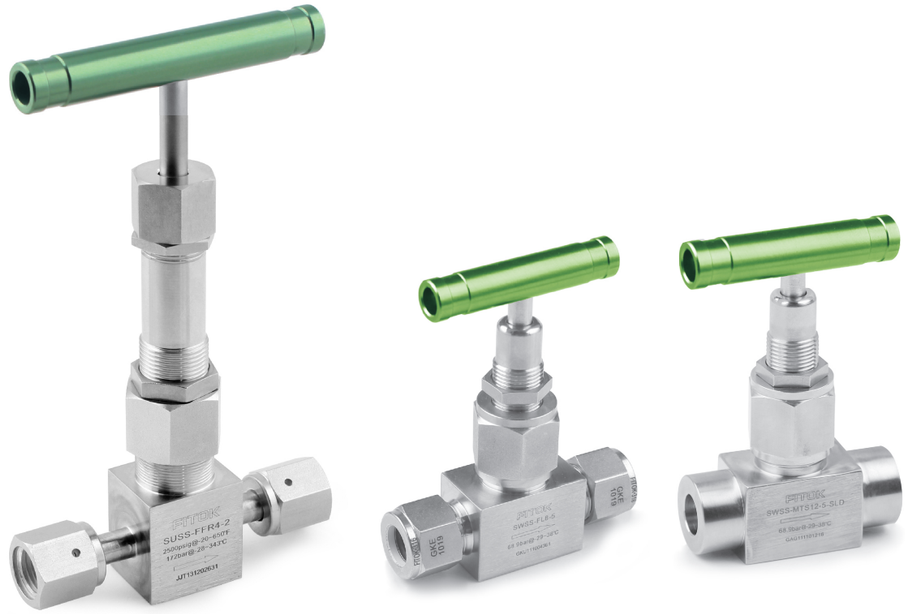
Bellows-sealed Valves

SW, SU Series



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FITOK
Valves and Fittings

Contents

Bellows-sealed Valves
SW Series

01

Bellows-sealed Valves
SU Series

05

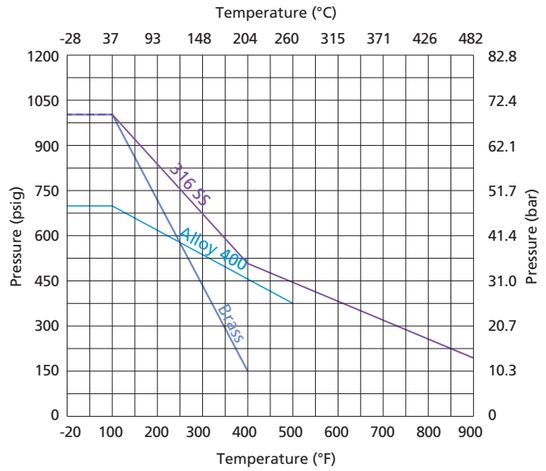
Bellows-sealed Valves

SW Series

Features

- Maximum working pressure: 1000 psig (68.9 bar)
- Working temperature: -20°F to 900°F (-28°C to 482°C)
- Variety of end connections
- Body material: 316 SS, brass and monel
- Hydraulic-formed multilayer bellows for longer cycle life
- Nonrotating stem tip eliminates galling within the seat area
- 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
- Handle color options are available
- Panel and bottom mounting available
- Every FITOK bellows-sealed valve is factory tested with helium to a maximum leak rate of 4 × 10^{-9} std cm^3/s at the seat, envelope and all seals.

