



# High Pressure Equipment

## Ball Valves and Subsea Ball Valves

10,000, 15,000 & 20,000 psi service

HiP offers two styles of ball valves (free floating and severe duty trunion) to provide shut-off of liquid or gas flow through 20,000 psi. These valves are available in two-way and three-way configurations, as well as a diverter style in trunion valves.

**Subsea Ball Valves** are designed for the extreme pressures and harsh environments commonly found in the offshore oil and gas industry. HiP offers the industry's broadest line of subsea ball valves for 10, 15 and 20,000 psi.

## Relief Valves

60,000 psi service

**Relief Valves** are engineered to protect a system from over-pressure damage and failure. Relief Valves are available in metal seat, soft seat and field adjustable styles in a variety of pressures ranges up to 60,000 psi. HiP relief valves are now available with CE marking. These products will proudly be marked with the CE symbol, signifying they comply with the stringent requirements of the Pressure Equipment Directive (PED).

## Block & Bleed Valves

20,000 psi service

High Pressure Equipment has developed a line of block and bleed needle valves, double block and bleed needle valves, and double block and bleed ball valves to provide an excellent method of blocking, bleeding and calibrating pressure gauges and transmitters.



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# Ball Valves

## Ball Valves

### 10,000, 15,000 and 20,000 psi service

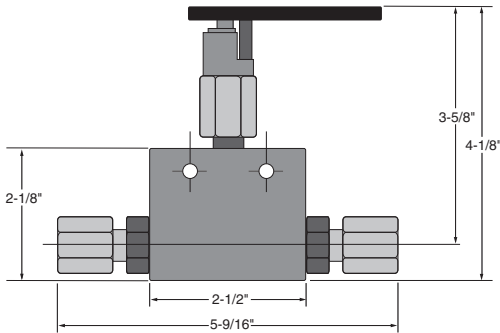
High Pressure Equipment offers two styles of ball valves (free floating and trunion) to provide effective shut-off of liquid or gas flow.

Two-way ball valves offer complete shut-off with a convenient  $\frac{1}{4}$  turn. Valve actuators are available for remote control of HiP ball valves.

Virtually all metal components are stainless steel to insure consistent operation under even the most severe applications. Teflon packing provides reliable leak-free service up to 400°F. Other packings, including Polypak and Grafoil are available upon request.



### Two-Way Free Floating Ball Valves



| Catalog No. | Tube Size        | Conn*               | Pressure Rating @RT | Minimum Orifice | C <sub>v</sub> |
|-------------|------------------|---------------------|---------------------|-----------------|----------------|
| 15-16AF1    | $\frac{1}{16}$ " | AF1                 | 15,000 psi          | 0.052           | 0.09           |
| 15-16AF2    | $\frac{1}{8}$ "  | AF2                 | 15,000 psi          | 0.094           | 0.20           |
| 10-16AF4    | $\frac{1}{4}$ "  | AF4                 | 10,000 psi          | 0.125           | 0.45           |
| 10-16AF6    | $\frac{3}{8}$ "  | AF6                 | 10,000 psi          | 0.250           | 2.70           |
| 20-16LF4    | $\frac{1}{4}$ "  | LF4                 | 20,000 psi          | 0.109           | 0.31           |
| 20-16LF6    | $\frac{3}{8}$ "  | LF6                 | 20,000 psi          | 0.203           | 1.70           |
| 20-16LF9    | $\frac{9}{16}$ " | LF9                 | 20,000 psi          | 0.250           | 2.70           |
| 20-16HF2    | $\frac{1}{8}$ "  | HF2                 | 20,000 psi          | 0.062           | 0.12           |
| 20-16HF4    | $\frac{1}{4}$ "  | HF4                 | 20,000 psi          | 0.094           | 0.20           |
| 20-16HF6    | $\frac{3}{8}$ "  | HF6                 | 20,000 psi          | 0.125           | 0.45           |
| 20-16HF9    | $\frac{9}{16}$ " | HF9                 | 20,000 psi          | 0.188           | 1.45           |
| 15-16NFA    | $\frac{1}{8}$ "  | $\frac{1}{8}$ " NPT | 15,000 psi          | 0.250           | 2.70           |
| 15-16NFB    | $\frac{1}{4}$ "  | $\frac{1}{4}$ " NPT | 15,000 psi          | 0.250           | 2.70           |
| 15-16NFC    | $\frac{3}{8}$ "  | $\frac{3}{8}$ " NPT | 15,000 psi          | 0.250           | 2.70           |
| 15-16NFD    | $\frac{1}{2}$ "  | $\frac{1}{2}$ " NPT | 15,000 psi          | 0.250           | 2.70           |

\* Other connections available upon request. Consult factory.

