

Ball Valves

BF, BFH, BG, BH, BO, BP, BR, BRC,
BV, BK and BU Series

Ball Valves
Plug Valves



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Important Information about Ball Valves

- ⦿ FITOK ball valves are designed to be used in fully open or fully closed position.
- ⦿ Packing adjustment may be required during the service life of the valve (except for BF, BFH and BU series).
- ⦿ For better quality maintenance, FITOK ball valves should be kept in fully open position in warehouse.
- ⦿ Valves that have not been actuated for a period of time may have a higher initial actuation torque.

Trunnion Ball Valves

BF and BFH Series

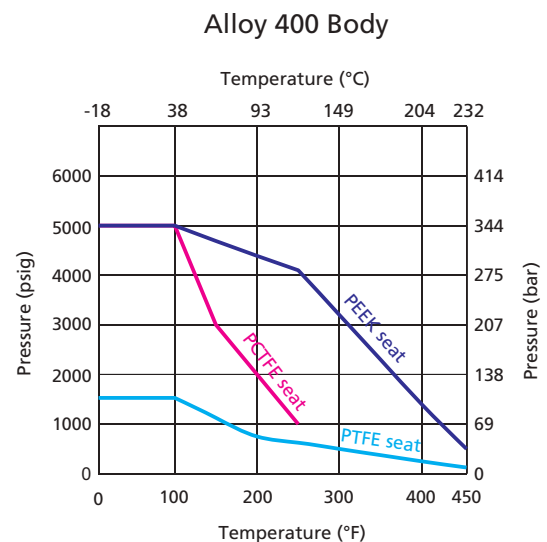
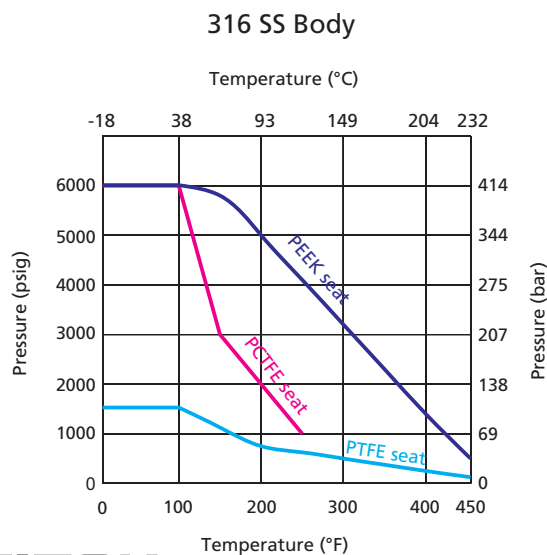
Features

- ⦿ Working pressure up to: 10,000 psig (690 bar)
- ⦿ Working temperature: 0°F to 450°F (-18°C to 232°C)
- ⦿ Orifice size: 0.19" (4.8 mm)
- ⦿ Fixed ball with double sealing
- ⦿ Trunnion-style ball to prevent ball blowout
- ⦿ Automatic compensation of seat sealing
- ⦿ Low operating torque
- ⦿ Blowout proof stem
- ⦿ Handle as indicator of flow direction
- ⦿ Positive handle stop
- ⦿ Handle color options available
- ⦿ Pneumatic and electric actuator available
- ⦿ Panel mountable
- ⦿ Leak-tight performance testing with nitrogen or compressed air for every valve at the rated pressure (not higher than 6000 psig) to meet the requirement of no visible leak
- ⦿ Compact maximum-flow design
- ⦿ 2- or 3-way flow patterns
- ⦿ Spring-load seats to provide leak tight integrity in both low-and high-pressure systems and reduce seat wear from pressure surges
- ⦿ The inlet of 3-way valve can be any port
- ⦿ Low-temperature service option available
- ⦿ BF series 3-way ball valves for "fast fill" CNG filling station application available
- ⦿ BF series ball valves with ECE R110 type approval available



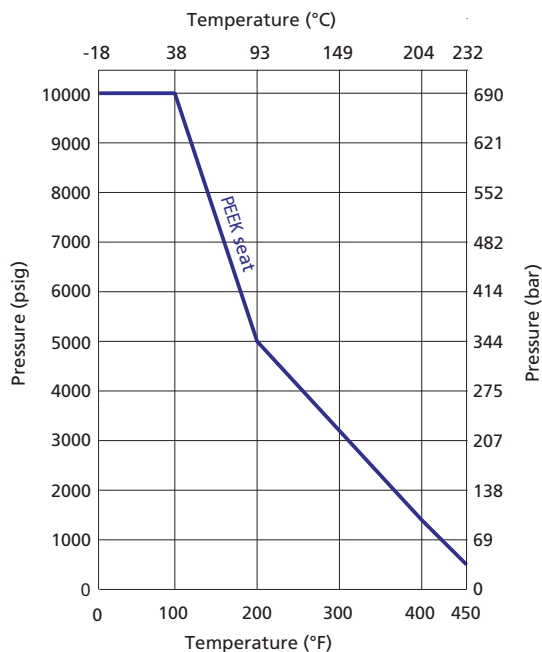
Pressure vs. Temperature

BF Series



BFH Series

316 SS Body



Pressure Rating@100°F (38°C)

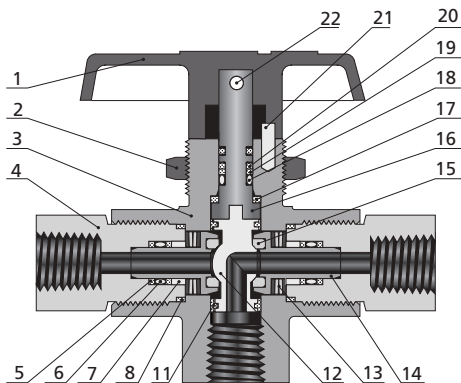
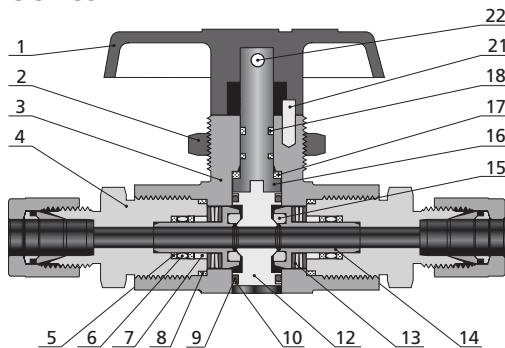
Material	End Connection	Pressure Rating, psig (bar)
316 SS	FNS2, FNS4 FL4, ML6	10000 (690)
	ML10	8400 (578)
	FL6/ML8	7500 (516)
	FL8	6700 (461)
	ML12	6800 (470)

Note: Maximum working pressure of BFH Series ball valves is 10,000 psig. The specified pressure rating is restricted by end connections.

Ball Valves
Plug Valves

Standard Materials of Construction

BF Series

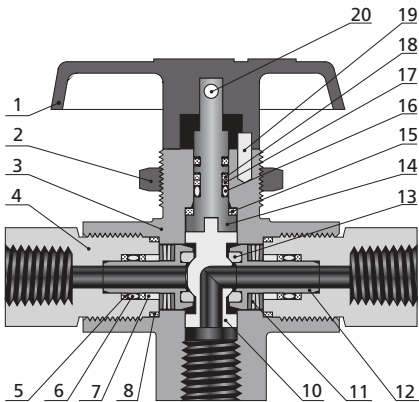
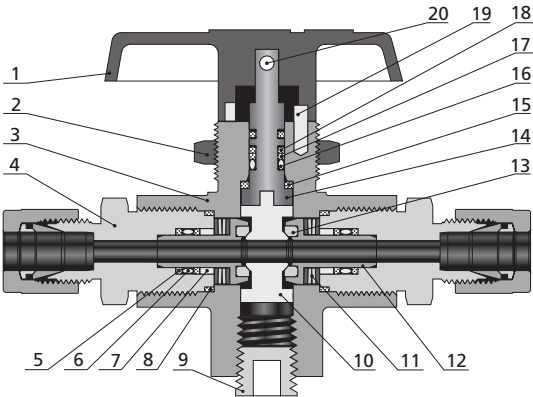


Notes: Wetted components are listed in italics.

1. Ball trunnions are PTFE coated for BF series 2-way valves.
2. For other materials, please contact FITOK Group or our authorized distributors.

Item	Component	Valve Body Material			
		316 SS		Alloy 400	
		2-way	3-way	2-way	3-way
		Material Grade/ASTM Specification			
1	Handle	Nylon with SS insert			
2	Panel Nut	316 SS/A479			
3	Body	F316 SS/A182		Alloy 400/B164	
4	End Connection	316 SS/A479		Alloy 400/B164	
5	Seat Retainer Backup Ring	Reinforced PTFE			
6	Seat Retainer O-ring	Fluorocarbon FKM			
7	Seat Retainer Guide	316 SS/A479		Alloy 400/B164	
8	End Connection Seal	Silver-plated 316L/A269			
9	Trunnion O-ring	Fluorocarbon FKM	—	Fluorocarbon FKM	—
10	Trunnion Backup Ring	Reinforced PTFE	—	Reinforced PTFE	—
11	Trunnion Bearing	—	PEEK	—	PEEK
12	Ball	316 SS/A479	S21800/A479	Alloy 400/B164	
13	Seat Spring	Alloy X-750/AMS 5542			
14	Seat Retainer	316 SS/A479		Alloy 400/B164	
15	Seat	PTFE or PEEK or PCTFE			
16	Stem	316 SS/A479		Alloy 400/B164	
17	Stem Washer	PEEK			
18	Stem O-ring	Fluorocarbon FKM		Fluorocarbon FKM	
19	Secondary Stem Backup Ring	—	PTFE/D1710	—	PTFE/D1710
20	Primary Stem Backup Ring	—	PEEK	—	PEEK
21	Stop Pin	SS			
22	Set Screw	Zinc-plated carbon steel			
Lubricants		Fluorinated-based			

BFH Series

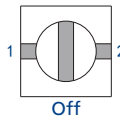
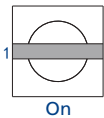
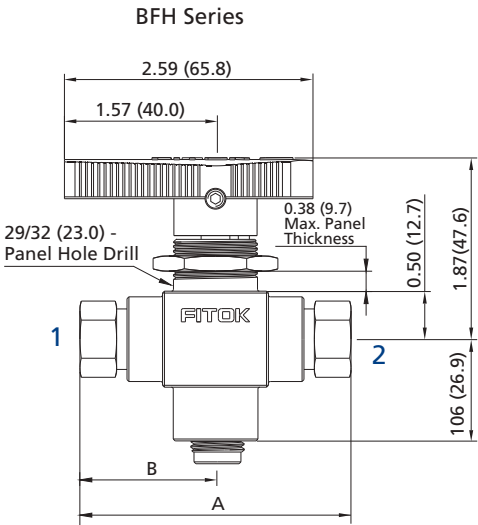
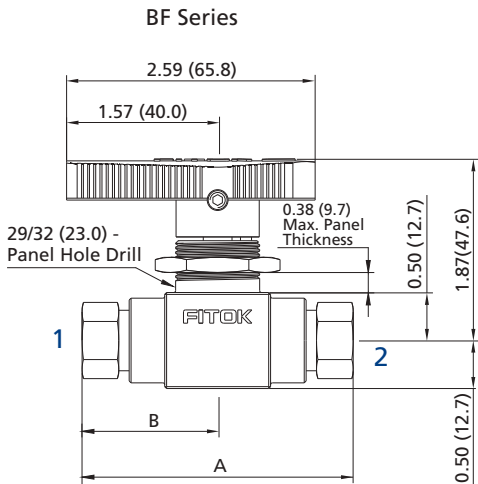


Item	Component	2-way	3-way
		Material Grade/ASTM Specification	
1	Handle	Nylon with SS insert	
2	Panel Nut	316 SS/A479	
3	Body	316 SS/A479	
4	End Connection	316 SS/A479	
5	Seat Retainer Backup Ring	Reinforced PTFE	
6	Seat Retainer O-ring	Fluorocarbon FKM	
7	Seat Retainer Guide	316 SS/A479	
8	End Connection Seal	Silver-plated 316L/A269	
9	Plug	316 SS/A479	
10	Ball	S21800/A479	
11	Seat Spring	Alloy X-750/AMS 5542	
12	Seat Retainer	316 SS/A479	
13	Seat	PEEK	
14	Stem	316 SS/A479	
15	Stem Washer	PEEK	
16	Stem O-ring	Fluorocarbon FKM	
17	Secondary Stem Backup Ring	PTFE/D1710	
18	Primary Stem Backup Ring	PEEK	
19	Stop Pin	SS	
20	Set Screw	Zinc-plated carbon steel	
Lubricants		Fluorinated-based	

Notes: Wetted components are listed in italics.
1. Ball trunnions are PTFE coated for BFH series ball valves.
2. For other materials, please contact FITOK Group or our authorized distributors.

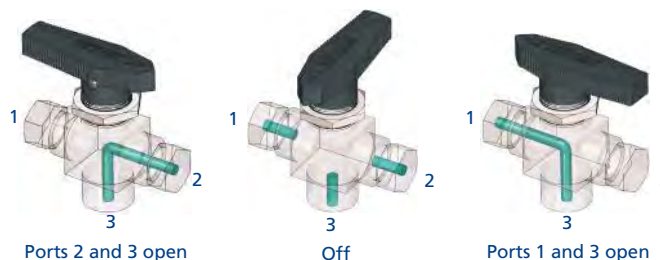
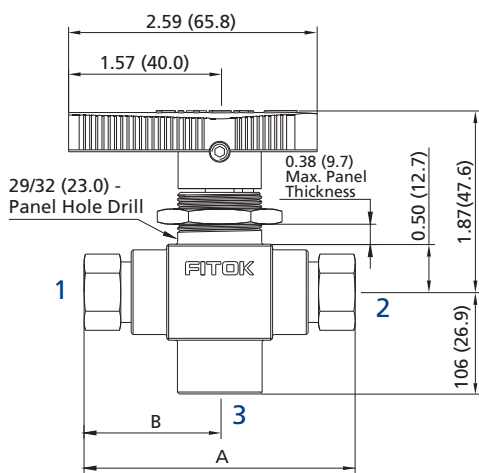
Dimensions

2-way Valves



Basic Ordering Number		Connection Type and Size	Orifice in. (mm)	Cv	Dimensions, in. (mm)	
BF Series	BFH Series	Connection 1/2			A	B
BF□□-FNS2	BFH□□-FNS2-P	1/8 Female NPT	0.19 (4.8)	1.2	2.94 (74.7)	1.47 (37.3)
BF□□-FNS4	————	1/4 Female NPT		1.0	3.93 (99.8)	1.97 (50.0)
————	BFH□□-FNS4-P				1.2	4.25 (108.0)
BF□□-FNS8	————	1/2 Female NPT		1.6	4.14 (105.2)	2.07 (52.6)
BF□□-FL4	BFH□□-FL4-P	1/4" FITOK		1.4	4.39 (111.5)	2.19 (55.6)
BF□□-FL6	BFH□□-FL6-P	3/8" FITOK		1.0	4.60 (116.8)	2.30 (58.4)
BF□□-FL8	BFH□□-FL8-P	1/2" FITOK		1.6	4.14 (105.2)	2.07 (52.6)
BF□□-ML6	BFH□□-ML6-P	6 mm FITOK		1.5	4.15 (105.4)	
BF□□-ML8	BFH□□-ML8-P	8 mm FITOK		1.3	4.41 (112.0)	2.20 (55.9)
BF□□-ML10	BFH□□-ML10-P	10 mm FITOK		1.0	4.60 (116.8)	2.30 (58.4)
BF□□-ML12	BFH□□-ML12-P	12 mm FITOK				

3-way Valves



Basic Ordering Number		Connection Type and Size		Orifice in. (mm)	Cv	Dimensions, in. (mm)	
BF Series	BFH Series	Connection 1/2	Connection 3			A	B
BF□□-FNS2-3	BFH□□-FNS2-P-3	1/8 Female NPT	1/4 Female NPT	0.19 (4.8)	0.75	2.94 (74.7)	1.47 (37.3)
BF□□-FNS4-3	_____	1/4 Female NPT				3.93 (99.8)	1.97 (50.0)
_____	BFH□□-FNS4-P-3					4.14 (105.2)	2.07 (52.6)
BF□□-FL4-3	BFH□□-FL4-P-3	1/4" FITOK				4.39 (111.5)	2.19 (55.6)
BF□□-FL6-3	BFH□□-FL6-P-3	3/8" FITOK				4.60 (116.8)	2.30 (58.4)
BF□□-FL8-3	BFH□□-FL8-P-3	1/2" FITOK				4.14 (105.2)	2.07 (52.6)
BF□□-ML6-3	BFH□□-ML6-P-3	6 mm FITOK				4.15 (105.4)	
BF□□-ML8-3	BFH□□-ML8-P-3	8 mm FITOK				4.41 (112.0)	2.20 (55.9)
BF□□-ML10-3	BFH□□-ML10-P-3	10 mm FITOK				4.60 (116.8)	2.30 (58.4)
BF□□-ML12-3	BFH□□-ML12-P-3	12 mm FITOK					

1. FITOK means FITOK double ferrule tube fittings.
2. Sizes and types listed are standard. Other sizes and types are available upon request, please contact FITOK Group or our authorized distributors.
3. Dimensions are shown with tube fitting nuts finger-tightened. All dimensions are for reference only and are subject to change.
For dimensions not shown above, please contact FITOK Group or our authorized distributors.
4. Bottom port of all 3-way valves is 1/4 in. female NPT.

Special Application Ball Valves

Low-Temperature Service

BF and BFH series ball valves for low-temperature service, with a temperature rating of -40°F to 200°F (-40°C to 93°C), are available.

Low-temperature service valves have low-temperature NBR O-rings. All other materials are the same as those of standard valves.

To order a valve for low-temperature service, add -LT into the valve ordering number.

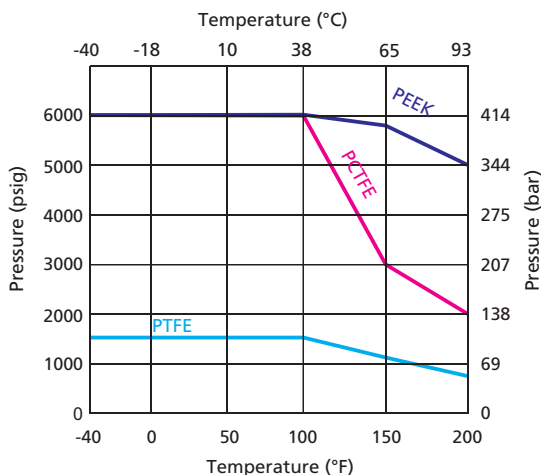
For example: BFSS-FL4-P-LT

BFSS-FL4-P-3-LT

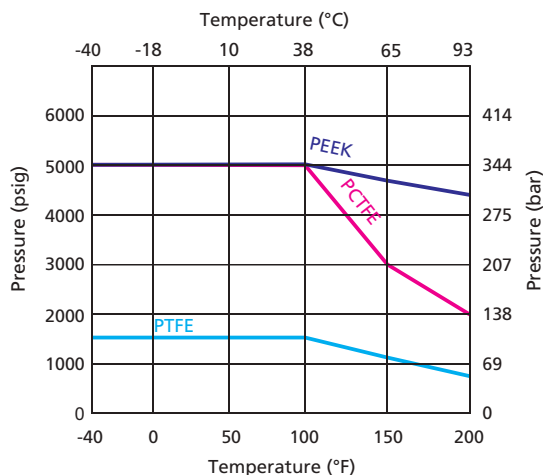
Seal kit for field replacement is available, see "Seal Kits" on Page B-09.

Low-Temperature Service BF Series Pressure vs. Temperature

316 SS Body

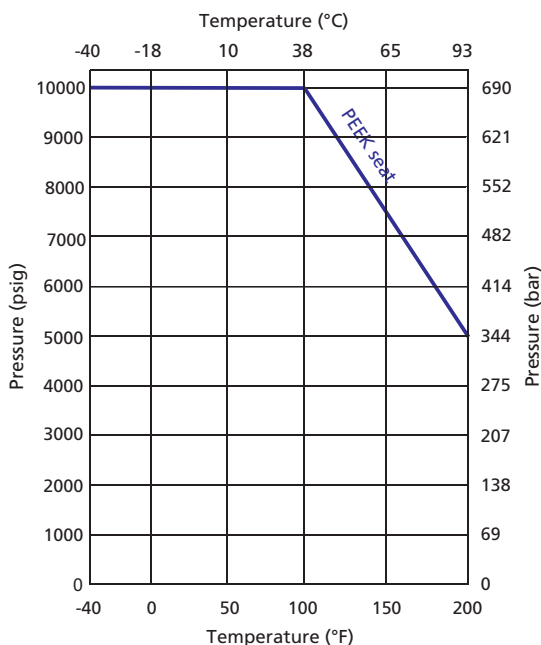


Alloy 400 Body



Low-Temperature Service BFH Series Pressure vs. Temperature

316 SS Body



Note: The maximum working pressure for BFH series low-temperature service ball valves is the same as that of standard ball valves.

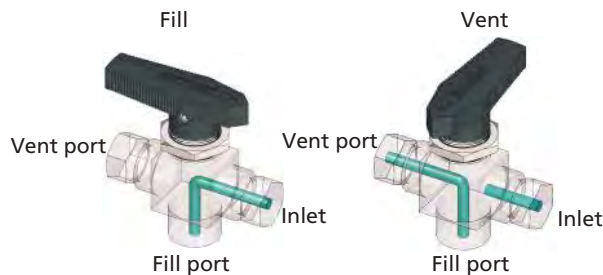
"Fast Fill" CNG Filling Station Application

BF series 3-way valves for use in "fast-fill" CNG filling station as well as a variety of filling station applications are available.

Features

- ⦿ A directional installation with 90 degree actuation for ease of operation during filling
 - ⦿ 3-way design with vent port for ease of venting after fill
 - ⦿ PEEK seats to reduce maintenance required in high-cycle applications
 - ⦿ Cycle life test report available upon request
 - ⦿ Field repairable with seal kit, see "Seal Kits" on Page B-09
- To order, the flow pattern designator should be specified as "3DL" in the valve ordering number.

Example: BFSS-FNS4-P-3DL (The material and pressure vs. temperature curve are the same with those of BF series standard valves.)
 BFSS-FNS4-P-3DL-LT (The material and pressure vs. temperature curve are the same with those of BF series low-temperature service valves.)



CNG/NGV Application

BF series ball valves with ECE R110 manual valve type approval available.

Classification: Class 0

Temperature rating: -40°F to 248°F (-40°C to 120°C)

Pressure rating: 3770 psig (260 bar)

CNG/NGV application valves have low-temperature FKM O-rings and PEEK seats. All other materials are the same as those of standard valves.

To order a valve for CNG/NGV application, add **-R110** into the valve ordering number.

For example: BFSS-FL4-P-**R110**

BFSS-FL4-P-3-**R110**

Seal kit for field replacement is available, see "Seal Kits" on Page B-09.

Seal Kits

Valve Series	Flow Pattern	Special Application	Basic Seal Kit Ordering Number	Content
BF	2-way	/	BFSS-2-□	Seat retainer backup ring, seat retainer O-ring, seat retainer guide, end connection seal, trunnion O-ring, trunnion backup ring, ball, seat spring, seat retainer, seat, stem, stem washer, stem O-ring, instructions.
		Low-temperature service	BFSS-2-□-LT	
		CNG/NGV application	BFSS-2-P-R110	
	3-way	/	BFSS-3-□	Seat retainer backup ring, seat retainer O-ring, seat retainer guide, end connection seal, trunnion bearing, ball, seat spring, seat retainer, seat, stem, stem washer, stem O-ring, secondary stem backup ring, primary stem backup ring, instructions.
		Low-temperature service	BFSS-3-□-LT	
		"Fast Fill" CNG filling station application	BFSS-3DL-P	
			BFSS-3DL-P-LT	
		CNG/NGV application	BFSS-3-P-R110	
BFH	2-way	/	BFHSS-2-P	Seat retainer backup ring, seat retainer O-ring, seat retainer guide, end connection seal, ball, seat spring, seat retainer, seat, stem, stem washer, stem O-ring, secondary stem backup ring, primary stem backup ring, instructions.
		Low-temperature service	BFHSS-2-P-LT	
	3-way	/	BFHSS-3-P	
		Low-temperature service	BFHSS-3-P-LT	

Seat Material	Designator
PTFE	T
PCTFE	K
PEEK	P

1. Seal kit components are the same materials and grades listed in materials of construction.

2. To order seal kits for BF series standard and low-temperature service ball valves, select a seat designator from the table at left and add to the basic seal kit ordering number.

Example: BFSS-2-T

BFSS-2-P-LT

3. The listed basic seal kit ordering numbers specify 316 stainless steel material.

To order kits with other materials, such as Alloy 400 material, replace "SS" with "M" in the ordering number.

Example: BFM-2-T

Locking Device

⊙ Lock BF series 2-way or 3-way valves, locking hole diameter is 0.21 in (5.2 mm).

⊙ To order a ball valve with locking device, add **-L** to the valve ordering number.

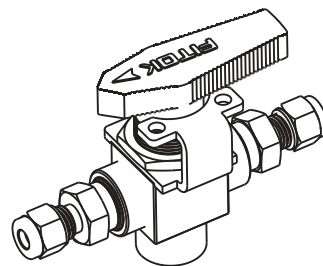
Example: BFSS-ML6-L/BFSS-ML6-3-L

Ball Valve without Handle

⊙ Ball Valve without handle can be directly connected to the FITOK actuator assembly.

⊙ To order, please add **-AM** to the valve ordering number.

Example: BFSS-FL4-P-**AM**



- | BFSS - FNS4 - ML12 - P - RXHQ3 - L - SCEF2 | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|---------------|-----------|-------------------|---------------------------------|-------------------|--------------|-------------------|--|-------------------|--|---------------|------------|-----------------|---|--------------|--|--------------|-------------------|----------------|-----|---------------------|-------------------------|------------------------|-------|
| Series | | Body Material | | Connection 1 Type | | Connection 1 Size | | Connection 2 Type | | Connection 2 Size | | Seat Material | | Handle/Actuator | | For Actuator | | Flow Pattern | | Locking Device | | Special Application | | Cleaning and Packaging | |
| BF | | SS | 316 SS | FNS | Female NPT | 2 | 1/8" | | | | | BF Series | | I | Black Nylon Handle | | None | | 2-Way | | No | | None | | FC-01 |
| BFH | | M | Alloy 400 | NS | Male NPT | 4 | 1/4" | | | | | K | PTFE | GR | Red Nylon Handle | H | Mechanical Limit Switch | 3 | 3-Way | L | Yes | S | NACE MR0175 | F2 | FC-02 |
| | | | | FRT | Female BSPT | 6 | 3/8" or 6 mm | | | | | P | PCTFE | J | Green Nylon Handle | N | Inductive Limit Switch | 3DL | 3-Way "Fast Fill" | | | SI | Inert Silicon Coating | | |
| | | | | RT | Male BSPT | 8 | 1/2" or 8 mm | | | | | | PEEK | O | Blue Nylon Handle | Q | Solenoid Valve | | | | | CE | CE Certification | | |
| | | | | FRP | Female BSP (for RP) | 10 | 10 mm | | | | | | BFH Series | AM | Without Handle | HQ | Mechanical Limit Switch and Solenoid Valve | | | | | LT | Low-temperature Service | | |
| | | | | BP | Male BSP (for RG) | 12 | 12 mm | | | | | P | PEEK | C | 90° Normally Closed Pneumatic Actuator | NQ | Inductive Limit Switch and Solenoid Valve | | | | | R110 | ECE R110 | | |
| | | | | FMS | Female Metric Thread (for RG-M) | | | | | | | | | D | 90° Double Acting Pneumatic Actuator | | | | | | | | | | |
| | | | | MS | Male Metric Thread (for RG-M) | | | | | | | | | LX | 180° Left End Normally Open Pneumatic Actuator | | | | | | | | | | |
| | | | | FL | Fractional Tube Fitting | | | | | | | | | RX | 180° Right End Normally Open Pneumatic Actuator | | | | | | | | | | |
| | | | | ML | Metric Tube Fitting | | | | | | | | | DX | 180° Double Acting Pneumatic Actuator | | | | | | | | | | |
| | | | | | | | | | | | | | | E | 90° Electric Actuator | | | | | | | | | | |
| | | | | | | | | | | | | | | EX | 180° Electric Actuator | | | | | | | | | | |
- Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

Cleaning and Packaging:

 - FC-01: Standard cleaning and packaging for general industrial procedures.
 - FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleanliness requirement of ASTM G93 Level C.

For more information about pneumatically actuated ball valves, please refer to the catalog Actuated Ball Valves.

Inert Silicon Coating: Except for ball valves with PEEK seat, wetted metal components Inert Silicon coated.

CE certification is available. For more information, please contact FITOK group or our authorized agents.

