



# 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.



### Ball Valves Index

Free Floating Ball Valves . . . . .	70
Severe Duty Trunion Style Ball Valves . . . . .	71-72
Ball Valve Actuators . . . . .	73
Subsea Ball Valves . . . . .	74-77

### Relief Valves Index

Metal Seat Relief Valves . . . . .	78
Soft Seat Relief Valves . . . . .	79
Field Adjustable Relief Valves . . . . .	80

### Block & Bleed Valves Index

Block and Bleed Needle Valves . . . . .	81
Double Block and Bleed Needle Valves . . . . .	82
Double Block and Bleed Ball Valves . . . . .	83

# Ball Valves

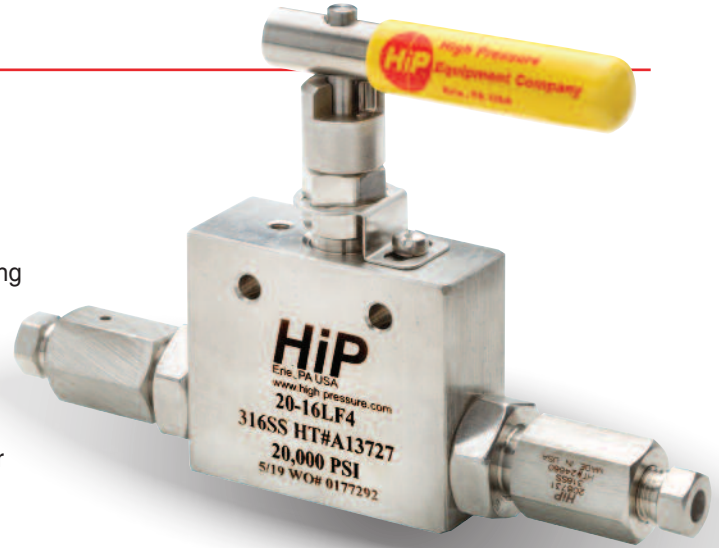
## Ball Valves

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

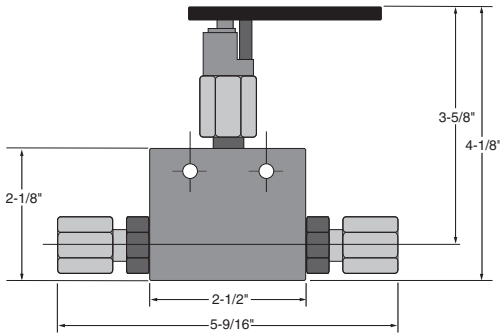
High Pressure Equipment offers two styles of ball valves (free floating and trunion) to provide effective shut-off of liquid or gas flow.

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.

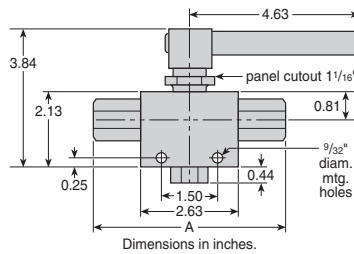
## Severe Duty Ball Valves (Trunion Style) 10,000, 15,000 and 20,000 psi service

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".

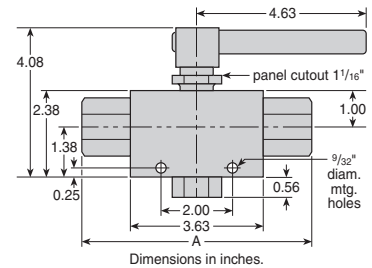
The two-way ball valve offers complete shut-off with a convenient 1/4 turn. The standard configuration of the three-way ball valve requires 1/2 turn to change port outlets and provides for complete shut-off. An optional diverter style three-way ball valve requires only a 1/4 turn to change the port outlets.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

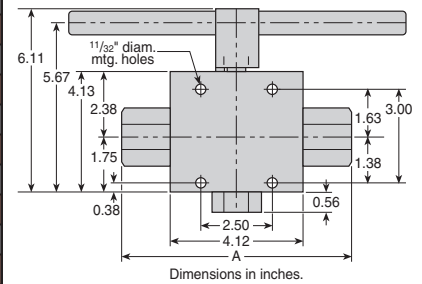
- Trunion style closure, ideal for severe duty applications
- Two-way and three-way valve configurations
- Three-way, 1/4 turn diverter valve
- .187", .375", .500" or 1.000" orifices
- Air actuators for remote operation
- Convenient panel mount design (cut 1 1/16" diameter hole) .187 and .375 only
-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



