

Subsea Valves

Fittings

Tubing

Quick Couplings

Line Filters

Valves

Sour Service Products

Subsea Valves

Part Number Crossover Charts



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Subsea Ball Valves

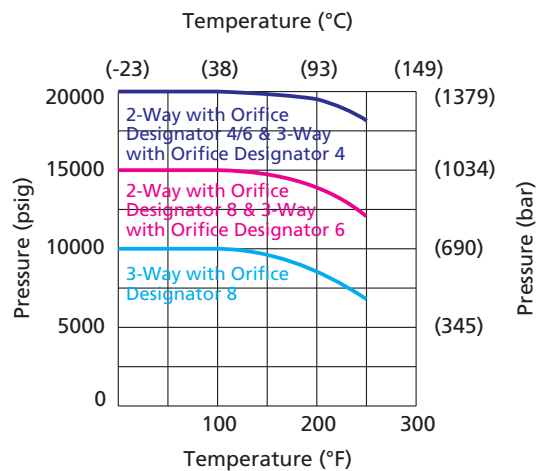
2-Way Valves, 3-Way Valves

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)

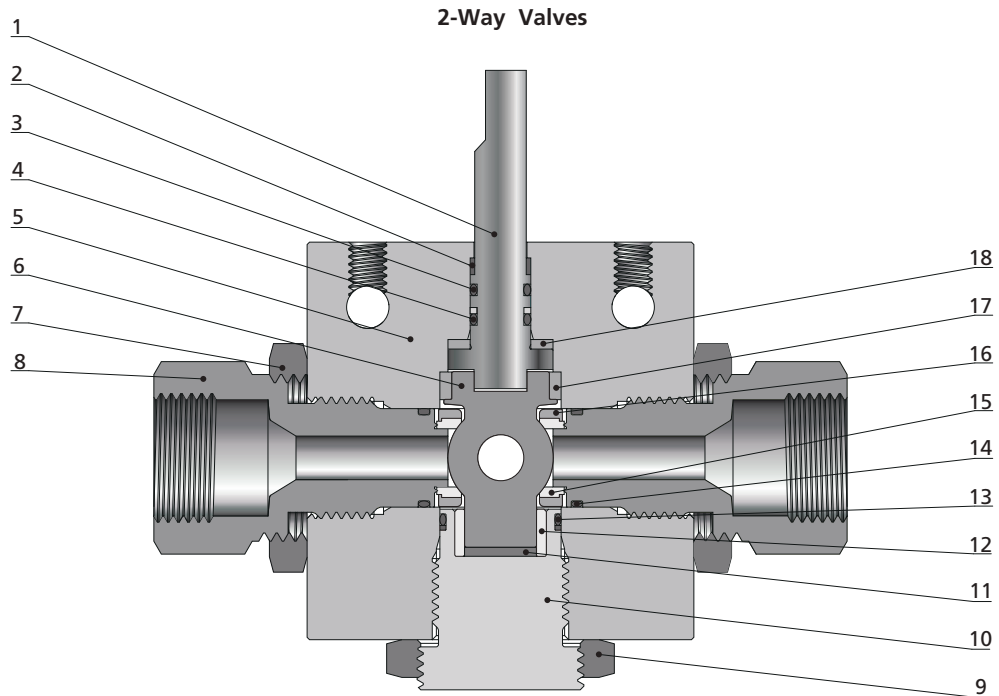


Pressure vs. Temperature Curve



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

Standard Materials of Construction



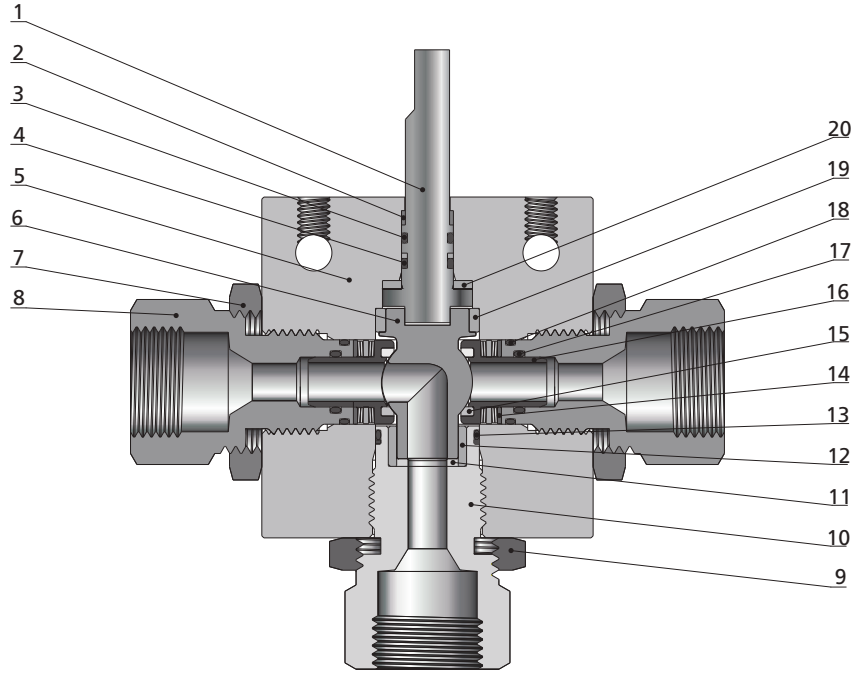
Item	Component	Material Grade
1	<i>Ball Stem</i>	316SS
2	Stem Backup	PEEK
3	O-Ring	NBR
4	<i>O-Ring</i>	<i>NBR</i>
5	<i>Body</i>	<i>316 SS / S17400 SS(For Orifice No. 16 Only)</i>
6	<i>Ball</i>	<i>316SS</i>
7	Lock Nut	316 SS
8	<i>Seat Gland</i>	<i>316 SS / S17400 SS(For Orifice No. 16 Only)</i>
9	Locking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

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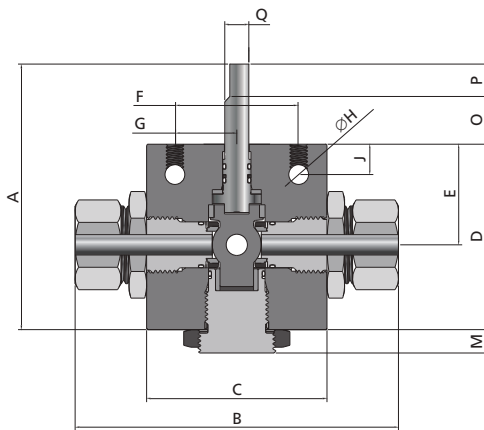
3-Way Valves



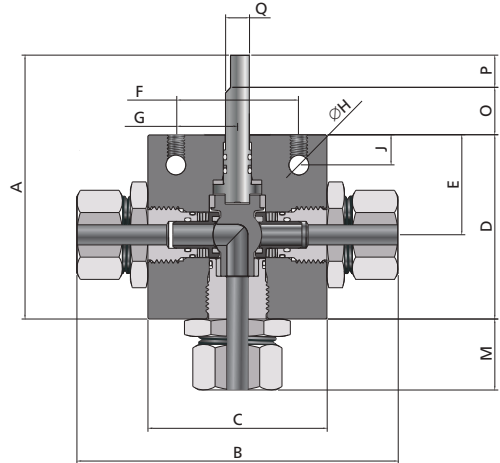
Item	Component	Material Grade
1	<i>Ball Stem</i>	316 SS
2	Stem Backup	PEEK
3	O-Ring	NBR
4	<i>O-Ring</i>	<i>NBR</i>
5	<i>Body</i>	316 SS
6	<i>Ball</i>	316 SS
7	Lock Nut	316 SS
8	<i>Seat Gland</i>	316 SS
9	Locking Piece	316SS
10	<i>Bottom Gland</i>	316SS
11	<i>Bottom Thrust Washer</i>	PEEK
12	<i>Bearing</i>	PEEK
13	O-Ring	NBR
14	<i>Belleville Washer</i>	S17700
15	<i>Seat</i>	PEEK
16	<i>Seat Retainer</i>	S17700
17	O-Ring	NBR
18	O-Ring	NBR
19	<i>Bearing</i>	PEEK
20	<i>Thrust Washer</i>	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)

Dimensions, in. (mm)					
Flow Pattern	Orifice No.	O	P	Q	R
2-Way	4	1.278 (32.5)	0.50 (12.7)	0.25 (6.35)	0.22 (5.48)
	6	1.24 (31.7)	1.25 (31.8)	0.44 (11.1)	0.38 (9.35)
	8	1.56 (39.7)	0.88 (22.2)	0.59 (14.9)	0.44 (11.13)
3-Way	4	1.28 (32.5)	0.5 (12.7)	0.25 (6.35)	0.22 (5.49)
	8	1.56 (39.7)	0.88 (22.2)	0.62 (15.9)	0.44 (11.13)

Ball Stem Connection

Orifice 4

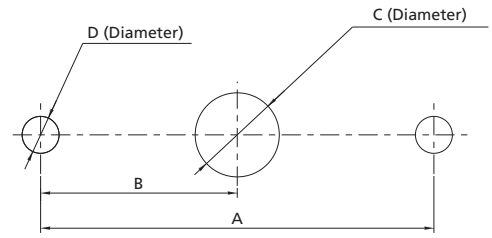
Orifice 6/8

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

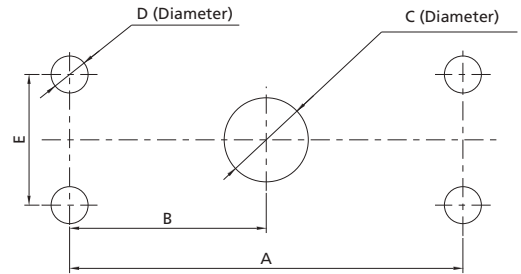
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Ball Valve Panel Mounting Dimensions

Flow Pattern	Orifice No.	Dimensions, in. (mm)			
		A	B	C	D
2-Way	4	1.5 (38.1)	0.75 (19.05)	0.31 (7.9)	0.28 (7.1)
3-Way	4	2 (50.8)	1 (25.4)	0.31 (7.9)	0.28 (7.1)

