Subsea Valves

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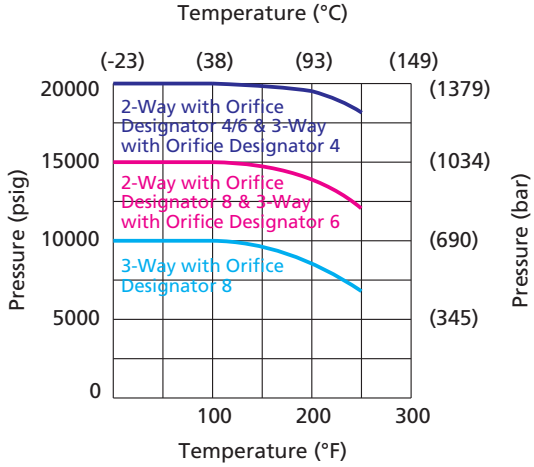
Subsea Ball Valves

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)

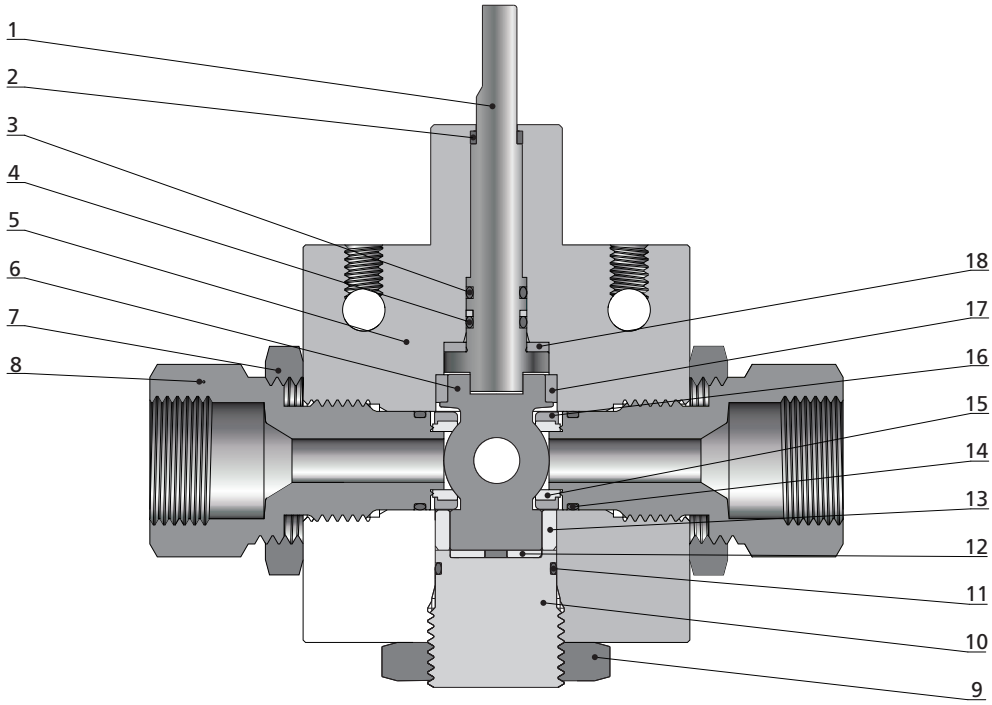
Pressure vs. Temperature Curve



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

Standard Materials of Construction

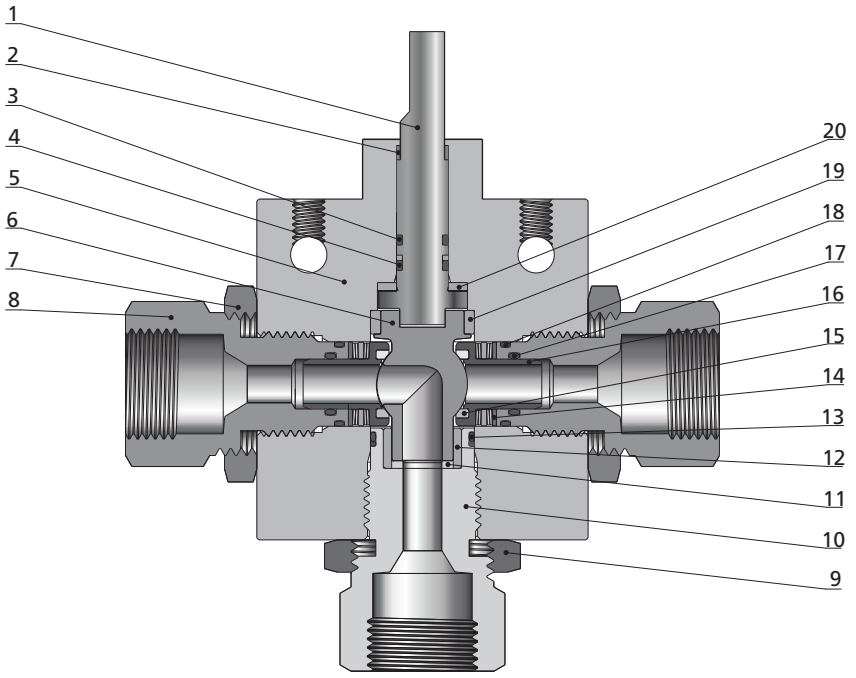
2-Way Valves



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

Wetted components listed in italics.

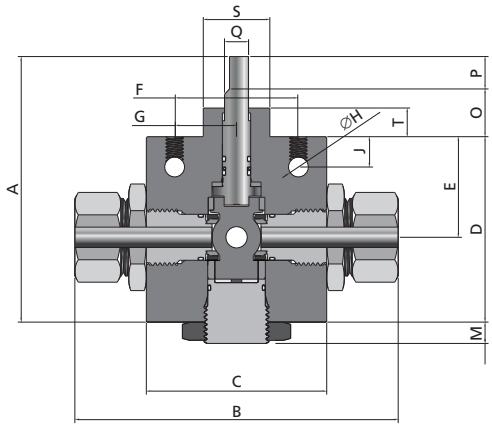
3-Way Valves



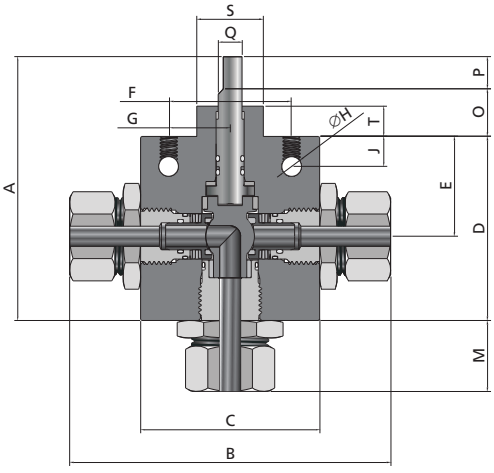
Item	Component	Material Grade
1	*Ball Stem*	*316 SS*
2	Stem Backup	PEEK
3	O-Ring	NBR
4	*O-Ring*	*NBR*
5	*Body*	*316 SS*
6	*Ball*	*316 SS*
7	Lock Nut	316 SS
8	*Seat Gland*	*316 SS*
9	Locking Piece	316SS
10	*Bottom Gland*	*316SS*
11	*Bottom Thrust Washer*	*PEEK*
12	*Bearing*	*PEEK*
13	*O-Ring*	*NBR*
14	*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

