

Subsea Ball Valves

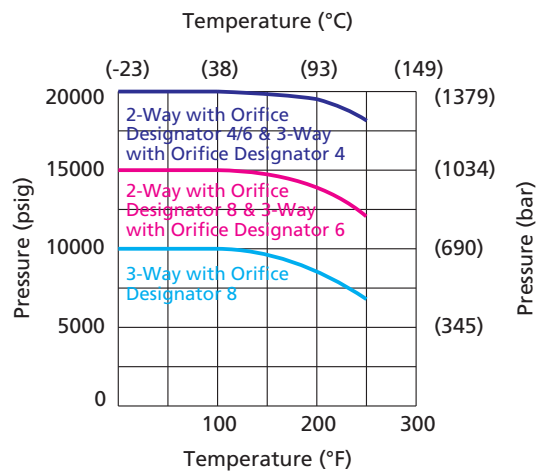
2-Way Valves, 3-Way Valves

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)

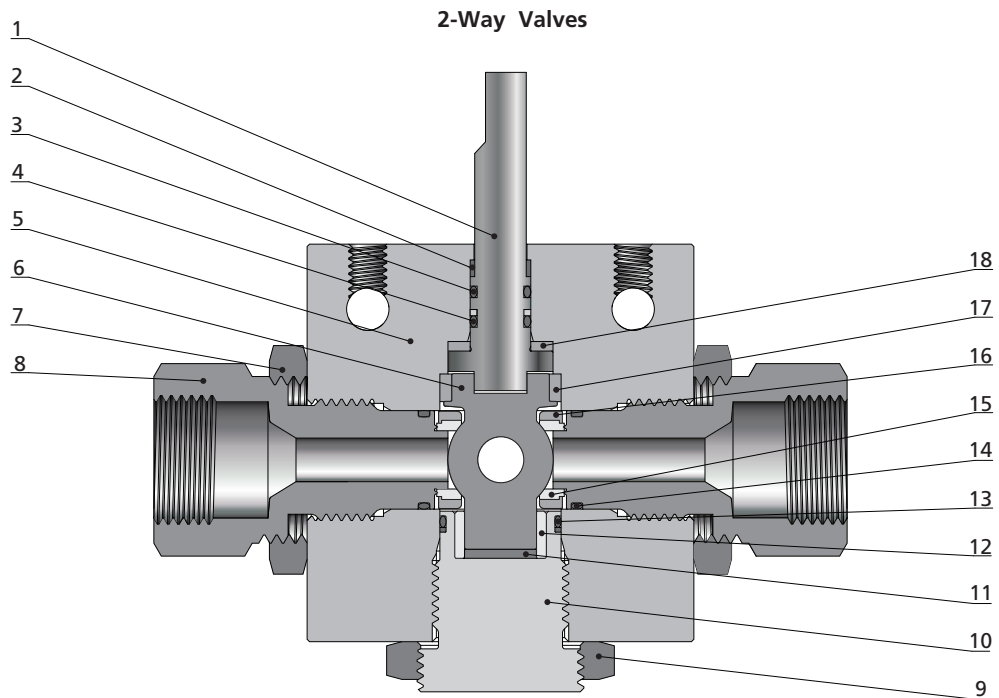


Pressure vs. Temperature Curve



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

Standard Materials of Construction



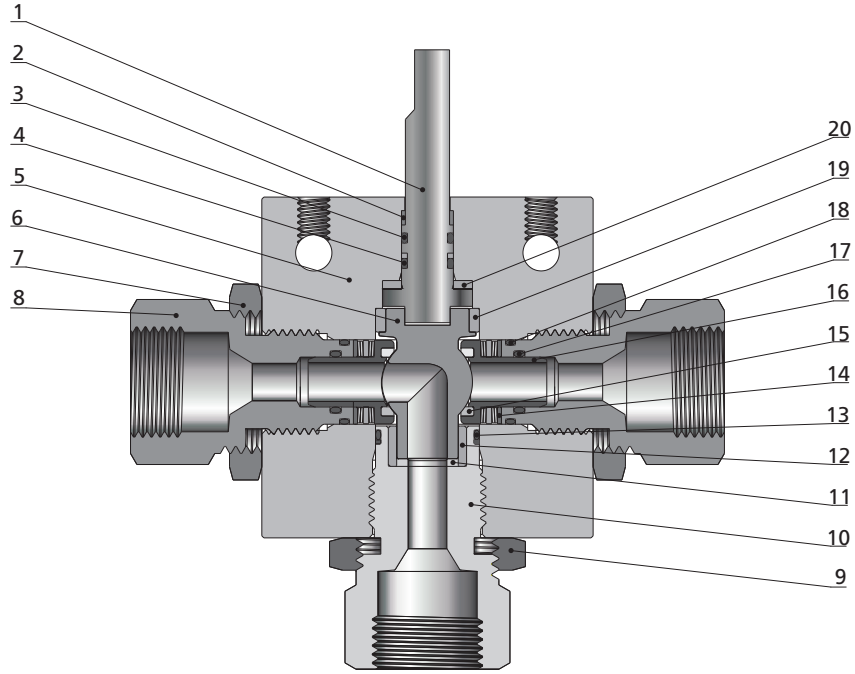
| Item | Component | Material Grade |
|------|-----------------------------|--|
| 1 | <i>Ball Stem</i> | 316SS |
| 2 | Stem Backup | PEEK |
| 3 | O-Ring | NBR |
| 4 | <i>O-Ring</i> | <i>NBR</i> |
| 5 | <i>Body</i> | <i>316 SS / S17400 SS(For Orifice No. 16 Only)</i> |
| 6 | <i>Ball</i> | <i>316SS</i> |