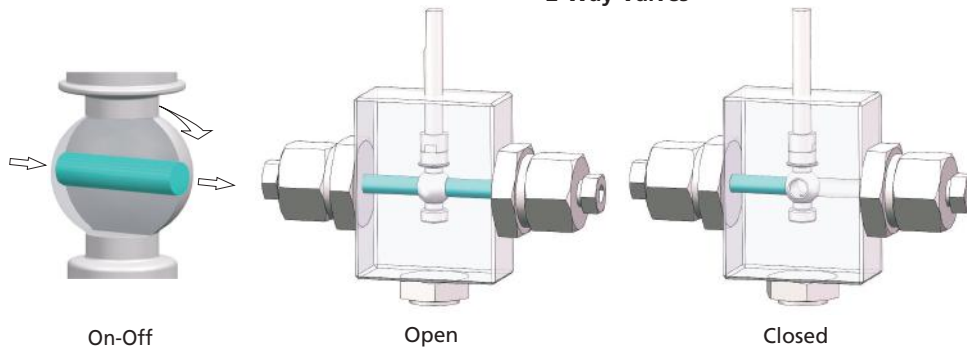


Flow Pattern	Orifice No.	Dimensions, in. (mm)				
		A	B	C	D	E
2-Way	6	2.5 (63.5)	1.25 (31.75)	0.5 (12.7)	0.33 (8.5)	0.88 (22.3)
	8	3 (76.2)	1.5 (38.1)	0.69 (17.5)	0.33 (8.5)	1 (25.4)
3-Way	8	3 (76.2)	1.5 (38.1)	0.69 (17.5)	0.33 (8.5)	1 (25.4)

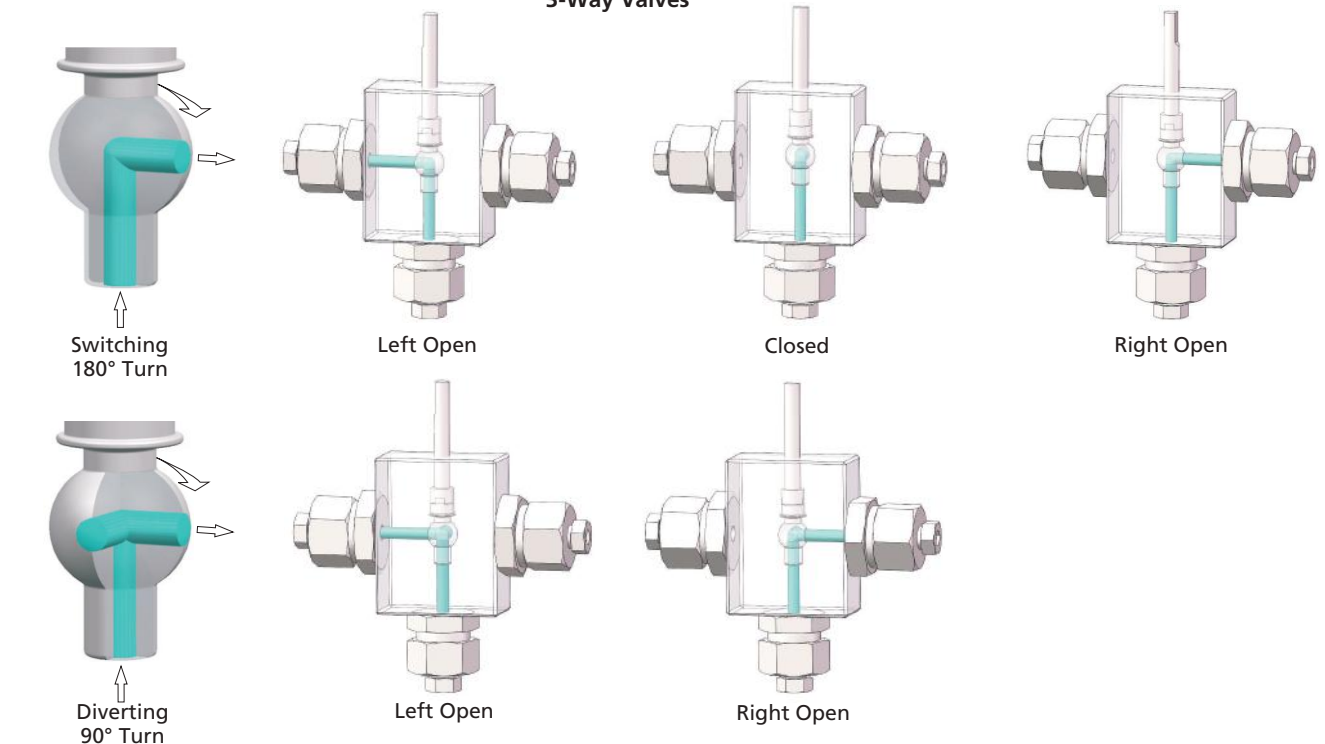


Flow Configuration

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	0.128 (3.25)	0.26	20SBSS-DFF4-4-1	20,000 (1379)
		DFF6	0.25 (6.35)	1.51	20SBSS-DFF6-4-1	
		MF4	0.109 (2.77)	0.36	20SBSS-MF4-4-1	
		MF6	0.203 (5.16)	1.23	20SBSS-MF6-4-1	
		MF9	0.25 (6.35)	1.51	20SBSS-MF9-4-1	
		HF4	0.094 (2.39)	0.26	20SBSS-HF4-4-1	
	HF6	0.125 (3.17)	0.47	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)	1.23	20SBSS-MF6-6-1	20,000 (1379)
		MF9	0.312 (7.92)	2.93	20SBSS-MF9-6-1	
		MF12	0.375 (9.52)	3.51	20SBSS-MF12-6-1	
	8	FNS12	0.5 (12.7)	10.2	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		

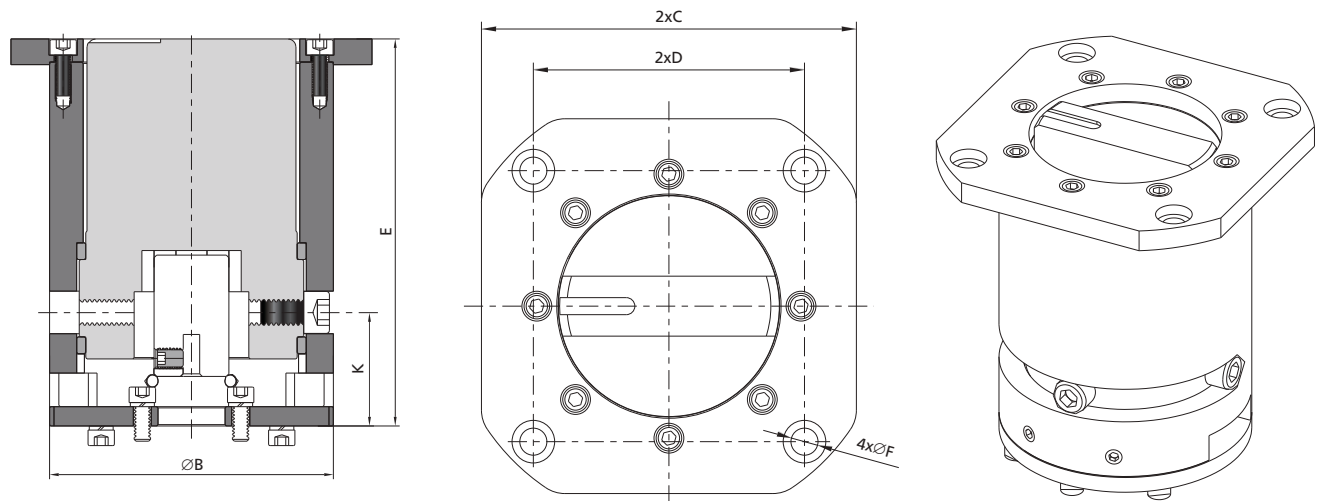
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Ordering Information and Dimensions (continued)

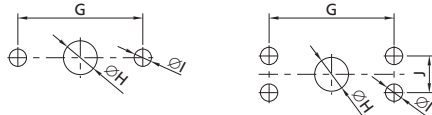
Flow Pattern	Orifice No.	Connection	Orifice Size in. (mm)	Cv	Ordering Number	Working Pressure psig (bar)
3-Way	4	MF9	0.188 (4.77)	0.5	20SBSS-MF9-4-2	20,000 (1379)
					20SBSS-MF9-4-2D	
		HF4	0.094 (2.39)	0.13	20SBSS-HF4-4-2	
					20SBSS-HF4-4-2D	
	HF6	0.125 (3.17)	0.22	20SBSS-HF6-4-2		
				20SBSS-HF6-4-2D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

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.



