



Ball Valves (HB Series)

Catalog 4121-HB
Revised, April 2004



HB Series Ball Valves

Introduction

Parker High Pressure HB4 Series Ball Valves, featuring Supercase® ball and trunnions, provide reliable shut-off or switching functions. The Supercase® trunnion style ball enhances the resistance of the trunnions against seizure and the resistance of the spherical ball to particle abrasion. The compact and rugged design employs spring-loaded seats for high cycle life and low operating torques at pressures up to 10,000 psig (689 bar).

Features

- Supercase® ball/trunnion for longer cycle life
- Two-way and three-way designs
- Compact FNPT version for tight work areas
- Blow-out resistant two-piece ball/stem
- Full operating pressure at any port
- Low operating torque
- Manual, electric or pneumatic actuation
- Panel mountable to 3/8" (9.6 mm) thickness
- No packing to adjust
- Color coded fracture resistant handles
- Handle indicates direction of flow
- Positive handle stops
- Wide variety of US Customary and SI ports
- Top of stem marked to indicate flow direction
- 100% factory tested
- Compact package
- Heat code traceability

Specifications

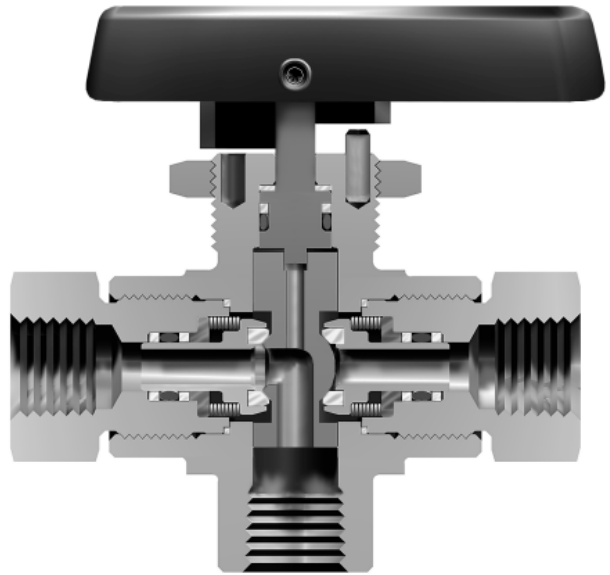
- Pressure rating: 10,000 psig (689 bar) CWP
with PEEK (PKR) Seats;
6,000 psig (414 bar) CWP
with PCTFE (K) Seats
- Temperature rating: -65 ½F to 400 ½F (-54 ½C to 204 ½C)
- Body material: Stainless Steel
- Body configurations: Two-way and Three-way
- Port connections: Tube compression (CPI™ / A-LOK®);
Short and Long Female NPT
- Port size: 1/8" - 1/2" (6mm to 12mm)

Flow Data

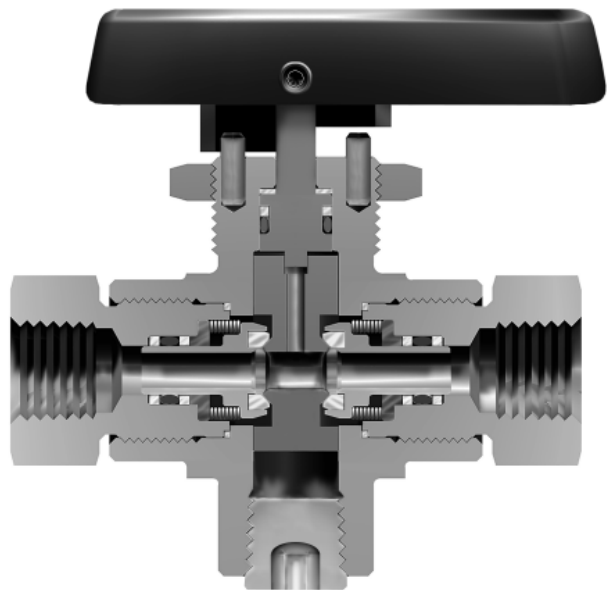
Two-way HB4L: $C_v = 1.02$; $x_T = 0.42$; Orifice = 0.188" (4.8 mm)
Three-way HB4X: $C_v = 0.62$; $x_T = 0.71$; Orifice = 0.188" (4.8 mm)
Tested in accordance with ISA S75.02. Gas flow will be choked when $P_1 - P_2 / P_1 = x_T$.

