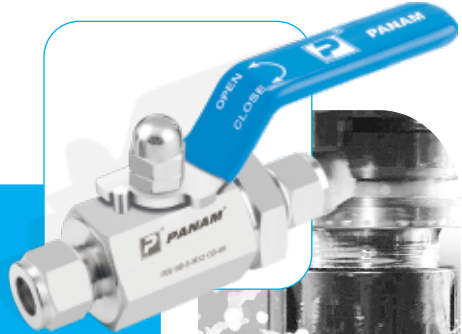




PANAM
ENGINEERING
BEYOND
LIMITS

Ball Valves (HB Series)

Maximum Working Pressure upto
10000 psi (689 bar)



+91 22 4146 9000

sales@panam.in

www.panam.in

Rev/04/2023

Introduction

PANAM[®] has emerged as renowned name in global market for 'Instrumentation Fittings & Valves'. Since its inception in 1998 to present day, **PANAM**[®] has added new product every year and has broadened its product portfolio and its clientele base by supplying to potential customers worldwide. Key core values like Timely Delivery, Quality Consistency, Product Improvisation and After Sales Service has been instrumental in the phase wise evolution of company. Continuous improvement is the key to success, Customer feedback are taken with positive attitude and product are constantly groomed to a new quality and performance level to cope up with the competition. Our products are known for providing high-quality, high-reliability, low-cost options for the oil and gas industry.

Over the year, the company has evolved from a product based company to a complete system solution provider. Over the coming years the entity of the company will attain state of the art operational efficiency for maintaining a competitive edge, with the advent increase in the utilization of its products in oil, gas and power sector.

PANAM[®] is having state of the art manufacturing facility span over an area of 65,000 sqft with a fleet of CNC Machines, VMC Machines, Semi-Automatic Lathe Machines, High Pressure Test Bench with SCADA Control, Configuration Centre for Transmitters and dedicated R&D Team.

PANAM[®] offers Ball Valves HB Series with a variety of end connections including NPT Tapered, ISO Tapered (BSPT), ISO Parallel (BSPP), Metric Thread / **PANAM**[®] Tube Fittings.

PANAM[®] Ball Valves HB series is subject to the required factory testing, meeting the requirements of NACE MR0175, with heat code traceability. Maximum working pressure up to 10000 psi (689 bar).

Contents

• Ball Valve HB Series - 6000 psi (414 bar) / 10000 psi (689 bar)	1
• Characteristics of Ball Valve HB Series - 6000 psi (414 bar) / 10000 psi (689 bar)	1
• Features of Ball Valve HB Series - 6000 psi (414 bar) / 10000 psi (689 bar)	1
• Design and Material of Construction - 6000 psi (414 bar) / 10000 psi (689 bar)	2
• End Connection and Sizes for 6000 psi (414 bar)	3
• End Connection and Sizes for 10000 psi (689 bar)	5
• Pressure V/s Temperature - 6000 psi (414 bar) / 10000 psi (689 bar)	7
• Sealing Material Characteristics - 6000 psi (414 bar) / 10000 psi (689 bar)	7
• Seal Adjustment - 6000 psi (414 bar) / 10000 psi (689 bar)	7
• Testing - 6000 psi (414 bar) / 10000 psi (689 bar)	7
• Cleaning & Packaging - 6000 psi (414 bar) / 10000 psi (689 bar)	8
• Ordering Information - 6000 psi (414 bar) / 10000 psi (689 bar)	8
• Ball Valves HB Series of One-Piece Design - 2000 psi (138 bar)	9
• Characteristics of One-Piece Design - 2000 psi (138 bar)	9
• Design and Materials of Ball Valves HB Series of One-Piece Design - 2000 psi (138 bar)	9
• Connection Types and Sizes of Ball Valves HB Series of One-Piece Design - 2000 psi (138 bar)	10
• Ball Valves HB Series - 1000 psi (68 bar) / 2000 psi (138 bar)	11
• Characteristics - 1000 psi (68 bar) / 2000 psi (138 bar)	11
• Design and Materials - 1000 psi (68 bar) / 2000 psi (138 bar)	11
• Connection Types and Sizes - 1000 psi (68 bar) / 2000 psi (138 bar)	12
• Pressure V/s Temperature - 1000 psi (68 bar) / 2000 psi (138 bar)	13
• Sealing Material Characteristics - 1000 psi (68 bar) / 2000 psi (138 bar)	13
• Seal Adjustment - 1000 psi (68 bar) / 2000 psi (138 bar)	13
• Testing - 1000 psi (68 bar) / 2000 psi (138 bar)	13
• Cleaning and Packaging - 1000 psi (68 bar) / 2000 psi (138 bar)	14
• Ordering Information - 1000 psi (68 bar) / 2000 psi (138 bar)	14
• Ordering Information - Spare Parts	15
• Safety	15
• PANAM ® Products	16

Ball Valve HB Series - 6000 psi (414 bar) / 10000 psi (689 bar)

HB series high performance two-piece ball valves are designed for bi-directional flow under pressure up to 10000 psi (689 bar) in cold condition ensuring 100% sealing and continuous operation. Ball Valves HB Series are suitable for the most complex tasks in the oil, gas industry and process control systems.

The valves meet the requirements of ASME B31.1 and can be used in power industry. The leakage is minimized. Tube end connections eliminate the use of tapered thread and sealant, prevent from system contamination, reduce leakage, weight and dimensions, and installation costs

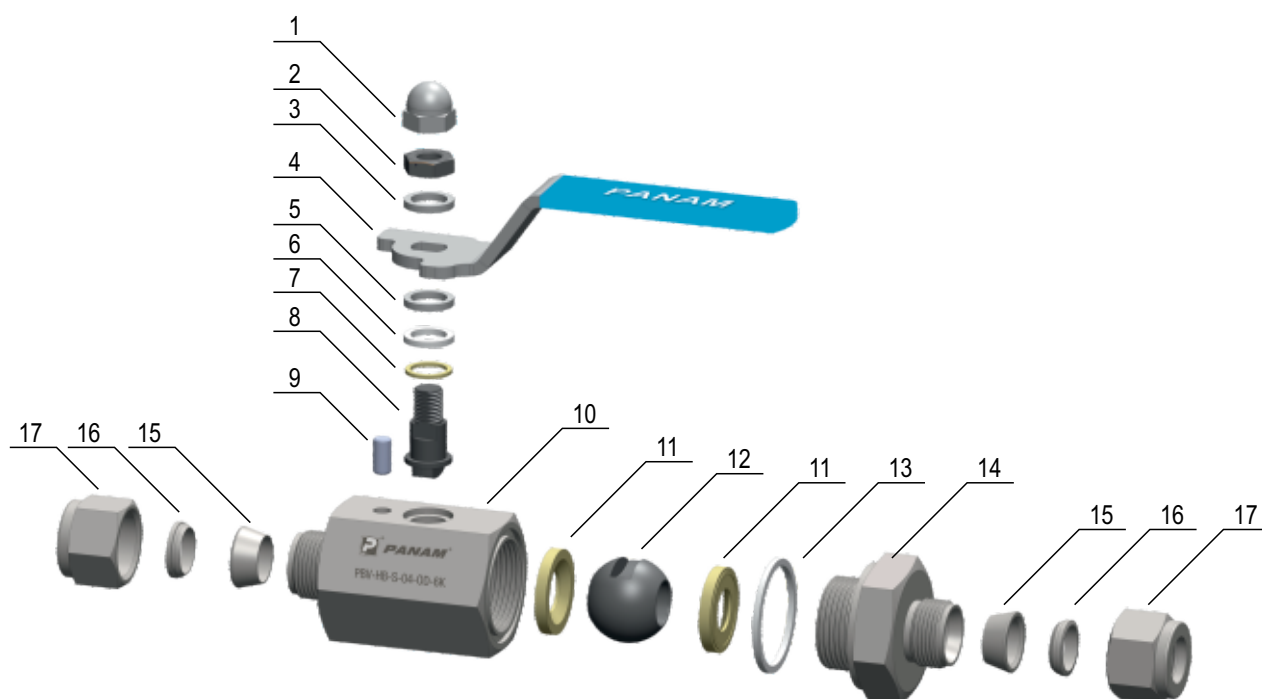
Characteristics

- Standard body material – Stainless Steel SS 316
- Maximum working pressure 6000 psi (414 bar) with DELRIN and PCTFE seat
- Maximum working pressure 10000 (689 bar) with modified PEEK seat
- Working temperature from -26°C to +85°C (from -18°F to +185°F) with DELRIN seat
- Working temperature from -54 °C to +149°C (from -65°F to +300°F) with PCTFE seat
- Working temperature from -40°C to 232°C (from -40°F to 450°F) with PEEK seat
- End connections from 1/4 " to 1" (from 6 mm to 25 mm)
- Variety of end connections includes female thread, male thread, male/female and **PANAM**® tube fitting
- Different types of thread: NPT tapered, ISO (BSPT) tapered, ISO (BSPP) parallel, metric thread

