

Ball Valves

Subsea Series

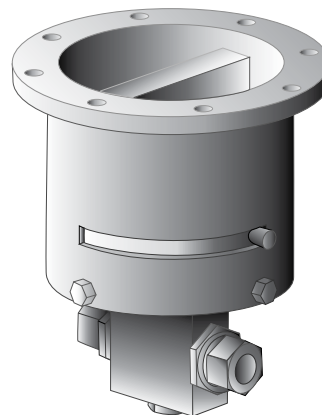
*Internal Pressures to 20,000 psi (1379 bar)
Water Depths to 12,500 ft (3810 meters)*

Autoclave Engineers subsea ball valves have been designed to fulfill the ever growing demand in the petroleum industry as well as the need for externally pressurized components in other markets. Utilizing the same design technology as the standard ball valve, the subsea design incorporates the necessary design alterations to provide a reliable externally pressurized valve for the subsea industry.

With the availability of fittings, tubing, and related equipment our ball valves can provide all your needs on high-pressure applications above or below the surface.

AE Ball Valve Features:

- One-piece, trunnion mounted style, stem design eliminates shear failure found in two-piece designs.
- Re-torqueable seat glands for longer seat life.
- PEEK seats which offer excellent resistance to chemicals, heat, and wear/abrasion.
- Full-port flow path minimizes pressure drop.
- 316 cold worked stainless steel construction.
- Buna-N o-ring standard 250°F (121°C) max.
- Low friction pressure assisted graphite filled Teflon stem seal increases cycle life.
- Wide selection of tube and pipe end fittings available.
- Available to NACE MR-01-75.
- Optional wetted materials.
- Available in a number of flow configurations and port sizes.
- Standard 3/4" and 1" orifice 2-way ball valves available. Consult factory.



Adaptable for Remote Operated Vehicle (ROV) operation by customer

Applications:

- Subsea hydraulic manifolds
- Subsea control panels
- Subsea trees

**Autoclave
Engineers**

Fluid Components
Division of Snap-tite, Inc.
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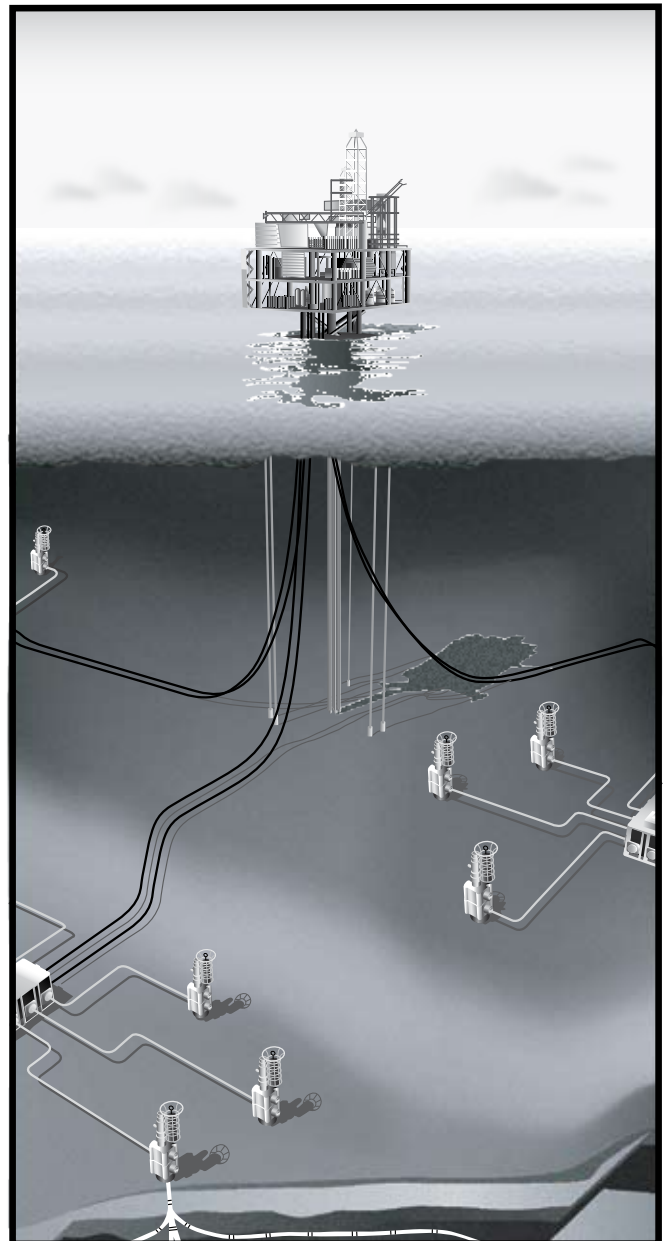
The Autoclave Engineers ball valves can be utilized to switch or isolate flow. The standard material of construction of the valve is 316 cold worked stainless steel with PEEK seats, graphite filled Teflon stem seal, and o-ring material as required by the process fluid.

The subsea ball valve design incorporates additional o-ring seals, which prevent the ingress of seawater into the valve which would adversely affect the operation of the valve as well as contaminate the process fluid. A significant feature of the subsea design is a thrust washer positioned under the stem preventing outside sea water from moving the stem from it's aligned position.



Subsea ball valves are designed to facilitate operation by a Remote Operated vehicle (ROV). ROV operator assemblies are used for valve mounting and to provide positive stopping for precise 90° operation.

Various tube and pipe connections are available throughout a variety of valve configurations with standard port sizes from 3/16" to 1". Contact Autoclave Engineers technical sales support or your local distributor for more information on optional materials of construction, seal materials and ROV operator designs to fit your application requirements.



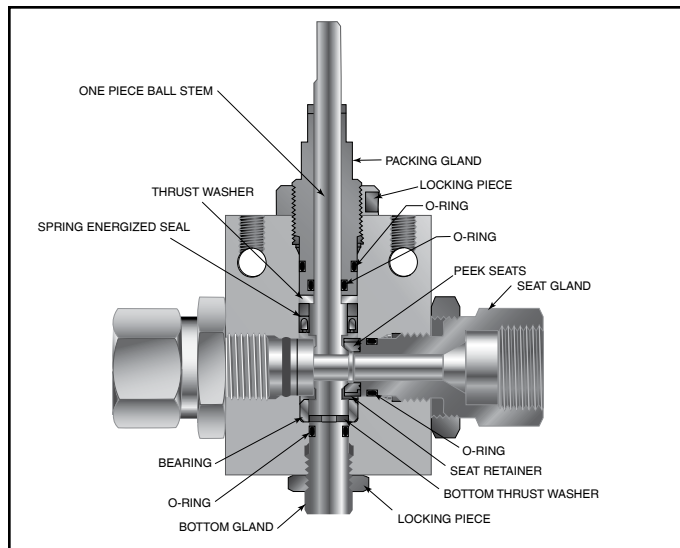
Ball Valves - 2-Way Subsea Series (1/4" Orifice)

Pressures to 20,000 psi (1379 bar) .250" (6.35mm) Orifice

Connection	MAWP @ Room Temperature	Minimum Orifice inches(mm)
W125	15,000 psi (1034 bar)	.094 (2.39)
SW250	15,000 psi (1034 bar)	.128 (3.25)
SW375	15,000 psi (1034 bar)	.250 (6.35)
SW500	10,000 psi (690 bar)	.250 (6.35)
SF250CX20	20,000 psi (1379 bar)	.109 (2.77)
SF375CX20	20,000 psi (1379 bar)	.203 (5.16)
SF562CX20	20,000 psi (1379 bar)	.250 (6.35)
F250C	20,000 psi (1379 bar)	.094 (2.39)
F375C	20,000 psi (1379 bar)	.125 (3.17)
F562C	20,000 psi (1379 bar)	.188 (4.77)
1/8" NPT	15,000 psi (1034 bar)	.250 (6.35)
1/4" NPT	15,000 psi (1034 bar)	.250 (6.35)
3/8" NPT	15,000 psi (1034 bar)	.250 (6.35)
1/2" NPT	15,000 psi (1034 bar)	.250 (6.35)

Valve C_V=1.51

MAWP: Maximum Allowable Working Pressure
C_V listed is for maximum orifice size of .250 inches only.
Consult factory for C_V of valves with reduced orifice sizes.