Bottom Mounting Hole



Stem Port



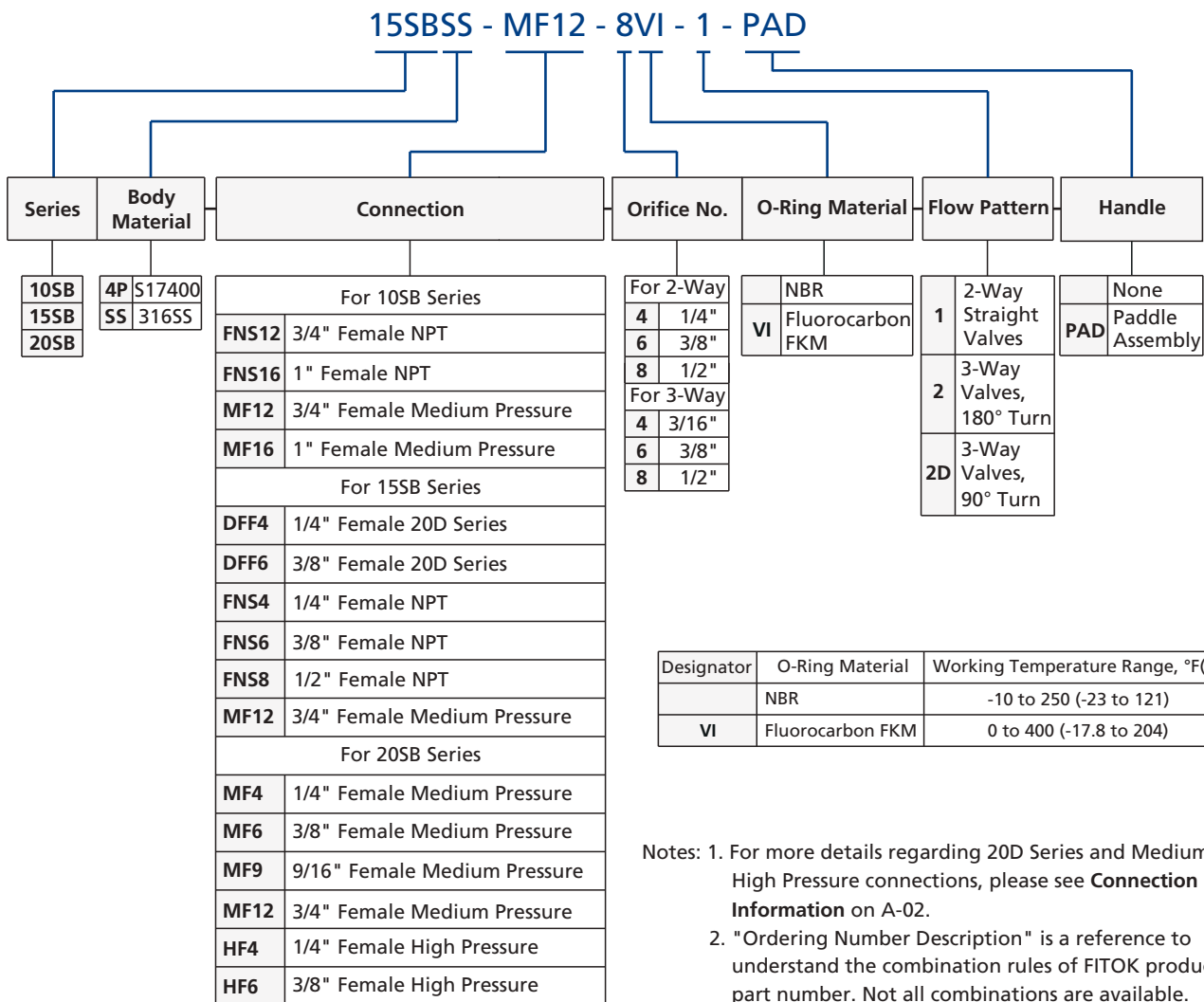
Orifice 4

Orifice 6

Note: To order valves with paddle assembly, add "-PAD" to the valve ordering number. Example: 20SBSS-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)	0.28 (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



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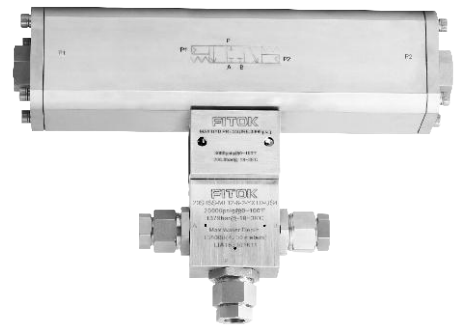
Subsea Hydraulic Ball Valves

Features

- Working pressure up to 20,000 psig (1379 bar)
- Maximum external pressure: 6,000 psig (414 bar)
- Hydraulic supply pressure: 3,000 psig (207 bar)
- Working temperature: 0 to 200°F (-17.8 to 93°C)
- High tensile 316 stainless steel or S17400 stainless steel for valve body and S17400 for hydraulic actuator
- Fluorocarbon FKM O-ring and PEEK seal provide excellent resistance against chemicals, heat and abrasion
- Three types of hydraulic actuators (YC, YO, YXTD) available
- Maximum water depth: 13,800 ft. (4200 m)



Subsea Hydraulic Ball Valves (2-Way)



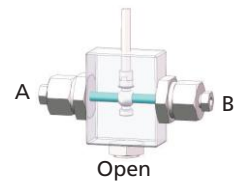
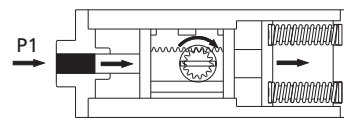
Subsea Hydraulic Ball Valves (3-Way)

Working Principle

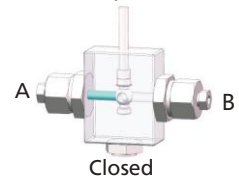
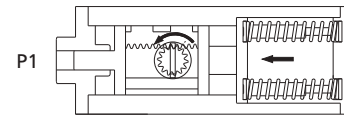
2-way (90° on-off)

YC: Hydraulic to open, single acting with spring return (Normally Closed)

Hydraulic pressure applied to port P1 forces the piston to move towards right and compress the spring, causing a clockwise rotation by 90 degrees. The valve fully opens.

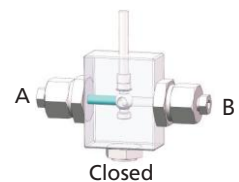
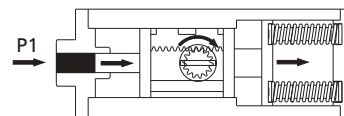


Following loss of hydraulic pressure on port P1, the compressed spring forces the piston to move towards left, causing a counterclockwise rotation by 90 degrees. The valve closes.

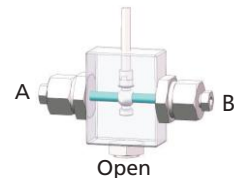
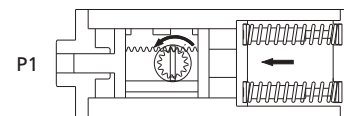


YO: Hydraulic to closed, single acting with spring return (Normally Open)

Hydraulic pressure applied to port P1 forces the piston to move towards right and compress the spring, causing a clockwise rotation by 90 degrees. The valve closes.



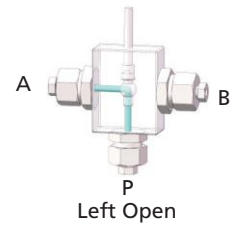
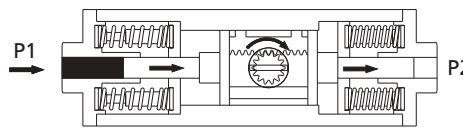
Following loss of hydraulic pressure on port P1, the compressed spring forces the piston to move towards left, causing a counterclockwise rotation by 90 degrees. The valve fully opens.



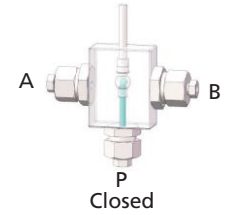
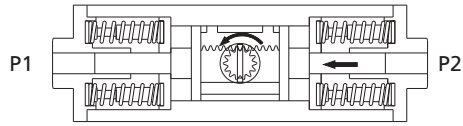
3-way (180° switching)

YXTD: 180° Normally Closed, double acting with spring return

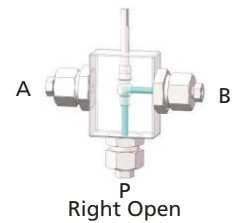
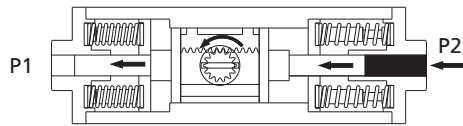
Hydraulic pressure applied to port P1 forces the piston to move towards right and compress the spring, causing a clockwise rotation by 90 degrees. The flow is allowed from bottom inlet port P to outlet A.



Following loss of hydraulic pressure on port P1, the compressed spring forces the piston to move towards left, causing a counterclockwise rotation by 90 degrees. The valve closes.



Hydraulic pressure applied to port P2 forces the piston to move towards left and compress the spring, causing a counterclockwise rotation by 90 degrees. The flow is allowed from bottom inlet port P to outlet B.



Ordering Number Description

15SBSS - MF6 - 6VI - 1 - YC - FNS4

Series	Body Material	Connection	Orifice No.	O-Ring Material	Flow Pattern	Hydraulic Actuator	Hydraulic Connection Type	Hydraulic Connection Size																																				
10SB	4P S17400		For 2-Way 4 1/4"	NBR	1 2-Way Straight Valves		FNS Female NPT	4 1/4"																																				
15SB	SS 316SS		6 3/8"	VI Fluorocarbon FKM	2 3-Way Valves, 180° Turn		US Female SAE O-Ring	7 7/16"-20																																				
20SB			For 3-Way 4 3/16"		2D 3-Way Valves, 90° Turn			8 1/2"																																				
<table border="1"> <thead> <tr> <th colspan="2">For 10SB Series</th> </tr> </thead> <tbody> <tr> <td>FNS12</td> <td>3/4" Female NPT</td> </tr> <tr> <td>FNS16</td> <td>1" Female NPT</td> </tr> <tr> <td>MF12</td> <td>3/4" Female Medium Pressure</td> </tr> <tr> <td>MF16</td> <td>1" Female Medium Pressure</td> </tr> <tr> <th colspan="2">For 15SB Series</th> </tr> <tr> <td>DFF4</td> <td>1/4" Female 20D Series</td> </tr> <tr> <td>DFF6</td> <td>3/8" Female 20D Series</td> </tr> <tr> <td>FNS4</td> <td>1/4" Female NPT</td> </tr> <tr> <td>FNS6</td> <td>3/8" Female NPT</td> </tr> <tr> <td>FNS8</td> <td>1/2" Female NPT</td> </tr> <tr> <th colspan="2">For 20SB Series</th> </tr> <tr> <td>MF4</td> <td>1/4" Female Medium Pressure</td> </tr> <tr> <td>MF6</td> <td>3/8" Female Medium Pressure</td> </tr> <tr> <td>MF9</td> <td>9/16" Female Medium Pressure</td> </tr> <tr> <td>MF12</td> <td>3/4" Female Medium Pressure</td> </tr> <tr> <td>HF4</td> <td>1/4" Female High Pressure</td> </tr> <tr> <td>HF6</td> <td>3/8" Female High Pressure</td> </tr> </tbody> </table>									For 10SB Series		FNS12	3/4" Female NPT	FNS16	1" Female NPT	MF12	3/4" Female Medium Pressure	MF16	1" Female Medium Pressure	For 15SB Series		DFF4	1/4" Female 20D Series	DFF6	3/8" Female 20D Series	FNS4	1/4" Female NPT	FNS6	3/8" Female NPT	FNS8	1/2" Female NPT	For 20SB Series		MF4	1/4" Female Medium Pressure	MF6	3/8" Female Medium Pressure	MF9	9/16" Female Medium Pressure	MF12	3/4" Female Medium Pressure	HF4	1/4" Female High Pressure	HF6	3/8" Female High Pressure
For 10SB Series																																												
FNS12	3/4" Female NPT																																											
FNS16	1" Female NPT																																											
MF12	3/4" Female Medium Pressure																																											
MF16	1" Female Medium Pressure																																											
For 15SB Series																																												
DFF4	1/4" Female 20D Series																																											
DFF6	3/8" Female 20D Series																																											
FNS4	1/4" Female NPT																																											
FNS6	3/8" Female NPT																																											
FNS8	1/2" Female NPT																																											
For 20SB Series																																												
MF4	1/4" Female Medium Pressure																																											
MF6	3/8" Female Medium Pressure																																											
MF9	9/16" Female Medium Pressure																																											
MF12	3/4" Female Medium Pressure																																											
HF4	1/4" Female High Pressure																																											
HF6	3/8" Female High Pressure																																											
<table border="1"> <thead> <tr> <th colspan="2">For 2-way, 3-way</th> </tr> </thead> <tbody> <tr> <td>YC</td> <td>90° Normally Closed Hydraulic Actuator</td> </tr> <tr> <td>YO</td> <td>90° Normally Open Hydraulic Actuator</td> </tr> <tr> <td>YXTD</td> <td>180° Spring Return Double Acting Hydraulic Actuator</td> </tr> </tbody> </table>									For 2-way, 3-way		YC	90° Normally Closed Hydraulic Actuator	YO	90° Normally Open Hydraulic Actuator	YXTD	180° Spring Return Double Acting Hydraulic Actuator																												
For 2-way, 3-way																																												
YC	90° Normally Closed Hydraulic Actuator																																											
YO	90° Normally Open Hydraulic Actuator																																											
YXTD	180° Spring Return Double Acting Hydraulic Actuator																																											