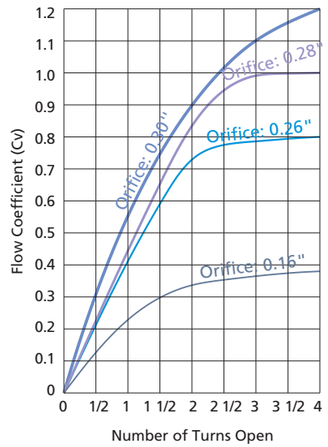
Pressure vs. Temperature



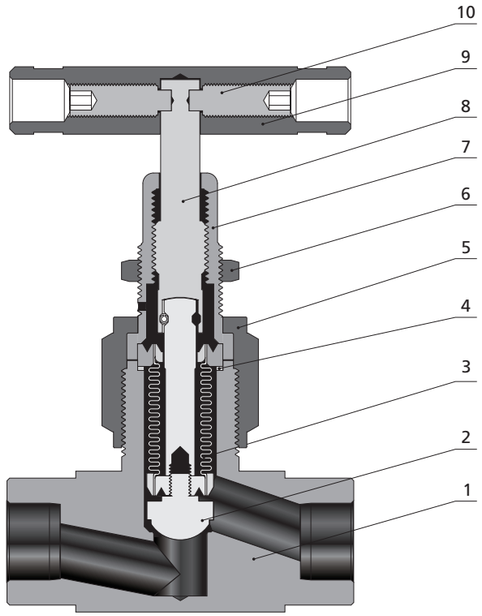
200°F (93°C) max. with PCTFE stem tip (soft tip).

Flow Coefficient vs. Turns Open

Regulating Stem



Standard Materials of Construction



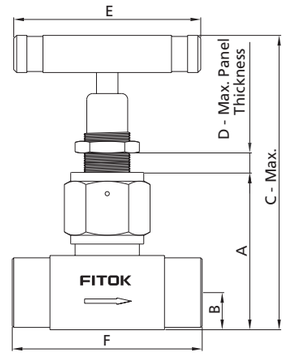
Tip Types

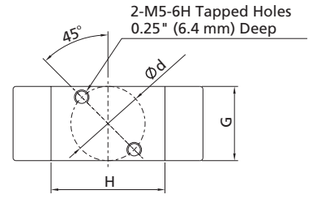
Conical Tip | Regulating Tip | Spherical Tip

Component		Valve Body Material Grade/ASTM Specification		
		316 SS	Brass	Alloy 400
1	Body	316 SS/A182	Brass/B283	Alloy 400/B564
2	Stem Tip	Chrome-plated		Alloy k-500/AMS4676 (regulating)
		PCTFE/D1430 (conical)		PCTFE/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 Powdered metal	Brass/B16	17-4PH powdered 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 Screws	Alloy Steel/ANSI 18.3		
Wetted Lubricant		Fluorinated-based (Spherical Tip)		
Non-wetted Lubricant		Molybdenum disulfide		

Contact the authorized representative or FITOK Group for valves of other materials.

Dimensions





Basic Ordering Number	Connection Type and Size		Orifice in. (mm)	Cv	Dimension, in. (mm)								
	Inlet	Outlet			A	B	C	D	E	F	G	H	Ød
SW□□-FL4-2-	1/4" FITOK	1/4" FITOK	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)
SW□□-FL6-3-	3/8" FITOK	3/8" FITOK	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)
SW□□-FL8-5-	1/2" FITOK	1/2" FITOK	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)
SW□□-ML6-2-	6 mm FITOK	6 mm FITOK	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)
SW□□-ML10-4-	10 mm FITOK	10 mm FITOK	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)
SW□□-ML12-5-	12 mm FITOK	12 mm FITOK	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)
SW□□-TS4-2-	1/4" TS	1/4" TS	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)
SW□□-TS6-4-	3/8" TS	3/8" TS	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)
SW□□-TS8-5-	1/2" TS	1/2" TS	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)
SW□□-TB4-2-	1/4" TB	1/4" TB	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)
SW□□-TB6-4-	3/8" TB	3/8" TB	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)
SW□□-TB8-5-	1/2" TB	1/2" TB	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)
SW□□-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)
SW□□-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)
SW□□-FR4-2-	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)
SW□□-FR8-5-	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. FITOK means FITOK 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 FITOK 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 FITOK Group.
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.