Features

- Two -piece design for minimizing the leakage
- ASME B16.34 compliance where applicable
- Safety factor 4:1
- Possible use in the systems with bi-directional flow
- Delrin and PEEK as standard seat material for ball valves up to 6000 psi (414 bar) & 10000 psi (689 bar) accordingly
- Delrin, PCTFE or PEEK as stem sealing material
- Leak-free shutoff
- Anti-blow-out proof stem
- Available with compression end connections to exclude tapered threads and sealing materials (Teflon tape)
- Low torque

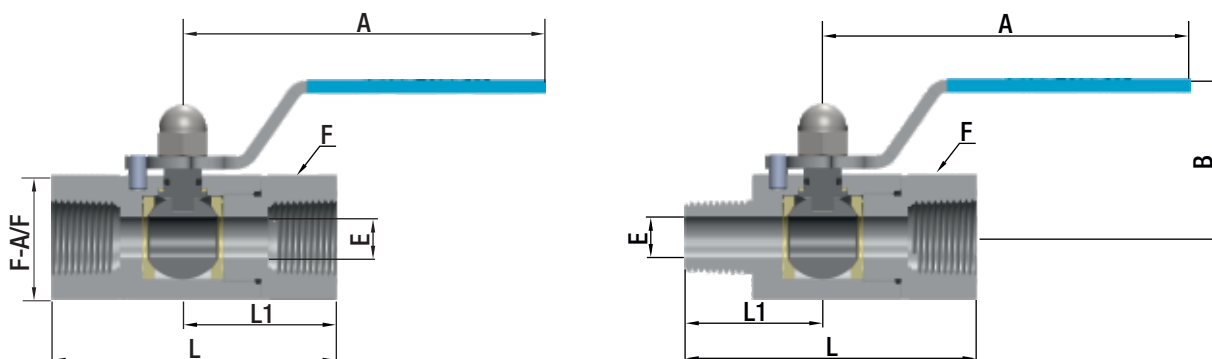
Design and Material of Construction - 6000 psi (414 bar) / 10000 psi (689 bar)



No	Part	Material	Qty
1	Cap Nut	ASTM A479 SS 316	1
2	Hex Nut	ASTM A479 SS 316	1
3	Handle Washer	ASTM A479 SS 316	1
4	Handle	ASTM A240 SS 316	1
5	Stem Seal Washer	ASTM A479 SS 316	1
6	Outer Stem Seal	PTFE	1
7	Inner Stem Seal	Delrin/PCTFE/PEEK*	1
8	Stem	ASTM A479 SS 316	1
9	Body	ASTM A479 SS 316	1
10	Locking Pin	ASTM A479 SS 316	1
11	Seat	Delrin/PCTFE/PEEK	2
12	Ball	ASTM A479 SS 316	1
13	Body Seal	PTFE	1
14	Adapter	ASTM A479 SS 316	1
15	Front Ferrule	ASTM A479 SS 316	2
16	Back Ferrule	ASTM A479 SS 316	2
17	Lock Nut	ASTM A479 SS 316	2

*Note: Material of upper and lower stem seal and body material depend on seat material

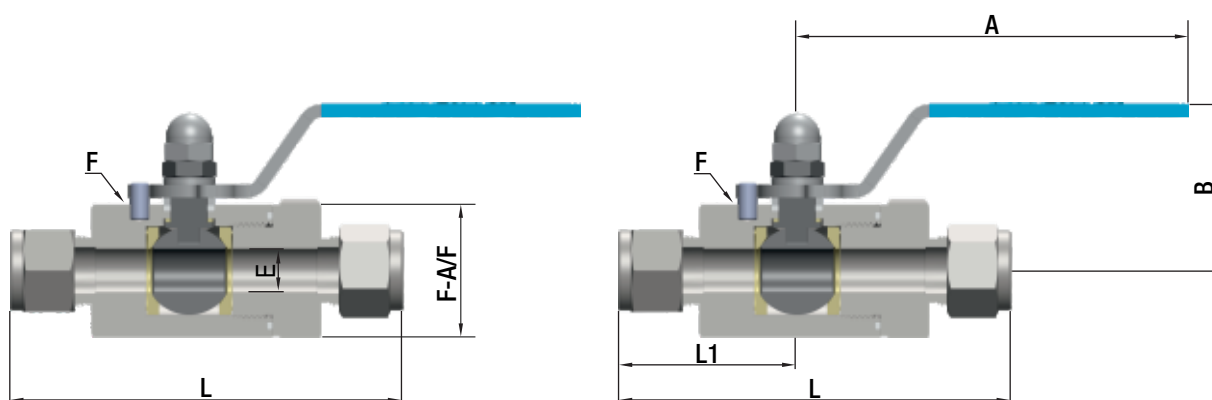
End Connections and Sizes For 6000 psi (414 bar)



End Connection		Part Number	Orifice	L	L1	A	B	F-A/F
Type	Size							
NPT Female	1/4"	PBV-HB-S-04-FF-6K	6.4	56.00	26.75	69.40	30.20	25.4
	3/8"	PBV-HB-S-06-FF-6K	6.4	66.00	34.25	81.53	43.59	25.4
	1/2"	PBV-HB-S-08-FF-6K	12.0	83.00	38.25	107.00	45.40	36.0
	3/4"	PBV-HB-S-12-FF-6K	15.0	89.00	39.50	106.95	49.90	46.0
	1"	PBV-HB-S-16-FF-6K	19.0	115.00	51.00	165.90	65.60	56.0
NPT Male / NPT Female	1/4"	PBV-HB-S-04-MF-6K	6.4	59.00	29.75	69.43	30.20	25.4
	3/8"	PBV-HB-S-06-MF-6K	6.4	64.00	29.75	69.43	30.20	25.4
	1/2"	PBV-HB-S-08-MF-6K	12.0	85.00	40.25	107.00	45.40	36.0
	3/4"	PBV-HB-S-12-MF-6K	15.0	89.00	39.50	107.00	49.90	46.0
	1"	PBV-HB-S-16-MF-6K	19.0	115.00	51.00	165.90	65.60	56.0
BSPT Female	1/4"	PBV-HB-S-04R-FF-6K	6.4	56.00	26.75	69.40	30.20	25.4
	3/8"	PBV-HB-S-06R-FF-6K	6.4	66.00	34.25	81.53	43.59	25.4
	1/2"	PBV-HB-S-08R-FF-6K	12.0	83.00	38.25	107.00	45.40	36.0
	3/4"	PBV-HB-S-12R-FF-6K	15.0	89.00	39.50	106.95	49.90	46.0
	1"	PBV-HB-S-16R-FF-6K	19.0	115.00	51.00	165.90	65.60	56.0
BSPT Male/ Female	1/4"	PBV-HB-S-04R-MF-6K	6.4	59.00	29.75	69.43	30.20	25.4
	3/8"	PBV-HB-S-06R-MF-6K	6.4	64.00	29.75	69.43	30.20	25.4
	1/2"	PBV-HB-S-08R-MF-6K	12.0	85.00	40.25	107.00	45.40	36.0
	3/4"	PBV-HB-S-12R-MF-6K	15.0	89.00	39.50	107.00	49.90	46.0
	1"	PBV-HB-S-16R-MF-6K	19.0	115.00	51.00	165.90	65.60	56.0
BSPP Female	1/4"	PBV-HB-S-04G-FF-6K	6.4	56.00	26.75	69.40	30.20	25.4
	3/8"	PBV-HB-S-06G-FF-6K	6.4	66.00	34.25	81.53	43.59	25.4
	1/2"	PBV-HB-S-08G-FF-6K	12.0	83.00	38.25	107.00	45.40	36.0
	3/4"	PBV-HB-S-12G-FF-6K	15.0	89.00	39.50	107.00	49.90	46.0
	1"	PBV-HB-S-16G-FF-6K	19.0	115.00	51.00	165.90	65.60	56.0
BSPP Male/ BSPP Female	1/4"	PBV-HB-S-04-MF-6K	6.4	59.00	29.75	69.43	30.20	25.4
	3/8"	PBV-HB-S-06-MF-6K	6.4	64.00	29.75	69.43	30.20	25.4
	1/2"	PBV-HB-S-08-MF-6K	12.0	85.00	40.25	107.00	45.40	36.0
	3/4"	PBV-HB-S-12-MF-6K	15.0	89.00	39.50	107.00	49.90	46.0
	1"	PBV-HB-S-16-MF-6K	19.0	115.00	51.00	165.90	65.60	56.0
Metric Thread	M20 X M1.5	PBV-HB-S-20M-FF-6K	12.0	85.00	40.25	107.00	45.40	36.0
	M20 X M1.5	PBV-HB-S-20M-MF-6K	12.0	85.00	40.25	107.00	45.40	36.0

