

Subsea Ball Valves

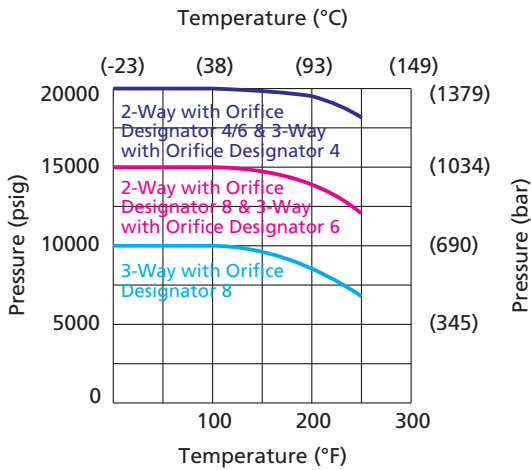
2-Way Valves, 3-Way Valves

Features

- Working pressure up to 20,000 psig (1379 bar)
- Maximum external pressure: 6,000 psig (414 bar)
- NBR O-ring for operation from -10 to 250°F (-23 to 121°C); other O-ring materials available
- High tensile 316 stainless steel or S17400 stainless steel as standard material for valve body
- Paddle assembly optional
- PEEK seats offer excellent resistance against chemicals, heat and abrasion
- Full-port flow path to minimize pressure drop
- 2-way and 3-way valve configurations
- Bidirectional flow for 2-way valves
- Wide selection of tube and pipe end fittings available
- A variety of wetted materials optional
- Maximum water depth: 13,800 ft. (4200 m)

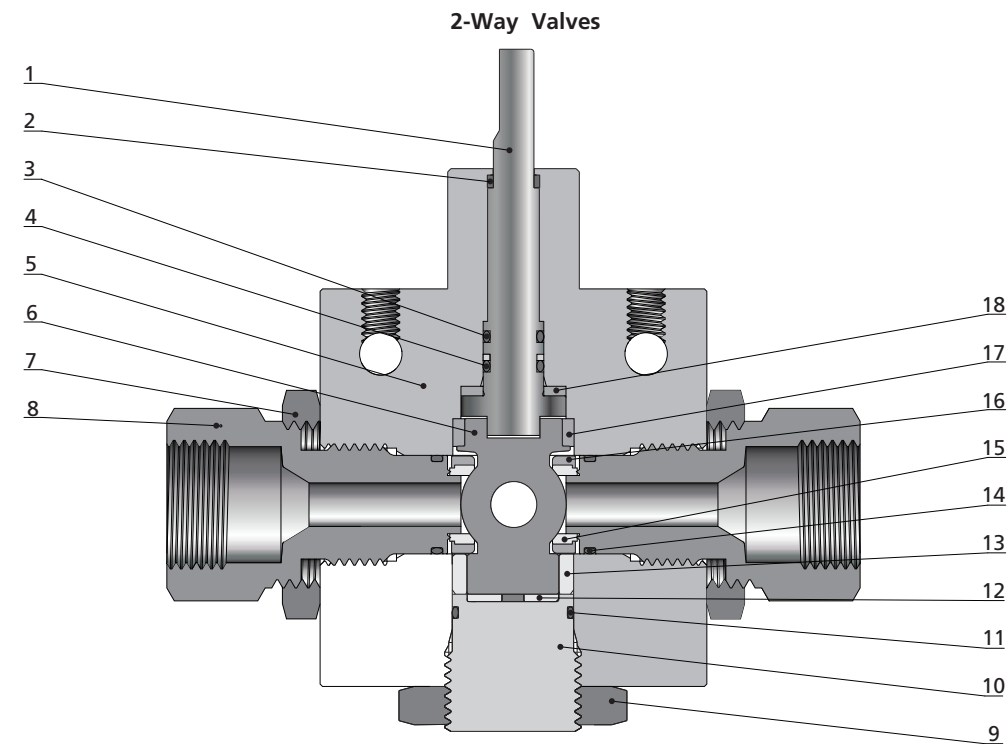


Pressure vs. Temperature Curve



Note: The side connection is not allowed to work as inlet.

