



Hydraulik - Pneumatik

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Ball Valves HB Serie

4121 HB
April 2004

KATALOG

Vertrieb:

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Ball Valves (HB Series)

Catalog 4121-HB
Revised, April 2004



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HB Series Ball Valves

Introduction

Parker High Pressure HB4 Series Ball Valves, featuring Suparcase® ball and trunnions, provide reliable shut-off or switching functions. The Suparcase® 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

- Suparcase® 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

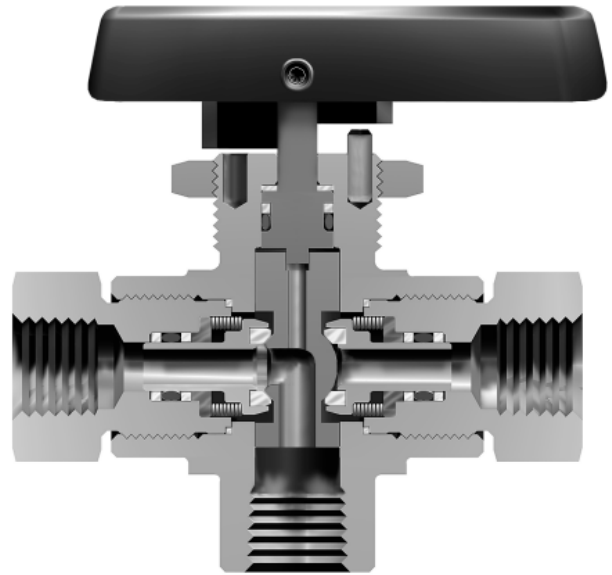
- Pressure rating: 10,000 psig (689 bar) CWP with PEEK (PKR) Seats;
6,000 psig (414 bar) CWP with PCTFE (K) Seats
- Temperature rating: -65 ½F to 400 ½F (-54 ½C to 204 ½C)
- Body material: Stainless Steel
- Body configurations: Two-way and Three-way
- Port connections: Tube compression (CPI™ / A-LOK®);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

Flow Data

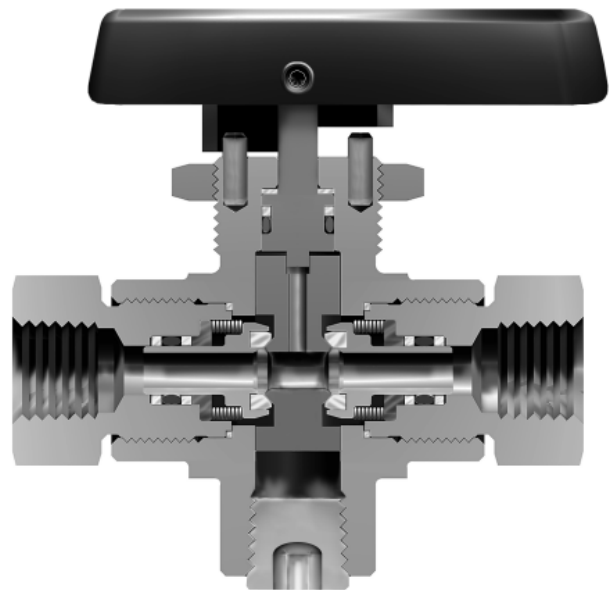
Two-way HB4L: $C_v = 1.02$; $x_T = 0.42$; Orifice = 0.188" (4.8 mm)
Three-way HB4X: $C_v = 0.62$; $x_T = 0.71$; Orifice = 0.188" (4.8 mm)
Tested in accordance with ISA S75.02. Gas flow will be choked when $P_1 - P_2 / P_1 = x_T$.

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.

