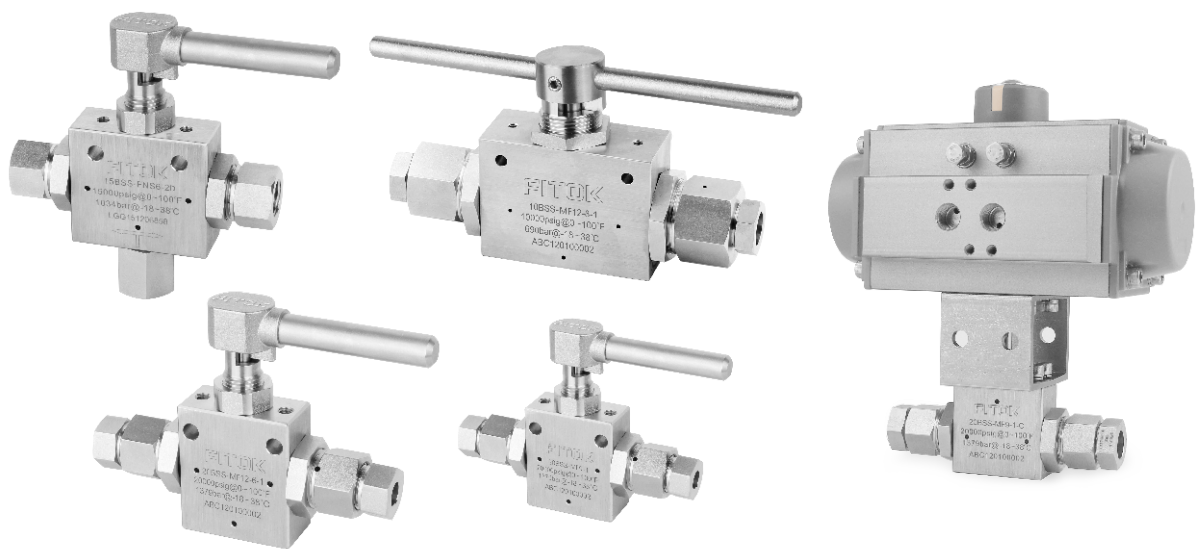


Ball Valves and Pneumatic Ball Valves

- 10B Series: 10,000 psig (690 bar)
- 15B Series: 15,000 psig (1034 bar)
- 20B Series: 20,000 psig (1379 bar)



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Subsea Valves

Part Number
Crossover Charts

Features

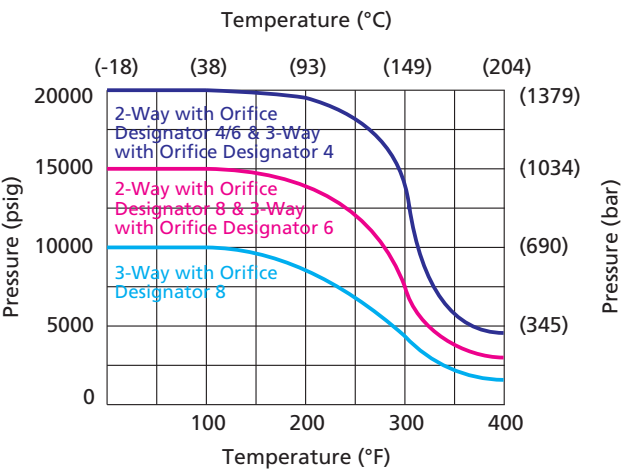
- Working pressure up to 20,000 psig (1379 bar)
- FKM O-ring for operation from 0°F to 400°F (-17.8°C to 204°C); other O-ring materials available
- PEEK seats offer excellent resistance to chemicals, heat and abrasion
- Trunnion mounted stem design
- Full-port flow path to minimize pressure drop
- 2-way and 3-way valve configurations optional, with bidirectional flow for 2-way valves
- Pneumatic actuator optional with air pressure from 80 psig to 116 psig (5.5 bar to 8 bar)

