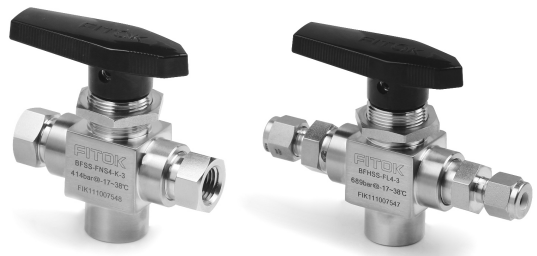


Trunnion Ball Valves

BF and BFH Series High Pressure Service

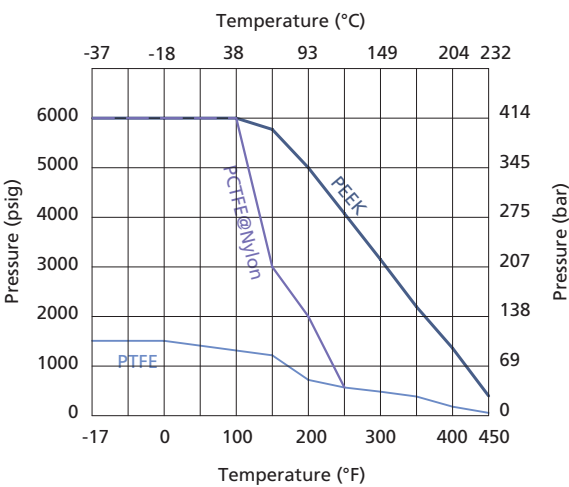
Features

- Maximum working pressure: 10000 psig (689 bar)
- Working temperature: 0°F to 450°F (-18°C to 232°C)
- Fixed ball with double sealing
- Automatic compensation of seat sealing
- Low operating torque
- Handle as indicator of flow direction
- Positive handle stop
- Handle color options are available
- Pneumatic or electric actuator available
- Blowout proof stem
- Panel mountable
- Leak-tight performance testing with nitrogen for every valve at the maximum working pressure, but not higher than 6000 psig
- Compact maximum-flow design
- 2-or 3-way flow patterns
- Spring-load seats: Provide leak tight integrity in both low and high-pressure systems, reduce seat wear from pressure surges.
- Trunnion-style ball: Prevents ball blowout.

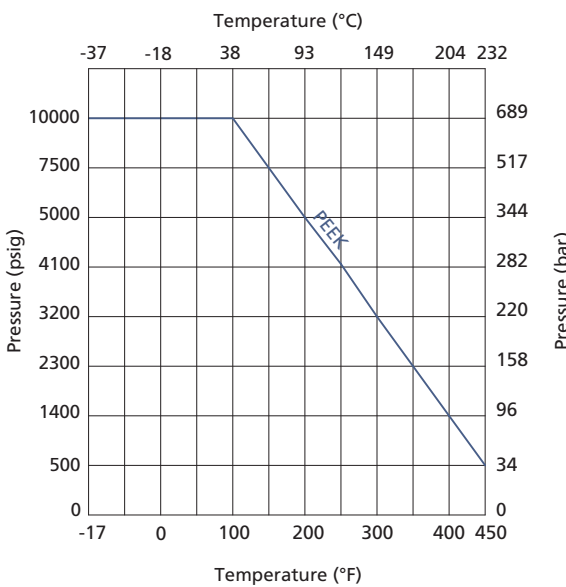


Pressure vs. Temperature

BF Series



BFH Series



Important information about ball valves

- ⦿ FITOK ball valves are designed to be used in a fully open or fully closed position.
- ⦿ Valves that have not been cycled for a period of time may have a higher initial actuation torque.