Standard Materials of Construction

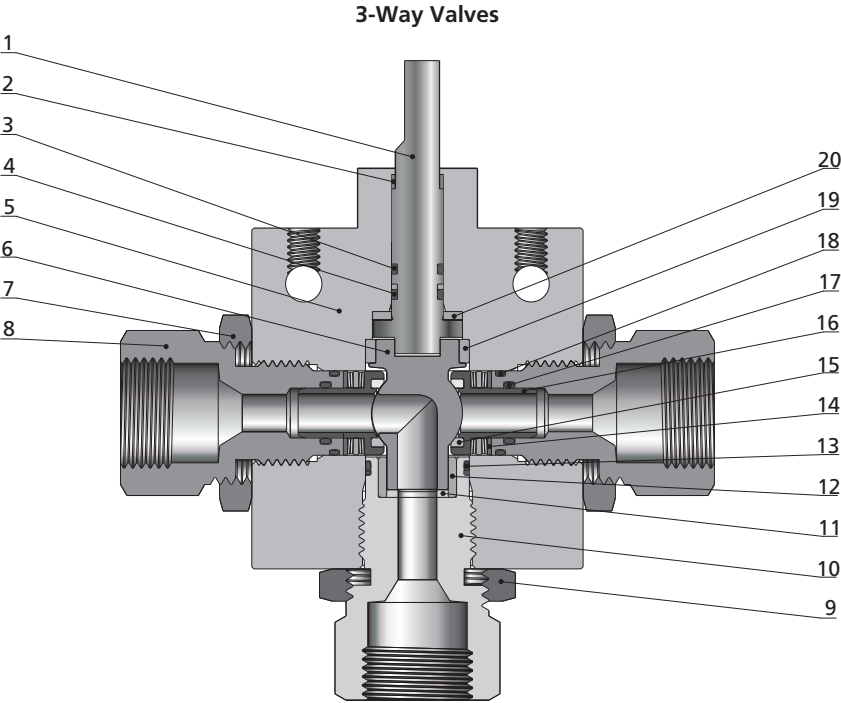


Item	Component	Material Grade
1	<i>Ball Stem</i>	316SS
2	Stem Backup	PEEK
3	O-Ring	NBR
4	<i>O-Ring</i>	<i>NBR</i>
5	<i>Body</i>	<i>316 SS / S17400 SS(For Orifice No. 16 Only)</i>
6	<i>Ball</i>	<i>316SS</i>
7	Lock Nut	316 SS
8	<i>Seat Gland</i>	<i>316 SS / S17400 SS(For Orifice No. 16 Only)</i>
9	Locking Piece	316SS
10	<i>Bottom Gland</i>	<i>316 SS / S17400 SS(For Orifice No. 16 Only)</i>
11	<i>O-Ring</i>	<i>NBR</i>
12	<i>Bottom Thrust Washer</i>	<i>PEEK</i>
13	<i>Bearing</i>	<i>PEEK</i>
14	<i>O-Ring</i>	<i>NBR</i>
15	<i>Seat</i>	<i>PEEK</i>
16	<i>Seat Retainer</i>	<i>316SS</i>
17	<i>Bearing</i>	<i>PEEK</i>
18	<i>Thrust Washer</i>	<i>PEEK</i>
Lubricant		Molybdenum Disulfide/Fluorinated-Based

Wetted components listed in italics.

Fittings
Tubing
Quick Couplings
Line Filters
Valves
Sour Service Products
Subsea Valves
Part Number Crossover Charts

