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Instrumentation Solutions





ZHEJIANG FANGDUN INSTRUMENT VALVE CO.,LTD No.177, Zhanwang Road,Longwan Industry Center, Wenzhou,Zhejiang,China 325024

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ZHEJIANG FANGDUN INSTRUMENT VALVE CO., LTD

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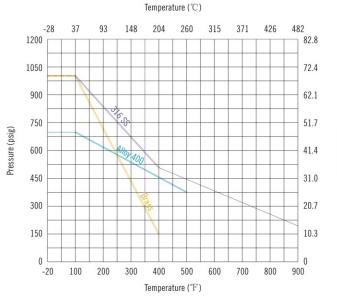




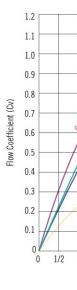
Features

- 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 resistent 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



Bellows-sealed Valve S1 Series

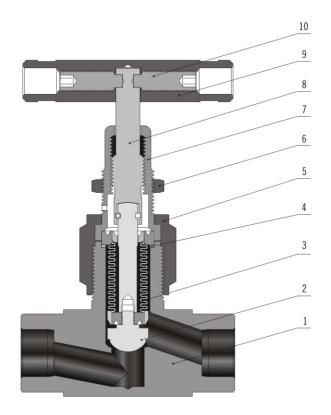




Number of Turns Open

Bellows-sealed Valve S1 Series

Standard Materials of Construction



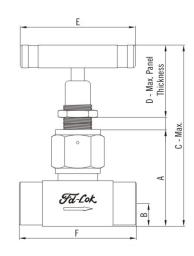
Tip Types



0		Valve B	ody Material Grade/ASTM Spe	cification
Compo	onent	316 SS	Brass	Alloy 400
1	Body	316 SS/A479	Brass/B16	Alloy 400/B164
		316 SS/A47	9 (regulating)	Alloy k-500/AMS4676 (regulating)
2	Stem Tip	PCTFE/D14	30 (conical)	PCTFE/D1430 (conical)
		Weld Stellite (regu	lating or spherical)	
3a	Bellow	321 SS/A269 (316	L SS/A269 optional)	Alloy 400/B165
3b	Stem	316 SS/A479 (3	16L SS optional)	Alloy 400/B164
3c	Weld Ring	316 SS/A479 (3	16L SS optional)	Alloy 400/B164
4	Cooket	Silver-plated	316 SS/A580	Sliver-plated Alloy 400/AMS4730
4	Gasket	PTFE-coated-	316 SS/A580	PTFE-coated Alloy 400/AMS4730
5	Bonnet Nut	Sliver-plated 316 SS/A479	Sliver-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 alun	ninum 2024-T4/B211 (stainless steel and	phenolic optional)
10	Set Screw		Alloy Steel/ANSI 18.3	
Wetted Lu	ıbricant		Fluorinated-based (Spherical Tip)	
Nonwetted	Lubricant		Molybdenum disulfide	

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

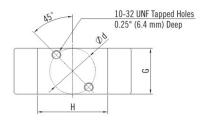
Dimension



Basic	Connection 7	Type and Size	Orifice		Dimension, in. (mm)								
Ordering Number	Inlet	Outlet	in. (mm)	Cv	A	В	C	D	Е	F	G	н	Φd
-\$1-\$4-2-	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
-\$1-\$6-3-	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)	1.0 (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)	1.0 (25.
-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)	1.0 (25.
-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)	1.0 (25.
-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)	1.0 (25.
-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)	1.0 (25.
-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)	1.0 (25.
-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)	1.0 (25.
-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)	1.0 (25.
-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)	1.0 (25.
-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)	1.0 (25.
-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)	1.0 (25
-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)	1.0 (25
-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)	1.0 (25

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.

 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
 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.