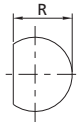


3-Way Valves

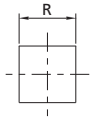
Flow Pattern	Orifice No.	Dimensions, in. (mm)										
		A	B	C	D	E	F	G	H	J	M	Block Thickness
2-Way	4	4.31 (109.3)	4.20 (106.8)	2 (50.8)	2.53 (64.2)	1.28 (32.5)	1.5 (38.1)	0.75 (19.05)	0.28 (7.1)	0.43 (10.9)	0.35 (8.8)	1 (25.4)
	6	5.94 (150.8)	5.53 (140.4)	3 (76.2)	3.43 (87.3)	1.78 (45.2)	2.5 (63.5)	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)	1.8 (45.8)	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



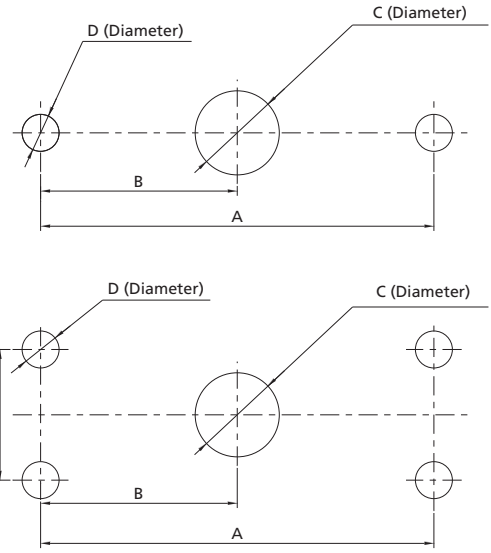
Orifice 6/8

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

Ball Valve Panel Mounting Dimensions

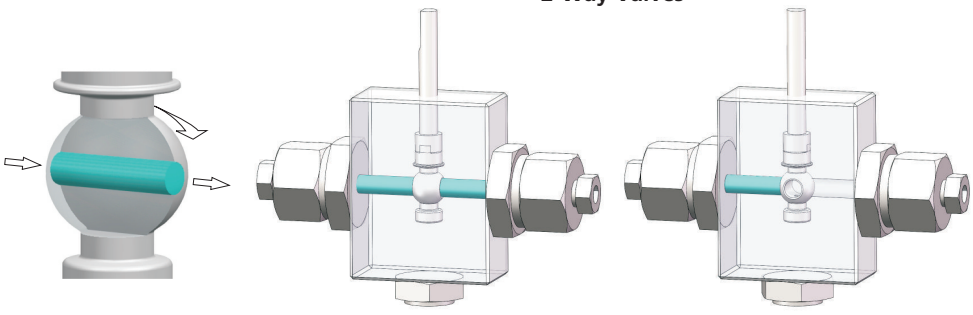
Flow Pattern	Orifice No.	Dimensions, in. (mm)			
		A	B	C	D
2-Way	4	1.5 (38.1)	0.75 (19.05)	0.88 (22.23)	0.28 (7.1)
3-Way	4	2 (50.8)	1 (25.4)	0.88 (22.23)	0.28 (7.1)

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)