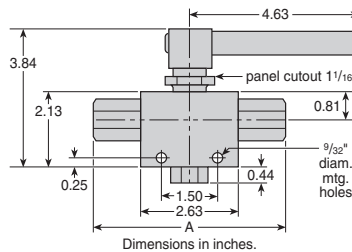
## Severe Duty Ball Valves (Trunion Style) 10,000, 15,000 and 20,000 psi service

High Pressure Equipment Company introduces its TRUNION STYLE ball valves for effective shut-off of liquid and gas flow through 20,000 psi @ 400°F maximum. Our offering features a trunion ball design, making this type of valve ideal for severe duty applications. This valve is available in two-way or three-way configurations with orifices of .187", .375", .500" or 1.000".

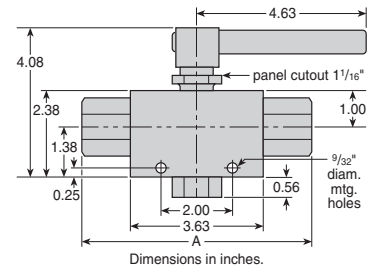
The two-way ball valve offers complete shut-off with a convenient 1/4 turn. The standard configuration of the three-way ball valve requires 1/2 turn to change port outlets and provides for complete shut-off. An optional diverter style three-way ball valve requires only a 1/4 turn to change the port outlets. Air operated actuators are available for remote control.

Material of construction is 316 stainless steel, O-rings are Viton, ball seat is PEEK. Alternate materials of construction are available upon request.

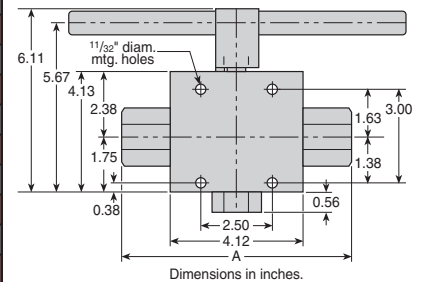
- Trunion style closure, ideal for severe duty applications
- Two-way and three-way valve configurations
- Three-way, 1/4 turn diverter valve
- .187", .375", .500" or 1.000" orifices
- Air actuators for remote operation
- Convenient panel mount design (cut 1 1/16" diameter hole) .187 and .375 only
- Large selection of tube and pipe fittings available
- Optional wetted parts available
- Optional O-rings available