3-Piece Ball Valves

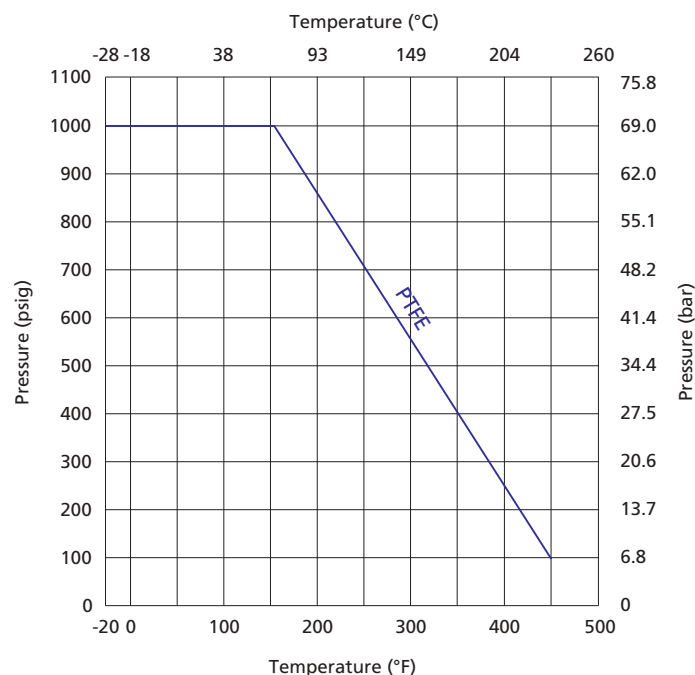
BG Series

Features

- ⦿ Working pressure up to: 1000 psig (69.0 bar)
- ⦿ Working temperature: -20°F to 450°F (-28°C to 232°C)
- ⦿ End connections:
 - 1/8 to 1 thread
 - 1/8" to 1" pipe butt or socket weld
 - 1/4" to 1" and 6 mm to 25 mm tube butt or socket weld
 - 1/4" to 1" and 6 mm to 25 mm tube fitting
- ⦿ Orifice sizes: 0.19" (4.8 mm) to 1" (25 mm)
- ⦿ Blowout proof stem
- ⦿ Bidirectional flow
- ⦿ Leak-tight performance testing with nitrogen or compressed air for every valve at the rated pressure to meet the requirement of no visible leak

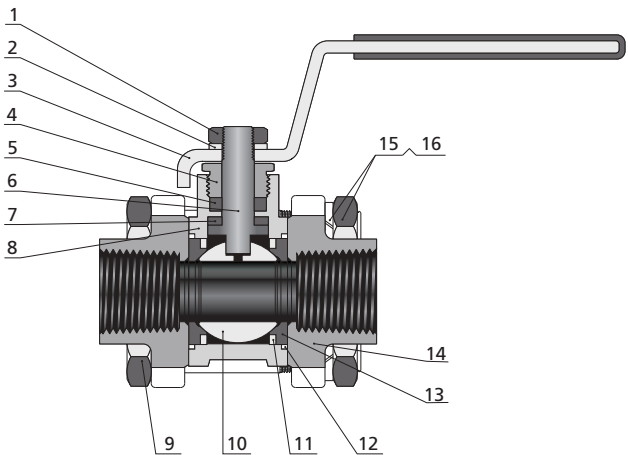


Pressure vs. Temperature



Note: The temperature and pressure rating are based on valves of standard materials.

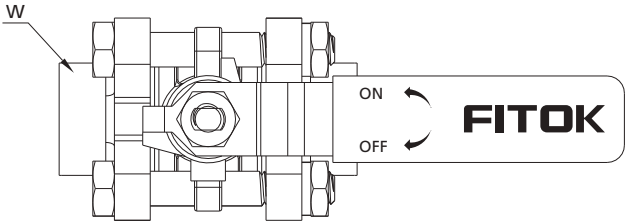
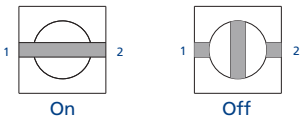
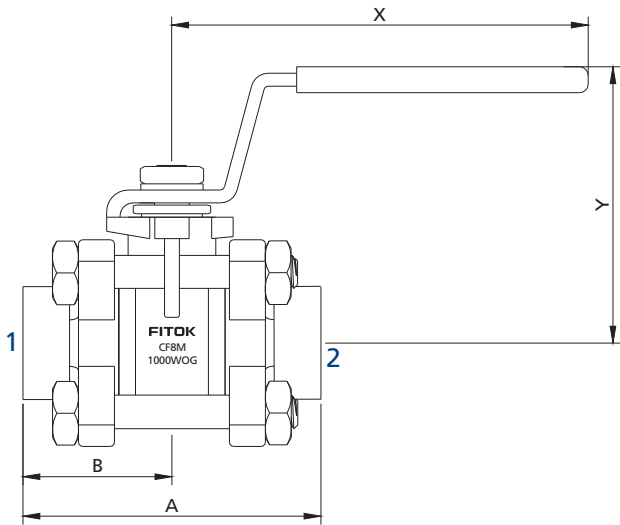
Standard Materials of Construction



Item	Component	Valve Body Material	
		CF8M/A351	CF8/A351
1	Stem Nut	SS	
2	Gasket	SS	
3	Handle	304 SS/A240 (with vinyl sleeve)	
4	Gland	316 SS/A479 or 304 SS/A479	
5	Upper Packing	PTFE/D1710	
6	Stem	316 SS/A479 or 304 SS/A479	
7	Lower Bearing	PTFE/D1710	
8	Body	CF8M/A351	CF8/A351
9	Body Bolt	SS	
10	Ball	316 SS/A479 or 304 SS/A479	
11	Support Ring	316 SS/A240 or 304 SS/A240	
12	Flange Seal	PTFE/D1710	
13	Seat	PTFE/D1710	
14	End Connection	CF8M/A351	CF8/A351
15	Gasket	SS	
16	Nut	SS	
Lubricants		Silicone-based and PTFE-based	

Note: Wetted components are listed in italics.
For other materials, please contact FITOK Group or our authorized distributors.

Dimensions



Basic Ordering Number	Connection Type and Size		Orifice in. (mm)	Cv	Dimensions, in. (mm)				
	Connection 1	Connection 2			A	B	W	X	Y
BG□□-FNS2-05	1/8 Female NPT	1/8 Female NPT	0.19 (4.8)	1.2	2.05 (52.1)	1.03 (26.0)	0.63 (16.0)	2.69 (68.3)	1.46 (37.0)
BG□□-FRP2-05	1/8 Female BSPP	1/8 Female BSPP							
BG□□-PB4-05	1/4×SCH80 Pipe Butt Weld	1/4×SCH80 Pipe Butt Weld							
BG□□-FL4-05	1/4" FITOK	1/4" FITOK							
BG□□-ML6-05	6 mm FITOK	6 mm FITOK							
BG□□-ML8-05	8 mm FITOK	8 mm FITOK							
BG□□-FNS4-07	1/4 Female NPT	1/4 Female NPT	0.28 (7.1)	3.8	2.05 (52.1)	1.03 (26.0)			
BG□□-FRP4-07	1/4 Female BSPP	1/4 Female BSPP							
BG□□-FL6-07	3/8" FITOK	3/8" FITOK							
BG□□-ML10-07	10 mm FITOK	10 mm FITOK							
BG□□-FL8-11	1/2" FITOK	1/2" FITOK	0.42 (10.6)	7.5	4.04 (103.0)	2.02 (51.3)			
BG□□-ML12-11	12 mm FITOK	12 mm FITOK							
BG□□-ML14-11	14 mm FITOK	14 mm FITOK							
BG□□-FNS6-13	3/8 Female NPT	3/8 Female NPT	0.50 (12.7)	11.3	2.57 (65.2)	1.28 (32.6)	0.93 (23.5)	3.94 (100.0)	2.19 (55.7)
BG□□-FRP6-13	3/8 Female BSPP	3/8 Female BSPP							
BG□□-PS6-13	3/8 PS	3/8 PS							
BG□□-PB8-13	1/2×SCH80 Pipe Butt Weld	1/2×SCH80 Pipe Butt Weld			2.96 (75.3)	1.48 (37.7)			
BG□□-FL10-13	5/8" FITOK	5/8" FITOK							
BG□□-ML16-13	16 mm FITOK	16 mm FITOK			4.04 (103.0)	2.02 (51.3)			
BG□□-FNS8-15	1/2 Female NPT	1/2 Female NPT	0.55 (14.0)	13.0			2.74 (69.5)	1.37 (34.8)	1.06 (27.0)
BG□□-FRP8-15	1/2 Female BSPP	1/2 Female BSPP							
BG□□-PS8-15	1/2 PS	1/2 PS							
BG□□-MTB22-15	22×3 mm Tube Butt Weld	22×3 mm Tube Butt Weld							
BG□□-TS12-15	3/4" TS	3/4" TS			4.04 (103.0)	2.02 (51.3)			
BG□□-MTS18-15	18 mm Tube Socket Weld	18 mm Tube Socket Weld							
BG□□-FL12-15	3/4" FITOK	3/4" FITOK							
BG□□-ML18-15	18 mm FITOK	18 mm FITOK							
BG□□-FNS12-20	3/4 Female NPT	3/4 Female NPT	0.79 (20.0)	50.0	3.15 (80.0)	1.57 (40.0)	1.34 (34.0)	5.18 (131.5)	2.66 (67.5)
BG□□-FRP12-20	3/4 Female BSPP	3/4 Female BSPP							

Basic Ordering Number	Connection Type and Size		Orifice in. (mm)	Cv	Dimensions, in. (mm)				
	Connection 1	Connection 2			A	B	W	X	Y
BG□□-PB12-20	3/4×SCH80 Pipe Butt Weld	3/4×SCH80 Pipe Butt Weld	0.79 (20.0)	34	3.15 (80.0)	1.57 (40.0)	1.34 (34.0)	5.18 (131.5)	2.66 (67.5)
BG□□-PS12-20	3/4 PS	3/4 PS							
BG□□-TS16-20	1" TS	1" TS							
BG□□-MTB25-20	25×3.5 mm Tube Butt Weld	25×3.5 mm Tube Butt Weld							
BG□□-MTS25-20	25 mm Tube Socket Weld	25 mm Tube Socket Weld			5.12 (130.0)	2.56 (65.0)	1.34 (34.0)	5.18 (131.5)	2.66 (67.5)
BG□□-FL16-20	1" FITOK	1" FITOK							
BG□□-ML22-20	22 mm FITOK	22 mm FITOK							
BG□□-ML25-20	25 mm FITOK	25 mm FITOK							
BG□□-FNS16-25	1 Female NPT	1 Female NPT	0.98 (25.0)	65	3.54 (90.0)	1.77 (45.0)	1.57 (40.0)	5.95 (151.2)	3.08 (78.2)
BG□□-FRP16-25	1 Female BSPP	1 Female BSPP							
BG□□-PS16-25	1 PS	1 PS							
BG□□-PB16-25	1×SCH80 Pipe Butt Weld	1×SCH80 Pipe Butt Weld							

1. FITOK means FITOK double ferrule tube fittings, TS means fractional tube socket weld, MTS means metric tube socket weld, TB means fractional tube butt weld, MTB means metric tube butt weld, PS means pipe socket weld, and PB means pipe butt weld.
2. Butt welding ends are manually welded. For connections with orbital welding, please contact FITOK Group or our authorized distributors.
3. Sizes and types listed are standard. Other sizes and types are available upon request, please contact FITOK Group or our authorized distributors.
4. Dimensions are shown with tube fitting nuts finger-tightened. All dimensions are for reference only and are subject to change. For dimensions not shown above, please contact FITOK Group or our authorized distributors.

Seal Kits

Valve Orifice	Basic Seal Kit Ordering Number	Content
05/07	T-BG-2-RK	Seat, flange seal, lower packing, upper packing, instructions
11/13	T-BG-4-RK	
15	T-BG-6-RK	
20	T-BG-12-RK	
25	T-BG-16-RK	Seat, flange seal, stem bearing, packing support, lower packing, upper packing, instructions

Locking Device

- ⦿ Lock BG series valves, locking hole diameters of:
valves with orifice 05 or 07 are 0.185 in (4.7 mm);
valves with orifice 11, 13, 15, or 20 are 0.22 in (5.7 mm);
valves with orifice 25 are 0.19 in (4.8 mm)
- ⦿ To order a ball valve with locking device, add -L to the valve ordering number.
Example: BGSS-FRT8-15-L

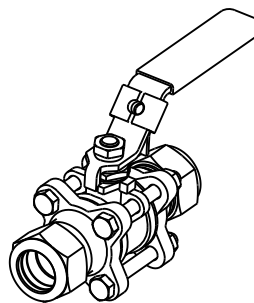


Diagram of Ball Valves with Locking Device and Orifice 05, 07, 11, 13, 15, or 20

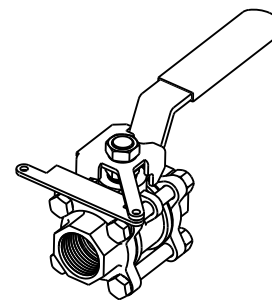


Diagram of Ball Valves with Locking Device and Orifice 25

Ordering Number Description

BGSS - FNS8 - ML18 - 15 - L - SF2																				
Series		Body Material		Connection 1 Type		Connection 1 Size		Connection 2 Type		Connection 2 Size		Orifice Size		Locking Device		Special Application		Cleaning and Packaging		
BG	SS	CF8M	FNS	Female NPT	2	1/8"			Same as Connection 1		Specified in the same way as connection 1 type and size	05	0.19" (4.8 mm)		L	No		None	F2	FC-02
	S4	CF8	NS	Male NPT	4	1/4" or 1/4xSCH80						07	0.28" (7.1 mm)				S	NACE MR0175		
			FRT	Female BSPT	5	5/16"						11	0.42" (10.6 mm)				SI	Inert Silicon Coating		
			RT	Male BSPT	6	3/8" or 6 mm						13	0.50" (12.7 mm)							
			FRP	Female BSPP (for RP)	8	1/2" or 8 mm or 1/2xSCH80						15	0.55" (14.0 mm)							
			BP	Male BSPP (for RG)	10	5/8" or 10 mm						20	0.79" (20 mm)							
			FMS	Female Metric Thread (for RG-M)	12	3/4" or 12 mm or 3/4xSCH80						25	0.98" (25 mm)							
			MS	Male Metric Thread (for RG-M)	14	14 mm or M14 x 1.5														
			MTS	Metric Tube Socket	16	1" or 16 mm or 1"xSCH80														
			TS	Fractional Tube Socket	18	18 mm														
			MTB	Metric Tube Butt Weld	20	1 1/4" or 20 mm or M20 x 1.5														
			TB	Fractional Tube Butt Weld	22	22 mm or 22x3 mm or M22x1.5														
			PS	Pipe Socket Weld	24	1 1/2" or M24 x 1.5														
			PB	Pipe Butt Weld	25	25 mm or 25x3.5 mm														
			FL	Fractional Tube Fitting																
			ML	Metric Tube Fitting																
			UFB	Rotatable Fractional Tube Butt Weld																
			UMB	Rotatable Metric Tube Butt Weld																
			UPB	Rotatable Pipe Butt Weld																

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

1.Standard thread pitch for metric threads are as follows:
M10 and below: 1 mm
M12 to M24: 1.5 mm
Standard thread pitch should be omitted in the ordering number, others should be specified.

2. If you need a port with orbital welding, please contact FITOK Group.

3. For oxygen-enriched environment or hazardous media service, contact FITOK Group or our authorized distributors.

4. Cleaning and Packaging:
FC-01: Standard cleaning and packaging for general industrial procedures.
FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleaning requirement of ASTM G93 Level C.

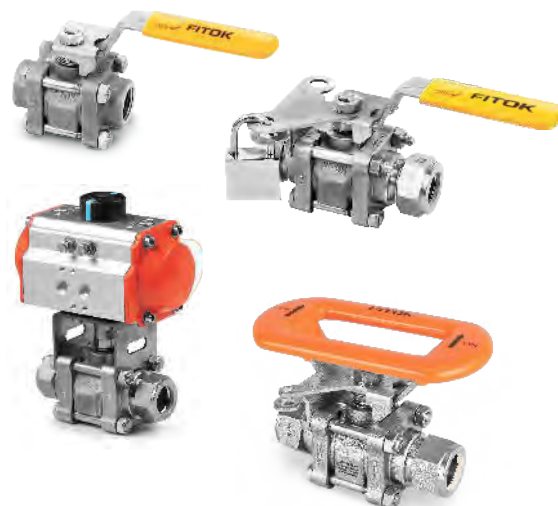
5. Inert Silicon Coating: Wetted metal components Inert Silicon coated.

3-Piece Ball Valves

BH Series

Features

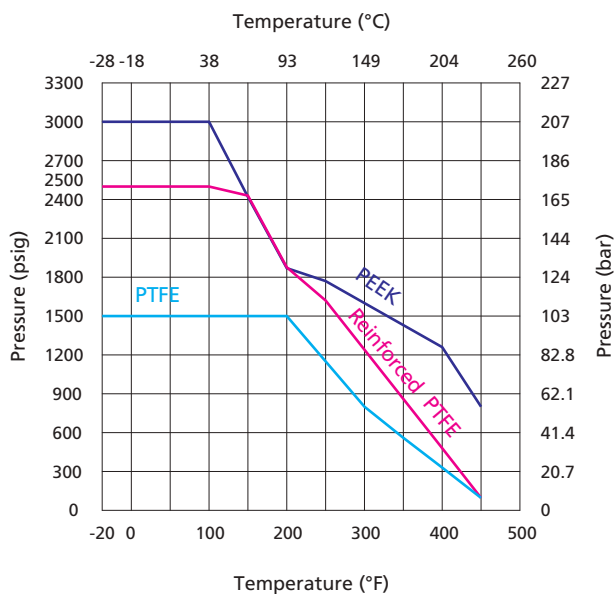
- ⦿ Working pressure up to: 3000 psig (207 bar)
- ⦿ Working temperature: -20°F to 450°F (-28°C to 232°C)
- ⦿ End connections:
 - 1/8 to 2 thread
 - 1/8" to 2" pipe butt or socket weld
 - 1/4" to 2" and 6 mm to 50 mm tube butt or socket weld
 - 1/4" to 2" and 6 mm to 38 mm tube fitting
- ⦿ 3-piece precision cast body construction
- ⦿ Orifice sizes: 0.19" (4.8 mm) to 1.5" (38.1 mm)
- ⦿ Blowout proof stem
- ⦿ Pneumatic and electric actuator available
- ⦿ Bidirectional flow for 2-way valves
- ⦿ Bottom port as inlet for 3-way valves
- ⦿ Leak-tight performance testing with nitrogen or compressed air for every valve at the rated pressure to meet the requirement of no visible leak



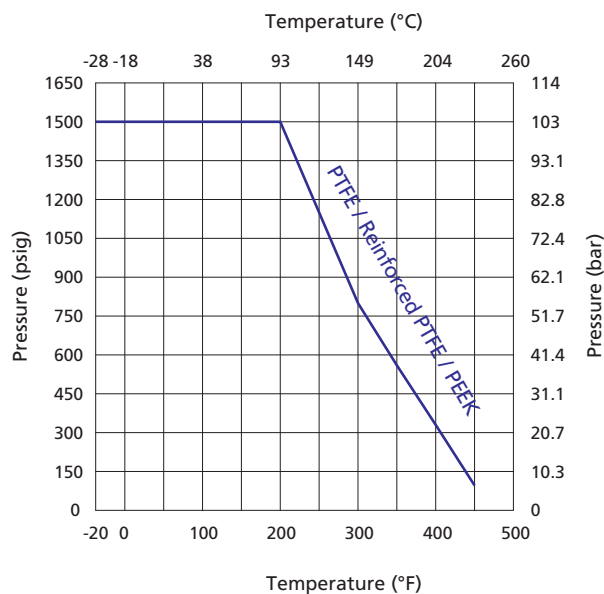
Pressure vs. Temperature

2-way Valves

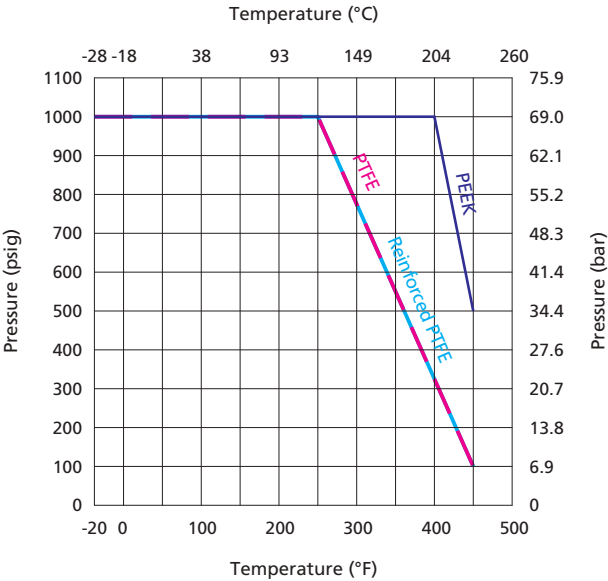
Orifice Size: 0.19", 0.28", 0.41", 0.52" & 0.88"



Orifice Size: 1.13", 1.25" & 1.50"

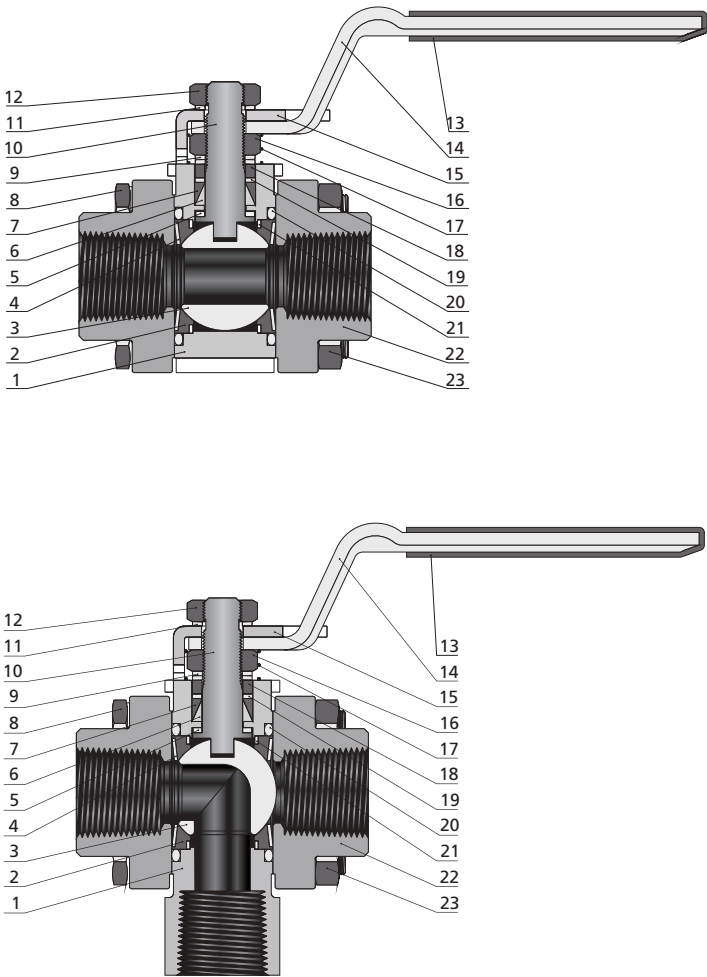


3-way Valves



Note: The temperature and pressure rating are based on valves of standard materials.

Standard Materials of Construction

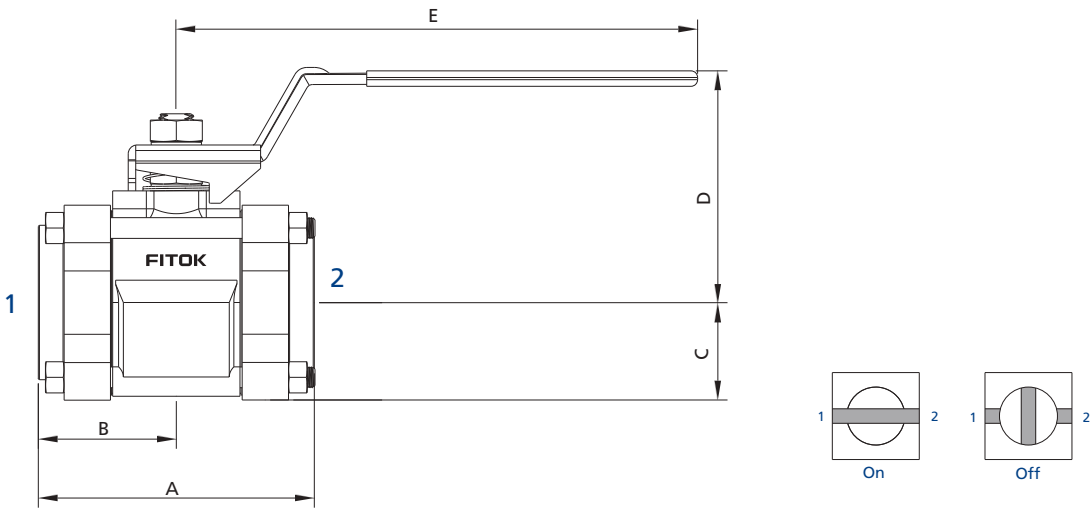


Item	Component	Material Grade/ASME Specification	
1	Body	CF8M/A351	CF8/A351
2	Seat	PTFE or Reinforced PTFE or PEEK	
3	Ball	316 SS/A479	
4	Coned-disc Spring	Strain-hardened 316 SS/A240	
5	Stem Bearing	PEEK	
6	Lower Packing	Reinforced PTFE	
7	Upper Packing	Reinforced PTFE	
8	Body Bolt	Gr. B8M/A193	
9	Stem Spring	Strain-hardened 316 SS/A240	
10	Stem	316 SS/A479	
11	Stem Spring	Strain-hardened 316 SS/A240	
12	Stem Nut	Gr. 8M/A194	
13	Handle Sleeve	Vinyl	
14	Handle	304 SS/A240	
15	Stop Plate	304 SS/A240	
16	Stem Nut	Gr. 8M/A194	
17	Grounding Spring	302 SS/A313	
18	Gland	PTFE-coated 316 SS/A479	
19	Packing Support	PEEK	
20	Flange Seal	PTFE/D1710	
21	Support Ring	316 SS/A240	
22	End Connection	CF8M/A351	CF8/A351
23	Body Nut	Gr.8M/A194	
Lubricants		Silicone-based and PTTE-based	

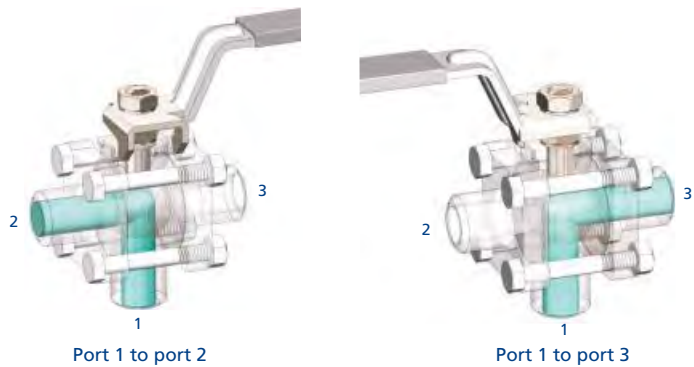
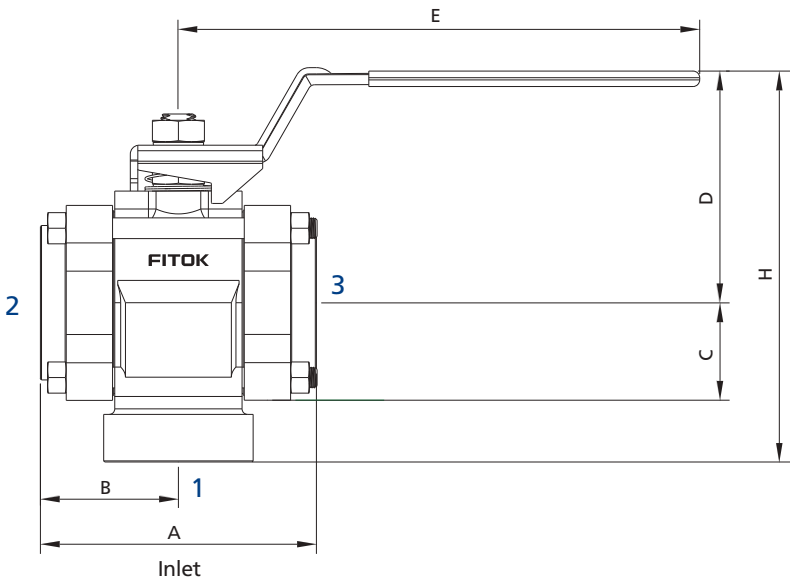
Note: Wetted components are listed in italics.
For other materials, please contact FITOK Group or our authorized distributors.

