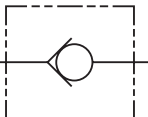
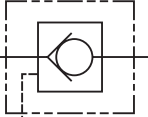
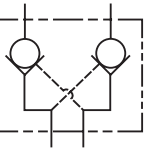
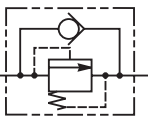


	SERIES	CAVITY	DESCRIPTION	FLOW LPM/GPM	PRESSURE BAR/PSI	PAGE NO.		
	<b>STANDARD CHECKS</b>							
		D1A060	2U	Check Valve Insert, Ball Type	145/38	420/6000	CV5	
		D1B125	2C	Check Valve Insert, Ball Type	500/132	420/6000	CV6	
		D0WB2	CAVOW-2	Cartridge Check, Ball Type	3.5/0.9	420/6000	CV7	
		D02B2	C08-2	Cartridge Check, Ball Type	45/12	420/6000	CV8	
	☆	CVH081P	C08-2	Cartridge Check, Poppet Type	38/10	350/5000	CV9	
	☆	CVH103P	C10-2	Cartridge Check, Poppet Type	60/16	350/5000	CV10	
		D04B2	C10-2	Cartridge Check, Ball Type	160/42	420/6000	CV11	
		CVH121P	C12-2	Cartridge Check, Poppet Type	121/32	350/5000	CV12	
		D06B2P	C16-2	Cartridge Check, Poppet Type	280/74	420/6000	CV13	
		CVH161P	C16-2	Cartridge Check, Poppet Type	226/60	350/5000	CV14	
		CVH201P	C20-2	Cartridge Check, Poppet Type	303/80	350/5000	CV15	
	☆	CVH104P	C10-2	Cartridge Check, Poppet Type 2 to 1 Flow Path	19/5	350/5000	CV16	
		D06C2	C16-2	Cartridge Check, Poppet Type 2 to 1 Flow Path	500/132	420/6000	CV17	
		<b>PILOT OPERATED CHECKS</b>						
			CP084P	C08-3	Single P.O. Check, Pilot on Port 1	19/5	207/3000	CV18
		☆	CPH104P	C10-3	Single P.O. Check, Pilot on Port 1	30/8	350/5000	CV19
			CPH124P	C12-3	Single P.O. Check, Pilot on Port 1	75/20	350/5000	CV20
☆		CSP(H)081		Single P.O. Check Package	38/10	350/5000	CV21-22	
☆		CSP(H)103		Single P.O. Check Package	60/16	350/5000	CV23-24	
		CSP(H)161		Single P.O. Check Package, Steel Body	226/60	350/5000	CV25-26	
		D4A020	53-1	Single P.O. Check, Pilot on Port 3	30/8	420/6000	CV27	
		D4A040	68-1	Single P.O. Check, Pilot on Port 3	60/16	420/6000	CV28	
		D3B125	3C	Single P.O. Check, Pilot on Port 3	150/40	420/6000	CV29	
		CPC101P	C10-3	Pilot to Close Check, Pilot on Port 3	20/5	420/6000	CV30	
		<b>DUAL PILOT OPERATED CHECKS</b>						
		CPD084P	C08-4	Dual P.O. Check Cartridge	19/5	207/3000	CV32	
	☆	CDP(H)081		Dual P.O. Check Package	38/10	350/5000	CV33-34	
	☆	CDP(H)103		Dual P.O. Check Package	60/16	350/5000	CV35-36	
	CDP(H)161		Dual P.O. Check Package, Steel Body	226/60	350/5000	CV37-38		
	<b>CHECK WITH RELIEF</b>							
		D04F2	C10-2	Check With Thermal Relief, Relieving Port 2 to 1	130/40	420/6000	CV39	

\*Rated to 207 Bar/3000 PSI with Aluminum Body.

☆ Denotes New Winner's Circle Product Line.



