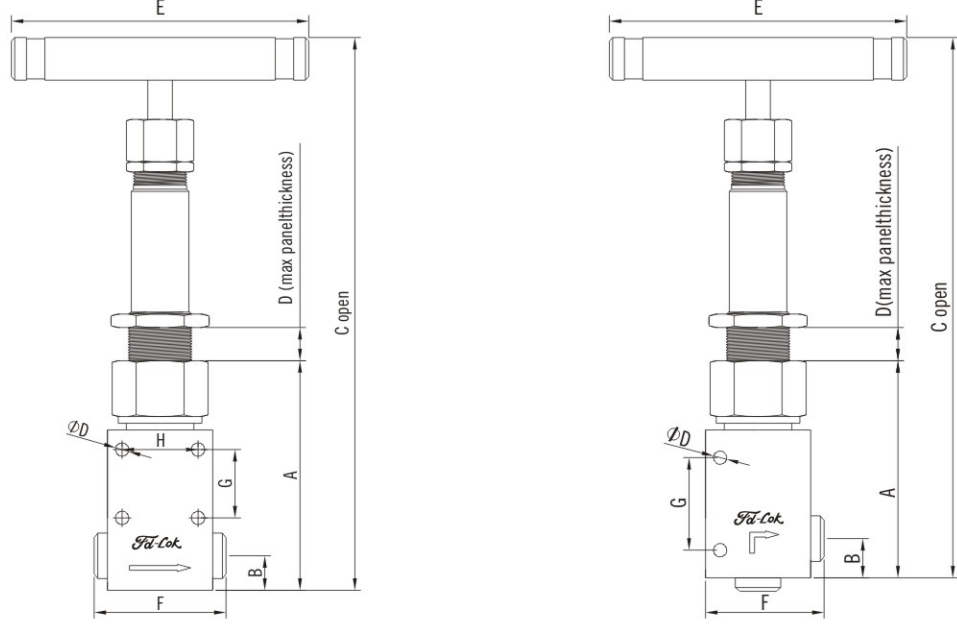
Basic Ordering Number	End Connections		Orifice in. (mm)	Cv	Dimensions, in. (mm)									
	Inlet Size	Outlet Size			A	B	C	D	E	F	G	H	Ød	
-S2-S4-2-	1/4" FD-LOK	1/4" FD-LOK	0.172 (4.37)	0.36	1.49 (37.8)	0.56 (14.2)	6.48 (165)	0.38 (9.7)	2.50 (63.5)	2.46 (62.5)	1.0 (25.4)	1.06 (26.9)	1.0 (25.4)	
-S2-S6-4-	3/8" FD-LOK	3/8" FD-LOK	0.265 (6.73)	0.85	1.61 (40.9)	0.50 (12.7)	6.59 (167)	0.38 (9.7)	2.50 (63.5)	3.09 (78.5)	1.13 (28.7)	1.57 (39.9)	1.13 (28.7)	
-S2-S8-5-	1/2" FD-LOK	1/2" FD-LOK	0.312 (7.92)	1.20	1.61 (40.9)	0.50 (12.7)	6.59 (167)	0.38 (9.7)	2.50 (63.5)	3.30 (83.8)	1.13 (28.7)	1.57 (39.9)	1.13 (28.7)	
-S2-SM6-2-	6 mm FD-LOK	6 mm FD-LOK	0.172 (4.37)	0.36	1.49 (37.8)	0.56 (14.2)	6.48 (165)	0.38 (9.7)	2.50 (63.5)	2.46 (62.5)	1.0 (25.4)	1.06 (26.9)	1.0 (25.4)	
-S2-SM10-4-	10 mm FD-LOK	10 mm FD-LOK	0.28 (7.1)	1.00	1.61 (40.9)	0.50 (12.7)	6.59 (167)	0.38 (9.7)	2.50 (63.5)	3.11 (79.0)	1.13 (28.7)	1.57 (39.9)	1.13 (28.7)	
-S2-SM12-4-	12 mm FD-LOK	12 mm FD-LOK	0.28 (7.1)	1.00	1.61 (40.9)	0.50 (12.7)	6.59 (167)	0.38 (9.7)	2.50 (63.5)	3.30 (83.8)	1.13 (28.7)	1.57 (39.9)	1.13 (28.7)	
-S2-SW4-2-	1/4" SW	1/4" SW	0.156 (3.96)	0.36	1.49 (37.8)	0.56 (14.2)	6.48 (165)	0.38 (9.7)	2.50 (63.5)	1.68 (42.7)	1.0 (25.4)	1.0 (25.4)	1.0 (25.4)	
-S2-SW6-4-	3/8" SW	3/8" SW	0.28 (7.1)	1.00	1.61 (40.9)	0.50 (12.7)	6.59 (167)	0.38 (9.7)	2.50 (63.5)	2.27 (57.7)	1.13 (28.7)	1.52 (38.6)	1.13 (28.7)	
-S2-SW8-5-	1/2" SW	1/2" SW	0.312 (7.92)	1.20	1.61 (40.9)	0.50 (12.7)	6.59 (167)	0.38 (9.7)	2.50 (63.5)	2.27 (57.7)	1.13 (28.7)	1.52 (38.6)	1.13 (28.7)	
-S2-BW4-2-	1/4" BW	1/4" BW	0.156 (3.96)	0.36	1.49 (37.8)	0.56 (14.2)	6.48 (165)	0.38 (9.7)	2.50 (63.5)	1.68 (42.7)	1.0 (25.4)	1.0 (25.4)	1.0 (25.4)	
-S2-BW6-4-	3/8" BW	3/8" BW	0.28 (7.1)	1.00	1.61 (40.9)	0.50 (12.7)	6.59 (167)	0.38 (9.7)	2.50 (63.5)	2.27 (57.7)	1.13 (28.7)	1.52 (38.6)	1.13 (28.7)	
-S2-BW8-5-	1/2" BW	1/2" BW	0.312 (7.92)	1.20	1.61 (40.9)	0.50 (12.7)	6.59 (167)	0.38 (9.7)	2.50 (63.5)	2.27 (57.7)	1.13 (28.7)	1.52 (38.6)	1.13 (28.7)	
-S2-FFR4-2-	1/4" Female FR	1/4" Female FR	0.156 (3.96)	0.36	1.49 (37.8)	0.56 (14.2)	6.48 (165)	0.38 (9.7)	2.50 (63.5)	2.76 (70.1)	1.0 (25.4)	1.0 (25.4)	1.0 (25.4)	
-S2-FFR8-5-	1/2" Female FR	1/2" Female FR	0.3 (7.6)	1.20	1.61 (40.9)	0.50 (12.7)	6.59 (167)	0.38 (9.7)	2.50 (63.5)	2.98 (75.7)	1.13 (28.7)	1.52 (38.6)	1.13 (28.7)	
-S2-MFR4-2-	1/4" Male FR	1/4" Male FR	0.156 (3.96)	0.36	1.49 (37.8)	0.56 (14.2)	6.48 (165)	0.38 (9.7)	2.50 (63.5)	2.24 (56.9)	1.0 (25.4)	1.0 (25.4)	1.0 (25.4)	
-S2-MFR8-5-	1/2" Male FR	1/2" Male FR	0.3 (7.6)	1.20	1.61 (40.9)	0.50 (12.7)	6.59 (167)	0.38 (9.7)	2.50 (63.5)	3.00 (76.2)	1.13 (28.7)	1.52 (38.6)	1.13 (28.7)	