| 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.

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

Fittings
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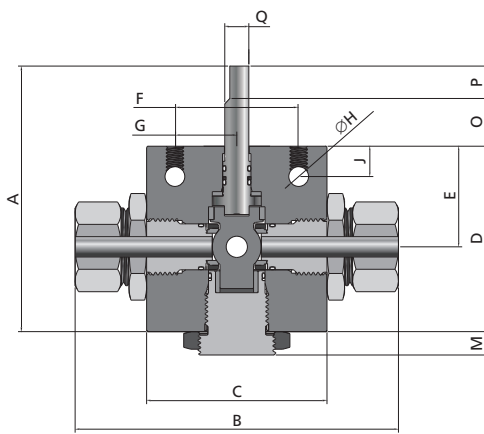
3-Way Valves



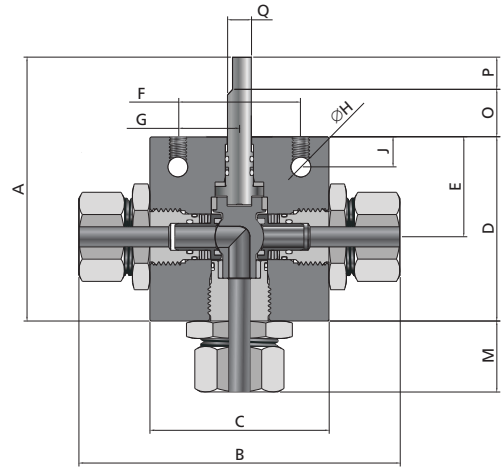
| Item | Component | Material Grade |
|------|-----------------------------|--|
| 1 | <i>Ball Stem</i> | 316 SS |
| 2 | Stem Backup | PEEK |
| 3 | O-Ring | NBR |
| 4 | <i>O-Ring</i> | <i>NBR</i> |
| 5 | <i>Body</i> | 316 SS |
| 6 | <i>Ball</i> | 316 SS |
| 7 | Lock Nut | 316 SS |
| 8 | <i>Seat Gland</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

