

B

Introduction

Parker manually, pneumatically, and electrically actuated two-way B Series Ball Valves provide quick 1/4 turn on-off control of fluids utilized in process and instrumentation applications. A broad selection of valve body, seat, and seal materials provide a wide range of pressures and temperatures at which the valve may be used.

Features

- ▶ Free floating ball design provides seat wear compensation.
- ▶ Available in 316 stainless steel and brass construction. Monel® Alloy 400 and Hastelloy® C-276 construction available upon request.
- ▶ Micro-finished ball provides a positive seal.
- ▶ Straight through flow path for minimum pressure drop.
- ▶ Bi-directional flow.
- ▶ Wide variety of US Customary and SI ports.
- ▶ 90° actuation.
- ▶ Panel mountable.
- ▶ Adjustable PTFE stem seal can be maintained in-line.
- ▶ Handle indicates flow direction.
- ▶ Low operating torques.
- ▶ Positive handle stops.
- ▶ Color coded handles.
- ▶ Optional pneumatic and electric actuation.
- ▶ Optional live-loaded PTFE stem seals.
- ▶ Optional non-adjustable O-ring stem seals.
- ▶ Optional upstream and downstream drain models.
- ▶ Optional stainless steel and extended handles.

Specifications

Pressure Ratings:

Material	Pressure Rating	with PTFE Seats
316 Stainless Steel	6000 psig (414 bar)*	1500 psig (103 bar)
Brass	3000 psig (207 bar)	1500 psig (103 bar)
Monel® Alloy 400	3000 psig (207 bar)	1500 psig (103 bar)
Hastelloy® C-276	3000 psig (207 bar)	1500 psig (103 bar)

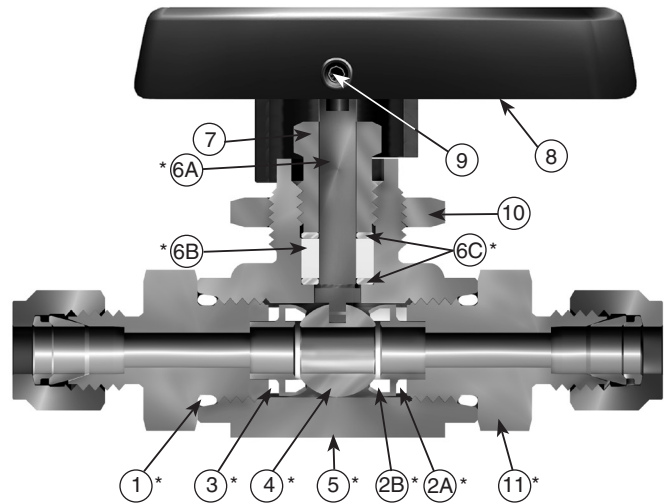
* B6 Series: 6000 psig rating or 4400 psig (303 bar) CWP
 B8 Series: 6000 psig rating or 4000 psig (276 bar) CWP

Pressure Rating and Tubing Selection

For working pressures of A-LOK® and CPI™ tube connections, please see the Instrument Tubing Selection Guide (Bulletin 4200-TS), found in the Technical Section of the Parker Instrumentation Process Control Binder, or the Parker Instrument Fitting Installation Manual (Bulletin 4200-B4).

For working pressures of valves with external or internal pipe threads, please see Catalog 4260, Instrumentation Pipe Fittings.

Materials of Construction



Model Shown: 6A-B6LJ-SSP

Materials of Construction

Item #	Part Description	Stainless Steel	Brass
*1	Connector O-Ring	PTFE**	
*2A	Seat Retainer	ASTM A 276 Type 316	ASTM B 16 Alloy C36000
*2B	Seat	PTFE, PCTFE, PEEK	
*3	Retainer Seal	PTFE**	
*4	Ball	316 Stainless Steel	
*5	Body	ASTM A 351 Grade CF3M	ASTM B 283 Alloy C37700
*6A	Stem	ASTM A 276 Type 316	
*6B	Stem Seal	PTFE**	
*6C	Stem Washer	316 Stainless Steel	
7	Packing Nut	ASTM A 479 Type 316	ASTM B 453 Alloy C34000
8	Handle	Nylon 6/6	
9	Handle Set Screw	Stainless Steel	
10	Panel Nut	316 Stainless Steel	
*11	End Connector	ASTM A 479 Type 316	ASTM B 16 Alloy C36000

* Wetted Parts.

