



[HOME](#) > [ENGINEERING & TECHNICAL](#) > [TECHNICAL ARTICLES](#) > [INTRODUCTION TO CHECK VALVES](#)

Technical Articles

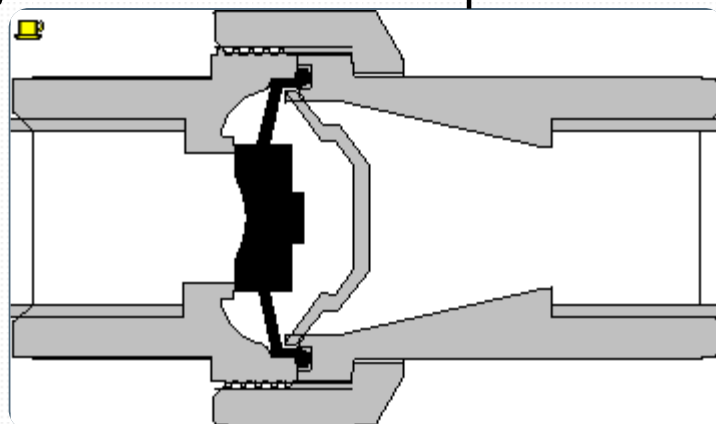
July 21, 2016

Introduction to Check Valves

PLASTIC CHECK VALVES

True Blue® PVC, CPVC, PVDF, PP & PTFE thermoplastic Check Valves help you stop unwanted reverse flow with an automatic bubble-tight seal.

- [Series CKM & CK](#) Diaphragm operated; self-sealing and normally-closed.
- [Series CKS](#) PFA encapsulated spring designs; self-sealing and normally-closed.
- [Series CKD](#) Compact design for low pressure applications; not self-sealing but has lower cracking pressure.



All True Blue Check Valves feature rugged thermoplastic construction with no wetted metal parts. As your assurance of quality, each valve is individually tested under pressure by a Plast-O-Matic inspector prior to shipment.

Diaphragm Check Valves are Superior to “ball checks”

The patented diaphragm in the Plast-O-Matic True Blue Check Valve is designed to re-seat with a bubble tight seal regardless of mounting position or reverse flow. Ball style check valves require two properties to seal properly: First, the ball check must be mounted with the flow direction pointed up, because gravity is required to pull the ball to the seat. Secondly, some reverse pressure and flow must be present, because pressure is required to seal the ball exactly on the seat.

If either of these conditions are not met, the ball check will leak! On the other hand, the Plast-O-Matic diaphragm

check will seal in any position, whether or not flow is present.

Here's a Simple Test: Take a Plast-O-Matic diaphragm check valve and place it flow arrow up on a paper towel. Pour a small amount of water into the outlet, lift up the valve, and you will see that it has remained absolutely sealed — no evidence of dampness on the paper towel. Now take any ball-style check valve and perform the exact same test — just be sure to have extra paper towels on hand!



Series CKM:

Unsurpassed performance in a plastic check valve. Patented diaphragm design provides the ultimate normally-closed, zero reverse-flow valve. Available pipe sizes 1/2" 3/4" and 1". Body materials are Geon® PVC, Corzan® CPVC, Glass-filled polypropylene, and Kynar® PVDF. Seal materials are EPDM and FKM.

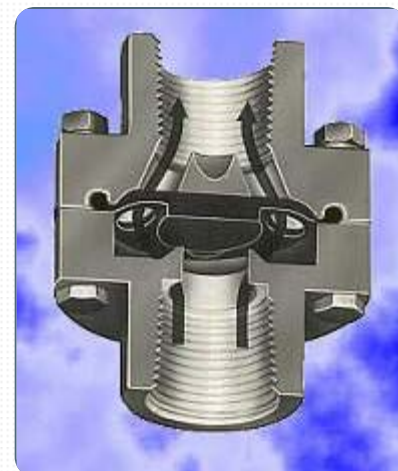
- Self-sealing — not dependent upon gravity, mounting position or reverse flow.
- Leak-free sealing protects against the hazards of reverse flow.
- Rapid closure helps to eliminate sudden back-flow water hammer.
- Union nuts simplify inspection/removal with minimal piping breakdown.
- **Minimal Cracking Pressure:** Valve begins to open for desired flow at approximately 1.0 to 1.5 PSI.
- Maximum working pressure is 150 PSI inlet, 100 PSI backpressure at 77° F, except Glass-filled polypro which is rated 100 PSI inlet.
- No metal parts internally or externally.