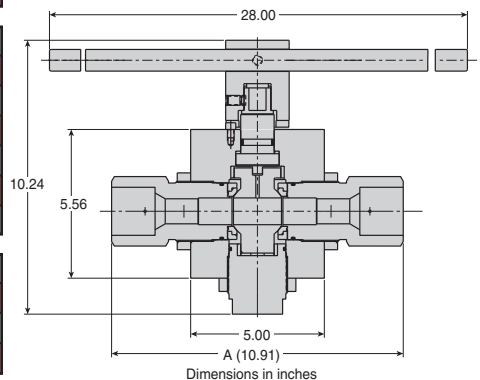
**.187 Orifice**



**.375 Orifice**



**.500 Orifice**



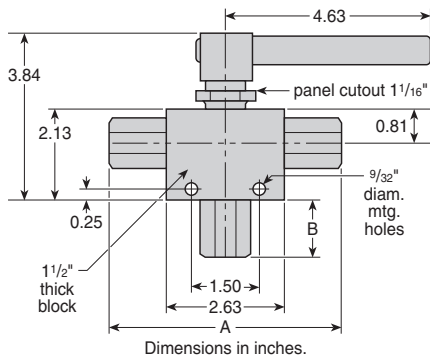
**1.000 Orifice**

## Two-Way Trunion Ball Valves - 90°

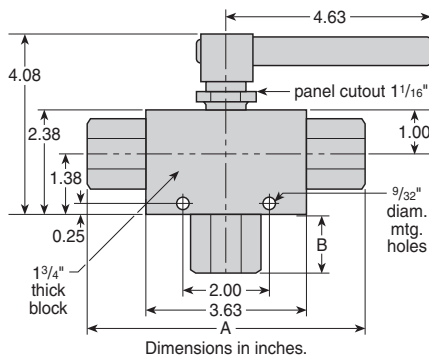
| Orifice | Tube Size | Connection | Pressure Rating | Minimum Orifice | C <sub>v</sub> | A        | Catalog No. |
|---------|-----------|------------|-----------------|-----------------|----------------|----------|-------------|
| .187    | 1/16"     | AF1        | 15,000 psi      | .052            | 0.09           | 4.19     | 15-71AF1    |
|         | 1/8"      | AF2        | 15,000 psi      | .094            | 0.20           | 4.19     | 15-71AF2    |
|         | 1/4"      | AF4        | 10,000 psi      | .125            | 0.45           | 4.69     | 10-71AF4    |
|         | 3/8"      | AF6        | 10,000 psi      | .187            | 1.45           | 4.69     | 10-71AF6    |
|         | 1/4"      | LF4        | 20,000 psi      | .109            | 0.31           | 4.63     | 20-71LF4    |
|         | 3/8"      | LF6        | 20,000 psi      | .187            | 1.45           | 4.63     | 20-71LF6    |
|         | 9/16"     | LF9        | 20,000 psi      | .187            | 1.45           | 5.13     | 20-71LF9    |
|         | 1/4"      | HF4        | 20,000 psi      | .094            | 0.20           | 4.63     | 20-71HF4    |
|         | 3/8"      | HF6        | 20,000 psi      | .125            | 0.45           | 4.63     | 20-71HF6    |
|         | 9/16"     | HF9        | 20,000 psi      | .187            | 1.45           | 4.87     | 20-71HF9    |
|         | 1/8"      | 1/8" NPT   | 15,000 psi      | .187            | 1.45           | 4.63     | 15-71NFA    |
|         | 1/4"      | 1/4" NPT   | 15,000 psi      | .187            | 1.45           | 4.63     | 15-71NFB    |
| 3/8"    | 3/8" NPT  | 15,000 psi | .187            | 1.45            | 4.65           | 15-71NFC |             |
| .375    | 3/8"      | AF6        | 10,000 psi      | .250            | 2.70           | 5.13     | 10-74AF6    |
|         | 9/16"     | LF9        | 15,000 psi      | .312            | 4.22           | 6.25     | 15-74LF9    |
|         | 3/4"      | LF12       | 15,000 psi      | .375            | 6.08           | 6.67     | 15-74LF12   |
|         | 1"        | LF16       | 15,000 psi      | .375            | 6.08           | 7.45     | 15-74LF16   |
|         | 1/4"      | 1/4" NPT   | 15,000 psi      | .250            | 2.70           | 5.63     | 15-74NFB    |
|         | 3/8"      | 3/8" NPT   | 15,000 psi      | .375            | 6.08           | 5.63     | 15-74NFC    |
| 1/2"    | 1/2" NPT  | 15,000 psi | .375            | 6.08            | 5.63           | 15-74NFD |             |
| .500    | 3/4"      | LF12       | 10,000 psi      | .500            | 10.2           | 6.56     | 10-80LF12   |
|         | 1"        | LF16       | 10,000 psi      | .500            | 10.2           | 7.44     | 10-80LF16   |
|         | 3/4"      | 3/4" NPT   | 10,000 psi      | .500            | 10.2           | 6.44     | 10-80NFF    |
|         | 1"        | 1" NPT     | 10,000 psi      | .500            | 10.2           | 7.44     | 10-80NFH    |
| 1.000   | 1 1/2"    | LF24       | 10,000 psi      | 1.000           | 30.0           | 10.91    | 10-83LF24   |