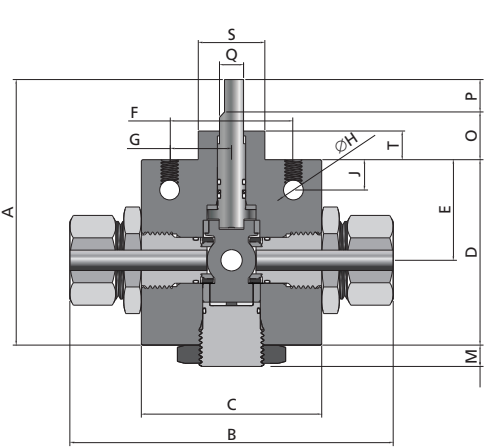
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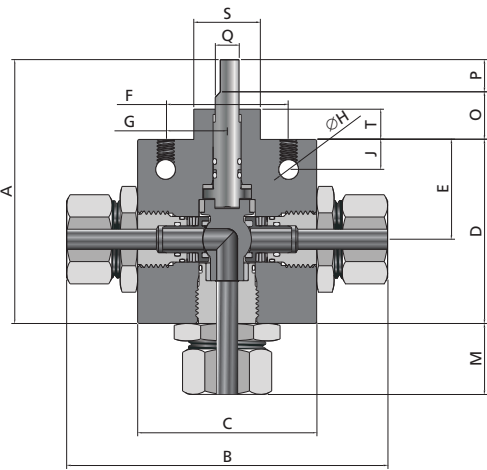
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3	O-Ring	NBR
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5	Body	316 SS
6	Ball	316 SS
7	Lock Nut	316 SS
8	Seat Gland	316 SS
9	Locking Piece	316SS
10	Bottom Gland	316SS
11	Bottom Thrust Washer	PEEK
12	Bearing	PEEK
13	O-Ring	NBR
14	Belleville Washer	S17700
15	Seat	PEEK
16	Seat Retainer	S17700
17	O-Ring	NBR
18	O-Ring	NBR
19	Bearing	PEEK
20	Thrust Washer	PEEK
Lubricant		Molybdenum Disulfide/Fluorinated-Based

Wetted components listed in italics.

Dimensions



2-Way Valves



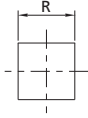
3-Way Valves

Dimensions, in. (mm)												
Flow Pattern	Orifice No.	A	B	C	D	E	F	G	H	J	M	Block Thickness
2-Way	4	4.31 (109.3)	4.20 (106.8)	2 (50.8)	2.53 (64.2)	1.28 (32.5)	1.5 (38.1)	0.75 (19.05)	0.28 (7.1)	0.43 (10.9)	0.35 (8.8)	1 (25.4)
	6	5.94 (150.8)	5.53 (140.4)	3 (76.2)	3.43 (87.3)	1.78 (45.2)	2.5 (63.5)	1.25 (31.75)	0.31 (7.9)	0.41 (10.3)	0.35 (8.8)	1.38 (34.9)
	8	6.67 (169.5)	7.72 (196.2)	4.12 (104.6)	4.23 (107.5)	2.07 (52.4)	3 (76.2)	1.5 (38.1)	0.31 (7.9)	0.5 (12.7)	0.61 (15.5)	1.75 (44.5)
3-Way	4	4.34 (110.2)	4.70 (119.5)	2.5 (63.5)	2.56 (65)	1.34 (34)	2 (50.8)	1 (25.4)	0.28 (7.1)	0.41 (10.3)	1.1 (28)	1 (25.4)
	8	6.67 (169.5)	7.72 (196.2)	4.12 (104.6)	4.23 (107.5)	2.07 (52.4)	3 (76.2)	1.5 (38.1)	0.31 (7.9)	0.5 (12.7)	1.45 (36.8)	1.75 (44.5)
Flow Pattern	Orifice No.	Dimensions, in. (mm)										
		O	P	Q	R	S	T					
2-Way	4	1.278 (32.5)	0.50 (12.7)	0.25 (6.35)	0.22 (5.48)	0.81 (20.6)	0.65 (16.4)					
	6	1.24 (31.7)	1.25 (31.8)	0.44 (11.1)	0.38 (9.35)	0.94 (23.9)	1.03 (26.2)					
	8	1.56 (39.7)	0.88 (22.2)	0.59 (14.9)	0.44 (11.13)	1.50 (38.1)	0.77 (19.6)					
3-Way	4	1.28 (32.5)	0.5 (12.7)	0.25 (6.35)	0.22 (5.49)	0.81 (20.6)	0.65 (16.4)					
	8	1.56 (39.7)	0.88 (22.2)	0.62 (15.9)	0.44 (11.13)	1.50 (38.1)	0.77 (19.6)					