Working Pressure at Ambient Temperature

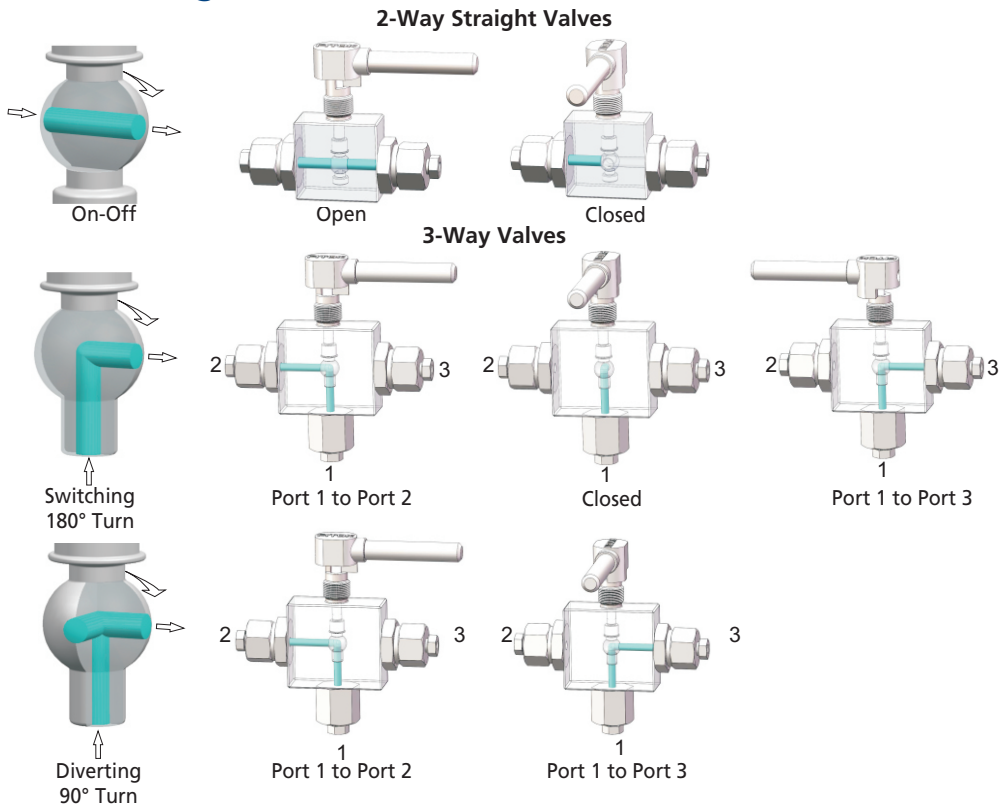
Flow Pattern	Orifice		Working Pressure ^① psig (bar)
	Designator	Dimensions, in. (mm)	
2-Way	4	0.25 (6.35)	20,000 (1379)
	6	0.375 (9.5)	20,000 (1379)
	8	0.5 (12.7)	15,000 (1034)
3-Way	4	0.19 (4.8)	20,000 (1379)
	6	0.33 (8.3)	15,000 (1034)
	8	0.5 (12.7)	10,000 (690)

① The working pressure of NPT connections 1/2" or under is 15,000 psig (1034 bar), while that of NPT connections over 1/2" is 10,000 psig (690 bar).