Technical Data

Seat Material	Temperature Rating °F (°C)	Pressure Rating at 100°F (37°C) psig (bar)		Flow Coefficient (Cv)
		Stainless Steel	Alloy 400	
BF Series				
PCTFE, reinforced nylon	0 to 250 (-17 to 121)	6000 (413)	5000 (344)	2-way valves-1.0 to 1.6 depending on end connection; 3-way valves-0.75
PEEK	0 to 450 (-17 to 232)	6000 (413)	5000 (344)	
PTFE		1500 (103)		
BFH Series				
PEEK	0 to 450 (-17 to 232)	6000 to 10000 (413 to 689), depending on end connection	—	2-way valves-1.0 to 1.6 depending on end connection; 3-way valves-0.75

Flow Data at 70°F (20°C)

BF Series 2-way

0.19" (4.8 mm) orifice, 1.2 Cv

Inlet Pressure psig (bar)	Pressure Drop (Δ p) psig (bar)	Air Flow std L/min (std ft³/min)	Water Flow L/min (U.S. gal/min)
1000 (69)	10 (0.69)	14 (334)	3.5 (13)
3000 (207)	50 (3.45)	30 (834)	7.5 (28)
6000 (414)	100 (6.89)	60 (1670)	11.0 (41)

BF Series 3-way

0.19" (4.8 mm) orifice, 0.75 Cv

Inlet Pressure psig (bar)	Pressure Drop (Δ p) psig (bar)	Air Flow std L/min (std ft³/min)	Water Flow L/min (U.S. gal/min)
1000 (69)	10 (0.69)	10 (275)	3.0 (11)
3000 (207)	50 (3.45)	23 (630)	7.0 (26)
6000 (414)	100 (6.89)	42 (1150)	9.5 (35)

BFH Series 2-way

0.19" (4.8 mm) orifice, 1.2 Cv

Inlet Pressure psig (bar)	Pressure Drop (Δ p) psig (bar)	Air Flow std L/min (std ft³/min)	Water Flow L/min (U.S. gal/min)
1000 (69)	150 (10.3)	90 (2550)	15 (56)
6000 (414)	600 (41.4)	345 (9660)	30 (111)
10000 (689)	1000 (68.9)	560 (15680)	40 (148)