NOTE: Ball valves are not recommended for critical gas applications such as Hydrogen, Helium or other small molecular gases.

Ordering Procedure

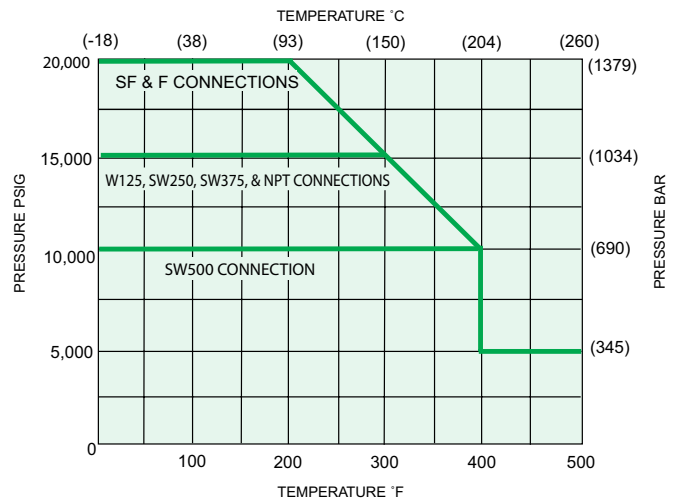
For complete information on available end connections, see next page. 2-way ball valves are furnished complete with tube or pipe connections. Standard valve has Buna-N o-rings [250°F (121°C)] max.

Typical catalog number: **S2B 4 S 20 M9**

S2B	4	S	20	M9	XXX
Valve Series Subsea-2-way	Ball Orifice Diameter 4-1/4" (6.35mm)	Material S - 316SS (For material options contact factory)	Pressure (X 1000 psi)	End Connection M9 - SF562CX20 (See Chart on next page)	Options V - Viton: 400°F (204°C) max EPDM - Ethylene Propylene: 250°F (121°C) max HT - Perfluoroelastomer: 500°F (260°C) max



PRESSURE TEMPERATURE RATINGS



Maximum temperature rating is determined by the o-ring material (see descriptions below).

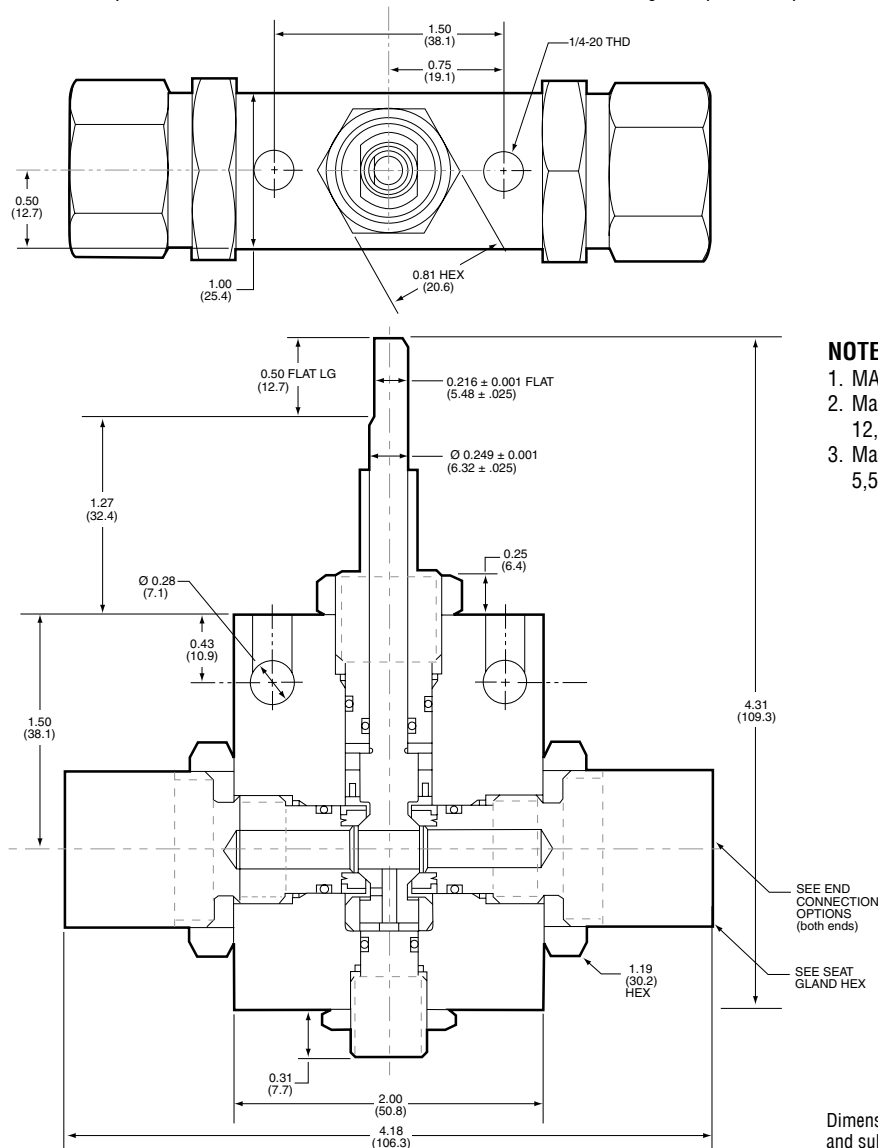
Maximum pressure rating is determined by the end connection (see table above).

End Connection Options

Catalog Number	End Connection Number	Connection	MAWP @ Room Temperature	Seat Gland Hex Inches(mm)
S2B4S15L2	L2	W125	15,000 psi (1034 bar)	1 (25.40)
S2B4S15L4	L4	SW250	15,000 psi (1034 bar)	1 (25.40)
S2B4S15L6	L6	SW375	15,000 psi (1034 bar)	1 (25.40)
S2B4S10L8	L8	SW500	10,000 psi (690 bar)	1 (25.40)
S2B4S20M4	M4	SF250CX20	20,000 psi (1379 bar)	1 (25.40)
S2B4S20M6	M6	SF375CX20	20,000 psi (1379 bar)	1 (25.40)
S2B4S20M9	M9	SF562CX20	20,000 psi (1379 bar)	1 (25.40)
S2B4S20H4	H4	F250C	20,000 psi (1379 bar)	1 (25.40)
S2B4S20H6	H6	F375C	20,000 psi (1379 bar)	1 (25.40)
S2B4S20H9	H9	F562C	20,000 psi (1379 bar)	1.38 (35.05)
S2B4S15P2	P2	1/8" NPT	15,000 psi (1034 bar)	1 (25.40)
S2B4S15P4	P4	1/4" NPT	15,000 psi (1034 bar)	1 (25.40)
S2B4S15P6	P6	3/8" NPT	15,000 psi (1034 bar)	1 (25.40)
S2B4S15P8	P8	1/2" NPT	15,000 psi (1034 bar)	1.38 (35.05)

MAWP: Maximum Allowable Working Pressure

See ball valve option/details section for end connection details, material, and high temperature options.



NOTE:

1. MAWP (See Table)
2. Maximum Sea Depth
12,500 FT (3811 meters)
3. Maximum External Pressure
5,500 psi (379 bar)

Dimensions for reference only
and subject to change.