- 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.

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Subsea Check Valves

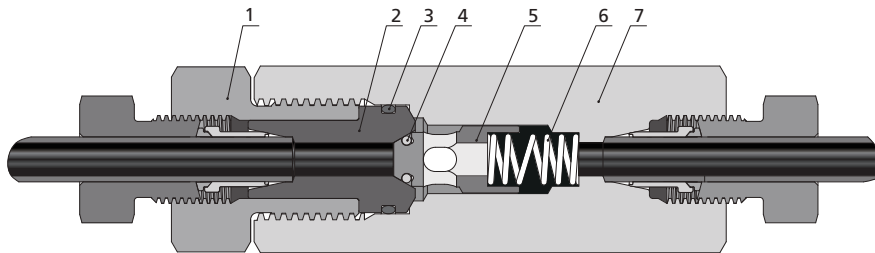
Features

- Working pressure up to 20,000 psig (1379 bar)
- Maximum external pressure: 6,000 psig (414 bar)
- Cracking pressure: 14 to 26 psig (0.97 to 1.79 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 for valve body
- NACE MR0175 optional
- Provides unidirectional flow and tight shut-off for liquids and gases with high reliability. When differential drops below cracking pressure, valve shuts off (not for use as relief valve)
- Soft seat seal ring style or metal-to-metal seat poppet style available
- Maximum water depth: 13,800 ft. (4200 m)



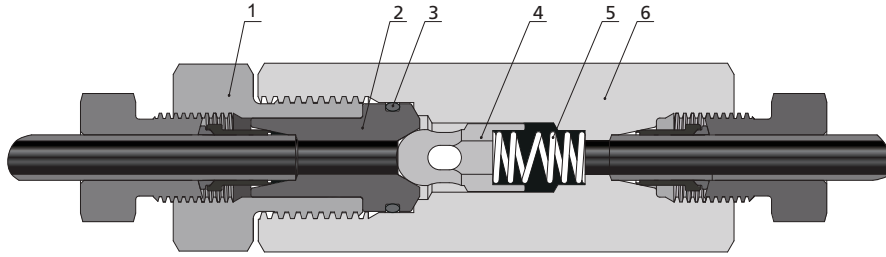
Standard Materials of Construction

SC Series



Item	Component	Material Grade
1	Cover Gland	316SS
2	Cover	316SS
3	Seal Ring	NBR
4	Seal Ring	NBR
5	Ball Poppet	316SS
6	Spring	304SS
7	Valve Body	316SS

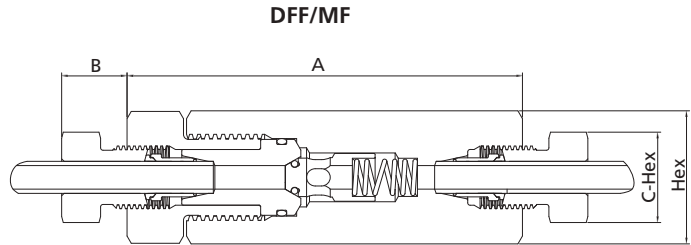
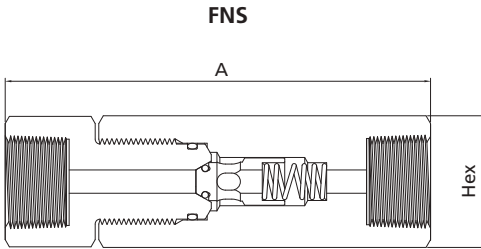
SCO Series



Item	Component	Material Grade
1	Cover Gland	316SS
2	Cover	316SS
3	Seal Ring	NBR
4	Ball Poppet	S17400SS
5	Spring	304SS
6	Valve Body	316SS

Wetted components listed in italics.

Ordering Information and Dimensions



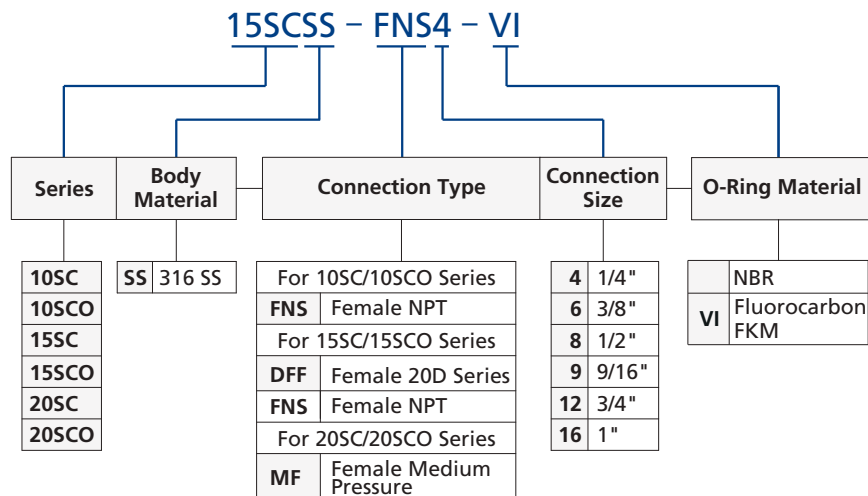
Ordering Number	Connection	Orifice Size in. (mm)	Cv	Dimensions, in. (mm)				Working Pressure psig (bar)
				A	B	C-Hex	Hex	
10SCSS-FNS12	FNS12	0.52 (13.21)	4.70	6.11 (155.19)	—	—	1.75 (44.45)	10,000 (690)
10SCSS-FNS16	FNS16	0.69 (17.53)	7.40	7.32 (185.93)	—	—	1.88 (47.75)	
10SCOSS-FNS12	FNS12	0.52 (13.21)	4.70	6.11 (155.19)	—	—	1.75 (44.45)	
10SCOSS-FNS16	FNS16	0.69 (17.53)	7.40	7.32 (185.93)	—	—	1.88 (47.75)	
15SCSS-DFF4	DFF4	0.188 (4.78)	0.63	3.43 (87.12)	0.52 (13.21)	0.63 (16.00)	0.81 (20.57)	15,000 (1034)
15SCSS-DFF6	DFF6	0.250 (6.35)	1.70	3.82 (97.03)	0.53 (13.46)	0.75 (19.05)	1.00 (25.40)	
15SCSS-DFF8	DFF8	0.36 (9.12)	2.30	4.55 (115.57)	0.60 (15.24)	0.93 (23.62)	1.38 (35.05)	
15SCOSS-DFF4	DFF4	0.188 (4.78)	0.63	3.43 (87.12)	0.53 (13.46)	0.63 (16.00)	0.81 (20.57)	
15SCOSS-DFF6	DFF6	0.250 (6.35)	1.70	3.82 (97.03)	0.53 (13.46)	0.75 (19.05)	1.00 (25.40)	
15SCOSS-DFF8	DFF8	0.36 (9.12)	2.30	4.55 (115.57)	0.60 (15.24)	0.93 (23.62)	1.38 (35.05)	
15SCSS-FNS4	FNS4	0.12 (3.05)	0.28	3.43 (87.12)	—	—	0.94 (23.81)	

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Ordering Information and Dimensions (continued)

	Ordering Number	Connection	Orifice Size in. (mm)	Cv	Dimensions, in. (mm)				Working Pressure psig (bar)	
					A	B	C-Hex	Hex		
Fittings	15SCSS-FNS6	FNS6	0.22 (5.59)	0.84	3.82 (97.03)	—	—	1.13 (28.58)	15,000 (1034)	
	15SCSS-FNS8	FNS8	0.36 (9.12)	2.30	4.55 (115.57)	—	—	1.38 (35.05)		
	15SCOSS-FNS4	FNS4	0.12 (3.05)	0.28	3.43 (87.12)	—	—	0.94 (23.81)		
	15SCOSS-FNS6	FNS6	0.22 (5.59)	0.84	3.82 (97.03)	—	—	1.13 (28.58)		
	15SCOSS-FNS8	FNS8	0.36 (9.12)	2.30	4.55 (115.57)	—	—	1.38 (35.05)		
Tubing	20SCSS-MF4	MF4	0.125 (3.18)	0.28	2.94 (74.68)	0.38 (9.65)	0.50 (12.70)	0.81 (20.57)		20,000 (1379)
	20SCSS-MF6	MF6	0.218 (5.54)	0.84	3.34 (84.84)	0.44 (11.18)	0.62 (15.75)	1.00 (25.40)		
	20SCSS-MF9	MF9	0.359 (9.12)	2.30	4.35 (110.49)	0.55 (13.97)	0.94 (23.81)	1.38 (35.05)		
	20SCSS-MF12	MF12	0.516 (13.11)	4.70	5.50 (139.70)	0.62 (15.75)	1.19 (30.23)	1.75 (44.45)		
Quick Couplings	20SCSS-MF16	MF16	0.688 (17.48)	7.40	7.07 (179.59)	0.74 (18.80)	1.38 (35.05)	2.12 (53.85)		
	20SCOSS-MF4	MF4	0.125 (3.18)	0.28	2.94 (74.68)	0.38 (9.65)	0.50 (12.70)	0.81 (20.57)		
	20SCOSS-MF6	MF6	0.218 (5.54)	0.84	3.12 (79.25)	0.47 (11.94)	0.62 (15.75)	1.00 (25.40)		
	20SCOSS-MF9	MF9	0.359 (9.12)	2.30	4.18 (106.17)	0.53 (13.46)	0.94 (23.81)	1.38 (35.05)		
Line Filters	20SCOSS-MF12	MF12	0.516 (13.11)	4.70	5.50 (139.70)	0.62 (15.75)	1.19 (30.23)	1.75 (44.45)		
	20SCOSS-MF16	MF16	0.688 (17.48)	7.40	6.63 (168.40)	0.72 (18.29)	1.38 (35.05)	2.12 (53.85)		
	Valves									

Ordering Number Description



- Notes: 1. For more details regarding 20D Series and Medium 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.
3. Please contact FITOK Group or our authorized distributors for more information on wetted materials (Eg: 2507 SD), seal materials and operational designs to fulfill your application requirements.