Testing

Standard production testing - valves are 100% factory tested with nitrogen at 1,000 psig (69 bar) for leakage at the seats and body seals. Both areas are required to have less than 0.1 SCCM leakage. Optional testing is available upon request. Consult your authorized Parker Instrumentation Distributor or the factory for further information.

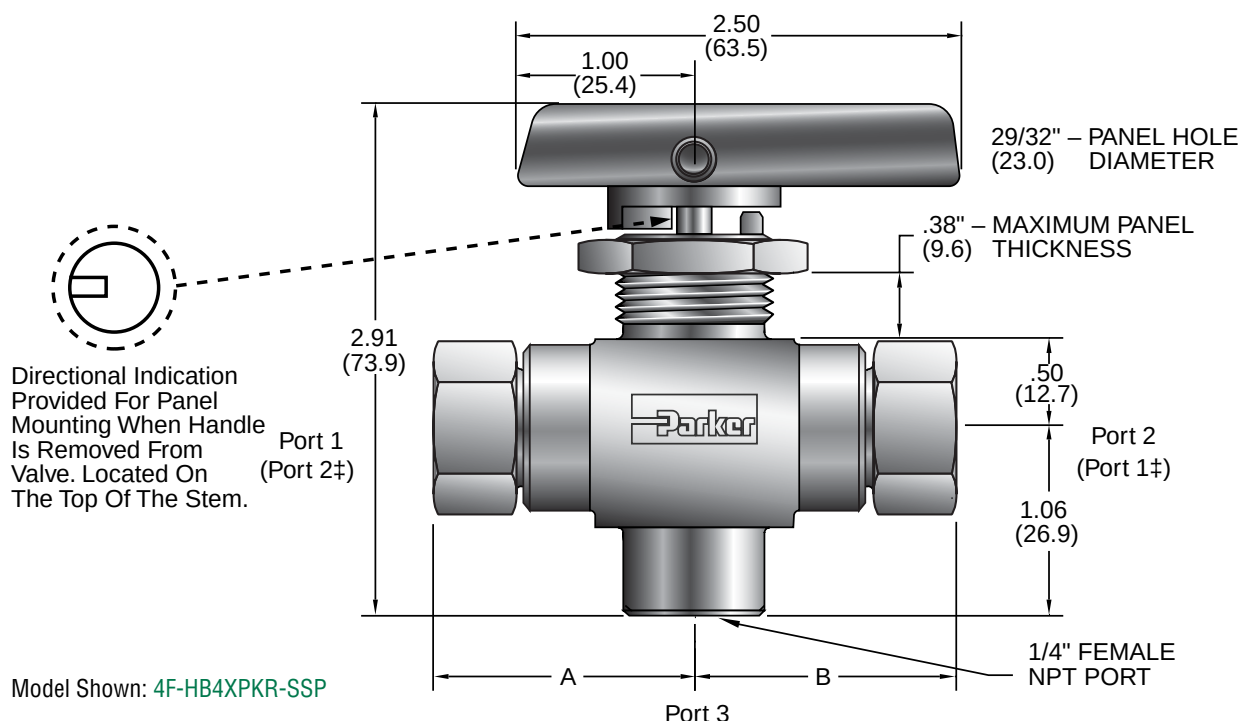


Three-way HB4X design



Two-way HB4L design

HB Series Ball Valves



Dimensions / Pressure Data

() Denotes dimensions in millimeters
 ‡ For two-way valves, Port 1 is the inlet port and Port 2 is the outlet port.