Ordering Information

g and	2	FC-01 FC-02										
Cleaning Packag		F2						1				
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Hand	Gree	Blac	Red Alum	Blue Alum	321 Steel	Blac	Togg					
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Type	Spherical	Regulating	Conical									
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) Material	Same as Body Material	PCTFE	Stellite									
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e Size	08 (in.) .0 mm)	16(in.) .1 mm)	26(in.) .6 mm)	28(in.) .1 mm)	3(in.) .6 mm)	433(in.) 1 mm)	630(in.)	(mm)				
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Infe	Frac	Metu	Frac Butt	Metr Butt	Pipe	Pipe	Frac	Meti	Nut- Frac Nipr	Bulg	Fem	Mal
	SW	SM	BW	MB	ß	8	S	SM	MN	MU	FFR	MFR
Series	SI											
Material	16 SS	16L SS	04 SS	21 SS	loy 400	rass						
Body	SS 31			sl 32	M	B						
	Body Material Series Orifice Size Orifice Size Inlet Type Inlet Size Orifice Size Tip Material	Series Inlet Type Inlet Size Oritice Size Inlet Type Handle Cleaning Size Inlet Type Inlet Size Oritice Size Oritice Size Inlet Size Inlet Size Inlet Size Size Inlet Type Inlet Size Outlet Size Oritice Size Inlet Size Inlet Size Size Inlet Size Inlet Size Inlet Size Inlet Size Inlet Size Inlet Size Size Inlet Size Inlet Size Inlet Size Inlet Size Inlet Size Inlet Size Size Inlet Size Inlet Size Inlet Size Inlet Size Inlet Size Inlet Size Size Inlet Size Inlet Size Inlet Size Inlet Size Inlet Size Inlet Size Size Socket Weld 2 1/8 (in.) Same as Inlet 1 0.08 (in.) Same as	Series Inlet Type Outlet Size Orifice Size In Material Tip Type Handle Cleaning Same as lote 2 1/8 (in.) Same as lote 1 0.016 (in.) Body Material Auminum Bar Ns Metric Tube 4 1/4 (in.) Specified in the same as lote 2 0.16 (in.) 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W Stellite Conical BW Fractional Tube 1/2 (in.) or 3/6 (in.) or Stellite Conical C	Series Inlet Type Inlet Size Outlet Type Inlet Size Inlet Type Inlet Type Inlet Size Outlet Type Inlet Size Series Inlet Type Inlet Size Outlet Type Inlet Size Series Inlet Type Inlet Size Outlet Type Inlet Size Series Inlet Type Inlet Size Inlet Size Inlet Size Series Series Inlet Size Inlet Size Inp Size Series Series Indices Indices Indices Ms Series Series Indices Indices Ms Series Series Indices Indices Ms Batt Weld N Series Indices Ms Mstrict Tube Indices Indices Indices Ms Mstrict Tube Indices Indices Indices Ms Mstrict Tube Indices Indices Indices Mstrict Tube Mstrict Tube Indices Indices Indices Mstrict Tube Mstrict Tube Indices Indices Indices Mstrict Tube Indices Indices Indices Indices	Series Inlet Type Inlet Size Outlet Type Material Tip Type Handle Cleaning Series Inlet Type Inlet Size Outlet Type Oritice Size Tip Material Tip Type Handle Packag Si Sw Scoket Weld 2 1/8 (in.) 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Bellows-sealed Valve S1 Series

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Features

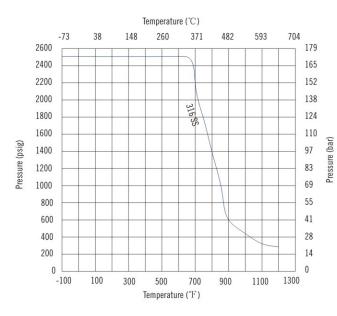
S2 Series

•Working pressure up to 2500 psig (172 bar)

•Working temperatures from-20°F to1200°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^{-9} std cm³/s at the seat, envelope and all seals

Pressure vs. Temperature

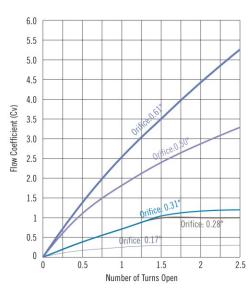


200°F (93°C) max. with PCTFE stem tip (soft tip).