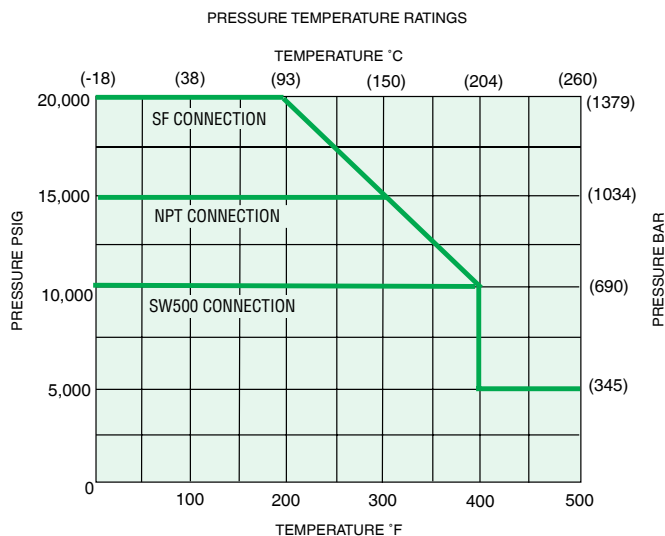
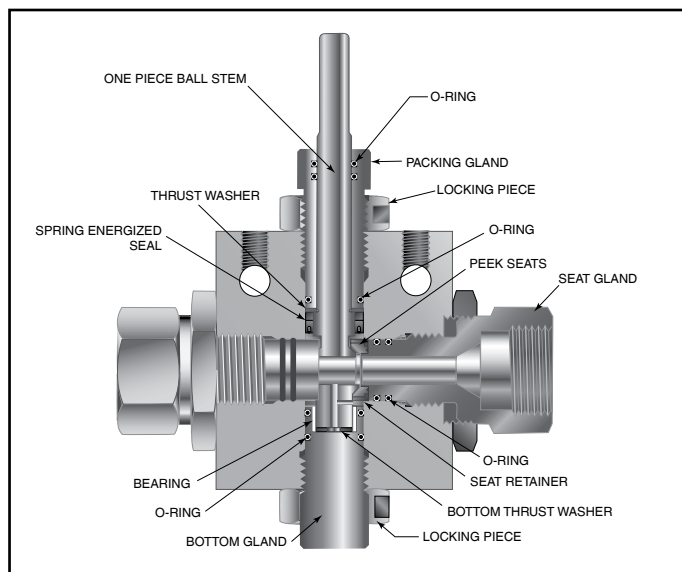
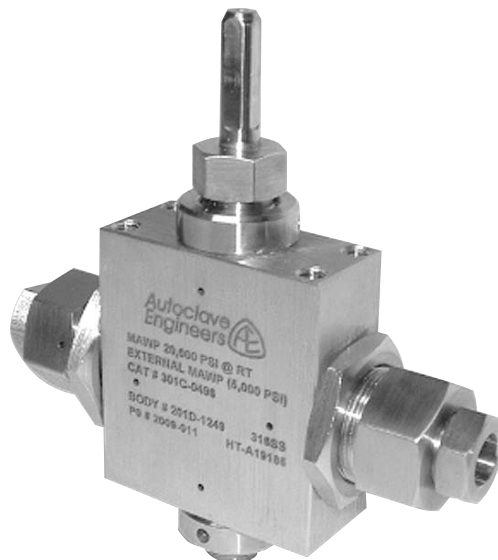
Ball Valves - 2-Way Subsea Series (3/8" Orifice)

Pressures to 20,000 psi (1379 bar) .375" (9.52mm) Orifice

Connection	MAWP @ Room Temperature	Minimum Orifice inches(mm)
SW500	10,000 psi (690 bar)	.375 (9.52)
SF375CX20	20,000 psi (1379 bar)	.203 (5.16)
SF562CX20	20,000 psi (1379 bar)	.312 (7.92)
SF750CX20	20,000 psi (1379 bar)	.328 (8.33)
1/4" NPT	15,000 psi (1034 bar)	.375 (9.52)
3/8" NPT	15,000 psi (1034 bar)	.375 (9.52)
1/2" NPT	15,000 psi (1034 bar)	.375 (9.52)

Valve C_v=3.51

MAWP: Maximum Allowable Working Pressure
C_v listed is for maximum orifice size of .375 inches only.
Consult factory for C_v of valves with reduced orifice sizes.



Maximum temperature rating is determined by the o-ring material (see descriptions below).

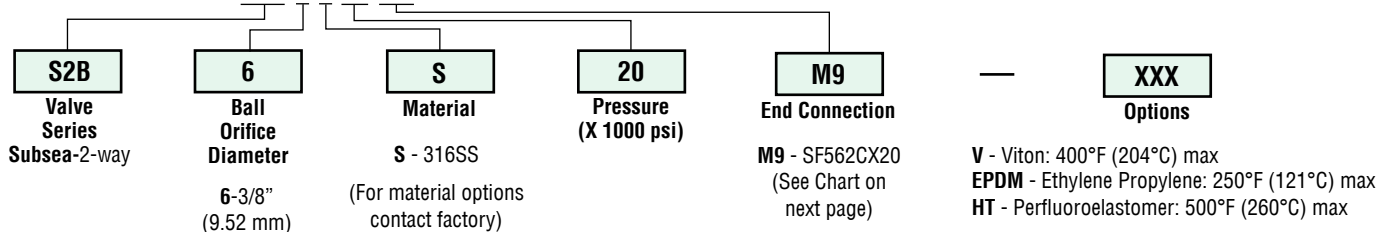
Maximum pressure rating is determined by the end connection (see table above).

NOTE: Ball valves are not recommended for critical gas applications such as Hydrogen, Helium or other small molecular gases.

Ordering Procedure

For complete information on available end connections, see next page. 2-way ball valves are furnished complete with tube or pipe connections. Standard valve has Buna-N o-rings [250°F (121°C)] max.

Typical catalog number: **S2B 6 S 20 M9**

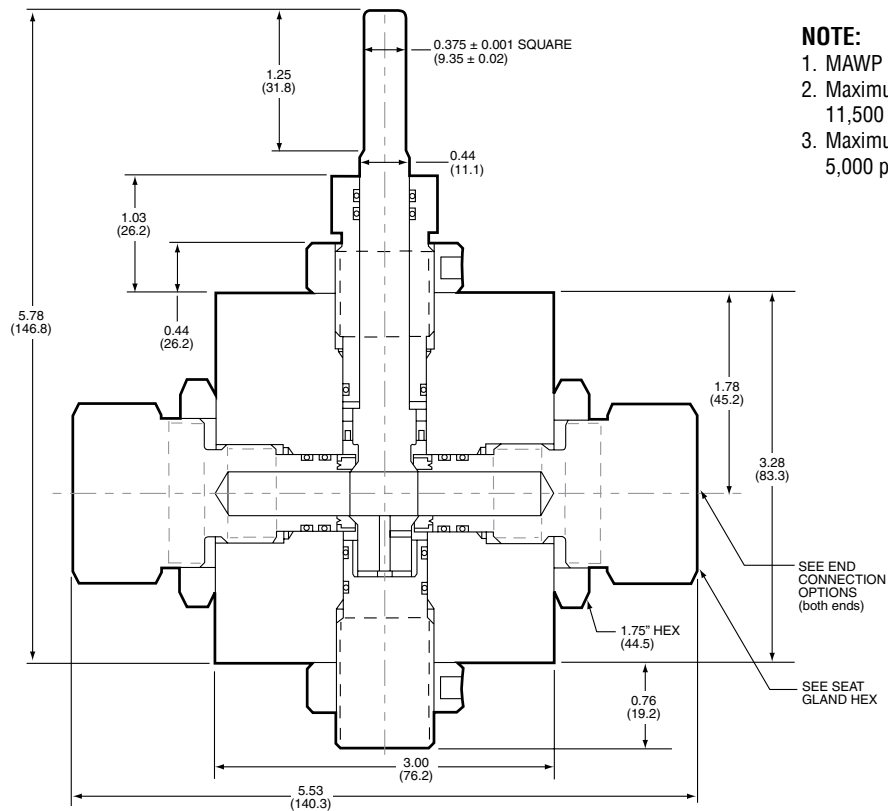
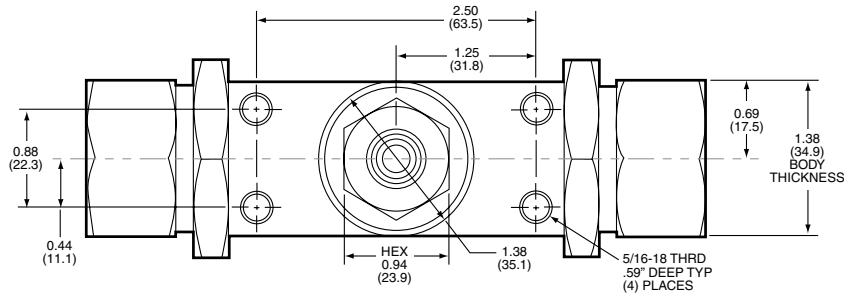


End Connection Options

Catalog Number	End Connection Number	Connection	MAWP @ Room Temperature	Seat Gland Hex Inches(mm)
S2B6S10L8	L8	SW500	10,000 psi (690 bar)	1.38 (35.05)
S2B6S20M6	M6	SF375CX20	20,000 psi (1379 bar)	1.38 (35.05)
S2B6S20M9	M9	SF562CX20	20,000 psi (1379 bar)	1.38 (35.05)
S2B6S20M12	M12	SF750CX20	20,000 psi (1379 bar)	1.38 (35.05)
S2B6S15P4	P4	1/4" NPT	15,000 psi (1034 bar)	1.38 (35.05)
S2B6S15P6	P6	3/8" NPT	15,000 psi (1034 bar)	1.38 (35.05)
S2B6S15P8	P8	1/2" NPT	15,000 psi (1034 bar)	1.38 (35.05)

MAWP: Maximum Allowable Working Pressure

See ball valve option/details section for end connection details, material, and high temperature options.