Ball Stem Connection



Orifice 4



Orifice 6/8

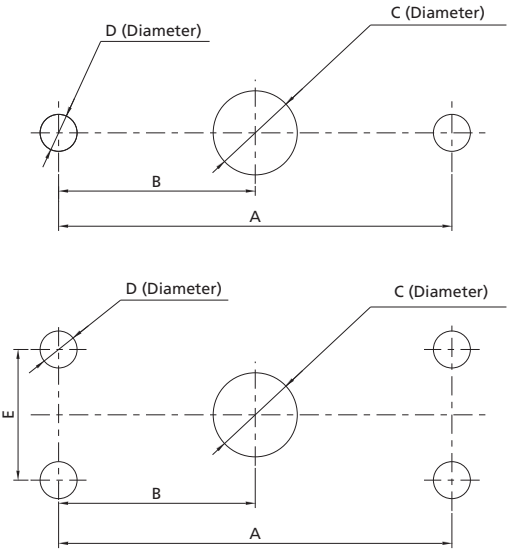
All dimensions are for reference only and are subject to change.

Fittings	Tubing	Quick Couplings	Line Filters	Valves	Sour Service Products	Subsea Valves	Part Number Crossover Charts
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Ball Valve Panel Mounting Dimensions

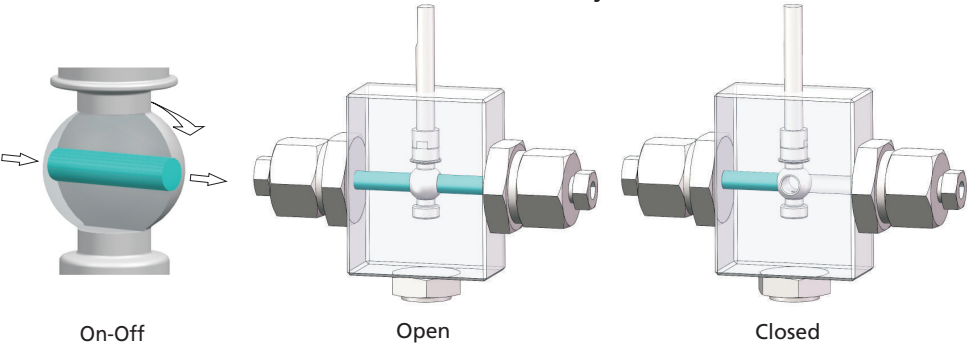
Flow Pattern	Orifice No.	Dimensions, in. (mm)			
		A	B	C	D
2-Way	4	1.5 (38.1)	0.75 (19.05)	0.88 (22.23)	0.28 (7.1)
3-Way	4	2 (50.8)	1 (25.4)	0.88 (22.23)	0.28 (7.1)

Flow Pattern	Orifice No.	Dimensions, in. (mm)				
		A	B	C	D	E
2-Way	6	2.5 (63.5)	1.25 (31.75)	1.00 (25.4)	0.33 (8.5)	0.88 (22.3)
	8	3 (76.2)	1.5 (38.1)	0.69 (17.5)	0.33 (8.5)	1 (25.4)
3-Way	8	3 (76.2)	1.5 (38.1)	1.56 (39.69)	0.33 (8.5)	1 (25.4)