# Ball Valves

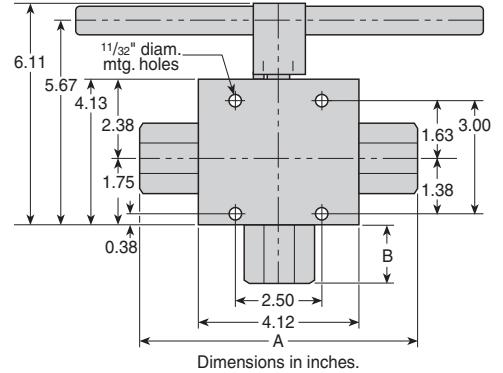
## Three-Way Trunion Ball Valves



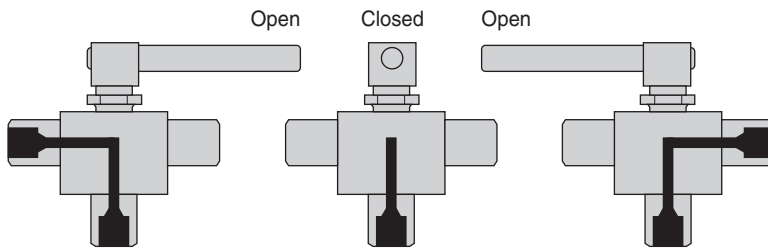
**.187 Orifice**



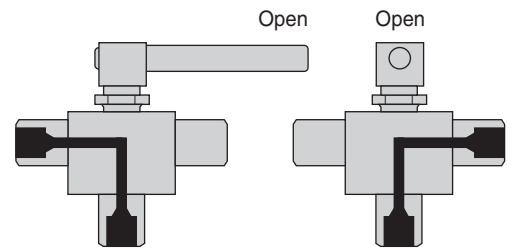
**.375 Orifice**



**.500 Orifice**



**180° Three-Way Ball Valve**



**90° Three-Way Diverter Valve**

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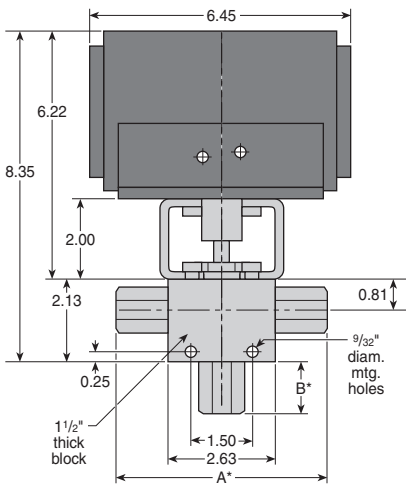
| Orifice | Tube Size | Connection | Pressure Rating | Minimum Orifice | C <sub>v</sub> | A    | B        | 3-Way 90°<br>Catalog No. | 3-Way 180°<br>Catalog No. |
|---------|-----------|------------|-----------------|-----------------|----------------|------|----------|--------------------------|---------------------------|
| .187    | 1/16"     | AF1        | 15,000 psi      | .052            | 0.04           | 4.19 | 0.55     | 15-73AF1                 | 15-72AF1                  |
|         | 1/8"      | AF2        | 15,000 psi      | .094            | 0.10           | 4.19 | 0.55     | 15-73AF2                 | 15-72AF2                  |
|         | 1/4"      | AF4        | 10,000 psi      | .125            | 0.22           | 4.69 | 0.83     | 10-73AF4                 | 10-72AF4                  |
|         | 3/8"      | AF6        | 10,000 psi      | .187            | 0.71           | 4.69 | 1.01     | 10-73AF6                 | 10-72AF6                  |
|         | 1/4"      | LF4        | 20,000 psi      | .109            | 0.15           | 4.63 | 1.00     | 20-73LF4                 | 20-72LF4                  |
|         | 3/8"      | LF6        | 20,000 psi      | .187            | 0.71           | 4.63 | 1.00     | 20-73LF6                 | 20-72LF6                  |
|         | 9/16"     | LF9        | 20,000 psi      | .187            | 0.71           | 5.13 | 1.25     | 20-73LF9                 | 20-72LF9                  |
|         | 1/4"      | HF4        | 20,000 psi      | .094            | 0.10           | 4.63 | 0.81     | 20-73HF4                 | 20-72HF4                  |
|         | 3/8"      | HF6        | 20,000 psi      | .125            | 0.22           | 4.63 | 0.94     | 20-73HF6                 | 20-72HF6                  |
|         | 9/16"     | HF9        | 20,000 psi      | .187            | 0.71           | 4.87 | 1.19     | 20-73HF9                 | 20-72HF9                  |
|         | 1/8"      | 1/8" NPT   | 15,000 psi      | .187            | 0.71           | 4.63 | 0.50     | 15-73NFA                 | 15-72NFA                  |
|         | 1/4"      | 1/4" NPT   | 15,000 psi      | .187            | 0.71           | 4.63 | 1.06     | 15-73NFB                 | 15-72NFB                  |
| 3/8"    | 3/8" NPT  | 15,000 psi | .187            | 0.71            | 4.65           | 1.06 | 15-73NFC | 15-72NFC                 |                           |
| .375    | 3/8"      | AF6        | 10,000 psi      | .250            | 1.07           | 5.13 | 0.75     | 10-76AF6                 | 10-75AF6                  |
|         | 9/16"     | LF9        | 15,000 psi      | .312            | 1.67           | 6.25 | 1.06     | 15-76LF9                 | 15-75LF9                  |
|         | 3/4"      | LF12       | 15,000 psi      | .375            | 2.40           | 6.67 | 1.18     | 15-76LF12                | 15-75LF12                 |
|         | 1"        | LF16       | 15,000 psi      | .375            | 2.40           | 7.45 | 1.99     | 15-76LF16                | 15-75LF16                 |
|         | 1/4"      | 1/4" NPT   | 15,000 psi      | .250            | 1.07           | 5.63 | 1.06     | 15-76NFB                 | 15-75NFB                  |
|         | 3/8"      | 3/8" NPT   | 15,000 psi      | .375            | 2.40           | 5.63 | 1.06     | 15-76NFC                 | 15-75NFC                  |
|         | 1/2"      | 1/2" NPT   | 15,000 psi      | .375            | 2.40           | 5.63 | 1.06     | 15-76NFD                 | 15-75NFD                  |
| .500    | 3/4"      | LF12       | 10,000 psi      | .500            | 7.43           | 6.56 | 1.30     | 10-82LF12                | 10-81LF12                 |
|         | 1"        | LF16       | 10,000 psi      | .500            | 7.43           | 7.44 | 1.74     | 10-82LF16                | 10-81LF16                 |
|         | 3/4"      | 3/4" NPT   | 10,000 psi      | .500            | 7.43           | 6.44 | 1.30     | 10-82NFF                 | 10-81NFF                  |
|         | 1"        | 1" NPT     | 10,000 psi      | .500            | 7.43           | 7.44 | 1.74     | 10-82NFH                 | 10-81NFH                  |