Bellows-sealed Valve S2 Series



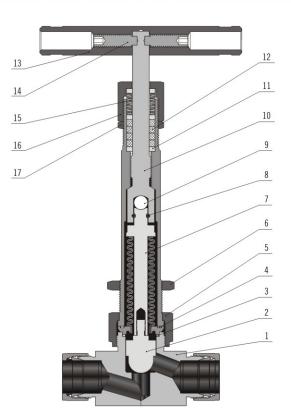
Flow Coefficient vs. Turns Open



Regulating Stem

Bellows-sealed Valve S2 Series

Standard Materials of Construction



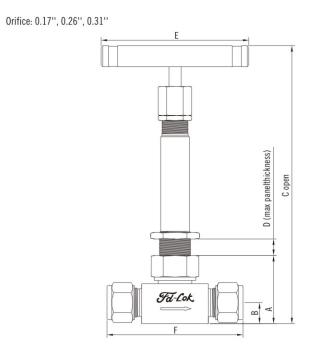
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	Component	Valve Body Material Grade/ASTM Specification
	component	316 SS
1	Body	316 SS/A479
		316 SS/A479 (regulating)
2	Stem Tip	PCTFE/D1430 (conical)
		Weld Stellite (regulating or spherical)
3	0.5151	Silver-plated 316 SS/A580
4	Gasket	PTFE-coated 316 SS/A580
5	Bonnet Nut	Siver-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	\$17700/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.

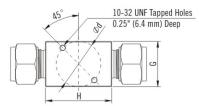
Dimensions



Basic Ordering Number -S2-S4-2-	End Con	nections	Orifice	Cv				Dir	nensions	, in. (mm))		
	Inlet Size	Outlet Size	in. (mm)	64	Α	В	C	D	E	F	G	Н	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)

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

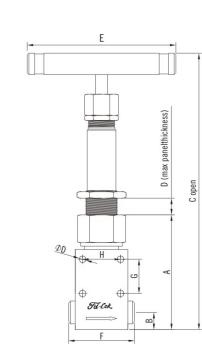
Bellows-sealed Valve S2 Series

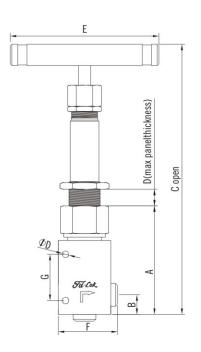


Bellows-sealed Valve S2 Series

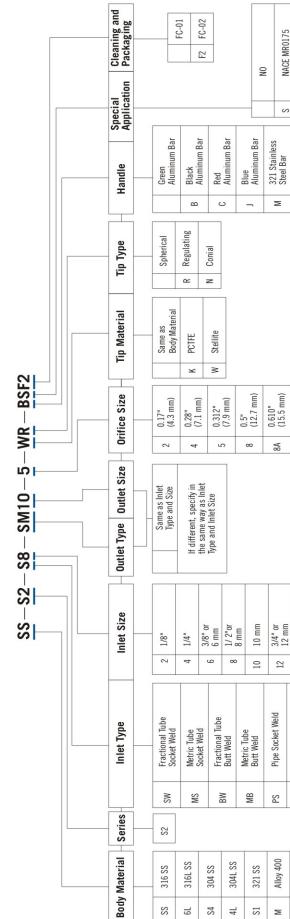
Dimensions

Orifice: 0.50", 0.61"





Basic	End Con	Orifice	01/	Dimensions, in. (mm)									
Ordering Number	Inlet Size	Outlet Size	in. (mm)	CV	Α	В	C	D	Е	F	G	Н	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

NO.		NACE MR0175	for Nuclear ation	Class 2	Class 3
		S NA	Classification for Nuclear Facility Application	N2 Cla	N3 Cla
	321 Stainless	Steel Bar	Black Knob		
		Σ	0		

	6 mm	1/ 2"or	8 mm	10 mm	3/4" or 1.2 mm	14 mm or M14 x 1.5	1" or 16 mm	18 mm	1 1/4 or 20 mm or M20 x 1.5	22 mm or M22 x 1.5	25 mm	M27 x 2	28 mm
•	٥	œ		10	12	14	16	18	20	22	25	27	28
	Fractional Tube	Butt Weld	Metric Tube	DIUT WEIG	Pipe Socket Weld	Pipe Butt Weld	Fractional TubeFitting	Metric Tube Fitting	Nut+Gasket+ Fractional Bulge	Nipple Nut Castot Matric	Bulge Nipple	Female FR Fitting	Male FR Fitting
	MU	DW	MB		PS	ΡB	s	SM	MN		MU	FFR	MFR

Alloy 400

others should be specified.

strial

ASTM G93 Level C. ed in nts to 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 numb 2. Cleaning and Packaging: FC-01. Standard cleaning and packaging for general industri FC-02. Special cleaning and packaging for wetted system con