CV

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SV

Solenoid  
Valves

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Proportional  
Valves

CE

Coils &  
Electronics

BC

Bodies &  
Cavities

TD

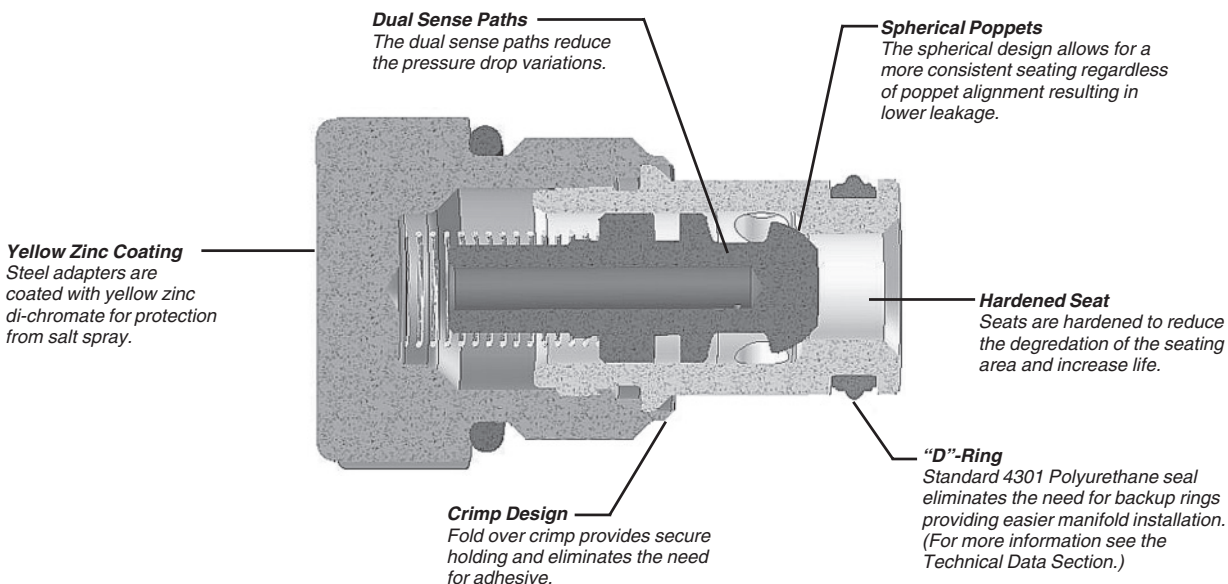
Technical  
Data**INTRODUCTION:**

This technical tips section is designed to help familiarize you with the Parker line of Check Valves. In this section we present the products that are new to this catalog as well as some design features of our checks valves. In addition, we present common options available to help you in selecting products for your application. Finally we give a brief synopsis of the operation and applications of the various product offered in this section.

**NEW PRODUCTS:**

There are several new additions and product improvements to our Check Valve product line.

*Here are just some of the general design features and advantages to the "Winner's Circle" check valve.*

**COMMON OPTIONS:**

Since check valves and shuttles are fairly simple components, there are very few options. Here are the standard options you will find.

**Seals:** The Winner's Circle products feature a standard 4301 Polyurethane "D"-Ring. The "D"-Ring eliminates the need for backup rings. The majority of the products are available in Nitrile or Fluorocarbon Seals. You should match the seal compatibility to the temperature and fluid being used in your application.

**Crack Pressure:** Parker offers a number of standard crack pressure options for each valve. Check the model code pages for these options. The crack pressure is defined as the minimum amount of pressure that is needed to unseat the poppet. In pilot operated check applications, you may want to go with a slightly higher cracking pressure to keep the piston weight, friction, and drag from accidentally unseating the poppet.

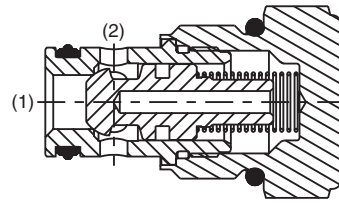
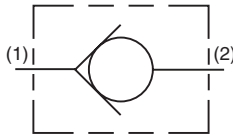
**Pilot Piston Seal:** On the pilot piston style pilot operated check valves, Parker offers the option to place a seal on the piston to reduce the leakage across the piston. **Note:** Sealing the pilot piston does not decrease the leakage across the poppet. In other words, if you are trying to reduce the leakage from the actuator port, sealing the piston will not help. While most applications do not require a seal on the piston, it can be advantageous in applications with very small pump flows where the lost fluid would have a high impact on actuator speed.