## Ball Valve Actuators

High Pressure Equipment Company offers air operated actuators to accommodate remote operation. **NOTE: These air operators are only for use with two-way and three-way diverter style valves.**

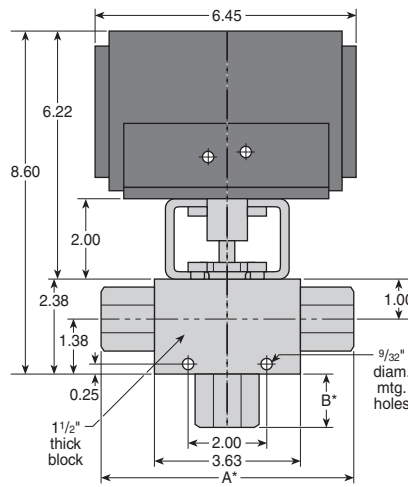
**To order:** simply specify the appropriate ball valve catalog number and add the suffix “-TSR8” for air to open/spring to close, or “-TDA8” for air to open and close (double acting) or TSR20 for 0.500 orifice. For trunion only.

Use TDA4 and TSR4 for floating ball style valves.



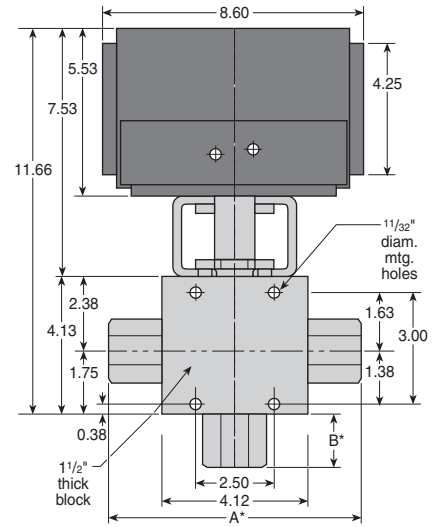
Dimensions in inches.  
\* Dimensions found within charts on pages 6.3-6.4

**.187 Orifice**



Dimensions in inches.  
\* Dimensions found within charts on pages 6.3-6.4

**.375 Orifice**



Dimensions in inches.  
\* Dimensions found within charts on pages 6.3-6.4

**.500 Orifice**

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# Ball Valves

## Subsea Ball Valves

In today's offshore oil and gas industry, wells have become deeper than ever, causing a growing demand for subsea ball valves that can withstand extreme pressures and harshest environments. As a leader in developing ways to provide effective shut off under increasing temperature and pressure requirements at greater depths, High Pressure Equipment offers subsea ball valves that provide safe and reliable operation at very high external pressures.

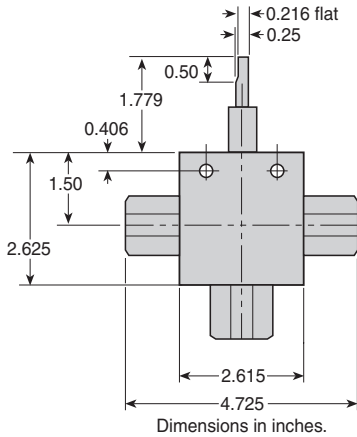
High Pressure Equipment's Subsea Ball Valves feature their reliable trunion style ball design and incorporate the required design modifications for ideal performance in critical subsea systems. HiP offers the industry's widest range of subsea valve sizes, these valves are available in 2 or 3 way configurations with 180° operation or 90° diverter styles in .187", .375" and .500" orifices and 10, 15 and 20,000 psi pressure ranges.

