



Ball and Plug Valves

Catalog 4121-BV

January 2019

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



ENGINEERING YOUR SUCCESS.

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* Actual pressure rating will be determined by the valve configuration, such as body material, seat material, etc.
Contact the factory for more information.

WARNING – USER RESPONSIBILITY

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

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Introduction

Parker PR Series Plug Valves provide positive leak tight shut-off, high flow capacity, and quick quarter-turn operation in a compact attractive package. The patented blow-out resistant seat design offers reliable sealing technology at all operating pressures. In addition to on-off actuation, the plug design allows forward flow throttling. A selection of valve seat and seal materials may be chosen for media compatibility and performance over a broad range of temperatures. The pressure balanced atmospheric seals are backed by PTFE rings to enhance their performance and increase cycle life.

Features

PR

- ▶ Patented blow-out resistant seat design
- ▶ Pressures up to 3,000 psig (207 bar) CWP
- ▶ Quarter-turn operation
- ▶ Reliable simple design
- ▶ Straight-through flow
- ▶ Stainless steel and brass construction
- ▶ Nitrile, ethylene propylene, fluorocarbon, and highly fluorinated fluorocarbon rubber seats and seals
- ▶ PTFE back-up rings on atmospheric seals
- ▶ Low operating torque
- ▶ Minimum pressure drop
- ▶ Throttling capability
- ▶ Positive handle stops
- ▶ Color coded fracture resistant nylon handles with directional flow indication
- ▶ Easy to service
- ▶ 100% factory tested
- ▶ Options include lock-out devices, downstream venting, and both stainless steel and T-bar handles

Specifications

Pressure Ratings:

Normal Flow Direction: 3000 psig (207 bar) CWP

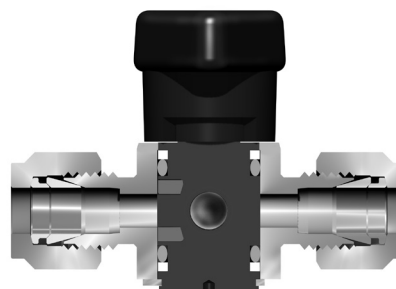
Reverse Flow Direction: 150 psig (10 bar)

Downstream Vent Option: 150 psig (10 bar)

Open



Closed



Model Shown: 4A-PR4-VT-SS

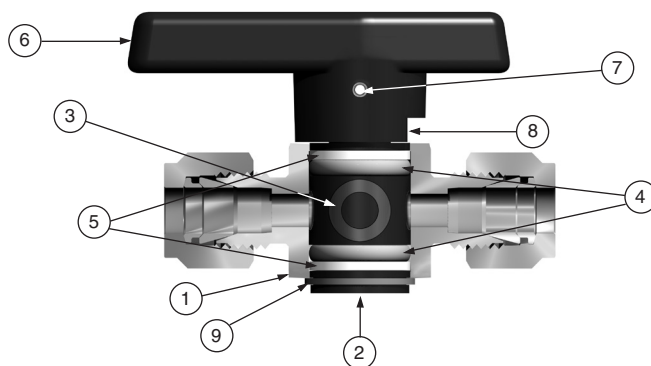
U.S. Patent 5,234,193

Materials of Construction

Item #	Part Description	Stainless Steel	Brass
1	Body	ASTM A 479 Type 316	ASTM B 16 Alloy C36000
2	Plug*	ASTM A 479 Type 316	ASTM B 16 Alloy C36000
3	Seat**	Fluorocarbon Rubber	
4	O-Ring Seals**	Fluorocarbon Rubber	
5	Back-up Rings	PTFE	
6	Handle	Nylon 6/6	
7	Handle Pin	316 Stainless Steel	
8	Body Pin	316 Stainless Steel (not shown)	
9	Retaining Ring	316 Stainless Steel	

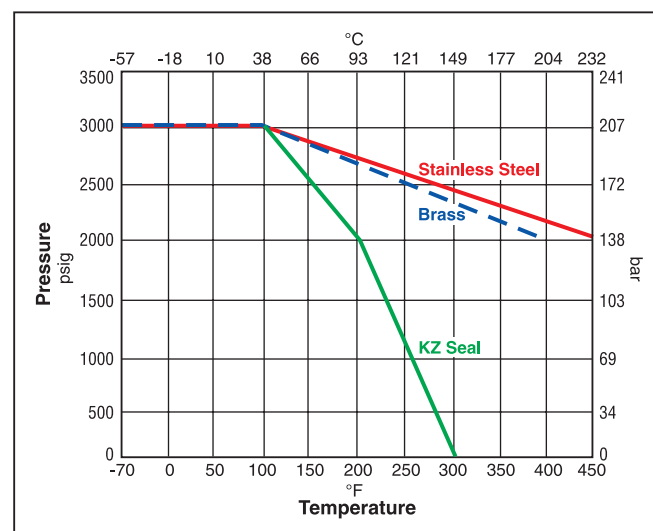
* Plugs are PTFE color coated – Stainless steel plugs are black; Brass plugs are brown.