Dimensions

2-way Valves



3-way Valves



Basic Ordering Number																	
Connection Type and Size		Orifice in. (mm)		Cv		Dimensions, in. (mm)											
2-way	3-way	Connection 1	Connection 2/3	2-way	3-way	2-way	3-way	A	B	C	D	E	H				
BH□□-FL4-05	BH□□-FL4-05-3	1/4" FITOK	1/4" FITOK	0.19 (4.8)	0.19 (4.8)	1.2	1.2	3.17 (80.5)	1.59 (40.4)	0.68 (17.3)	1.66 (42.2)	2.37 (60.2)	3.35 (85.1)				
BH□□-ML6-05	BH□□-ML6-05-3	6 mm FITOK	6 mm FITOK														
BH□□-ML8-05	BH□□-ML8-05-3	8 mm FITOK	8 mm FITOK														
BH□□-TS4-05	—	1/4" TS	1/4" TS		—	1.2	—	2.16 (54.9)	1.08 (27.4)				2.08 (52.8)	1.04 (26.4)	—		
BH□□-MTS6-05	—	6 mm Tube Socket Weld	6 mm Tube Socket Weld														
BH□□-PB4-05	—	1/4×SCH80 Pipe Butt Weld	1/4×SCH80 Pipe Butt Weld														
BH□□-FNS2-07	BH□□-FNS2-07-3	1/8 Female NPT	1/8 Female NPT	0.28 (7.1)	0.28 (7.1)	3.8	1.7	2.16 (54.9)	1.08 (27.4)	0.68 (17.3)	1.66 (42.2)	2.37 (60.2)	3.12 (79.2)				
BH□□-FRT2-07	BH□□-FRT2-07-3	1/8 Female BSPT	1/8 Female BSPT														
BH□□-FRP2-07	BH□□-FRP2-07-3	1/8 Female BSPP	1/8 Female BSPP														
BH□□-FNS4-07	BH□□-FNS4-07-3	1/4 Female NPT	1/4 Female NPT					3.17 (80.5)	1.59 (40.4)				0.68 (17.3)	1.66 (42.2)	2.37 (60.2)	4.37 (111)	
BH□□-FRT4-07	BH□□-FRT4-07-3	1/4 Female BSPT	1/4 Female BSPT														
BH□□-FRP4-07	BH□□-FRP4-07-3	1/4 Female BSPP	1/4 Female BSPP														
BH□□-FL6-07	BH□□-FL6-07-3	3/8" FITOK	3/8" FITOK					3.20 (81.3)	1.60 (40.6)				0.68 (17.3)	1.66 (42.2)	2.37 (60.2)	4.37 (111)	
BH□□-ML10-07	BH□□-ML10-07-3	10 mm FITOK	10 mm FITOK														
BH□□-TS6-07	—	3/8" TS	3/8" TS														
BH□□-PB6-07	—	3/8×SCH80 Pipe Butt Weld	3/8×SCH80 Pipe Butt Weld														
BH□□-FL8-10	BH□□-FL8-10-3	1/2" FITOK	1/2" FITOK	0.41 (10.4)	0.41 (10.4)	7.5	3.5	4.04 (103)	2.02 (51.3)	0.89 (22.6)	2.35 (59.7)	4.50 (114)	4.48 (114)				
BH□□-ML12-10	BH□□-ML12-10-3	12 mm FITOK	12 mm FITOK														
BH□□-TS8-10	—	1/2" TS	1/2" TS														
BH□□-FNS6-13	BH□□-FNS6-13-3	3/8 Female NPT	3/8 Female NPT	0.52 (13.1)	0.52 (13.1)	12.0	5.0	2.70 (68.6)	1.35 (34.3)	0.89 (22.6)	2.35 (59.7)	4.50 (114)	4.19 (106)				
BH□□-FRT6-13	BH□□-FRT6-13-3	3/8 Female BSPT	3/8 Female BSPT														
BH□□-FRP6-13	BH□□-FRP6-13-3	3/8 Female BSPP	3/8 Female BSPP														
BH□□-FNS8-13	BH□□-FNS8-13-3	1/2 Female NPT	1/2 Female NPT					4.04 (103)	2.02 (51.3)								
BH□□-FRT8-13	BH□□-FRT8-13-3	1/2 Female BSPT	1/2 Female BSPT														
BH□□-FRP8-13	BH□□-FRP8-13-3	1/2 Female BSPP	1/2 Female BSPP														
BH□□-FL12-13	BH□□-FL12-13-3	3/4" FITOK	3/4" FITOK			13.6	5.0	2.70 (68.6)	1.34 (34)				4.48 (114)				
BH□□-ML16-13	BH□□-ML16-13-3	16 mm FITOK	16 mm FITOK														
BH□□-ML18-13	BH□□-ML18-13-3	18 mm FITOK	18 mm FITOK														
BH□□-TS12-13	—	3/4" TS	3/4" TS			15.0	—	2.69 (68.3)	1.34 (34)								
BH□□-PS8-13	—	1/2 PS	1/2 PS														
BH□□-PB8-13	—	1/2×SCH80 Pipe Butt Weld	1/2×SCH80 Pipe Butt Weld														
BH□□-PB12-13	—	3/4×SCH80 Pipe Butt Weld	3/4×SCH80 Pipe Butt Weld														
BH□□-FNS12-22	BH□□-FNS12-22-3	3/4 Female NPT	3/4 Female NPT	0.88 (22.2)	0.71 (18.0)	31.0	12.0	3.59 (91.2)	1.8 (45.7)	1.25 (31.8)	2.94 (74.7)	6.00 (152)	5.45 (138)				
BH□□-FRT12-22	BH□□-FRT12-22-3	3/4 Female BSPT	3/4 Female BSPT														

B-20 Ball Valves

Basic Ordering Number		Connection Type and Size		Orifice in.(mm)		Cv		Dimensions, in. (mm)					
2-way	3-way	Connection 1	Connection 2/3	2-way	3-way	2-way	3-way	A	B	C	D	E	H
BH□□-FRP12-22	BH□□-FRP12-22-3	3/4 Female BSPP	3/4 Female BSPP	0.88 (22.2)	0.71 (18.0)	31.0	12.0	3.59 (91.2)	1.8 (45.7)	1.25 (31.8)	2.94 (74.7)	6.00 (152)	5.45 (138)
BH□□-FNS16-22	BH□□-FNS16-22-3	1 Female NPT	1 Female NPT			38.0		4.45 (113)	2.23 (56.6)				
BH□□-FRT16-22	BH□□-FRT16-22-3	1 Female BSPT	1 Female BSPT					5.36 (136)	2.68 (68)				
BH□□-FRP16-22	BH□□-FRP16-22-3	1 Female BSPP	1 Female BSPP			40.0		6.34 (161)	3.17 (80.5)				5.91 (150)
BH□□-FL16-22	BH□□-FL16-22-3	1" FITOK	1" FITOK					5.36 (136)	2.68 (68)				
BH□□-FL20-22	BH□□-FL20-22-3	1 1/4" FITOK	1 1/4" FITOK					6.14 (156)	3.07 (78)				
BH□□-ML25-22	BH□□-ML25-22-3	25 mm FITOK	25 mm FITOK					3.59 (91.2)	1.80 (45.7)				
BH□□-ML28-22	BH□□-ML28-22-3	28 mm FITOK	28 mm FITOK			38.0		3.59 (91.2)	1.80 (45.7)				
BH□□-TS16-22	—	1" TS	1" TS					4.39 (112)	2.19 (55.6)				
BH□□-MTS25-22	—	25 mm Tube Socket Weld	25 mm Tube Socket Weld					4.57 (116)	2.28 (57.9)				
BH□□-PS12-22	—	3/4 PS	3/4 PS	1.13 (28.6)	—	36.0	—	3.59 (91.2)	1.80 (45.7)	1.25 (31.8)	4.03 (102)	9.14 (232)	—
BH□□-PS16-22	—	1 PS	1 PS			42.0		4.39 (112)	2.19 (55.6)				
BH□□-PB16-22	—	1×SCH80 Pipe Butt Weld	1×SCH80 Pipe Butt Weld			40.0		4.51 (115)	2.25 (57.2)				
BH□□-TS20-29	—	1 1/4" TS	1 1/4" TS			80.0		4.57 (116)	2.28 (57.9)				
BH□□-PB20-32	—	1 1/4×SCH80 Pipe Butt Weld	1 1/4×SCH80 Pipe Butt Weld			90.0		4.94 (125)	2.47 (62.5)				
BH□□-FNS20-32	BH□□-FNS20-32-3	1 1/4 Female NPT	1 1/4 Female NPT			100.0		4.51 (115)	2.25 (57.2)				
BH□□-FNS24-32	BH□□-FNS24-32-3	1 1/2 Female NPT	1 1/2 Female NPT					4.57 (116)	2.28 (57.9)				
BH□□-TS24-32	—	1 1/2" TS	1 1/2" TS			90.0		4.94 (125)	2.47 (62.5)				
BH□□-PS20-32	—	1 1/4 PS	1 1/4 PS			100.0		4.51 (115)	2.25 (57.2)				
BH□□-PS24-32	—	1 1/2 PS	1 1/2 PS					4.57 (116)	2.28 (57.9)				
BH□□-PB24-32	—	1 1/2×SCH80 Pipe Butt Weld	1 1/2×SCH80 Pipe Butt Weld			100.0		4.94 (125)	2.47 (62.5)				
BH□□-FNS32-38	BH□□-FNS32-38-3	2 Female NPT	2 Female NPT	1.50 (38.1)	0.98 (25.0)	130.0	23.0	4.94 (125)	2.47 (62.5)	1.74 (44.2)	4.16 (106)	9.14 (232)	7.21 (183)
BH□□-FRT32-38	BH□□-FRT32-38-3	2 Female BSPT	2 Female BSPT		—		—	6.14 (156)	3.12 (78)				
BH□□-TS32-38	—	2" TS	2" TS					4.94 (125)	2.47 (62.5)				
BH□□-PS32-38	—	2 PS	2 PS					6.14 (156)	3.12 (78)				
BH□□-PB32-38	—	2×SCH80 Pipe Butt Weld	2×SCH80 Pipe Butt Weld					6.14 (156)	3.12 (78)				

1. FITOK means FITOK double ferrule tube fittings, TS means fractional tube socket weld, MTS means metric tube socket weld, TB means fractional tube butt weld, MTB means metric tube butt weld, PS means pipe socket weld, and PB means pipe butt weld.
2. Sizes and types listed are standard. Other sizes and types are available upon request, please contact FITOK Group or our authorized distributors.
3. Dimensions are shown with tube fitting nuts finger-tightened. All dimensions are for reference only and are subject to change. For dimensions not shown above, please contact FITOK Group or our authorized distributors.

Ball Valves for Special Applications

Fire safe applications

API 607 and ISO 15848-1 certified.

Patented stem packing design and seat design.

Working temperature: -40°F to 400°F (-40°C to 204°C).

Working pressure up to: 1500 psig (103 bar).

Orifice size: 0.19" (4.8 mm) to 1.25" (31.8 mm).

Helium leak rate/stem diameter $\leq 1.78 \times 10^{-6}$ std cm^3/s .

To order a fire safe valve, add -IE to the valve ordering number.

For example: BHSS-FL16-22-IE

To order a FDA-compliant fire safe valve, add -FDA-IE to the valve ordering number.

For example: BHSS-FL16-22-FDA-IE



Structure Features

Live-loaded disc spring

Elastic compensation effect

Graphite stem packing

Maintain good sealing performance under fire conditions

PTFE stem packing

Maintain good sealing performance under normal conditions

Metal seal design

Reduce the risk of leakage under fire conditions by reducing the active gap between the spherical surface and the sealing surface

PTFE flange seal

Maintain good sealing performance under normal conditions

PTFE seat

Maintain good sealing performance under normal conditions

Graphite flange seal

Maintain good sealing performance under fire conditions

Anti-static device

Grounding spring to provide anti-static protection

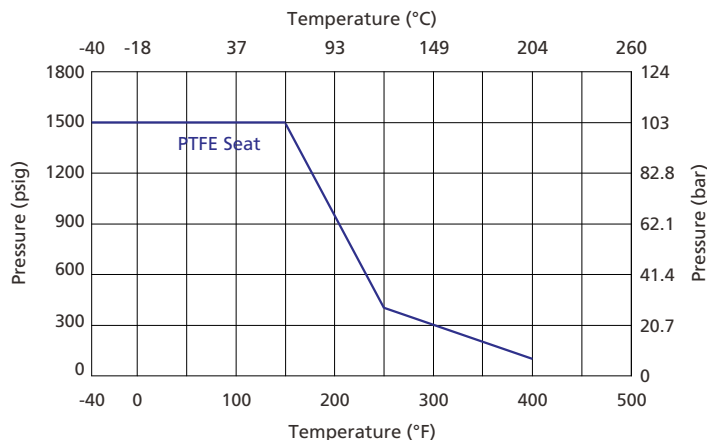
Special bolt construction

Maintain body seal during rapid temperature changes resulting from fire exposure and water quenching

Vented ball

Allow pressure to equalize between the valve body and the upstream port, preventing overpressurization and potential seal blowout under fire conditions

Pressure vs. Temperature



Standard Materials of Construction

Component	Material/ ASME Specification
<i>Disc Spring</i>	<i>Alloy X-750/AMS 5542</i>
Flange Seal	Graphite
Stem Packing	Graphite
<i>Packing Support</i>	<i>316 SS/A479</i>
<i>Stem Lower Bearing</i>	<i>316 SS/A479</i>
<i>Stem Upper Bearing</i>	<i>PEEK</i>
Body Bolt	SS

Notes: Wetted components are listed in italics. Other components not listed are in the same material as components of general service ball valves. For other materials, please contact FITOK Group or our authorized distributors.

Low-Temperature Service

Working Temperature Range: -65°F to 250°F (-54°C to 121°C).

Working Pressure: Up to 3000 psig (207 bar).

Orifice Sizes: 0.19" (4.8 mm) to 0.88" (22.2 mm).

Valves for low-temperature service are equipped with low-temperature EPDM O-rings.

All other materials are the same as those of standard valves.

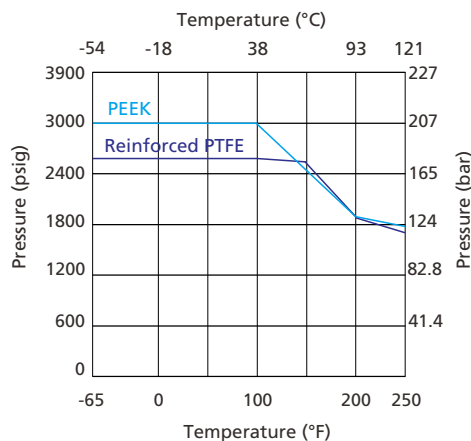
To order a valve for low-temperature service, add **-LT** to the valve ordering number.

For example: BHSS-FL4-P05-LT

BHSS-FL4-P05-3-LT

Seal kits for field replacement are available (see "Seal Kits" section).

Pressure VS Temperature



Materials of Construction

Component	Material/Specification
Seat	<i>PEEK/Reinforced PTFE</i>
Flange Seal	<i>Low Temperature EPDM</i>
Upper/Lower Packing	<i>Reinforced PTFE</i>

Note: Wetted components are listed in italics. Other components are same as standard materials of construction.

Seal Kits

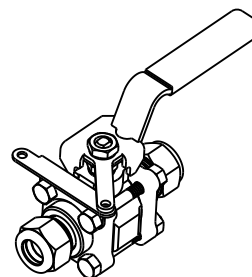
Valve Orifice	Flow Pattern	Special Application	Basic Seal Kit Ordering Number	Content
05/07	2-way and 3-way	None	BHSS-□4-RK	Seat, disc spring, stem bearing, lower packing, upper packing, stem spring, packing support, flange seal, instructions
		Low-temperature service	BHSS-□4-LT-RK	
10/13		None	BHSS-□8-RK	
		Low-temperature service	BHSS-□8-LT-RK	
22		None	BHSS-□16-RK	
		Low-temperature service	BHSS-□16-LT-RK	
29/32		None	BHSS-□24-RK	
		Low-temperature service	—	
38		None	BHSS-□32-RK	
		Low-temperature service	—	

Seat Material	Designator
PTFE	-
Reinforced PTFE	R
PEEK	P

1. Seal kit components are the same materials and grades listed in materials of construction.
2. The default seat material in the seal kit for BH series valves is PTFE. To order seats with other materials, add a seat material designator to "□" in the basic seal kit ordering number to get a complete ordering number.
Example: BHSS-8-RK
 BHSS-P8-LT-RK
3. The listed basic seal kit ordering numbers specify 316 material.
To order kits with other materials, such as Alloy C-276, replace "SS" with "HC" in the ordering number.
Example: BHHC-8-RK

Locking Device

- ⦿ Lock BH series 2-way or 3-way valves, locking hole diameters of the whole series of valves are 0.20 in (5.0 mm).
- ⦿ To order a ball valve with locking device, add -L to the valve ordering number.
Example: BHSS-FL16-22-L/BHSS-FL16-22-3L



Ball Valve without Handle

- ⦿ Ball Valve without handle can be directly connected to the FITOK actuator assembly.
- ⦿ To order, please add -AM to the valve ordering number.
Example: BHSS-FL4-P05-AM

Ordering Number Description

BHS4 - FNS8 - FRT8 - FL8 - P13G - OHQ3L - SCEF2																													
Series	Body Material		Connection 1 Type		Connection 1 Size		Connection 2/3 Type		Connection 2/3 Size		Seat Material		Orifice Size		Packing Material		Handle/Actuator		For Actuator		Flow Pattern		Locking Device		Special Application		Cleaning and Packaging		
BH	SS	CF8M	FNS	Female NPT	2	1/8"		Same as Connection 1			PTFE	05	0.19" (4.8 mm)		Reinforced PTFE	I	Yellow Handle Sleeve							No					FC-01
	S4	CF8	NS	Male NPT	4	1/4" or 1/4xSCH80		Specified in the same way as Connection 1 type and size			R Reinforced PTFE	07	0.28" (7.1 mm)		G Graphite		Red Handle Sleeve	H	Mechanical Limit Switch	L	Yes			S	NACE MR0175		F2	FC-02	
			FRT	Female BSPT	5	5/16"					P PEEK	10	0.41" (10.4 mm)			GR	Green Handle Sleeve	N	Inductive Limit Switch					SI	Inert Silicon Coated				
			RT	Male BSPT	6	3/8" or 6 mm or 3/8xSCH80						13	0.52" (13.1 mm)			J	Blue Handle Sleeve	Q	Solenoid Valve										
			FRP	Female BSPP (for RP)	8	1/2" or 8 mm or 1/2xSCH80						22	0.88" (22.2 mm)			EL	Oval Handle with Orange Sleeve		Mechanical Limit Switch and Solenoid Valve				CE	CE Certification					
			BP	Male BSPP (for RG)	10	10 mm						29	1.13" (28.6 mm)			AM	Without Handle												
			FMS	Female Metric Thread (for RG)	12	3/4" or 12 mm or 3/4xSCH80						32	1.25" (31.8 mm)			C	90°Normally Closed Pneumatic Actuator	NQ	Inductive Limit Switch and Solenoid Valve										
			MS	Male Metric Thread (for RG)	14	14 mm or M14x1.5						38	1.50" (38.1 mm)			O	90°Normally Open Pneumatic Actuator												
			MTS	Metric Tube Socket	16	1" or 16 mm or 1xSCH80										D	90°Double Acting Pneumatic Actuator												
			TS	Fractional Tube Socket	18	18 mm										LX	180° Left End Normally Open Pneumatic Actuator												
			MTB	Metric Tube Butt Weld	20	1 1/4" or 20 mm or M20x1.5 or 1 1/4xSCH80										RX	180° Right End Normally Open Pneumatic Actuator												
			TB	Fractional Tube Butt Weld	22	22 mm or M22x1.5										DX	180° Double Acting Pneumatic Actuator												
			PS	Pipe Socket Weld	24	1 1/2" or M24x1.5 or 1-1/2xSCH80										E	90° Electric Actuator												
			PB	Pipe Butt Weld	25	25 mm										EX	180° Electric Actuator												
			FL	Fractional Tube Fitting	27	M27x2																							
			ML	Metric Tube Fitting	28	28 mm																							
			UFB	Rotatable Fractional Tube Butt Weld	32	2" or 2xSCH80																							
			UMB	Rotatable Metric Tube Butt Weld																									
			UPB	Nut + Gasket + Pipe Bulged Nipple																									
			FO	Male FO Fitting																									
			FR	Male FR Fitting																									

1. Standard thread pitch for metric threads are as follows:
M10 and below: 1 mm
M12 to M24: 1.5 mm
M27 and above: 2 mm
Standard thread pitch should be omitted in the ordering number, others should be specified.

2. If you need a port with orbital welding, please contact FITOK Group.

3. FO means FITOK O-ring face seal fittings.
FR means FITOK metal gasket face seal fittings.

4. For oxygen-enriched environment or hazardous media service, contact FITOK Group or our authorized distributors.

5. Cleaning and Packaging:
FC-01: Standard cleaning and packaging for general industrial procedures.
FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleanliness requirements of ASTM G93 Level C.

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. All combinations are available.

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

6. For more information about pneumatic actuator ball valves, please refer to the catalog **Actuated Ball Valves**.

7. Inert Silicon Coated: Except for ball valves with PEEK seat, wetted metal components Inert Silicon Coated.

8. CE certification is available. For more information, please contact FITOK group or our authorized distributors.

One-Piece Instrumentation Ball Valves

BO Series

Features

- ⦿ Working pressure up to: 3000 psig (207 bar)
- ⦿ Working temperature: -65°F to 300°F (-54°C to 148°C)
- ⦿ End connections:
1/4 to 1/2 thread
1/16" to 3/4" and 3 mm to 18 mm tube fitting
- ⦿ 2-, 3-, 4-, 5-, 6- and 7-way models for on-off, switching and crossover service available
- ⦿ One-piece body and one-piece ball stem
- ⦿ No dead space
- ⦿ Top-loaded design to allow adjustment with the valve in-line
- ⦿ Thermal cycle performance improved and wear compensated by live-loaded design
- ⦿ Any reasonable connections available
- ⦿ Pneumatic and electric actuator available
- ⦿ Handle color options available
- ⦿ Full operating pressure at any port
- ⦿ Leak-tight performance testing with nitrogen or compressed air for every valve at the rated pressure to meet the requirement of no visible leak
- ⦿ The inlet can be any port except for valves with vent ports

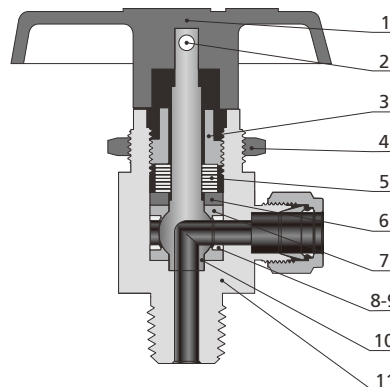
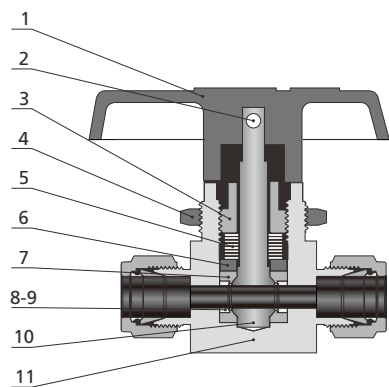


Ball Valves
Plug Valves

Notes:

1. To prevent seat leakage, packing adjustment may be required periodically during the service life of the valve.
2. A higher initial actuation torque may happen to the valves that have not been actuated for a period of time.
3. Before installation, instrumentation ball valves exposed to dynamic temperature conditions may lose their initial packing load. Stem packing adjustment should be required.

Standard Materials of Construction



Item	Component	Valve Body Material		
		316 SS	Brass	Alloy 400
		Material Grade/ASTM Specification		
1	Handle	Nylon or Aluminium		
2	Set Screw	Zinc-plated carbon steel		
3	Packing Bolt	316 SS/A479	Brass C36000/B16	316 SS/A479
4	Panel Nut	316 SS/A479	Brass C36000/B16	316 SS/A479
5	Disc Spring	S17700/A693		
6	Gland	316 SS/A479	316 SS/A479	316 SS/A479
7	<i>Packing Seat</i>	<i>PTFE/D1710 or UHMWPE/D4020 or PFA/D3307</i>		
8	<i>Support Ring</i>	316 SS/A479	316 SS/A479	Alloy 400/B164
9	<i>Support Disc</i>			
10	<i>Ball Stem</i>	316 SS/A479	Brass C36000/B16	Alloy 400/B164
11	<i>Body</i>	316 SS/A182	Brass C37700/B283	Alloy 400/B164
<i>Wetted Lubricant</i>		<i>Fluorinated-based and silicone-based</i>		
Non-wetted Lubricant		Molybdenum disulfide with hydrocarbon binder coat		

Note: Wetted components are listed in italics.

For other materials, please contact FITOK Group or our authorized distributors.

On-Off (2-way) Valves

Standard Flow Path

Straight Pattern



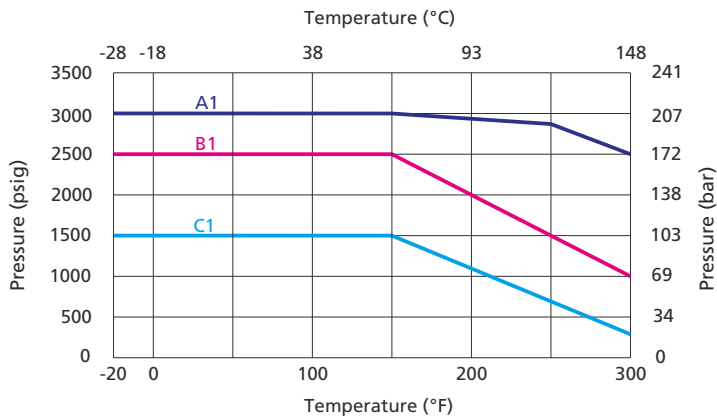
Angle Pattern



Pressure vs. Temperature

Straight Pattern and Angle Pattern

PTFE Packing Seat



A1: Straight Pattern Valves (orifice 0.19")

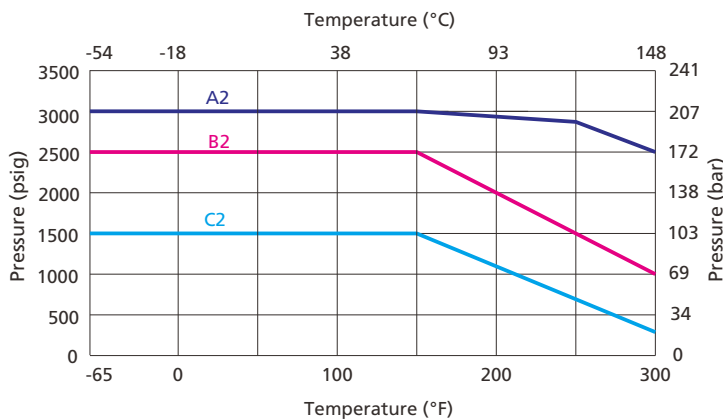
B1: Straight Pattern Valves (orifice 0.05" & 0.06" & 0.09" & 0.13" & 0.28" & 0.41")

Angle Pattern Valves (orifice 0.05" & 0.06" & 0.09" & 0.13" & 0.19")

C1: Angle Pattern Valves (orifice 0.28" & 0.41")

PFA, UHMWPE Packing Seat

The working temperature of UHMWPE packing seat should not be higher than 150°F (65°C).



A2: Straight Pattern Valves (orifice 0.19")

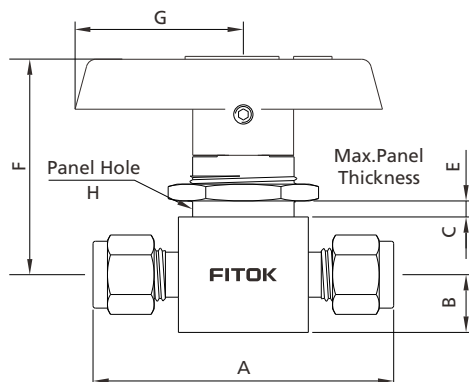
B2: Straight Pattern Valves (orifice 0.05" & 0.06" & 0.09" & 0.13" & 0.28" & 0.41")

Angle Pattern Valves (orifice 0.05" & 0.06" & 0.09" & 0.13" & 0.19")

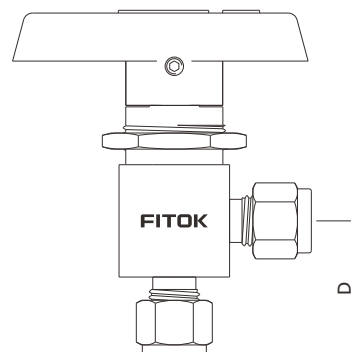
C2: Angle Valves (orifice 0.28" & 0.41")

Dimensions

Straight Pattern



Angle Pattern



B-28 Ball Valves

Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Cv		Dimensions, in. (mm)							
			Straight	Angle	A	B	C	D	E	F	G	H
BO□□-FL1-00	1/16" FITOK	0.05 (1.3)	0.10	—	1.68 (42.7)	0.28 (7.1)	0.34 (8.6)	—	0.25 (6.4)	1.43 (36.2)	1.10 (28)	19/32 (15.1)
BO□□-FL2-02	1/8" FITOK	0.09 (2.4)	0.20	0.15	2.01 (51.1)			0.97 (24.6)				
BO□□-FL4-03	1/4" FITOK	0.13 (3.2)	0.60	0.35	2.21 (56.1)			1.07 (27.2)				
BO□□-FL4-05		3/8" FITOK	0.19 (4.8)	1.40	0.90	2.39 (60.7)	0.38 (9.7)	0.44 (11.2)	1.17 (29.7)	0.19 (4.8)	1.64 (41.7)	1.57 (39.9)
BO□□-FL6-05	1.50			2.58 (65.5)		0.56 (14.2)	0.56 (14.2)	1.43 (36.3)	0.35 (9)	2.19 (55.5)	2.05 (52)	1 1/8 (28.6)
BO□□-FL6-07	0.28 (7.1)		6.00	2.00	3.05 (77.5)							
BO□□-FL8-10	1/2" FITOK	0.41 (10.3)	12.00	4.60	3.92 (99.6)	0.69 (17.5)	0.69 (17.5)	1.74 (44.2)	0.49 (12.5)	2.67 (67.7)	3.13 (79.6)	1 1/2 (38.1)
BO□□-FL12-10	3/4" FITOK		6.40	3.80								
BO□□-ML3-02	3 mm FITOK	0.09 (2.4)	0.20	0.15	2.01 (51.1)	0.28 (7.1)	0.34 (8.6)	0.97 (24.6)	0.25 (6.4)	1.43 (36.2)	1.10 (28)	19/32 (15.1)
BO□□-ML6-03	6 mm FITOK	0.13 (3.2)	0.60	0.35	2.21 (56.1)			1.07 (27.2)				
BO□□-ML6-05		0.19 (4.8)	1.40	0.90	2.39 (60.7)			0.38 (9.7)				
BO□□-ML8-05	8 mm FITOK		1.50		2.46 (62.5)			1.20 (30.5)				
BO□□-ML10-07	10 mm FITOK	0.28 (7.1)	6.00	2.00	3.07 (78.0)	0.56 (14.2)	0.56 (14.2)	1.43 (36.3)	0.35 (9)	2.19 (55.5)	2.05 (52)	1 1/8 (28.6)
BO□□-ML12-10	12 mm FITOK	0.41 (10.3)	12.00	4.60	3.92 (99.6)	0.69 (17.5)	0.69 (17.5)	1.74 (44.2)	0.49 (12.5)	2.67 (67.7)	3.13 (79.6)	1 1/2 (38.1)
BO□□-FNS2-03	1/8 Female NPT	0.13 (3.2)	0.50	0.30	1.63 (41.4)	0.28 (7.1)	0.34 (8.6)	0.81 (20.6)	0.25 (6.4)	1.43 (36.2)	1.10 (28)	19/32 (15.1)
BO□□-FNS2-05		1/4 Female NPT	0.19 (4.8)	1.20	0.70	2.00 (50.8)	0.38 (9.7)	0.44 (11.2)	1.00 (25.4)	0.19 (4.8)	1.64 (41.7)	1.57 (39.9)
BO□□-FNS4-05	0.90			0.75	2.06 (52.3)	1.03 (26.2)						
BO□□-FNS4-07			0.28 (7.1)	3.00	1.70	2.50 (63.5)	0.56 (14.2)	0.56 (14.2)	1.25 (31.8)	0.35 (9)	2.19 (55.5)	2.05 (52)
BO□□-FNS6-07	3/8 Female NPT	2.60		1.50								
BO□□-FNS8-10	1/2 Female NPT	0.41 (10.3)	6.30	3.50	3.12 (79.2)	0.69 (17.5)	0.69 (17.5)	1.56 (39.6)	0.49 (12.5)	2.67 (67.7)	3.13 (79.6)	1 1/2 (38.1)
BO□□-NS4-05	1/4 Male NPT	0.19 (4.8)	1.20	0.75	2.00 (50.8)	0.38 (9.7)	0.44 (11.2)	1.03 (26.2)	0.19 (4.8)	1.64 (41.7)	1.57 (39.9)	25/32 (19.8)
BO□□-FRT4-05	1/4 Female BSPT		0.90	—	2.06 (52.3)							
BO□□-FRT6-07	3/8 Female BSPT	0.28 (7.1)	2.60		2.50 (63.5)	0.56 (14.2)	0.56 (14.2)	—	0.35 (9)	2.19 (55.5)	2.05 (52)	1 1/8 (28.6)
BO□□-FRT8-10	1/2 Female BSPT	0.41 (10.3)	6.30		3.12 (79.2)	0.69 (17.5)	0.69 (17.5)		0.49 (12.5)	2.67 (67.7)	3.13 (79.6)	1 1/2 (38.1)
BO□□-FO4-03	1/4 Male FO	0.13 (3.2)	0.60	0.35	1.75 (44.4)	0.38 (9.7)	0.34 (8.6)	0.94 (23.9)	0.25 (6.4)	1.43 (36.2)	1.10 (28)	19/32 (15.1)
BO□□-FO4-05		0.19 (4.8)	2.40	0.90	1.88 (47.8)		0.44 (11.2)		0.19 (4.8)	1.64 (41.7)	1.57 (39.9)	25/32 (19.8)
BO□□-FR4-03	1/4 Male FR	0.13 (3.2)	0.60	0.35	2.13 (54.1)		0.34 (8.6)	1.09 (27.7)	0.25 (6.4)	1.43 (36.2)	1.10 (28)	19/32 (15.1)
BO□□-FR4-05		0.19 (4.8)	2.40	0.90		0.44 (11.2)	0.19 (4.8)		1.64 (41.7)	1.57 (39.9)	25/32 (19.8)	
BO□□-FR8-07	1/2 Male FR	0.28 (7.1)	6.00	—	2.88 (73.2)	0.56 (14.2)	—	0.35 (9)	2.19 (55.5)	2.05 (52)	1 1/8 (28.6)	
BO□□-FR8-10		0.41 (10.3)	12.00		3.12 (79.2)	0.69 (17.5)		0.49 (12.5)	2.67 (67.7)	3.13 (79.6)	1 1/2 (38.1)	

Switching (3-, 4-, 5-, 6- and 7-Way) Valves

Standard Flow Path

3-way Valves



3L Flow Path

This type of valve can connect one side port to the bottom port or shut off 3 ports. Switch between 0°, 90° and 180° positions with 180° rotation handle.