### Subsea Valve Features

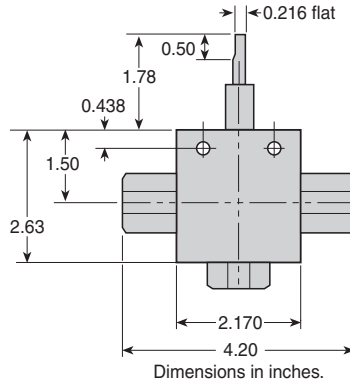
- Trunion style ball design
- 316 cold-worked SS construction
- Two and three-way valve configurations
- 90° diverter or 180° styles
- .187", .375" and .500" orifices
- PEEK ball seats, which offers excellent resistance to chemicals, heat and wear/abrasion
- Optional O-rings available
- Optional wetted materials
- Available to NACE MR-01-75



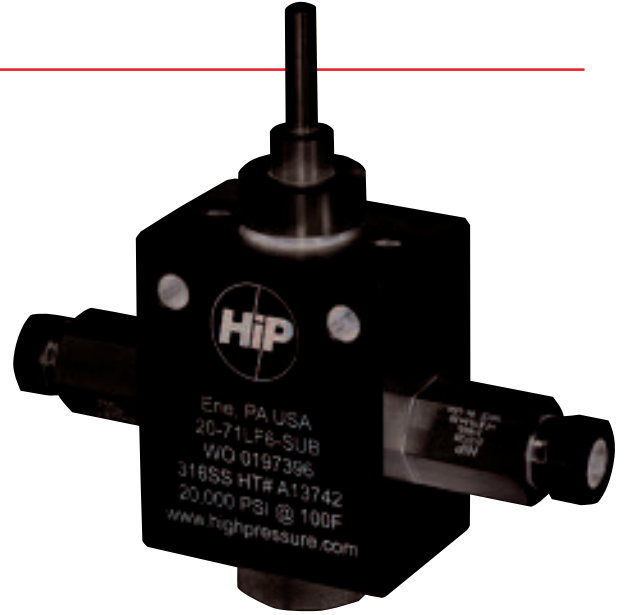
## .187 Orifice Subsea Ball Valves



**3-Way Ball Valve**



**2-Way Ball Valve**

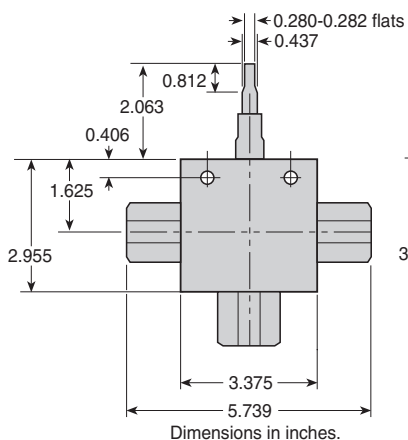


| Orifice                  | Tube Size | Connection | Pressure Rating | Minimum Orifice | Cv           | Catalog No.  |
|--------------------------|-----------|------------|-----------------|-----------------|--------------|--------------|
| 3-Way<br>180°            | 3/8"      | HF6        | 20,000 psi      | 0.125           | 0.22         | 20-72HF6-SUB |
|                          | 1/4"      | HF4        | 20,000 psi      | 0.094           | 0.10         | 20-72HF4-SUB |
|                          | 9/16"     | LF9        | 20,000 psi      | 0.187           | 0.71         | 20-72HF9-SUB |
|                          | 3/8"      | LF6        | 20,000 psi      | 0.187           | 0.71         | 20-72LF6-SUB |
|                          | 1/4"      | LF4        | 20,000 psi      | 0.109           | 0.15         | 20-72LF4-SUB |
|                          | 3/8"      | 3/8" NPT   | 15,000 psi      | 0.187           | 0.71         | 15-72NFC-SUB |
| 3-Way<br>90°<br>Diverter | 3/8"      | HF6        | 20,000 psi      | 0.125           | 0.22         | 20-73HF6-SUB |
|                          | 1/4"      | HF4        | 20,000 psi      | 0.094           | 0.10         | 20-73HF4-SUB |
|                          | 9/16"     | LF9        | 20,000 psi      | 0.187           | 0.71         | 20-73LF9-SUB |
|                          | 3/8"      | LF6        | 20,000 psi      | 0.187           | 0.71         | 20-73LF6-SUB |
|                          | 1/4"      | LF4        | 20,000 psi      | 0.109           | 0.15         | 20-73LF4-SUB |
|                          | 3/8"      | 3/8" NPT   | 15,000 psi      | 0.187           | 0.71         | 15-73NFC-SUB |
| 2-Way                    | 1/4"      | 1/4" NPT   | 15,000 psi      | 0.187           | 0.71         | 15-73NFB-SUB |
|                          | 9/16"     | HF9        | 20,000 psi      | 0.187           | 1.45         | 20-71HF9-SUB |
|                          | 3/8"      | HF6        | 20,000 psi      | 0.125           | 0.45         | 20-71HF6-SUB |
|                          | 1/4"      | HF4        | 20,000 psi      | 0.094           | 0.20         | 20-71HF4-SUB |
|                          | 9/16"     | LF9        | 20,000 psi      | 0.187           | 1.45         | 20-71LF9-SUB |
|                          | 3/8"      | LF6        | 20,000 psi      | 0.187           | 1.45         | 20-71LF6-SUB |
|                          | 1/4"      | LF4        | 20,000 psi      | 0.109           | 0.31         | 20-71LF4-SUB |
|                          | 1/2"      | 1/2" NPT   | 15,000 psi      | 0.187           | 1.45         | 15-71NFD-SUB |
|                          | 3/8"      | 3/8" NPT   | 15,000 psi      | 0.187           | 1.45         | 15-71NFC-SUB |
| 1/4"                     | 1/4" NPT  | 15,000 psi | 0.187           | 1.45            | 15-71NFB-SUB |              |
| 1/8"                     | 1/8" NPT  | 15,000 psi | 0.187           | 1.45            | 15-71NFA-SUB |              |