NOTE:

1. MAWP (See Table)
2. Maximum Sea Depth
11,500 FT (3505 meters)
3. Maximum External Pressure
5,000 psi (345 bar)

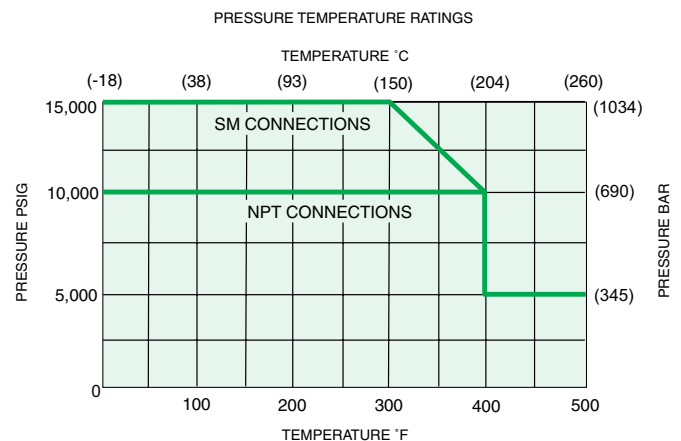
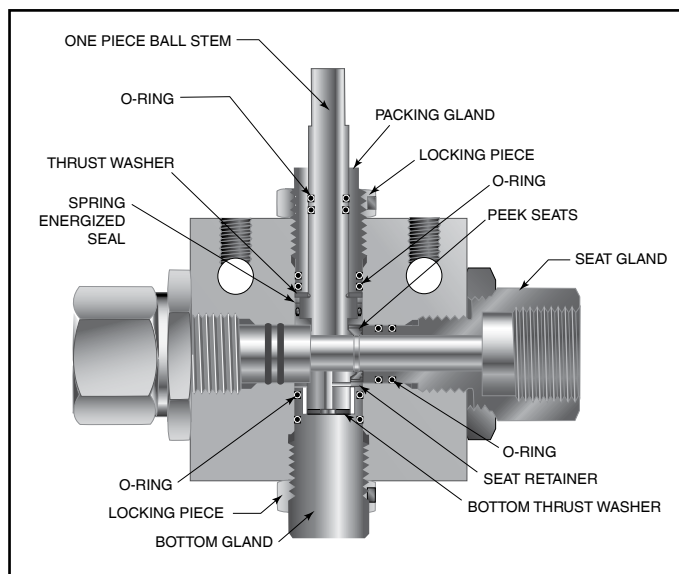
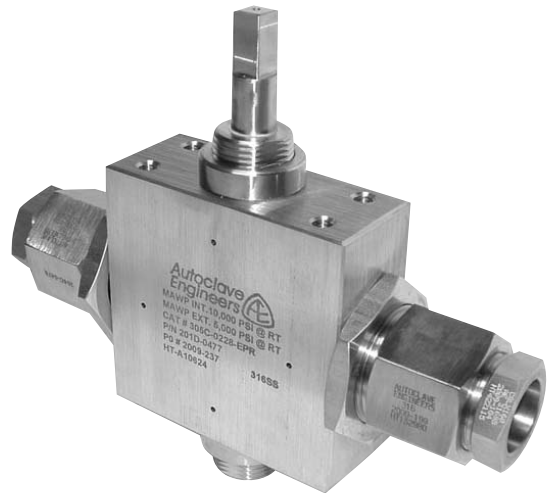
Dimensions for reference only
and subject to change.

Ball Valves - 2-Way Subsea Series (1/2" Orifice)

Pressures to 15,000 psi (1034 bar) .500" (12.7mm) Orifice

Connection	MAWP @ Room Temperature	Minimum Orifice Inches (mm)
SF750CX20	15,000 psi (1034 bar)	.500 (12.70)
SF1000CX20	15,000 psi (1034 bar)	.500 (12.70)
3/4" NPT	10,000 psi (690 bar)	.500 (12.70)
1" NPT	10,000 psi (690 bar)	.500 (12.70)
Valve C _v =10.20		

MAWP: Maximum Allowable Working Pressure



Maximum temperature rating is determined by the o-ring material (see descriptions below).

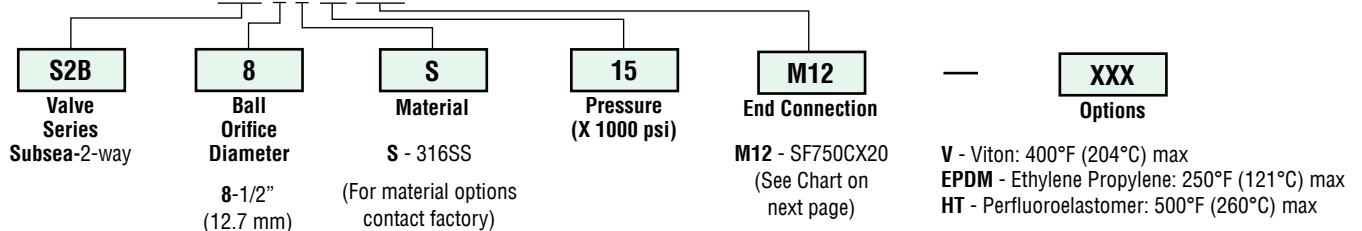
Maximum pressure rating is determined by the end connection (see table above).

NOTE: Ball valves are not recommended for critical gas applications such as Hydrogen, Helium or other small molecular gases.

Ordering Procedure

For complete information on available end connections, see next page. 2-way ball valves are furnished complete with tube or pipe connections. Standard valve has Buna-N o-rings [250°F (121°C)] max.