Pressure vs. Temperature Curve



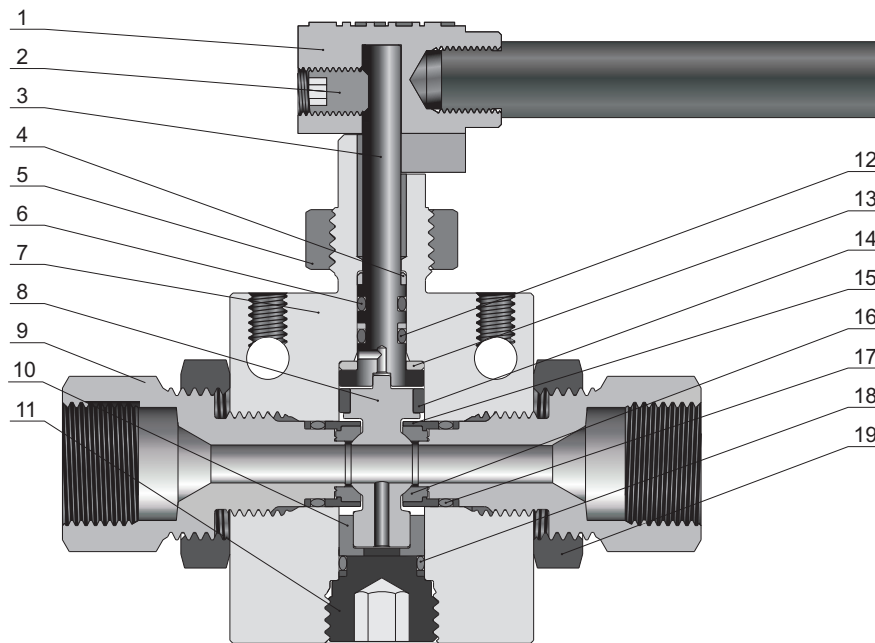
Flow Configuration



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

Standard Materials of Construction

2-Way Straight Valves



Item	Component	Material Grade
1	Handle	Stainless Steel
2	Set Screw	Stainless Steel
3	<i>Stem</i>	<i>316 SS</i>
4	Stem Backup	PEEK
5	Panel Nut	316 SS
6	Stem O-Ring	FKM
7	<i>Body</i>	<i>316 SS</i>
8	<i>Ball</i>	<i>316 SS</i>
9	<i>Seat Gland</i>	<i>316 SS</i>
10	<i>Ball Bearing</i>	<i>PEEK</i>
11	<i>Plug</i>	<i>316 SS</i>
12	<i>Stem O-Ring</i>	<i>FKM</i>
13	<i>Thrust Washer</i>	<i>PEEK</i>
14	<i>Ball Bearing</i>	<i>PEEK</i>
15	<i>Seat Retainer</i>	<i>316 SS</i>
16	<i>Seat</i>	<i>PEEK</i>
17	<i>Seat Gland O-Ring</i>	<i>FKM</i>
18	<i>Plug O-Ring</i>	<i>FKM</i>
19	Lock Nut	316 SS
Lubricant		Molybdenum Disulfide/Fluorinated-Based

Wetted components listed in italics.

Fittings

Tubing

Quick Couplings

Line Filters

Valves

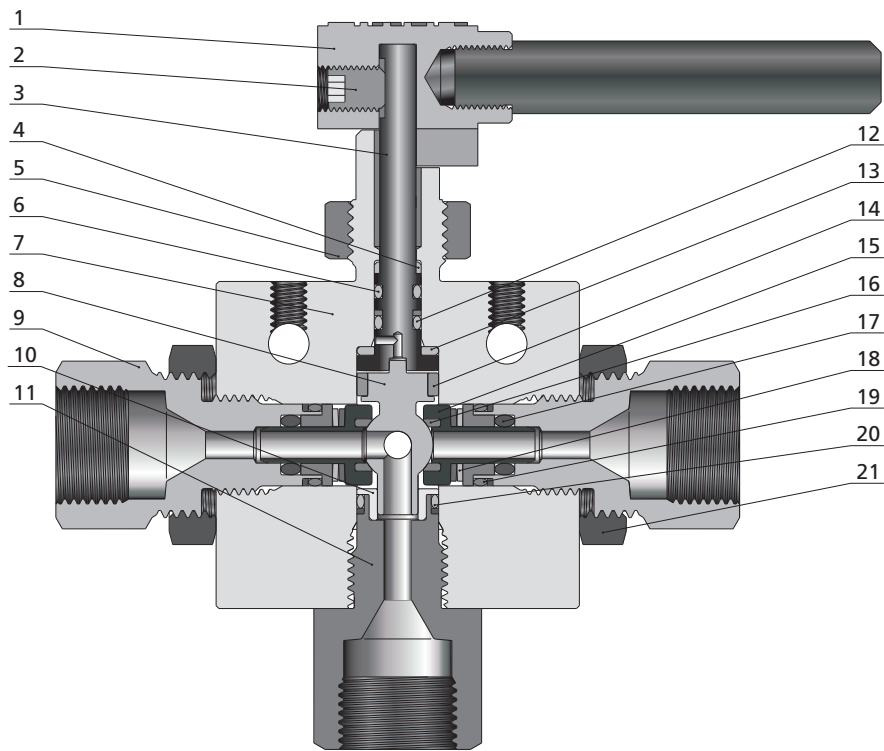
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3-Way Valves