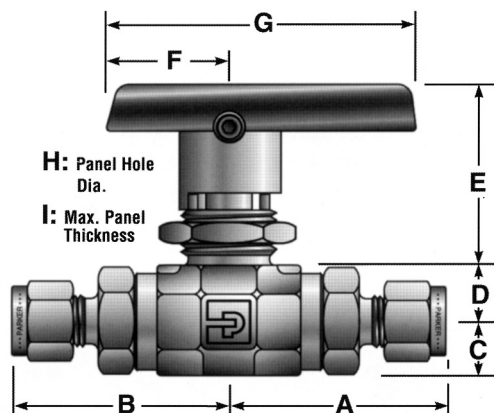
** Optional stem seal and body seal materials are described in the How to Order section.

Lubrication: Perfluorinated Polyether.

Hastelloy® is a registered trademark of Haynes International.
 Monel® Alloy 400 is a registered trademark of Special Metals Corporation.



Dimensions & Flow Data



**Model Shown:
4A-B6LJ-SSP**

Port Size	Basic Part #	Flow Data				End Connections		Dimensions Inches (mm)								
		Inch	mm	Cv	X _T *	Port 1	Port 2	A†	B†	C	D	E	F	G	H	I
1A	B2L	0.052	1.3	0.06	0.45	1/16" A-LOK®		1.30	1.30	0.33 (8.4)	0.33 (8.4)	0.94 (23.9)	0.75 (19.1)	1.88 (47.8)	0.58 (14.7)	0.13 (3.3)
1Z						1/16" CPI™	(33.0)	(33.0)								
2A		0.093	2.4	0.21	0.47	1/8" A-LOK®		1.36	1.36							
2Z						1/8" CPI™	(34.5)	(34.5)								
2F		0.165	4.2	0.93	0.43	1/8" Female NPT		1.07	1.07							
2M						1/8" Male NPT	(27.2)	(27.2)								
4A		0.165	4.2	0.93	0.43	1/4" A-LOK®		1.18	1.18							
4Z						1/4" CPI™	(30.0)	(30.0)								
4M		0.165	4.2	0.93	0.43	1/4" Male NPT		1.48	1.48							
M3A						1/4" A-LOK®	(37.6)	(37.6)								
M3Z		0.086	2.2	0.18	0.44	1/4" Male NPT		1.35	1.35							
4A						3mm A-LOK®	(34.3)	(34.3)								
4Z		0.187	4.7	1.04	0.42	3mm CPI™		1.37	1.37							
4F						1/4" A-LOK®	(34.8)	(34.8)								
4M		0.250	6.4	2.34	0.29	1/4" Female NPT		1.74	1.74							
4V						1/4" CPI™	(44.2)	(44.2)								
6A	0.250	6.4	2.34	0.29	1/4" Male NPT		1.51	1.51								
6Z					1/4" VacuSeal	(38.4)	(38.4)									
6M	0.250	6.4	2.34	0.29	3/8" A-LOK®		1.62	1.62								
M6A					3/8" CPI™	(41.1)	(41.1)									
M6Z	0.187	4.7	1.04	0.42	3/8" Male NPT		1.75	1.75								
M8A					1/4" Female NPT	(44.5)	(44.5)									
M8Z	0.250	6.4	2.34	0.42	1/4" Male NPT		1.80	1.80								
M10A					3/8" A-LOK®	(45.7)	(45.7)									
M10Z	0.250	6.4	2.34	0.42	3/8" CPI™		1.62	1.62								
6F					3/8" Male NPT	(41.1)	(41.1)									
8F	0.406	10.3	6.42	0.37	6mm A-LOK®		1.75	1.75								
8A					6mm CPI™	(44.5)	(44.5)									
8Z	0.406	10.3	6.42	0.37	8mm A-LOK®		1.78	1.78								
8M					8mm CPI™	(45.2)	(45.2)									
8V	0.406	10.3	6.42	0.37	10mm A-LOK®		1.81	1.81								
12A					10mm CPI™	(46.0)	(46.0)									
12Z	0.406	10.3	6.42	0.37	1/2" Female NPT		1.95	1.95								
12F					1/2" Male NPT	(49.5)	(49.5)									
M12A	0.375	9.5	5.57	0.37	1/2" Female NPT		2.15	2.15								
M12Z					1/2" A-LOK®	(54.6)	(54.6)									
M16A	0.406	10.3	6.42	0.37	1/2" CPI™		2.34	2.34								
M16Z					1/2" CPI™	(59.4)	(59.4)									
	0.406	10.3	6.42	0.37	1/2" Male NPT		2.22	2.22								
					1/2" VacuSeal	(56.4)	(56.4)									
	0.406	10.3	6.42	0.37	3/4" A-LOK®		2.21	2.21								
					3/4" CPI™	(56.1)	(56.1)									
	0.406	10.3	6.42	0.37	3/4" Female NPT		2.33	2.33								
					12mm A-LOK®	(59.2)	(59.2)									
	0.406	10.3	6.42	0.37	12mm CPI™		2.25	2.25								
					16mm A-LOK®	(57.1)	(57.1)									
	0.406	10.3	6.42	0.37	16mm CPI™		2.33	2.33								
					16mm CPI™	(59.2)	(59.2)									