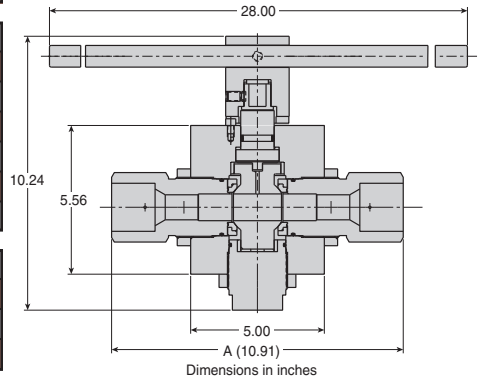
**.187 Orifice**



**.375 Orifice**



**.500 Orifice**



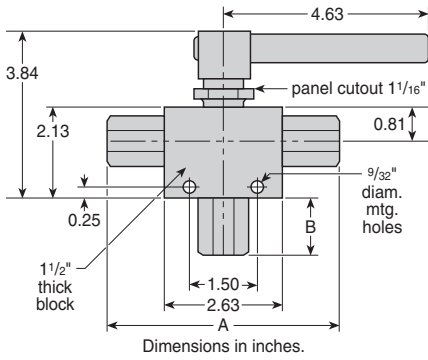
**1.000 Orifice**

## Two-Way Trunion Ball Valves - 90°

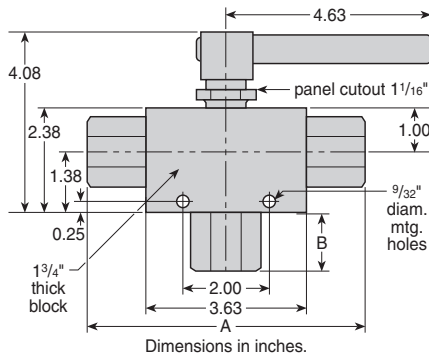
Orifice	Tube Size	Connection	Pressure Rating	Minimum Orifice	C <sub>v</sub>	A	Catalog No.
.187	1/16"	AF1	15,000 psi	.052	0.09	4.19	15-71AF1
	1/8"	AF2	15,000 psi	.094	0.20	4.19	15-71AF2
	1/4"	AF4	10,000 psi	.125	0.45	4.69	10-71AF4
	3/8"	AF6	10,000 psi	.187	1.45	4.69	10-71AF6
	1/4"	LF4	20,000 psi	.109	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