Note: Sizes are for reference only and can be changed. All sizes in mm unless specified otherwise

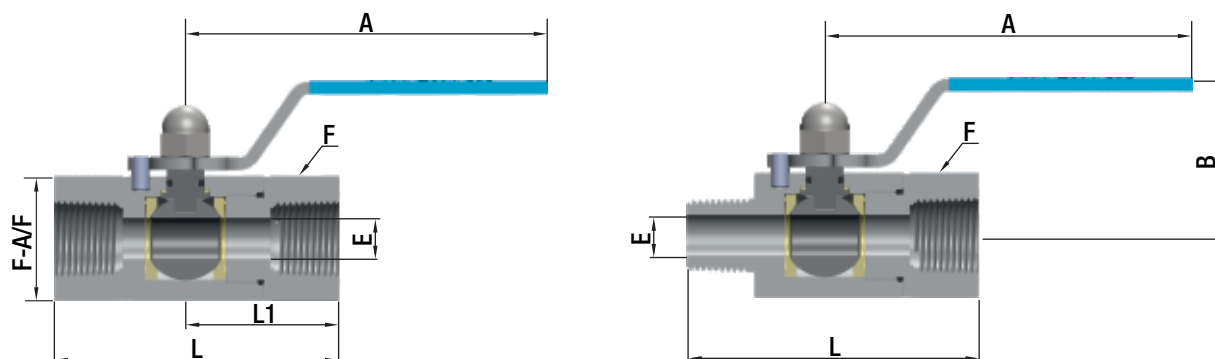
End Connections and Sizes For 6000 psi (414 bar)



End Connection		Part Number	Orifice	L	L1	A	B	F-A/F
Type	Size							
PANAM Tube Fittings (inch)	1/4"	PBV-HB-S-04-OD-6K	4.8	78.12	34.30	69.51	30.25	25.4
	3/8"	PBV-HB-S-06-OD-6K	6.4	78.76	33.88	69.51	30.20	25.4
	1/2"	PBV-HB-S-08-OD-6K	10.0	106.69	48.60	107.00	45.40	36.0
	3/4"	PBV-HB-S-12-OD-6K	15.0	111.57	48.29	107.00	49.90	46.0
	1"	PBV-HB-S-16-OD-6K	19.0	139.10	61.55	165.89	65.60	56.0
PANAM Tube Fittings (mm)	6mm	PBV-HB-S-M06-OD-6K	4.8	78.63	34.57	69.40	30.20	25.4
	8mm	PBV-HB-S-M08-OD-6K	6.4	80.95	35.23	69.40	30.20	25.4
	10mm	PBV-HB-S-M10-OD-6K	6.4	80.66	34.58	69.40	30.20	25.4
	12mm	PBV-HB-S-M12-OD-6K	10.0	107.96	49.24	107.00	45.40	36.0
	14mm	PBV-HB-S-M14-OD-6K	12.0	107.98	49.24	107.00	45.40	36.0
	16mm	PBV-HB-S-M16-OD-6K	12.0	107.94	49.22	107.00	45.40	36.0
	18mm	PBV-HB-S-M18-OD-6K	15.0	111.89	48.35	107.00	49.90	46.0
	25mm	PBV-HB-S-M25-OD-6K	19.0	139.26	61.63	165.89	65.60	56.0

Note: Sizes are for reference only and can be changed. All sizes in mm unless specified otherwise

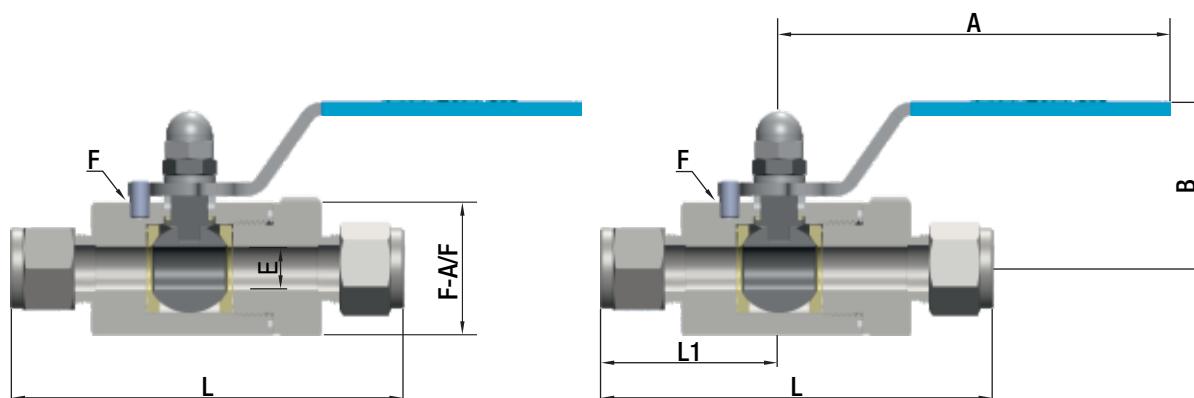
End Connections and Sizes For 10000 psi (689 bar)