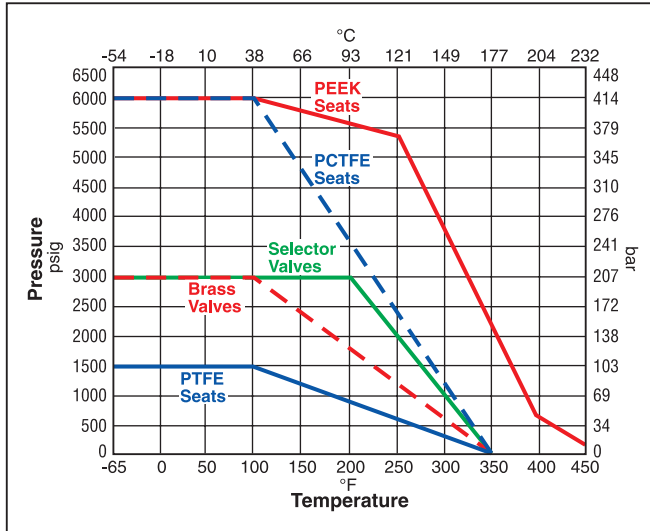
* Tested in accordance with ISA S75.02. Gas flow will be choked when $P_1 - P_2 / P_1 = X_T$.
 † For CPI™ and A-LOK®, dimensions are measured with nuts in the finger tight position

Dimensions in inches/millimeters are for reference only, subject to change.





Pressure vs. Temperature



Note: To determine MPa, multiply bar by 0.1

Note: 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.

Elastomeric stem packing and seals are recommended if the application subjects the valve to thermal cycling.

Please see pages 2 and 4 for maximum pressure ratings.

Temperature Ratings:

- PTFE -65°F to 350°F (-54°C to 177°C)
- PCTFE..... -65°F to 350°F (-54°C to 177°C)
- PEEK..... -65°F to 450°F (-54°C to 232°C)
- Nitrile Rubber..... -40°F to 250°F (-40°C to 121°C)
- Fluorocarbon Rubber..... -15°F to 450°F (-26°C to 232°C)
- Ethylene Propylene Rubber.... -65°F to 300°F (-54°C to 149°C)
- Highly Fluorinated Fluorocarbon Rubber -15°F to 200°F (-26°C to 93°C)