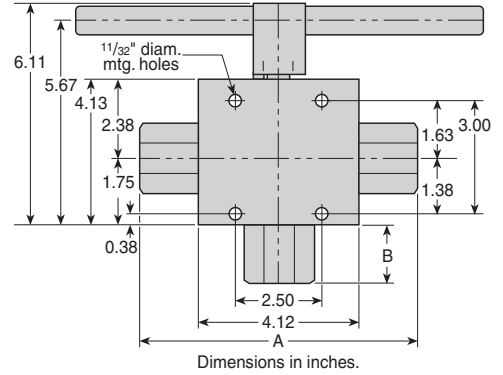
## Three-Way Trunion Ball Valves



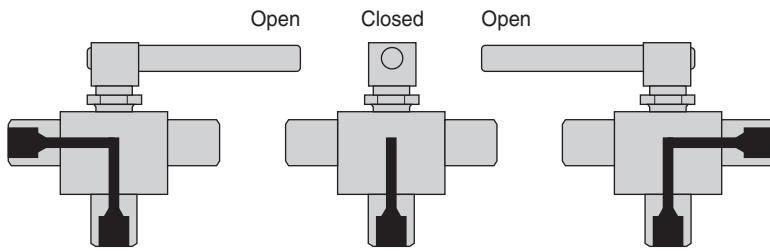
**.187 Orifice**



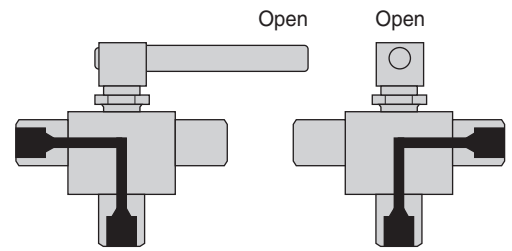
**.375 Orifice**



**.500 Orifice**



**180° Three-Way Ball Valve**



**90° Three-Way Diverter Valve**

8

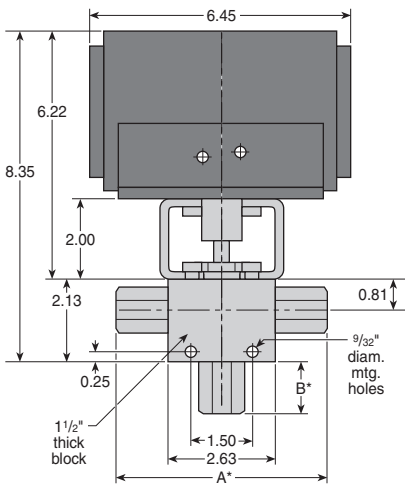
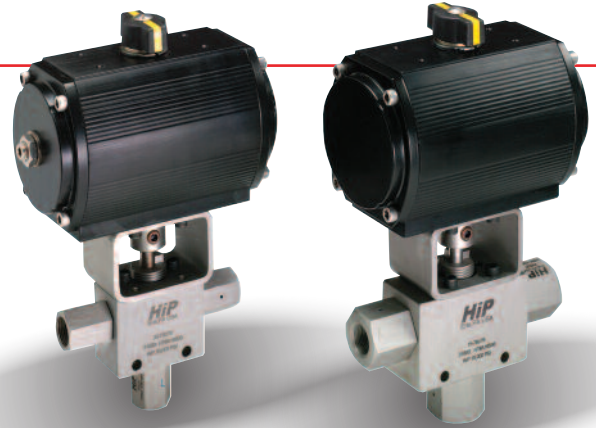
Orifice	Tube Size	Connection	Pressure Rating	Minimum Orifice	C <sub>v</sub>	A	B	3-Way 90° Catalog No.	3-Way 180° Catalog No.
.187	1/16"	AF1	15,000 psi	.052	0.04	4.19	0.55	15-73AF1	15-72AF1
	1/8"	AF2	15,000 psi	.094	0.10	4.19	0.55	15-73AF2	15-72AF2
	1/4"	AF4	10,000 psi	.125	0.22	4.69	0.83	10-73AF4	10-72AF4
	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.**

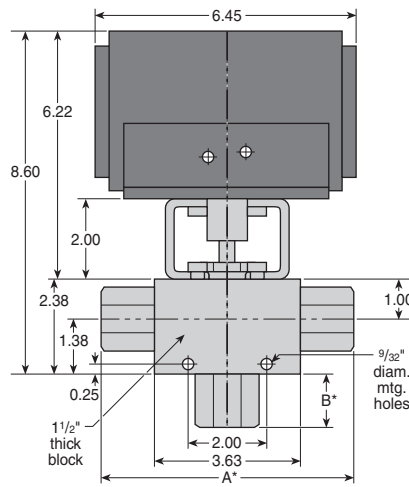
**To order:** simply specify the appropriate ball valve catalog number and add the suffix “-TSR8” for air to open/spring to close, or “-TDA8” for air to open and close (double acting) or TSR20 for 0.500 orifice. For trunion only.

Use TDA4 and TSR4 for floating ball style valves.



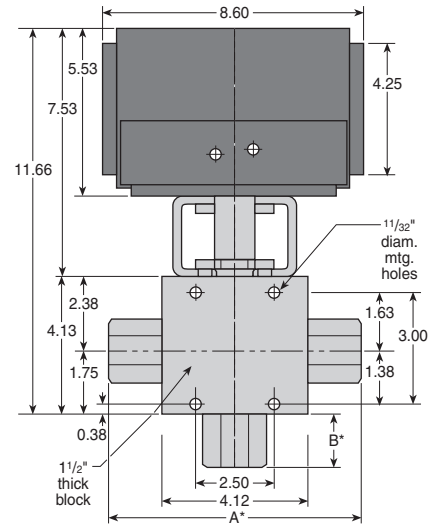
Dimensions in inches.  
\* Dimensions found within charts on pages 6.3-6.4

**.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**

**8**



# 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.

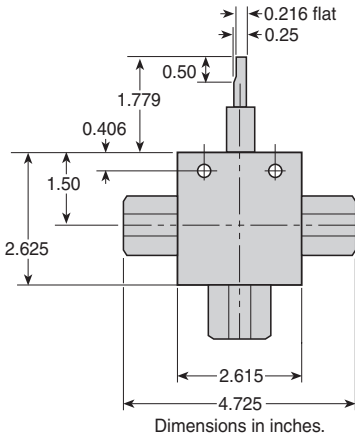
High Pressure Equipment's Subsea Ball Valves feature their reliable trunion style ball design and incorporate the required design modifications for ideal performance in critical subsea systems. HiP offers the industry's widest range of subsea valve sizes, these valves are available in 2 or 3 way configurations 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