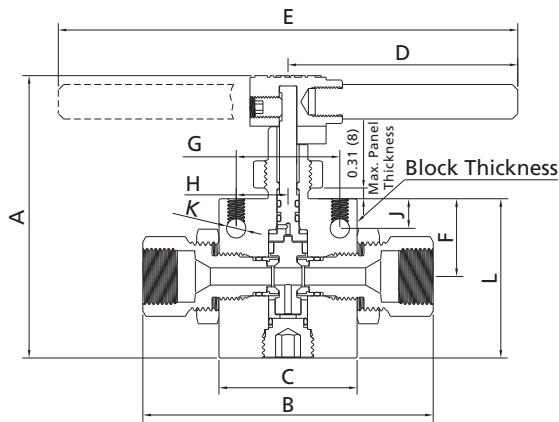


Item	Component	Material Grade
1	Handle	Stainless Steel
2	Set Screw	Stainless Steel
3	Stem	316 SS
4	Stem Backup	PEEK
5	Panel Nut	316 SS
6	Stem O-Ring	FKM
7	<i>Body</i>	<i>316 SS</i>
8	<i>Ball</i>	<i>316 SS</i>
9	<i>Seat Gland</i>	<i>316 SS</i>
10	<i>Ball Bearing</i>	<i>Copper Alloy</i>
11	<i>Bottom Gland</i>	<i>316 SS</i>
12	<i>Stem O-Ring</i>	<i>FKM</i>
13	<i>Thrust Washer</i>	<i>PEEK</i>
14	<i>Ball Bearing</i>	<i>PEEK</i>
15	<i>Seat Retainer</i>	<i>S17400</i>
16	<i>Seat</i>	<i>Carbon Filled PEEK</i>
17	<i>Seat Retainer O-Ring</i>	<i>FKM</i>
18	<i>Belleville Washer</i>	<i>S17700</i>
19	<i>Seat Gland O-Ring</i>	<i>FKM</i>
20	<i>Bottom Gland O-Ring</i>	<i>FKM</i>
21	Lock Nut	316 SS
Lubricant		Molybdenum Disulfide/Fluorinated-Based

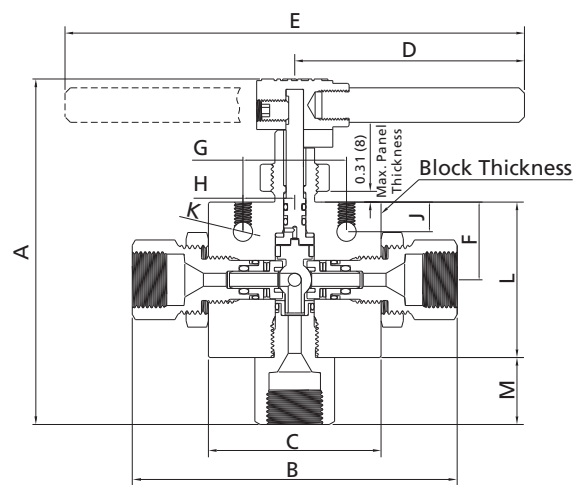
Wetted components listed in italics.

Dimensions

2-Way Straight Valves



3-Way Valves

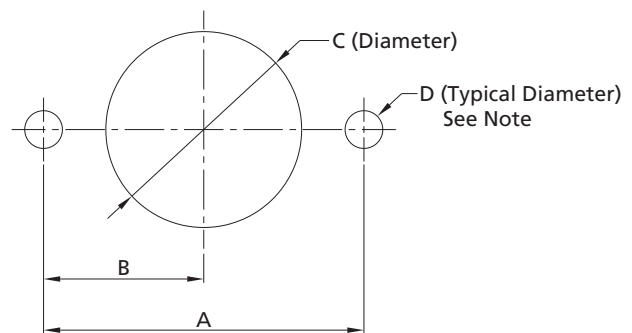


Flow Pattern	Orifice Designator	Dimensions, in. (mm)												Block Thickness
		A	B	C	D	E	F	G	H	J	K	L	M	
2-Way	4	4.09 (103.9)	4.19 (106.5)	2.00 (50.8)	3.33 (84.5)		1.13 (28.6)	1.50 (38.1)	0.75 (19.1)	0.43 (10.9)	0.28 (7.1)	2.31 (58.6)		1.00 (25.4)
	6	4.84 (121.0)	5.53 (140.3)	3.00 (76.2)	4.96 (126.0)		1.38 (34.9)	2.00 (50.8)	1.00 (25.4)	0.41 (10.3)	0.28 (7.1)	2.95 (74.9)		1.38 (34.9)
	8	5.39 (136.8)	7.73 (196.5)	4.12 (104.6)		10.25 (260.0)	1.66 (42.2)	3.00 (76.2)	1.50 (38.1)	0.50 (12.7)	0.28 (7.1)	3.52 (89.4)		1.75 (44.5)
3-Way	4	5.00 (127.0)	4.70 (119.5)	2.50 (63.5)	3.33 (84.5)		1.13 (28.6)	1.50 (38.1)	0.75 (19.1)	0.43 (10.9)	0.28 (7.1)	2.25 (57.2)	0.48 (12.3)	1.00 (25.4)
	6	5.88 (149.3)	5.53 (140.3)	3.00 (76.2)	4.96 (126.0)		1.38 (34.9)	2.00 (50.8)	1.00 (25.4)	0.41 (10.3)	0.28 (7.1)	2.87 (73.0)	1.89 (30.2)	1.38 (34.9)
	8	6.91 (175.6)	7.77 (197.4)	4.12 (104.6)		10.25 (260.0)	1.66 (42.2)	3.00 (76.2)	1.50 (38.1)	0.50 (12.7)	0.28 (7.1)	3.34 (84.9)	1.70 (43.2)	1.75 (44.5)