Flow Calculations with 1000 psig (69 bar) Inlet Pressure

Two-Way

Valve Series	Max. Cv	Pressure Drop ΔP		Water @ 60°F (16°C)		Air @ 60°F (16°C)	
		psig	bar	gpm	m ³ /hr	scfm	m ³ /hr
B2L	0.93	10	0.7	2.9	0.7	92.4	156.2
		50	3.5	6.6	1.5	200.3	338.3
		100	6.9	9.3	2.1	272.0	458.9
B6L	2.34	10	0.7	7.4	1.7	231.7	391.5
		50	3.5	16.5	3.8	494.2	834.7
		100	6.9	23.4	5.3	657.0	1107.9
B8L	6.42	10	0.7	20.3	4.6	637.1	1076.8
		50	3.5	45.4	10.3	1373.6	2320.3
		100	6.9	64.2	14.6	1852.3	3124.8

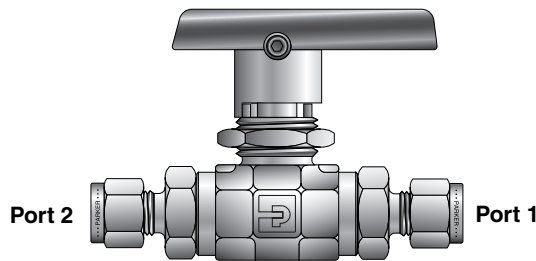
Three-Way

Valve Series	Max. Cv	Pressure Drop ΔP		Water @ 60°F (16°C)		Air @ 60°F (16°C)	
		psig	bar	gpm	m ³ /hr	scfm	m ³ /hr
B2X	0.63	10	0.7	2.0	0.5	62.7	106.0
		50	3.5	4.5	1.0	137.1	231.7
		100	6.9	6.3	1.4	188.4	317.9
B6X	0.87	10	0.7	2.8	0.6	86.7	146.6
		50	3.5	6.2	1.4	190.5	321.8
		100	6.9	8.7	2.0	263.2	444.4
B8X	3.62	10	0.7	11.5	2.6	360.6	609.5
		50	3.5	25.6	5.9	789.7	1343.5
		100	6.9	36.2	8.2	1087.4	1836.6