**PRODUCT TYPES / APPLICATIONS**

**Check Valve - Poppet Type**

Check valves are poppet style elements that allow free flow in one direction while preventing flow in the reverse direction.

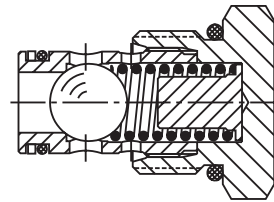
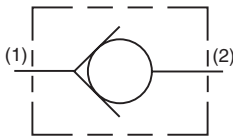
They can be used to isolate portions of a hydraulic circuit or to provide a free flow path around a restrictive valve.



**OPERATION** - Pressure on the inlet (port 1) of the check valve creates a force against the poppet, pushing it off its seat and permitting free flow to port 2. Reverse flow through the check is blocked by the poppet.

**Check Valve - Ball Type**

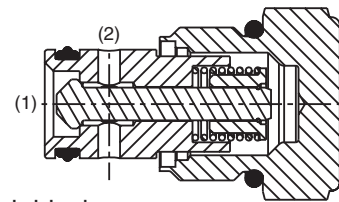
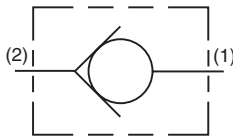
Ball type check valves are check valves that use a hardened steel ball to seal against the valve seat as opposed to a poppet. They are simple in their design and provide low leakage over the life of the system.



**OPERATION** - Pressure on the inlet (port 1) of the check valve creates a force on the steel ball pushing it off of its seat and permitting free flow to port 2. Reverse flow through the check is blocked by the steel ball on the seat.

**Side to Nose Check Valve**

Side to nose check valves are a special type of check valve where the free flow path is from the side of the cartridge valve to the nose. They functionally are the same as the standard check valve. Side to nose check valves are occasionally used by manifold designers to simply the flow path design of their blocks.



**OPERATION** - Pressure on the inlet (port 2) of the check valve creates a force against the poppet, pushing it off its seat and permitting free flow to port 1. Reverse flow through the check is blocked by the poppet.

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<b>BC</b>
Bodies & Cavities
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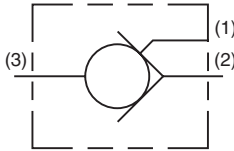
Bodies & Cavities

TD

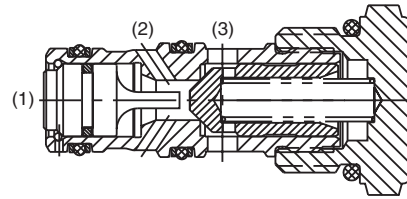
Technical Data

**Pilot Operated Check Valve**

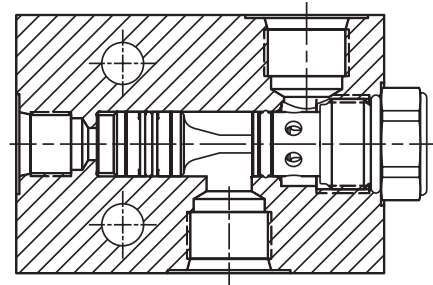
Pilot operated check valves (also referred to as P.O. check valves), are check valves which can be opened by an external pilot pressure. Thus, P.O. checks, block flow in one direction, like standard check valves, but can be released once an adequate pilot pressure is applied. Free flow is allowed in the reverse direction. P.O. checks are often used to positively lock a dual acting cylinder. There are two types of pilot operated check valves; threaded cartridge style and pilot piston style. These valves work best when used in conjunction with a control valve that vents the valve ports to tank when centered.



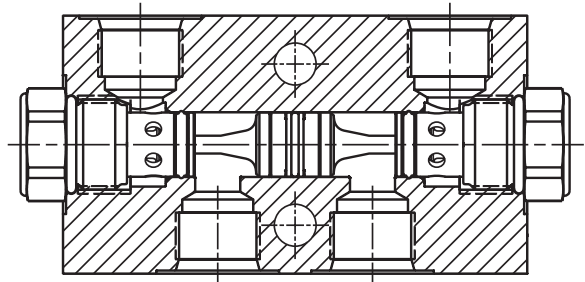
**Cartridge Style P.O. Check Valve**



**Single Pilot Piston Style P.O. Check Valve**



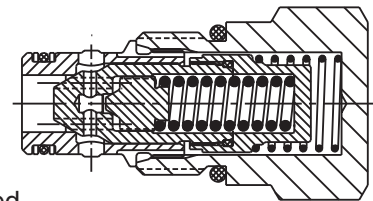
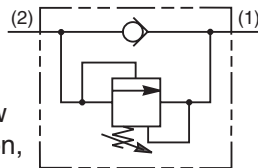
**Dual Pilot Piston Style P.O. Check Valve**