Ports 1 and 3 open

Off

Ports 1 and 2 open

4-way Valves



4L Flow Path

This type of valve can connect one side port to the bottom port, and shut off other 2 side ports at the same time. Switching can be done in 120° increments with 360° rotation handle.



Ports 1 and 2 open

Ports 1 and 3 open

Ports 1 and 4 open

5-way Valves



5L Flow Path

This type of valve can connect one side port to the bottom port, and shut off other 3 side ports at the same time. Switching can be done in 90° increments with 360° rotation handle.



Ports 1 and 2 open

Ports 1 and 3 open

Ports 1 and 4 open

Ports 1 and 5 open

6-way Valves



6L Flow Path

This type of valve can connect one side port to the bottom port, and shut off other 4 side ports at the same time. Switching can be done in 72° increments with 360° rotation handle.



Ports 1 and 2 open

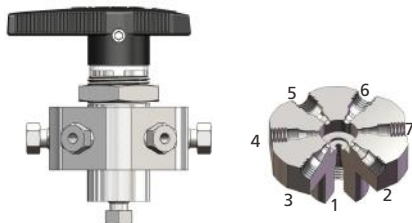
Ports 1 and 3 open

Ports 1 and 4 open

Ports 1 and 5 open

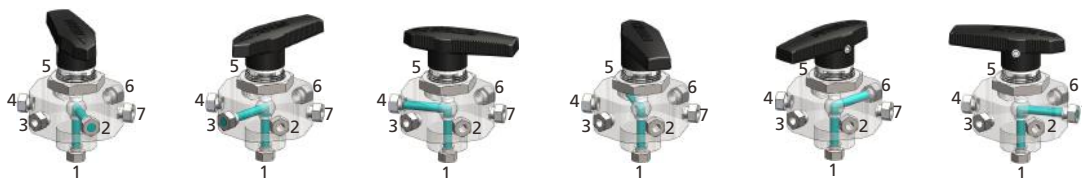
Ports 1 and 6 open

7-way Valves



7L Flow Path

This type of valve can connect one side port to the bottom port, and shut off other 5 side ports at the same time. Switching can be done in 60° increments with 360° rotation handle.



Ports 1 and 2 open

Ports 1 and 3 open

Ports 1 and 4 open

Ports 1 and 5 open

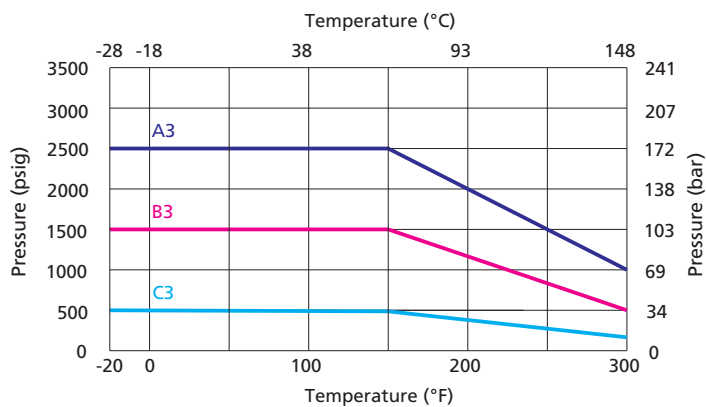
Ports 1 and 6 open

Ports 1 and 7 open

Pressure vs. Temperature

Switching Valves

PTFE Packing Seat



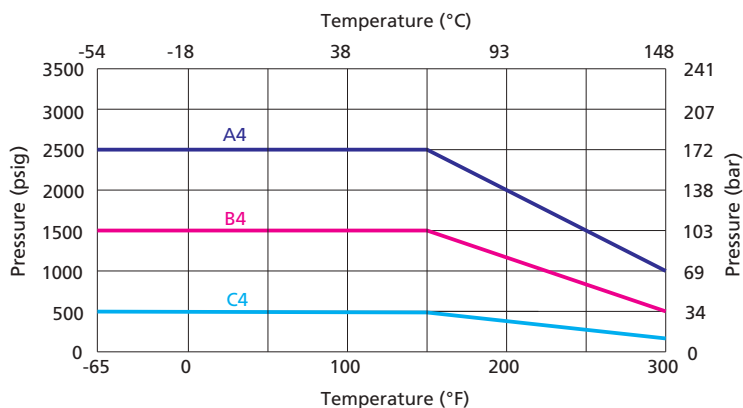
A3: 3-way (orifice 0.05" & 0.06" & 0.09" & 0.13" & 0.19")
4-way / 5-way (orifice 0.06")

B3: 3-way (orifice 0.28" & 0.41")
4-way / 5-way (orifice 0.41")

C3: 6-way / 7-way (orifice 0.05" & 0.06")

PFA, UHMWPE Packing Seat

The working temperature of UHMWPE packing seat should not be higher than 150°F (65°C).



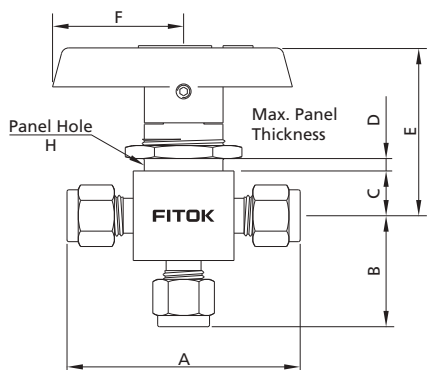
A4: 3-way (orifice 0.05" & 0.06" & 0.09" & 0.13" & 0.19")
4-way / 5-way (orifice 0.06")

B4: 3-way (orifice 0.28" & 0.41")
4-way / 5-way (orifice 0.41")

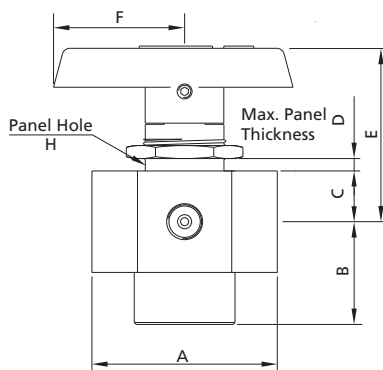
C4: 6-way / 7-way (orifice 0.05" & 0.06")

Dimensions

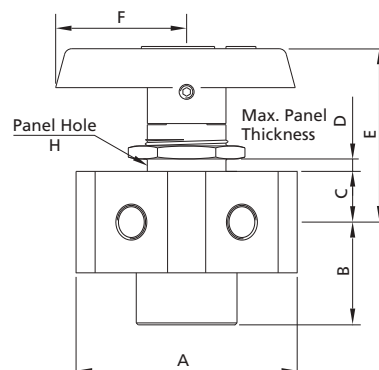
3-way Valves



4-and 5-way Valves



6-and 7-way Valves



Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Cv	Dimensions, in. (mm)								
				A	B	C	D	E	F	H		
	3-way Valves											
BO□□-FL1-00-3L	1/16" FITOK	0.05 (1.3)	0.08	1.68 (42.7)	0.81 (20.6)	0.34 (8.6)	0.25 (6.4)	1.43 (36.2)	1.10 (28)	19/32 (15.1)		
BO□□-FL2-02-3L	1/8" FITOK	0.09 (2.4)	0.15	2.01 (51.1)	0.97 (24.6)							
BO□□-FL4-03-3L	1/4" FITOK	0.13 (3.2)	0.35	2.21 (56.1)	1.07 (27.2)							
BO□□-FL4-05-3L		0.19 (4.8)	0.90	2.39 (60.7)	1.17 (29.7)	0.44 (11.2)	0.19 (4.8)	1.64 (41.7)	1.57 (39.9)	25/32 (19.8)		
BO□□-FL6-07-3L	3/8" FITOK	0.28 (7.1)	2.00	2.89 (73.4)	1.43 (36.3)	0.56 (14.2)	0.35 (9)	2.19 (55.5)	2.05 (52)	11/8 (28.6)		
BO□□-FL8-10-3L	1/2" FITOK	0.41 (10.3)	4.60	3.48 (88.4)	1.74 (44.2)	0.69 (17.5)	0.49 (12.5)	2.67 (67.7)	3.13 (79.6)	11/2 (38.1)		
BO□□-FL12-10-3L	3/4" FITOK		4.90									
BO□□-ML3-02-3L	3 mm FITOK	0.09 (2.4)	0.15	2.01 (51.1)	0.97 (24.6)	0.34 (8.6)	0.25 (6.4)	1.43 (36.2)	1.10 (28)	19/32 (15.1)		
BO□□-ML6-03-3L	6 mm FITOK	0.13 (3.2)	0.35	2.21 (56.1)	1.07 (27.2)							
BO□□-ML6-05-3L		0.19 (4.8)	0.90	2.39 (60.7)	1.17 (29.7)						0.44 (11.2)	0.19 (4.8)
BO□□-ML8-05-3L	8 mm FITOK		0.80	2.46 (62.5)	1.20 (30.5)							
BO□□-ML10-07-3L	10 mm FITOK	0.28 (7.1)	2.00	2.89 (73.4)	1.43 (36.3)	0.56 (14.2)	0.35 (9)	2.19 (55.5)	2.05 (52)	1 1/8 (28.6)		
BO□□-ML12-10-3L	12 mm FITOK	0.41 (10.3)	4.60	3.48 (88.4)	1.74 (44.2)	0.69 (17.5)	0.49 (12.5)	2.67 (67.7)	3.13 (79.6)	1 1/2 (38.1)		
BO□□-FNS2-03-3L	1/8 Female NPT	0.13 (3.2)	0.30	1.63 (41.4)	0.81 (20.6)	0.34 (8.6)	0.25 (6.4)	1.43 (36.2)	1.10 (28)	19/32 (15.1)		
BO□□-FNS4-05-3L	1/4 Female NPT	0.19 (4.8)	0.75	2.06 (52.3)	1.03 (26.2)	0.44 (11.2)	0.19 (4.8)	1.64 (41.7)	1.57 (39.9)	25/32 (19.8)		
BO□□-FNS4-07-3L		0.28 (7.1)	1.70	2.5 (63.5)	1.18 (30)	0.56 (14.2)	0.35 (9)	2.19 (55.5)	2.05 (52)	1 1/8 (28.6)		
BO□□-FNS6-07-3L			3/8 Female NPT								1.50	
BO□□-FNS8-10-3L	1/2 Female NPT	0.41 (10.3)	3.50	3.13 (79.5)	1.56 (39.6)	0.69 (17.5)	0.49 (12.5)	2.67 (67.7)	3.13 (79.6)	1 1/2 (38.1)		
BO□□-FRT4-05-3L	1/4 Female BSPT	0.19 (4.8)	0.75	2.06 (52.3)	1.03 (26.2)	0.44 (11.2)	0.19 (4.8)	1.64 (41.7)	1.57 (39.9)	25/32 (19.8)		
BO□□-FRT6-07-3L	3/8 Female BSPT	0.28 (7.1)	1.50	2.5 (63.5)	1.18 (30)	0.56 (14.2)	0.35 (9)	2.19 (55.5)	2.05 (52)	1 1/8 (28.6)		
BO□□-FRT8-10-3L	1/2 Female BSPT	0.41 (10.3)	3.50	3.13 (79.5)	1.56 (39.6)	0.69 (17.5)	0.49 (12.5)	2.67 (67.7)	3.13 (79.6)	1 1/2 (38.1)		
4 - & 5-way Valves												
BO□□-FL2-01-4L	1/8" Female FITOK Tube Fitting	0.06 (1.6)	0.07	2.36 (60)	1.32 (33.5)	0.44 (11.2)	0.20 (5.2)	1.76 (44.6)	1.57 (39.9)	29/32 (23.1)		
BO□□-FL2-01-5L				1.85 (47)	0.88 (22.4)							
BO□□-FNS2-01-4L	0.06 (1.6)	0.07	1.55 (39.4)									
BO□□-FNS2-01-5L												
BO□□-FNS8-10-4L	1/2 Female NPT	0.41 (10.3)	3.50	3.13 (79.5)	1.56 (39.6)	0.69 (17.5)	0.41 (10.5)	2.67 (70.2)	2.63 (66.7)	1 1/2 (38.1)		
BO□□-FNS8-10-5L												
6 - & 7-way Valves												
BO□□-FL1-00-6L	1/16" Female FITOK Tube Fitting	0.05 (1.3)	0.05	2.64 (67)	1.32 (33.5)	0.44 (11.2)	0.28 (7)	1.76 (44.6)	1.57 (39.9)	29/32 (23.1)		
BO□□-FL1-00-7L												
BO□□-FL2-01-6L	1/8" Female FITOK Tube Fitting	0.06 (1.6)	0.07	2.26 (57.6)	0.97 (24.7)							
BO□□-FL2-01-7L												

Crossover (4-, 6-Way) Valves

Standard Flow Path

4-way Valves

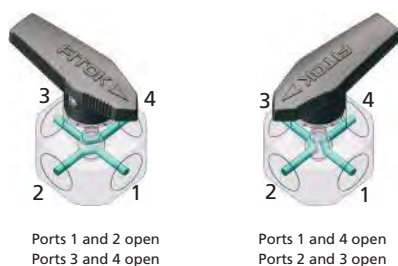


6-way Valves



4C Flow Path

This type of valve can connect two groups of adjacent ports at the same time. Switch between 0° and 90° positions with 90° rotation handle.



6C Flow Path

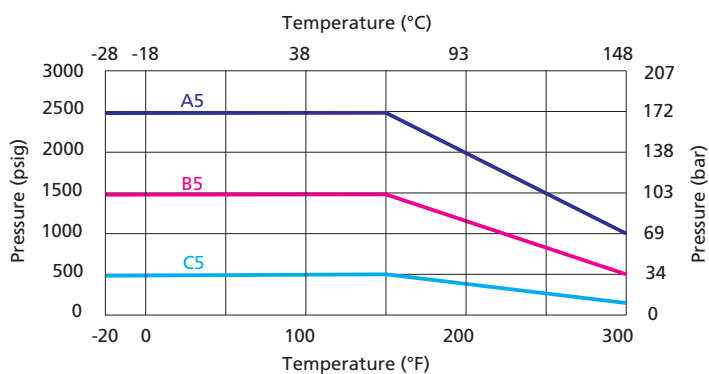
This type of valve can connect three groups of adjacent ports at the same time. Switch between 0° and 60° positions with 60° rotation handle.



Pressure vs. Temperature

Crossover Valves

PTFE Packing Seat



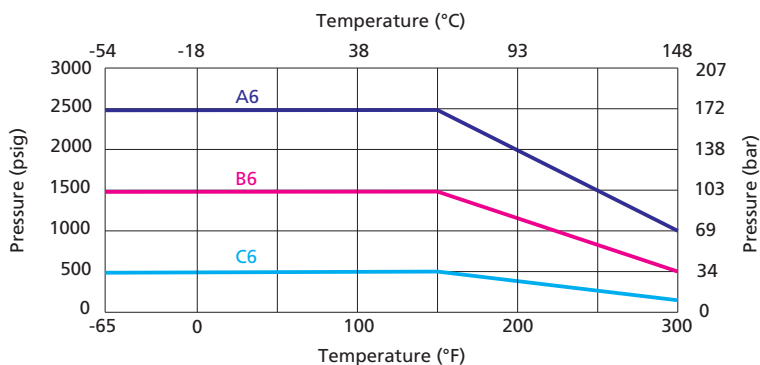
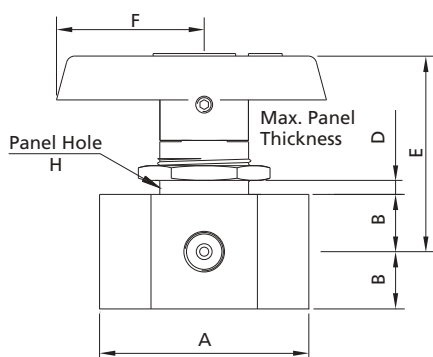
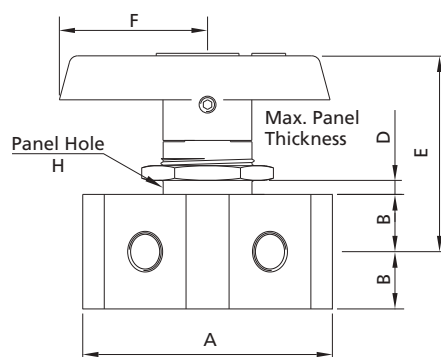
A5: 4-way (orifice 0.06")

B5: 4-way (orifice 0.41")

C5: 6-way (orifice 0.05" & 0.06")

PFA, UHMWPE Packing Seat

The working temperature of UHMWPE packing seat should not be higher than 150°F (65°C).

**Dimensions****4-way Valves****6-way Valves**

Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Cv	Dimensions, in. (mm)					
				A	B	D	E	F	H
4-way Valve									
BO□□-FL1-00-4C	1/16" Female FITOK Tube Fitting ^①	0.05 (1.3)	0.06	1.95 (49.6)	0.44 (11.2)	0.19 (4.8)	1.64 (41.7)	1.57 (39.9)	25/32 (19.8)
BO□□-FL2-01-4C	1/8" Female FITOK Tube Fitting ^①	0.06 (1.6)	0.08	2.61 (66.3)					
BO□□-FNS2-01-4C	1/8 Female NPT ^①			1.55 (39.4)					
BO□□-FNS8-07-4C	1/2 Female NPT ^②	0.28 (7.1)	1.60	3.13 (79.5)	0.69 (17.5)	0.48 (12.2)	2.67 (67.7)	3.13 (79.6)	1 1/2 (38.1)
6-way Valve									
BO□□-FL1-00-6C	1/16" Female FITOK Tube Fitting	0.05 (1.3)	0.06	1.95 (49.5)	0.44 (11.2)	0.19 (4.8)	1.68 (42.7)	1.53 (38.9)	29/32 (23.1)
BO□□-FL2-01-6C	1/8" Female FITOK Tube Fitting	0.06 (1.6)	0.08	2.59 (65.8)					

Notes: Connection type for ball valves in 4L, 5L, 6L, 7L, 4C, 6C, 4H, 4HL, 4V, 5HL, 5H and 5LV flow path is female FITOK tube fitting, which can not be used directly with standard FT and MT connections. Please contact FITOK Group or authorized distributors for use with standard FT and MT connections.

① There might be an across-connection flow during switching. If it is not acceptable to you, please specify a spherical orifice of 0.049 in. Example: BOSS-FL2-01-4C-049.

② There might be an across-connection flow during switching. If it is not acceptable to you, please specify a spherical orifice of 0.093 in. Example: BOSS-FNS8-07-4C-093.

1. FITOK means FITOK double ferrule tube fittings.

2. Sizes and types listed are standard. Other sizes and types are available upon request, please contact FITOK Group or our authorized distributors.

3. Dimensions are shown with tube fitting nuts finger-tightened. All dimensions are for reference only and are subject to change.

For dimensions not shown above, please contact FITOK Group or our authorized distributors.

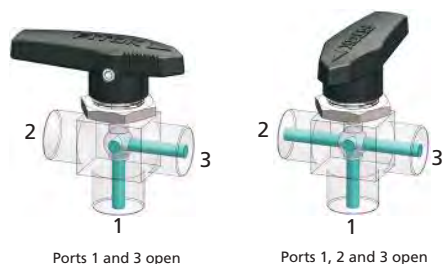
Special Flow Path

3-way Valves



3HL Flow Path

This type of valve can connect one side port to the bottom port, or connect two side ports to the bottom port. Switching can be done in 90° increments with 180° rotation handle.



Note: For Temperature VS. Pressure curves and dimensions of 3-way valves, see Switching (3-way) Valves above. For Temperature VS. Pressure curves and dimensions of 4-way valves, see Crossover (4-way) Valves above.

4-way Valves



4H Flow Path

This type of valve can connect two opposite ports. Switch between 0° and 90° positions with 90° rotation handle.



4HL Flow Path

This type of valve can connect three adjacent ports and shut off other ports. Switching can be done in 90° increments with 360° rotation handle.



4V Flow Path

This type of valve can connect two adjacent ports and shut off other ports. Switching can be done in 90° increments with 360° rotation handle.



5-way Valves



5H Flow Path

This type of valve can connect the bottom port to port 2 and port 4, or connect the bottom port to port 3 and port 5. Switch between 0° and 90° positions with 90° rotation handle.

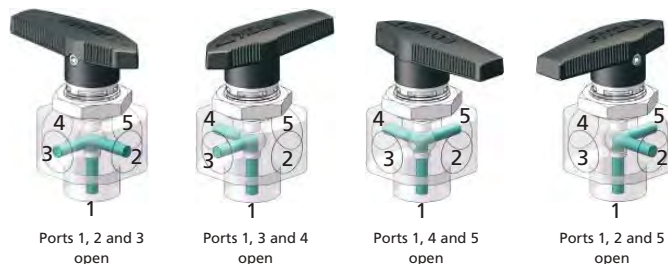
5HL Flow Path

This type of valve can connect three side ports to the bottom port, and shut off the fourth side port at the same time. Switching can be done in 90° increments with 360° rotation handle.



5LV Flow Path

This type of valve can connect two adjacent ports to the bottom port, and shut off other two side ports at the same time. Switching can be done in 90° increments with 360° rotation handle.



Note: For Temperature vs. Pressure curve and dimensions of 5-way valves, see Switching (5-way) Valves above.

Vent Port Options

Vented Valves

The maximum working pressure for vented valves is 500 psig (34.5 bar).

Straight-pattern Valves

A vent hole in the side of the valve body makes the downstream port vent to atmosphere when the valve is closed.

Angle-pattern and 3-way Valves

A vent hole in the side of the valve body makes the bottom port vent to atmosphere when the valve is closed.

Welded Vent Port Connections

A FITOK tube fitting or a tube stub welded to the vent port is available for stainless steel vented valves.

Process Option

Valves with FOG process are available. FOG refers to FC-02 without lubrication.

To order a valve with FOG process, add -FOG suffix to the valve ordering number, for example: BOSS-FL4-05-FOG.

The pressure rating of valves with FOG process: 200 psig (13.8 bar) for orifice 10, 500 psig (34.5 bar) for other orifice.

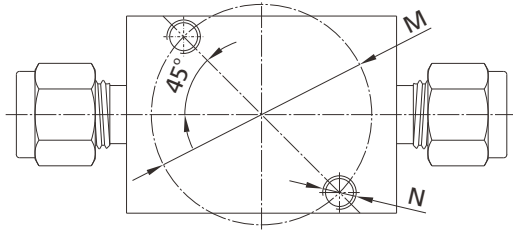
The starting torque of valves with FOG process is greater than that of the lubricated valves.

Bottom Screw Panel Mounting Options

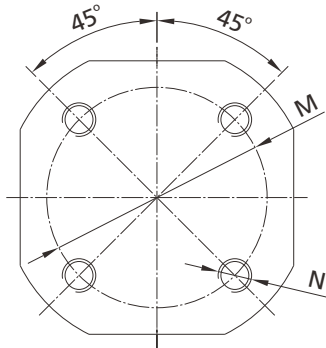
Mounting Dimensions

The bottom screw panel mounting options are not available on angle-pattern valves, 3-way valves, 6-way valves and 7-way valves.

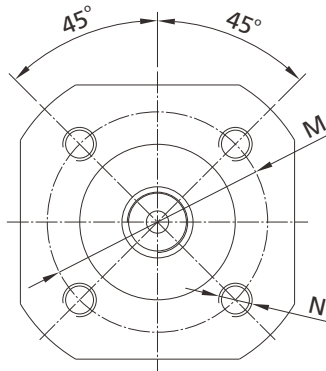
2-way



4-way



5-way



	Orifice in. (mm)	Dimensions, in. (mm)	
		M	N
2-way	0.05~0.13 (1.3~3.2)	0.63 (15.88)	M2.5 x 0.45 deep 0.24" (6)
	0.19 (4.8)	0.88 (22.23)	M3 x 0.5 deep 0.24" (6)
	0.28 (7.1)	1.25 (31.75)	M5 x 0.8 deep 0.24" (6)
	0.41 (10.3)	1.63 (41.28)	M5 x 0.8 deep 0.24" (6)
4-way	0.05~0.06 (1.3~1.6)	1.25 (31.75)	M5 x 0.8 deep 0.24" (6)
	0.28 (7.1)	2.00 (50.8)	M5 x 0.8 deep 0.24" (6)
5-way	0.05~0.06 (1.3~1.6)	1.25 (31.75)	M5 x 0.8 deep 0.24" (6)
	0.41 (10.3)	2.00 (50.8)	M5 x 0.8 deep 0.24" (6)

Locking Device

- ⦿ Locking Device 1 can lock BO series valves with 90° or 180° rotation handle, locking hole diameter is 0.21 in (5.2 mm);
- ⦿ To order a ball valve with locking device 1, add -LH to the valve ordering number.
Example: BOSS-FL6-07-LH/BOSS-FL6-07-3L-LH
- ⦿ Locking Device 2 can lock BO series valves with 90°, 180°, or 360° rotation handle, locking hole diameter is 0.34 in (8.7 mm);
- ⦿ To order a ball valve with locking device 2, add -LK to the valve ordering number.
Example: BOSS-ML6-05-LK/BOSS-ML6-05-5L-LK

Caution: These handles are designed to prevent unintentional valve operation. They are not tamper resistant and can be removed, even when locked.

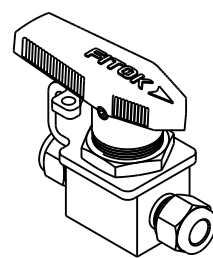


Diagram of Locking Device 1

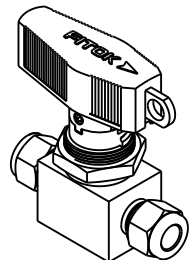


Diagram of Locking Device 2

Ball Valve without Handle

- ⦿ Ball Valve without handle can be directly connected to the FITOK actuator assembly.
- ⦿ To order, please add -AM to the valve ordering number.