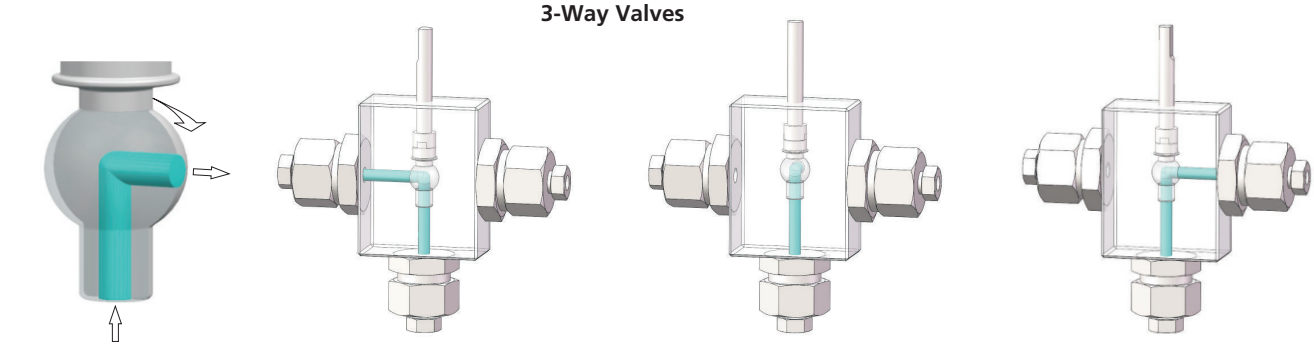
Flow Configuration

2-Way Valves

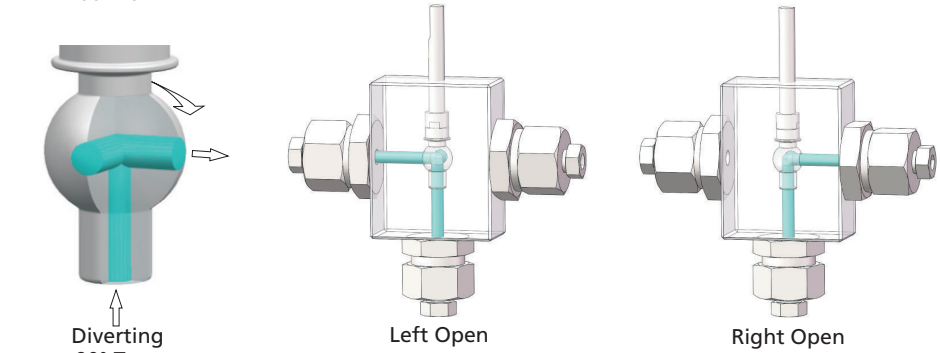


On-Off | Open | Closed

3-Way Valves



Switching 180° Turn | Left Open | Closed | Right Open



Diverting 90° Turn | Left Open | Right Open

Ordering Information and Dimensions

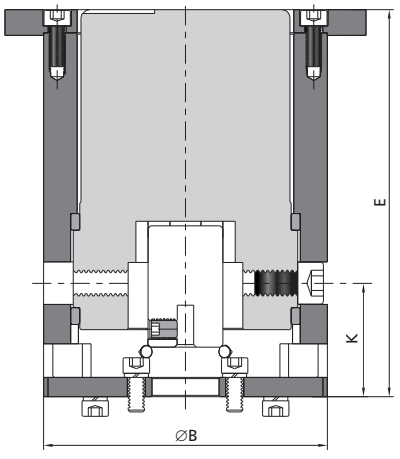
Flow Pattern	Orifice No.	Connection	Orifice Size in. (mm)	Cv	Ordering Number	Working Pressure psig (bar)
2-Way	4	FNS4	0.25 (6.35)	1.51	15SBSS-FNS4-4-1	15,000 (1034)
		FNS6			15SBSS-FNS6-4-1	
		FNS8			15SBSS-FNS8-4-1	
		DFF4	0.19 (4.80)	0.82	20SBSS-DFF4-4-1	20,000 (1379)
		DFF6	0.25 (6.35)	1.51	20SBSS-DFF6-4-1	
		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	15,000 (1034)
		MF16			15SBSS-MF16-8-1	
3-Way	4	FNS4	0.188 (4.77)	0.5	15SBSS-FNS4-4-2	
					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	

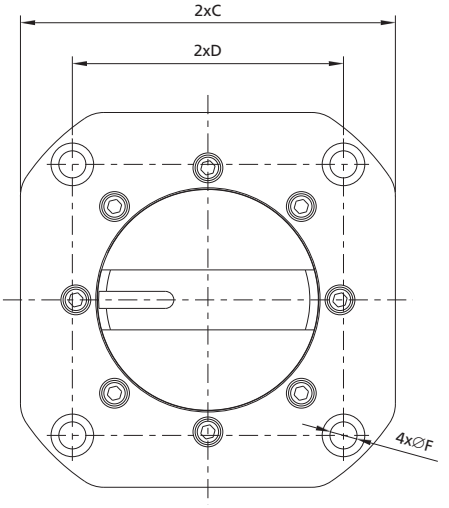
Ordering Information and Dimensions (continued)

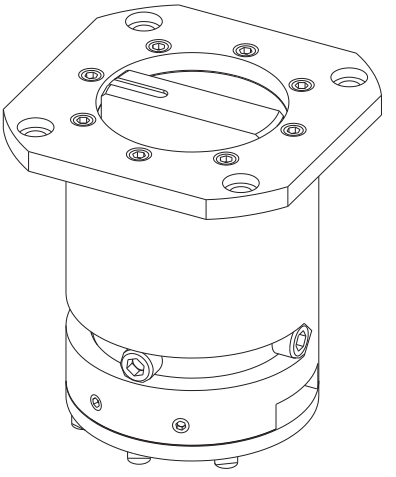
Flow Pattern	Orifice No.	Connection	Orifice Size in. (mm)	Cv	Ordering Number	Working Pressure psig (bar)
3-Way	4	MF9	0.188 (4.77)	0.5	20SBSS-MF9-4-2	20,000 (1379)
					20SBSS-MF9-4-2D	
		HF4	0.094 (2.39)	0.13	20SBSS-HF4-4-2	
					20SBSS-HF4-4-2D	
		HF6	0.125 (3.17)	0.22	20SBSS-HF6-4-2	
					20SBSS-HF6-4-2D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

Paddle Assembly Options

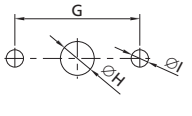
Paddle Assembly installed on the valve is suitable for ROV or diver operation to complete the opening and closing or reversing of underwater valves. PAD is made of stainless steel, which has good corrosion resistance in the submarine environment. The limit design is adopted in the structure to prevent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

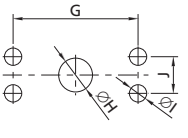






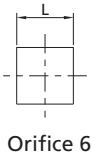
Bottom Mounting Hole





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)	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

15SBSS - MF12 - 8VI - 1 - PAD

Series	Body Material	Connection Type	Connection Size	Orifice No.	O-Ring Material	Flow Pattern	Handle
10SB	4P S17400	DFF Female 20D Series	4 1/4"	For 2-Way		1 2-Way Straight Valves	
15SB	SS 316SS	MF Female Medium Pressure	6 3/8"	4 1/4"	VI FKM	2 3-Way Valves, 180° Turn	PAD Paddle Assembly
20SB		FNS Female NPT	8 1/2"	6 3/8"		2D 3-Way Valves, 90° Turn	
		HF Female High Pressure	9 9/16"	8 1/2"			
			12 3/4"	For 3-Way			
			16 1"	4 3/16"			
				6 3/8"			
				8 1/2"			

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)

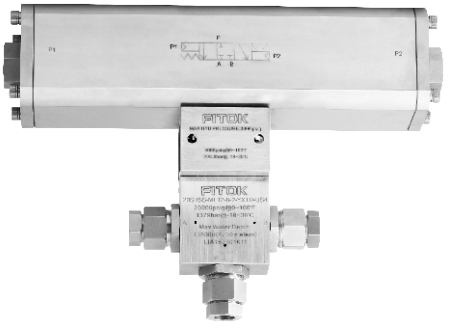
Notes: 1. For more details regarding 20D Series and Medium/ High Pressure connections, please see **Connection Information** on A-02.
2. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

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
- 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)



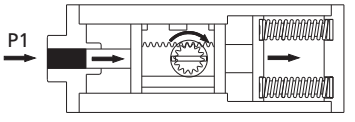
Subsea Hydraulic Ball Valves (3-Way)

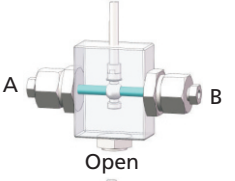
Working Principle

2-way (90° on-off)

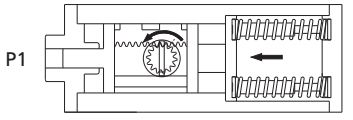
YC: Hydraulic to open, single acting with spring return (Normally Closed)

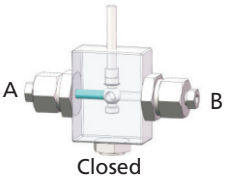
Hydraulic pressure applied to port P1 forces the piston to move towards right and compress the spring, causing a clockwise rotation by 90 degrees. The valve fully opens.