Series CK:

Unsurpassed performance in a plastic check valve. Patented diaphragm design provides the ultimate normally-closed, zero reverse-flow valve. Available pipe sizes 3/4" and 1". PTFE Body; seal materials are EPDM and FKM.

- Self-sealing — not dependent upon gravity, mounting position or reverse flow.
- Leak-free sealing protects against the hazards of reverse flow.
- Rapid closure helps to eliminate sudden back-flow water hammer.
- **Minimal Cracking Pressure:** Valve begins to open for desired flow at approximately 1.0 to 1.5 PSI.
- Generally the same as Series CKM. Series CK is simply a PTFE bodied version with the same diaphragm design and performance of CKM, but it has no union nut feature (Body requires wrench for disassembly and seal replacement).
- Maximum working pressure is 40 PSI inlet, 40 PSI backpressure at temperatures to 185° F.
- No internal metal parts; external fasteners are stainless steel.



Series CKS:

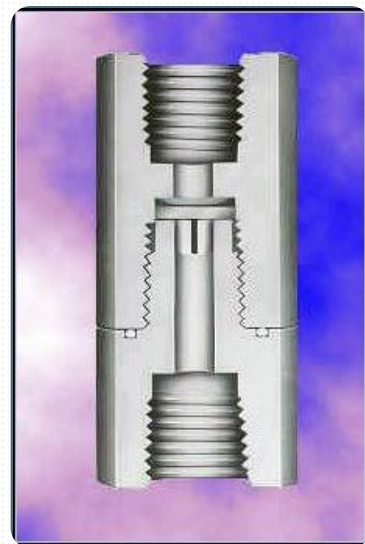
Unsurpassed performance in a plastic check valve. Unique poppet and PFA *encapsulated* spring design emulates the CKM diaphragm and provides the ultimate normally-closed, zero reverse-flow valve. Available pipe sizes 1-1/2" 2" and 3". Body materials are Geon PVC, Corzan CPVC, Natural polypropylene, and Kynar PVDF. Seal materials are EPDM and FKM (Viton).

- Self-sealing — not dependent upon gravity, mounting position or reverse flow.
- Leak-free sealing protects against the hazards of reverse flow.
- Rapid closure helps to eliminate sudden back-flow water hammer.
- Union nuts simplify inspection/removal with minimal piping breakdown.
- **Minimal Cracking Pressure:** Valve begins to open for desired flow at approximately 1.0 to 1.5 PSI.
- Maximum working pressure is 100 PSI at 77° F.
- No exposed metal parts. Spring is PFA encapsulated steel...note that this is preferable to coating; encapsulation eliminates the possibility for “flaking” and exposure of the metal. No other metal parts are used.



Series CKD:

These 1/4" & 1/2" valves utilize a flexible elastomer disk as opposed to Plast-O-Matic's patented diaphragm. The advantage is that the CKD requires even *less* pressure than the CKM to open. The drawback, of course, is that it is dependent on some reverse pressure for sealing assistance, and in low flow applications requires gravity to seal (install with flow direction “up”). But please note that when used for liquids with a high specific gravity, the disk may “float,” so it is therefore recommended to install with flow direction “down” with those types of liquids. Also note that in 1/2" piping systems where high flow is required, the 1/2" Series CKM check valve should be used, unless the super low cracking pressure of Series CKD is absolutely a requirement. Flow performance of 1/4" size exceeds the recommended flow rates for fractional size tubing.



- Very compact; slim design — not much larger diameter than corresponding pipe size.
- Available in Geon PVC, Natural polypro, PTFE and Kynar PVDF;
- Sizes 1/4" & 1/2".
- Seals in EPDM or Viton.
- High performance, heavy-duty design.
- Maximum pressure is 140 PSI in PVC, 125 PSI in natural polypro, and 100 PSI in Kynar and PTFE.
- **Minimal** cracking pressure required.