Example: BOSS-FL4-05-AM

Ordering Number Description

Ordering Number Description																																								
BOSS - ML6 - FL4 - ML8 - H05 - DXHQ3L - BLH - FL4 - SF2																																								
Series	Body Material		Connection 1 Type		Connection 1 Size		Connection 2 to 7 Type	Connection 2 to 7 Size	Seat Material		Orifice Size	Handle/Actuator	For Actuator	Flow Pattern	Panel Installation	Locking Device	Vent Port	Special Application	Cleaning and Packaging																					
BO	SS	316 SS	FNS	Female NPT	1	1/16"	Same as connection 1 Specified in the same way as connection 1 type and size		PTFE	H	UHMWPE	A	PFA	00	0.05" (1.3 mm)	I	Black Nylon Handle	None	H	Mechanical Limit Switch	A	Straight	No vent port	None	S	NACE MR0175	SI	Inert Silicon Coating	CE	CE Certification										
	S4	304 SS	NS	Male NPT	2	1/8"								01	0.06" (1.6 mm)		GR			Green Nylon Handle		N				Inductive Limit Switch		3L		3-way			FL2	1/8" tube fitting	FC-01					
	S1	321 SS	FRT	Female BSPT	3	3 mm								02	0.09" (2.4 mm)		J			Blue Nylon Handle		Q				Solenoid Valve		3HL		4-way			FL4	1/4" tube fitting		F2	FC-02			
	6L	316L SS	RT	Male BSPT	4	1/4"								03	0.13" (3.2 mm)		AM			Without Handle		HQ				Mechanical Limit Switch and Solenoid Valve		4L					5-way	FL6				3/8" tube fitting	FOG	FC-02 without Lubrication
	B	Brass	FMS	Female Metric Thread (for RG-M)	6	3/8" or 6 mm								05	0.19" (4.8 mm)		U			Black Aluminium Handle		NQ				Inductive Limit Switch and Solenoid Valve		4C						6-way				ML3		
	M	Alloy 400	MS	Male Metric Thread (for RG-M)	8	1/2" or 8 mm								07	0.28" (7.1 mm)		C			90° Normally Closed Pneumatic Actuator		Panel nut B Bottom screw				4H		7-way		ML6			6 mm tube fitting							
			FRP	Female BSPP (for RP)	10	10 mm								10	0.41" (10.3 mm)		O			90° Normally Open Pneumatic Actuator						4HL				5-way			ML8	8 mm tube fitting						
			FL	Fractional Tube Fitting	12	3/4" or 12 mm											D			90° Double Acting Pneumatic Actuator						5L		6-way					LH	Locking Device 1						
			ML	Metric Tube Fitting	14	14 mm											LX			180° Left End Normally Open Pneumatic Actuator						5H				7-way			LK	Locking Device 2						
			FO	Male FO Fitting	16	16 mm											RX			180° Right End Normally Open Pneumatic Actuator						5HL														
		FR	Male FR Fitting	18	18 mm			DX	180° Double Acting Pneumatic Actuator	5LV																														
								E	90° Electric Actuator	6L																														
								EX	180° Electric Actuator	6C																														
										7L																														

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

1. For oxygen-enriched environment or hazardous media service, contact FITOK Group or our authorized distributors.

2. Cleaning and Packaging:

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

- For oxygen-enriched environment or hazardous media service, contact FITOK Group or our authorized distributors.
- Cleaning and Packaging:
FC-01: Standard cleaning and packaging for general industrial procedures.
FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleanliness requirement of ASTM G93 Level C.
- For more information about pneumatic actuator ball valves, please refer to the catalog Actuated Ball Valves.
- Inert Silicon Coating: Wetted metal components Inert Silicon coated.
- CE certification is available. For more information, please contact FITOK group or our authorized distributors.

Bar Stock Ball Valves

BP Series

Features

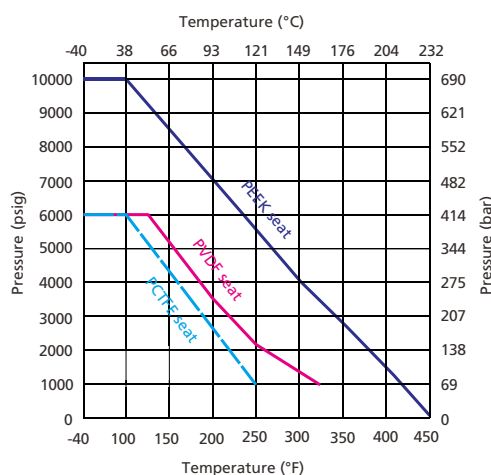
- Working pressure up to: 10000 psig (690 bar)
- Working temperature: -40°F to 450°F (-40°C to 232°C)
- Bidirectional flow for 2-way valves
- Seat wear compensation by free floating ball
- Variety of end connections
- Blowout proof stem for added safety
- Optional pneumatic and electric actuator
- Leak-tight performance testing with nitrogen or compressed air for every valve at the rated pressure



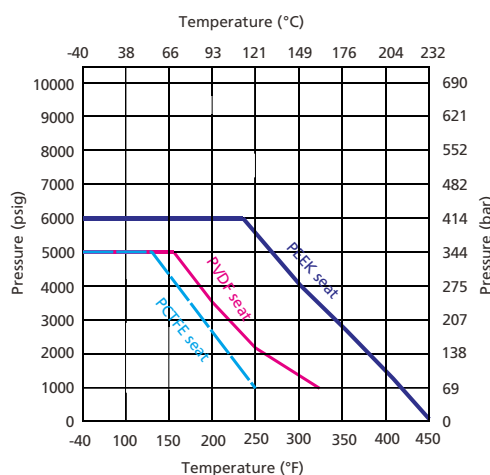
Pressure vs. Temperature

2-way Valves

Orifice code: 10

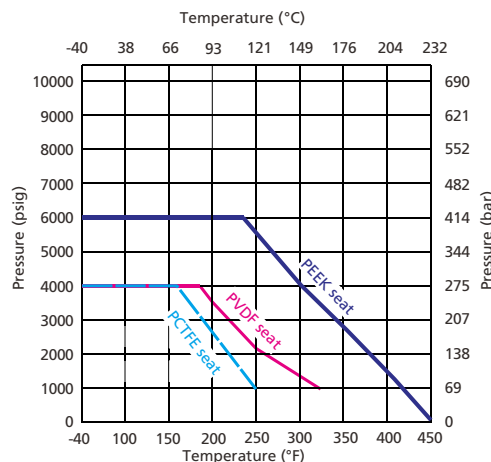


Orifice code: 13 and 19

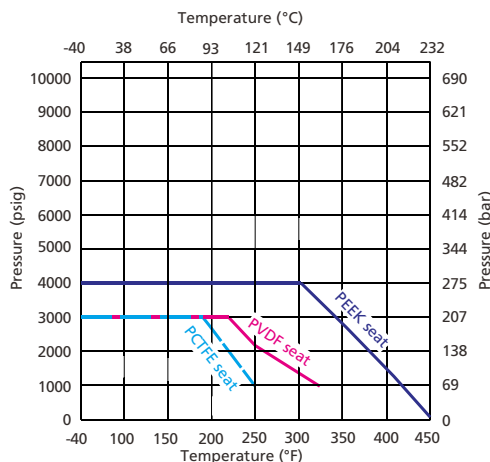


3-way Valves

Orifice code: 10



Orifice code: 13 and 19



Notes: 1. Graphs are with 316 SS body. For information of body in other materials, please contact FITOK Group or our authorized distributors.
2. The working pressure of valves is restricted by materials of the valve body and seat, as well as end connections. When choosing a valve for your applications, please refer to the above Temperature vs. Pressure Curves and the pressure rating in the dimension table. The minimum value shall be the pressure rating of the valve.

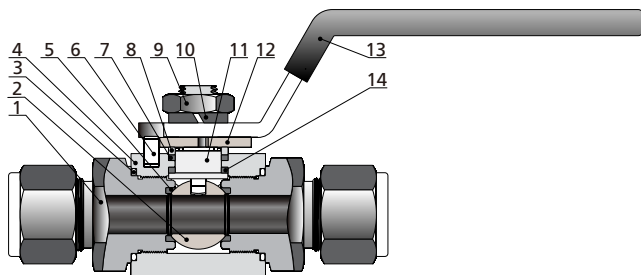
Pressure Rating@100°F (38°C)

Material	End Connection	Pressure Rating, psig (bar)
316 SS	FNS4, FNS6, FNS8, NS4, NS6, NS8, FL4, ML6	10000 (690)
	ML10	8400 (578)
	FL6, ML8	7500 (516)
	ML12	6800 (470)
	FL8	6700 (462)
	ML14	6200 (427)
	FL10, FNS8, FNS12, FNS16, NS12, NS16	6000 (414)
	ML16, FL12	5800 (400)
	ML20	5500 (379)
	ML18	5400 (372)
	ML22	4900 (338)
	FL16	4700 (324)
	ML25	4600 (317)

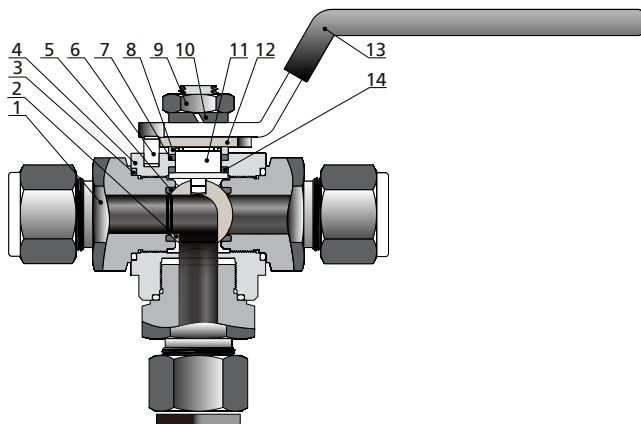
Note: Maximum working pressure of BP Series ball valves is 10,000 psig. The specified pressure rating is restricted by end connections.

Standard Materials of Construction

2-way Valves



3-way Valves



Item	Component	Body Material
		316 SS
1	<i>End Connection</i>	<i>316 SS/A479</i>
2	<i>Ball</i>	<i>316 SS/A479</i>
3	<i>O-ring</i>	<i>Fluorocarbon FKM</i>
4	<i>Body</i>	<i>316 SS/A479</i>
5	<i>Seat</i>	<i>PVDF or PCTFE or PEEK</i>
6	Stop Pin	SS
7	<i>Stem Packing</i>	<i>PTFE/D1710</i>
8	Stem Washer	316 SS/A479
9	Stem Nut ^①	SS
10	Spring Washer	SS
11	<i>Stem</i>	<i>316 SS/A479</i>
12	Stop Block	304 SS/A240
13	Handle	SS with vinyl cover
14	Lower Packing ^②	PEEK

Note: Wetted components are listed in italics.

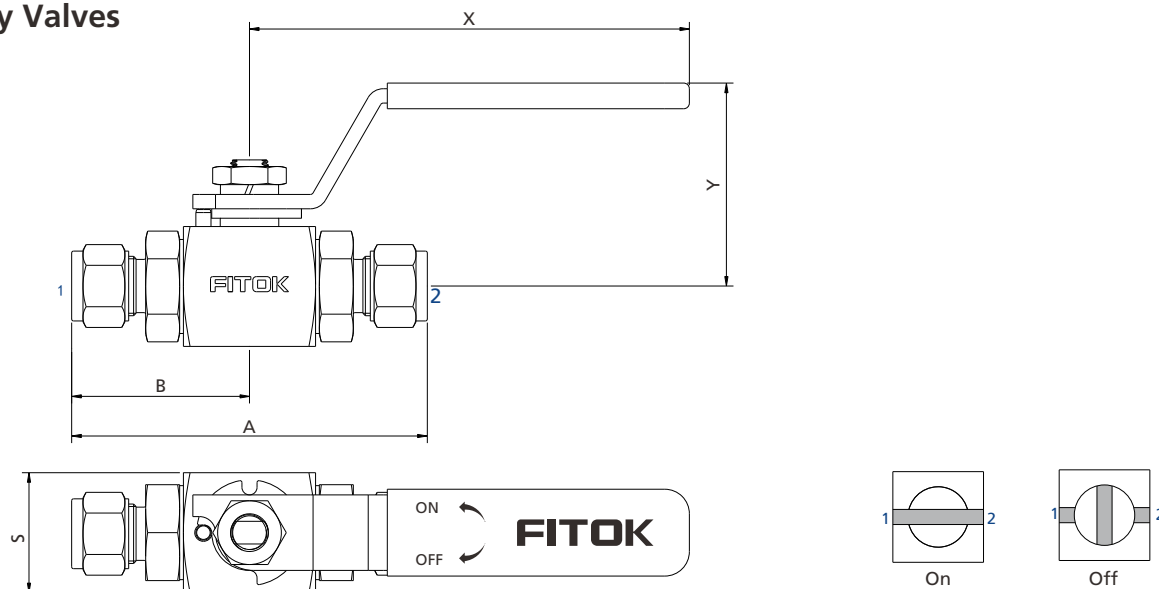
For other materials, please contact FITOK Group or our authorized distributors.

① Ball valves with orifice code 13 or 19 have 2 stem nuts.

② Lower packing material of ball valves with orifice code 19 is PTFE.

Dimensions

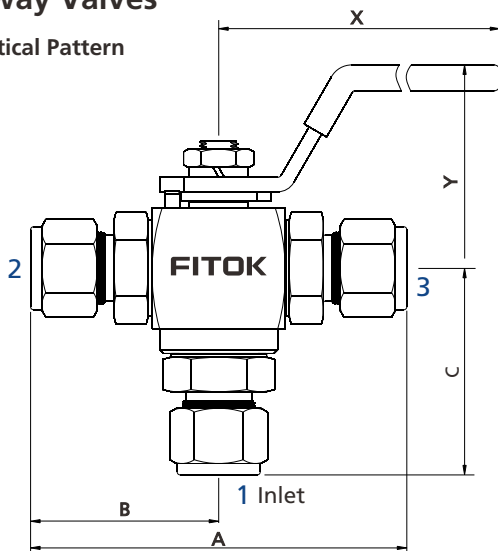
2-way Valves



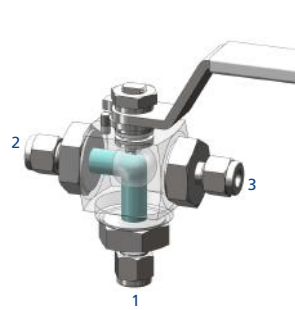
Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Cv	Dimensions, in. (mm)				
	Connection 1/2			A	B	X	Y	S
BP□□-ML6-10	6 mm FITOK	0.19(4.8)	1.2	3.54 (90.0)	1.77 (45.0)	4.57 (116.0)	2.12 (53.9)	1.30 (32.0)
BP□□-ML8-10	8 mm FITOK	0.25(6.4)	2.3	3.60 (91.6)	1.80 (45.8)			
BP□□-ML10-10	10 mm FITOK	0.31(7.9)	3.8	3.70 (94.0)	1.85 (47.0)			
BP□□-ML12-10	12 mm FITOK	0.39 (10.0)	7.5	3.94 (100.0)	1.97 (50.0)			
BP□□-ML14-10	14 mm FITOK							
BP□□-FL4-10	1/4" FITOK	0.19(4.8)	1.2	3.56 (90.4)	1.78 (45.2)			
BP□□-FL6-10	3/8" FITOK	0.28(7.1)	3.7	3.72 (94.6)	1.86 (47.3)			
BP□□-FL8-10	1/2" FITOK	0.39 (10.0)	7.5	3.92 (99.6)	1.96 (49.8)			
BP□□-FNS4-10	1/4 Female NPT			3.03 (77.0)	1.52 (38.5)			
BP□□-FNS6-10	3/8 Female NPT			2.80 (71.0)	1.40 (35.5)			
BP□□-FNS8-10	1/2 Female NPT			3.27 (83.0)	1.63 (41.5)			
BP□□-NS4-10	1/4 Male NPT	0.28(7.1)	3.7	3.36 (85.4)	1.68 (42.7)	5.59 (142.0)	2.54 (64.4)	1.50 (38.0)
BP□□-NS6-10	3/8 Male NPT	0.39 (10.0)	7.5					
BP□□-NS8-10	1/2 Male NPT			3.75 (95.2)	1.88 (47.6)			
BP□□-ML16-13	16 mm FITOK	0.50 (12.7)	10.0	4.42 (112.2)	2.21 (56.1)			
BP□□-ML18-13	18 mm FITOK			4.12 (104.6)	2.06 (52.3)			
BP□□-ML20-13	20 mm FITOK			4.43 (112.6)	2.22 (56.3)			
BP□□-ML22-13	22 mm FITOK			4.29 (109.0)	2.15 (54.5)			
BP□□-FL10-13	5/8" FITOK			4.36 (110.6)	2.18 (55.3)			
BP□□-FL12-13	3/4" FITOK			3.54 (90.0)	1.77 (45.0)			
BP□□-FNS8-13	1/2 Female NPT			4.09 (104.0)	2.05 (52.0)			
BP□□-FNS12-13	3/4 Female NPT			4.14 (105.2)	2.07 (52.6)			
BP□□-NS12-13	3/4 Male NPT							
BP□□-ML20-19	20 mm FITOK	0.71 (18.0)	30.0	4.87 (123.8)	2.43 (61.9)	6.46 (164.0)	2.72 (69.0)	1.96 (50.0)
BP□□-ML22-19	22 mm FITOK			5.11 (129.8)	2.66 (64.9)			
BP□□-ML25-19	25 mm FITOK			4.59 (116.6)	2.29 (58.3)			
BP□□-FL12-19	3/4" FITOK			5.11 (129.8)	2.66 (64.9)			
BP□□-FL16-19	1" FITOK			3.81 (96.8)	1.91 (48.4)			
BP□□-FNS12-19	3/4 Female NPT			4.26 (108.2)	2.13 (54.1)			
BP□□-FNS16-19	1 Female NPT			4.91 (124.8)	2.45 (62.4)			
BP□□-NS16-19	1 Male NPT							

3-way Valves

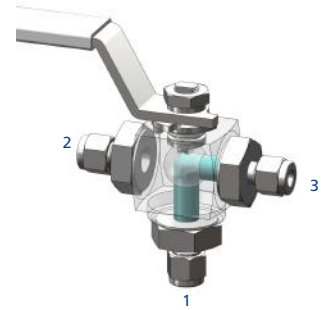
Vertical Pattern



Port 1 as inlet
180° rotation handle

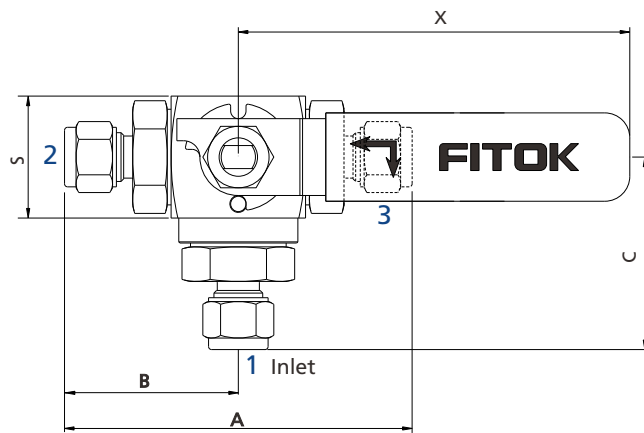


Port 1 to port 2

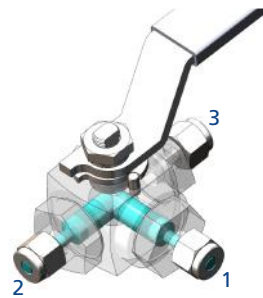


Port 1 to port 3

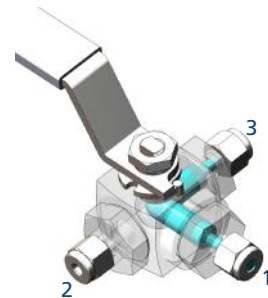
Horizontal Pattern



Port 1 as inlet
90° rotation handle



Port 1 to port 2



Port 1 to port 3

Note: Restricted flow path for BP series: only port 1 as inlet, port 2 and port 3 as outlet

Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Dimensions, in. (mm)					
	Connection 1/2/3		A	B	C	X	Y	S
BP□□-ML6-10-3□	6 mm FITOK	0.19 (4.8)	3.54 (90.0)	1.77 (45.0)	2.00 (51.0)	4.57 (116.0)	2.12 (53.9)	1.30 (32.0)
BP□□-ML8-10-3□	8 mm FITOK	0.25 (6.4)	3.60 (91.6)	1.80 (45.8)	2.02 (51.3)			
BP□□-ML10-10-3□	10 mm FITOK	0.31 (7.9)	3.70 (94.0)	1.85 (47.0)	2.07 (52.5)			
BP□□-ML12-10-3□	12 mm FITOK	0.39 (10.0)	3.94 (100.0)	1.97 (50.0)	2.18 (55.5)			
BP□□-ML14-10-3□	14 mm FITOK							
BP□□-FL4-10-3□	1/4" FITOK	0.19 (4.8)	3.56 (90.4)	1.78 (45.2)	1.95 (49.5)			
BP□□-FL6-10-3□	3/8" FITOK	0.28 (7.1)	3.72 (94.6)	1.86 (47.3)	2.16 (54.8)			
BP□□-FL8-10-3□	1/2" FITOK	0.39 (10.0)	3.92 (99.6)	1.96 (49.8)	2.13 (54.0)			
BP□□-FNS4-10-3□	1/4 Female NPT		3.03 (77.0)	1.52 (38.5)	1.44 (36.5)			
BP□□-FNS6-10-3□	3/8 Female NPT		2.80 (71.0)	1.40 (35.5)	1.57 (40.0)			
BP□□-FNS8-10-3□	1/2 Female NPT		3.27 (83.0)	1.63 (41.5)	1.83 (46.4)			
BP□□-NS4-10-3□	1/4 Male NPT	0.28 (7.1)	3.36 (85.4)	1.68 (42.7)	1.90 (48.2)			
BP□□-NS6-10-3□	3/8 Male NPT	0.39 (10.0)						
BP□□-NS8-10-3□	1/2 Male NPT		3.75 (95.2)	1.88 (47.6)	2.09 (53.1)			

Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Dimensions, in. (mm)					
	Connection 1/2/3		A	B	C	X	Y	S
BP□□-ML16-13-3□	16 mm FITOK	0.50 (12.7)	4.42 (112.2)	2.21 (56.1)	2.60 (66.1)	5.59 (142.0)	2.54 (64.4)	1.50 (38.0)
BP□□-ML18-13-3□	18 mm FITOK		4.12 (104.6)	2.06 (52.3)	2.45 (62.3)			
BP□□-ML20-13-3□	20 mm FITOK		4.43 (112.6)	2.22 (56.3)	2.61 (66.3)			
BP□□-ML22-13-3□	22 mm FITOK		4.29 (109.0)	2.15 (54.5)	2.54 (64.5)			
BP□□-FL10-13-3□	5/8" FITOK		4.36 (110.6)	2.18 (55.3)	2.57 (65.3)			
BP□□-FL12-13-3□	3/4" FITOK		3.54 (90.0)	1.77 (45.0)	2.02 (51.2)			
BP□□-FNS8-13-3□	1/2 Female NPT		4.09 (104.0)	2.05 (52.0)	2.44 (62.0)			
BP□□-FNS12-13-3□	3/4 Female NPT		4.14 (105.2)	2.07 (52.6)	2.46 (62.6)			
BP□□-NS12-13-3□	3/4 Male NPT							
BP□□-ML20-19-3□	20 mm FITOK	0.71 (18.0)	4.87 (123.8)	2.43 (61.9)	2.89 (73.4)	6.46 (164.0)	2.72 (69.0)	1.96 (50.0)
BP□□-ML22-19-3□	22 mm FITOK		5.11 (129.8)	2.66 (64.9)	3.00 (76.2)			
BP□□-ML25-19-3□	25 mm FITOK		4.86 (123.4)	2.43 (61.7)	3.02 (76.7)			
BP□□-FL12-19-3□	3/4" FITOK		5.11 (129.8)	2.66 (64.9)	2.85 (72.4)			
BP□□-FL16-19-3□	1" FITOK		3.82 (97.0)	1.91 (48.5)	2.22 (56.5)			
BP□□-FNS12-19-3□	3/4 Female NPT		4.26 (108.2)	2.13 (54.1)	2.72 (69.1)			
BP□□-FNS16-19-3□	1 Female NPT		4.54 (115.2)	2.27 (57.6)	2.72 (69.1)			
BP□□-NS12-19-3□	3/4 Male NPT		4.91 (124.8)	2.45 (62.4)	2.90 (73.9)			
BP□□-NS16-19-3□	1 Male NPT							

1. FITOK means FITOK double ferrule tube fittings.

2. Sizes and types listed are standard. Other sizes and types are available upon request, please contact FITOK Group or our authorized distributors.

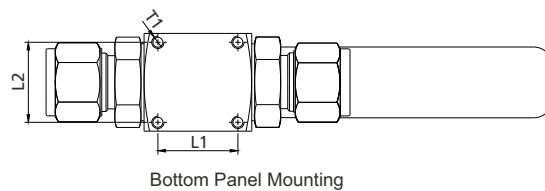
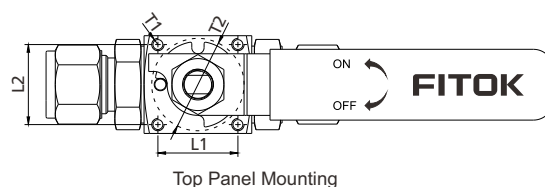
3. Dimensions are shown with tube fitting nuts finger-tightened. All dimensions are for reference only and are subject to change.

For dimensions not shown above, please contact FITOK Group or our authorized distributors.

Panel Mounting Options

Dimension for Panel Mounting

Orifice in. (mm)	in. (mm)			
	L1	L2	T1	T2
0.39 (10.0)	1.02 (26.0)	1.02 (26.0)	M4×0.7P deep 0.19 (5.0)	1.18 (30.0)
0.50 (12.7)	1.18 (30.0)	1.18 (30.0)	M5×0.8P deep 0.19 (5.0)	1.18 (30.0)
0.71 (18.0)	1.37 (35.0)	1.57 (40.0)	M5×0.8P deep 0.19 (5.0)	1.50 (38.0)



Seal Kits

Valve Orifice	Flow Pattern	Basic Seal Kit Ordering Number	Content
10	2-way	BPSS-□10-RK	Seat, upper packing, lower packing, O-ring, stem, ball, instructions
	3-way (vertical)	BPSS-□10-3-RK	
	3-way (horizontal)	BPSS-□10-3S-RK	
13	2-way	BPSS-□13-RK	
	3-way (vertical)	BPSS-□13-3-RK	
	3-way (horizontal)	BPSS-□13-3S-RK	
19	2-way	BPSS-□19-RK	
	3-way (vertical)	BPSS-□19-3-RK	
	3-way (horizontal)	BPSS-□19-3S-RK	

Seat Material	Designator
PVDF	-
PCTFE	K
PEEK	P

1. Seal kit components are the same materials and grades listed in materials of construction.
2. The default seat material in the seal kit for BP series valves is PVDF. To order seats with other materials, add a seat material designator to "□" in the basic seal kit ordering number to get a complete ordering number.
Example: BPSS-10-RK
BPSS-P10-RK
3. The listed basic seal kit ordering numbers specify 316 stainless steel material. To order kits with other materials, such as 304 stainless steel material, replace "SS" with "S4" in the ordering number.
Example: BPS4-10-RK

Locking Device

- ⦿ Locking Device 1 can lock BP series 2-way or 3-way valves, locking hole diameter is 0.23 in (6.0 mm);
- ⦿ To order a ball valve with locking device 1, add **-L** to the valve ordering number.
Example: BPSS-FL4-10-L/BPSS-FL4-10-3SL/BPSS-FL4-10-3L
- ⦿ Locking Device 2 can lock BP series 2-way or 3-way valves, locking hole diameters of valves with orifice 10 or 13 are 0.23 in (6.0 mm);
- ⦿ To order a ball valve with locking device 2, add **-LK** to the valve ordering number.
Example: BPSS-FL4-10-LK/BPSS-FL4-10-3SLK
- ⦿ When both top mounting holes and locking devices are present, only locking device 2 should be selected. When both bottom mounting holes and locking devices are present, either locking device may be selected.
Example: BPSS-FL4-10-MLK/BPSS-FL4-10-MDL/BPSS-FL4-10-MDLK

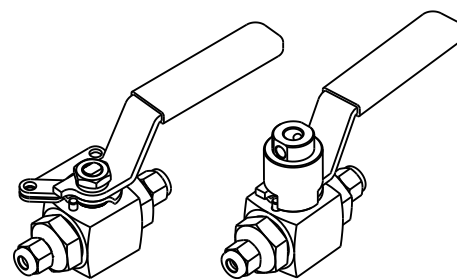


Diagram of Locking Device 1

Diagram of Locking Device 2

Ball Valve without Handle

Ball Valve without handle can be directly connected to the FITOK actuator assembly. To order, please add **-AM** to the valve ordering number.
Example: BPSS-FL12-13-AM

Ordering Number Description

BPSS - ML20 - FL12 - FNS8 - P13 - OHQ3MLK - SCEF2

Series		Body Material	Connection 1 Type		Connection 1 Size	Connection 2/3 Type	Connection 2/3 Size	Seat Material	Orifice Size	Handle/Actuator	For Actuator	Flow Pattern	Panel Mounting	Locking Device	Special Application	Cleaning and Packaging																				
BP	SS	316 SS	FNS	Female NPT	4	Same as Connection 1 Specified in the same way as Connection 1 type and size	10	Max. 0.39" (10.0 mm)	PVDF	I	Yellow Handle Sleeve	None	Straight	No	None	FC-01																				
	S4	304 SS	NS	Male NPT	6												K PCTFE	13	0.50" (12.7 mm)	H	Mechanical Limit Switch	3	3-Way (Vertical Pattern)	L Locking Device 1	S NACE MR0175	F2	FC-02									
	S1	321 SS	FRT	Female BSPT	8																							P PEEK	19	0.71" (18.0 mm)	N	Inductive Limit Switch	3S	3-Way (Horizontal Pattern)	LK Locking Device 2	SI Inert Silicon Coating
			RT	Male BSPT	10																															
		FRP	Female BSPP (for RP)	12	O	90° Normally Open Pneumatic Actuator	NQ	Inductive Limit Switch and Solenoid Valve	MD	With Bottom Panel Mounting Holes																										
		FL	Fractional Tube Fitting	14																																
		ML	Metric Tube Fitting	16																																
		UFB	Rotatable Fractional Tube Butt Weld	18																																
		UMB	Rotatable Metric Tube Butt Weld	20																																
		UPB	Nut + Gasket + Pipe Bulged Nipple	22																																
				25																																
				28																																
				30																																
				32																																

- Standard thread pitch for metric threads are as follows:
M10 and below: 1 mm
M12 to M24: 1.5 mm
M27 and above: 2 mm
Standard thread pitch should be omitted in the ordering number, others should be specified.
- For oxygen-enriched environment or hazardous media service, contact FITOK Group or our authorized distributors.
- Cleaning and Packaging:
FC-01: Standard cleaning and packaging for general industrial procedures.
FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleanliness requirements of ASTM G93 Level C.
- For more information about pneumatic actuator ball valves, please refer to the catalog Actuated Ball Valves.
- Inert Silicon Coating: Except for ball valves with PEEK seat, wetted metal components Inert Silicon coated.
- CE certification is available. For more information, please contact FITOK group or our authorized distributors.
- The rated working pressure of BP series ball valves for "NACE MRO175" application is lower than that of standard valves. For detailed pressure values, please contact FITOK Group or our authorized distributors.