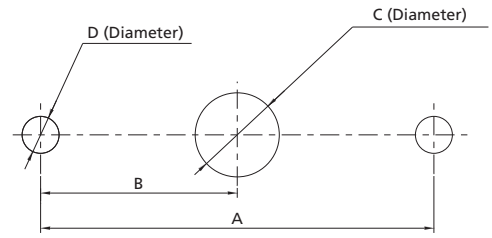
Orifice 6/8

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

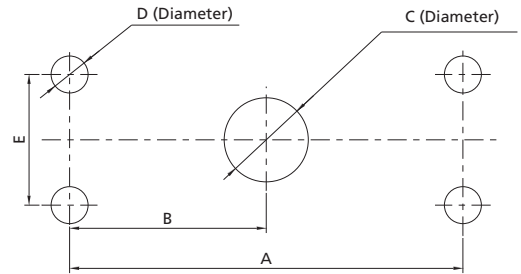
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| Fittings |
| Tubing |
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| Valves |
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Ball Valve Panel Mounting Dimensions

| 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) |

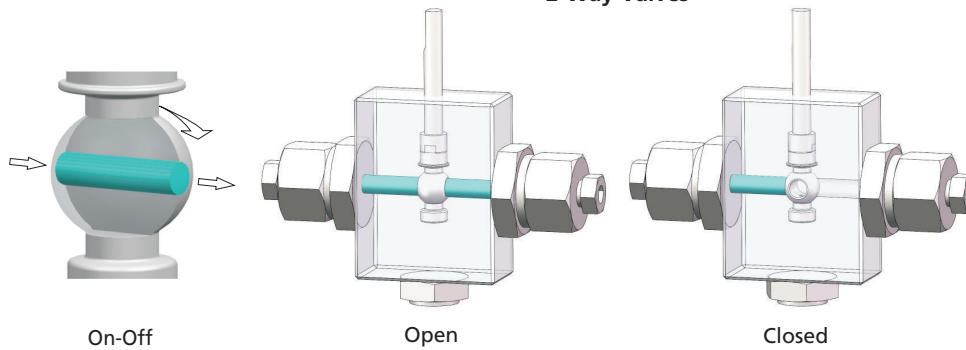


| Flow Pattern | Orifice No. | Dimensions, in. (mm) | | | | |
|--------------|-------------|----------------------|-----------------|----------------|---------------|----------------|
| | | A | B | C | D | E |
| 2-Way | 6 | 2.5 (63.5) | 1.25 (31.75) | 0.5 (12.7) | 0.33 (8.5) | 0.88 (22.3) |
| | 8 | 3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