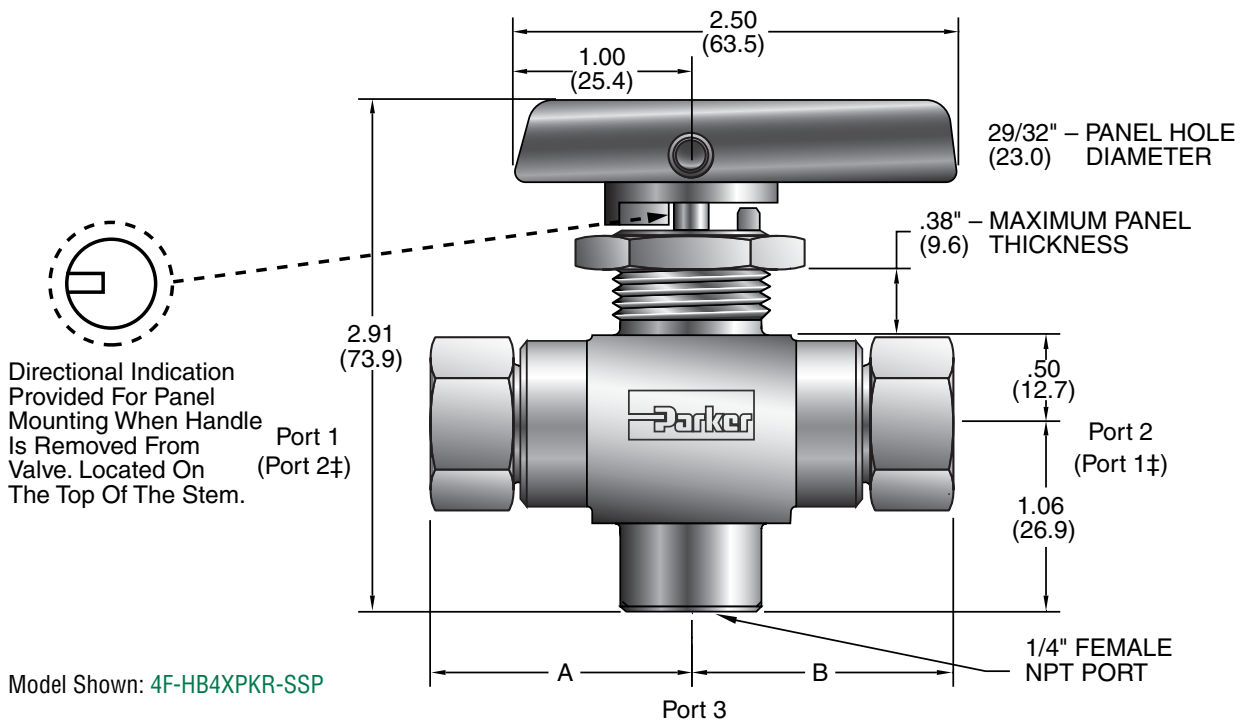


Three-way HB4X design



Two-way HB4L design

HB Series Ball Valves



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

Dimensions / Pressure Data

| Basic Part Number* | Pressure Rating† @ 100 ½F (38 ½C) | | End Connections | | Dimensions | | | |
|--------------------|-----------------------------------|-----|-------------------------|--------|-------------------------|------|------|------|
| | psig | bar | Port 1 | Port 2 | A†† | | B†† | |
| | | | | | 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 |
| 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 |

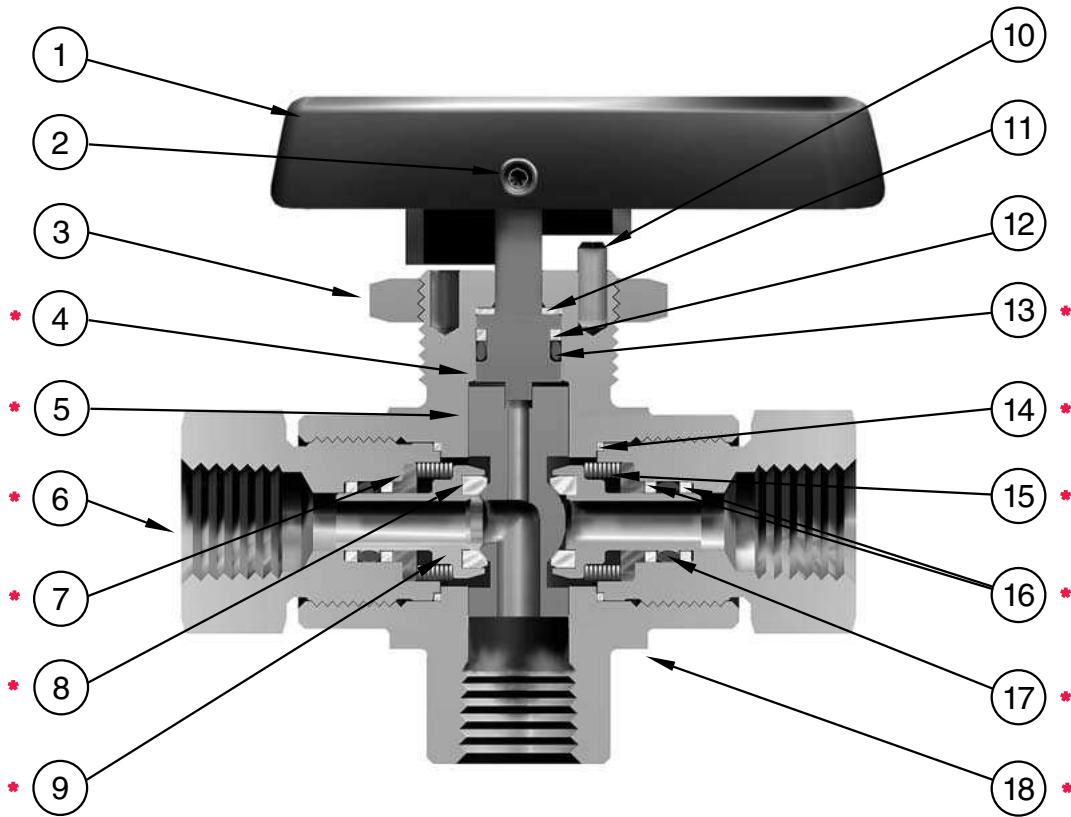
* Flow configurations are two-way (HB4L) and three-way (HB4X); Seat materials are PEEK (Polyetheretherketone) and PCTFE (Polychlorotrifluoroethylene).