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

Hex Bar Stock Ball Valves

BR Series

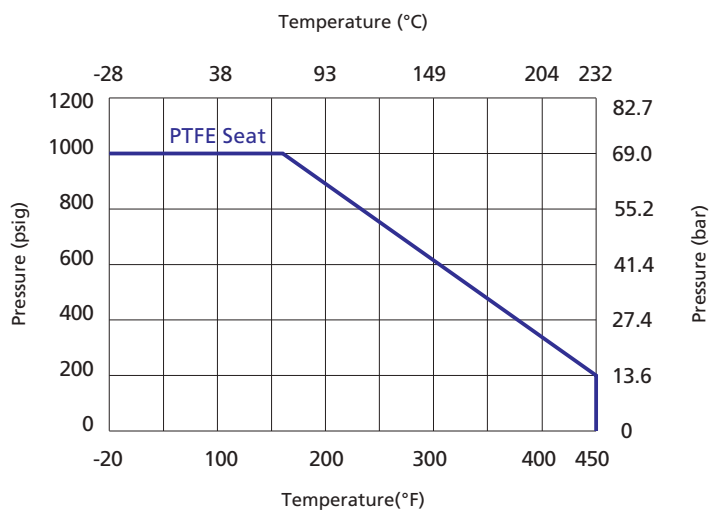
Features

- Working pressure up to 1000 psig (69.0 bar)
- Working temperature: -20°F to 450°F (-28°C to 232°C)
- Compact and economical ball valve designed for industrial applications
- Blowout-proof stem minimizes the risk of valve failure due to stem displacement or loosening
- Free-floating ball design allows the ball to be pushed against the seat by fluid pressure, ensuring a tight and reliable seal
- Bidirectional flow
- Low-torque handle enables easy and smooth operation
- A variety of end connections available
- Handle color options available
- Each valve is tested for internal and external leakage using nitrogen or compressed air at rated working pressure before shipment



Ball Valves
Plug Valves

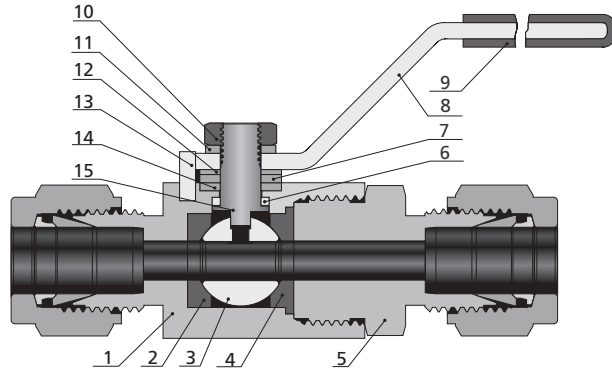
Pressure vs. Temperature



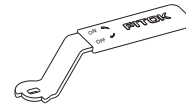
Standard Materials of Construction

Bar Stock Body

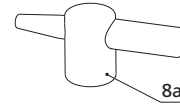
Ball Valves
Plug Valves



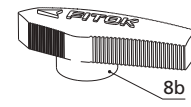
Handle Options



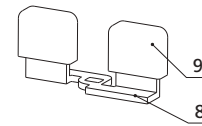
Lever Handle



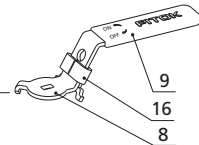
Aluminium Handle (-U)



Nylon Handle (-NY)



Butterfly Handle (-T)

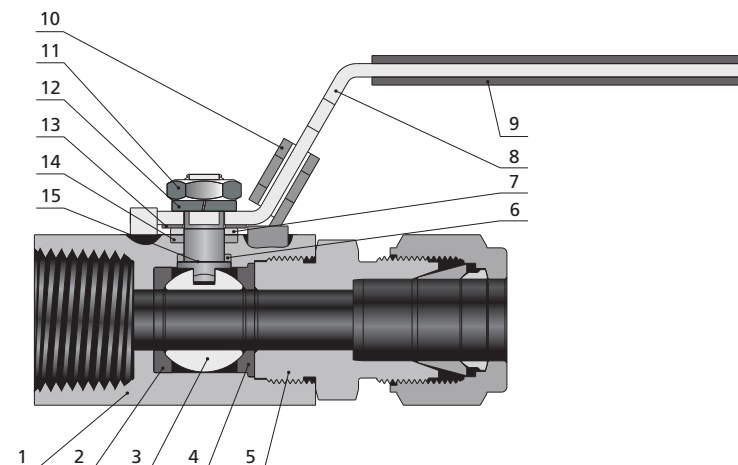


Handle with Locking Device 1 (-LB)

Item	Component	Material/Specification		
1	Body	316 SS/A479	Alloy 400/B164	Brass C36000/B16
2	Front Seat	PTFE/D1710		
3	Ball	316 SS/A479	Alloy 400/B164	316 SS/A479
4	Back Seat	PTFE/D1710		
5	End Connection	316 SS/A479	Alloy 400/B164	Brass C36000/B16
6	Lower Packing	PTFE/D1710		
7	Washer	316 SS/A479		
8	Handle	304 SS/A240		
8a		Aluminium		
8b		Nylon with 304 SS insert		
9	Sleeve	Vinyl ester		
10	Stem Nut	Stainless steel		
11	Gasket	Stainless steel		
12	Coned-disc Spring	S17700/A693		
13	Stop Pin ^①	Stainless steel		
14	Upper Packing	PTFE/D1710		
15	Stem	316 SS/A479	Alloy 400/B164	316 SS/A479
16	Lock Block	304 SS/A240		

Note: Wetted components are listed in italics.

① A handle with a locking device does not include a stop pin.

Cast Body (When the valve has a handle with locking device 2)

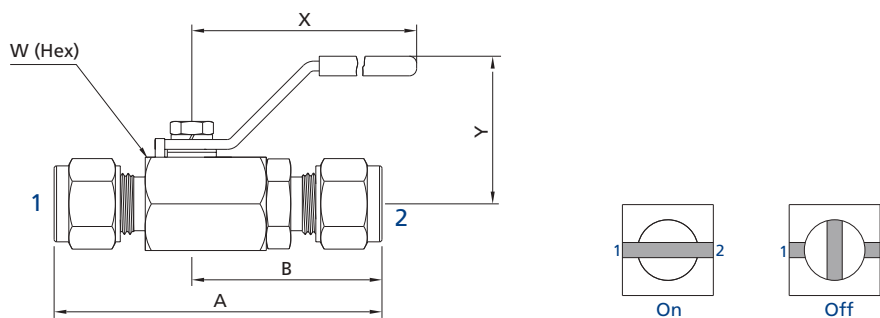
Item	Component	Material/Specification
1	<i>Body</i>	<i>CF8M/A351</i>
2	<i>Front Seat</i>	<i>PTFE/D1710</i>
3	<i>Ball</i>	<i>316 SS/A479</i>
4	<i>Back Seat</i>	<i>PTFE/D1710</i>
5	<i>End Connection</i>	<i>316 SS/A479</i>
6	<i>Lower Packing</i>	<i>PTFE/D1710</i>
7	Washer	316 SS/A479
8	Handle	304 SS/A240
9	Sleeve	Vinyl ester
10	Lock Block	304 SS/A240
11	Stem Nut	Stainless steel
12	Gasket	Stainless steel
13	Coned-disc Spring	S17700/A693
14	<i>Upper Packing</i>	<i>PTFE/D1710</i>
15	<i>Stem</i>	<i>316 SS/A479</i>

Notes: 1. Wetted components are listed in italics.

2. The standard models listed in this catalog feature a two-piece construction. However, due to the impact of connection types and orifice sizes, some models may have a three-piece construction. Please refer to the sales drawing for details.

Dimensions

Bar Stock Body



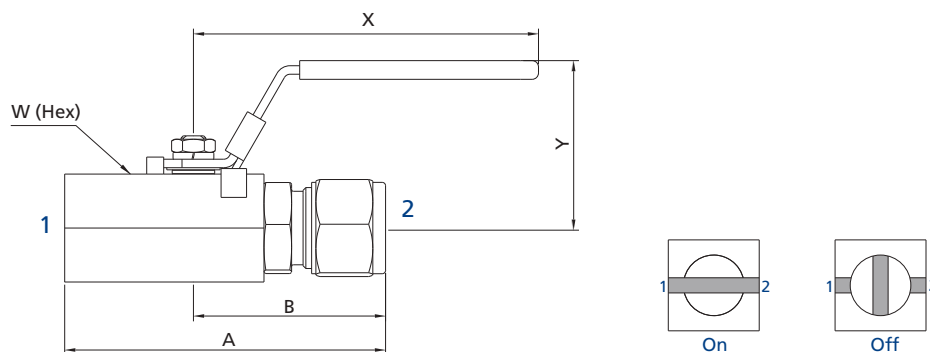
Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Cv	Dimensions, in. (mm)				
	Connection 1/2			A	B	W	X	Y
BR□□-ML6-05	6 mm FITOK	0.19 (4.8)	1.25	2.57 (65.2)	1.50 (38.1)	3/4 (19.05)	2.36 (60)	1.18 (30)
BR□□-ML8-05	8 mm FITOK			2.63 (66.8)	1.53 (38.8)			
BR□□-FL4-05	1/4" FITOK			2.57 (65.2)	1.50 (38.1)			
BR□□-FL5-05	5/16" FITOK			2.63 (66.8)	1.53 (38.8)			
BR□□-FNS2-05	1/8 Female NPT			1.85 (47.0)	1.08 (27.4)			
BR□□-FRP2-05	1/8 Female BSPP			2.00 (50.0)	1.14 (29.0)			
BR□□-FRP4-05	1/4 Female BSPP			2.00 (50.0)	1.14 (29.0)			
BR□□-FNS4-05	1/4 Female NPT			1.85 (47.0)	1.08 (27.4)			
BR□□-ML10-07	10 mm FITOK	0.28 (7.1)	2.50	2.87 (72.9)	1.68 (42.7)	7/8 (22.23)		1.26 (32)
BR□□-FL6-07	3/8" FITOK							
BR□□-FRP6-07	3/8 Female BSPP			2.03 (51.6)	1.18 (30.0)			
BR□□-FNS6-07	3/8 Female NPT							
BR□□-ML12-10	12 mm FITOK	0.35 (8.9)	5.30	3.15 (80.0)	1.83 (46.5)	1 1/16 (27.0)	3.15 (80)	1.54 (39)
BR□□-ML14-10	14 mm FITOK			3.24 (82.2)	1.87 (47.5)			
BR□□-FL8-10	1/2" FITOK			3.15 (80.0)	1.83 (46.5)			
BR□□-FL10-10	5/8" FITOK			3.24 (82.2)	1.87 (47.5)			
BR□□-FRP8-10	1/2 Female BSPP			2.08 (53.0)	1.12 (28.5)	15/16 (24.0)		
BR□□-FNS8-10	1/2 Female NPT			2.08 (53.0)	1.12 (28.5)			
BR□□-ML16-13	16 mm FITOK	0.47 (12.0)	8.60	3.50 (88.9)	2.00 (50.8)	1 1/4 (31.75)	3.94 (100)	2.03 (51.7)
BR□□-ML18-13	18 mm FITOK							
BR□□-FL12-13	3/4" FITOK			2.48 (63.0)	1.30 (33.0)			
BR□□-FRP12-13	3/4 Female BSPP			2.39 (60.7)	1.20 (30.5)			
BR□□-FNS12-13	3/4 Female NPT	0.63 (16.0)	17.35	3.96 (100.6)	2.24 (56.8)	1 1/2 (38.1)		2.15 (54.8)
BR□□-ML22-16	22 mm FITOK			4.31 (109.5)	2.42 (61.5)			
BR□□-ML25-16	25 mm FITOK			3.25 (82.6)	1.63 (41.3)			
BR□□-FL16-16	1" FITOK			3.00 (76.5)	1.50 (38.1)			
BR□□-FRP16-16	1 Female BSPP							
BR□□-FNS16-16	1 Female NPT							

1. FITOK means FITOK double ferrule tube fittings.

2. Sizes and types listed are standard. Other sizes and types are available upon request, please contact FITOK Group or our authorized distributors.

3. Dimensions are shown with FITOK tube fitting nuts finger-tightened. All dimensions are for reference only and are subject to change. For dimensions not shown above, please contact FITOK Group or our authorized distributors.

Cast Body



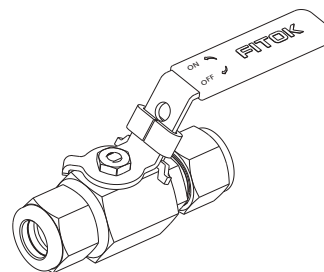
Basic Ordering Number	Connection Type and Size		Orifice in. (mm)	Cv	Dimensions, in. (mm)				
	Connection 1	Connection 2			A	B	W	X	Y
BRSS-FNS6-07-L	3/8" Female NPT	3/8" Female NPT	0.28 (7.1)	2.5	2.03 (51.6)	1.19 (30.1)	7/8 (22.23)	2.40 (61.2)	1.25 (31.8)
BRSS-FNS6-FL6-07-L	3/8" Female NPT	3/8" FITOK			2.53 (64.2)	1.68 (42.7)			
BRSS-FNS8-10-L	1/2" Female NPT	1/2" Female NPT	0.35 (8.9)	5.3	2.08 (52.8)	1.08 (27.5)	1 (25.4)	3.20 (81.2)	1.56 (39.6)
BRSS-FNS8-FL8-10-L	1/2" Female NPT	1/2" FITOK			2.78 (70.5)	1.78 (45.2)			
BRSS-FNS12-13-L	3/4" Female NPT	3/4" Female NPT	0.47 (12.0)	8.6	2.39 (60.6)	1.21 (30.6)	1 1/4 (31.75)	3.80 (96.4)	1.93 (48.9)
BRSS-FNS12-FL12-13-L	3/4" Female NPT	3/4" FITOK			3.19 (80.9)	2.00 (50.9)			
BRSS-FNS16-16-L	1" Female NPT	1" Female NPT	0.63 (16.0)	17.35	3.78 (96)	2.28 (57.8)	1 1/2 (38.1)		2.05 (52.1)
BRSS-FNS16-FL16-16-L	1" Female NPT	1" FITOK			3.92 (99.6)	2.42 (61.4)			

1. FITOK means FITOK double ferrule tube fittings.
2. Sizes and types listed are standard. Other sizes and types are available upon request, please contact FITOK Group or our authorized distributors.
3. Dimensions are shown with FITOK tube fitting nuts finger-tightened. All dimensions are for reference only and are subject to change. For dimensions not shown above, please contact FITOK Group or our authorized distributors.

Locking Device

Locking Device 1 (-LB)

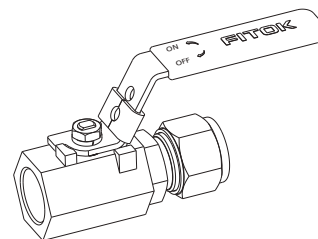
Body Material	Orifice	Locking Hole Diameter in. (mm)	Example
A variety of optional materials (bar stock)	05	0.19 (4.8)	BRSS-ML12-10-LB
	07		
	10	0.24 (6.2)	
	13		
	16		



Locking Device 1

Locking Device 2 (-L)

Body Material	Orifice	Locking Hole Diameter in. (mm)	Example
CF8M (cast)	07	0.19 (4.8)	BRSS-FNS8-10-L
	10		
	13	0.22 (5.7)	
	16		



Locking Device 2

Note: The locking device is only applicable to lever handles. For other handle types requiring a locking device, please contact FITOK Group or our authorized distributors.

Seal Kits

Valve Orifice	Basic Seal Kit Ordering Number	Content
05	BRSS-05-RK	Front seat, back seat, ball, lower packing, upper packing, instructions
07	BRSS-07-RK	
10	BRSS-10-RK	
13	BRSS-13-RK	
16	BRSS-16-RK	

1. Seal kit components are the same materials and grades listed in materials of construction.
2. The listed basic seal kit ordering numbers specify 316 stainless steel material. To order kits with other materials, such as 304 stainless steel material, replace "SS" with "S4" in the ordering number.
Example: BRS4-05-RK

Ordering Number Description

BRSS - ML8 - FL4 - 05 - JL - SF2																						
Series		Body Material		Connection 1 Type		Connection 1 Size		Connection 2 Type		Connection 2 Size		Orifice		Handle		Locking Device		Special Application		Cleaning and Packaging		
BR	SS	316 SS or CF8M		FNS	Female NPT		2	1/8"		Same as connection 1	Specified in the same way as connection 1 type and size	05	0.19" (4.8 mm)		Lever Handle with Yellow Handle Sleeve			None			FC-01	
	6L	316L SS		NS	Male NPT		4	1/4"				07	0.28" (7.1 mm)		Lever Handle with Red Handle Sleeve		LB	Locking Device 1		S	NACE MR0175	
	S4	304 SS		FRT	Female BSPT		5	5/16"				10	0.35" (8.9 mm)		Lever Handle with Blue Handle Sleeve		L	Locking Device 2		SI	Inert Silicon Coating	
	M	Alloy 400		RT	Male BSPT		6	3/8" or 6 mm				13	0.47" (12.0 mm)		Black Aluminium Handle		Note: Locking device only applies to lever handle.					
	B	Brass		FRP	Female BSPP (for RP)		8	1/2" or 8 mm				16	0.63" (16.0 mm)									
					BP	Male BSPP (for RG)		10	10 mm					Black Nylon Handle								
				FL	Fractional Tube Fitting		12	3/4" or 12 mm				Butterfly Handle with Yellow Handle Sleeve										
				ML	Metric Tube Fitting		14	14 mm or M14 x 1.5				Butterfly Handle with Red Handle Sleeve										
				UFB	Rotatable Fractional Tube Butt Weld		16	1" or 16 mm				Butterfly Handle with Blue Handle Sleeve										
				UMB	Rotatable Metric Tube Butt Weld		18	18 mm														
				UPB	Rotatable Pipe Butt Weld		20	1 1/4" or 20 mm or M20 x 1.5														
							22	22 mm or M22 x 1.5														
							25	25 mm														

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

1. Standard thread pitch for metric threads are as follows:
M10 and below: 1 mm
M12 to M24: 1.5 mm
M27 and above: 2 mm

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

- Standard thread pitch for metric threads are as follows:
M10 and below: 1 mm
M12 to M24: 1.5 mm
M27 and above: 2 mm
Standard thread pitch should be omitted in the ordering number, others should be specified.
- For oxygen-enriched environment or hazardous media service, contact FITOK Group or our authorized distributors.
- Cleaning and Packaging:
FC-01: Standard cleaning and packaging for general industrial procedures.
FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleaning requirement of ASTM G93 Level C.
- Inert Silicon Coating: Wetted metal components Inert Silicon coated.

Hex Bar Stock Ball Valves

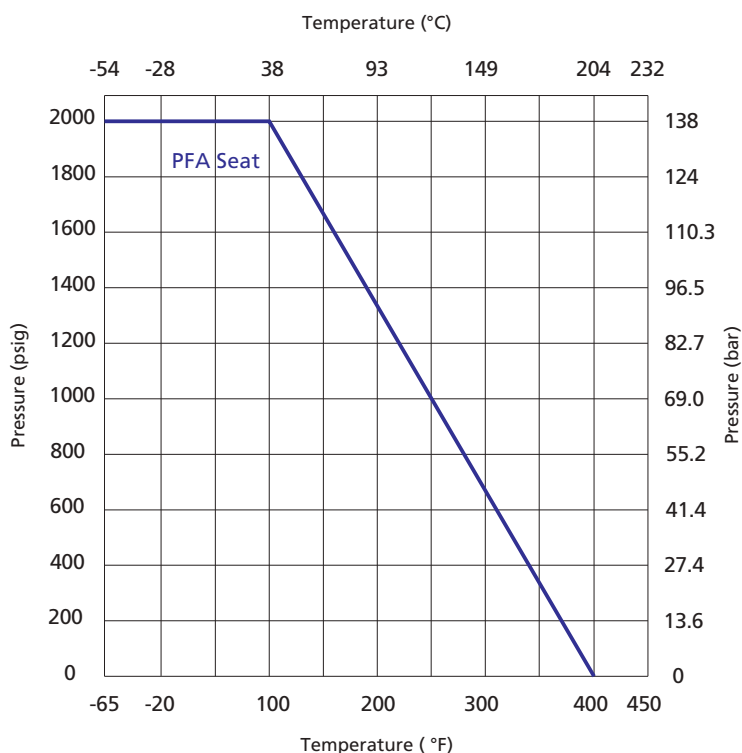
BRC Series

Features

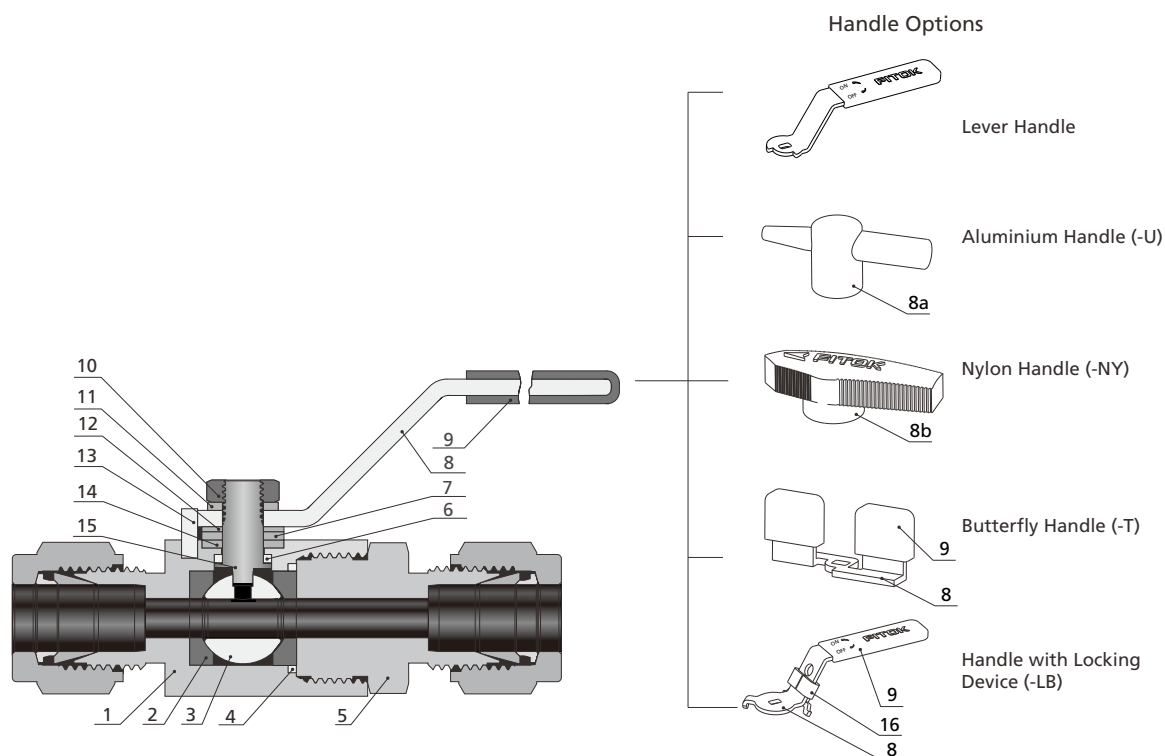
- Working pressure up to 2000 psig (138 bar)
- Working temperature: -65°F to 400°F (-54°C to 204°C)
- Compact and economical ball valve designed for industrial applications
- Blowout-proof stem minimizes the risk of valve failure due to stem displacement or loosening
- Free-floating ball design allows the ball to be pushed against the seat by fluid pressure, ensuring a tight and reliable seal
- Bidirectional flow
- Low-torque handle enables easy and smooth operation
- A variety of end connections available
- Handle color options available
- Each valve is tested for internal and external leakage using nitrogen or compressed air at rated working pressure before shipment



Pressure vs. Temperature



Standard Materials of Construction

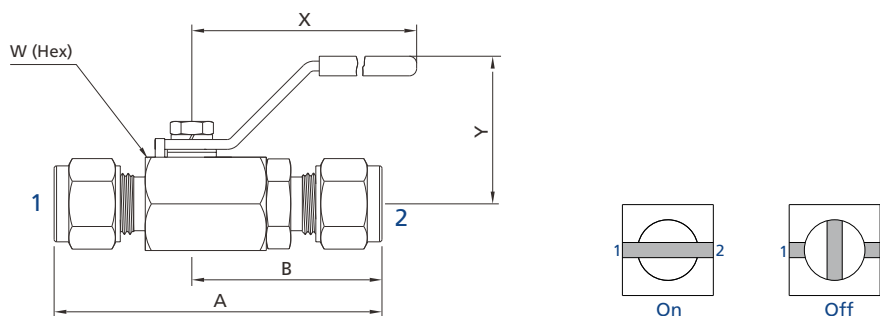


Item	Component	Material/Specification	
1	Body	<i>316 SS/A479</i>	<i>Alloy 400/B164</i>
2	Seat	PFA	
3	Ball	<i>316 SS/A479</i>	<i>Alloy 400/B164</i>
4	Sealing Gasket	<i>316L SS/A269</i>	<i>Alloy 400/B164</i>
5	End Connection	<i>316 SS/A479</i>	<i>Alloy 400/B164</i>
6	Lower Packing	PTFE/D1710	
7	Washer	<i>316 SS/A479</i>	
8	Handle	304 SS/A240	
8a		Aluminium	
8b		Nylon with 304 SS insert	
9	Sleeve	Vinyl ester	
10	Stem Nut	Stainless steel	
11	Gasket	Stainless steel	
12	Coned-disc Spring	S17700/A693	
13	Stop Pin ^①	Stainless steel	
14	Upper Packing	RPTFE	
15	Stem	<i>316 SS/A479</i>	<i>Alloy 400/B164</i>
16	Lock Block	304 SS/A240	

Note: Wetted components are listed in italics.

① A handle with a locking device does not include a stop pin.

Dimensions



Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Cv	Dimensions, in. (mm)				
	Connection 1/2			A	B	W	X	Y
BRC□□-ML6-05	6 mm FITOK	0.19 (4.8)	1.25	2.57 (65.2)	1.50 (38.1)	3/4 (19.05)	2.36 (60)	1.18 (30)
BRC□□-ML8-05	8 mm FITOK			2.63 (66.8)	1.53 (38.8)			
BRC□□-FL4-05	1/4" FITOK			2.57 (65.2)	1.50 (38.1)			
BRC□□-FL5-05	5/16" FITOK			2.63 (66.8)	1.53 (38.8)			
BRC□□-FNS2-05	1/8 Female NPT			1.85 (47.0)	1.08 (27.4)			
BRC□□-FRP2-05	1/8 Female BSPP			2.00 (50.0)	1.14 (29.0)			
BRC□□-FRP4-05	1/4 Female BSPP			2.00 (50.0)	1.14 (29.0)			
BRC□□-FNS4-05	1/4 Female NPT			1.85 (47.0)	1.08 (27.4)			
BRC□□-ML10-07	10 mm FITOK	0.28 (7.1)	2.50	2.87 (72.9)	1.68 (42.7)	7/8 (22.23)		1.26 (32)
BRC□□-FL6-07	3/8" FITOK							
BRC□□-FRP6-07	3/8 Female BSPP			2.03 (51.6)	1.18 (30.0)			
BRC□□-FNS6-07	3/8 Female NPT							
BRC□□-ML12-10	12 mm FITOK	0.35 (8.9)	5.30	3.15 (80.0)	1.83 (46.5)	1 1/16 (27.0)	3.15 (80)	1.54 (39)
BRC□□-ML14-10	14 mm FITOK			3.24 (82.2)	1.87 (47.5)			
BRC□□-FL8-10	1/2" FITOK			3.15 (80.0)	1.83 (46.5)			
BRC□□-FL10-10	5/8" FITOK			3.24 (82.2)	1.87 (47.5)			
BRC□□-FRP8-10	1/2 Female BSPP			2.08 (53.0)	1.12 (28.5)	15/16 (24.0)		
BRC□□-FNS8-10	1/2 Female NPT			2.08 (53.0)	1.12 (28.5)			
BRC□□-ML16-13	16 mm FITOK	0.47 (12.0)	8.60	3.50 (88.9)	2.00 (50.8)	1 1/4 (31.75)	3.94 (100)	2.03 (51.7)
BRC□□-ML18-13	18 mm FITOK							
BRC□□-FL12-13	3/4" FITOK			3.13 (79.5)	1.95 (49.5)			
BRC□□-FRP12-13	3/4 Female BSPP			3.13 (79.5)	1.95 (49.5)			
BRC□□-FNS12-13	3/4 Female NPT	0.63 (16.0)	17.35	3.96 (100.6)	2.24 (56.8)	1 1/2 (38.1)		2.15 (54.8)
BRC□□-ML22-16	22 mm FITOK			4.31 (109.5)	2.42 (61.5)			
BRC□□-ML25-16	25 mm FITOK			3.68 (93.4)	2.14 (54.3)			
BRC□□-FL16-16	1" FITOK			3.43 (87.1)	2.01 (51.1)			
BRC□□-FRP16-16	1 Female BSPP							
BRC□□-FNS16-16	1 Female NPT							

1. FITOK means FITOK double ferrule tube fittings.

2. Sizes and types listed are standard. Other sizes and types are available upon request, please contact FITOK Group or our authorized distributors.