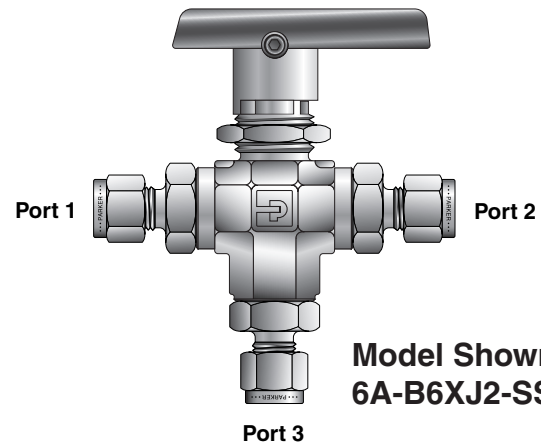


How to Order

B



Model Shown: 6A-B6LJ2-SSP



Model Shown: 6A-B6XJ2-SSP

Ports 1, 2, and 3			Valve Series	Seat Material	Seal Material	Body Material		
1A	1/16" A-LOK®	B2L B2X	J	PTFE	(Blank) PTFE	SSP 316 Stainless Steel BP Brass MP Monel® Alloy 400 HCP Hastelloy® C-276		
1Z	1/16" CPI™		J2	PCTFE	V Fluorocarbon Rubber			
2A	1/8" A-LOK®		B6L B6X	J PTFE J2 PCTFE S2 Spring-Loaded PCTFE PKR PTFE Lubricated PEEK SPKR Spring-Loaded PTFE Lubricated PEEK	EPR Ethylene Propylene Rubber			
2Z	1/8" CPI™				BN Nitrile Rubber			
2F	1/8" Female NPT				KZ Highly Fluorinated Fluorocarbon Rubber			
2M	1/8" Male NPT				LT Live-Loaded PTFE Packing with PTFE Seals			
4A	1/4" A-LOK®				VLT Live-Loaded PTFE Packing with Fluorocarbon Rubber Seals			
4Z	1/4" CPI™				EPRLT Live-Loaded PTFE Packing with Ethylene Propylene Rubber Seals			
4M	1/4" Male NPT				BNLT Live-Loaded PTFE Packing with Nitrile Rubber Seals			
4V	1/4" VacuSeal				KZLT Live-Loaded PTFE Packing with Highly Fluorinated Fluorocarbon Rubber Seals			
6A	3/8" A-LOK®				B8L B8X		J PTFE J2 PCTFE S2 Spring-Loaded PCTFE PKR PTFE Lubricated PEEK SPKR Spring-Loaded PTFE Lubricated PEEK	Notes: 1. Panel Mounting Nut supplied with each valve. Various port combinations are available. 2. See How to order. 3. VacuSeal is not available in Brass. 4. 12F (3/4" Female NPT) not panel mountable.
6Z	3/8" CPI™							
6M	3/8" Male NPT							
M6A	6mm A-LOK®							
M6Z	6mm CPI™							
M8A	8mm A-LOK®							
M8Z	8mm CPI™							
M10A	10mm A-LOK®							
M10Z	10mm CPI™							
6F	3/8" Female NPT	B12L B12X	J PTFE J2 PCTFE S2 Spring-Loaded PCTFE PKR PTFE Lubricated PEEK SPKR Spring-Loaded PTFE Lubricated PEEK	Notes: 1. Panel Mounting Nut supplied with each valve. Various port combinations are available. 2. See How to order. 3. VacuSeal is not available in Brass. 4. 12F (3/4" Female NPT) not panel mountable.				
8A	1/2" A-LOK®							
8Z	1/2" CPI™							
8F	1/2" Female NPT							
8M	1/2" Male NPT							
8V	1/2" VacuSeal							
12Z	3/4" CPI™							
12F	3/4" Female NPT							
M12A	12mm A-LOK®							
M12Z	12mm CPI™							
M16A	16mm A-LOK®							
M16Z	16mm CPI™							

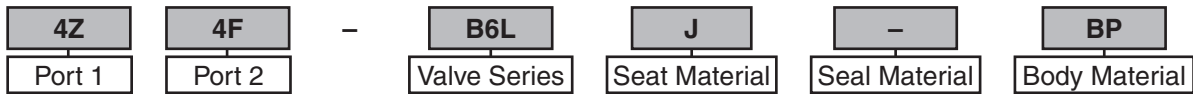
See examples on page 9. See pages 10 and 11 for information about How to Order Options and Maintenance Kits.





How to Order (Continued)

Examples: Two-Way Valves

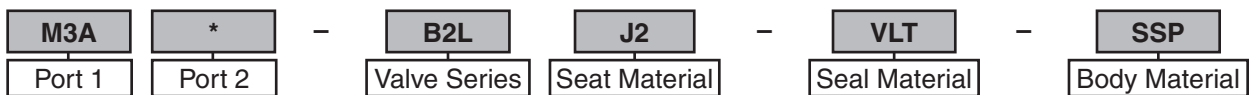


Describes a B6L ball valve with a 1/4" CPI™ end connection for port 1 and a 1/4" female NPT end connection for port 2, PTFE seats, PTFE stem and body seals, brass construction, with a panel mounting nut.



Describes a B8L ball valve with a 1/2" A-LOK® end connections for ports 1 and 2, PTFE seats, Nitrile rubber stem and body seals, stainless steel construction, with a panel mounting nut.

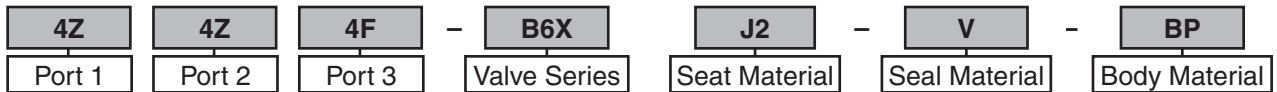
* **Note:** If ports 1 and 2 are the same, eliminate the port 2 designator.



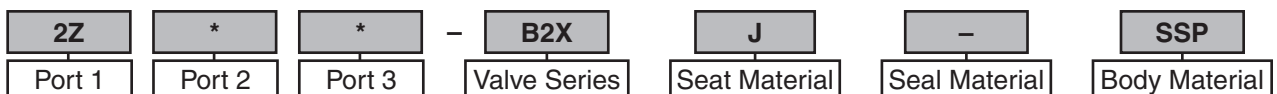
Describes a B2L ball valve with 3mm A-LOK® end connections for ports 1 and 2, PCTFE seats, fluorocarbon rubber body seals, PCTFE packing, stainless steel construction, with a panel mounting nut.