Part Number Description

SWSS – FL8 – ML10 – 5 – WR – BSF2

Series	Body Material	Inlet Type	Inlet Size	Outlet Type	Outlet Size	Tip Type	Tip Material	Orifice Size	Handle	Special Application	Cleaning and Packaging
SW	SS 316 SS	TS Fractional Tube Socket Weld	2 1/8"	Same as Inlet	Same as Inlet	Spherical	Same as Body Material	2 0.16" (4.1 mm)	Green Aluminum Bar	NO	FC-01
	6L 316L SS	MTS Metric Tube Socket Weld	4 1/4"	Specified in the same way as Inlet type and size	Specified in the same way as Outlet type and size	R Regulating	K PCTFE	3 0.26" (6.6 mm)	B Black Aluminum Bar	S NACE MR0175	F2 FC-02
	S4 304 SS	TB Fractional Tube Butt Weld	6 3/8" or 6 mm			N Conical	W Stellite	4 0.28" (7.1 mm)	C Red Aluminum Bar	Classification for Nuclear Facility Application	
	4L 304L SS	MTB Metric Tube Butt Weld	8 1/2" or 8 mm					5 0.30" (7.6 mm)	J Blue Aluminum Bar	N2 Class 2	
	S1 321 SS	PS Pipe Socket Weld	10 10 mm					6 0.39" (10 mm)	M 321 Stainless Steel Bar	N3 Class 3	
	M Alloy 400	PB Pipe Butt Weld	12 3/4" or 12 mm					7 0.63" (16 mm)	O Black Knob		
	B Brass	FL Fractional Tube Fitting	14 14 mm or M14						T Toggle handle		
	904L 904L SS	ML Metric Tube Fitting	16 1" or 16 mm								
		UFB Nut+Gasket+ Fractional Bulge Nipple	18 18 mm								
		UMB Nut+Gasket+ MetricBulge Nipple	20 20 mm								
		FFR Female FR Fitting									
		FR Male FR Fitting									

Note: "Part Number Description" is used for composition rules of FITOK product model,
Not suitable for specific product part number selection, not random combinations.
If in doubt, please contact FITOK company or authorized agents.

1. *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.
2. *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.

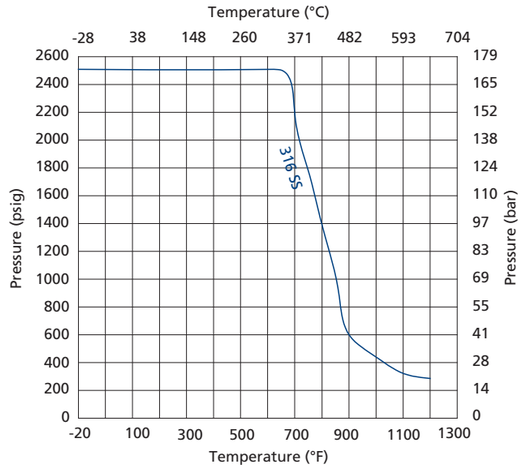
Bellows-sealed Valves

SU Series

Features

- Working pressure up to 2500 psig (172 bar)
- Working temperature: -20°F to 1200°F (-28°C to 649°C)
- Variety of end connections
- 316 SS body material
- 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.
- Handle color options are available
- Every FITOK bellows-sealed valve is factory tested with helium to a maximum leak rate of 4 × 10^{-9} std cm^3/s at the seat, envelope and all seals

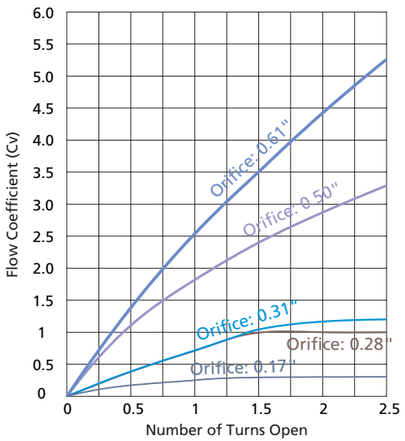
Pressure vs. Temperature



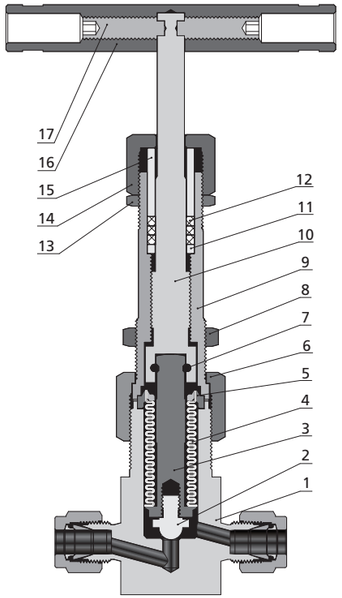
200°F (93°C) max. with PCTFE stem tip (soft tip).