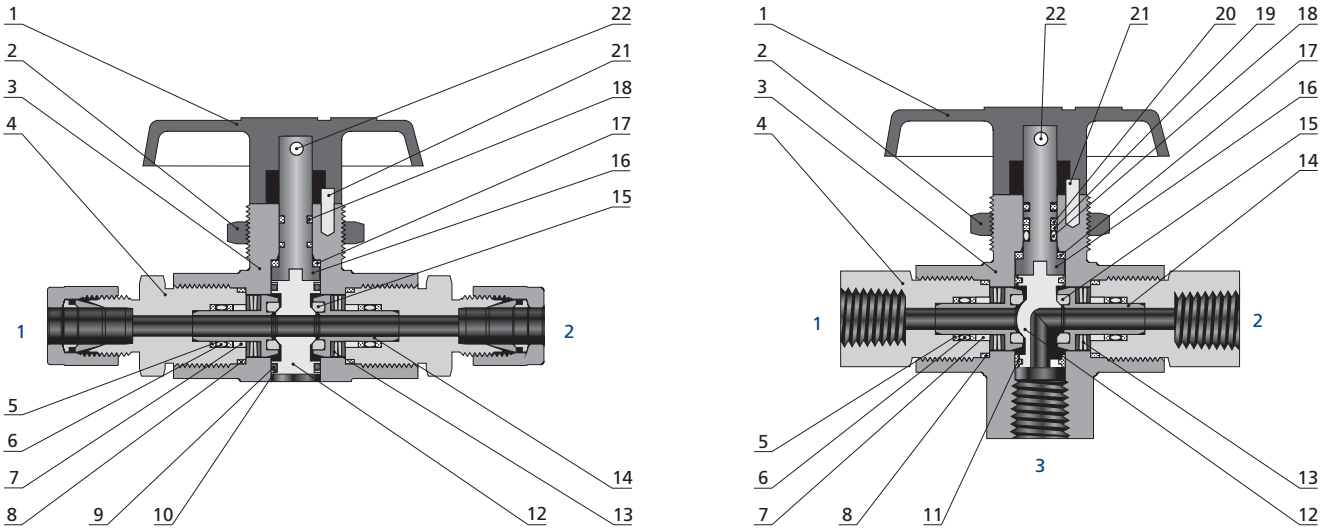
BFH Series 3-way

0.19" (4.8 mm) orifice, 0.75 Cv

Inlet Pressure psig (bar)	Pressure Drop (Δ p) psig (bar)	Air Flow std L/min (std ft³/min)	Water Flow L/min (U.S. gal/min)
1000 (69)	150 (10.3)	55 (1540)	10 (37.0)
6000 (414)	600 (41.4)	200 (5600)	20 (74.0)
10000 (689)	1000 (68.9)	330 (9240)	25 (92.5)

Standard Materials of Construction

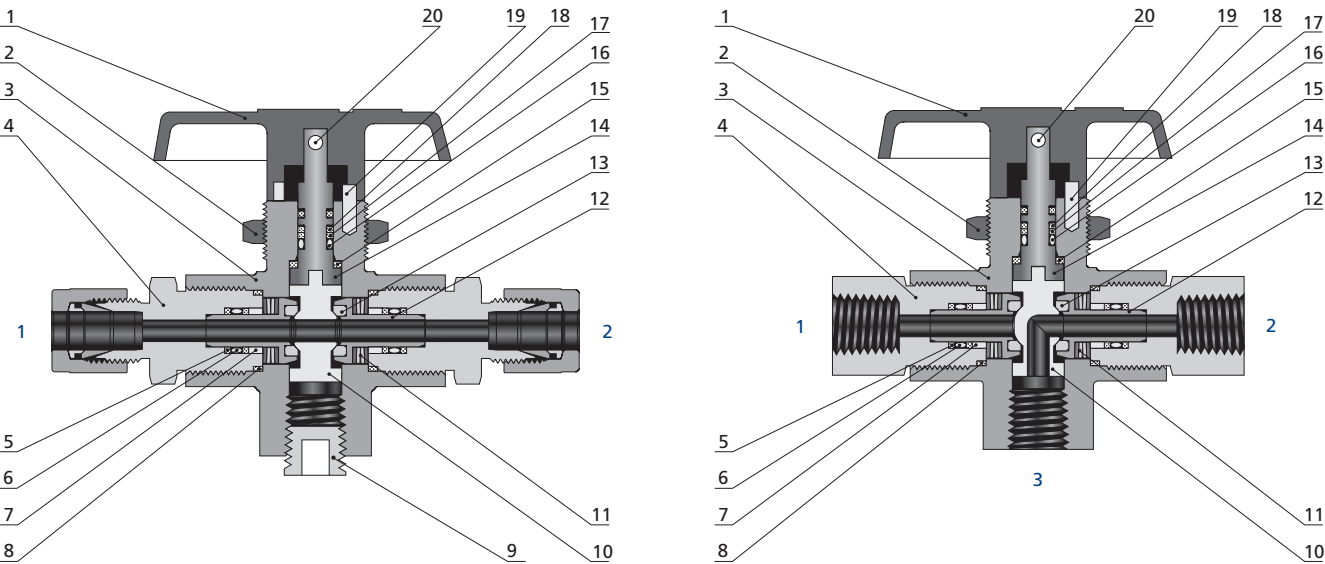
BF Series



Item	Component	Valve Body Material			
		316 Stainless Steel		Alloy 400	
		2-way	3-way	2-way	3-way
		Material Grade/ASTM Specification			
1	Handle	Nylon or Aluminium			
2	Panel Nut	316 SS/B783			
3	Body	316 SS/A479	316 SS/A182	Alloy 400/B164	
4	End Connector	316 SS/A479		Alloy R-405/B164	
5	Seat Retainer Backup Ring	Reinforced PTFE			
6	Seat Retainer O-ring	Fluorocarbon FKM			
7	Seat Retainer Guide	316 SS/A276		Alloy R-405/B164	
8	End Connector Seal	PTFE/D1710			
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/A276	S21800/A276	Alloy R-405/B164	
13	Seat Spring	Alloy X-750/AMS 5542			
14	Seat Retainer	316 SS/A276		Alloy R-405/B164	
15	Seat	PTFE or PEEK or PCTFE			
16	Stem	316 SS/A276		Alloy R-405/B164	
17	Stem Washer	Reinforced PTFE	PEEK	Reinforced PTFE	PEEK
18	Stem O-ring	Fluorocarbon FKM		Fluorocarbon FKM	
19	Secondary Stem Backup Ring	—	PTFE/D710	—	PTFE/D710
20	Primary Stem Backup Ring	—	PEEK	—	PEEK
21	Pin	Stainless Steel			
22	Set Screw	Stainless Steel			
Lubricants		Fluorinated-based (all valves) tungsten disulfide additive (valves with peek seats)			