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

Subsea Needle 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 for valve body
- ⦿ Standard stem seal material: PTFE
- ⦿ NACE MR0175 optional
- ⦿ Using a two-part spindle assembly with a non-rising upper stem, it is of great advantage when being used with ROVs
- ⦿ Non-rotating lower stem to ensure positive non-galling operation during shut-off
- ⦿ Packing located under stem threads
- ⦿ Metal-to-metal seating to ensure ideal shut-off, longer stem/seat service lifetime for abrasive flow, excellent corrosion resistance and greater durability for repeated on/off cycles
- ⦿ Reliable packing gland locking device
- ⦿ Wide selection of tube and pipe end fittings available
- ⦿ 2-way straight and angle flow patterns available
- ⦿ Orifice size: 0.203"
- ⦿ Rated Cv: 0.75
- ⦿ Maximum water depth: 13,800 ft. (4200 m)



Fittings

Tubing

Quick Couplings

Line Filters

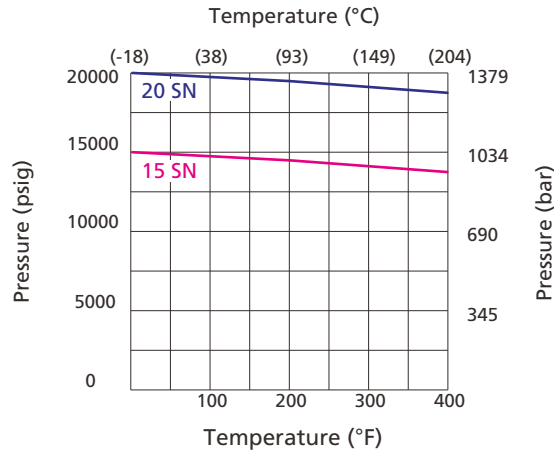
Valves

Sour Service Products

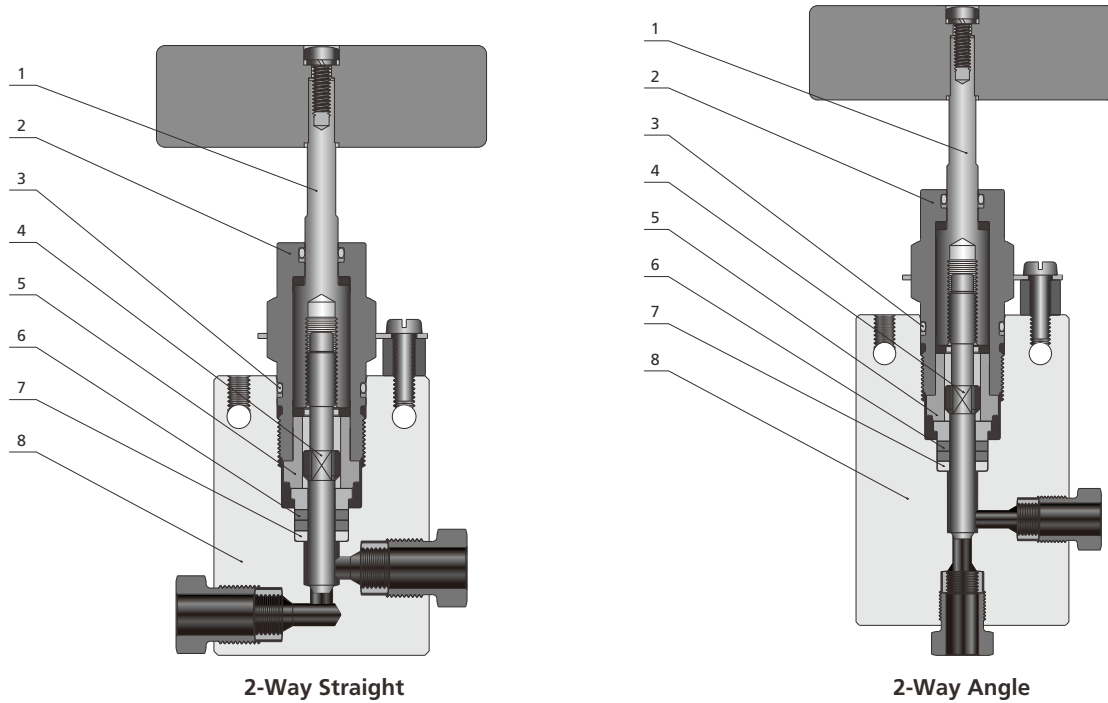
Subsea Valves

Part Number Crossover Charts

Pressure vs. Temperature Curve



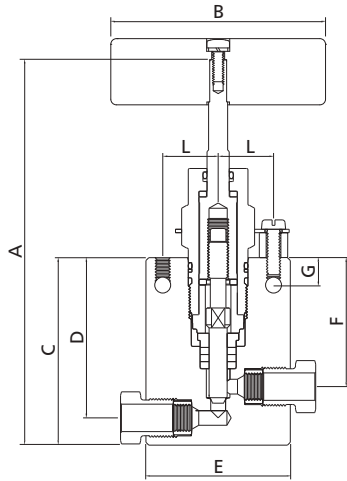
Standard Materials of Construction



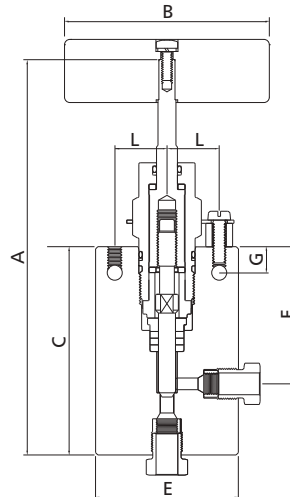
Item	Component	Material Grade
1	Upper Stem	316SS
2	Packing Gland	316SS
3	O-Ring	NBR
4	<i>Lower Stem</i>	<i>S17400</i>
5	Packing Ring	C63000
6	<i>Packing</i>	<i>PTFE</i>
7	<i>Packing Washer</i>	<i>S17400</i>
8	<i>Body</i>	<i>316 SS</i>
	Lubricant	Molybdenum Disulfide

Wetted components listed in italics.

Ordering Information and Dimensions



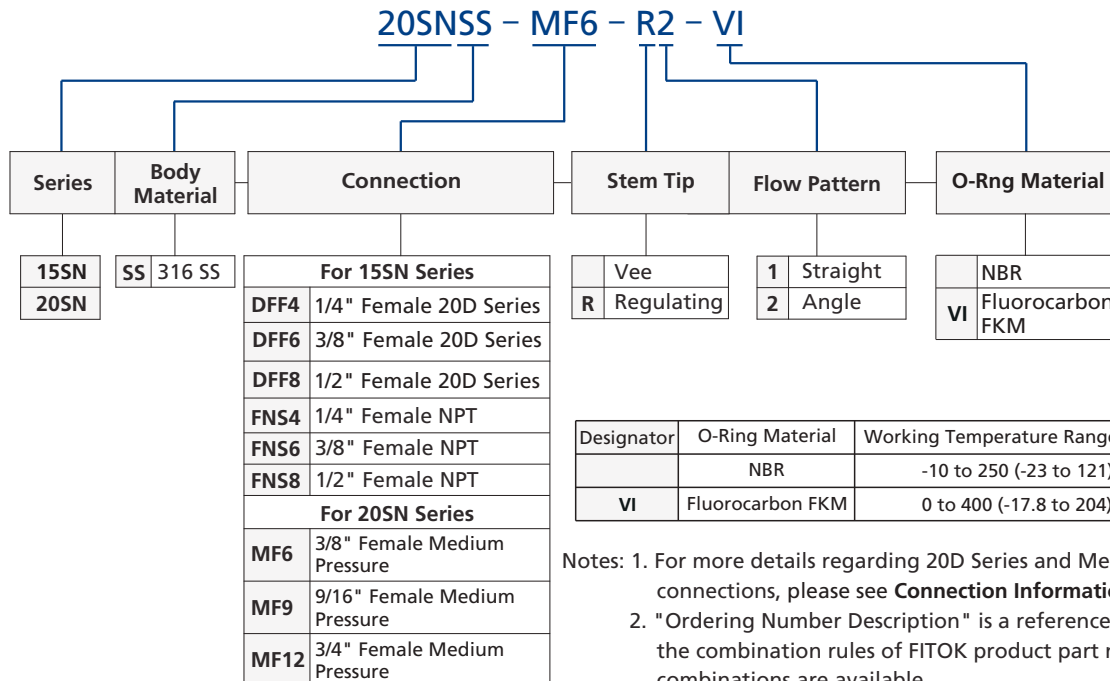
2-Way Straight



2-Way Angle

Ordering Number	Connection	Dimensions, in. (mm)								
		A	B	C	D	E	F	G	L	Block Thickness
20SNSS-MF6-1	MF6	5.35 (135.9)	3.00 (76.2)	2.60 (66.00)	2.22 (56.4)	2.00 (50.8)	1.79 (45.40)	0.38 (9.65)	0.77 (19.5)	1.00 (25.4)
20SNSS-MF9-1	MF9	5.75 (146.1)	3.00 (76.2)	3.00 (76.2)	2.40 (61.0)	2.50 (63.5)	2.00 (50.8)	0.38 (9.65)	0.77 (19.5)	1.50 (38.1)
20SNSS-MF12-1	MF12	5.90 (149.9)	3.00 (76.2)	3.15 (80.0)	2.43 (61.8)	3.00 (76.2)	2.00 (50.8)	0.38 (9.65)	0.77 (19.5)	1.50 (38.1)
20SNSS-MF6-2	MF6	5.78 (146.9)	3.00 (76.2)	3.03 (77.00)	—	2.00 (50.8)	1.78 (45.40)	0.38 (9.65)	0.77 (19.5)	1.00 (25.4)
20SNSS-MF9-2	MF9	6.25 (158.8)	3.00 (76.2)	3.50 (88.9)	—	2.50 (63.5)	2.00 (50.8)	0.38 (9.65)	0.77 (19.5)	1.50 (38.1)
20SNSS-MF12-2	MF12	6.50 (165.2)	3.00 (76.2)	3.75 (95.3)	—	3.00 (76.2)	2.00 (50.8)	0.38 (9.65)	0.77 (19.5)	1.50 (38.1)