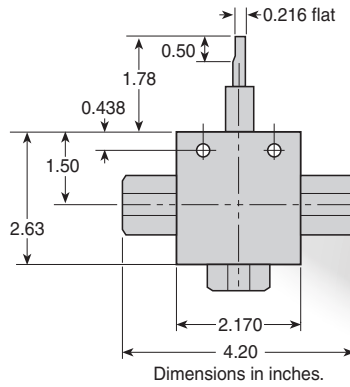
- Trunion style ball design
- 316 cold-worked SS construction
- Two and three-way valve configurations
- 90° diverter or 180° styles
- .187", .375" and .500" orifices
- PEEK ball seats, which offers excellent resistance to chemicals, heat and wear/abrasion
- Optional O-rings available
- Optional wetted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



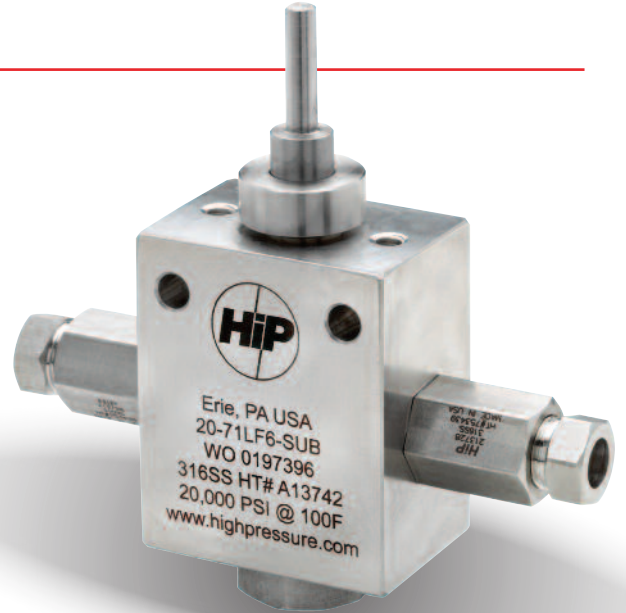
## .187 Orifice Subsea Ball Valves



**3-Way Ball Valve**



**2-Way Ball Valve**

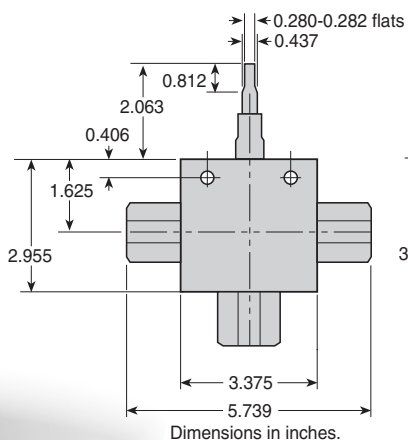
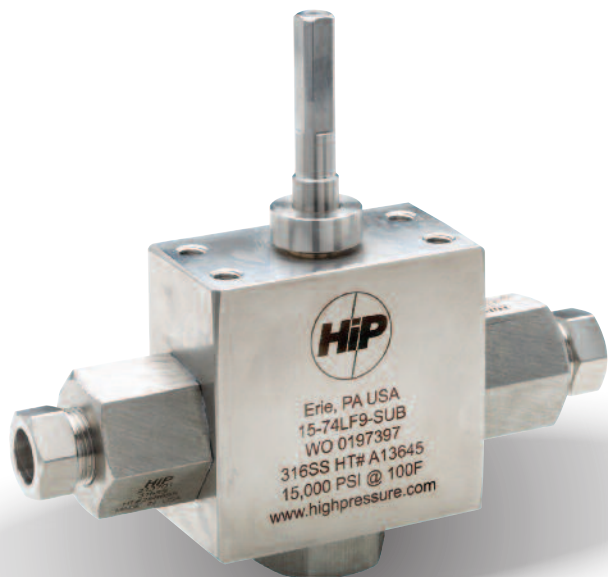


Orifice	Tube Size	Connection	Pressure Rating	Minimum Orifice	Cv	Catalog No.
3-Way 180°	3/8"	HF6	20,000 psi	0.125	0.22	20-72HF6-SUB
	1/4"	HF4	20,000 psi	0.094	0.10	20-72HF4-SUB
	9/16"	LF9	20,000 psi	0.187	0.71	20-72HF9-SUB
	3/8"	LF6	20,000 psi	0.187	0.71	20-72LF6-SUB
	1/4"	LF4	20,000 psi	0.109	0.15	20-72LF4-SUB
	3/8"	3/8" NPT	15,000 psi	0.187	0.71	15-72NFC-SUB
3-Way 90° 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	