Typical catalog number: **S2B 8 S 15 M12**

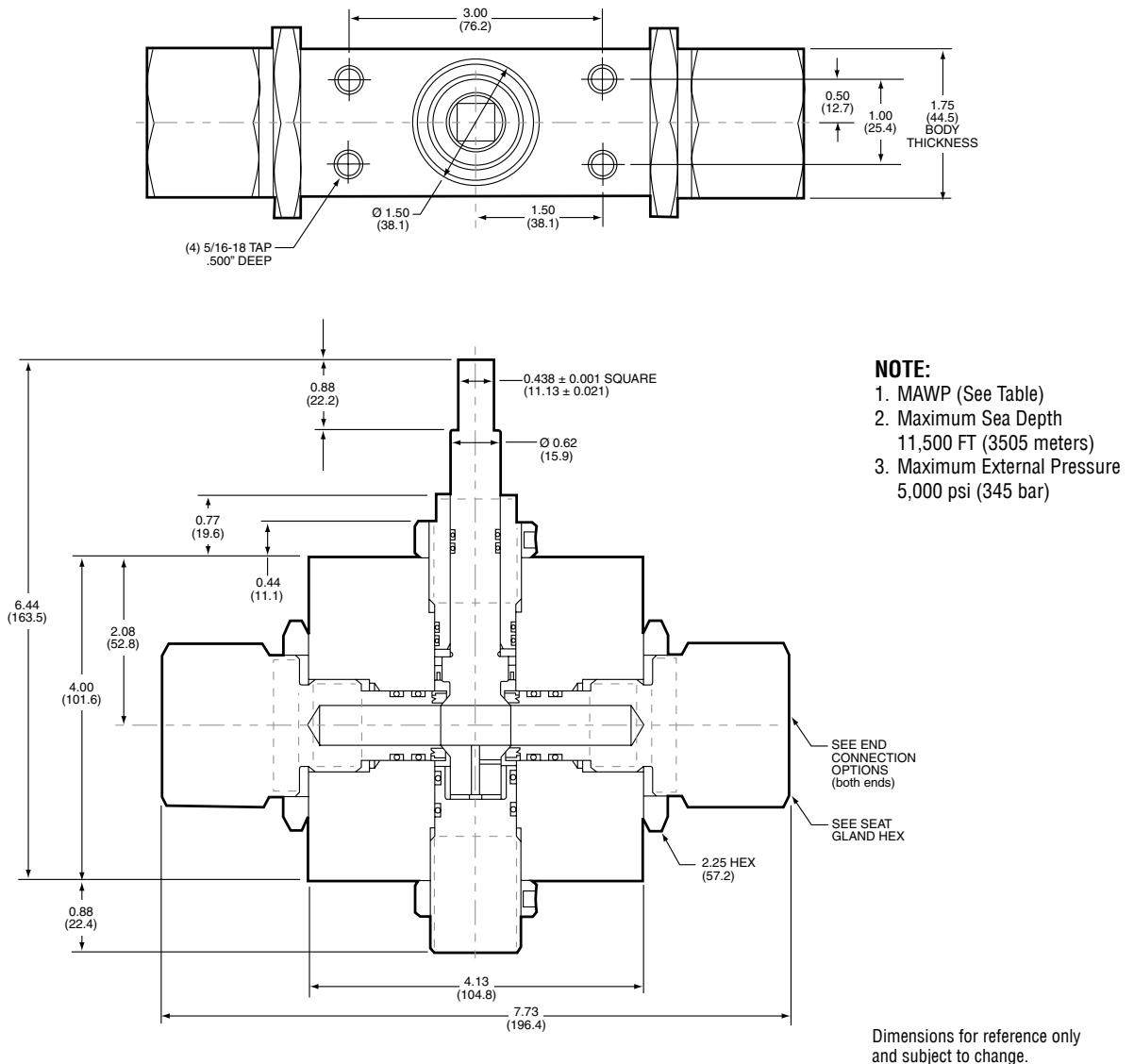


End Connection Options

Catalog Number	End Connection Number	Connection	MAWP @ Room Temperature	Seat Gland Hex Inches(mm)
S2B8S15M12	M12	SF750CX20	15,000 psi (1034 bar)	1.75 (44.5)
S2B8S15M16	M16	SF1000CX20	15,000 psi (1034 bar)	1.75 (44.5)
S2B8S10P12	P12	3/4" NPT	10,000 psi (690 bar)	1.75 (44.5)
S2B8S10P16	P16	1" NPT	10,000 psi (690 bar)	1.75 (44.5)

MAWP: Maximum Allowable Working Pressure

See ball valve option/details section for end connection details, material, and high temperature options.



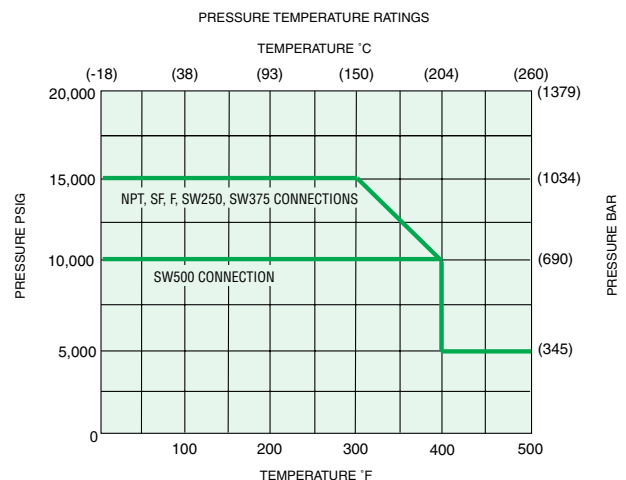
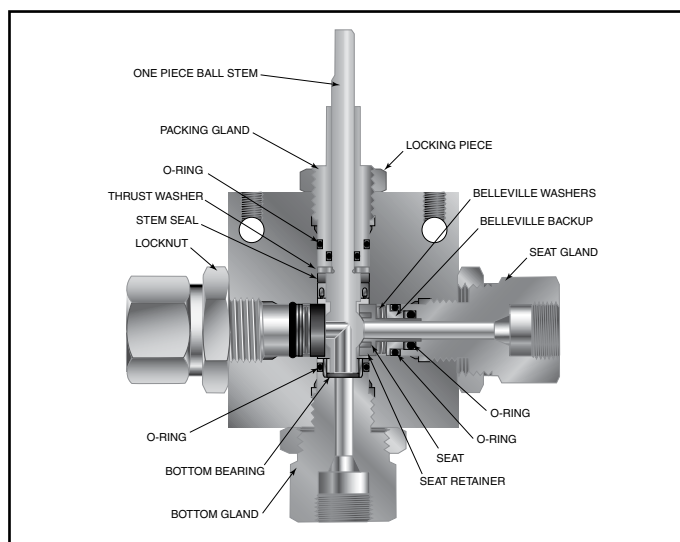
Ball Valves - 3-Way Subsea Series (3/16" Orifice)

Pressures to 15,000 psi (1034 bar) .187" (4.77mm) Orifice

Connection	MAWP @ Room Temperature	Minimum Orifice inches(mm)
SF250CX20	15,000 psi (1034 bar)	.109 (2.77)
SF375CX20	15,000 psi (1034 bar)	.188 (4.77)
SF562CX20	15,000 psi (1034 bar)	.188 (4.77)
F250C	15,000 psi (1034 bar)	.094 (2.39)
F375C	15,000 psi (1034 bar)	.125 (3.17)
1/4" NPT	15,000 psi (1034 bar)	.188 (4.77)
3/8" NPT	15,000 psi (1034 bar)	.188 (4.77)

Valve $C_v = .50$

MAWP: Maximum Allowable Working Pressure
 C_v listed is for maximum orifice size of .188 inches only.
 Consult factory for C_v of valves with reduced orifice sizes.



Maximum temperature rating is determined by the o-ring material (see descriptions below).

Maximum pressure rating is determined by the end connection (see table above).

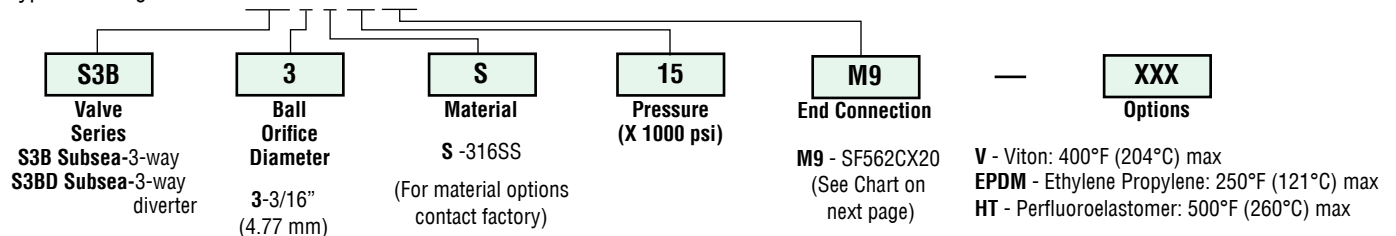
Note: Side inlet pressure not recommended. Bottom inlet pressure only.

NOTE: Ball valves are not recommended for critical gas applications such as Hydrogen, Helium or other small molecular gases.

Ordering Procedure

For complete information on available end connections, see next page. 3-way ball valves are furnished complete with tube or pipe connections. Standard valve has Buna-N o-rings [250°F (121°C)] max.

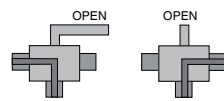
Typical catalog number: **S3B 3 S 15 M9**



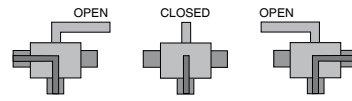
End Connection Options

Catalog Number	End Connection Number	Connection	MAWP @ Room Temperature	Seat Gland Hex Inches(mm)
S3B3S15M4 S3BD3S15M4	M4	SF250CX20	15,000 psi (1034 bar)	1 (25.40)
S3B3S15M6 S3BD3S15M6	M6	SF375CX20	15,000 psi (1034 bar)	1 (25.40)
S3B3S15M9 S3BD3S15M9	M9	SF562CX20	15,000 psi (1034 bar))	1 (25.40)
S3B3S15H4 S3BD3S15H4	H4	F250C	15,000 psi (1034 bar)	1 (25.40)
S3B3S15H6 S3BD3S15H6	H6	F375C	15,000 psi (1034 bar)	1 (25.40)
S3B3S15P4 S3BD3S15P4	P4	1/4" NPT	15,000 psi (1034 bar)	1 (25.40)
S3B3S15P6 S3BD3S15P6	P6	3/8" NPT	15,000 psi (1034 bar)	1 (25.40)

See ball valve option/detail section for end connection details, material, and high temperature options.