End Connection		Part Number	Orifice	L	L1	A	B	F-A/F
Type	Size							
NPT Female	1/4"	PBV-HB-S-04-FF-10K	6.4	70.00	29.30	107.00	45.00	36.0
	3/8"	PBV-HB-S-06-FF-10K	6.4	70.00	29.30	107.00	45.00	36.0
	1/2"	PBV-HB-S-08-FF-10K	10.0	87.00	34.50	107.00	47.50	41.0
	3/4"	PBV-HB-S-12-FF-10K	15.0	100.00	42.00	139.97	61.50	51.0
NPT Male / NPT Female	1/4"	PBV-HB-S-04-MF-10K	6.4	75.00	34.30	107.00	45.00	36.0
	3/8"	PBV-HB-S-06-MF-10K	6.4	75.00	34.30	107.00	45.00	36.0
	1/2"	PBV-HB-S-08-MF-10K	10.0	90.00	37.50	107.00	47.50	41.0
	3/4"	PBV-HB-S-12-MF-10K	15.0	102.00	44.00	139.97	61.50	51.0
BSPT Female	1/4"	PBV-HB-S-04R-FF-10K	6.4	70.00	29.30	107.00	45.00	36.0
	3/8"	PBV-HB-S-06R-FF-10K	6.4	70.00	29.30	107.00	45.00	36.0
	1/2"	PBV-HB-S-08R-FF-10K	10.0	87.00	34.50	107.00	47.50	41.0
	3/4"	PBV-HB-S-12R-FF-10K	15.0	100.00	42.00	139.97	61.50	51.0
BSPT Male/ Female	1/4"	PBV-HB-S-04R-MF-10K	6.4	75.00	34.30	107.00	45.00	36.0
	3/8"	PBV-HB-S-06R-MF-10K	6.4	75.00	34.30	107.00	45.00	36.0
	1/2"	PBV-HB-S-08R-MF-10K	10.0	90.00	37.50	107.00	47.50	41.0
	3/4"	PBV-HB-S-12R-MF-10K	15.0	102.00	44.00	139.97	61.50	51.0
BSPP Female	1/4"	PBV-HB-S-04G-FF-10K	6.4	70.00	29.30	107.00	45.00	36.0
	3/8"	PBV-HB-S-06G-FF-10K	6.4	70.00	29.30	107.00	45.00	36.0
	1/2"	PBV-HB-S-08G-FF-10K	10.0	87.00	34.50	107.00	47.50	41.0
	3/4"	PBV-HB-S-12G-FF-10K	15.0	100.00	42.00	139.97	61.50	51.0
BSPP Male/ BSPP Female	1/4"	PBV-HB-S-04G-MF-10K	6.4	75.00	34.30	107.00	45.00	36.0
	3/8"	PBV-HB-S-06G-MF-10K	6.4	75.00	34.30	107.00	45.00	36.0
	1/2"	PBV-HB-S-08G-MF-10K	10.0	90.00	37.50	107.00	47.50	41.0
	3/4"	PBV-HB-S-12G-MF-10K	15.0	102.00	44.00	139.97	61.50	51.0
BSPP Male/ BSPP Female	M20X1.5	PBV-HB-S-20M-FF-10K	10.0	87.00	34.50	107.00	47.50	41.0
	M20X1.5	PBV-HB-S-20M-MF-10K	10.0	87.00	34.50	107.00	47.50	41.0

Note: Sizes are for reference only and can be changed. All sizes in mm unless specified otherwise

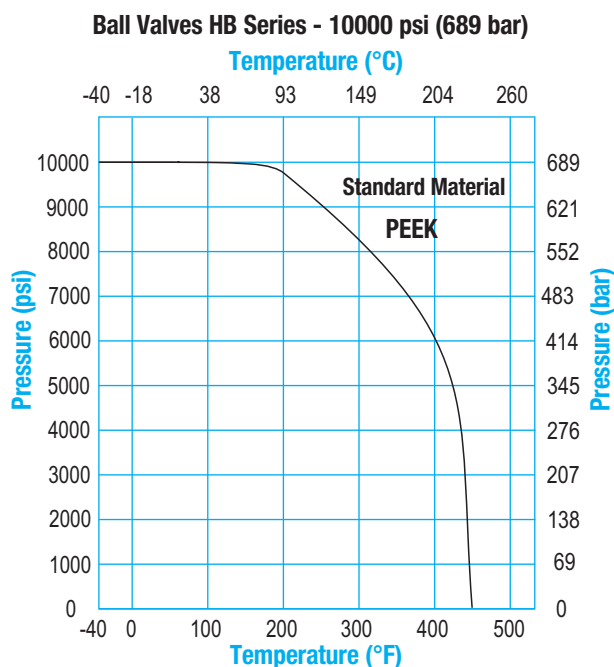
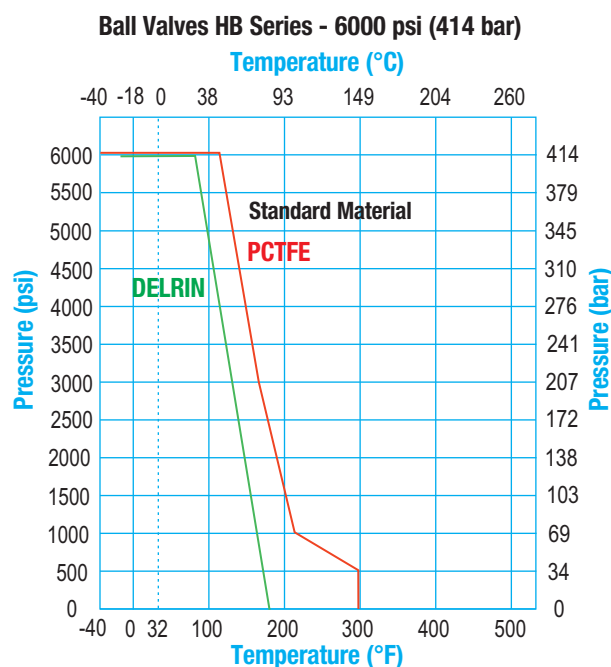
End Connections and Sizes For 10000 psi (689 bar)



End Connection		Part Number	Orifice	L	L1	A	B	F-A/F
Type	Size							
PANAM Tube Fittings (inch)	1/4"	PBV-HB-S-04-OD-10K	5.5	92.12	38.86	107.00	45.00	36.0
	3/8"	PBV-HB-S-06-OD-10K	6.4	92.76	39.43	107.00	45.00	36.0
	1/2"	PBV-HB-S-08-OD-10K	10.0	107.34	43.67	107.00	47.50	41.0
	3/4"	PBV-HB-S-12-OD-10K	15.0	121.57	52.79	139.97	61.50	51.0
PANAM Tube Fittings (mm)	6mm	PBV-HB-S-M06-OD-10K	5.5	92.00	39.19	107.00	45.00	36.0
	8mm	PBV-HB-S-M08-OD-10K	6.4	95.45	40.78	107.00	45.00	36.0
	10mm	PBV-HB-S-M10-OD-10K	6.4	95.45	40.82	107.00	45.00	36.0
	12mm	PBV-HB-S-M12-OD-10K	10.0	107.51	43.76	107.00	47.50	41.0
	14mm	PBV-HB-S-M14-OD-10K	10.0	107.26	43.36	107.00	47.50	41.0
	16mm	PBV-HB-S-M16-OD-10K	10.0	106.43	43.22	107.00	47.50	41.0
	18mm	PBV-HB-S-M18-OD-10K	15.0	122.19	52.85	139.97	61.50	51.0
	20mm	PBV-HB-S-M20-OD-10K	15.0	122.19	52.85	139.97	61.50	51.0

Note: Sizes are for reference only and can be changed. All sizes in mm unless specified otherwise

Pressure V/s Temperature



Sealing Material Characteristics

DELRIN (Polyosimethylene or Polyformaldehyde)

Delrin is a versatile engineering polymer with a combination of properties similar to those of metals. The material has a unique combination of strength, stiffness, hardness and elasticity, as well as excellent dimensional stability, fatigue strength, abrasion and solvent resistance. Creep resistance, dimensional stability, high chemical resistance to most organic solvents. Not suitable for use with acids, bases, and oxidizing agents. Maximum operational temperature of material <90°C (<194°F).

PCTFE (Polychlorotetrafluoroethylene)

High chemical resistance and wider operating temperature range. Low moisture absorption, resistance to hydrolysis and hot steam, ability to maintain strength and flexibility at low temperatures (Operating temperature range from -195°C to + 150°C (from -319°F to + 302°F). Excellent material for use with oxygen and nitrogen.

PEEK (Polyetheretherketone)

PEEK is a semi-crystalline polymer with high temperature resistance, high mechanical strength, and high chemical resistance. Excellent material for high pressure and temperature. Resistant to chemically aggressive environments and radioactive radiation. Withstands temperatures up to + 260°C (up to + 500°F) for a long time, as well as boiling water or steam without losing physical properties.

Seal Adjustment

Considering that the ball valves are designed for use in a variety of technological processes, in some cases, it may be necessary to adjust the seal. Factory packing adjustment setting is 1000 psi (69 bar) Information on valve seal adjustment and adjustment procedure is stated in the installation and operating instructions for each series of ball valves.