1. Ball trunnions are PTFE coated in BF series 2-way valve.
2. Other materials are available upon request, refer to the ordering information.

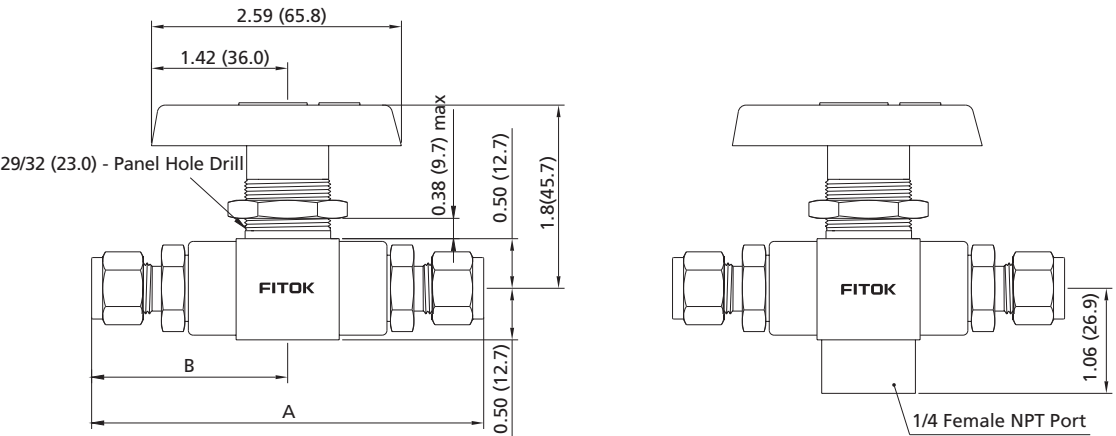
BFH Series



Item	Component	2-way	3-way
		Material Grade/ASTM Specification	
1	Handle	Nylon or Aluminium	
2	Panel Nut	316 SS/B783	
3	Body	316 SS/A479	316 SS/A182
4	End Connector	316 SS/A479	
5	Seat Retainer Guide	Reinforced PTFE	
6	Seat Retainer O-ring	Fluorocarbon FKM	
7	Seat Carrier Guide	316 SS/A276	
8	End Connector Seal	PTFE/D1710	
9	Plug	316 SS/A276	
10	Ball	S21800/A276	
11	Seat Spring	Alloy X-750/AMS 5542	
12	Seat Retainer	316 SS/A276	
13	Seat	PEEK	
14	Stem	316 SS/A276	
15	Stem Washer	PEEK	
16	Stem O-ring	Fluorocarbon FKM	
17	Secondary Stem Backup Ring	PTFE/D710	
18	Primary Stem Backup Ring	PEEK	
19	Pin	Stainless Steel	
20	Set Screw	Stainless Steel	
Lubricants		Molybdenum and Tungsten disulfide and Fluorinated-based	

1. Ball trunnions are Xylan® coated in BFH series 2-way valve.
2. Other materials are available upon request, refer to the ordering information.