Ordering Number Description

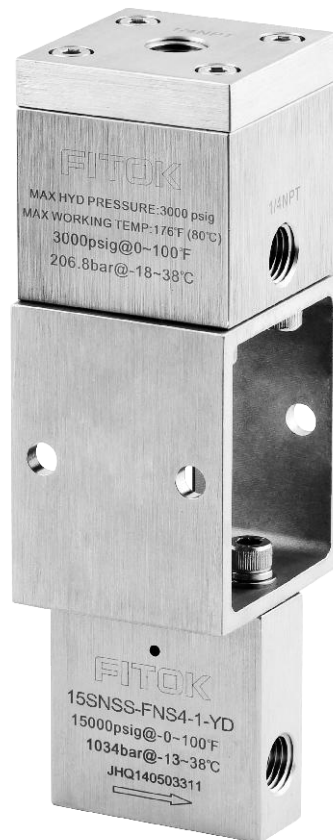


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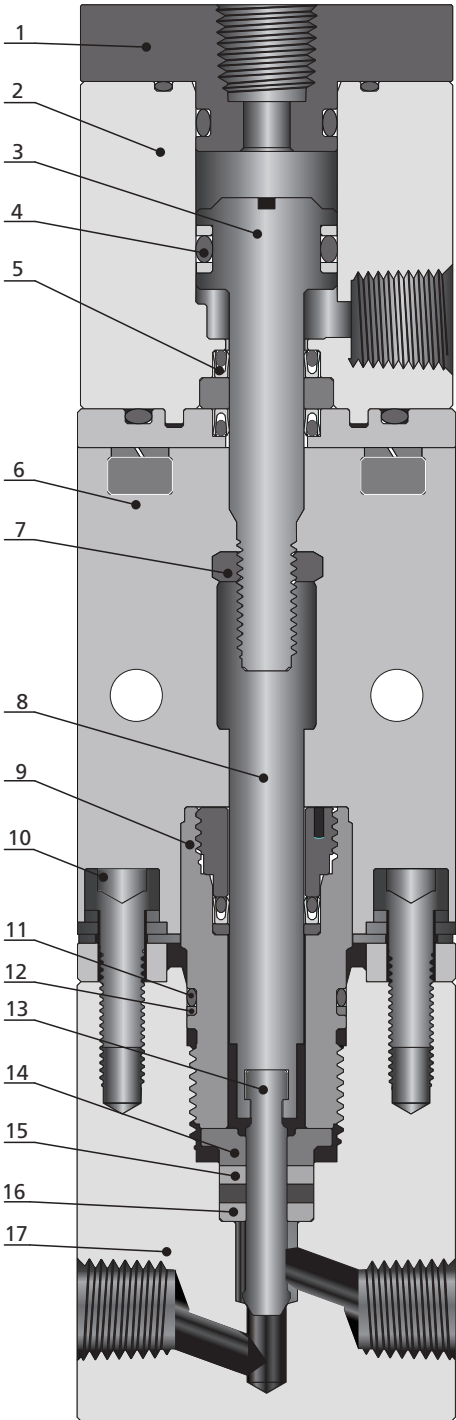
Subsea Hydraulic Needle Valves

Features

- Working pressure up to 20,000 psig (1379 bar)
- Maximum external pressure: 6,000 psig (414 bar)
- Hydraulic supply pressure: 3,000 psig (207 bar)
- Working temperature: 0 to 175°F (-18 to 80°C)
- High tensile 316 stainless steel for valve body
- Standard stem seal material: PTFE
- NACE MR0175 optional
- Metal-to-metal seating to ensure ideal shut-off, longer stem/seat service lifetime for abrasive flow, excellent corrosion resistance and greater durability for repeated on/off cycles
- Reliable packing gland locking device
- Wide selection of tube and pipe end fittings available
- 2-way straight and angle flow patterns available
- Orifice: 0.203"
- Rated Cv: 0.75
- Maximum water depth: 13,800 ft. (4200 m)



Standard Materials of Construction

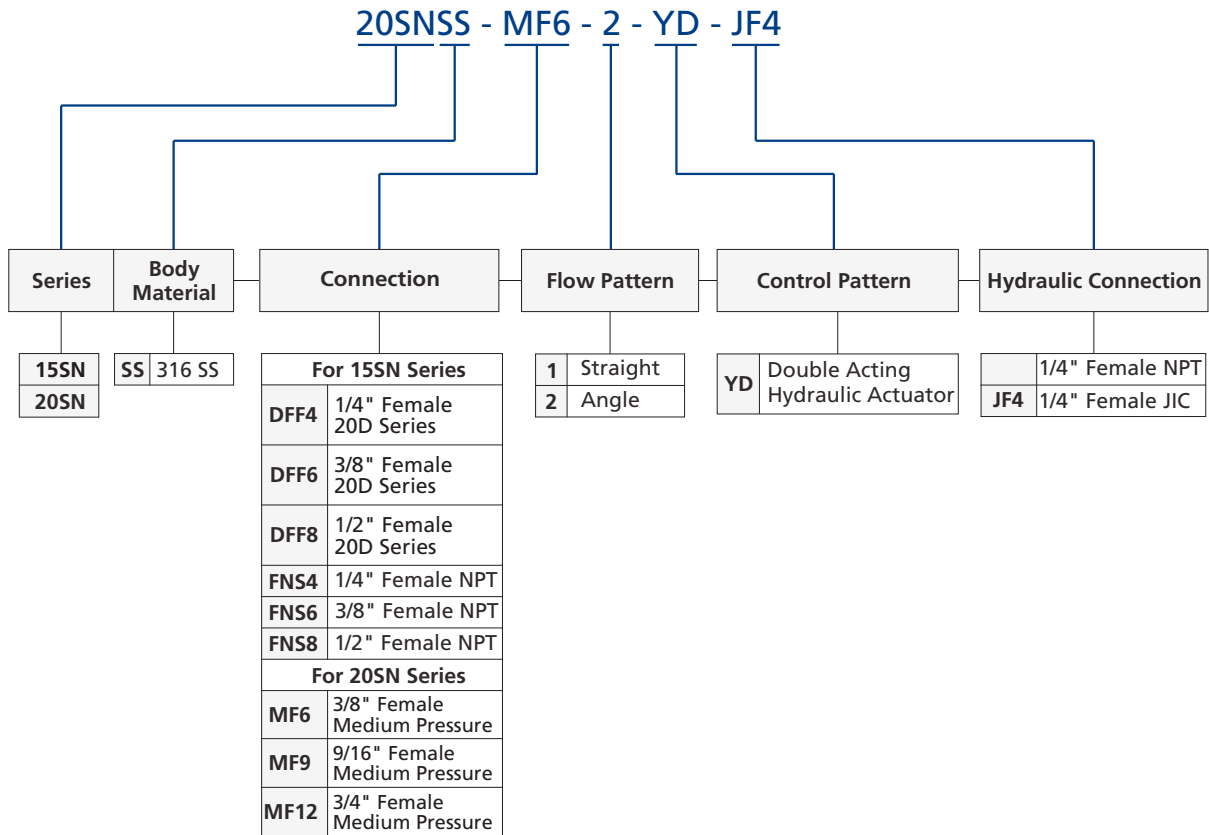


Item	Component	Material Grade
1	Gland	316 SS
2	Actuator Body	316 SS
3	Piston Rod	316 SS
4	O-Ring	Fluorocarbon FKM
5	Piston Seal	UHMWPE
6	Support Block	316 SS
7	Nut	Stainless Steel
8	Upper Stem	316 SS
9	Packing Gland	316 SS
10	Locking Screw	SS
11	O-Ring	NBR
12	O-Ring Retainer	PTFE
13	<i>Lower Stem</i>	<i>S17400</i>
14	Packing Ring	C63000
15	<i>Packing</i>	<i>PTFE</i>
16	<i>Packing Washer</i>	<i>S17400</i>
17	<i>Body</i>	<i>316 SS</i>

Wetted components listed in italics.

Fittings
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Part Number Crossover Charts

Ordering Number Description



- Notes: 1. For more details regarding 20D Series and Medium 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.