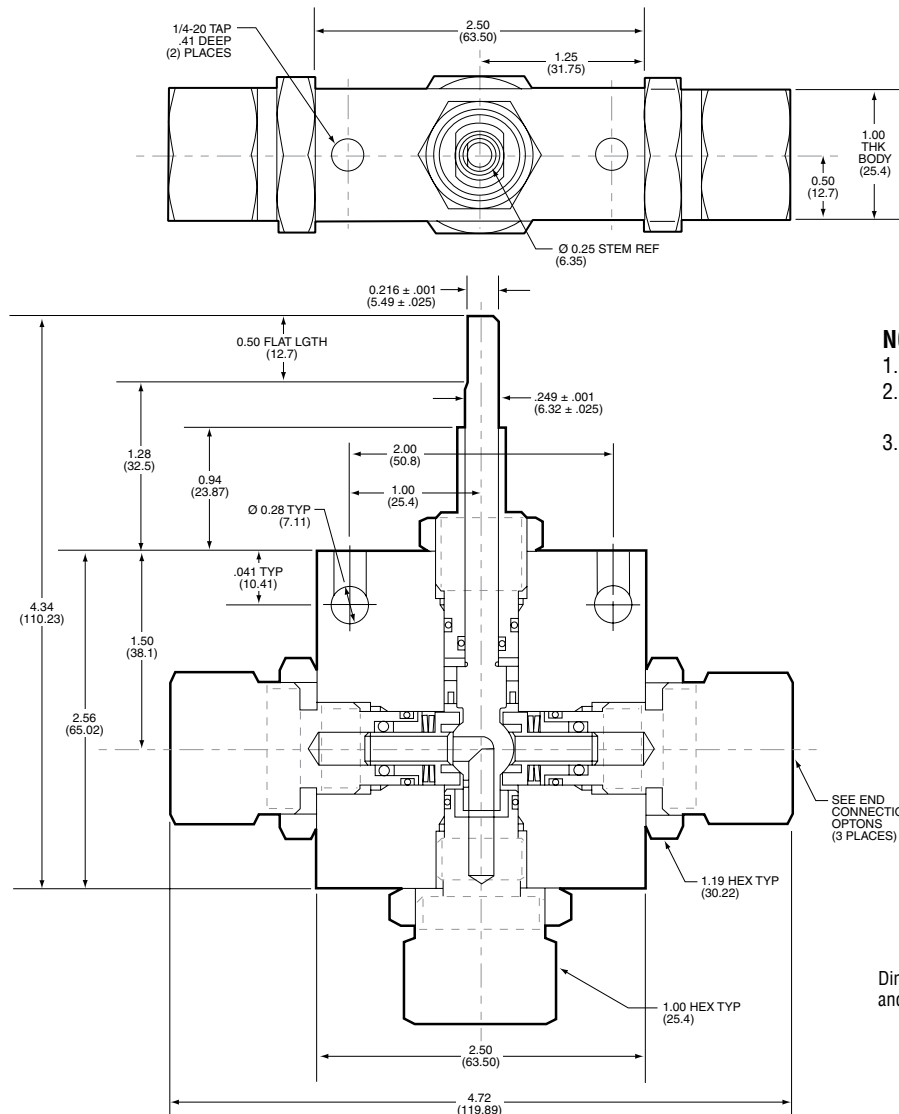


*3-Way Diverter Valve
90° Turn



3-Way Ball Valve
180° Turn

*The Diverter Valve design permits inlet flow through the bottom port. Outlet flow may be diverted to either valve side port.



NOTE:

1. MAWP (See Table)
2. Maximum Sea Depth
10,300 FT (3140 meters)
3. Maximum External Pressure
4,500 psi (310 bar)

SEE END
CONNECTION
OPTIONS
(3 PLACES)

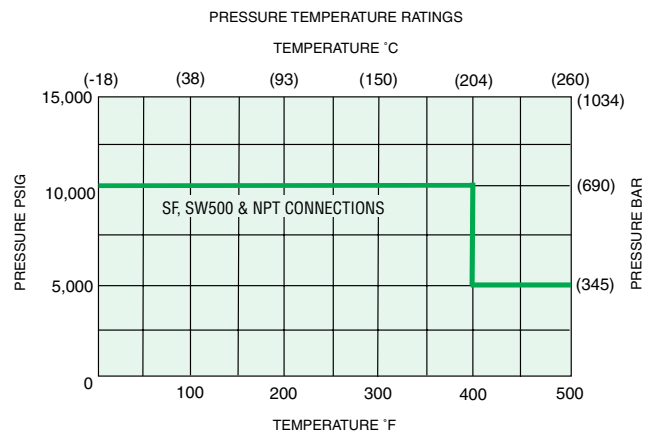
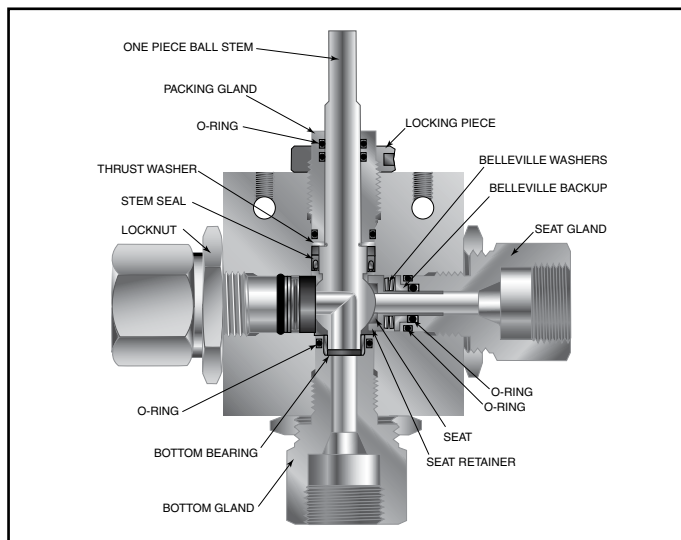
Dimensions for reference only
and subject to change.

Ball Valves - 3-Way Subsea Series (3/8" Orifice)

Pressures to 10,000 psi (689 bar) .328" (8.33mm) Orifice

Connection	MAWP @ Room Temperature	Minimum Orifice inches(mm)
SW500	10,000 psi (690 bar)	.328 (8.33)
SF375CX20	10,000 psi (690 bar)	.203 (5.16)
SF562CX20	10,000 psi (690 bar)	.312 (7.92)
SF750CX20	10,000 psi (690 bar)	.328 (8.33)
1/4" NPT	10,000 psi (690 bar)	.328 (8.33)
3/8" NPT	10,000 psi (690 bar)	.328 (8.33)
1/2" NPT	10,000 psi (690 bar)	.328 (8.33)
Valve C _V =2.1		

MAWP: Maximum Allowable Working Pressure
C_V listed is for maximum orifice size of .328 inches only.
Consult factory for C_V of valves with reduced orifice sizes.



Maximum temperature rating is determined by the o-ring material (see descriptions below).

Maximum pressure rating is determined by the end connection (see table above).

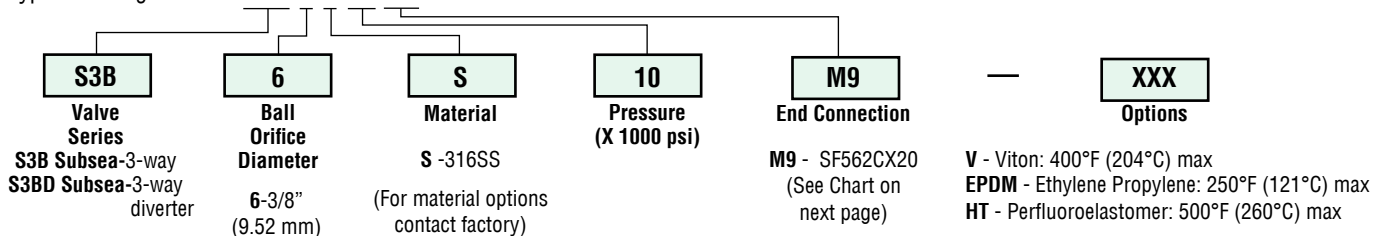
Note: Side inlet pressure not recommended. Bottom inlet pressure only.