** Optional Seat and O-ring seal materials are available.
Lubrication: Perfluorinated polyether



Model Shown: 4A-PR4-VT-SS

Pressure vs. Temperature



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

The temperature rating of the elastomer seals become the limiting factor on temperature range.

Temperature Ratings

Material	Temperature Rating
Nitrile Rubber	-30°F to 225°F (-34°C to 107°C)
Fluorocarbon Rubber	-10°F to 450°F (-23°C to 232°C)
Highly Fluorinated Fluorocarbon Rubber	-10°F to 300°F (-23°C to 149°C)
Ethylene Propylene Rubber	-70°F to 275°F (-57°C to 135°C)

Note: To determine MPa, multiply bar by 0.1

Flow Calculations with 1000 psig (69 bar) Inlet Pressure

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
PR4	1.24	10	0.7	3.9	0.9	123.1	209.6
		50	3.4	8.8	2.0	265.9	446.3
		100	6.9	12.4	2.8	359.6	607.0
PR6	3.19	10	0.7	10.1	2.3	315.7	533.5
		50	3.4	22.6	5.1	672.3	1128.2
		100	6.9	31.9	7.2	891.6	1504.1



Kits

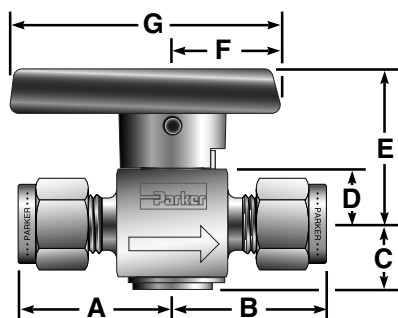
Plug Kits – Specify the combination of valve series, seal material, plug material, and handle color (if applicable).

Example: KIT-PR4-VT-SS-R. This kit consists of a PR4 stainless steel plug with fluorocarbon rubber seat and seal elastomers, PTFE back-up rings, red handle, and handle pin.

Seal Kits – Specify the combination of valve series and seal material.

Example: KIT-PR4-BN. This kit consists of a PR4 Nitrile rubber seat and seal elastomers and PTFE back-up rings.

Flow Data / Dimensions



Model Shown: 4A-PR4-VT-B

Port Size	Basic Part #	Flow Data				End Connections	Dimensions Inches (mm)							
		Orifice		Cv	X _T *		Port 1	Port 2	A†	B†	C	D	E	F
		Inch	mm											
2F	PR4	0.193	4.9	1.24	0.39	1/8" Female NPT	0.89 (22.6)	0.89 (22.6)	0.46 (11.7)	0.38 (9.7)	1.07 (27.2)	0.75 (19.1)	1.88 (47.8)	
2M		0.172	4.4	1.02	0.39	1/8" Male NPT	0.77 (19.6)	0.77 (19.6)						
2A		0.093	2.4	0.22	0.48	1/8" A-LOK®	1.00	1.00						
2Z						1/8" CPI™	(25.4)	(25.4)						
4F		0.193	4.9	1.24	0.39	1/4" Female NPT	1.05 (26.7)	1.05 (26.7)						
4M		0.193	4.9	1.24	0.39	1/4" Male NPT	0.96 (24.4)	0.96 (24.4)						
4A		0.187	4.7	1.18	0.41	1/4" A-LOK®	1.09	1.09						
4Z						1/4" CPI™	(27.7)	(27.7)						
4V		0.187	4.7	1.18	0.41	1/4" VacuSeal	1.02 (25.9)	1.02 (25.9)						
6A		0.193	4.9	1.24	0.39	3/8" A-LOK®	1.14	1.14						
6Z						3/8" CPI™	(29.0)	(29.0)						
M6A		0.188	4.8	1.18	0.41	6mm A-LOK®	1.08	1.08						
M6Z						6mm CPI™	(27.4)	(27.4)						
4F	PR6	0.281	7.1	3.19	0.28	1/4" Female NPT	1.19 (30.2)	1.19 (30.2)	0.67 (17.0)	0.56 (14.2)	1.49 (37.8)	0.99 (25.1)	2.40 (61.0)	
6A		0.281	7.1	3.19	0.28	3/8" A-LOK®	1.33	1.33						
6Z						3/8" CPI™	(33.8)	(33.8)						
8F		0.281	7.1	3.19	0.28	1/2" Female NPT	1.44 (36.6)	1.44 (36.6)						
8M		0.281	7.1	3.19	0.28	1/2" Male NPT	1.32 (33.5)	1.32 (33.5)						
8A		0.281	7.1	3.19	0.28	1/2" A-LOK®	1.44	1.44						
8Z						1/2" CPI™	(36.6)	(36.6)						
M8A		0.250	6.4	2.84	0.29	8mm A-LOK®	1.30	1.30						
M8Z						8mm CPI™	(33.0)	(33.0)						
M10A		0.281	7.1	3.19	0.28	10mm A-LOK®	1.34	1.34						
M10Z						10mm CPI™	(34.0)	(34.0)						
M12A		0.281	7.1	3.19	0.28	12mm A-LOK®	1.47	1.47						
M12Z						12mm CPI™	(37.3)	(37.3)						