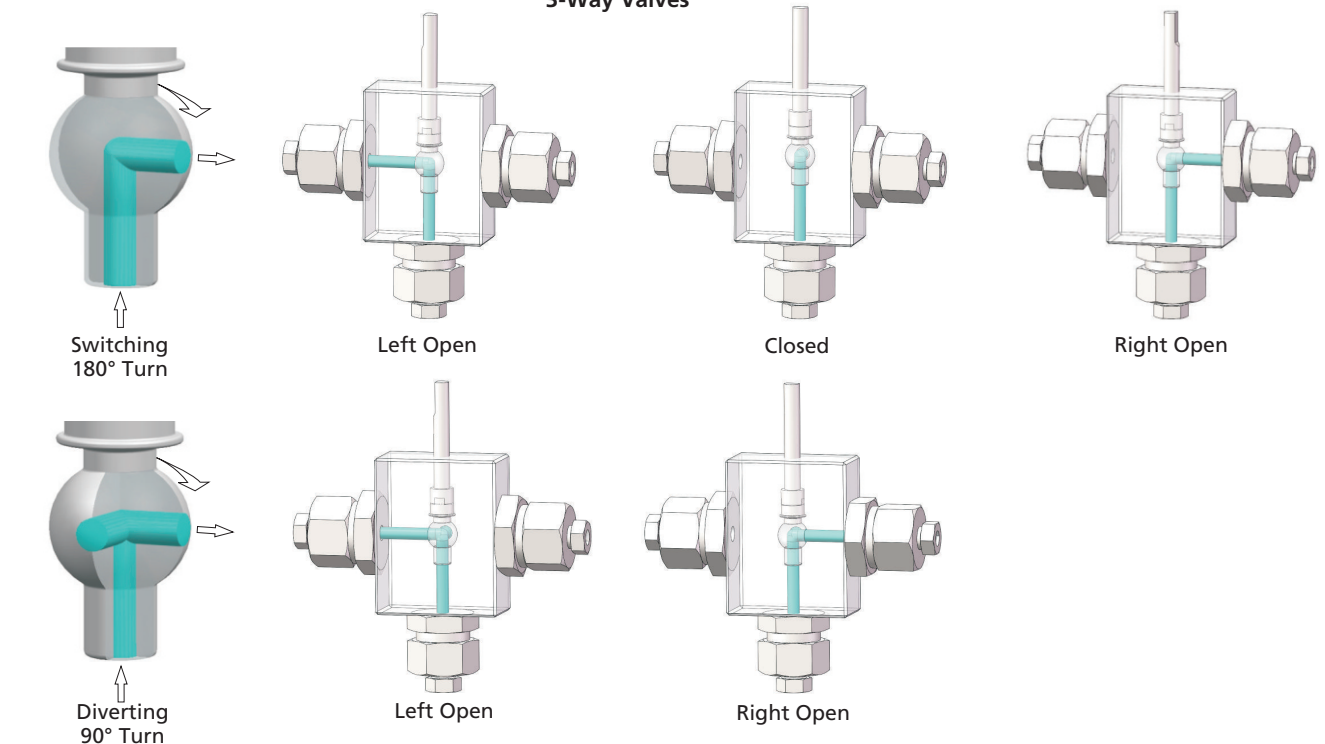


Flow Configuration

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 | | |

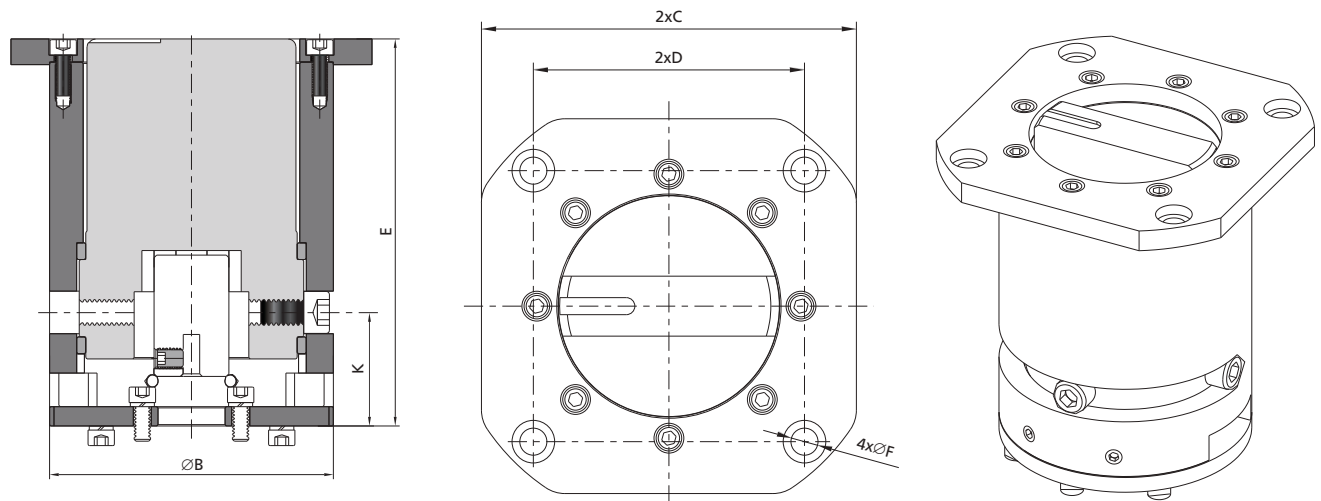
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|------------------------------|
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Ordering Information and Dimensions (continued)

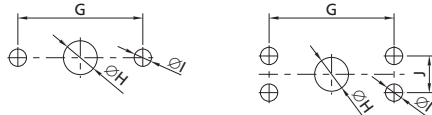
| Flow Pattern | Orifice No. | Connection | Orifice Size in. (mm) | Cv | Ordering Number | Working Pressure psig (bar) |
|--------------|-------------|--------------|-----------------------|-----------------|-----------------|-----------------------------|
| 3-Way | 4 | MF9 | 0.188 (4.77) | 0.5 | 20SBSS-MF9-4-2 | 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