NOTE: Ball valves are not recommended for critical gas applications such as Hydrogen, Helium or other small molecular gases.

Ordering Procedure

For complete information on available end connections, see next page. 3-way ball valves are furnished complete with tube or pipe connections. Standard valve has Buna-N o-rings [250°F (121°C)] max.

Typical catalog number: **S3B 6 S 10 M9**

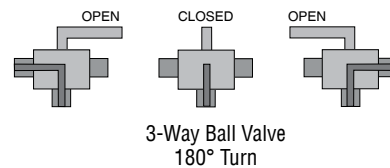
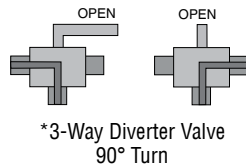


End Connection Options

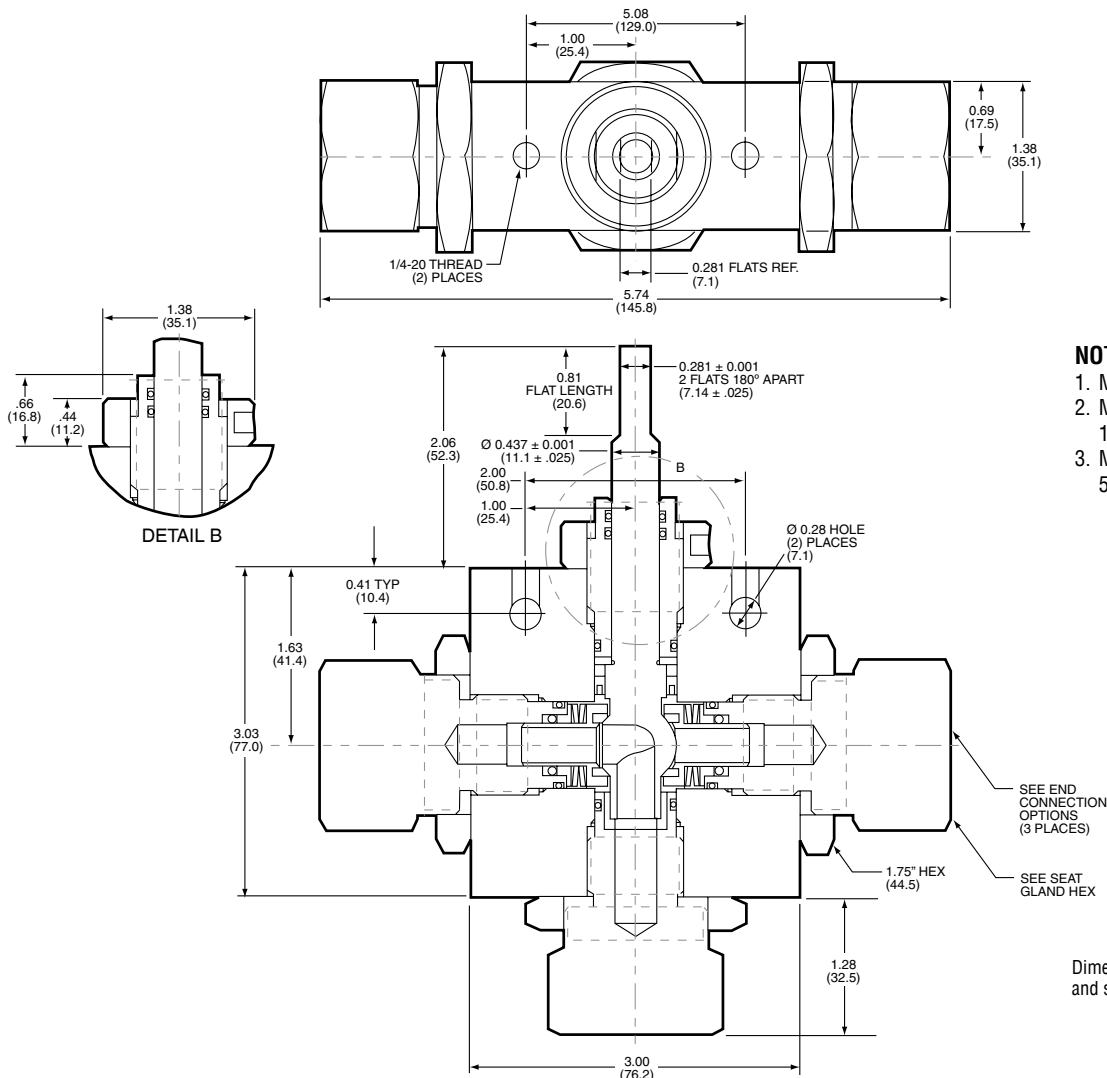
Catalog Number	End Connection Number	Connection	MAWP @ Room Temperature	Seat Gland Hex Inches(mm)
S3B6S10L8 S3BD6S10L8	L8	SW500	10,000 psi (690 bar)	1.38 (35.05)
S3B6S10M6 S3BD6S10M6	M6	SF375CX20	10,000 psi (690 bar)	1.38 (35.05)
S3B6S10M9 S3BD6S10M9	M9	SF562CX20	10,000 psi (690 bar)	1.38 (35.05)
S3B6S10M12 S3BD6S10M12	M12	SF750CX20	10,000 psi (690 bar)	1.38 (35.05)
S3B6S10P4 S3BD6S10P4	P4	1/4" NPT	10,000 psi (690 bar)	1.38 (35.05)
S3B6S10P6 S3BD6S10P6	P6	3/8" NPT	10,000 psi (690 bar)	1.38 (35.05)
S3B6S10P8 S3BD6S10P8	P8	1/2" NPT	10,000 psi (690 bar)	1.38 (35.05)

MAWP: Maximum Allowable Working Pressure

See ball valve option/details section for end connection details, material, and high temperature options.



*The Diverter Valve design permits inlet flow through the bottom port. Outlet flow may be diverted to either valve side port.



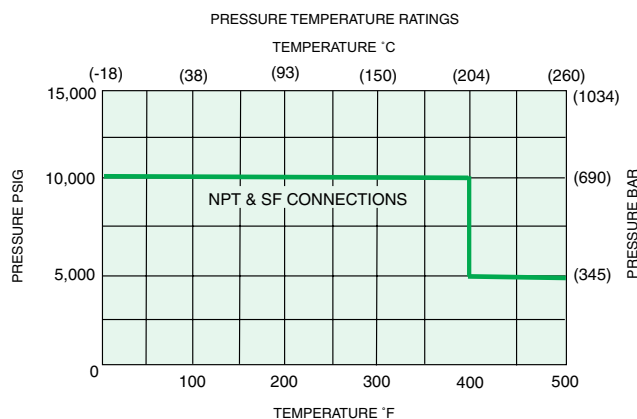
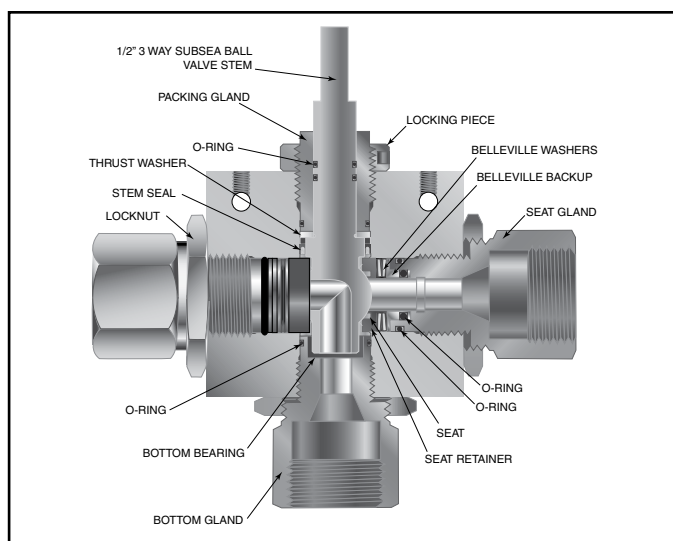
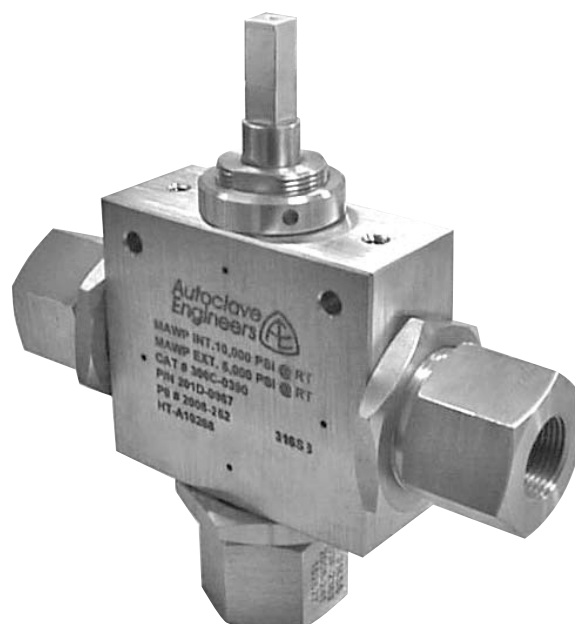
Dimensions for reference only and subject to change.