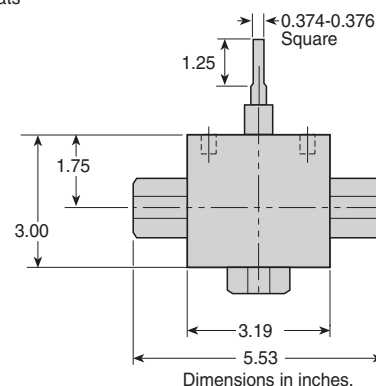
8

# Ball Valves

## .375 Orifice Subsea Ball Valves



**3-Way Ball Valve**



**2-Way Ball Valve**

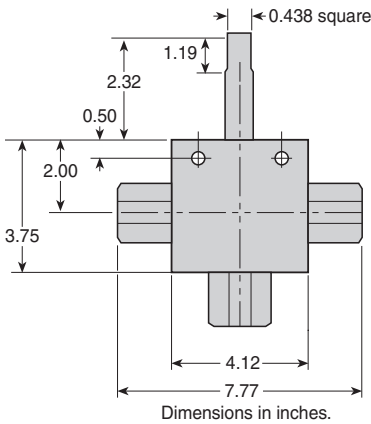
8

Orifice	Tube Size	Connection	Pressure Rating	Minimum Orifice	Cv	Catalog No.
3-Way 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 90° 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

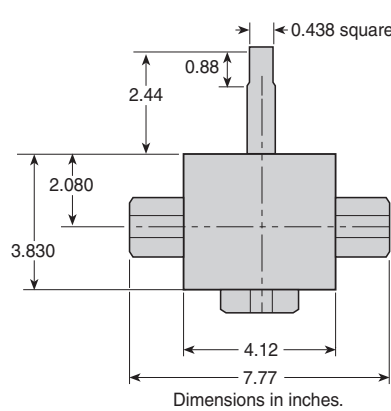


## **.500 Orifice Subsea Ball Valves**

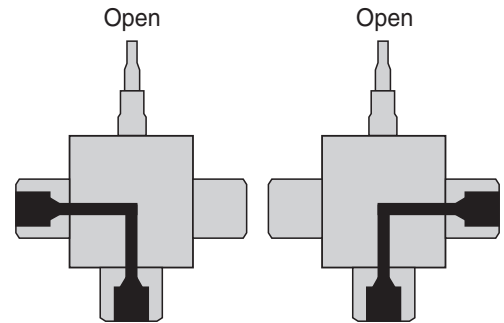
Orifice	Tube Size	Connection	Pressure Rating	Minimum Orifice	Cv	Catalog No.
3-Way 180°	1"	1" NPT	10,000 psi	.500	4.40	10-81NFH-SUB
	3/4"	3/4" NPT	10,000 psi	.500	4.40	10-81NFF-SUB
	1"	LF16	10,000 psi	.500	4.40	10-81LF16-SUB
	3/4"	LF12	10,000 psi	.500	4.40	10-81LF12-SUB
3-Way 90° Diverter	1"	1" NPT	10,000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



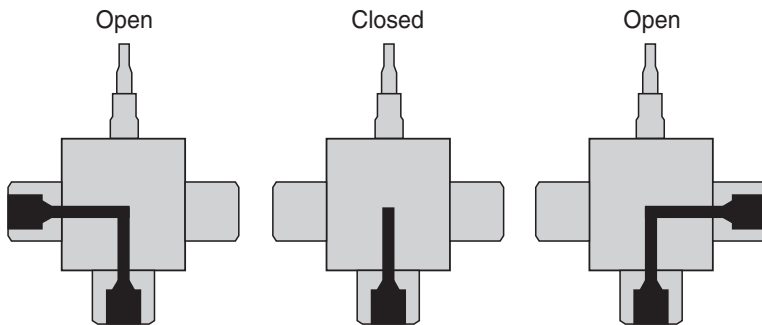
**3-Way Ball Valve**



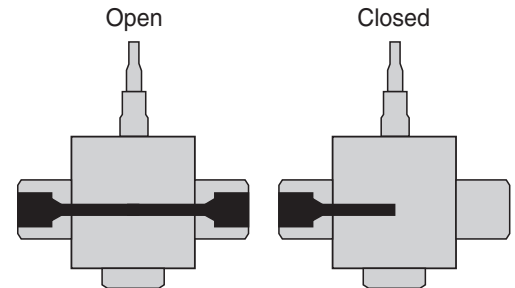
**2-Way Ball Valve**



**90° Three-Way Diverter Valve**



**180° Three-Way Ball Valve**



**Two-Way Valve**

**8**