Dimensions and order information



2-way Valve

Basic Ordering Number		Connection Size		Cv	Dimension, in. (mm)	
BF Series	BFH Series	Connection 1	Connection 2		A	B
BF□□-FNS2	BFH□□-FNS2	1/8 Female NPT	1/8 Female NPT	1.2	2.94 (74.7)	1.47 (37.3)
BF□□-FNS4	————	1/4 Female NPT	1/4 Female NPT		3.93 (99.8)	1.97 (50.0)
————	BFH□□-FNS4					
BF□□-FNS8	————	1/2 Female NPT	1/2 Female NPT		4.25 (108.0)	2.13 (54.1)
BF□□-FL4	BFH□□-FL4	1/4" FITOK	1/4" FITOK		4.14 (105.2)	2.07 (52.6)
BF□□-FL6	BFH□□-FL6	3/8" FITOK	3/8" FITOK		4.39 (111.5)	2.19 (55.6)
BF□□-FL8	BFH□□-FL8	1/2" FITOK	1/2" FITOK		4.60 (116.8)	2.30 (58.4)
BF□□-ML6	BFH□□-ML6	6 mm FITOK	6 mm FITOK		4.14 (105.2)	2.07 (52.6)
BF□□-ML8	BFH□□-ML8	8 mm FITOK	8 mm FITOK		4.15 (105.4)	
BF□□-ML10	BFH□□-ML10	10 mm FITOK	10 mm FITOK		4.41 (112.0)	2.20 (55.9)
BF□□-ML12	BFH□□-ML12	12 mm FITOK	12 mm FITOK		4.60 (116.8)	2.30 (58.4)

3-way Valve

Basic Ordering Number		Connection Size			Cv	Dimension, in. (mm)	
BF Series	BFH Series	Connection 1	Connection 2	Connection 3		A	B
BF□□-FNS2-3	BFH□□-FNS2-3	1/8 Female NPT	1/8 Female NPT	1/4 Female NPT	0.75	2.94 (74.7)	1.47 (37.3)
BF□□-FNS4-3	_____	1/4 Female NPT	1/4 Female NPT			3.93 (99.8)	1.97 (50.0)
_____	BFH□□-FNS4-3		1/4 Female NPT			4.14 (105.2)	2.07 (52.6)
BF□□-FL4-3	BFH□□-FL4-3	1/4" FITOK	1/4" FITOK			4.39 (111.5)	2.19 (55.6)
BF□□-FL6-3	BFH□□-FL6-3	3/8" FITOK	3/8" FITOK			4.60 (116.8)	2.30 (58.4)
BF□□-FL8-3	BFH□□-FL8-3	1/2" FITOK	1/2" FITOK			4.14 (105.2)	2.07 (52.6)
BF□□-ML6-3	BFH□□-ML6-3	6 mm FITOK	6 mm FITOK			4.15 (105.4)	
BF□□-ML8-3	BFH□□-ML8-3	8 mm FITOK	8 mm FITOK			4.41 (112.0)	2.20 (55.9)
BF□□-ML10-3	BFH□□-ML10-3	10 mm FITOK	10 mm FITOK			4.60 (116.8)	2.30 (58.4)
BF□□-ML12-3	BFH□□-ML12-3	12 mm FITOK	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, refer to the ordering information.
3. Dimensions are shown with FITOK nuts finger-tightened. All dimensions are for reference only and are subject to change.
For dimensions not shown above, please contact the authorized representative or FITOK Group.
4. Bottom port of all 3-way valves is 1/4 in. female NPT.

Service Option

Low-temperature Service

Trunnion 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 valves have low-temperature Buna C O-rings. All other materials and ratings are the same as those of standard valves.

Example: BFSS-FL4-P-L (2-way)

BF Series Low-temperature service Pressure - temperature Ratings

Material	316 SS		Alloy 400	
Seat Material	PCTFE PEEK	PTFE	PCTFE PEEK	PTFE
Temperature, °F (°C)	Working Pressure, psig (bar)			
-40 to 100 (-40 to 37)	6000 (414)	1500 (103)	5000 (344)	1500 (103)
100 to 200 (37 to 93)	See Pressure vs. Temperature			