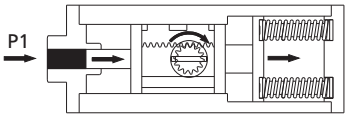
Following loss of hydraulic pressure on port P1, the compressed spring forces the piston to move towards left, causing a counterclockwise rotation by 90 degrees. The valve closes.

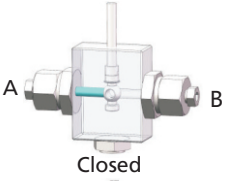




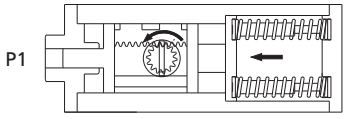
YO: Hydraulic to closed, single acting with spring return (Normally Open)

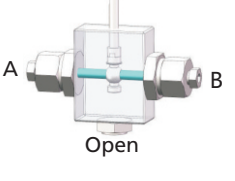
Hydraulic pressure applied to port P1 forces the piston to move towards right and compress the spring, causing a clockwise rotation by 90 degrees. The valve closes.





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.

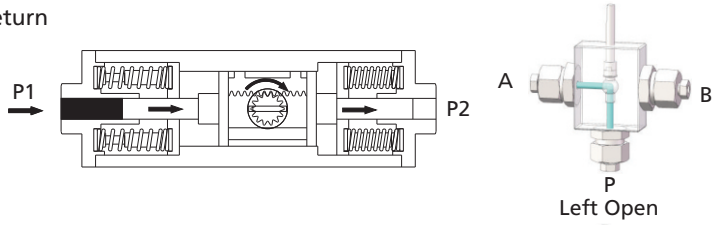




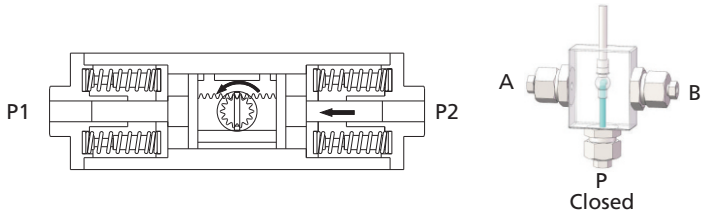
3-way (180° switching)

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

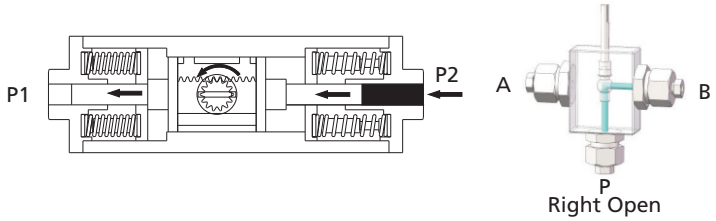
Hydraulic pressure applied to port P1 forces the piston to move towards right and compress the spring, causing a clockwise rotation by 90 degrees. The flow is allowed from bottom inlet port P to outlet A.



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

Series	
10SB	
15SB	
20SB	

Body Material	
4P	S17400
SS	316SS

Connection	
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

Orifice No.	
For 2-Way	
4	1/4"
6	3/8"
For 3-Way	
4	3/16"
6	3/8"

O-Ring Material	
	NBR
VI	FKM

Flow Pattern	
1	2-Way Straight Valves
2	3-Way Valves, 180° Turn
2D	3-Way Valves, 90° Turn

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

Hydraulic Connection Type	
FNS	Female NPT
US	Female SAE O-Ring

Hydraulic Connection Size	
4	1/4"
7	7/16"-20
8	1/2"

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.

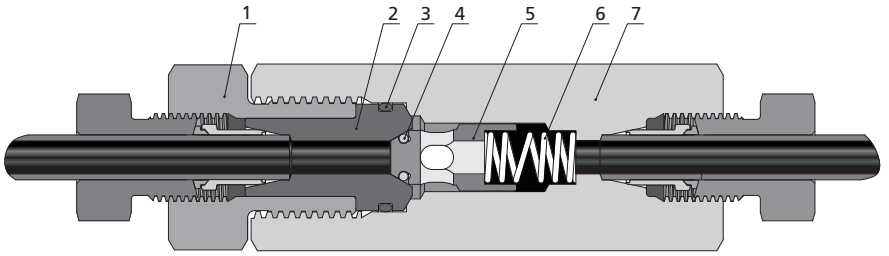
Subsea Check Valves

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)

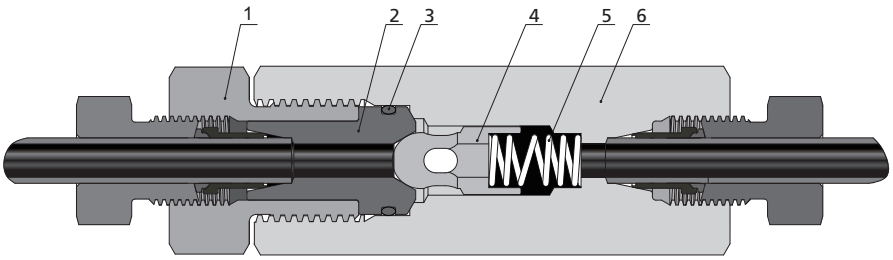
Standard Materials of Construction

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

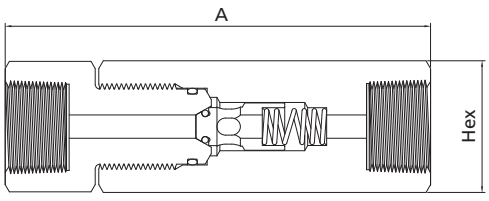


Item	Component	Material Grade
1	Cover Gland	316SS
2	*Cover*	*316SS*
3	Seal Ring	NBR
4	*Ball Poppet*	*S17400SS*
5	*Spring*	*304SS*
6	*Valve Body*	*316SS*

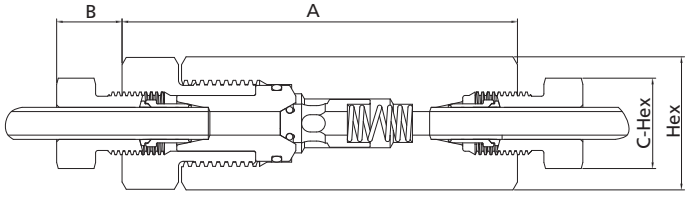
Wetted components listed in italics.