Fittings
 Tubing
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 Valves
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 Part Number Crossover Charts

Subsea Hydraulic Directional Control Valves

Features

- ⦿ Working pressure up to 20,000 psig (1379 bar)
- ⦿ Pilot working pressure: 3,000 psig (207 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 for valve body
- ⦿ NBR O-rings seal provides excellent oil resistance
- ⦿ Easy to connect, switch off and reverse between different flow channels
- ⦿ Hydraulic remote control for easy operation
- ⦿ Bolt connection for easy disassembly and maintenance
- ⦿ Low impact performance to maximize cycle life
- ⦿ Suitable for application with oil or water
- ⦿ Orifice size: 0.25", 0.375"
- ⦿ Maximum water depth: 13,800 ft. (4200 m)



Fittings

Tubing

Quick Couplings

Line Filters

Valves

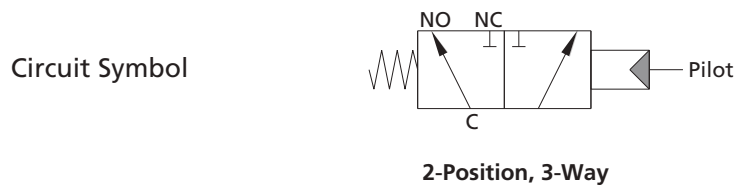
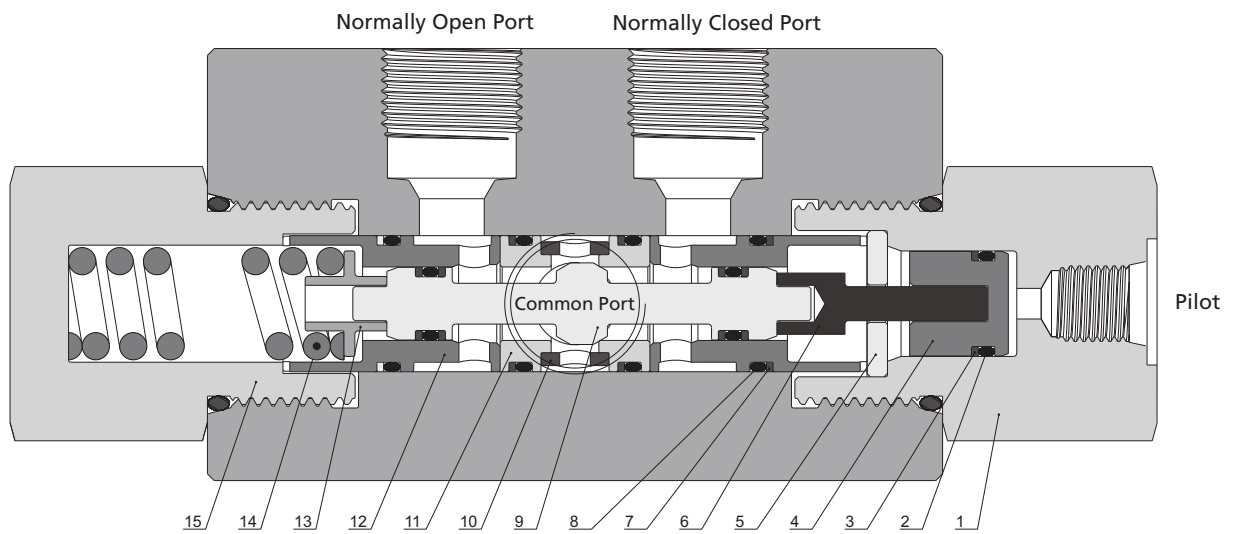
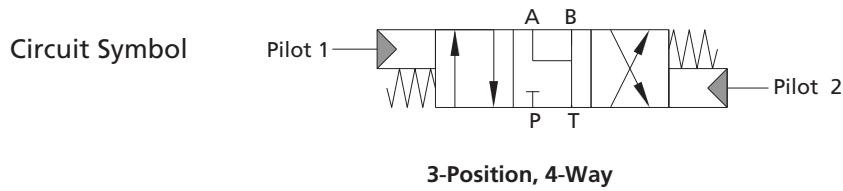
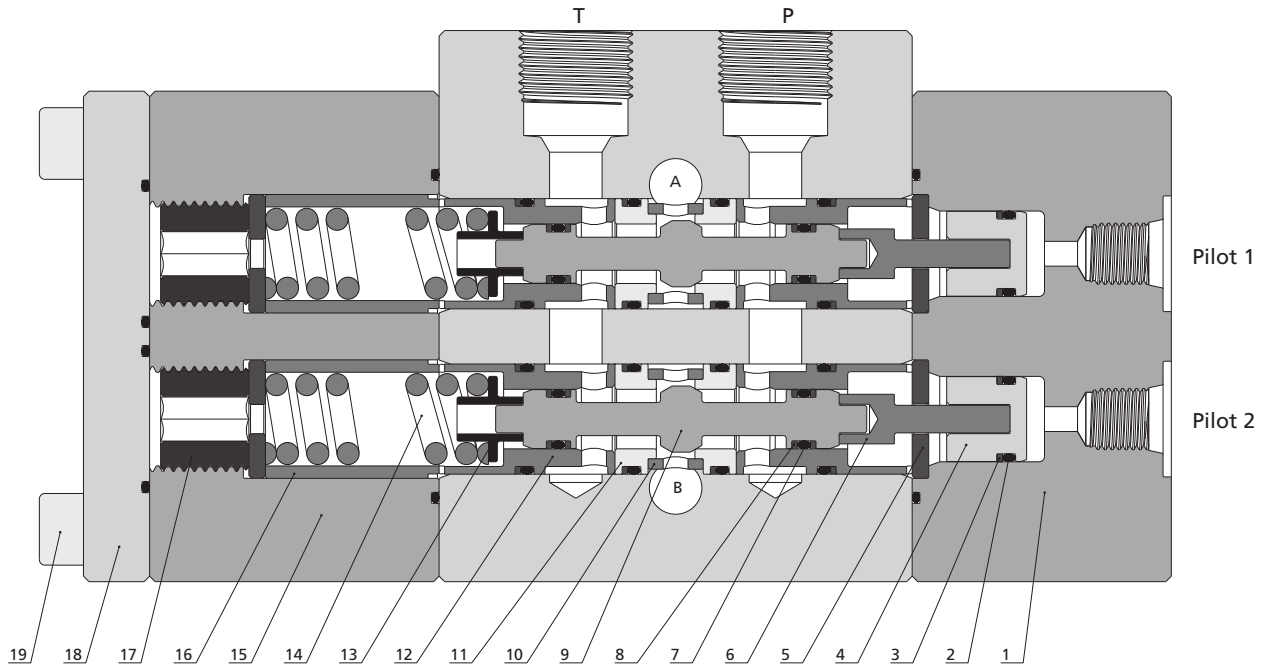
Sour Service
Products

Subsea Valves

Part Number
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Standard Materials of Construction

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Part Number Crossover Charts

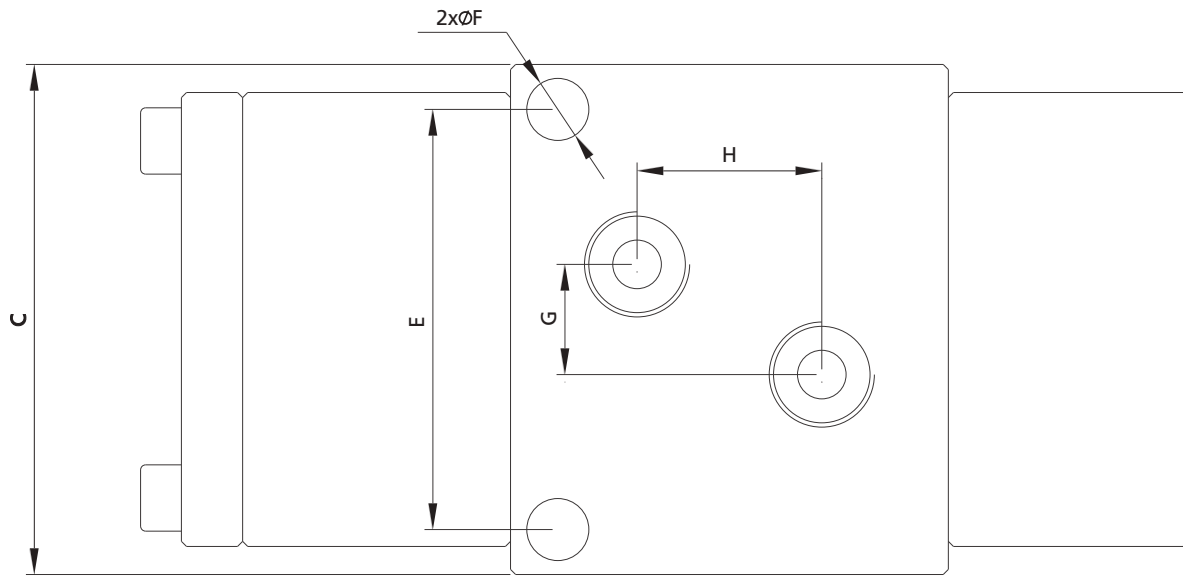
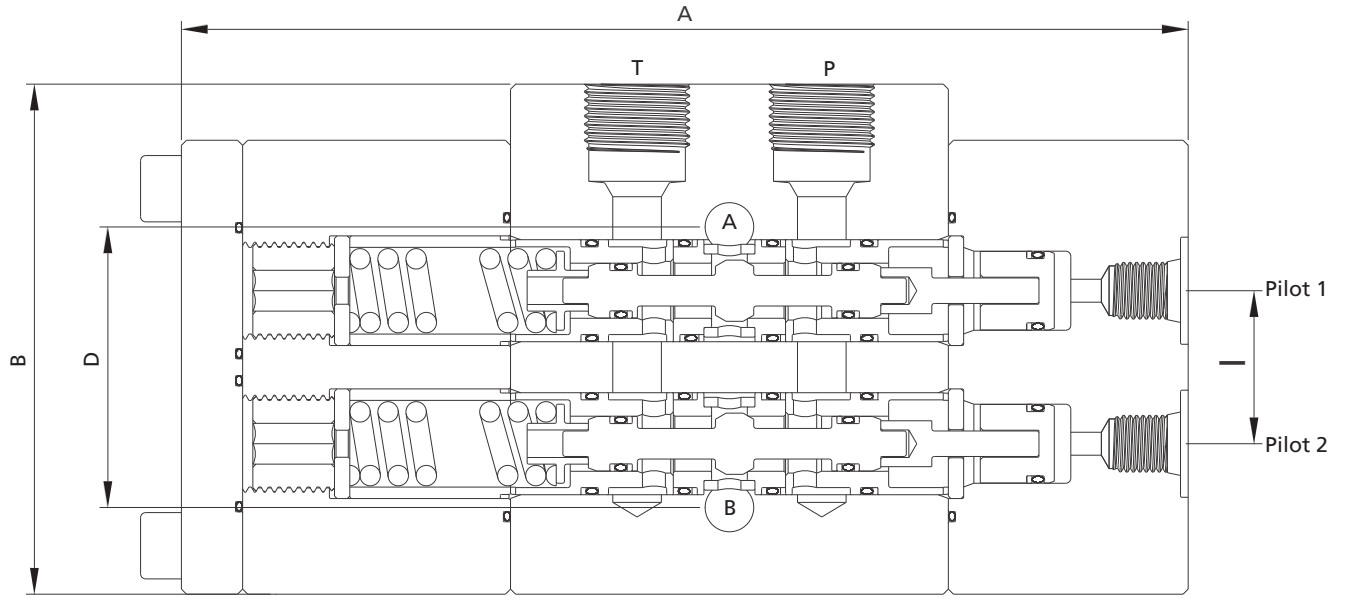


Item	Component	Material Grade
1	Gland	F316
2	O-Ring	NBR
3	Retaining Ring	PTFE
4	Piston	316 SS
5	Gasket	316 SS
6	Connection Block	316 SS
7	<i>O-Ring</i>	<i>NBR</i>
8	<i>Retaining Ring</i>	<i>PEEK</i>
9	<i>Stem</i>	<i>S17400</i>
10	<i>Pad</i>	<i>S17400</i>
11	<i>Seat</i>	<i>316 SS</i>
12	<i>Bush</i>	<i>S17400</i>
13	Connection Block	316 SS
14	Spring	S17700
15	Gland	F316
16	Bush	S17400
17	Screw	316 SS
18	Gland	F316
19	Locking Screw	316 SS

Wetted components listed in italics.