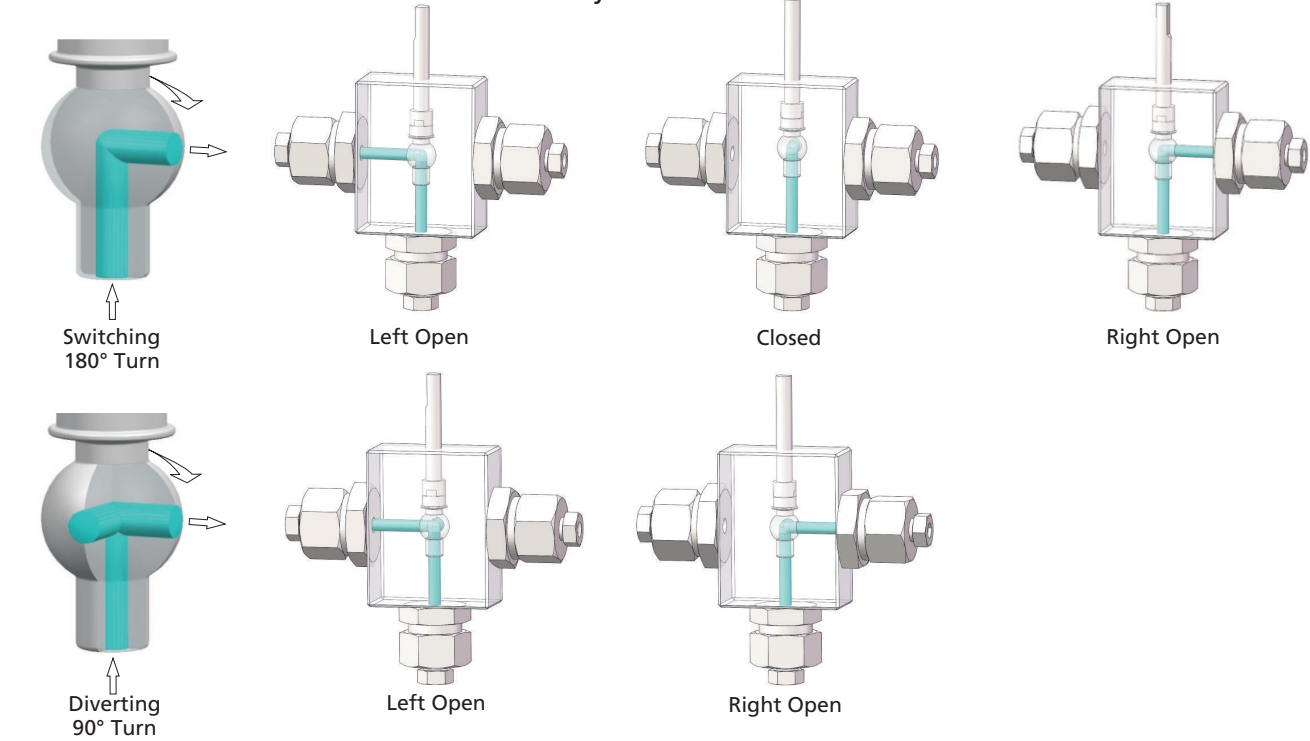


Flow Configuration

2-Way Valves



3-Way Valves



Ordering Information and Dimensions

Flow Pattern	Orifice No.	Connection	Orifice Size in. (mm)	Cv	Ordering Number	Working Pressure psig (bar)
2-Way	4	FNS4	0.25 (6.35)	1.51	15SBSS-FNS4-4-1	15,000 (1034)
		FNS6			15SBSS-FNS6-4-1	
		FNS8			15SBSS-FNS8-4-1	
		DFF4	0.19 (4.80)	0.82	20SBSS-DFF4-4-1	20,000 (1379)
		DFF6	0.25 (6.35)	1.51	20SBSS-DFF6-4-1	
		MF4	0.109 (2.77)	0.23	20SBSS-MF4-4-1	
		MF6	0.203 (5.16)	0.98	20SBSS-MF6-4-1	
		MF9	0.25 (6.35)	1.51	20SBSS-MF9-4-1	
		HF4	0.094 (2.39)	0.16	20SBSS-HF4-4-1	
		HF6	0.125 (3.17)	0.32	20SBSS-HF6-4-1	
	6	FNS4	0.375 (9.52)	3.51	15SBSS-FNS4-6-1	15,000 (1034)
		FNS6			15SBSS-FNS6-6-1	
		FNS8			15SBSS-FNS8-6-1	
		MF6	0.203 (5.16)	0.98	20SBSS-MF6-6-1	20,000 (1379)
		MF9	0.312 (7.92)	2.36	20SBSS-MF9-6-1	
		MF12	0.375 (9.52)	3.51	20SBSS-MF12-6-1	
	8	FNS12	0.5 (12.7)	6.31	10SBSS-FNS12-8-1	10,000 (690)
		FNS16			10SBSS-FNS16-8-1	
		MF12			15SBSS-MF12-8-1	
		MF16			15SBSS-MF16-8-1	
3-Way	4	FNS4	0.188 (4.77)	0.5	15SBSS-FNS4-4-2	15,000 (1034)
					15SBSS-FNS4-4-2D	
		FNS6			15SBSS-FNS6-4-2	
					15SBSS-FNS6-4-2D	
		MF4	0.109 (2.77)	0.17	20SBSS-MF4-4-2	20,000 (1379)
					20SBSS-MF4-4-2D	
		MF6	0.188 (4.77)	0.5	20SBSS-MF6-4-2	
					20SBSS-MF6-4-2D	