Ordering Information and Dimensions

FNS



DFF/MF



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

Ordering Information and Dimensions (continued)

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

Ordering Number Description

15SCSS – FNS4 – VI

Series	Body Material	Connection Type	Connection Size	O-Ring Material
10SC	SS 316 SS	For 10SC/10SCO Series	4 1/4"	NBR
10SCO		FNS Female NPT	6 3/8"	VI FKM
15SC		For 15SC/15SCO Series	8 1/2"	
15SCO		DFF Female 20D Series	9 9/16"	
20SC		FNS Female NPT	12 3/4"	
20SCO		For 20SC/20SCO Series	16 1"	
		MF Female Medium Pressure		

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.

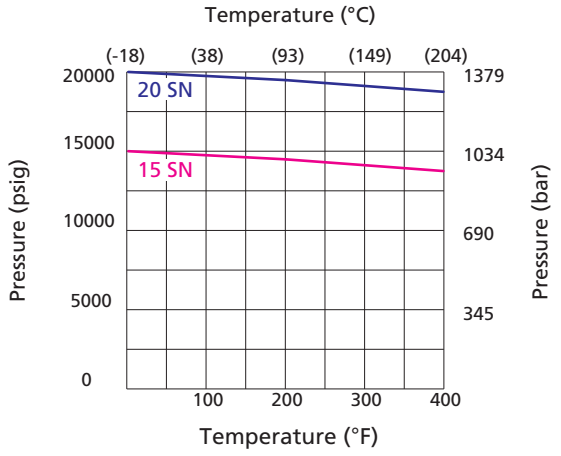
Designator	O-Ring Material	Working Temperature Range, °F(°C)
	NBR	-10 to 250 (-23 to 121)
VI	FKM	0 to 400 (-17.8 to 204)

Subsea Needle Valves

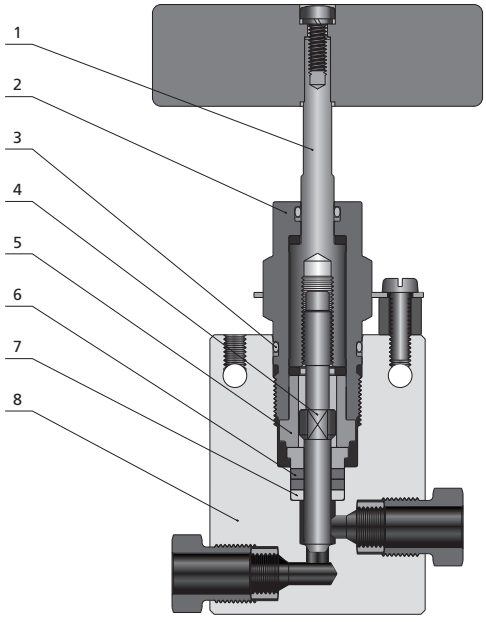
Features

- 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)

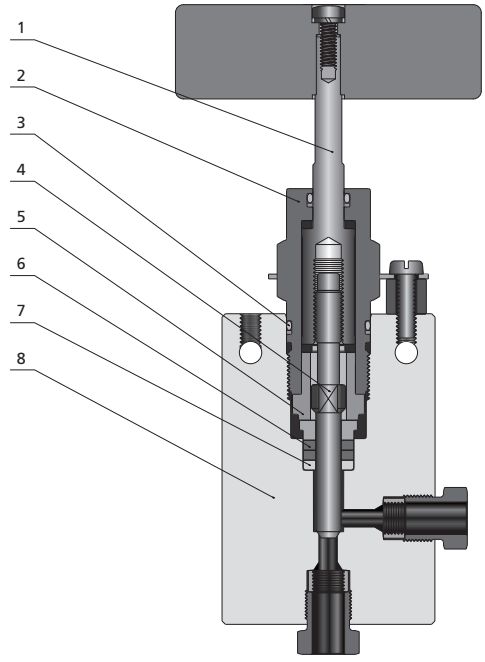
Pressure vs. Temperature Curve



Standard Materials of Construction



2-Way Straight

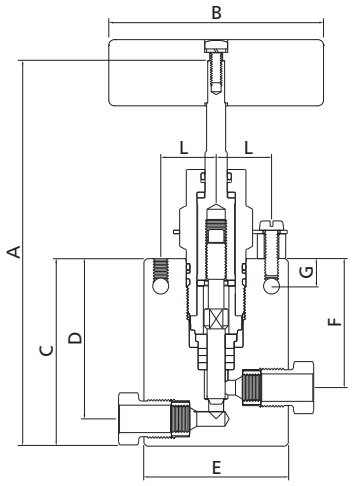


2-Way Angle

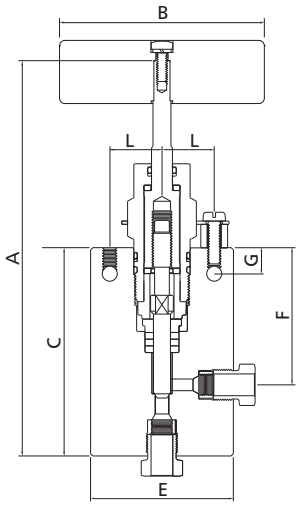
Item	Component	Material Grade
1	Upper Stem	316SS
2	Packing Gland	316SS
3	O-Ring	NBR
4	*Lower Stem*	*S17400*
5	Packing Ring	C63000
6	*Packing*	*PTFE*
7	*Packing Washer*	*S17400*
8	*Body*	*316 SS*
	Lubricant	Molybdenum Disulfide

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

20SNSS – MF6 – R2 – VI

Series	Body Material	Connection	Stem Tip	Flow Pattern	O-Rng Material
15SN	SS 316 SS	For 15SN Series	Vee	1 Straight	NBR
20SN		DFF4 1/4" Female 20D Series	R Regulating	2 Angle	VI FKM
		DFF6 3/8" Female 20D Series			
		DFF8 1/2" Female 20D Series			
		FNS4 1/4" Female NPT			
		FNS6 3/8" Female NPT			
		FNS8 1/2" Female NPT			
		For 20SN Series			
		MF6 3/8" Female Medium Pressure			
		MF9 9/16" Female Medium Pressure			
		MF12 3/4" Female Medium Pressure			

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)