Testing

Every **PANAM**® valve is hydrostatically tested in accordance with MSS-SP-99. The procedure includes hydrostatic testing of the valve body and stem seal leakage check.

The hydrostatic test is carried out using pure water or other liquids with the same or lower viscosity at pressure 1.5 times higher than maximum working pressure. Pressure leakage test of the seat is carried out at pressure 1.1 times higher than maximum working pressure. The seat and stem seal of every valve is hydraulically tested in nitrogen at 6.9 Mpa (1000 psi).

Upon request, additional tests can be carried out, e.g. vibration testing, temperature test, leakage test in helium.

Cleaning & Packaging

All **PANAM**® Ball Valves HB Series are cleaned in accordance with Standard Procedure of **PANAM ENGINEERS LTD.** Standard cleaning and packaging Procedure PWI/5.7/21.

Note. For valves cleaned of lubricant, the torque is substantially increases.

Ordering Information

PBV-HB-S-06G-MF-PK-6K-LH

PANAM®

Valve

BV - Ball Valve

Series

HB - Hex Body

Material

S - SS 316	F55 - Super Duplex - UNS S32760
MO - Monel 400	6MO - UNS S31254
HC - Hastelloy C276	INC625 - Inconel 625
F51 - Duplex - UNS S31803	INC825 - Inconel 825
F53 - Super Duplex - UNS S32750	

Connection Size

04 - 1/4"	16 - 1"	M10 - 10mm	M18 - 18mm
06 - 3/8"	20M - M20x1.5	M12 - 12mm	M20 - 20mm
08 - 1/2"	M06 - 6mm	M14 - 14mm	M22 - 22mm
12 - 3/4"	M08 - 8mm	M16 - 16mm	M25 - 25mm

Thread Type

- NPT **R** - BSPT **G** - BSPP

Connection Type

OD - PANAM ® Tube Fitting	FF - Female x Female	MOD - Male x PANAM ® Tube Fitting
MM - Male x Male	MF - Male x Female	

Seat Material

- Delrin (Standard for 6K)	- PEEK (Standard For 10K)
PK - PEEK (For 6K)	PCTFE - PCTFE (For 6K)

Working Pressure

6K - Working Pressure - 6000 psi (414 bar) **10K** - Working Pressure - 10000 psi (689 bar)

Options

SG - NACE MR-01-75 **OXY** - Oxygen Cleaning **LH** - Locking Handle

Ball Valves HB Series of One-Piece Design - 2000 psi (138 bar)

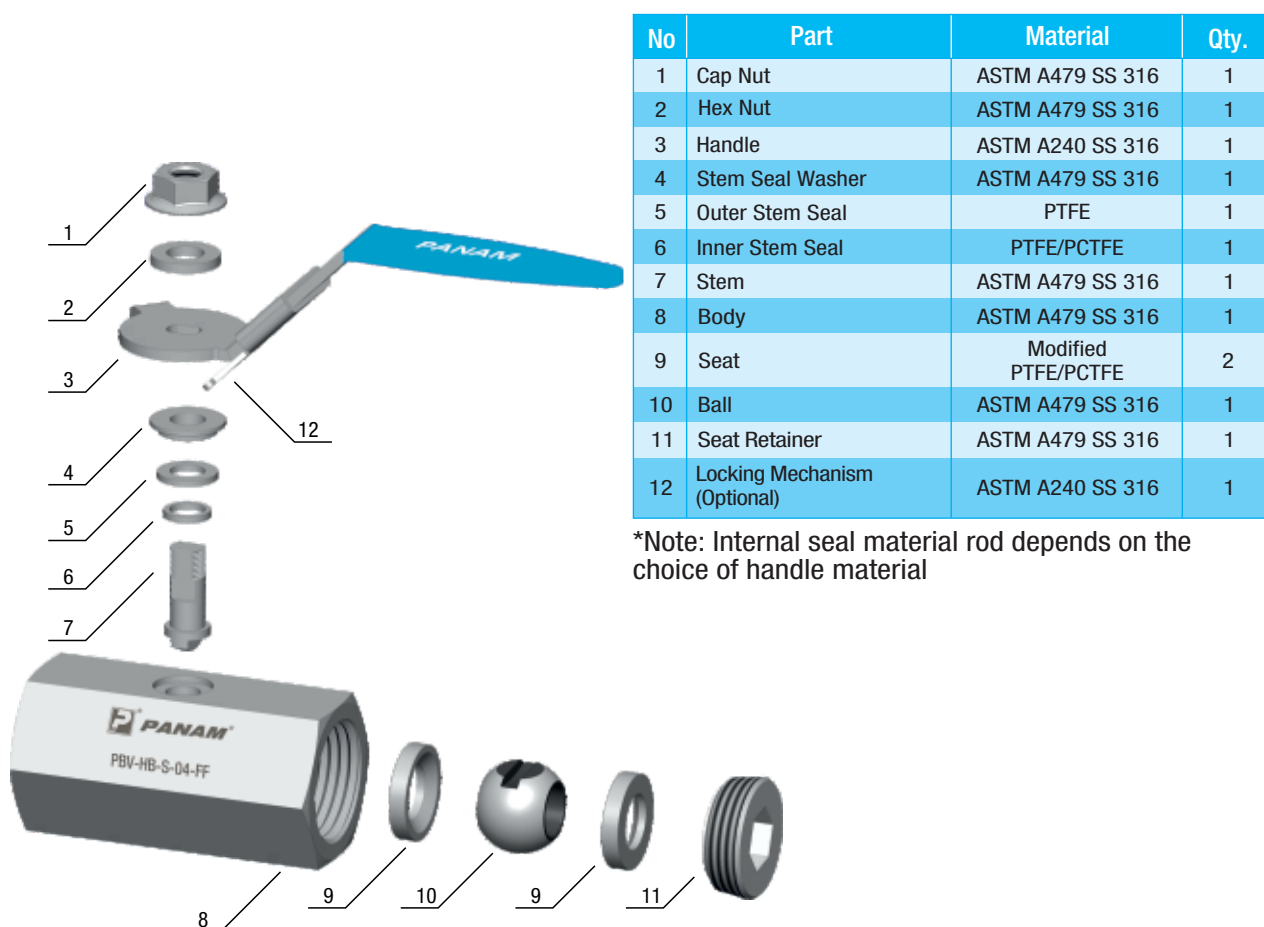
PANAM® Ball Valves HB Series of one-piece design are universal and are used for medium pressure. Ball valves of HB Series are compact in size and design.

They have a larger orifice higher flow rates and they are characterized by long service life and low torque. Ball Valves HB Series are designed for the use in bidirectional flow conditions in fully open or fully closed position.

Characteristics

- CV from 1.25 to 17.35
- Working temperature from -40°C to +204°C (from -40°F to +752°F) with modified PTFE seat
- Maximum working pressure 2000 psi (138 bar)
- End connections from 1/4 " to 1" (From 6 mm to 25 mm)
- Standard body material – Stainless Steel SS 316
- Variety of threaded end connections
- Working temperature from -54 °C to +149°C (from -65°F to +300°F) with PCTFE seat
- Different types of thread: NPT tapered, ISO tapered (BSPT), ISO parallel (BSPP), metric thread
- Two-position stainless steel handle – 'open' and 'close' positions (as an additional option - a handle with a locking mechanism)