Basic Part Number*	Pressure Rating† @ 100 ½F (38 ½C)		End Connections		Dimensions			
			Port 1	Port 2	A ^{††}		B ^{††}	
	psig	bar			inch	mm	inch	mm
2F-HB4	10,000	689	1/8" Female NPT		1.47	37.3	1.47	37.3
4F-HB4**			1/4" Female NPT		1.47	37.3	1.47	37.3
4FL-HB4			1/4" Female NPT		1.97	50.0	1.97	50.0
4A-HB4			1/4" A-LOK® Compression		2.07	52.6	2.07	52.6
4Z-HB4			1/4" CPI™ Compression		2.07	52.6	2.07	52.6
M6A-HB4			6mm A-LOK® Compression		2.07	52.6	2.07	52.6
M6Z-HB4			6mm CPI™ Compression		2.07	52.6	2.07	52.6
6A-HB4	6,600	455	3/8" A-LOK® Compression		2.19	55.6	2.19	55.6
6Z-HB4	6,600	455	3/8" CPI™ Compression		2.19	55.6	2.19	55.6
8A-HB4	6,300	434	1/2" A-LOK® Compression		2.30	58.4	2.30	58.4
8Z-HB4	6,300	434	1/2" CPI™ Compression		2.30	58.4	2.30	58.4
M8A-HB4	7,975	550	8mm A-LOK® Compression		2.07	52.6	2.07	52.6
M8Z-HB4	7,975	550	8mm CPI™ Compression		2.07	52.6	2.07	52.6
M10A-HB4	6,525	450	10mm A-LOK® Compression		2.20	55.9	2.20	55.9
M10Z-HB4	6,525	450	10mm CPI™ Compression		2.20	55.9	2.20	55.9
M12A-HB4	6,162	425	12mm A-LOK® Compression		2.30	58.4	2.30	58.4
M12Z-HB4	6,162	425	12mm CPI™ Compression		2.30	58.4	2.30	58.4

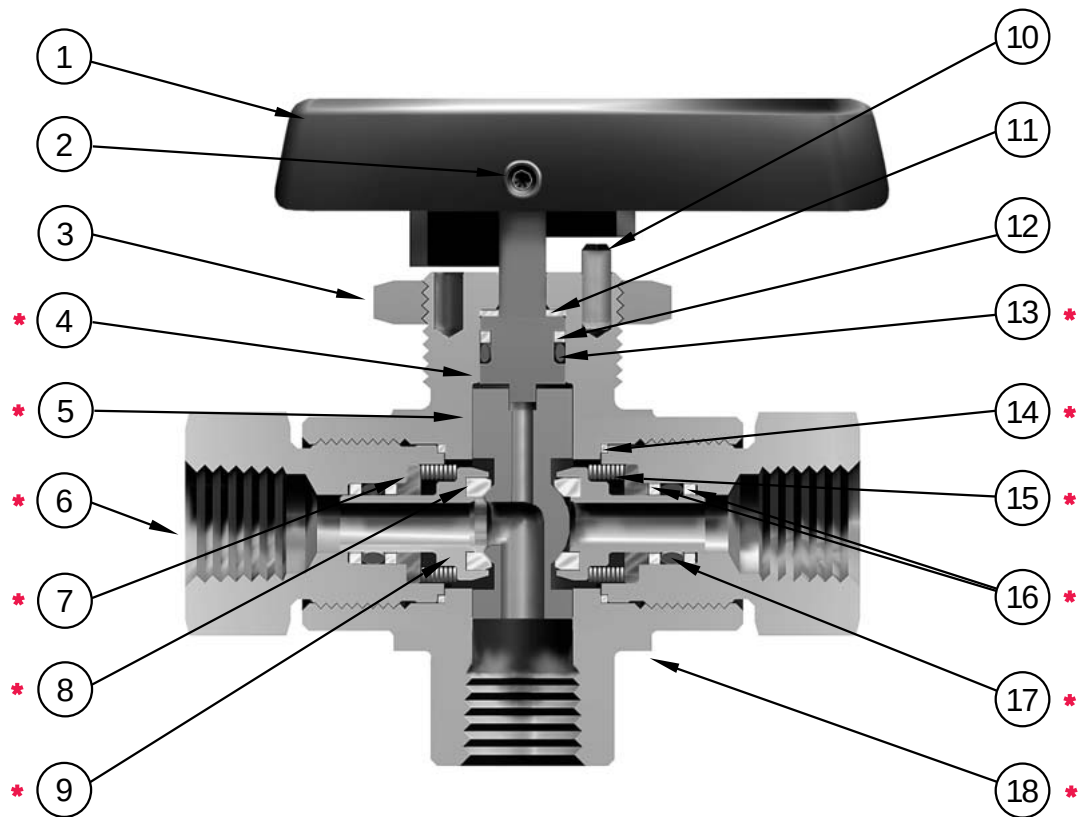
* Flow configurations are two-way (HB4L) and three-way (HB4X); Seat materials are PEEK (Polyetheretherketone) and PCTFE (Polychlorotrifluoroethylene).