Flow Coefficient vs. Turns Open

Regulating Stem



Standard Materials of Construction



Tip Types

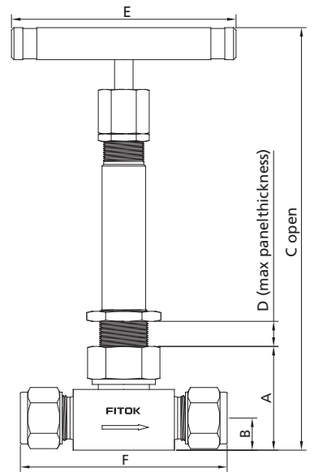
Conical Tip | Regulating Tip | Spherical Tip

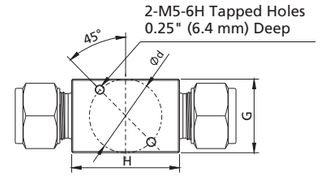
Component		Valve Body Material Grade/ASTM Specification
		316 SS
1	Body	316 SS/A182
2	Stem Tip	Chrome-plated
		PCTFE/D1430 (conical)
		Weld Stellite (regulating or spherical)
3	Stem	316 SS/A479 (316L SS optional)
4	Bellows	321 SS/A269 (316L SS/A269 optional)
5	Weld Ring	316 SS/A479 (316L SS optional)
6	Bonnet Nut	316 SS/A479
7	Pin	stainless steel
8	Panel Mount Nut	17-4PH powdered metal
9	Bonnet	316 SS/A479
10	Actuator	416 SS/A582
11	Space	316 SS/A276
12	Packing	PTFE or Graphite
13	Jam Nut	316 SS/A276
14	Packing Nut	316 SS/A276
15	Gland	316 SS/A276
16	Handle	Green anodized aluminum 6061/B211 (stainless steel and phenolic optional)
17	Set Screws	stainless steel

Contact the authorized representative or FITOK Group 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
SU□□-FL4-2-	1/4" FITOK	1/4" FITOK	0.17 (4.37)	0.36	2.69 (59.9)	0.56 (14.2)	6.48 (165)	0.38 (9.7)	2.50 (63.5)	2.46 (62.5)	1.00 (25.4)	1.06 (26.9)	1.00 (25.4)
SU□□-FL6-4-	3/8" FITOK	3/8" FITOK	0.27 (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)
SU□□-FL8-5-	1/2" FITOK	1/2" FITOK	0.31 (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)
SU□□-ML6-2-	6 mm FITOK	6 mm FITOK	0.17 (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)	1.00 (25.4)	1.06 (26.9)	1.00 (25.4)
SU□□-ML10-4-	10 mm FITOK	10 mm FITOK	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)
SU□□-ML12-4-	12 mm FITOK	12 mm FITOK	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)
SU□□-TS4-2-	1/4" TS	1/4" TS	0.16 (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)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
SU□□-TS6-4-	3/8" TS	3/8" TS	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)
SU□□-TS8-5-	1/2" TS	1/2" TS	0.31 (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)
SU□□-TB4-2-	1/4" TB	1/4" TB	0.16 (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)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
SU□□-TB6-4-	3/8" TB	3/8" TB	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)
SU□□-TB8-5-	1/2" TB	1/2" TB	0.31 (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)
SU□□-FFR4-2-	1/4" Female FR	1/4" Female FR	0.16 (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)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
SU□□-FFR8-5-	1/2" Female FR	1/2" Female FR	0.30 (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)
SU□□-FR4-2-	1/4" Male FR	1/4" Male FR	0.16 (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)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
SU□□-FR8-5-	1/2" Male FR	1/2" Male FR	0.30 (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. FITOK means FITOK double ferrule tube fittings, FO means O-ring seal fittings, FR means metal gasket seal fittings. They are interchangeable with Swagelok/Parker products.