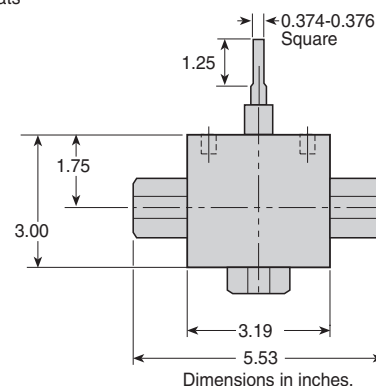
**8**

# Ball Valves

## .375 Orifice Subsea Ball Valves



**3-Way Ball Valve**



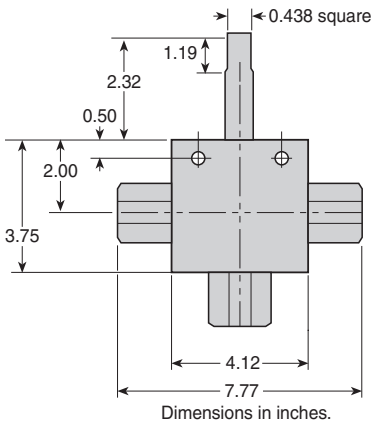
**2-Way Ball Valve**

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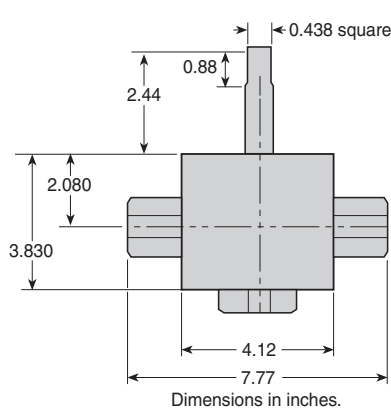
| Orifice                  | Tube Size | Connection | Pressure Rating | Minimum Orifice | Cv   | Catalog No.   |
|--------------------------|-----------|------------|-----------------|-----------------|------|---------------|
| 3-Way<br>180°            | 3/4"      | LF12       | 15,000 psi      | 0.375           | 2.40 | 15-75LF12-SUB |
|                          | 9/16"     | LF9        | 15,000 psi      | 0.312           | 1.67 | 15-75LF9-SUB  |
|                          | 3/8"      | LF6        | 15,000 psi      | 0.203           | 0.81 | 15-75LF6-SUB  |
|                          | 1/2"      | 1/2" NPT   | 15,000 psi      | 0.375           | 2.40 | 15-75NFD-SUB  |
|                          | 3/8"      | 3/8" NPT   | 15,000 psi      | 0.375           | 2.40 | 15-75NFC-SUB  |
|                          | 1/4"      | 1/4" NPT   | 15,000 psi      | 0.250           | 1.07 | 15-75NFB-SUB  |
| 3-Way<br>90°<br>Diverter | 3/4"      | LF12       | 15,000 psi      | 0.375           | 2.40 | 15-76LF12-SUB |
|                          | 9/16"     | LF9        | 15,000 psi      | 0.312           | 1.67 | 15-76LF9-SUB  |
|                          | 3/8"      | LF6        | 15,000 psi      | 0.203           | 0.81 | 15-76LF6-SUB  |
|                          | 1/2"      | 1/2" NPT   | 15,000 psi      | 0.375           | 2.40 | 15-76NFD-SUB  |
|                          | 3/8"      | 3/8" NPT   | 15,000 psi      | 0.375           | 2.40 | 15-76NFC-SUB  |
|                          | 1/4"      | 1/4" NPT   | 15,000 psi      | 0.250           | 1.07 | 15-76NFB-SUB  |
| 2-Way                    | 3/4"      | LF12       | 15,000 psi      | 0.375           | 6.08 | 15-74LF12-SUB |
|                          | 9/16"     | LF9        | 15,000 psi      | 0.312           | 4.22 | 15-74LF9-SUB  |
|                          | 3/8"      | LF6        | 15,000 psi      | 0.203           | 2.20 | 15-74LF6-SUB  |
|                          | 1/2"      | 1/2" NPT   | 15,000 psi      | 0.375           | 6.08 | 15-74NFD-SUB  |
|                          | 3/8"      | 3/8" NPT   | 15,000 psi      | 0.375           | 6.08 | 15-74NFC-SUB  |
|                          | 1/4"      | 1/4" NPT   | 15,000 psi      | 0.250           | 2.70 | 15-74NFB-SUB  |