** Designed with shorter end-to-end dimensions than the 4FL model to save space.

† Reduced pressure rating is determined by the maximum rated pressure of the tubing as stated in the [Parker Instrument Tubing Selection Guide Bulletin 4200-TS](#). The working pressure ratings are limited by the seat material (PCTFE - 6,000 psig (414 bar) maximum and PEEK - 10,000 psig (689 bar) maximum) and the temperature of the application.

†† For CPI™ and A-LOK®, dimensions are measured with nuts in the finger tight position.

HB Series Ball Valves



Materials of Construction

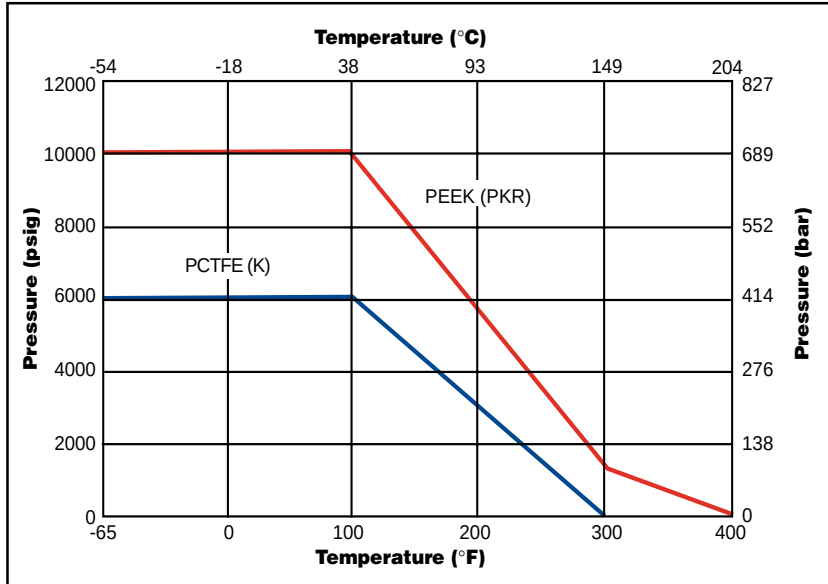
No.	Part Description	6,000 psi (414 bar)	10,000 psi (689 bar)
1	Handle/Insert	Nylon 6/6/316 SS	
2	Handle Screw	Stainless Steel	
3	Panel Nut	316 Stainless Steel	
*4	Stem	ASTM A 479 Type 316	
*5	Ball	ASTM A 479 Type 316	
*6	Port End Connector	ASTM A 479 Type 316	
*7	Spring Washer	ASTM A 479 Type 316	
*8	Seat	PCTFE	PEEK
*9	Seat Retainer	ASTM A 276 Type 316	
10	Handle Stop Pins	302 Stainless Steel	
11	Stem Washer	PEEK	
12	Stem O-ring Back-up	PTFE	
*13	Stem O-ring	Fluorocarbon Rubber**	
*14	Connector End Seal	PEEK	
*15	Spring	ASTM A 313 Type 631	
*16	Seat Retainer O-ring Back-up	PTFE	
*17	Seat Retainer O-ring	Fluorocarbon Rubber**	
*18	Valve Body	ASTM A 276 Type 316	
*19	Pipe Plug (Not shown/HB4L only)	316 Stainless Steel	