** 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

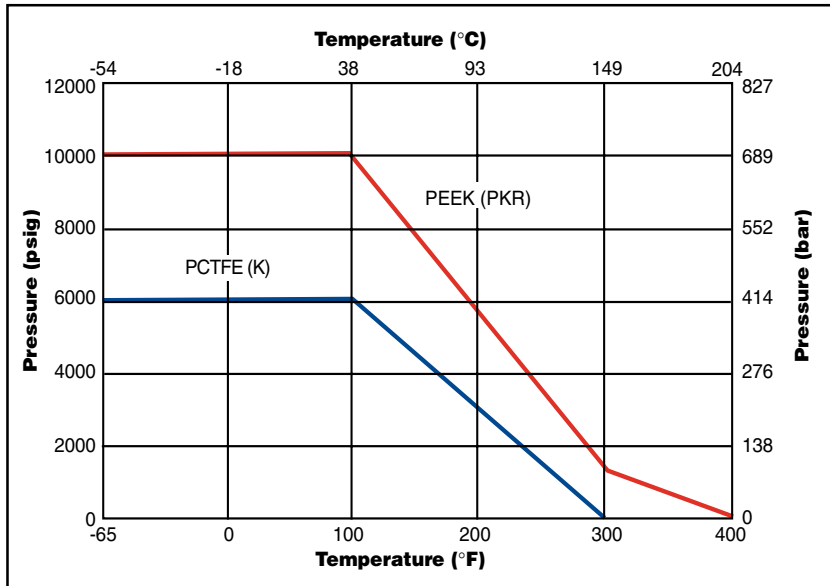
| No. | Part Description | 6,000 psi (414 bar) | 10,000 psi (689 bar) |
|-----|---------------------------------|-----------------------|----------------------|
| 1 | Handle/Insert | Nylon 6/6/316 SS | |
| 2 | Handle Screw | Stainless Steel | |
| 3 | Panel Nut | 316 Stainless Steel | |
| *4 | Stem | 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 ½F to 250 ½F (-40 ½C to 121 ½C)

- Ethylene Propylene Rubber:

- 65 ½F to 300 ½F (-54 ½C to 149 ½C)

- Fluorocarbon Rubber:

- 15 ½F to 400 ½F (-26 ½C to 204 ½C)

Flow Calculations (Two-way HB4L)

| Inlet Pressure | | Pressure Drop ΔP | | Water @ 60 ½F (16 ½C) | | Air @ 60 ½F (16 ½C) | |
|----------------|-----|------------------|-------|-----------------------|-------|---------------------|--------|
| 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 ½F (16 ½C) | | Air @ 60 ½F (16 ½C) | |
|----------------|-----|------------------|-------|-----------------------|-------|---------------------|--------|
| 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 |

HB Series Ball Valves

How to Order

The correct part number is easily derived by following the circled number sequence. The six product characteristics required are coded as shown below. * Note: If ports 1 and 2 are the same, eliminate the port 2 designator.

| | | | | | | |
|--------|--------|---|--------------|---------------|---------------|---------------|
| 4Z | * | - | HB4XPKR | - | - | SSP |
| ① | ② | | ③ | ④ | ⑤ | ⑥ |
| Port 1 | Port 2 | | Valve Series | Seat Material | Seal Material | Body Material |