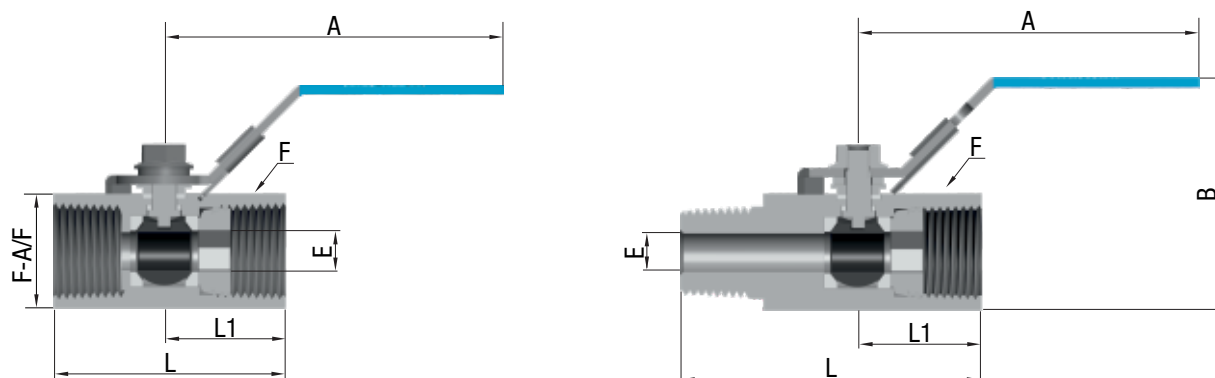
Design and Materials of Ball Valves HB Series of One-Piece Design



*Note: Internal seal material rod depends on the choice of handle material

*Note: Material of inner stem seal depends on seat material

Connection Types and Sizes of Ball Valves HB Series of One-Piece Design - 2000 psi (138 bar)



End Connection		Part Number	Orifice	L	L1	A	B	F-A/F
Type	Size							
NPT Female	1/4"	PBV-HB-S-04-FF	5.0	40.0	21.00	67.67	39.31	11/16"
	3/8"	PBV-HB-S-06-FF	7.5	45.0	23.00	80.49	49.19	7/8"
	1/2"	PBV-HB-S-08-FF	9.0	54.5	28.68	80.51	53.69	1-1/16"
	3/4"	PBV-HB-S-12-FF	12.5	61.0	31.55	97.70	62.70	1-1/4"
	1"	PBV-HB-S-16-FF	16.0	75.0	39.20	99.68	67.18	1-1/2"
NPT Male / NPT Female	1/4"	PBV-HB-S-04-MF	5.0	45.0	21.00	67.67	39.11	11/16"
	3/8"	PBV-HB-S-06-MF	7.5	45.0	23.00	80.49	49.19	7/8"
	1/2"	PBV-HB-S-08-MF	9.0	70.0	28.68	80.51	53.69	1-1/16"
	3/4"	PBV-HB-S-12-MF	12.5	68.0	45.50	102.00	53.00	1-1/4"
	1"	PBV-HB-S-16-MF	16.0	78.0	39.20	99.68	67.18	1-1/2"
BSPT Female	1/4"	PBV-HB-S-04R-FF	5.0	40.0	21.00	67.67	39.31	11/16"
	3/8"	PBV-HB-S-06R-FF	7.5	45.0	23.00	80.49	49.19	7/8"
	1/2"	PBV-HB-S-08R-FF	9.0	54.5	28.68	80.51	53.69	1-1/16"
	3/4"	PBV-HB-S-12R-FF	12.5	61.0	31.55	97.70	62.70	1-1/4"
	1"	PBV-HB-S-16R-FF	16.0	75.0	39.20	99.68	67.18	1-1/2"
BSPT Male / BSPT Female	1/4"	PBV-HB-S-04R-MF	5.0	45.0	21.00	67.67	39.11	11/16"
	3/8"	PBV-HB-S-06R-MF	7.5	45.0	24.80	82.00	38.00	7/8"
	1/2"	PBV-HB-S-08R-MF	9.0	70.0	28.68	80.51	53.69	1-1/16"
	3/4"	PBV-HB-S-12R-MF	12.5	68.0	45.50	102.00	53.00	1-1/4"
	1"	PBV-HB-S-16R-MF	16.0	78.0	45.50	102.00	53.00	1-1/2"
BSPP Female	1/4"	PBV-HB-S-04G-FF	5.0	40.0	21.00	67.70	39.11	3/4"
	3/8"	PBV-HB-S-06G-FF	7.5	45.0	23.00	80.49	49.19	7/8"
	1/2"	PBV-HB-S-08G-FF	9.0	54.5	28.68	80.21	52.19	1-1/16"
	3/4"	PBV-HB-S-12G-FF	12.5	61.0	31.55	97.70	61.50	1-1/4"
	1"	PBV-HB-S-16G-FF	16.0	75.0	39.20	99.68	66.88	1-1/2"
BSPP Male / BSPP Female	1/4"	PBV-HB-S-04G-MF	5.0	45.0	21.00	67.67	39.11	11/16"
	3/8"	PBV-HB-S-06G-MF	7.5	45.0	23.00	80.49	49.19	7/8"
	1/2"	PBV-HB-S-08G-MF	9.0	70.0	28.68	80.51	53.69	1-1/16"
	3/4"	PBV-HB-S-12G-MF	12.5	68.0	45.50	102.00	53.00	1-1/4"
	1"	PBV-HB-S-16G-MF	16.0	78.0	39.20	99.68	67.18	1-1/2"
Metric Thread	M20 x 1.5	PBV-HB-S-20M-FF	9.0	54.5	28.68	80.51	53.69	1-1/16"
	M20 x 1.5	PBV-HB-S-20M-MF	9.0	70.0	28.68	80.51	53.69	1-1/16"

Note: Sizes are for reference only and can be changed. All sizes in mm unless specified otherwise

Ball Valve HB Series

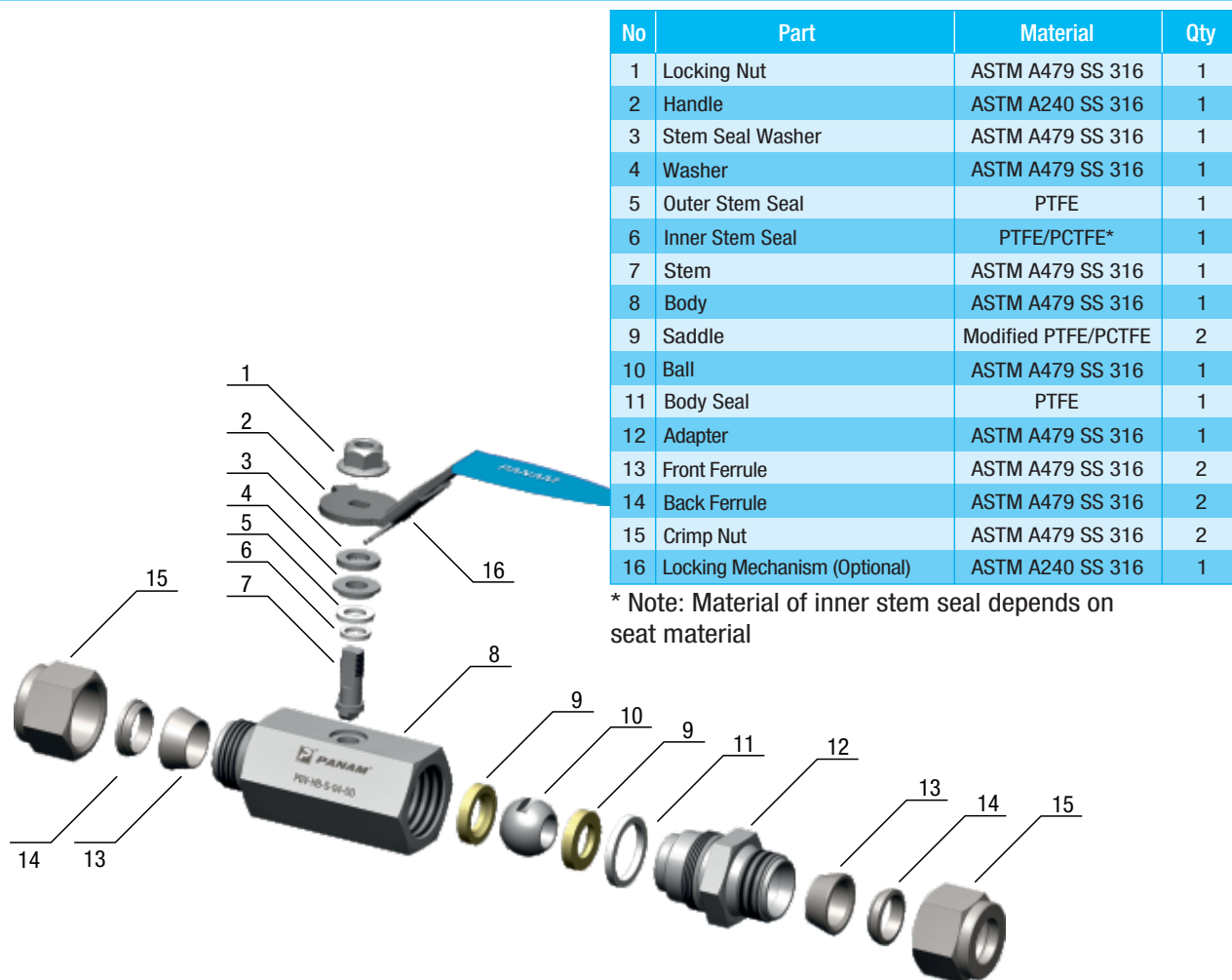
PANAM® Ball Valves HB Series of medium pressure for general application are similar to Ball Valves HB series of one-piece design. The difference is that the tube end connections or combination male / tube end connection. Ball Valve HB Series are compact in size and design.