* **Note:** If ports 1 and 2 are the same, eliminate the port 2 designator.

Examples: Three-Way Diverter Valves



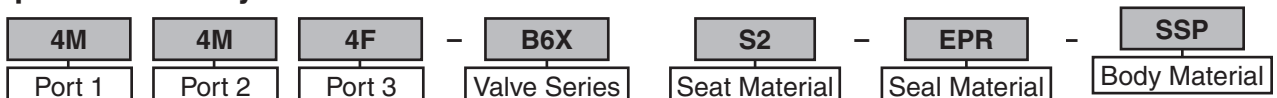
Describes a B6X ball valve with 1/4" CPI™ end connections for side ports 1 and 2, 1/4" female NPT end connection for bottom port 3, PCTFE seats, fluorocarbon rubber stem and body seals, brass construction, and a panel mounting nut.



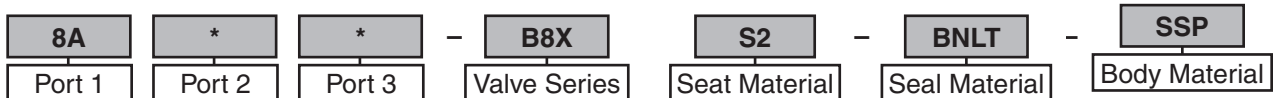
Describes a B2X ball valve with 1/8" CPI™ end connections for ports 1, 2, and 3, PTFE seats, PTFE stem and body seals, stainless steel construction, and a panel mounting nut.

* **Note:** If ports 1, 2, and 3 are the same, eliminate the port 2 and port 3 designators.

Examples: Three-Way Selector Valves



Describes a B6X ball valve with 1/4" male NPT end connections for side ports 1 and 2, 1/4" female NPT end connection for bottom port 3, spring-loaded PCTFE seats, ethylene propylene rubber stem and body seals, stainless steel construction, and a panel mounting nut.



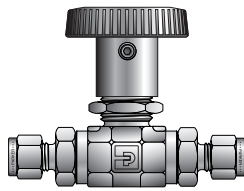
Describes a B8X ball valve with 1/2" A-LOK® end connections for ports 1, 2, and 3, spring-loaded PCTFE seats, Nitrile rubber body seals, live loaded PTFE packing, stainless steel construction, and a panel mounting nut.

* **Note:** If ports 1, 2, and 3 are the same, eliminate the port 2 and port 3 designators.

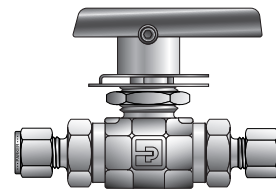


Options

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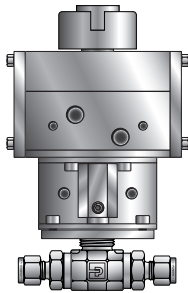


Round Handle

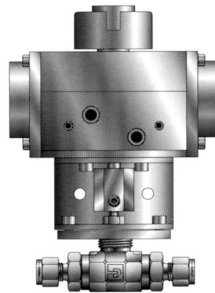


Lock-Out Handle

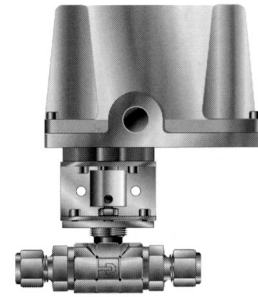
Actuator Options



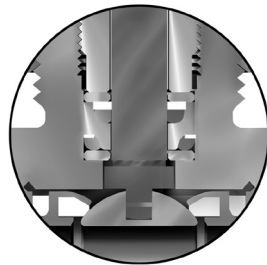
Double Acting (61AD)
Pneumatic Actuator



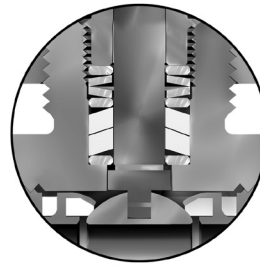
Spring Returns (61AC & AO)
Pneumatic Actuator