* Wetted Parts

** Optional elastomer seals available

Lubrication: Perfluorinated polyether

Pressure vs. Temperature



Note: To determine MPa, multiply bar by 0.1

This Pressure versus Temperature chart reflects the maximum temperature range of indicated materials.

When combining seat and seal materials, the most restrictive temperature rating of the seats or seals becomes the limiting factor on valve temperature range.

Temperature Ratings:

Buna-N (Nitrile) Rubber:

-40 ½°F to 250 ½°F (-40 ½°C to 121 ½°C)

Ethylene Propylene Rubber:

-65 ½°F to 300 ½°F (-54 ½°C to 149 ½°C)

Fluorocarbon Rubber:

-15 ½°F to 400 ½°F (-26 ½°C to 204 ½°C)

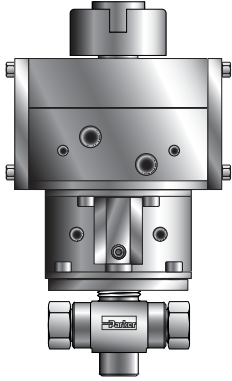
Flow Calculations (Two-way HB4L)

Inlet Pressure		Pressure Drop ΔP		Water @ 60 ½°F (16 ½°C)		Air @ 60 ½°F (16 ½°C)	
psig	bar	psig	bar	gpm	m³/hr	scfm	m³/hr
100	7	1	0.1	1.0	0.2	10.8	17.4
		10	0.7	3.2	0.7	32.0	50.7
		50	3.5	7.2	1.6	50.5	76.0
1000	69	10	0.7	3.2	0.7	101.3	171.3
		100	6.9	10.2	2.3	297.7	502.3
		500	34.5	22.8	5.2	446.7	749.6
3000	207	100	6.9	10.2	2.3	542.0	919.9
		1000	69.0	32.3	7.3	1297.0	2198.9
		1500	103.4	39.5	9.0	1327.2	2248.8
6000	414	1000	69.0	32.3	7.3	2158.5	3662.7
		2000	137.9	45.6	10.4	2188.5	4388.6
		3000	206.8	55.9	12.7	2647.9	4486.8
10000	689	1000	69.0	32.3	7.3	2954.3	5020.2
		2000	137.9	45.6	10.4	3818.4	6487.0
		3000	206.8	55.9	12.7	4236.2	7194.9

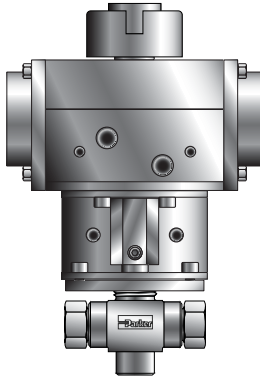
Flow Calculations (Three-way HB4X)

Inlet Pressure		Pressure Drop ΔP		Water @ 60 ½°F (16 ½°C)		Air @ 60 ½°F (16 ½°C)	
psig	bar	psig	bar	gpm	m³/hr	scfm	m³/hr
100	7	1	0.1	0.6	0.1	6.6	10.6
		10	0.7	2.0	0.4	20.0	31.9
		50	3.5	4.4	1.0	37.1	57.4
1000	69	10	0.7	2.0	0.4	61.8	104.4
		100	6.9	6.2	1.4	187.2	316.1
		500	34.5	13.9	3.1	337.4	567.7
3000	207	100	6.9	6.2	1.4	333.1	565.4
		1000	69.0	19.6	4.5	903.4	1532.8
		1500	103.4	24.0	5.5	1004.4	1703.2
6000	414	1000	69.0	19.6	4.5	1393.5	2365.2
		2000	137.9	27.7	6.3	1803.8	3060.4
		3000	206.8	34.0	7.7	2004.9	3399.8
10000	689	1000	69.0	19.6	4.5	1858.9	3159.0
		2000	137.9	27.7	6.3	2499.6	4247.2
		3000	206.8	34.0	7.7	2903.0	4932.1