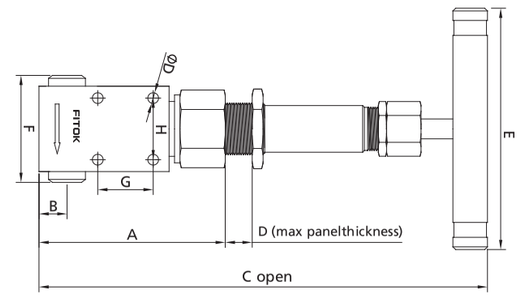
2. Dimensions are shown with FITOK nuts finger-tightened. All dimensions are for reference only and are subject to change. For dimensions not shown above, please contact the authorized representative or FITOK Group.

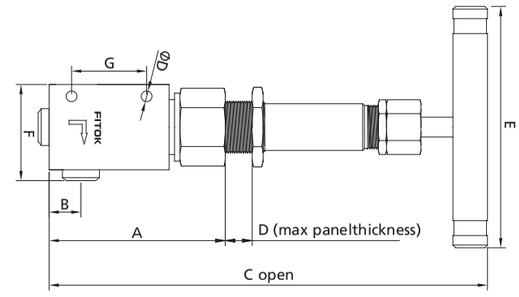
3. The sizes and types listed are standard. Other sizes and types are available upon request, refer to ordering information.

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
SU□□-TS12-8-	3/4" TS	3/4" TS	0.50 (12.7)	3.10	4.88 (124)	1.00 (25.4)	11.60 (295)	0.59 (14.9)	4.00 (102)	2.44 (62.0)	1.25 (31.8)	1.46 (37.0)	0.27 (6.9)
SU□□-TB12-8-	3/4" TB	3/4" TB	0.50 (12.7)	3.10	4.88 (124)	1.00 (25.4)	11.60 (295)	0.59 (14.9)	4.00 (102)	2.44 (62.0)	1.25 (31.8)	1.46 (37.0)	0.27 (6.9)
SU□□-TS12-8A-	3/4" TS	3/4" TS	0.61 (15.5)	5.30	4.88 (124)	1.44 (36.6)	11.60 (295)	0.59 (14.9)	4.00 (102)	2.49 (63.2)	1.60 (40.6)	—	0.26 (6.6)
SU□□-TB12-8A-	3/4" TB	3/4" TB	0.61 (15.5)	5.30	4.88 (124)	1.44 (36.6)	11.60 (295)	0.59 (14.9)	4.00 (102)	2.49 (63.2)	1.60 (40.6)	—	0.26 (6.6)
SU□□-TB16-8A-	1" TB	1" TB	0.61 (15.5)	5.30	4.88 (124)	1.44 (36.6)	11.60 (295)	0.59 (14.9)	4.00 (102)	2.49 (63.2)	1.60 (40.6)	—	0.26 (6.6)





Part Number Description

SUSS – FL8 – ML10 – 5 – WR – BSF2

Series	Body Material	Inlet Type	Inlet Size	Outlet Type	Outlet Size	Orifice Size	Tip Material	Tip Type	Handle	Special Application	Cleaning and Packaging
SU	SS 316 SS 6L 316L SS S4 304 SS 4L 304L SS S1 321 SS M Alloy 400	TS Fractional Tube Socket Weld MTS Metric Tube Socket Weld TB Fractional Tube Butt Weld MTB Metric Tube Butt Weld PS Pipe Socket Weld PB Pipe Butt Weld FL Fractional Tube Fitting ML Metric Tube Fitting UFB Nut+Gasket+ Fractional Bulge Nipple UMB Nut+Gasket+ MetricBulge Nipple FFR Female FR Fitting FR Male FR Fitting	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 16 1" or 16 mm 18 18 mm 20 11/4 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 0.31" (7.9 mm) 8 0.50" (12.7 mm) 8A 0.61" (15.5 mm)	Same as Body Material K PCTFE W Stellite	Spherical R Regulating N Conial	Green Aluminum Bar B Black Aluminum Bar C Red Aluminum Bar J Blue Aluminum Bar M 321 Stainless Steel Bar O Black Knob	NO S NACE MR0175 Classification for Nuclear Facility Application N2 Class 2 N3 Class 3	FC-01 F2 FC-02

Note: "Part Number Description" is used for composition rules of FITOK product model,
Not suitable for specific product part number selection, not random combinations.
If in doubt, please contact FITOK company or authorized agents.

1. 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.
2. 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.