70, 80 & 90 Series
Electric Actuator



O-Ring Stem Seals



Live-Loaded Stem Seals

Two-Way Valve Upstream and Downstream Drain Options

For draining upstream or downstream media on two-way valves at pressures below 150 psig (10 bar), add the suffix **-VBU** (Vented Ball Upstream) or **-VBD** (Vented Ball Downstream). Example: 4Z-B6LJ-SSP-VBU. This option is also suitable to vent the ball cavity in vacuum applications. For pressures up to 3,000 psig (207 bar), select **S2** or **SPKR** spring-loaded seats and add the suffix **-VBU** (Vented Ball Upstream) or **-VBD** (Vented Ball Downstream). Example: 4Z-B6LS2-SSP-VBU

Note: VBD and VBU are ball cavity vents only.

How to Order Options

Pneumatic Actuators: For detailed actuator information, refer to the Pneumatic Actuators section of this catalog. For factory assembly, add the actuator part number as the suffix to the valve part number. For field installation, specify the actuator desired. The appropriate mounting hardware may be obtained by adding the valve series and actuator size to the prefix **MK-**.

Electric Actuators: For detailed actuator information refer to the Electric Actuators section of this catalog. For factory assembly, add the actuator part number as the suffix to the valve part number. For field installation, specify the actuator desired. The appropriate mounting hardware may be obtained by adding the valve series and actuator series to the prefix **MK-**.

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.

Examples

2F-B2XJ2-V-SSP-61ACX-2
61ACX-2
MK-B2X-61

8A-B8LPKR-BN-SS-71A
71A
MK-B8L-70

4A-B6LJ-EPR-SSP-C3

B

How to Order Maintenance Kits

Lock-Out Devices:

For field installation, simply substitute the correct valve series number after LD.

LD-B8L

Metal Oval Handles: NOTE: Not available in size 2.

B8-OVAL-SS-HANDLE-ASSY

Colored Round Handle Kits: Series-Handle-Color. (Example consists of a green handle and handle screw.)

B6-RD-HANDLE-GREEN

NOTE: Round handles are not recommended for B8 valves with PEEK seats.

Stainless Steel Handle Kits: Series-Handle-SS. (Example consists of a stainless steel handle and handle screw.)

B8-HANDLE-SS

Colored Lever Handle Kits: Series-Handle-Color. Black is standard. B = Blue, G = Green, R = Red (Example consists of a red handle and handle screw.)

B6-HANDLE-RED

Two-way Valve Seal Kits:

PTFE Stem Seal Kits: Kit-Valve Series and Seat Material-Body Material.

KIT-B2LJ-SS

(Consists of one PTFE stem seal, two stem seal washers, two encapsulated PTFE ball seats, two end connector PTFE seals, one assembly mandrel, maintenance instructions.)

Elastomeric Stem Seal Kits: Kit-Valve Series and Seat Material-Elastomer Material-Body Material.

KIT-B2LJ2-BN-SS

(Consists of two stem seal Nitrile rubber O-rings, two PTFE back-up rings, two stem seal washers, two encapsulated PCTFE ball seats, two end connector Nitrile rubber O-ring seals, two seat retainer Nitrile rubber O-ring seals, stem glands and maintenance instructions.)

Diverter Valve Seal Kits:

PTFE Stem Seal Kits: Kit-Valve Series and Seat Material-Body Material.

KIT-B6XPKR-SS

(Consists of one PTFE stem seal, two stem seal washers, two encapsulated PEEK ball seats, three end connector PTFE seals, one assembly mandrel, maintenance instructions.)

Elastomeric Stem Seal Kits: Kit-Valve Series and Seat Material-Elastomer-Body Material.

KIT-B6XJ-V-SS

(Consists of two stem seal fluorocarbon rubber O-rings, two PTFE back-up rings, two stem seal washers, two encapsulated PTFE ball seats, three end connector fluorocarbon rubber O-ring seals, two seat retainer fluorocarbon rubber O-ring seals, stem glands and maintenance instructions.)