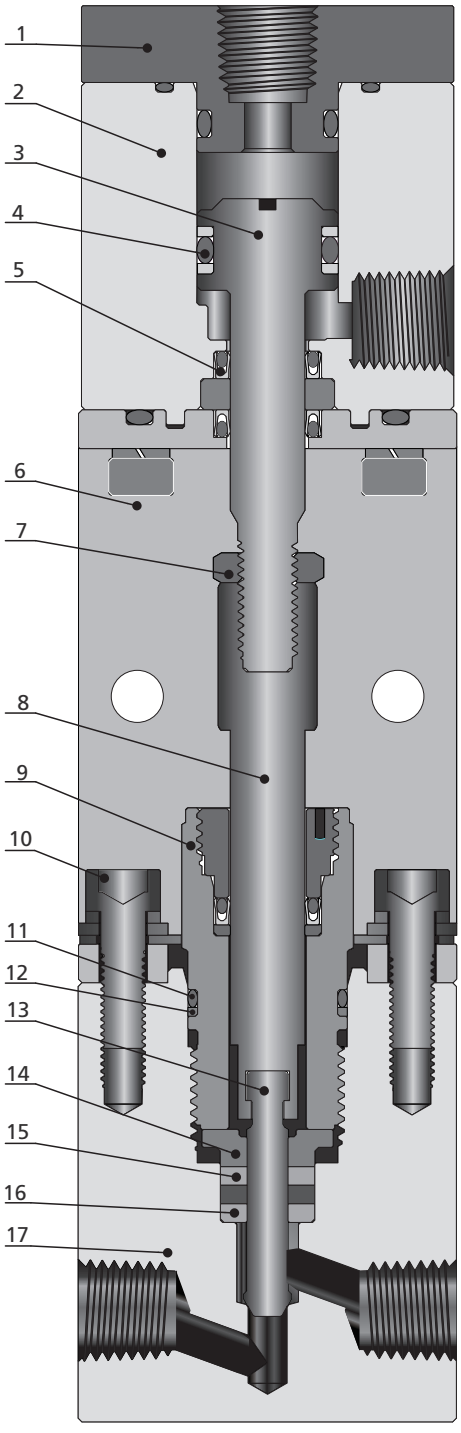
Notes: 1. For more details regarding 20D Series and Medium Pressure connections, please see **Connection Information** on A-02.
2. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

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)

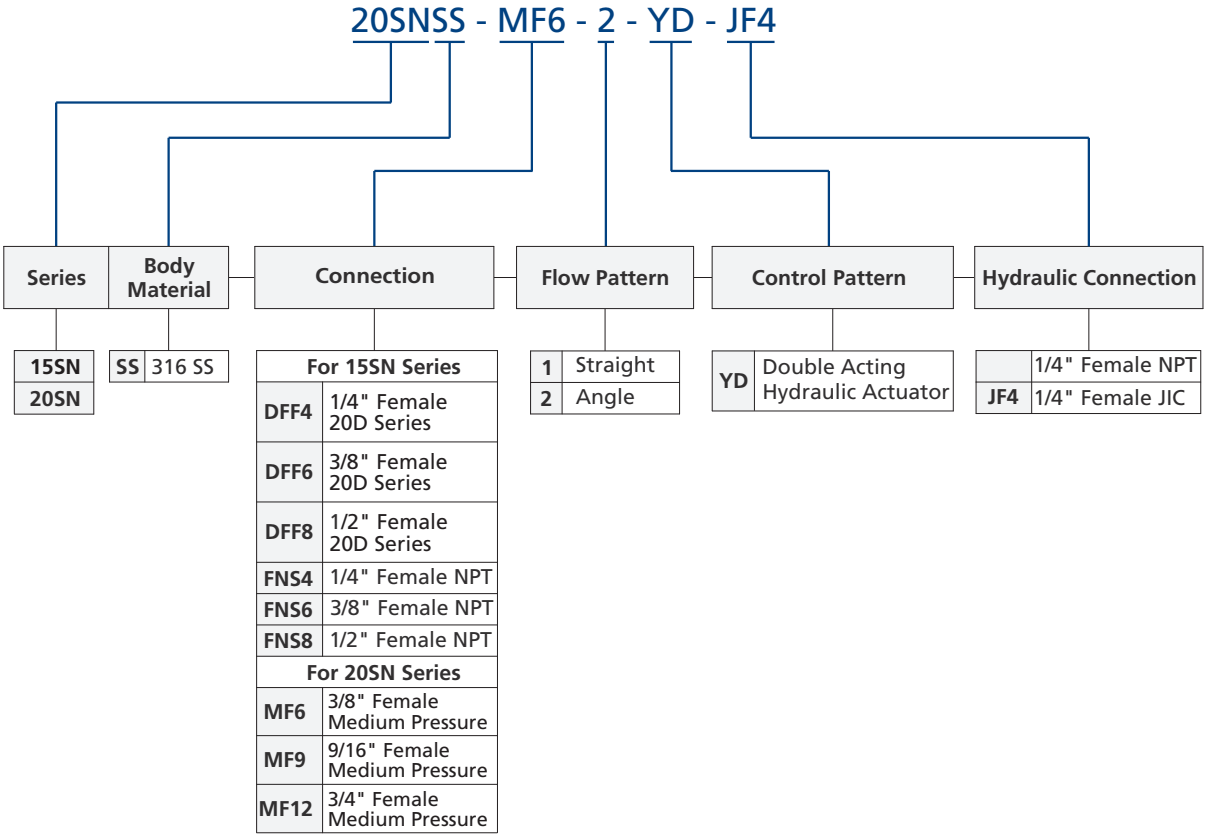
Standard Materials of Construction



Item	Component	Material Grade
1	Gland	316 SS
2	Actuator Body	316 SS
3	Piston Rod	316 SS
4	O-Ring	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	*Lower Stem*	*S17400*
14	Packing Ring	C63000
15	*Packing*	*PTFE*
16	*Packing Washer*	*S17400*
17	*Body*	*316 SS*

Wetted components listed in italics.