## **.500 Orifice Subsea Ball Valves**

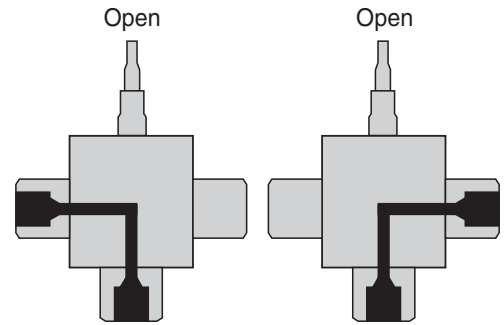
| Orifice                  | Tube Size | Connection | Pressure Rating | Minimum Orifice | Cv   | Catalog No.   |
|--------------------------|-----------|------------|-----------------|-----------------|------|---------------|
| 3-Way<br>180°            | 1"        | 1" NPT     | 10,000 psi      | .500            | 4.40 | 10-81NFH-SUB  |
|                          | 3/4"      | 3/4" NPT   | 10,000 psi      | .500            | 4.40 | 10-81NFF-SUB  |
|                          | 1"        | LF16       | 10,000 psi      | .500            | 4.40 | 10-81LF16-SUB |
|                          | 3/4"      | LF12       | 10,000 psi      | .500            | 4.40 | 10-81LF12-SUB |
| 3-Way<br>90°<br>Diverter | 1"        | 1" NPT     | 10,000 psi      | .500            | 4.40 | 10-82NFH-SUB  |
|                          | 3/4"      | 3/4" NPT   | 10,000 psi      | .500            | 4.40 | 10-82NFF-SUB  |
|                          | 1"        | LF16       | 10,000 psi      | .500            | 4.40 | 10-82LF16-SUB |
|                          | 3/4"      | LF12       | 10,000 psi      | .500            | 4.40 | 10-82LF12-SUB |
| 2-Way                    | 1"        | 1" NPT     | 10,000 psi      | .500            | 10.2 | 10-80NFH-SUB  |
|                          | 3/4"      | 3/4" NPT   | 10,000 psi      | .500            | 10.2 | 10-80NFF-SUB  |
|                          | 1"        | LF16       | 10,000 psi      | .500            | 10.2 | 10-80LF16-SUB |
|                          | 3/4"      | LF12       | 10,000 psi      | .500            | 10.2 | 10-80LF12-SUB |



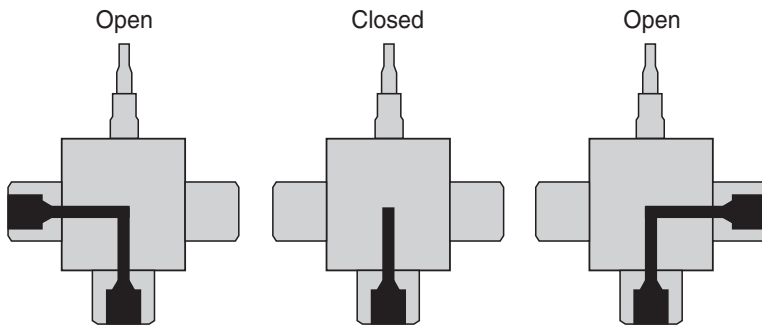
**3-Way Ball Valve**



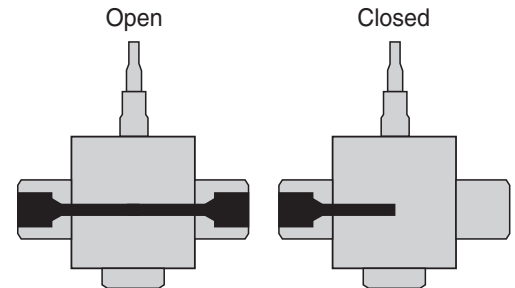
**2-Way Ball Valve**



**90° Three-Way Diverter Valve**



**180° Three-Way Ball Valve**



**Two-Way Valve**

**8**