1. FD-LOK means FD-LOK double ferrule tube fittings, FO means O-ring seal fittings, FR means metal gasket seal fittings. They are interchangeable with Swagelok/Parker products.
2. Dimensions shown with FD-LOK nuts finger-tight. All dimensions are for reference only, subject to change. For dimensions not shown above, consult the factory please.
3. The sizes and types listed are standard. Other sizes and types are available upon request, refer to ordering information.

Bellows-sealed Valve S2 Series

Dimensions

Orifice: 0.50", 0.61"



Basic Ordering Number	End Connections		Orifice in. (mm)	CV	Dimensions, in. (mm)								
	Inlet Size	Outlet Size			A	B	C	D	E	F	G	H	Ød
-S2-SW12-8-	3/4" SW	3/4" SW	0.50 (12.7)	3.10	4.88 (124)	1.00 (25.4)	11.6 (295)	0.59 (14.9)	4.00 (102)	2.44 (62.0)	1.25 (31.8)	1.46 (37.0)	0.27 (6.9)
-S2-BW12-8-	3/4" BW	3/4" BW	0.50 (12.7)	3.10	4.88 (124)	1.00 (25.4)	11.6 (295)	0.59 (14.9)	4.00 (102)	2.44 (62.0)	1.25 (31.8)	1.46 (37.0)	0.27 (6.9)
-S2-SW12-8A-	3/4" SW	3/4" SW	0.61 (15.5)	5.30	4.88 (124)	1.44 (36.6)	11.6 (295)	0.59 (14.9)	4.00 (102)	2.49 (63.2)	1.60 (40.6)	—	0.26 (6.6)
-S2-BW12-8A-	3/4" BW	3/4" BW	0.61 (15.5)	5.30	4.88 (124)	1.44 (36.6)	11.6 (295)	0.59 (14.9)	4.00 (102)	2.49 (63.2)	1.60 (40.6)	—	0.26 (6.6)
-S2-BW16-8A-	1" BW	1" BW	0.61 (15.5)	5.30	4.88 (124)	1.44 (36.6)	11.6 (295)	0.59 (14.9)	4.00 (102)	2.49 (63.2)	1.60 (40.6)	—	0.26 (6.6)

Ordering Information

SS—S2—S8—SM10—5—WR—BSF2

Body Material	Series	Inlet Type	Inlet Size	Outlet Type	Outlet Size	Orifice Size	Tip Material	Tip Type	Handle	Special Application	Cleaning and Packaging
SS 6L S4 4L S1 M	S2	SW MS BW MB PS PB S SM UW MU FFR MFR	2 1/8" 4 1/4" 6 3/8" or 6 mm 8 1/2" or 8 mm 10 10 mm 12 3/4" or 12 mm 14 14 mm or M14 x 1.5 16 1" or 16 mm 18 18 mm 20 1 1/4" or 20 mm or M20 x 1.5 22 22 mm or M22 x 1.5 25 25 mm 27 M27 x 2 28 28 mm	Same as Inlet Type and Size If different, specify in the same way as Inlet Type and Inlet Size	2 0.17" (4.3 mm) 4 0.28" (7.1 mm) 5 0.312" (7.9 mm) 8 0.5" (12.7 mm) 8A 0.610" (15.5 mm)	Same as Body Material K PCTFE W Stellite	Spherical Regulating Conical	Green Aluminum Bar Black Aluminum Bar Red Aluminum Bar Blue Aluminum Bar 321 Stainless Steel Bar Black Knob	FC-01 FC-02 F2	NO S NACE MR0175 Classification for Nuclear Facility Application N2 Class 2 N3 Class 3	

1. Standard thread pitch for metric threads are as follows:
M10 and below: 1 mm
M12 to M20: 1.5 mm

2. Standard thread pitch should be ignored in the ordering number, others should be specified.

FC-01: Standard cleaning and packaging for general industrial procedures.

FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleanliness requirement as stated in ASTM G93 Level C.