* 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.

How to Order

The correct part number is easily derived from the following example and ordering chart. The six product characteristics required are coded as shown in the chart.

* **Note:** If the inlet and outlet ports are the same, eliminate the outlet port designator.

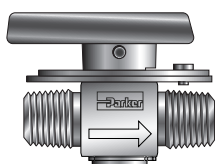
The following example describes a PR Series rotary plug valve equipped with 1/4" CPI™ compression inlet and outlet ports, Nitrile seals, PTFE back-up rings, and stainless steel construction.

Example:

4Z		–	PR4	–	BNT		–	SS		
		–		–			–			
Inlet Port*	Outlet Port*		Valve Series		Seal Material	Back-Up Rings		Body Material		
Inlet and Outlet Ports*			Valve Series		Seal Material	Back-Up Rings		Body Material		
2A	1/8" A-LOK®	6A	3/8" A-LOK®	PR4	V	Fluorocarbon Rubber	T	PTFE	SS	Stainless Steel
2Z	1/8" CPI™	6Z	3/8" CPI™		KZ	Highly Fluorinated Fluorocarbon Rubber			B	Brass
2F	1/8" Female NPT	M6A	6mm A-LOK®		EPR	Ethylene Propylene Rubber				
2M	1/8" Male NPT	M6Z	6mm CPI™		BN	Nitrile Rubber				
4A	1/4" A-LOK®									
4Z	1/4" CPI™									
4F	1/4" Female NPT									
4M	1/4" Male NPT									
4V	1/4" VacuSeal									
4F	1/4" Female NPT	M8A	8mm A-LOK®	PR6	V	Fluorocarbon Rubber				
6A	3/8" A-LOK®	M8Z	8mm CPI™		EPR	Ethylene Propylene Rubber				
6Z	3/8" CPI™	M10A	10mm A-LOK®		BN	Nitrile Rubber				
8A	1/2" A-LOK®	M10Z	10mm CPI™							
8Z	1/2" CPI™	M12A	12mm A-LOK®							
8F	1/2" Female NPT	M12Z	12mm CPI™							
8M	1/2" Male NPT									

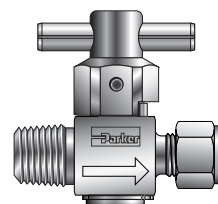
* If the inlet and outlet ports are the same, eliminate the outlet port designator.

Options



Lock-Out Device

Used to lock the handle from accidental rotation in either the opened or closed position. To order the device separately, specify **LD-PR4** or **LD-PR6**.



T-Bar Handle

An all metal bar stock design for higher strength and durability. Consists of a stainless steel pin and aluminum adapter. To order, add the suffix **–T** to the end of the part number.

Example and model shown: 4M4A-PR4-EPRT-SS-T.

Downstream Venting – As the valve is positioned from opened to closed, downstream pressure is released to atmosphere through a vent hole in the body and plug. The maximum recommended operating pressure for this option is 150 psig (10 bar). To order, insert **V** after PR in the model number. **Example:** 4A-PRV4-VT-B

Colored Handles – Black is the standard color. Add the designator corresponding to the correct handle color as a suffix to the part number: **B** – blue, **G** – green, **R** – red. **Example:** M6A-PR4-BNT-SS-G

Stainless Steel Directional Handles – A stainless steel handle with the same design configuration as the standard nylon handle is available for the PR4 series. Add the designator **–ST** as a suffix to the part number.

Example: 4Z-PR4-EPRT-SS-ST

Parker's Motion & Control Technologies

At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 1-800-C-Parker.