Describes a HB4X, three-way ball valve with 1/4" CPI™ compression end connections for ports 1 and 2, PEEK seats and fluorocarbon rubber seals, stainless steel body construction, and a panel mounting nut. Port 3 is always a 1/4" FNPT port.

| | | | | | | |
|--------|--------|---|--------------|---------------|---------------|---------------|
| 4F | 4A | - | HB4LK | - | EPR | SSP |
| ① | ② | | ③ | ④ | ⑤ | ⑥ |
| Port 1 | Port 2 | | Valve Series | Seat Material | Seal Material | Body Material |

Describes a HB4L, two-way ball valve with a 1/4" female NPT port 1 and a 1/4" A-LOK® compression port 2, PCTFE seats and ethylene propylene rubber seals, stainless steel body construction, and a panel mounting nut.

Note: Port 3 will always have a 1/4" MNPT plug when ordering a HB4L Series two-way ball valve.

| ① Port 1 | ② Port 2 | ③ Valve Series | ④ Seat Material | ⑤ Seal Material | ⑥ Body Material |
|--------------------------------|--------------------------------|-------------------|--|------------------------------------|--|
| 2F - 1/8" Female NPT | 2F - 1/8" Female NPT | HB4L (2-way) | PKR- (PEEK - Polyarylether- ketone) | Blank- (Fluorocarbon Rubber) | SSP - (Stainless Steel with Panel Nut) |
| 4F - 1/4" Female NPT | 4F - 1/4" Female NPT | | | | |
| 4FL - 1/4" Female NPT (Long) | 4FL - 1/4" Female NPT (Long) | | | | |
| 4A - 1/4" A-LOK® Compression | 4A - 1/4" A-LOK® Compression | | | | |
| 4Z - 1/4" CPI™ Compression | 4Z - 1/4" CPI™ Compression | | | | |
| 6A - 3/8" A-LOK® Compression | 6A - 3/8" A-LOK® Compression | | | | |
| 6Z - 3/8" CPI™ Compression | 6Z - 3/8" CPI™ Compression | | | | |
| 8A - 1/2" A-LOK® Compression | 8A - 1/2" A-LOK® Compression | | | | |
| 8Z - 1/2" CPI™ Compression | 8Z - 1/2" CPI™ Compression | | | | |
| M6A - 6mm A-LOK® Compression | M6A - 6mm A-LOK® Compression | | | | |
| M6Z - 6mm CPI™ Compression | M6Z - 6mm CPI™ Compression | HB4X (3-way) | K- (PCTFE, Poly- chlorotrifluoro- ethylene) | BN- (Buna-N Rubber) | SSP - (Stainless Steel with Panel Nut) |
| M8A - 8mm A-LOK® Compression | M8A - 8mm A-LOK® Compression | | | | |
| M8Z - 8mm CPI™ Compression | M8Z - 8mm CPI™ Compression | | | | |
| M10A - 10mm A-LOK® Compression | M10A - 10mm A-LOK® Compression | | | | |
| M10Z - 10mm CPI™ Compression | M10Z - 10mm CPI™ Compression | | | | |
| M12A - 12mm A-LOK® Compression | M12A - 12mm A-LOK® Compression | | | | |
| M12Z - 12mm CPI™ Compression | M12Z - 12mm CPI™ Compression | | | | |
| | | | | | |

Available End Connections

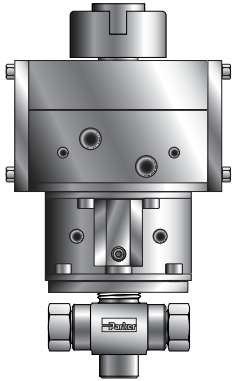
Z - One ferrule CPI™ compression port

A - Two ferrule A-LOK® compression port

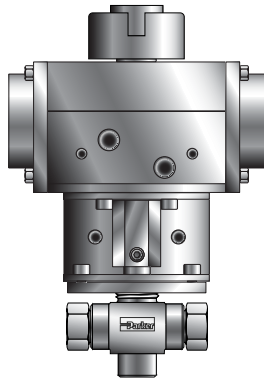
F - ANSI/ASME B1.20.1 internal pipe threads



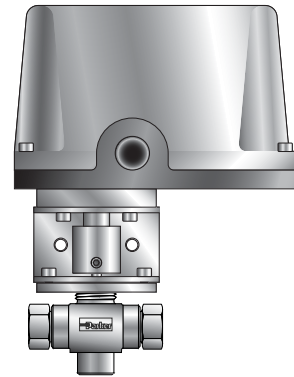
Actuator Options



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.

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Catalog 4121-HB, 10M, 04/04

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