3. Dimensions are shown with FITOK tube fitting nuts finger-tightened. All dimensions are for reference only and are subject to change. For dimensions not shown above, please contact FITOK Group or our authorized distributors.

O-Ring Stem Packing Ball Valves

- ☉ Suitable for applications where adjusting the packing during valve operation is inconvenient.

Materials of Construction

Item	Component	Material/Specification
1	<i>O-ring</i>	<i>Fluorocarbon FKM/EPDM/Buna N/FFKM</i>
2	<i>Lower Packing</i>	<i>PEEK</i>
2	Seal	PTFE

Wetted components are listed in italics.

Other components are consistent with standard materials of construction.

Temperature Range

Stem Packing Material	Designator	Temperature Range °F (°C)
<i>Fluorocarbon FKM</i>	<i>VI</i>	<i>5 ~ 400 (-15 ~ 204)</i>
<i>EPDM</i>	<i>E</i>	<i>-40 ~ 250 (-40 ~ 121)</i>
<i>Buna N</i>	<i>B</i>	<i>0 ~ 250 (-17 ~ 121)</i>
<i>FFKM</i>	<i>Z</i>	<i>14 ~ 400 (-10 ~ 204)</i>

Ordering Information

- ☉ To order an O-ring upper seal ball valve, add the suffix VI to the standard part number.

Example: BRCSS-ML12-10VI

Locking Device

Locking Device (-LB)

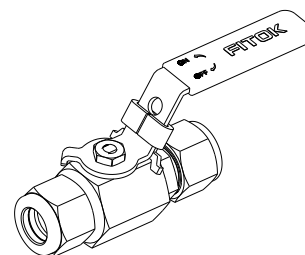
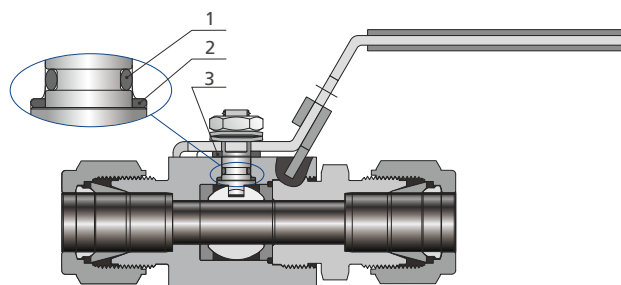
Body Material	Orifice	Locking Hole Diameter in. (mm)	Example
A variety of optional materials (bar stock)	05	0.19 (4.8)	BRCSS-ML12-10-LB
	07		
	10	0.24 (6.2)	
	13		
	16		

Note: The locking device is only applicable to lever handles. For other handle types requiring a locking device, please contact FITOK Group or our authorized distributors.

Seal Kits

Valve Orifice	Basic Seal Kit Ordering Number	Content
05	BRCSS-05-RK	Seat, sealing gasket, ball, lower packing, upper packing, instructions
07	BRCSS-07-RK	
10	BRCSS-10-RK	
13	BRCSS-13-RK	
16	BRCSS-16-RK	

1. Seal kit components are the same materials and grades listed in materials of construction.
2. The listed basic seal kit ordering numbers specify 316 stainless steel material. To order kits with other materials, such as 304 stainless steel material, replace "SS" with "S4" in the ordering number.
Example: BRCS4-05-RK



Locking Device

Ordering Number Description

BRCSS – ML8 – FL4 – 05B – JLB – SF2																							
Series		Body Material		Connection 1 Type		Connection 1 Size		Connection 2 Type		Connection 2 Size		Orifice		Seal Material		Handle		Locking Device		Special Application		Cleaning and Packaging	
BRC		SS	316 SS	FNS	Female NPT	2	1/8"	Same as connection 1		05	0.19" (4.8 mm)	RPTFE		Lever Handle with Yellow Handle Sleeve		No		None		FC-01			
6L		316L SS	NS	Male NPT	4	1/4"	Specified in the same way as connection 1 type and size		07	0.28" (7.1 mm)	VI Fluorocarbon FKM		Lever Handle with Red Handle Sleeve		LB Locking Device		S NACE MR0175		F2 FC-02				
S4		304 SS	FRT	Female BSPT	5	5/16"			10	0.35" (8.9 mm)	B Buna N		Lever Handle with Blue Handle Sleeve		Note: Locking device only applies to lever handle.		SI Inert Silicon Coating						
M		Alloy 400	RT	Male BSPT	6	3/8" or 6 mm			13	0.47" (12.0 mm)	E EPDM												
			FRP	Female BSPP (for RP)	8	1/2" or 8 mm			16	0.63" (16.0 mm)	Z FFKM												
			BP	Male BSPP (for RG)	10	10 mm							U Black Aluminium Handle										
			FL	Fractional Tube Fitting	12	3/4" or 12 mm							NY Black Nylon Handle										
			ML	Metric Tube Fitting	14	14 mm or M14 × 1.5							T Butterfly Handle with Yellow Handle Sleeve										
			UFB	Rotatable Fractional Tube Butt Weld	16	1" or 16 mm							TI Butterfly Handle with Red Handle Sleeve										
			UMB	Rotatable Metric Tube Butt Weld	18	18 mm							TJ Butterfly Handle with Blue Handle Sleeve										
			UPB	Nut + Gasket + Pipe Bulged Nipple	20	1 1/4" or 20 mm or M20 × 1.5																	
					22	22 mm or M22 × 1.5																	
					25	25 mm																	

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

1. Standard thread pitch for metric threads are as follows:
M10 and below: 1 mm
M12 to M24: 1.5 mm

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

1. Standard thread pitch for metric threads are as follows:

M10 and below: 1 mm

M12 to M24: 1.5 mm

M27 and above: 2 mm

Standard thread pitch should be omitted in the ordering number, others should be specified.

2. For oxygen-enriched environment or hazardous media service, contact FITOK Group or our authorized distributors.

3. Cleaning and Packaging:

FC-01: Standard cleaning and packaging for general industrial procedures.

FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleaning requirement of ASTM G93 Level C.

4. Inert Silicon Coating: Wetted metal components Inert Silicon coated.

High Performance Ball Valves

BV Series

Features

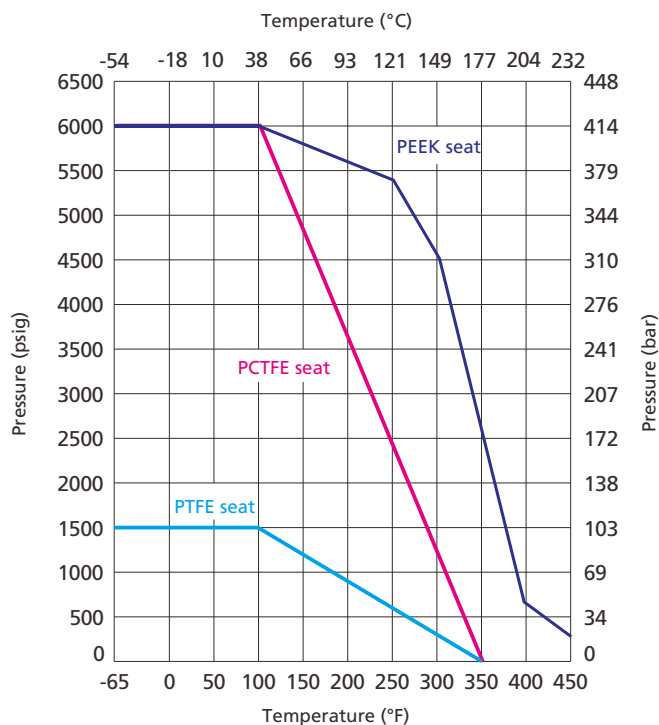
- Working pressure up to: 6000 psig (414 bar)
- Working temperature: -65°F to 450°F (-54°C to 232°C)
- Low operating torque
- Handle as indicator of flow direction
- Positive handle stop
- Electric and pneumatic actuator available
- Handle color options available
- Leak-tight performance testing with nitrogen or compressed air for every valve to meet the requirement of no visible leakage at the rated pressure
- Bidirectional flow for straight valves
- The inlet of 3-way valves and angle pattern valves can only be the bottom port



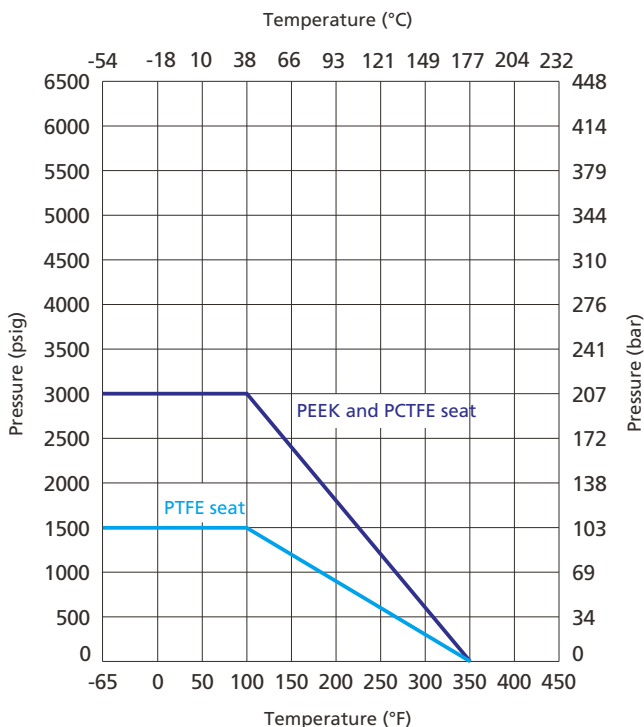
Ball Valves
Plug Valves

Pressure vs. Temperature

316 SS Body



Brass Body



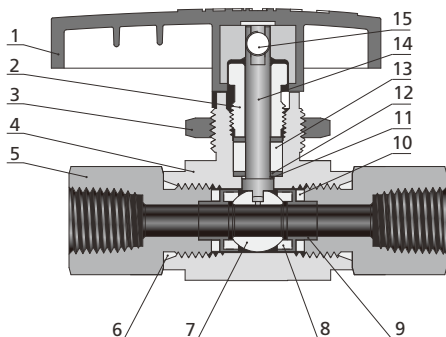
Note: The working pressure of valves is restricted by materials of the valve body and seat, as well as end connections. When choosing a valve for your applications, please refer to the above Temperature vs. Pressure Curves and the pressure rating in the dimension table. The minimum value shall be the pressure rating of the valve.

Pressure Rating@100°F (38°C)

End Connection	Pressure Rating, psig (bar)	
	Brass	316 SS
FL1, FL2, FL4, ML3, ML6, FNS2, FNS4, FNS6, FNS8, FNS12 NS2, NS4, NS6, NS8, NS12 RT2, RT4, RT6, RT8, RT12 FRT2, FRT4, FRT6, FRT8, FRT12 FRP2, FRP4, FRP6, FRP8, FRP12 BP2, BP4, BP6, BP8, BP12	3000 (207)	6000 (414)
ML8	2300 (159)	
FL6	2200 (152)	
FL8	2100 (145)	
ML12	2000 (138)	
ML10, ML14	1900 (131)	
FL12	1800 (124)	5800 (400)
ML16	1700 (117)	
ML20	1600 (110)	5500 (379)
ML18		5400 (372)
ML22	1450 (100)	4900 (338)

Standard Materials of Construction

Straight Valves

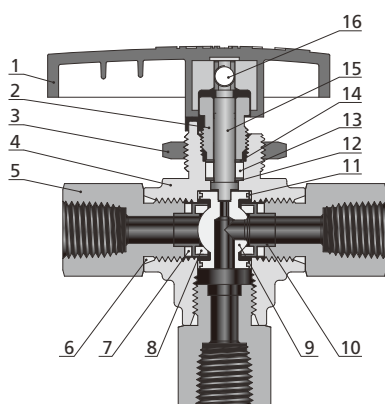


Item	Component	Valve Body Material	
		SS	Brass
1	Handle	Nylon or Aluminium	
2	Packing Nut	316 SS/A479	C36000/B16
3	Panel Nut	316 SS/A479	
4	Body	CF8M/A351	C37700/B283
5	End Connection	316 SS/A479	C36000/B16
6	Connection Ring	PTFE	
7	Ball	316 SS/A479	
8	Seat	PTFE or PCTFE or PEEK	
9	Seat Retainer	316 SS/A479	
10	Seat Packing	PTFE	
11	Stem Back-up Ring	PEEK	
12	Stem Washer	316/A479	
13	Stem Packing	PTFE	
14	Stem	316 SS/A479	
15	Set Screw	Zinc-plated carbon steel	
	Lubricants	Fluorinated-based	

Note: Wetted components are listed in italics.

For other materials, please contact FITOK Group or our authorized distributors.

3-way Valves

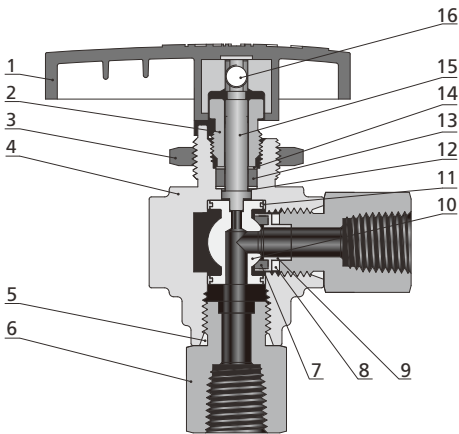


Item	Component	Valve Body Material	
		SS	Brass
1	Handle	Nylon or Aluminium	
2	Packing Nut	316 SS/A479	C36000/B16
3	Panel Nut	316 SS/A479	
4	Body	<i>CF8M/A351</i>	<i>C37700/B283</i>
5	End Connection	316 SS/A479	C36000/B16
6	Connection Ring	PTFE	
7	Seat Packing	PTFE	
8	Seat	PTFE or PCTFE or PEEK	
9	Ball	316 SS/A479	
10	Seat Retainer	316 SS/A479	
11	Trunnion Bearing	PEEK	
12	Stem Back-up Ring	PEEK	
13	Stem Packing	PEEK	
14	Stem Washer	316 SS/A479	
15	Stem	316 SS/A479	
16	Set Screw	Zinc-plated carbon steel	
	Lubricants	Fluorinated-based	

Note: Wetted components are listed in italics.

For other materials, please contact FITOK Group or our authorized distributors.

Angle Pattern Valves

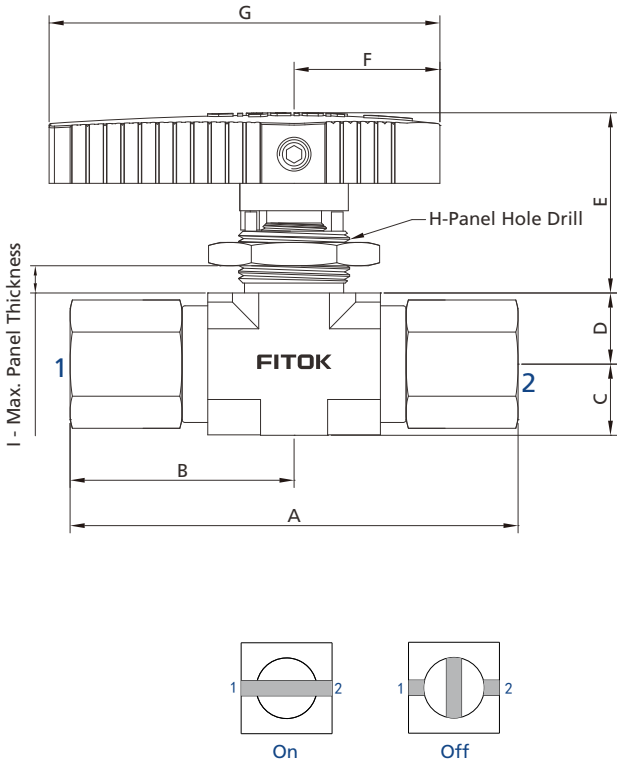


Item	Component	Valve Body Material	
		SS	Brass
1	Handle	Nylon or Aluminium	
2	Packing Nut	316 SS/A479	C36000/B16
3	Panel Nut	316 SS/A479	
4	Body	CF8M/A351	C37700/B283
5	Connection Ring	PTFE	
6	End Connection	316 SS/A479	C36000/B16
7	Seat	PTFE or PCTFE or PEEK	
8	Seat Packing	PTFE	
9	Seat Retainer	316 SS/A479	
10	Ball	316 SS/A479	
11	Trunnion Bearing	PEEK	
12	Stem Back-up Ring	PEEK	
13	Stem Packing		
14	Stem Washer	316 SS/A479	
15	Stem	316 SS/A479	
16	Set Screw	Zinc-plated carbon Steel	
	Lubricants	Fluorinated-based	

Note: Wetted components are listed in italics.
For other materials, please contact FITOK Group or our authorized distributors.

Dimensions

Straight Valves



Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Cv	Dimensions, in. (mm)										
	Connection 1/2			A	B	C	D	E	F	G	H	I		
BV□□-FL1-01	1/16" FITOK	0.05 (1.3)	0.06	2.60 (66.0)	1.30 (33.0)	0.36 (9.2)	0.33 (8.5)	0.94 (23.9)	0.79 (20.0)	1.97 (50.0)	0.58 (14.7)	0.18 (4.6)		
BV□□-FL2-02	1/8" FITOK	0.09 (2.4)	0.21	2.72 (69.0)	1.36 (34.5)									
BV□□-ML3-02	3 mm FITOK			2.74 (69.6)	1.37 (34.8)									
BV□□-FRT2-04	1/8 Female BSPT	0.17 (4.2)	0.93	2.14 (54.4)	1.07 (27.2)									
BV□□-FRP2-04	1/8 Female BSPP			2.36 (60.0)	1.18 (30.0)									
BV□□-FNS2-04	1/8 Female NPT													
BV□□-RT2-04	1/8 Male BSPT													
BV□□-BP2-04	1/8 Male BSPP													
BV□□-NS2-04	1/8 Male NPT			2.70 (68.6)	1.35 (34.3)									
BV□□-RT4-04	1/4 Male BSPT													
BV□□-BP4-04	1/4 Male BSPP													
BV□□-NS4-04	1/4 Male NPT			0.19 (4.7)	1.04	3.48 (88.4)	1.74 (44.2)	0.48 (12.2)	0.48 (12.2)	1.24 (31.5)	0.59 (25.0)	2.64 (67.0)	0.77 (19.6)	0.25 (6.4)
BV□□-FL4-05	1/4" FITOK					3.50 (89.0)	1.75 (44.5)							
BV□□-ML6-05	6 mm FITOK	3.60 (91.4)	1.80 (45.7)											
BV□□-FL6-06	3/8" FITOK	2.34	3.56 (90.4)		1.78 (45.2)									
BV□□-ML8-06	8 mm FITOK		3.62 (92.0)		1.81 (46.0)									
BV□□-ML10-06	10 mm FITOK		3.02 (76.8)		1.51 (38.4)									
BV□□-FRT4-06	1/4 Female BSPT													
BV□□-FRP4-06	1/4 Female BSPP													
BV□□-FNS4-06	1/4 Female NPT		3.24 (82.2)		1.62 (41.1)									
BV□□-RT4-06	1/4 Male BSPT													
BV□□-BP4-06	1/4 Male BSPP													
BV□□-NS4-06	1/4 Male NPT													
BV□□-RT6-06	3/8 Male BSPT													
BV□□-BP6-06	3/8 Male BSPP	0.41 (10.3)	6.42	4.68 (118.8)	2.34 (59.4)	0.75 (19.0)	0.71 (18.0)	1.54 (39.0)	1.42 (36.0)	3.78 (96.0)	0.90 (22.9)	0.38 (9.7)		
BV□□-FL8-10	1/2" FITOK			4.66 (118.4)	2.33 (59.2)									
BV□□-FL12-10	3/4" FITOK													
BV□□-ML12-10	12 mm FITOK												0.37 (9.5)	5.57
BV□□-ML14-10	14 mm FITOK			0.41 (10.3)	6.42								4.84 (123.0)	2.42 (61.5)
BV□□-ML16-10	16 mm FITOK													
BV□□-ML18-10	18 mm FITOK													
BV□□-ML20-10	20 mm FITOK												3.90 (99.0)	1.95 (49.5)
BV□□-ML22-10	22 mm FITOK													
BV□□-FRT6-10	3/8 Female BSPT													
BV□□-FRP6-10	3/8 Female BSPP												4.30 (109.2)	2.15 (54.6)
BV□□-FNS6-10	3/8 Female NPT													
BV□□-FRT8-10	1/2 Female BSPT													
BV□□-FRP8-10	1/2 Female BSPP	4.30 (109.2)	2.15 (54.6)											
BV□□-FNS8-10	1/2 Female NPT													
BV□□-FRT12-10	3/4 Female BSPT	4.50 (114.2)	2.25 (57.1)											
BV□□-FRP12-10	3/4 Female BSPP													
BV□□-FNS12-10	3/4 Female NPT													
BV□□-RT8-10	1/2 Male BSPT	4.44 (112.8)	2.22 (56.4)											
BV□□-BP8-10	1/2 Male BSPP													
BV□□-NS8-10	1/2 Male NPT													
BV□□-RT12-10	3/4 Male BSPT													
BV□□-BP12-10	3/4 Male BSPP													
BV□□-NS12-10	3/4 Male NPT													

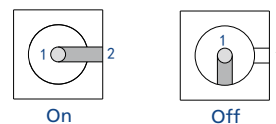
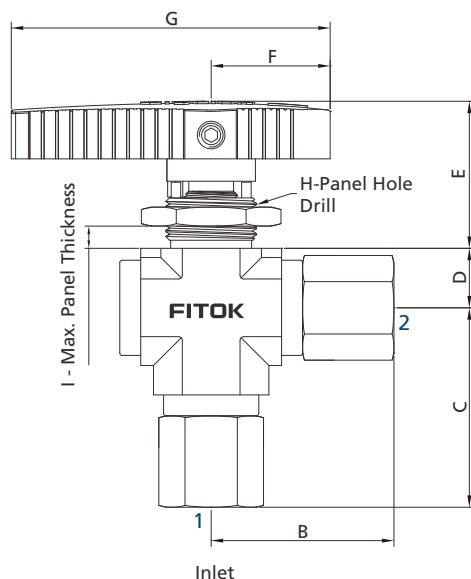
Technical drawing of the FITOK H-Panel showing dimensions and labels:

- Dimensions:**
 - A:** Total width of the panel.
 - B:** Distance from the left edge to the center of the inlet.
 - C:** Total height of the panel.
 - D:** Distance from the top edge to the center of the inlet.
 - E:** Distance from the top edge to the top of the H-Panel.
 - F:** Distance from the center of the inlet to the right edge of the H-Panel.
 - G:** Total width of the H-Panel.
 - I - Max. Panel Thickness:** Maximum thickness of the panel.
- Labels:**
 - 1:** Inlet
 - 2:** Outlet
 - 3:** Max. Panel Thickness
 - FITOK:** Brand name
 - H-Panel Hole Drill:** Label for the hole in the H-Panel.

Port 1 to port 3

Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Cv	Dimensions, in. (mm)														
	Connection 1/2/3			A	B	C	D	E	F	G	H	I						
BV□□-FL8-10-3	1/2" FITOK	0.37 (9.5)	3.48	4.68 (118.8)	2.34 (59.4)	2.68 (68.1)												
BV□□-FL12-10-3	3/4" FITOK			4.66(118.4)	2.33 (59.2)	2.67 (67.9)												
BV□□-ML12-10-3	12 mm FITOK																	
BV□□-ML14-10-3	14 mm FITOK																	
BV□□-ML16-10-3	16 mm FITOK			4.84 (123.0)	2.42 (61.5)	2.76 (70.2)												
BV□□-ML18-10-3	18 mm FITOK																	
BV□□-ML20-10-3	20 mm FITOK			3.90 (99.0)	1.95 (49.5)	2.29 (58.2)												
BV□□-ML22-10-3	22 mm FITOK																	
BV□□-FRT6-10-3	3/8 Female BSPT					0.71 (18.0)	1.54 (39.0)	1.42 (36.0)	3.78 (96.0)	0.90 (22.9)	0.38 (9.7)							
BV□□-FRP6-10-3	3/8 Female BSPP			4.30 (109.2)	2.15 (54.6)							2.49 (63.3)						
BV□□-FNS6-10-3	3/8 Female NPT																	
BV□□-FRT8-10-3	1/2 Female BSPT																	
BV□□-FRP8-10-3	1/2 Female BSPP			3.97 (101.0)	1.99 (50.5)							2.33 (59.1)						
BV□□-FNS8-10-3	1/2 Female NPT																	
BV□□-FRT12-10-3	3/4 Female BSPT																	
BV□□-FRP12-10-3	3/4 Female BSPP			4.50 (114.2)	2.25 (57.1)							2.59 (65.8)						
BV□□-FNS12-10-3	3/4 Female NPT																	
BV□□-RT8-10-3	1/2 Male BSPT			4.44 (112.8)	2.22 (56.4)							2.56 (65.1)						
BV□□-BP8-10-3	1/2 Male BSPP																	
BV□□-NS8-10-3	1/2 Male NPT																	
BV□□-RT12-10-3	3/4 Male BSPT																	
BV□□-BP12-10-3	3/4 Male BSPP																	
BV□□-NS12-10-3	3/4 Male NPT																	

Angle Pattern Valves



Basic Ordering Number	Connection Type and Size	Pressure Rating of End Connections @ 100°F (38°C), psig (bar)		Orifice in. (mm)	Cv	Dimensions, in. (mm)									
		Connection 1/2	316 SS			Brass	B	C	D	E	F	G	H	I	
BV□□-FL1-01-A	1/16" FITOK	6000 (414)	3000 (207)	0.05 (1.3)	0.06	1.30 (33.0)	1.35 (34.3)	0.33 (8.5)	0.94 (23.9)	0.79 (20.0)	1.97 (50.0)	0.58 (14.7)	0.18 (4.6)		
BV□□-FL2-02-A	1/8" FITOK	6000 (414)	3000 (207)	0.09 (2.4)	0.21	1.36 (34.5)	1.41 (35.8)								
BV□□-ML3-02-A	3 mm FITOK	6000 (414)	3000 (207)			1.37 (34.8)	1.42 (36.1)								
BV□□-FRT2-04-A	1/8 Female BSPT	6000 (414)	3000 (207)	0.12 (3.0)	0.28	1.07 (27.2)	1.12 (28.5)								
BV□□-FRP2-04-A	1/8 Female BSPP	6000 (414)	3000 (207)			1.18 (30.0)	1.23 (31.3)								
BV□□-FNS2-04-A	1/8 Female NPT	6000 (414)	3000 (207)												
BV□□-RT2-04-A	1/8 Male BSPT	6000 (414)	3000 (207)												
BV□□-BP2-04-A	1/8 Male BSPP	6000 (414)	3000 (207)												
BV□□-NS2-04-A	1/8 Male NPT	6000 (414)	3000 (207)												
BV□□-RT4-04-A	1/4 Male BSPT	6000 (414)	3000 (207)												
BV□□-BP4-04-A	1/4 Male BSPP	6000 (414)	3000 (207)			1.35 (34.3)	1.40 (35.6)								
BV□□-NS4-04-A	1/4 Male NPT	6000 (414)	3000 (207)			0.19 (4.7)	0.70							1.74 (44.2)	1.88 (47.7)
BV□□-FL4-05-A	1/4" FITOK	6000 (414)	3000 (207)					1.75 (44.5)	1.89 (48.0)						
BV□□-ML6-05-A	6 mm FITOK	6000 (414)	3000 (207)					1.80 (45.7)	1.94 (49.2)						
BV□□-FL6-05-A	3/8" FITOK	6000 (414)	2200 (152)					1.78 (45.2)	1.92 (48.7)						
BV□□-ML8-05-A	8 mm FITOK	6000 (414)	2300 (159)	1.81 (46.0)	1.95 (49.5)										
BV□□-ML10-05-A	10 mm FITOK	6000 (414)	1900 (131)	1.51 (38.4)	1.65 (41.9)										
BV□□-FRT4-05-A	1/4 Female BSPT	6000 (414)	3000 (207)	1.62 (41.1)	1.76 (44.6)										
BV□□-FRP4-05-A	1/4 Female BSPP	6000 (414)	3000 (207)												
BV□□-FNS4-05-A	1/4 Female NPT	6000 (414)	3000 (207)												
BV□□-RT4-05-A	1/4 Male BSPT	6000 (414)	3000 (207)												
Bv□□-BP4-05-A	1/4 Male BSPP	6000 (414)	3000 (207)												
BV□□-NS4-05-A	1/4 Male NPT	6000 (414)	3000 (207)												
BV□□-RT6-05-A	3/8 Male BSPT	6000 (414)	3000 (207)												
BV□□-BP6-05-A	3/8 Male BSPP	6000 (414)	3000 (207)												
BV□□-NS6-05-A	3/8 Male NPT	6000 (414)	3000 (207)												

Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Cv	Dimensions, in. (mm)							
	Connection 1/2			B	C	D	E	F	G	H	I
BV□□-FL8-10-A	1/2 " FITOK	0.37 (9.5)	3.48	2.34(59.4)	2.68(68.1)	0.71 (18.0)	1.54 (39.0)	1.42 (36.0)	3.78 (96.0)	0.90 (22.9)	0.38 (9.7)
BV□□-FL12-10-A	3/4" FITOK			2.33 (59.2)	2.67 (67.9)						
BV□□-ML12-10-A	12 mm FITOK										
BV□□-ML14-10-A	14 mm FITOK										
BV□□-ML16-10-A	16 mm FITOK										
BV□□-ML18-10-A	18 mm FITOK										
BV□□-ML20-10-A	20 mm FITOK			2.42 (61.5)	2.76 (70.2)						
BV□□-ML22-10-A	22 mm FITOK										
BV□□-FRT6-10-A	3/8 Female BSPT			1.95 (49.5)	2.29 (58.2)						
BV□□-FRP6-10-A	3/8 Female BSPP										
BV□□-FNS6-10-A	3/8 Female NPT			2.15 (54.6)	2.49 (63.3)						
BV□□-FRT8-10-A	1/2 Female BSPT										
BV□□-FRP8-10-A	1/2 Female BSPP			1.99 (50.5)	2.33 (59.1)						
BV□□-FNS8-10-A	1/2 Female NPT										
BV□□-FRT12-10-A	3/4 Female BSPT			2.25 (57.1)	2.59 (65.8)						
BV□□-FRP12-10-A	3/4 Female BSPP										
BV□□-FNS12-10-A	3/4 Female NPT			2.22 (56.4)	2.56 (65.1)						
BV□□-RT8-10-A	1/2 Male BSPT										
BV□□-BP8-10-A	1/2 Male BSPP										
BV□□-NS8-10-A	1/2 Male NPT										
BV□□-RT12-10-A	3/4 Male BSPT										
BV□□-BP12-10-A	3/4 Male BSPP										
BV□□-NS12-10-A	3/4 Male NPT										

1. FITOK means FITOK double ferrule tube fittings.

2. Sizes and types listed are standard. Other sizes and types are available upon request, please contact FITOK Group or our authorized distributors.