Ordering Number Description



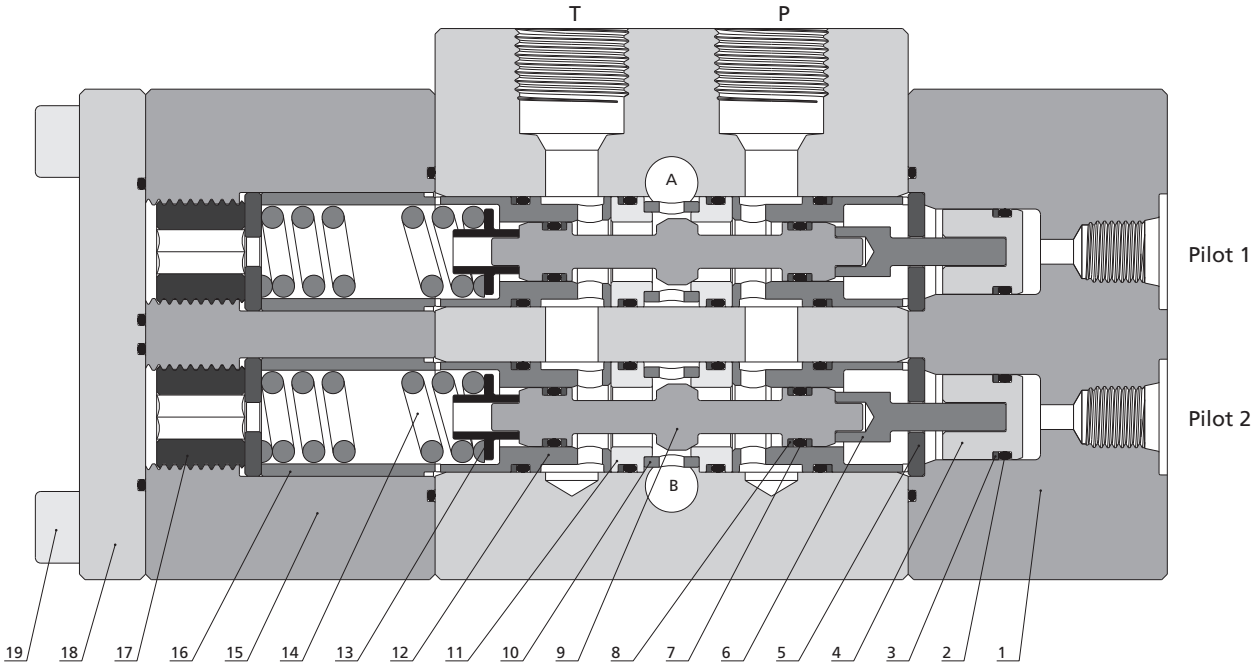
Notes: 1. For more details regarding 20D Series and Medium Pressure connections, please see **Connection Information** on A-02.
2. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

Subsea Hydraulic Directional Control Valves

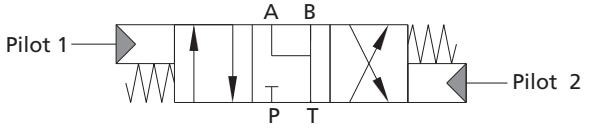
Features

- 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)