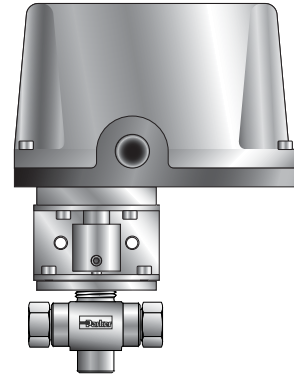
Actuator Options



Double Acting (61AD)
Pneumatic Actuator



Spring Return (61AC & AO)
Pneumatic Actuator



70 and 80 Series
Electric Actuator

How to Order Options

Lock-Out Devices - Add the suffix **-LD** to the end of the part number to order directly on the valve.

Example: 2F-HB4LPKR-BN-SSP-**LD**. For field installation, simply substitute the correct valve series number after LD.

Example: LD-HB4L

Colored Handles - Add the designator corresponding to the correct handle as a suffix to the part number: **W** - white, **B** - blue, **G** - green, **R** - red, **Y** - yellow. **Example:** M6A-HB4XPKR-SSP-**G**

Oxygen Cleaning - Add the suffix **-C3** to the end of the part number to receive valves cleaned and assembled for oxygen service in accordance with Parker Specification ES8003. **Example:** 4A-HB4LPKR-EPR-SSP-**C3**

Pneumatic Actuators - For detailed actuator information, refer to Catalog 4123-PA. For factory assembly, add the actuator part number as the suffix to the valve part number. **Example:** 4FL-HB4XK-SSP-**61ACX-2**. For field installation, specify the actuator desired. **Example:** **61ACX-2**. The appropriate mounting hardware may be obtained by adding the valve series and actuator size to the prefix **MK-**. **Example:** **MK-HB4X-61**

Electric Actuators - For detailed actuator information, refer to Catalog 4123-EA. For factory assembly, add the actuator part number as the suffix to the valve part number. **Example:** 6A-HB4XPKR-SSP-**71XA**. For field installation, specify the actuator desired. **Example:** **71XA**. The appropriate mounting hardware may be obtained by adding the valve series and actuator series to the prefix **MK-**. **Example:** **MK-HB4X-70**

How to Order Maintenance Kits

Handle Kits: HB4-Handle-Color. Example: HB4-HANDLE-RED (Consists of a red handle and handle screw).

Two-way Seal Kits: KIT-HB4LPKR or KIT-HB4LK (Consists of a two-way ball, springs, stem washers and stem seal, back-up ring, end connector seals, seat retainer seals, seat retainer back-up rings, and seat assemblies).

Three-way Seal Kits: KIT-HB4XPKR or KIT-HB4XK (Consists of a three-way ball, springs, stem washers and stem seal, back-up ring, end connector seals, seat retainer seals, seat retainer back-up rings, and seat assemblies).



WARNING

FAILURE, IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the "Offer of Sale" located in Catalog 4110-U Needle Valves (U Series).



Catalog 4121-HB, 10M, 04/04

Parker Hannifin Corporation
Instrumentation Products Division
2651 Alabama Highway 21 North
Jacksonville, AL 36265-9681
USA
Phone: (256) 435-2130
Fax: (256) 435-7718
www.parker.com/ipdus

Parker Hannifin plc
Instrumentation Products Division
Riverside Road
Pottington Business Park
Barnstaple, Devon EX31 1NP
England
Phone: +44 (0) 1271 313131
Fax: +44 (0) 1271 373636
Email: ipd@parker.com
www.parker.com/ipd