BFH Series Low-temperature service Pressure - temperature Ratings

Material	316 SS				
End Connection	FNS2, FNS4 FL4, ML6	ML10	FL6 ML8	FL8	ML12
Temperature, °F (°C)	Working Pressure, psig (bar)				
-40 to 100 (-40 to 37)	10000 (689)	8400 (578)	7500 (516)	6700 (461)	6600 (454)
100 to 200 (37 to 93)	See Pressure vs. Temperature				

BF&BFH Series special cleaning and packaging F2 (FC-02)

TO: Order optional cleaning and packaging in accordance with FITOK special cleaning and packaging F2 (FC-02), to ensure compliance with product cleanliness requirements stated in ASTM G93 lever for BF series with PCTFE, PTFE, PEEK or reinforced nylon seats, add "F2" to valves ordering number.
Example: BFSS-ML8-P-3-F2 (3-way)

Oxygen service hazards

For more information about hazards and risks of oxygen-enriched system, please contact the authorized representative or FITOK Group.

BF&BFH Series seal kits

- 1. Seal kits contain components of the same material as original valve. See standard material of construction
- 2. To complete the ordering number, please add Z for seal kits. Examples as follows:

Valve Series	Basic Seal Kit Ordering Number	Kit Contents
BF 2-way seal kits	BFSS-ML12-ML10-P-CLF2-Z	Instructions, O-rings, stem bearing, ball, seat subassemblies (seats and seat carriers), seat springs, end screw seals, lubricant
BF 3-way seal kits	BFSS-FNS4-ML12-ML10-P-C3LF4-Z	Instructions, O-rings, stem bearing, stem, ball, seat subassemblies (seats and seat carriers), seat springs, end screw seals, lubricant
BFH 2-way seal kits	BFHSS-ML12-ML10-P-CLF2-Z	Instructions, stem, O-rings, backup rings, stem bearing, ball, seat subassemblies (seats and seat carriers), seat springs, end screw seals, lubricant
BFH 3-way seal kits	BFHSS-FNS4-ML12-ML10-P-C3LF4-Z	

Seal kit ordering numbers specify stainless steel material. For alloy 400 material, replace SS with M in the basic ordering number.

Part Number Description

BFSS – FNS4 – ML12 – P – RXLE3 – LSF2 – Z

Series	Body Material	Connection 1 Type	Connection 1 Size	Connection 2 Type	Connection 2 Size	Seat Material	Handle/Actuator	For Actuator	Flow Pattern	Valve Application	Special Application	Cleaning and Packaging	Seal Kits		
BF	SS 316 SS	FNS Female NPT	2 1/8"	Same as Connection 1	Specified in the same way as the connection 1 type and size	PTFE	Black Nylon	General	Normal Temperature	Low Temperature (as low as -40°F)	NO	FC-01	Non-seal kits		
BFH	6L 316L SS	NS Male NPT	4 1/4"			K PCTFE	C Red Nylon	L Mechanical Limit Switch							
	M Alloy 400	FRT Female BSPT	6 3/8" or 6 mm			P PEEK	F Green Nylon	E Electromagnetic Valve							
	904L 904L SS	RT Male BSPT	8 1/2" or 8 mm				J Blue Nylon	LE Mechanical Limit Switch and Electromagnetic Valve							
		FRP Female BSPP (for RP)	10 10 mm	2-Way			U Black Aluminium		3		S MR0175	F2 FC-02	Seal kits		
		BP Male BSPP (for RG)	12 12 mm												
		FMS Female Metric Thread (for RG)		90° Normally Closed Spring Return Pneumatic Actuator			CS		3						
		MS Male Metric Thread (for RG)					DA								
		FL Fractional Tube Fitting		90° Double Acting Pneumatic Actuator			OS		3						
		ML Metric Tube Fitting					RX								
				180° right end normally open spring return pneumatic actuator			DX		3						
							EA								
				180° Double Acting Pneumatic Actuator			EX		3						

Note: "Part Number Description" is used for composition rules of FITOK product model, Not suitable for specific product part number selection, not random combinations. If in doubt, please contact FITOK company or authorized agents.

- 1. For information about pneumatic and electric actuator, contact the authorized representative or FITOK Group.
- 2. 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 as stated in ASTM G93 Level C.