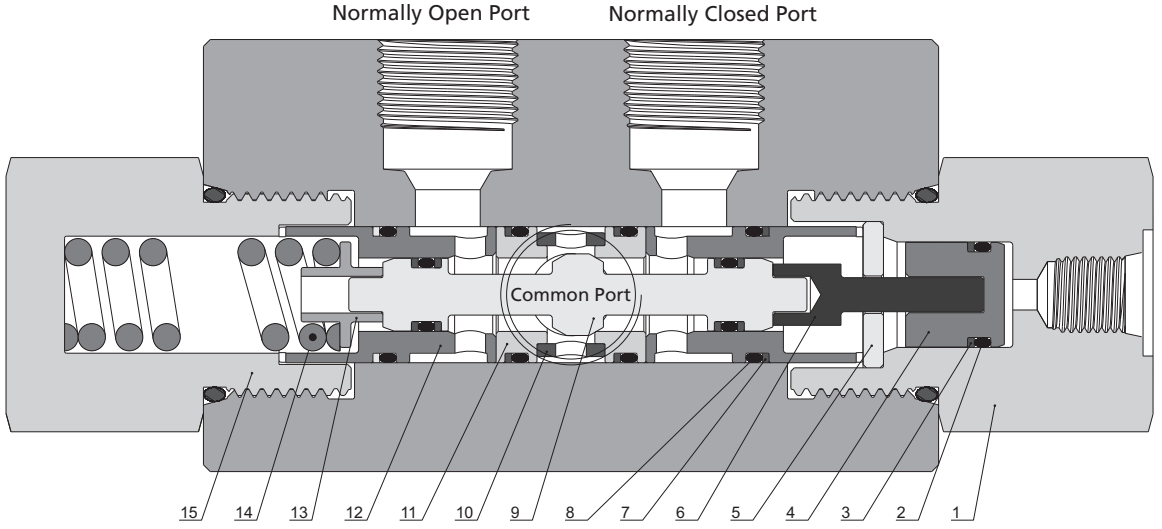
Standard Materials of Construction



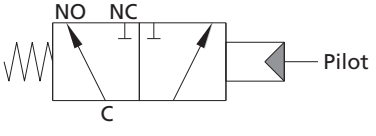
Circuit Symbol



3-Position, 4-Way



Circuit Symbol



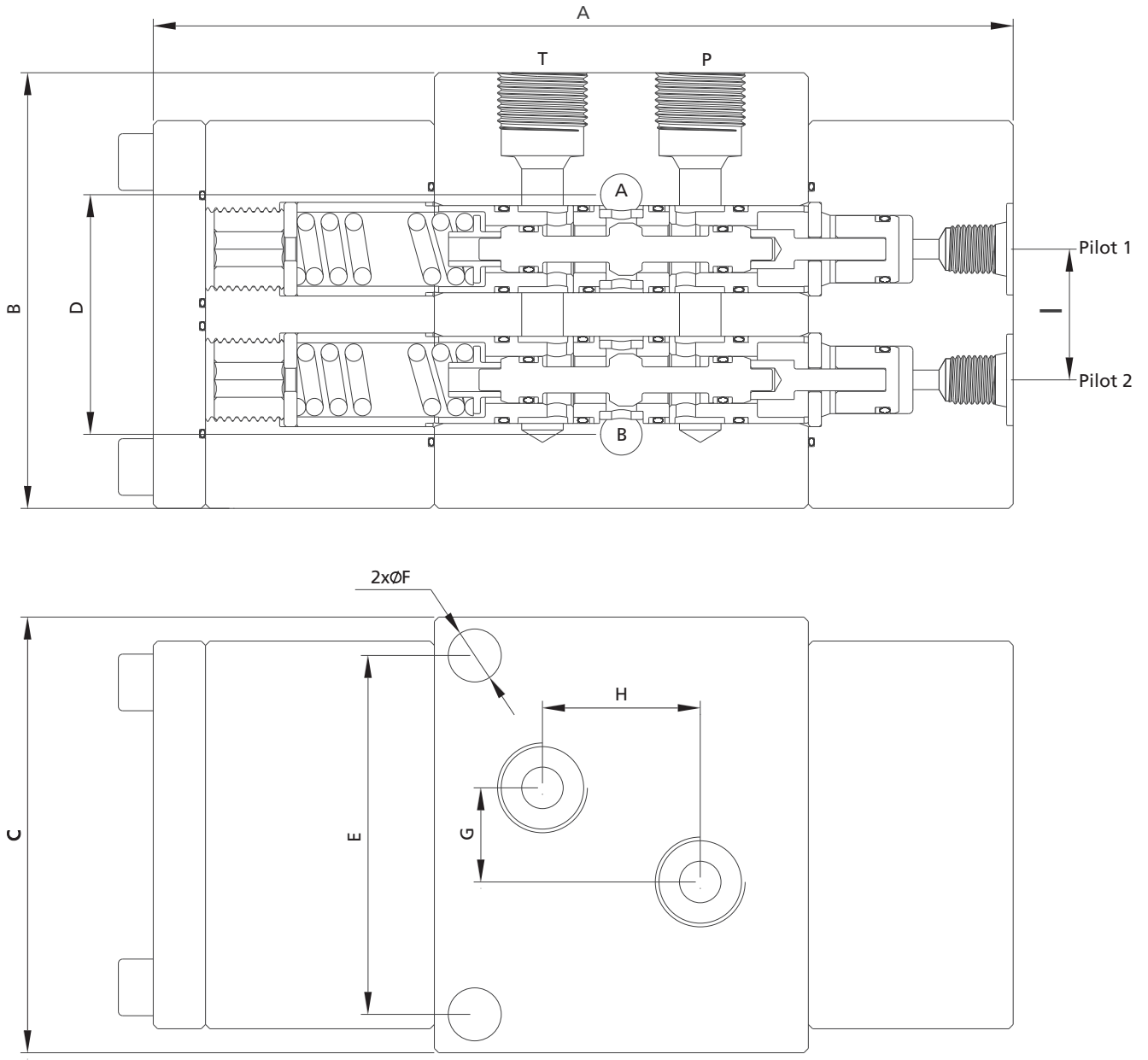
2-Position, 3-Way

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	*O-Ring*	*NBR*
8	*Retaining Ring*	*PEEK*
9	*Stem*	*S17400*
10	*Pad*	*S17400*
11	*Seat*	*316 SS*
12	*Bush*	*S17400*
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.

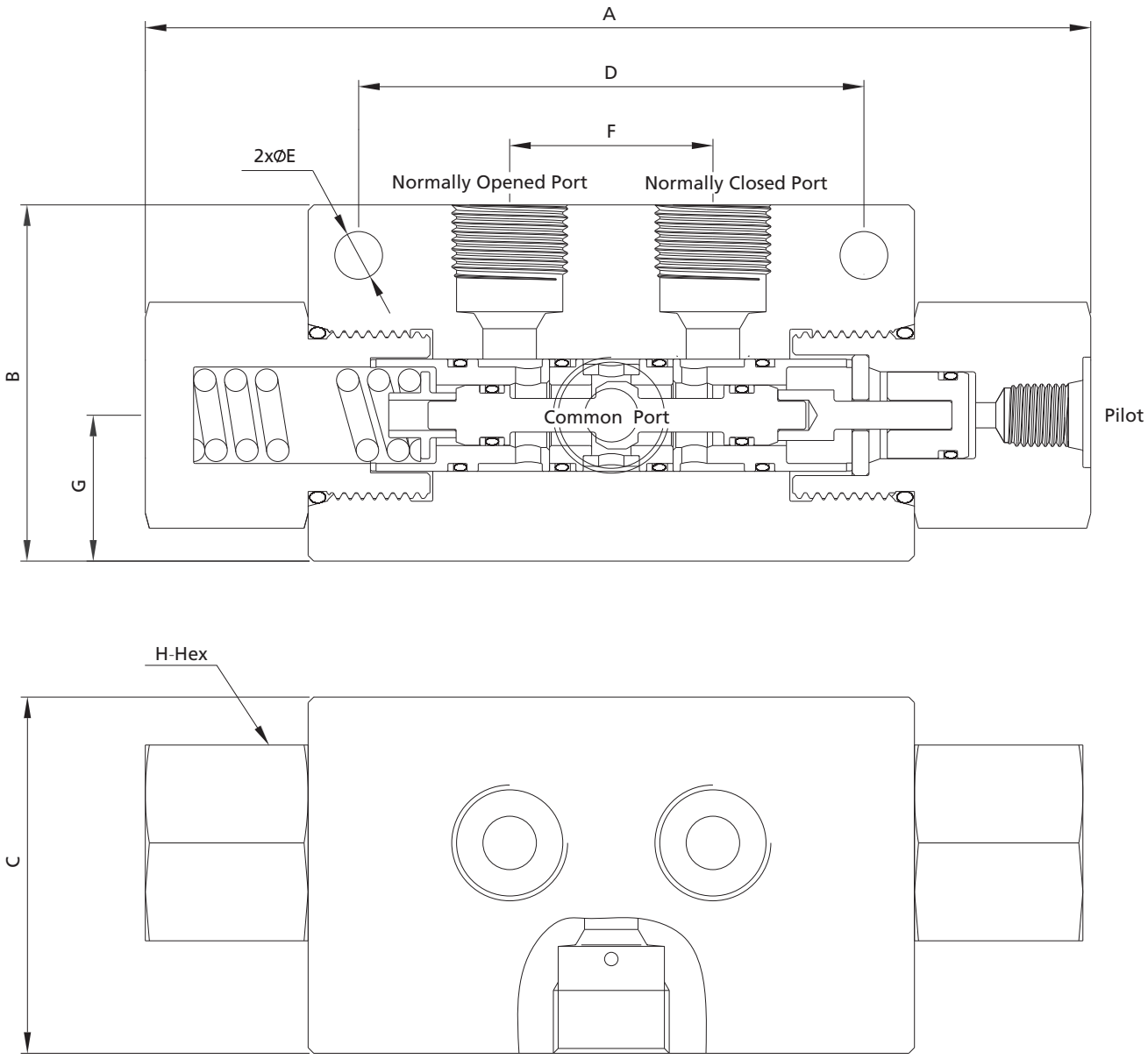
FITOK

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)	

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Ordering Number Description

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

Series	Body Material	Position Number	Way Number	Port Connection	Orifice No.	Pilot Connection	Thread Size	O-Ring Material
15SDC 20SDC	SS 316	3P 3-Position 2P 2-Position	4W 4-Way 3W 3-Way	FNS4 1/4" Female NPT FNS6 3/8" Female NPT FNS8 1/2" Female NPT MF6 3/8" Female Medium Pressure MF9 9/16" Female Medium Pressure MF12 3/4" Female Medium Pressure	1/4" 6 3/8"	US Female SAE O-Ring	7 7/16-20	NBR VI FKM

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 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.

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FK-IC-HV-02-EN-260915