**OPERATION** - In the absence of adequate pilot pressure, the poppet remains seated preventing flow from the actuator port (port 3) to the valve port (port 2). Once adequate pilot pressure is applied at the pilot port (port 1), the internal pilot piston unseats the check poppet permitting flow from port 3 to port 2. The amount of pressure needed at port 1 to unseat the check valve is determined by the pilot ratio of the pilot piston to the poppet seat diameter. If you have a pilot operated check valve with a 3:1 ratio pilot piston, then you would need a pilot pressure at port 1 that is 1/3 of the pressure being checked at port 3 plus the spring. For example, if you had 3000 psi on port 3 and a 5 psi spring and a 3:1 pilot ratio, it would take 1002 psi  $[(3000 \text{ psi} + 5 \text{ psi}) / 3]$  to release the check valve. Free flow is permitted from the valve port (port 2) to the cylinder port (port 3).

**Check Valve With Thermal Relief**

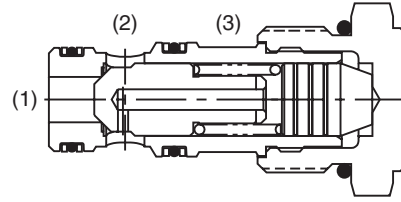
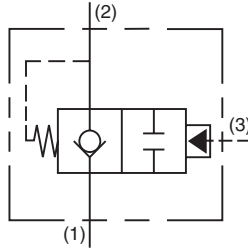
The check valve with thermal relief performs the same function as a standard check valve. It allows free flow in one direction. In the opposite direction, it performs as a normal check valve preventing flow, while also venting excess pressure caused by the thermal expansion of fluid. This type of valve can be used with an external pilot piston to provide a pilot operated valve that will vent trapped pressure due to thermal expansion. These valves work best when used in conjunction with a control valve that vents the valve ports to tank when centered.



**OPERATION** - The check valve is a guided poppet design. As the pressure on the inlet exceeds the spring rate, the poppet is pushed off of its seat allowing flow to pass. Once the pressure on the inlet side drops below the spring force, the spring then pushes the poppet back on its seat blocking flow from the outlet to the inlet of the check valve. If the pressure on the outlet side of the check valve (when it is in a load holding function) rises (through thermal expansion), the direct acting relief will vent the excess pressure caused by the thermal expansion to the inlet side of the check.

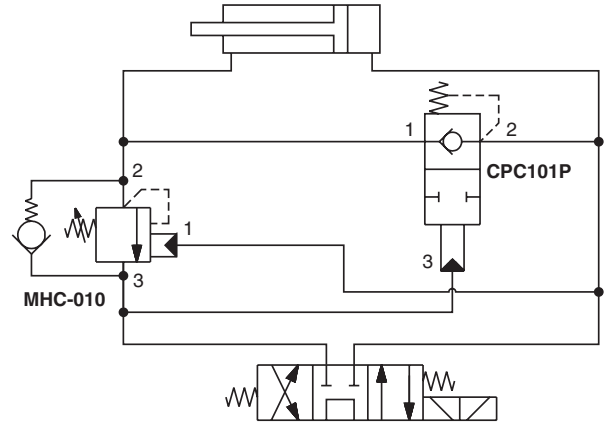
**Pilot to Close Check**

Pilot to close check valves are unique 2 way valves that act as a check valve, allowing free flow in one direction and blocking flow from the opposite direction. When an external pilot pressure is applied, flow is blocked from both directions.



These products are ideal for regeneration circuits. See sample diagram shown.

**OPERATION** - In the absence of adequate pilot pressure, the valve functions as a simple check valve, allowing free flow from port 1 to port 2. When adequate pilot pressure at port 3 is applied, the pilot piston holds the poppet closed, blocking flow in both directions.



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