They have a larger orifice for a higher flow rates and they are characterized by long service life and low torque. Ball Valves HB Series are designed for the use in bidirectional flow conditions in fully open or fully closed position.

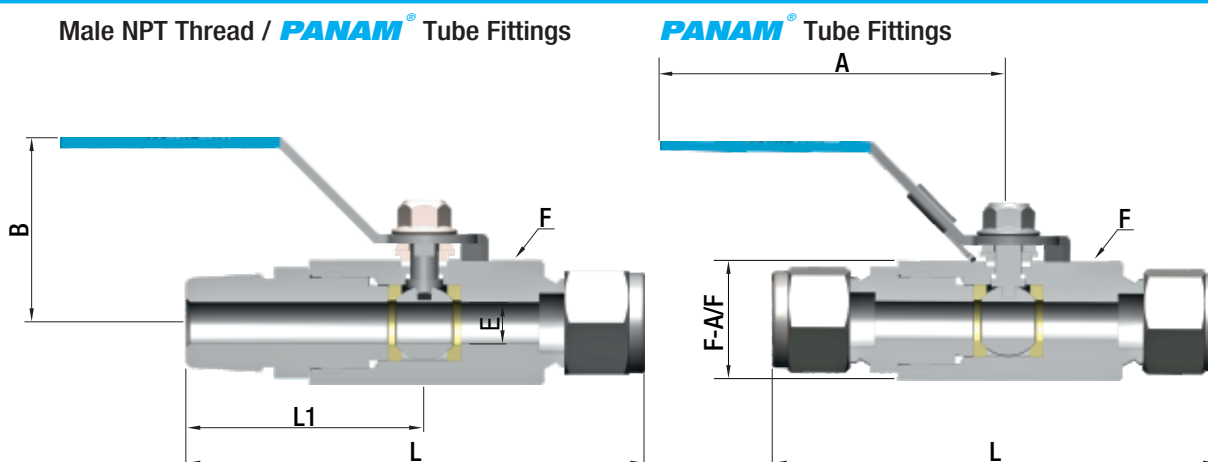
Characteristics

- Standard body material – Stainless Steel SS 316
- Maximum working pressure 2000 psi (138 bar)
- Working temperature from -40°C to +204°C (from -40°F to +400°F) with modified PTFE seat
- Working temperature from -54 °C to +149°C (from -65°F to +300°F) with PCTFE seat
- End connections from 1/4 " to 1" (From 6 mm to 25 mm)
- Types of end connections: tube connections at both sides, male thread/tube fittings-metric and inch sizes or male thread at both sides.
- Two-position stainless steel handle - "open" and "closed" positions (Optional - handle with locking mechanism).

Design and Materials



Connection Types and Sizes

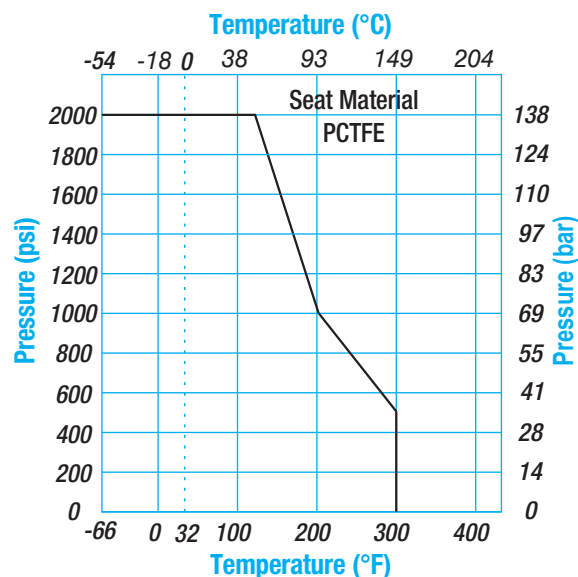
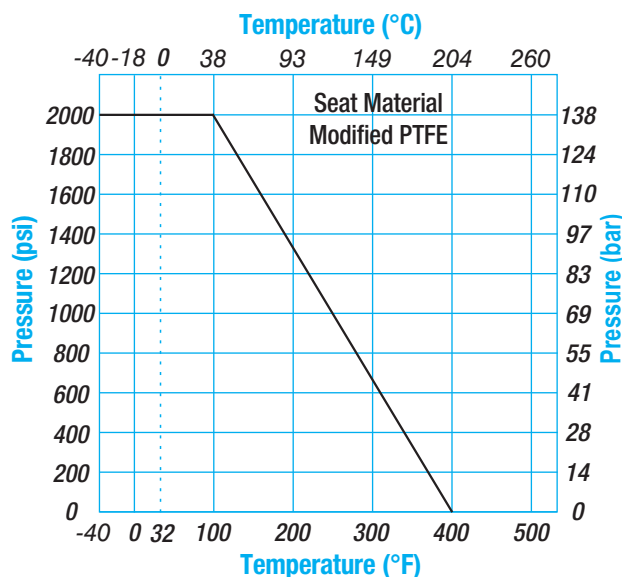


End Connection		Part Number	Orifice	L	L1	A	B	F-A/F
Type	Size							
PANAM® Tube Fittings (inch)	1/4"	PBV-HB-S-04-OD	5.0	80.00	45.18	67.67	30.38	11/16"
	3/8"	PBV-HB-S-06-OD	7.5	89.00	47.43	80.49	37.89	7/8"
	1/2"	PBV-HB-S-08-OD	9.0	101.89	53.95	80.49	40.19	1-1/16"
	3/4"	PBV-HB-S-12-OD	12.5	108.62	60.04	97.70	46.70	1-1/4"
	7/8"	PBV-HB-S-14-OD	16.0	133.25	72.20	99.68	49.08	1-1/2"
	1"	PBV-HB-S-16-OD	16.0	133.25	72.20	99.68	49.08	1-1/2"
PANAM® Tube Fittings (mm)	6mm	PBV-HB-S-M06-OD	5.0	80.27	45.37	67.67	36.36	11/16"
	8mm	PBV-HB-S-M08-OD	7.5	91.75	48.78	80.49	37.84	7/8"
	10mm	PBV-HB-S-M10-OD	7.5	91.84	48.82	80.49	37.84	7/8"
	12mm	PBV-HB-S-M12-OD	9.0	103.25	54.67	80.49	40.19	1-1/16"
	14mm	PBV-HB-S-M14-OD	9.0	103.25	54.67	80.49	40.19	1-1/16"
	16mm	PBV-HB-S-M16-OD	12.5	108.02	59.73	97.70	45.50	1-1/4"
	18mm	PBV-HB-S-M18-OD	12.5	108.02	59.73	97.70	45.50	1-1/4"
	20mm	PBV-HB-S-M20-OD	12.5	108.02	59.73	97.70	45.50	1-1/4"
	22mm	PBV-HB-S-M22-OD	16.0	133.25	72.20	99.68	49.08	1-1/2"
	25mm	PBV-HB-S-M25-OD	16.0	133.41	72.28	99.68	49.08	1-1/2"
NPT Male / PANAM® Tube Fittings (inch)	1/4"	PBV-HB-S-04-MOD	5.0	70.20	45.18	67.67	30.38	11/16"
	3/8"	PBV-HB-S-06-MOD	7.5	82.30	47.43	80.49	37.89	7/8"
	1/2"	PBV-HB-S-08-MOD	9.0	99.55	51.60	80.49	40.19	1-1/16"
	3/4"	PBV-HB-S-12-MOD	12.5	105.00	60.04	97.70	46.70	1-1/4"
	1"	PBV-HB-S-16-MOD	16.0	130.00	72.20	99.68	49.08	1-1/2"

Note: Sizes are for reference only and can be changed. All sizes in mm unless specified otherwise

Pressure V/s temperature

Ball Valves HB Series - 2000 psi (138 bar)



Sealing Material Characteristics

Modified PTFE (Polytetrafluoroethylene)

Modified PTFE is an excellent material for clean room applications.