AEROSPACE

Key Markets

- Aircraft engines
- Business & general aviation
- Commercial transports
- Land-based weapons systems
- Military aircraft
- Missiles & launch vehicles
- Regional transports
- Unmanned aerial vehicles

Key Products

- Flight control systems & components
- Fluid conveyance systems
- Fluid metering delivery & atomization devices
- Fuel systems & components
- Hydraulic systems & components
- Inert nitrogen generating systems
- Pneumatic systems & components
- Wheels & brakes



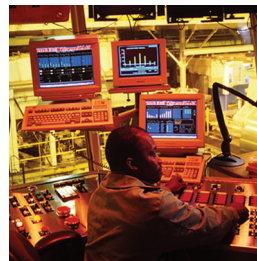
CLIMATE CONTROL

Key Markets

- Agriculture
- Air conditioning
- Food, beverage & dairy
- Life sciences & medical
- Precision cooling
- Processing
- Transportation

Key Products

- CO₂ controls
- Electronic controllers
- Filter driers
- Hand shut-off valves
- Hose & fittings
- Pressure regulating valves
- Refrigerant distributors
- Safety relief valves
- Solenoid valves
- Thermostatic expansion valves



ELECTROMECHANICAL

Key Markets

- Aerospace
- Factory automation
- Life science & medical
- Machine tools
- Packaging machinery
- Paper machinery
- Plastics machinery & converting
- Primary metals
- Semiconductor & electronics
- Textile
- Wire & cable

Key Products

- AC/DC drives & systems
- Electric actuators, gantry robots & slides
- Electrohydraulic actuation systems
- Electromechanical actuation systems
- Human machine interface
- Linear motors
- Stepper motors, servo motors, drives & controls
- Structural extrusions



FILTRATION

Key Markets

- Food & beverage
- Industrial machinery
- Life sciences
- Marine
- Mobile equipment
- Oil & gas
- Power generation
- Process
- Transportation

Key Products

- Analytical gas generators
- Compressed air & gas filters
- Condition monitoring
- Engine air, fuel & oil filtration & systems
- Hydraulic, lubrication & coolant filters
- Process, chemical, water & microfiltration filters
- Nitrogen, hydrogen & zero air generators



FLUID & GAS HANDLING

Key Markets

- Aerospace
- Agriculture
- Bulk chemical handling
- Construction machinery
- Food & beverage
- Fuel & gas delivery
- Industrial machinery
- Mobile
- Oil & gas
- Transportation
- Welding

Key Products

- Brass fittings & valves
- Diagnostic equipment
- Fluid conveyance systems
- Industrial hose
- PTFE & PFA hose, tubing & plastic fittings
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects



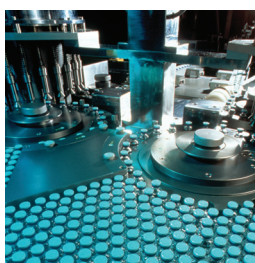
HYDRAULICS

Key Markets

- Aerospace
- Aerial lift
- Agriculture
- Construction machinery
- Forestry
- Industrial machinery
- Mining
- Oil & gas
- Power generation & energy
- Truck hydraulics

Key Products

- Diagnostic equipment
- Hydraulic cylinders & accumulators
- Hydraulic motors & pumps
- Hydraulic systems
- Hydraulic valves & controls
- Power take-offs
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects



PNEUMATICS

Key Markets

- Aerospace
- Conveyor & material handling
- Factory automation
- Life science & medical
- Machine tools
- Packaging machinery
- Transportation & automotive

Key Products

- Air preparation
- Brass fittings & valves
- Manifolds
- Pneumatic accessories
- Pneumatic actuators & grippers
- Pneumatic valves & controls
- Quick disconnects
- Rotary actuators
- Rubber & thermoplastic hose & couplings
- Structural extrusions
- Thermoplastic tubing & fittings
- Vacuum generators, cups & sensors



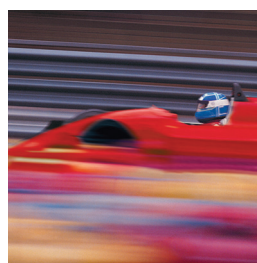
PROCESS CONTROL

Key Markets

- Chemical & refining
- Food, beverage & dairy
- Medical & dental
- Microelectronics
- Oil & gas
- Power generation

Key Products

- Analytical sample conditioning products & systems
- Fluoropolymer chemical delivery fittings, valves & pumps
- High purity gas delivery fittings, valves & regulators
- Instrumentation fittings, valves & regulators
- Medium pressure fittings & valves
- Process control manifolds



SEALING & SHIELDING

Key Markets

- Aerospace
- Chemical processing
- Consumer
- Energy, oil & gas
- Fluid power
- General industrial
- Information technology
- Life sciences
- Military
- Semiconductor
- Telecommunications
- Transportation

Key Products

- Dynamic seals
- Elastomeric o-rings
- EMI shielding
- Extruded & precision-cut, fabricated elastomeric seals
- Homogeneous & inserted elastomeric shapes
- High temperature metal seals
- Metal & plastic retained composite seals
- Thermal management



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