Ball Valves - 3-Way Subsea Series (1/2" Orifice)

Pressures to 10,000 psi (690 bar) .500" (12.7mm) Orifice

Connection	MAWP @ Room Temperature	Minimum Orifice inches(mm)
SF750CX20	10,000 psi (690 bar)	.500 (12.70)
SF1000CX20	10,000 psi (690 bar)	.500 (12.70)
3/4" NPT	10,000 psi (690 bar)	.500 (12.70)
1" NPT	10,000 psi (690 bar)	.500 (12.70)
Valve C _v =4.4		

MAWP: Maximum Allowable Working Pressure



Maximum temperature rating is determined by the o-ring material (see descriptions below).

Maximum pressure rating is determined by the end connection (see table above).

Note: Side inlet pressure not recommended. Bottom inlet pressure only.

NOTE: Ball valves are not recommended for critical gas applications such as Hydrogen, Helium or other small molecular gases.

Ordering Procedure

For complete information on available end connections, see next page. 3-way ball valves are furnished complete with tube or pipe connections. Standard valve has Buna-N o-rings [250°F (121°C)] max.

Typical catalog number: **S3B 8 S 10 M12**

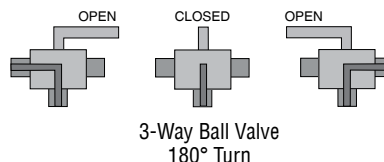
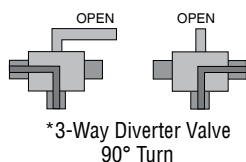
S3B	8	S	10	M12	XXX
Valve Series	Ball Orifice Diameter	Material	Pressure (X 1000 psi)	End Connection	Options
S3B Subsea-3-way S3BD Subsea-3-way diverter	8-1/2" (12.7 mm)	S-316SS (For material options contact factory)		M12 - SF750CX20 (See Chart on next page)	V - Viton: 400°F (204°C) max EPDM - Ethylene Propylene: 250°F (121°C) max HT - Perfluoroelastomer: 500°F (260°C) max

End Connection Options

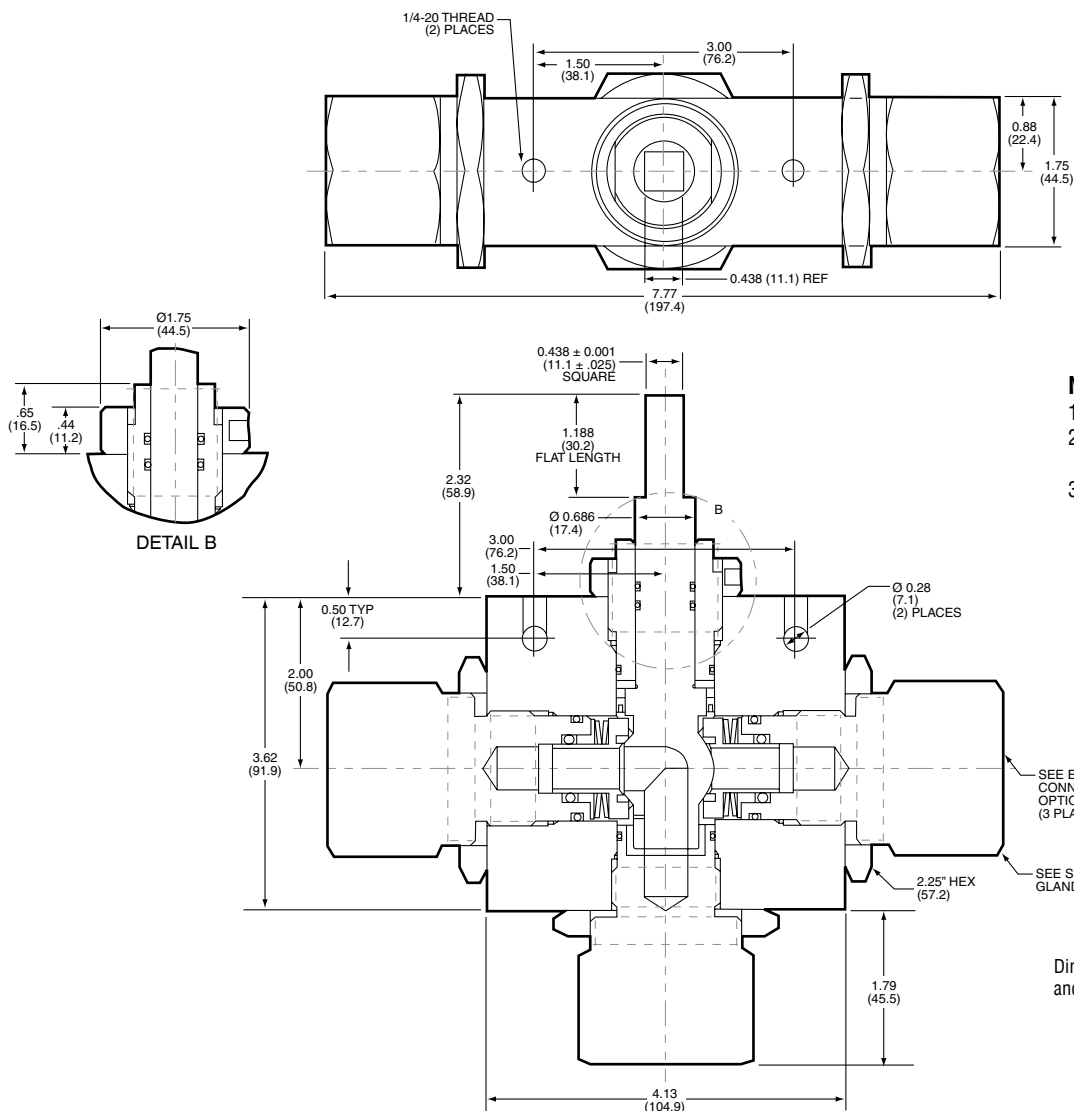
Catalog Number	End Connection Number	Connection	MAWP @ Room Temperature	Seat Gland Hex Inches(mm)
S3B8S10M12 S3BD8S10M12	M12	SF750CX20	10,000 psi (690 bar)	1.75 (44.5)
S3B8S10M16 S3BD8S10M16	M16	SF1000CX20	10,000 psi (690 bar)	1.75 (44.5)
S3B8S10P12 S3BD8S10P12	P12	3/4" NPT	10,000 psi (690 bar)	1.75 (44.5)
S3B8S10P16 S3BD8S10P16	P16	1" NPT	10,000 psi (690 bar)	1.75 (44.5)

MAWP: Maximum Allowable Working Pressure

See ball valve options for end connection details, material, and high temperature options.



*The Diverter Valve design permits inlet flow through the bottom port. Outlet flow may be diverted to either valve side port.



NOTE:

1. MAWP (See Table)
2. Maximum Sea Depth
11,500 FT (3505 meters)
3. Maximum External Pressure
5,000 psi (345 bar)

Dimensions for reference only
and subject to change.

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