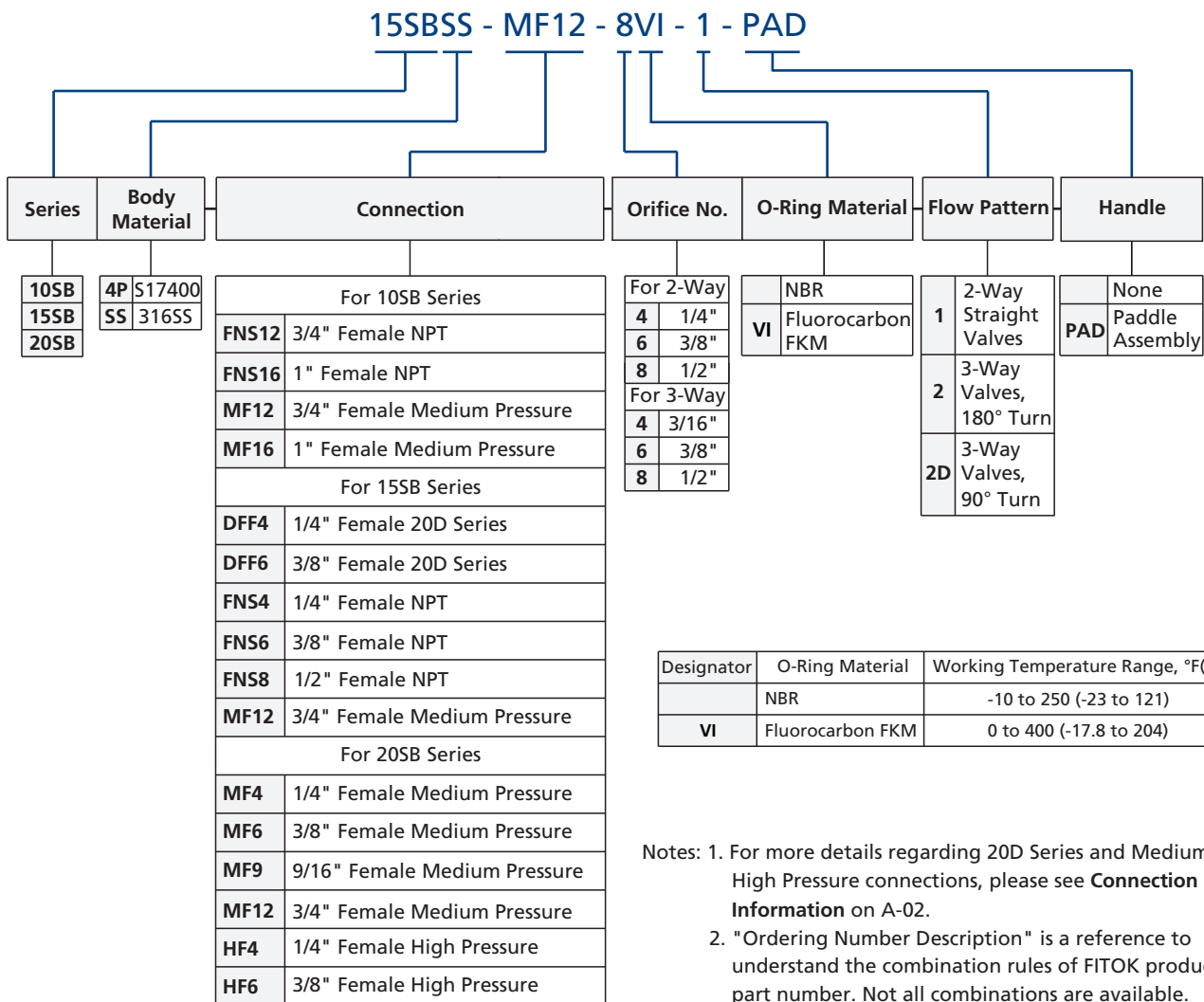
Orifice 4

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



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