- high resistance to chemical attack of a large number of organic and inorganic reagents and solvents. low coefficient of deformation, increased strength and abrasion resistance, and a reduced coefficient of friction, compared to conventional PTFE.
- Designed for higher temperatures and pressures than PTFE.

PCTFE (Polychlorotetrafluoroethylene)

High chemical resistance and wider operating temperature range.

Low moisture absorption, resistance to hydrolysis and hot steam, ability to maintain strength and flexibility at low temperatures (operating temperature range from -195°C to +150°C (from -319°F to +302°F).

Excellent material for use with oxygen and nitrogen

Seal Adjustment

Considering that the ball valves are designed for use in a variety of technological processes, in some cases, it may be necessary to adjust the seal. Factory packing adjustment setting is 1000 psi (69 bar) Information on valve seal adjustment and adjustment procedure is stated in the installation and operating instructions for each series of ball valves.

Testing

Every **PANAM**® valve is hydrostatically tested in accordance with MSS-SP-99. The procedure includes hydrostatic testing of the valve body and stem seal leakage check.

The hydrostatic test is carried out using pure water or other liquids with the same or lower viscosity at pressure 1.5 times higher than maximum working pressure. Pressure leakage test of the seat is carried out at pressure 1.1 times higher than maximum working pressure. The seat and stem seal of every valve is hydraulically tested in nitrogen at 6.9 MPa (1000 psi).

Upon request, additional tests can be carried out, e.g. vibration testing, temperature test, leakage test in helium.

Note. Valves that have not been used for a long time may have high handle torque.

Cleaning & Packaging

All **PANAM**® Ball Valves HB Series are cleaned in accordance with Standard Procedure of **PANAM ENGINEERS LTD.** Standard cleaning and packaging Procedure PWI/5.7/21.

Note. For valves cleaned of lubricant, the torque is substantially increases.

Ordering Information

PBV-HB-S-08G-MM - LH

PANAM®

Valve

BV - Ball Valve

Series

HB - Hex Body

Material

S - SS 316

MO - Monel 400

HC - Hastelloy C276

F51 - Duplex - UNS S31803

F53 - Super Duplex - UNS S32750

F55 - Super Duplex - UNS S32760

6MO - UNS S31254

INC625 - Inconel 625

INC825 - Inconel 825

Connection Size

04 - 1/4"

16 - 1"

M10 - 10mm

M18 - 18mm

06 - 3/8"

20M - M20x1.5

M12 - 12mm

M20 - 20mm

08 - 1/2"

M06 - 6mm

M14 - 14mm

M22 - 22mm

12 - 3/4"

M08 - 8mm

M16 - 16mm

M25 - 25mm

Thread Type

- NPT

R - BSPT

G - BSPP

Connection Type

OD - **PANAM**® Tube Fitting

FF - Female x Female

MOD - Male x **PANAM**® Tube Fitting

MM - Male x Male

MF - Male x Female

Seat Material

- Modified PTFE (Standard)

PCTFE - PCTFE

Working Pressure

- - Working Pressure - 2000 psi (138 bar) (Standard)

1K - Working Pressure - 1000 psi (68 bar)

Options

SG - NACE MR-01-75

OXY - Oxygen Cleaning

LH - Locking Handle

Ordering Information - Spare Parts

Ball Valves Repair Kit

SK Seal Kit includes Seats, Stem Seals, Body Seal.

The SBK Kit Includes, In addition to the Seal Kit, A Ball Valve

PBV-HB-SP-SK-6K-06-MM-PK

PANAM®

Valve

BV - Ball Valve

Series

HB - Hex Body

Part

SP - Spare Part

Kit Type

SK - Seal Kit

SBK - Seal Kit + A Ball

Working Pressure

1K - Working Pressure - 1000 psi (68 bar)

2K - Working Pressure - 2000 psi (138 bar)

6K - Working Pressure - 6000 psi (414 bar)

10K - Working Pressure - 10000 psi (689 bar)

Connection Size

04 - 1/4"

06 - 3/8"

08 - 1/2"

12 - 3/4"

16 - 1"

20M - M20x1.5

M06 - 6mm

M08 - 8mm

M10 - 10mm

M12 - 12mm

M14 - 14mm

M16 - 16mm

M18 - 18mm

M20 - 20mm

M22 - 22mm

M25 - 25mm

Connection Type

OD - **PANAM®** Tube Fitting

MM - Male x Male

FF - Female x Female

MF - Male x Female

MOD - Male x **PANAM®** Tube Fitting

Seat Material

- Modified PTFE (Standard for 1K/2K)

- Delrin (Standard for 6K)

- PEEK (Standard for 10K)

PK - PEEK (For 6K)

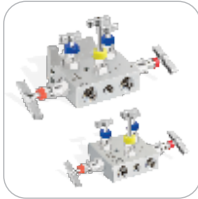
PCTFE - PCTFE (For 6K / 2K / 1K)

Safety

For safe operation of **PANAM®** ball valves shall be adequately selected. When choosing materials operating conditions, compatibility of materials, purpose and product specifications shall be considered. Installation and maintenance of products shall be carried out by qualified personnel.

Wrong selection, poor installation or incorrect operation and maintenance may result in accident, cause personal injury and result in material damage. **PANAM ENGINEERS LTD.** provides a guarantee for all manufactured and supplied products, however, is not responsible for the wrong selection, installation, operation and technical service of delivered products.

Other Products



2-3-5 VALVE MANIFOLDS



BELLOW SEAL VALVES



GAUGE ROOT VALVES



NEEDLE VALVES



HP NEEDLE VALVES



BALL VALVES



HP BALL VALVES



DOUBLE BLOCK & BLEED VALVES



MONO FLANGE VALVES



CHECK VALVES



RELIEF VALVES



FILTERS



TUBE FITTINGS



PIPE FITTINGS



HP PIPE FITTINGS



SWIVEL FITTINGS



JIC FITTINGS



WELD FITTINGS



HIGH PRESSURE FITTINGS



GAUGE SAVERS



PRESSURE GAUGES



TEMPERATURE GAUGES



PRESSURE TRANSMITTERS



TEMPERATURE TRANSMITTERS



PRESSURE REGULATORS



CONDENSATE POTS



AIR HEADERS



GRAB SAMPLING SYSTEM



PRE-FABRICATED HOOK UPS



FLANGE ADAPTERS



SWIVEL GAUGE ADAPTERS



THERMOWELLS



BLEED PLUGS



DIE-ELECTRIC FITTINGS



TUBING



PANAM ENGINEERS LTD.

501, Jaisingh Business Center, Parsiwada, Sahar Road, Andheri (East),
Mumbai - 400 099. BHARAT • Tel.: +91 22 4146 9000 / 4146 9001 / 4146 9002 / 4146 9003 / 4146 9004.

Email: sales@panam.in / sales@panamengineers.com

Website: www.panam.in / www.panamengineers.com