Fittings

Tubing

Quick Couplings

Line Filters

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Subsea Valves

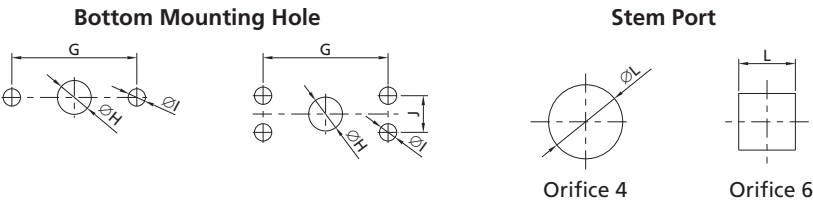
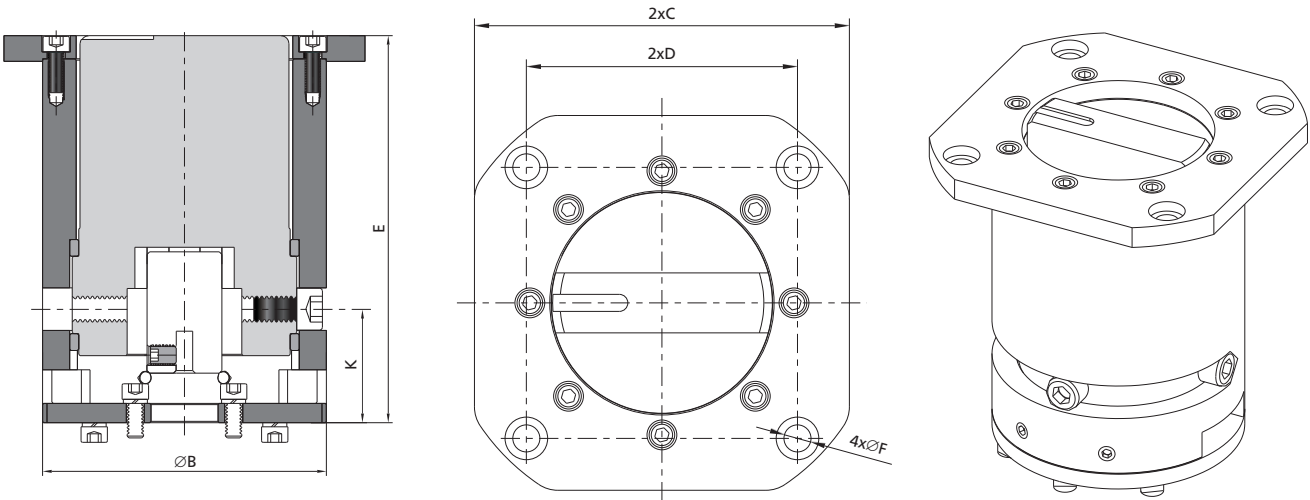
Part Number Crossover Charts

Ordering Information and Dimensions (continued)

Flow Pattern	Orifice No.	Connection	Orifice Size in. (mm)	Cv	Ordering Number	Working Pressure psig (bar)
3-Way	4	MF9	0.188 (4.77)	0.5	20SB5S-MF9-4-2	20,000 (1379)
					20SB5S-MF9-4-2D	
		HF4	0.094 (2.39)	0.13	20SB5S-HF4-4-2	
					20SB5S-HF4-4-2D	
	8	HF6	0.125 (3.17)	0.22	20SB5S-HF6-4-2	10,000 (690)
					20SB5S-HF6-4-2D	
		MF12	0.5 (12.7)	10.2	10SB5S-MF12-8-2	
		MF16			10SB5S-MF16-8-2	