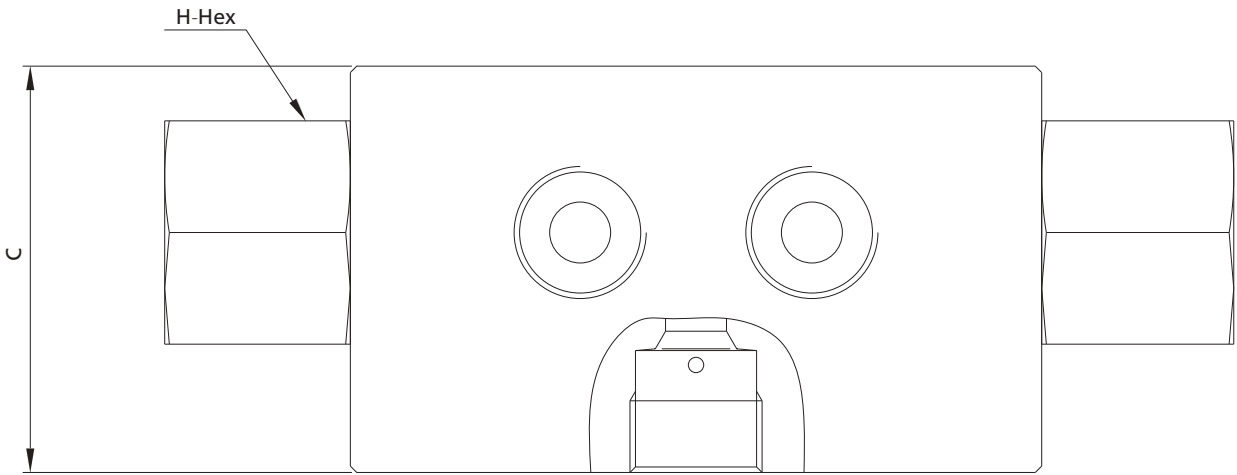
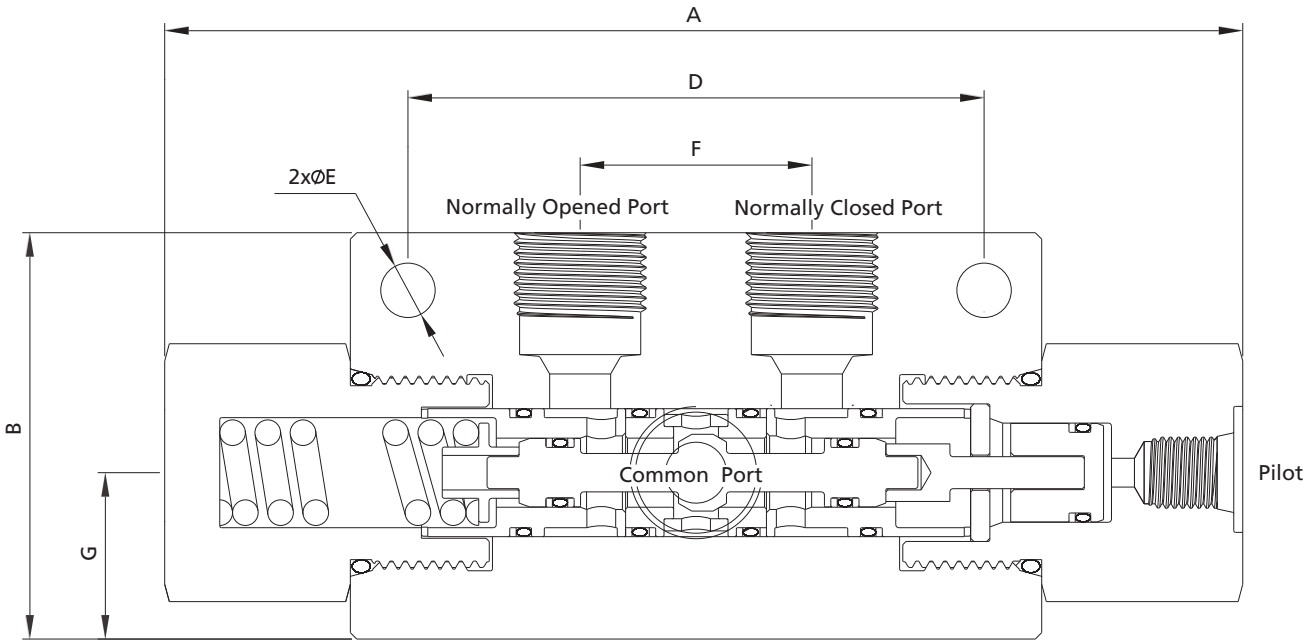
Fittings
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Part Number Crossover Charts

Ordering Information and Dimensions



3-Position, 4-Way

Ordering Number	Dimensions, in. (mm)										Working Pressure psig (bar)
	A	B	C	D	E	F	G	H	I	Orifice	
15SDCSS-3P4W-MF9-US7	6.70 (170.3)	3.50 (88.9)	3.50 (88.9)	1.74 (44.2)	2.82 (71.1)	0.41 (10.5)	0.76 (19.4)	1.13 (28.6)	1.00 (25.4)	0.25 (6.35)	15,000 (1034)
15SDCSS-3P4W-MF9-6-US7	7.20 (183)	3.54 (90)	3.74 (95)	1.26 (32)	3.19 (81)	0.33 (8.5)	1.02 (26)	1.10 (28)	1.10 (28)	0.375 (9.53)	
20SDCSS-3P4W-MF9-6-US7	7.20 (183)	3.78 (96)	4.13 (105)	1.26 (32)	3.50 (89)	0.33 (8.5)	1.02 (26)	1.46 (37)	1.10 (28)	0.375 (9.53)	20,000 (1379)



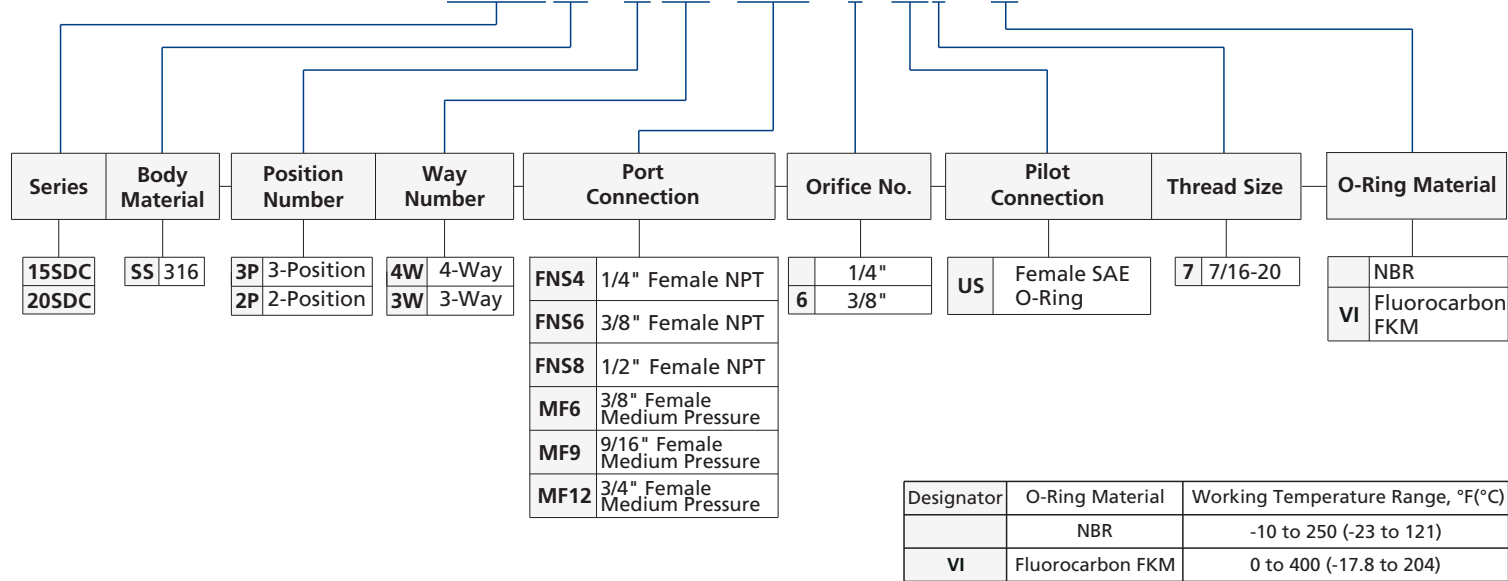
2-Position, 3-Way

Ordering Number	Dimensions, in. (mm)									Working Pressure psig (bar)
	A	B	C	D	E	F	G	H	Orifice	
15SDCSS-2P3W-MF9-US7	6.40 (162.5)	2.56 (65)	2.56 (65)	3.70 (94)	033 (8.5)	142 (36)	1.02 (26)	163 (41.28)	025 (6.35)	15,000 (1034)
15SDCSS-2P3W-MF9-6-US7	6.40 (162.5)	2.56 (65)	2.56 (65)	3.70 (94)	0.33 (8.5)	142 (36)	102 (26)	163 (41.28)	0375 (9.53)	

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

Ordering Number Description

15SDCSS - 3P4W - MF9 - 6 -US7 - VI



- Notes: 1. For more details regarding Medium Pressure connection, 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.