Selector Valve Seal Kits:

PTFE Stem Seal Kits: Kit-Valve Series and Seat Material.

KIT-B6XS2-SS

(Consists of one PTFE stem seal, two stem seal washers, two encapsulated spring-loaded PCTFE ball seats, two seat retainer fluorocarbon rubber O-rings, three end connector PTFE seals, one assembly mandrel, maintenance instructions.)

Elastomeric Stem Seal Kits: Kit-Valve Series and Seat Material-Elastomer.

KIT-B6XSPKR-V-SS

(Consists of two stem seal fluorocarbon rubber O-rings, two PTFE back-up rings, two stem seal washers, two encapsulated spring-loaded PEEK ball seat assemblies, three end connector fluorocarbon O-ring seals, two seat retainer fluorocarbon rubber O-rings, stem glands and maintenance instructions.)

Live-loaded Seal Kits:

Kit-Valve Series and Seat Material-Seal Material-Body Material.

KIT-B6LJ2-BNLT-SS

(Consists of one live-loaded PTFE stem packing, two packing springs (B8 series valves have four springs), three packing washers, two PCTFE encapsulated ball seats, two Nitrile rubber end connector O-ring seals, two Nitrile rubber seat retainer O-ring seals, maintenance instructions.)



How to Order 2-Way and 3-Way MAB Series Ball Valves

When ordering Parker MPI™ Ball valves, consider first the bore size to verify that it is large enough for the flow rate needed, then choose the end connection. We have flow and pressure options not found anywhere else. The correct part number is easily derived from the following example and ordering chart. The ten product characteristics required are coded as shown in the chart.

The following example describes an MAB Series, three-way diverter ball valve with a .375" orifice, fluorocarbon rubber seals, 1/4" MPI™ medium pressure inverted connections on all ports, stainless steel body and the optional lock out device.

Typical part number example: **4MP7-MAB6XPKD-V-SSP-LD** (part number is created based on customer selection of product parameters, see below for example)

4	MP7	-	MAB	6	X	PK	D	-	V	-	SSP	-	LD
Inlet/Outlet Connection Size	Connection Type		Valve Series	Orifice Size	Valve Type	Seat Material	3 Way Valve Type		Seat Gland Seal Material		Body Material		Options
4 = 1/4" 6 = 3/8" 8 = 1/2" 9 = 9/16" 12 = 3/4" 16 = 1"	MP7= Parker MPI™		MAB	3 = 3/16" ² 4 = 1/4" ¹ 6 = 3/8" 8 = 1/2" 12 = 3/4" ¹	L= 2 Way X= 3 Way	PK= PEEK	Blank= Selector D= Diverter		V***= Fluorocarbon Rubber KZ**= FFKM Highly Fluorinated Fluorocarbon Rubber BN= Nitrile Rubber EPR= Ethylene Propylene Rubber C**= PTFE U-Cup		SSP= Stainless Steel 2507= Super Duplex		LD= Lock Out Device XF= High Strength Ferrules for 2507 SD sizes 12 & 16 only Actuator Options (see pages 61-69)
									** Limited size availability - see O-ring options below *** Standard o-ring material				

¹ Only Available with 2-Way Valves

² Only Available with 3-Way Valves

Note: Critical gas applications such as hydrogen or helium are not recommended. Consult factory with application details for assistance.



Options

Standard valve has Fluorocarbon Rubber o-rings [0 °F (-18 °C) to 400 °F (204 °C) maximum].

KZ - Standard valve with FFKM Highly Fluorinated Fluorocarbon Rubber o-rings [30°F to 500°F (0° to 260°C)].

NOTE: Not available with 3/4" orifice 2-way valves

C - Standard valve with PTFE U-Cup Seal [0° to 500°F (-18° to 260°C)].

NOTE: Only available with 3/4" orifice 2-way valves

BN - Standard valve with Buna-N (Nitrile) Rubber o-rings [-20° to 250°F (-29° to 121°C)].

EPR - Standard valve with Ethylene Propylene Rubber o-rings [-20° to 250°F (-29° to 121°C)].

LD - Standard valve with factory-installed lock out device.