Paddle Assembly Options

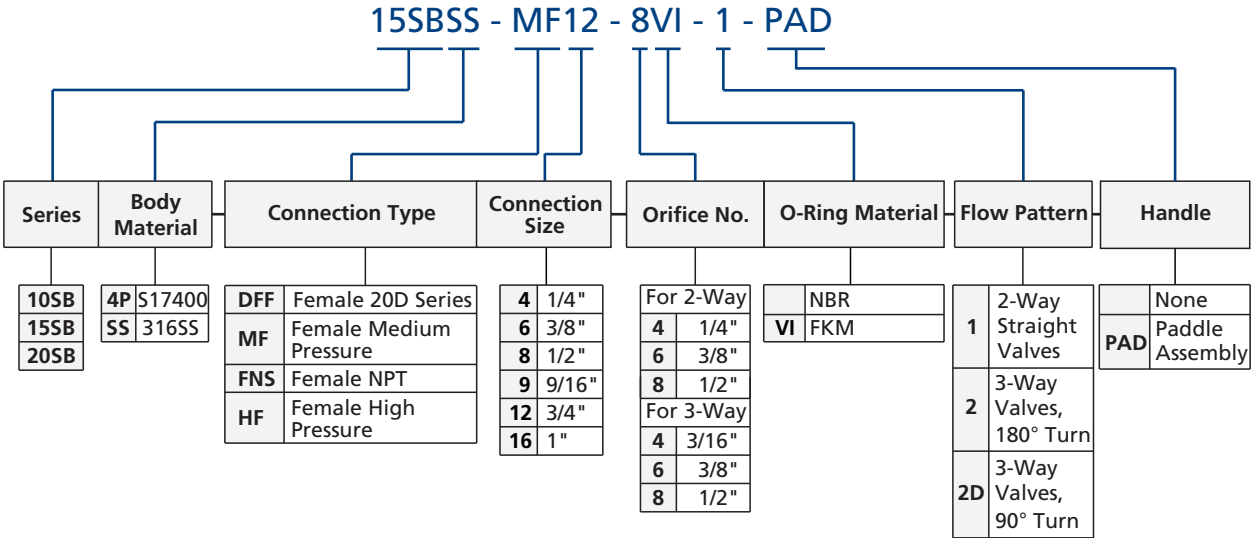
Paddle Assembly installed on the valve is suitable for ROV or diver operation to complete the opening and closing or reversing of underwater valves. PAD is made of stainless steel, which has good corrosion resistance in the submarine environment. The limit design is adopted in the structure to prevent the overtorque of ROV from affecting the normal use of the valve, meeting API 17H specification of ROV interface tooling.



Note: To order valves with paddle assembly, add "-PAD" to the valve ordering number. Example: 20SB5S-MF4-4-1-PAD.

Ordering Number	Flow Pattern	Orifice No.	Dimensions, in. (mm)											
			A	B	C	D	E	F	G	H	I	J	K	L
SS-PAD-4-1	2-Way	4	3.19 (81)	4.33 (110)	5.51 (140)	3.98 (101)	5.9 (150)	0.39 (10)	1.5 (38.1)	1.02 (26.0)	0.28 (7.1)	—	1.38 (35.1)	0.25 (6.35)
SS-PAD-6-1		6	3.19 (81)	4.33 (110)	5.51 (140)	3.98 (101)	5.9 (150)	0.39 (10)	2.5 (63.5)	1.44 (36.5)	0.33 (8.5)	0.88 (22.3)	2.5 (63.5)	0.38 (9.35)
SS-PAD-4-2	3-Way	4	3.19 (81)	4.33 (110)	5.51 (140)	3.98 (101)	5.9 (150)	0.39 (10)	2 (50.8)	1.44 (36.5)	0.28 (7.1)	—	1.38 (35.1)	0.25 (6.35)

Ordering Number Description



Designator	O-Ring Material	Working Temperature Range, °F(°C)
	NBR	-10 to 250 (-23 to 121)
VI	FKM	0 to 400 (-17.8 to 204)

- Notes: 1. For more details regarding 20D Series and Medium/ High Pressure connections, please see **Connection Information** on A-02.
2. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.