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

Panel Mounting Dimensions

Flow Pattern	Orifice Designator	Dimensions, in. (mm)			
		A	B	C	D
2-Way	4	1.50 (38.1)	0.75 (19.1)	0.75 (19.1)	0.28 (7.1)
	6	2.00 (50.8)	1.00 (25.4)	1.13 (28.6)	0.28 (7.1)
	8	3.00 (76.2)	1.50 (38.1)	1.44 (36.5)	0.28 (7.1)
3-Way	4	1.50 (38.1)	0.75 (19.1)	0.75 (19.1)	0.28 (7.1)
	6	2.00 (50.8)	1.00 (25.4)	1.13 (28.6)	0.28 (7.1)
	8	3.00 (76.2)	1.50 (38.1)	1.44 (36.5)	0.28 (7.1)



Notes: 1. Body mounting 1/4-20 thread.
2. All dimensions are for reference only and are subject to change.

Ordering Information and Dimensions

Flow Pattern	Orifice Designator	Connection	Orifice Size in. (mm)	Cv	Ordering Number	Working Pressure psig (bar)
2-Way	4	FNS2	0.25 (6.35)	1.51	15BSS-FNS2-4-1	15,000 (1034)
		FNS4	0.25 (6.35)	1.51	15BSS-FNS4-4-1	
		FNS6	0.25 (6.35)	1.51	15BSS-FNS6-4-1	
		FNS8	0.25 (6.35)	1.51	15BSS-FNS8-4-1	
		DFF2	0.094 (2.4)	0.16	15BSS-DFF2-4-1	
		DFF4	0.19 (4.8)	0.82	20BSS-DFF4-4-1	20,000 (1379)
		DFF6	0.25 (6.35)	1.51	20BSS-DFF6-4-1	
		DFF8	0.25 (6.35)	1.51	20BSS-DFF8-4-1	
		MF4	0.11 (2.8)	0.23	20BSS-MF4-4-1	
		MF6	0.2 (5.2)	0.98	20BSS-MF6-4-1	
		MF9	0.25 (6.35)	1.51	20BSS-MF9-4-1	
		HF4	0.094 (2.4)	0.16	20BSS-HF4-4-1	
		HF6	0.125 (3.2)	0.32	20BSS-HF6-4-1	
		HF9	0.19 (4.8)	0.82	20BSS-HF9-4-1	
	6	FNS4	0.375 (9.5)	3.51	15BSS-FNS4-6-1	15,000 (1034)
		FNS6	0.375 (9.5)	3.51	15BSS-FNS6-6-1	
		FNS8	0.375 (9.5)	3.51	15BSS-FNS8-6-1	
		DFF8	0.375 (9.5)	3.51	20BSS-DFF8-6-1	20,000 (1379)
		DFF9	0.375 (9.5)	3.51	20BSS-DFF9-6-1	
		MF6	0.2 (5.2)	0.98	20BSS-MF6-6-1	
		MF9	0.31 (7.9)	2.36	20BSS-MF9-6-1	
		MF12	0.375 (9.5)	3.51	20BSS-MF12-6-1	
	8	FNS12	0.5 (12.7)	6.31	10BSS-FNS12-8-1	10,000 (690)
		FNS16	0.5 (12.7)	6.31	10BSS-FNS16-8-1	15,000 (1034)
		DFF12	0.5 (12.7)	6.31	15BSS-DFF12-8-1	
		MF12	0.5 (12.7)	6.31	15BSS-MF12-8-1	
		MF16	0.5 (12.7)	6.31	15BSS-MF16-8-1	
3-Way	4	FNS2	0.19 (4.8)	0.5	15BSS-FNS2-4-2	15,000 (1034)
					15BSS-FNS2-4-2D	
		FNS4	0.19 (4.8)	0.5	15BSS-FNS4-4-2	
					15BSS-FNS4-4-2D	
		FNS6	0.19 (4.8)	0.5	15BSS-FNS6-4-2	
					15BSS-FNS6-4-2D	
		FNS8	0.19 (4.8)	0.5	15BSS-FNS8-4-2	
					15BSS-FNS8-4-2D	
		DFF2	0.094 (2.4)	0.13	15BSS-DFF2-4-2	
					15BSS-DFF2-4-2D	
		DFF4	0.19 (4.8)	0.5	20BSS-DFF4-4-2	20,000 (1379)
					20BSS-DFF4-4-2D	
		DFF6	0.19 (4.8)	0.5	20BSS-DFF6-4-2	
					20BSS-DFF6-4-2D	
		DFF8	0.19 (4.8)	0.5	20BSS-DFF8-4-2	
					20BSS-DFF8-4-2D	
		MF4	0.11 (2.8)	0.17	20BSS-MF4-4-2	
					20BSS-MF4-4-2D	
		MF6	0.19 (4.8)	0.5	20BSS-MF6-4-2	
					20BSS-MF6-4-2D	
		MF9	0.19 (4.8)	0.5	20BSS-MF9-4-2	
					20BSS-MF9-4-2D	