3. Dimensions are shown with tube fitting nuts finger-tightened. All dimensions are for reference only and are subject to change.

For dimensions not shown above, please contact FITOK Group or our authorized distributors.

Locking Device

Locking Device 1

- Locks BV series 2-way or 3-way valves, featuring a locking hole diameter of 0.21 in (5.2 mm).
- To order a ball valve with Locking Device 1, add - L to the valve ordering number.
Example: BVSS-ML12-10- L/BVSS-ML12-10-3- L

Locking Device 2

- Locks BV series 2-way or 3-way valves, featuring different locking hole diameters:
0.21 in (5.2 mm) for valves with orifice designators 05 and 06
0.34 in (8.7 mm) for valves with orifice designator 10
- To order a ball valve with Locking Device 2, add - LP to the valve ordering number.
Example: BVSS-ML12-10-LP/BVSS-ML12-10-3-LP
- No impact on panel mounting.
- Locking device kits are also available for individual purchase to add locking functionality to your existing standard manual ball valves, with ordering information as follows:

Locking Device 2 Kits

Name	Valve Orifice	Locking Hole Diameter	Kit Ordering Number	Content
Locking Device Kits	05, 06	0.21 in (5.2 mm)	BVS4-06-LP-RK	Upper lock plate, lower lock plate
	10	0.34 in (8.7 mm)	BVS4-10-LP-RK	

Ball Valve without Handle

- Ball Valve without handle can be directly connected to the FITOK actuator assembly.
- To order, please add -AM to the valve ordering number.
Example: BVSS-FL4-05-AM



Locking Device 1



Locking Device 2

Ordering Number Description

BVSS - FL8 - ML12 - ML10 - P06 - RXHQ3 - L - SCEF2

Series	Body Material	Connection 1 Type	Connection 1 Size	Connection 2/3 Type	Connection 2/3 Size	Seat Material	Orifice Size	Handle/ Actuator	For Actuator	Flow Pattern	Locking Device	Special Application	Cleaning and Packaging
BV	SS	CF8M	FNS	Female NPT	2	1/8"		02	0.09" (2.4 mm)			No	None
	6L	CF3M	NS	Male NPT	3	3 mm		03	0.13" (3.2 mm)			L	Locking Device 1
	S4	CF8	FRT	Female BSPT	4	1/4"		04	0.17" (4.2 mm)			LP	Locking Device 2
	B	Brass	RT	Male BSPT	5	5/16"		05	0.19" (4.7 mm)				
			FMS	Female Metric Thread (for RG-M)	6	3/8" or 6 mm or M6 x 1		06	0.25" (6.4 mm)				
			MS	Male Metric Thread (for RG-M)	8	1/2" or 8 mm		10	0.41" (10.3 mm)				
			FRP	Female BSPP (For RP)	10	10 mm or M10 x 1							
			BP	Male BSPP (For RG)	12	3/4" or 12 mm							
			FL	Fractional Tube Fitting	14	14 mm or M14 x 1.5							
			ML	Metric Tube Fitting	16	16 mm							
			UFB	Rotatable Fractional Tube Butt Weld	18	18 mm							
			UMB	Rotatable Metric Tube Butt Weld	20	20 mm or M20 x 1.5							
			UPB	Rotatable Pipe Butt Weld	22	22 mm or M22 x 1.5							
					24	M24 x 1.5							

Same as Connection 1

Specified in the same way as Connection 1 type and size

PTFE

PCTFE

PEEK

Black Nylon Handle

Red Nylon Handle

Green Nylon Handle

Blue Nylon Handle

Yellow Nylon Handle

Black Aluminium Handle

Without Handle

90° Normally Closed Pneumatic Actuator

90° Normally Open Pneumatic Actuator

90° Double Acting Pneumatic Actuator

180° Left End Normally Open Pneumatic Actuator

180° Right End Normally Open Pneumatic Actuator

180° Double Acting Pneumatic Actuator

90° Electric Actuator

180° Electric Actuator

None

Mechanical Limit Switch

Inductive Limit Switch

Solenoid Valve

Mechanical Limit Switch and Solenoid Valve

Inductive Limit Switch and Solenoid Valve

No

Locking Device 1

Locking Device 2

Straight

Angle (Bottom Port Inlet)

3-Way (Diverter Valve)

None

NACE MR0175

Inert Silicon Coating

CE Certification

FC-01

FC-02

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

1. Standard thread pitch for metric threads are as follows:
M10 and below: 1 mm
M12 to M24: 1.5 mm
Standard thread pitch should be omitted in the ordering number, others should be specified.

2. For oxygen-enriched environment or hazardous media service, contact FITOK Group or our authorized distributors.

3. Cleaning and Packaging:
FC-01: Standard cleaning and packaging for general industrial procedures.
FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleaning requirement of ASTM G93 Level C.

4. For more information about pneumatic actuator ball valves, please refer to the catalog Actuated Ball Valves.

5. Inert Silicon Coating: Except for ball valves with PEEK seat, wetted metal components

Note: "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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5. Inert Silicon Coating: Except for ball valves with PEEK seat, wetted metal components Inert Silicon coated.
6. CE certification is available. For more information

High Temperature Metal-Seated Ball Valves

BK Series

Features

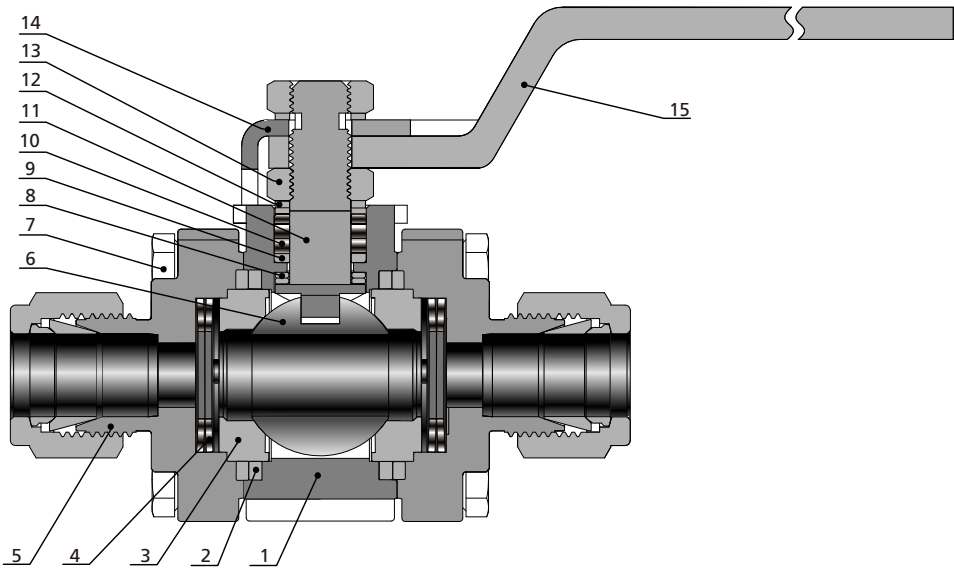
- ⦿ Applied for high temperature and high viscosity liquid medium, not recommended for use in high temperature gas or low viscosity liquid medium
- ⦿ 3-piece precision cast body construction
- ⦿ Free floating ball design provides seat wear compensation
- ⦿ Ball and seats mate-lapped for 100% contact ensures absolute shutoff
- ⦿ High temperature resistant sealing materials for thermal service up to 662°F (350°C)
- ⦿ Blowout-proof stem
- ⦿ Positive handle stop
- ⦿ Orifice sizes: 0.5" (12.7 mm), 1" (25.4 mm)
- ⦿ Variety of end connections
- ⦿ Test Standard: Low pressure gas tightness FCI 70-2 Class VI
High pressure liquid test ISO 5208 Rate D



Technical Data

Orifice, in. (mm)	0.5 (12.7), 1 (25.4)	
Material	316/304 SS	
Connection Type	FITOK Tube Fitting	Weld Fitting
Temperature, °F (°C)	-65 (-54) to 662 (350)	
Working Pressure, psig (bar)	1000 (69)	

Standard Materials of Construction

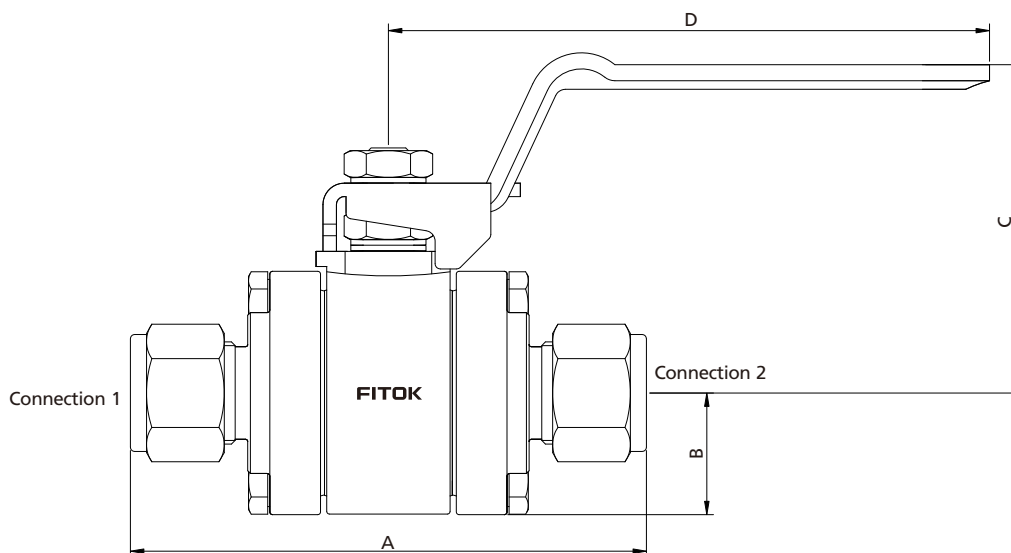


Item	Component	Material	
1	Body	<i>CF8M/A351</i>	<i>CF8/A351</i>
2	Flange Seal	Graphite	
3	Seat	<i>316 SS/A479, hardfacing stellite</i>	<i>304 SS/A479, hardfacing stellite</i>
4	Disc Spring	A75	
5	End Connection	<i>CF8M/A351</i>	<i>CF8/A351</i>
6	Ball	<i>316/304 SS, HVOF-sprayed Cr3C2/NiCr coatings</i>	
7	Hex Bolt (Full Thread)	Stainless Steel	
8	Stem Bearing	Stellite 6/A479	
9	Stem Washer	316 SS /A479	
10	Packing	Graphite	
11	Stem	316 SS/A479	
12	Stem Spring	Strain-hardened 316 SS/A240	
13	Hex Nut	Stainless Steel	
14	Stop Plate	304 SS/A240	
15	Handle	304 SS/A240	

Note: Wetted components are listed in italics. For other materials, please contact FITOK Group or our authorized distributors.

Dimensions

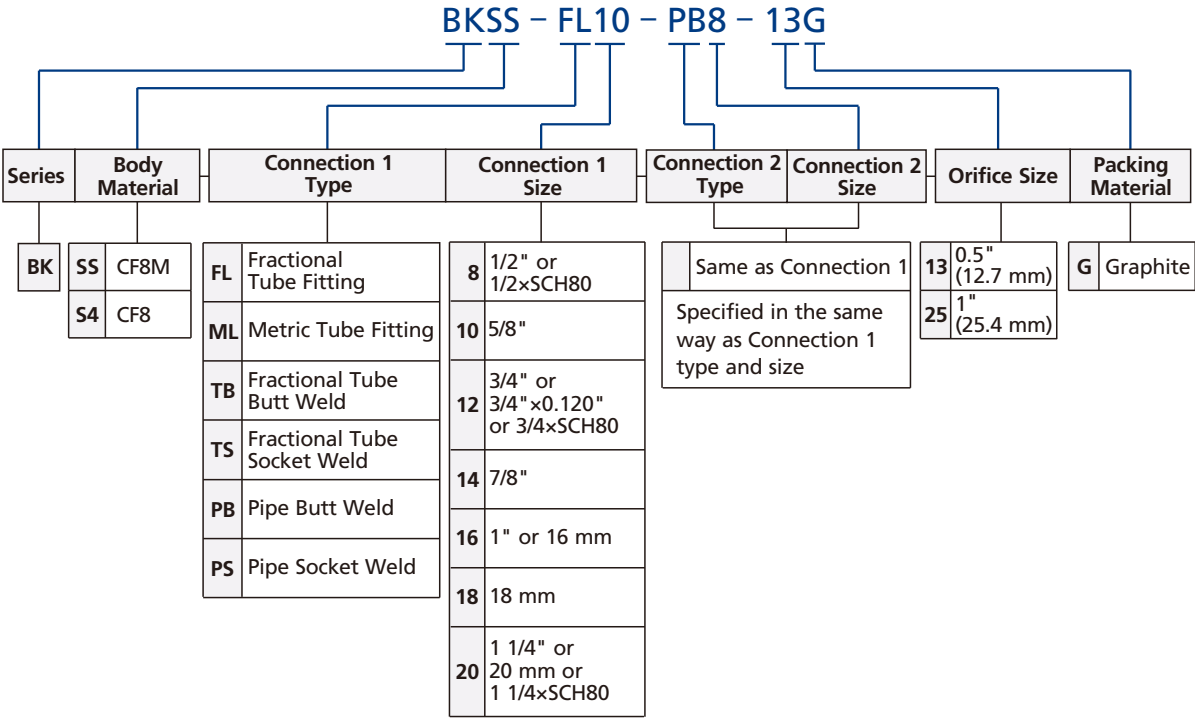
Dimensions are for reference only and are subject to change.



Basic Ordering Information	Connection Type		Orifice in. (mm)	Dimensions, in. (mm)			
	Connection 1	Connection 2		A	B	C	D
BK□□-FL8-13G	1/2" FITOK	1/2" FITOK	0.41 (10.4)	3.79 (96.2)	0.89 (22.7)	2.25 (57.1)	6.5 (165)
BK□□-FL10-13G	5/8" FITOK	5/8" FITOK	0.5 (12.7)	3.79 (96.2)	0.89 (22.7)	2.25 (57.1)	6.5 (165)
BK□□-FL12-13G	3/4" FITOK	3/4" FITOK		3.92 (99.6)	0.89 (22.7)	2.25 (57.1)	6.5 (165)
BK□□-ML16-13G	16 mm FITOK	16 mm FITOK		3.92 (99.6)	0.89 (22.7)	2.25 (57.1)	6.5 (165)
BK□□-ML18-13G	18 mm FITOK	18 mm FITOK		3.91 (99.4)	0.89 (22.7)	2.25 (57.1)	6.5 (165)
BK□□-TB12-13G	3/4" x 0.120" Tube Butt Weld	3/4" x 0.120" Tube Butt Weld		3.8 (96.6)	0.89 (22.7)	2.25 (57.1)	6.5 (165)
BK□□-TS12-13G	3/4" Tube Socket Weld	3/4" Tube Socket Weld		3.2 (80.2)	0.89 (22.7)	2.25 (57.1)	6.5 (165)
BK□□-PB8-13G	1/2 x SCH80 Pipe Butt Weld	1/2 x SCH80 Pipe Butt Weld		3.24 (82.34)	0.89 (22.7)	2.25 (57.1)	6.5 (165)
BK□□-PB12-13G	3/4 x SCH80 Pipe Butt Weld	3/4 x SCH80 Pipe Butt Weld		3.24 (82.34)	0.89 (22.7)	2.25 (57.1)	6.5 (165)
BK□□-TB24-25G	1 1/2" x 0.197" Tube Butt Weld	1 1/2" x 0.197" Tube Butt Weld	1 (25.4)	—	—	—	—
BK□□-TS20-25G	1 1/4" Tube Socket Weld	1 1/4" Tube Socket Weld		—	—	—	—
BK□□-PB20-25G	1 1/4 x SCH80 Pipe Butt Weld	1 1/4 x SCH80 Pipe Butt Weld		—	—	—	—

1. Connection type of "FITOK" means FITOK double ferrule tube fittings.
2. Sizes and types listed are standard. Other sizes and types are available upon request. For details, please contact FITOK Group or our authorized distributors.
3. Dimensions are shown with FITOK tube fitting nuts finger-tight. For dimensions not shown above, please contact FITOK Group or our authorized distributors.

Ordering Number Description



1. If you need a port with orbital welding, please contact FITOK Group.

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

Alternative Fuel Service (AFS) Ball Valves

BU Series

Features

- ⦿ Working pressures up to 6000 psig (414 bar)
- ⦿ Working temperature: -40 to 250°F (-40 to 121°C)
- ⦿ High flow-Cv from 4.0 to 13.8
- ⦿ Low-temperature fluorocarbon material provides sealing capability over full temperature range
- ⦿ Spring-loaded seat provides leak-tight integrity in both low-and high-pressure systems and reduces seat wear from pressure surges
- ⦿ A variety of end connections available
- ⦿ Low operating torque
- ⦿ All wetted components are compatible with hydrogen and compressed natural gas (CNG)
- ⦿ No packing adjustment required
- ⦿ Bidirectional flow
- ⦿ Options for handle colors
- ⦿ Pneumatic actuators available
- ⦿ Each valve is leak tested with nitrogen or compressed air at working pressure to meet a requirement of no visible leak
- ⦿ Field repairable with seal kit
- ⦿ ECE R110 type approval available

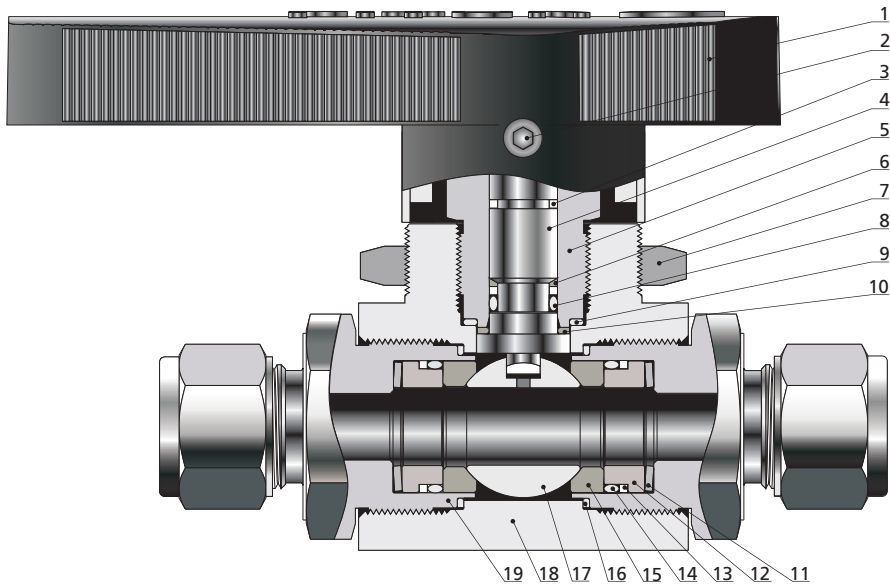


Pressure VS Temperature Ratings

End Connection	FITOK Tube Fitting			Female Pipe	
	3/8, 1/2 in., 12 mm	3/4 in., 16 mm	1 in.	3/8, 1/2 in.	3/4 in.
Temperature °F (°C)	Working Pressure, psig (bar)				
-40 (-40) ~ 250 (121)	6000 (414)	5800 (400)	4700 (324)	6000 (414)	6000 (414)

Note: Ratings are based on valves of standard materials.

Standard Materials of Construction

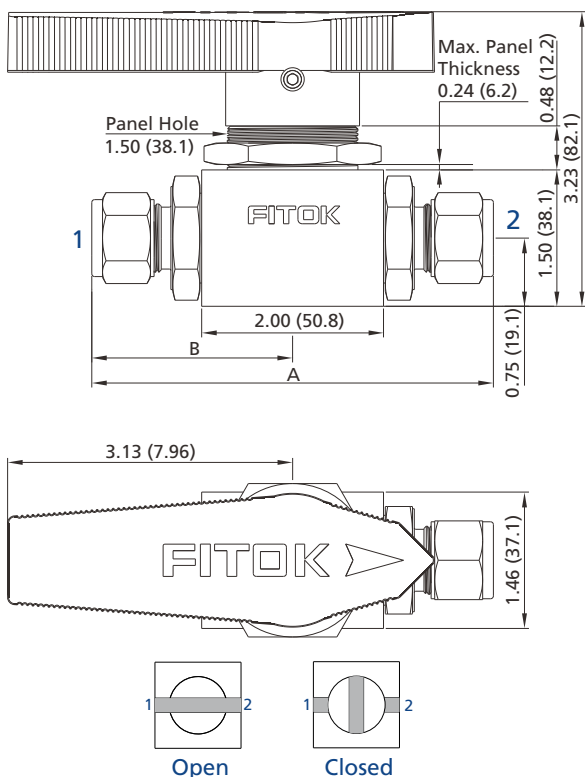


Item	Component	Material/ASTM Specification
1	Handle	Nylon with stainless steel insert
2	Set screw	Zinc-plated carbon steel
3	<i>Guide ring</i>	<i>PTFE/D1710</i>
4	<i>Stem</i>	<i>316 SS/A479</i>
5	<i>Packing bolt</i>	<i>316 SS/A479</i>
6	<i>Stem backup ring</i>	<i>PEEK</i>
7	Lock nut	316 SS/A479
8	<i>Stem O-ring</i>	<i>Low-temperature fluorocarbon</i>
9	<i>Packing bolt washer</i>	<i>Silver-plated 316 SS/A269</i>
10	<i>Thrust washer</i>	<i>PEEK</i>
11	<i>Coned-disc spring</i>	<i>316 SS/A240</i>
12	<i>Seat gland</i>	<i>316 SS/A479</i>
13	<i>Seat backup ring</i>	<i>PTFE/D1710</i>
14	<i>Seat O-ring</i>	<i>Low-temperature fluorocarbon</i>
15	<i>Seat</i>	<i>PEEK</i>
16	<i>End connection gasket</i>	<i>Silver-plated 316 SS/A269</i>
17	<i>Ball</i>	<i>316 SS/A479</i>
18	<i>Body</i>	<i>316 SS/A479</i>
19	<i>End connection</i>	<i>316 SS/A479</i>
<i>Lubricant</i>		<i>PTFE-based</i>

Note: Wetted components listed in italics.

Dimensions

Dimensions in in. (mm) are for reference only and subject to change.



Ordering Number	Connection ^① Type and Size	Cv	Orifice in. (mm)	Dimensions in. (mm)	
				A	B
BUSS-ML10-P12	10 mm FITOK	5.2	0.31 (7.9)	4.21 (107)	2.11 (53.5)
BUSS-ML12-P12	12 mm FITOK	5.2	0.41 (10.3)	4.42 (112.2)	2.21 (56.1)
BUSS-ML16-P12	16 mm FITOK	12.4	0.47 (12.0)	4.42 (112.3)	2.21 (56.2)
BUSS-FL6-P12	3/8" FITOK	4.0	0.28 (7.1)	4.20 (106.6)	2.10 (53.3)
BUSS-FL8-P12	1/2" FITOK	7.2	0.41 (10.3)	4.40 (111.8)	2.20 (55.9)
BUSS-FL12-P12	3/4" FITOK	7.1	0.47 (12.0)	4.50 (114.3)	2.46 (62.5)
BUSS-FL16-P12	1" FITOK	6.5	0.47 (12.0)	4.93 (125.1)	2.25 (57.1)
BUSS-FNS6-P12	3/8" Female NPT	11.0	0.47 (12.0)	4.01 (102)	2.00 (50.8)
BUSS-FNS8-P12	1/2" Female NPT	13.8		4.01 (102)	2.00 (50.8)
BUSS-FNS12-P12	3/4" Female NPT	7.8		4.13 (105)	2.06 (52.3)
BUSS-FRT8-P12	1/2" Female BSPT	13.8		4.01 (102)	2.00 (50.8)

Note: Dimensions shown with FITOK tube fitting nuts finger-tight. Valves can be ordered with two different end connections. Contact FITOK Group or our authorized distributors. Not recommended for panel mounting; not available with pneumatic actuator.

CNG/NGV Application

ECE R110 Manual Service Valve Type Approval

Classification: Class 0

Temperature: -40 to 248°F (-40 to 120°C)

Pressure: 3770 psig (260 bar)

To order, add **-R110** to the valve ordering number.

Example: BUSS-ML12-P12-**R110**

Seal kit for field replacement is available, see "Seal Kits".

Seal Kits

Seal Kit Name	Seal Kit Ordering Number	Seal Kit Content
Seat seal kit	SS-BU-P-SE	Seat, seat backup ring, seat O-ring, coned-disc spring, end connection gasket, instructions.
Stem and seat seal kit	SS-BU-P	Guide ring, stem backup ring, stem O-ring, packing bolt washer, thrust washer, seat, seat backup ring, seat O-ring, coned-disc spring, end connection gasket, instructions

Locking Device

Locking Device 1

- ⦿ Locks BU series valves, featuring a locking hole diameter of 0.21 in (5.2 mm).
- ⦿ To order a ball valve with Locking Device 1, add - **L** to the valve ordering number.
Example: BUSS-ML12-P12- **L**

Locking Device 2

- ⦿ Locks BU series valves, featuring a locking hole diameter of 0.34 in (8.7 mm).
- ⦿ To order a ball valve with Locking Device 2, add - **LP** to the valve ordering number.
Example: BUSS-ML12-P12-**LP**
- ⦿ No impact on panel mounting.
- ⦿ Locking device kits are also available for individual purchase to add locking functionality to your existing standard manual ball valves, with ordering information as follows:

Locking Device 2 Kits

Name	Kit Ordering Number	Content
Locking Device Kits	BU54-12-LP-RK	Upper lock plate, lower lock plate, handle, hexagon socket set screws



Locking Device 1



Locking Device 2

Ball Valve without Handle

- ⦿ Ball Valve without handle can be directly connected to the FITOK actuator assembly.
- ⦿ To order, please add -**AM** to the valve ordering number.
Example: BUSS-FL8-P12-**AM**

Ordering Number Description

BUSS – ML12 – FL12 – P12 – OHQL – SF2													
Series	Body Material	Connection 1 Type		Connection 1 Size	Connection 2 Type	Connection 2 Size	Seat Material	Orifice Size	Handle/Actuator	Actuator	Locking Device	Special Application	Cleaning and Packaging
BU	SS 316 SS	FNS	Female NPT	6 3/8"	Same as connection 1 Specified in the same way as connection 1	P PEEK	12 0.472" (12.0 mm) Max.	I Black Nylon Handle GR Green Nylon Handle J Blue Nylon Handle U Black Aluminum Handle AM Without Handle C 90° Normally Closed Pneumatic Actuator O 90° Normally Open Pneumatic Actuator D 90° Double Acting Pneumatic Actuator	H None H Mechanical Limit Switch N Inductive Limit Switch Q Solenoid Valve HQ Mechanical Limit Switch and Solenoid Valve NQ Inductive Limit Switch and Solenoid Valve	L No L Locking Device 1 LP Locking Device 2	R110 ECE R110 S NACE MR0175	F2 FC-01 F2 FC-02	
		FRT	Female BSPT	8 1/2"									
		RT	Male BSPT	10 10 mm									
		FL	Fractional Tube Fitting	12 3/4" or 12 mm									
		ML	Metric Tube Fitting	16 1" or 16 mm									

Number Description" is a reference to the combination rules of FITOK product er. Not all combinations are available.

1. Standard thread pitch for metric threads are as follows:
M10 and below: 1 mm
M12 to M24: 1.5 mm

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

- Standard thread pitch for metric threads are as follows:
M10 and below: 1 mm
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Standard thread pitch is omitted in ordering number.
For special thread pitch, specify in the ordering number.
- For oxygen-enriched environment or hazardous media service, contact FITOK Group or our authorized distributors.
- Cleaning and Packaging:
FC-01: Standard cleaning and packaging for general industrial procedures.
FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleaning requirement of ASTM G93 Level C.
- For more details about ball valves with pneumatic actuators, refer to Actuated Ball Valves.
- Certifications do not include attachments to the valve, such as actuators or a different handle mechanism.