Ordering Information and Dimensions (continued)

Flow Pattern	Orifice Designator	Connection	Orifice Size in. (mm)	Cv	Ordering Number	Working Pressure psig (bar)
3-Way	4	HF4	0.094 (2.4)	0.13	20BSS-HF4-4-2	20,000 (1379)
					20BSS-HF4-4-2D	
		HF6	0.125 (3.2)	0.22	20BSS-HF6-4-2	
					20BSS-HF6-4-2D	
		HF9	0.19 (4.8)	0.5	20BSS-HF9-4-2	
					20BSS-HF9-4-2D	
	6	FNS4	0.33 (8.3)	2.1	15BSS-FNS4-6-2	15,000 (1034)
					15BSS-FNS4-6-2D	
		FNS6	0.33 (8.3)	2.1	15BSS-FNS6-6-2	
					15BSS-FNS6-6-2D	
		FNS8	0.33 (8.3)	2.1	15BSS-FNS8-6-2	
					15BSS-FNS8-6-2D	
		DFF8	0.33 (8.3)	2.1	15BSS-DFF8-6-2	
					15BSS-DFF8-6-2D	
		DFF9	0.33 (8.3)	2.1	15BSS-DFF9-6-2	
					15BSS-DFF9-6-2D	
		MF6	0.2 (5.2)	0.81	15BSS-MF6-6-2	
					15BSS-MF6-6-2D	
		MF9	0.31 (7.9)	1.9	15BSS-MF9-6-2	
					15BSS-MF9-6-2D	
		MF12	0.33 (8.3)	2.1	15BSS-MF12-6-2	
					15BSS-MF12-6-2D	
	8	FNS12	0.5 (12.7)	4.4	10BSS-FNS12-8-2	10,000 (690)
					10BSS-FNS12-8-2D	
		FNS16	0.5 (12.7)	4.4	10BSS-FNS16-8-2	
					10BSS-FNS16-8-2D	
		MF12	0.5 (12.7)	4.4	10BSS-MF12-8-2	
					10BSS-MF12-8-2D	
		MF16	0.5 (12.7)	4.4	10BSS-MF16-8-2	
					10BSS-MF16-8-2D	

Fittings

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Subsea Valves

Part Number Crossover Charts

15BSS – MF6 – 6B– 2 – C – CE

Series			Body Material		Connection Type		Connection Size		Orifice Designator		O-Ring Material		Flow Pattern		Pneumatic Actuator		CE Certified	
10B	SS	316 SS	DFF	Female 20D Series	2	1/8"	4	0.25 in. (6.35 mm)	B	FKM	1	2-Way Straight Valves	C	90° Normally Closed Pneumatic Actuator	CE	None		
15B			MF	Female Medium Pressure	4	1/4"	6	0.375 in. (9.5 mm)		NBR	2	3-Way Valves, 180° Turn		O		90° Normally Open Pneumatic Actuator		
20B			FNS	Female NPT	6	3/8"	8	0.5 in. (12.7 mm)			2D	3-Way Valves, 90° Turn		D		90° Double Acting Pneumatic Actuator		
			HF	Female High Pressure	8	1/2"	9	9/16"					DX	180° Double Acting Pneumatic Actuator				
					12	3/4"	16	1"										
						</												

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

- 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.