Titan Flow Control, Inc. is a high quality manufacturer of check valves. With a dedication to great customer service, cutting edge engineering, and top quality products, Titan Flow Control's Check Valves are the preferred choice for achieving automatic shut-off and preventing backflow in piping systems.

Titan is committed to maintaining a large inventory of silent check valves, center guided check valves, double disc check valves, and single disc check valves in a variety of types, sizes, materials, and pressure classes.

At Titan Flow Control, you get the right check valve and you get it right away!
Check Valves are automatic shut-off valves that are commonly used for preventing backflow or drainage in a piping system. Often applied on the discharge side of pumps, check valves prevent the system from draining if the pump stops and protect against backflow, which could harm the pump or other equipment.

Titan Flow Control offers the following types of check valves to meet your specific needs:

**Center-Guided Check Valves**

- **Center Guided - Globe Style**
  - Clearance within Valve’s Body allows a butterfly valve to be installed on the outlet side without a spool piece

- **Center Guided - Wafer Style**
  - Interchangeable Seats and Springs are available in a wide variety of materials
  - Interchangeable Seats and Springs are available in a wide variety of materials
  - Resilient Seats with precision machined sealing surfaces maintain a bubble tight seal
  - Short Disc Travel reduces the risk of slamming and the potential for water hammer
  - Compact Design is economical and takes up less space in pipeline than globe style check valves

- **Center Guided - Threaded**
  - Soft and Metal Seats are available to meet the sealing needs of various applications
  - Short, Straight Flow Path across valve generates little turbulence
  - Large Cross-Sectional Area exceeds that of the pipeline to minimize head loss
  - Compression Spring coupled with a small stem guide provides less obstruction to the flow than a typical conical construction

**Titan Flow Control Features**

- Straightening Vanes reduce turbulence in incoming flow, minimizing vibrations that could result in premature valve failure
- Resilient seats with precision machined sealing surfaces maintain a bubble tight seal
- Interchangeable seats and springs are available in a wide variety of materials
- Compact design is economical and takes up less space in pipeline than globe style check valves
- Short disc travel reduces the risk of slamming and the potential for water hammer
**Single Disc Check Valves**

**Single Disc - Wafer Style**

- **Resilient, Soft Seats**
  coupled with precision machined sealing surfaces ensure a bubble tight seal

- **Economical Design**
  provides a highly efficient check valve that is inexpensive and has a short laying length

**Single Disc - Short Pattern**

- **Retainerless Body**
  eliminates potential leak paths to the outside and is a stronger casting

- **Simple Design**
  is reliable; there are no flange gaskets to replace

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**Dual Disc Check Valves**

**Retainerless Body**
on CS and SS eliminates potential leak paths to the outside and is a stronger casting

**Shock Bumpers**
stop discs and keep them stable preventing unnecessary stress on the check valve

**Split Disc Design**
minimizes pressure drop and shortens the distance each disc travels

**Independent Torsion Springs**
on large sizes respond quickly to fluctuations in flow velocity

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**Advantages of Ductile Iron Check Valves**

Titan Check Valves are made with the alloy Ductile Iron for prices that are comparable to Cast Iron! Ductile Iron is composed of graphite in spheroidal shapes compared to Cast Iron, which has lenticular flakes that make it brittle. Not only does Ductile Iron have a yield strength comparable to Carbon Steel, but it also has the anti-corrosive properties of cast iron, making it the preferred material for iron check valves.

**InConel X Springs**
are standard on all Carbon Steel and Stainless Steel bodies

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**Ductile Iron vs. Cast Iron**

**Ductile Iron**
- Cast Iron
  - Made with the alloy Ductile Iron for prices that are comparable to Cast Iron!
- Ductile Iron is composed of graphite in spheroidal shapes compared to Cast Iron, which has lenticular flakes that make it brittle.
- Not only does Ductile Iron have a yield strength comparable to Carbon Steel, but it also has the anti-corrosive properties of cast iron, making it the preferred material for iron check valves.
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**Call**
(910) 735-0000

**Fax**
(910) 738-3848

**Email**
titan@titanfci.com

**Visit**
www.titanfci.com
### Double Disc
**Wafer Style**

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Class</th>
<th>Material</th>
<th>Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV 41 - DI</td>
<td>Wafer</td>
<td>150</td>
<td>Ductile Iron</td>
<td>2&quot; - 48&quot;</td>
</tr>
<tr>
<td>CV 42 - CS/SS</td>
<td>Wafer</td>
<td>150</td>
<td>Carbon or Stainless</td>
<td>2&quot; - 48&quot;</td>
</tr>
<tr>
<td>CV 42L - CS/SS</td>
<td>Lug</td>
<td>150</td>
<td>Carbon or Stainless</td>
<td>2&quot; - 48&quot;</td>
</tr>
<tr>
<td>CV 44 - CS/SS</td>
<td>Wafer</td>
<td>300</td>
<td>Carbon or Stainless</td>
<td>2&quot; - 48&quot;</td>
</tr>
<tr>
<td>CV 46 - CC/SS</td>
<td>Wafer</td>
<td>600</td>
<td>Carbon or Stainless</td>
<td>2&quot; - 48&quot;</td>
</tr>
<tr>
<td>CV 47 - CC/SS</td>
<td>Wafer</td>
<td>900</td>
<td>Carbon or Stainless</td>
<td>2&quot; - 48&quot;</td>
</tr>
</tbody>
</table>

### Single Disc
**Wafer Style**

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Class</th>
<th>Material</th>
<th>Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV 31 - DI</td>
<td>Wafer</td>
<td>150</td>
<td>Ductile Iron</td>
<td>2&quot; - 12&quot;</td>
</tr>
<tr>
<td>CV 32 - CS/SS</td>
<td>Wafer</td>
<td>150</td>
<td>Carbon or Stainless</td>
<td>2&quot; - 12&quot;</td>
</tr>
</tbody>
</table>

### Single Disc
**Short Pattern Wafer**

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Class</th>
<th>Material</th>
<th>Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV 12 - CS/SS</td>
<td>Short Wafer</td>
<td>150</td>
<td>Carbon or Stainless</td>
<td>2&quot; - 24&quot;</td>
</tr>
</tbody>
</table>

### Key Features for Comparison

- **Minimal Slam**
- **Minimal ∆P**
- **Buried Service**
- **Vertical - Up**
- **Up & Down**
- **High Pressure**
- **High Velocities**
- **Short Length**
- **Low Cost**

- Designed to minimize slamming potential
- Designed to minimize head loss across valve
- May be used for buried service; valve box recommended
- May be used vertically, only in an upward position
- May be used in downward position with non-standard spring; C/F
- Pressures higher than 300 PSI are available
- May be used for velocities higher than 15 FPS
- Short face-to-face takes up minimal space in pipeline
- Relatively low initial cost
CV 50 - DI
Globe
Class 150
Ductile Iron
Sizes 2" - 36"

CV 51 - CS/SS
Globe
Class 150
Carbon or Stainless
Sizes 2" - 36"

CV 52 - DI
Globe
Class 300
Ductile Iron
Sizes 2" - 36"

CV 52 - CS/SS
Globe
Class 300
Stainless Steel
Sizes 2" - 36"

Center Guided
Wafer Style

CV 90 - DI
Wafer
Class 150 / 300
Ductile Iron
Sizes 2" - 12"

CV 91 - SS
Wafer
Class 150 / 300
Stainless Steel
Sizes 2" - 12"

As part of Titan Flow Control’s dedication to cutting edge design, Titan’s Engineering Department developed the patent pending CV 50 series of center guided, globe style, check valves. Only Titan’s CV 50 series have integral straightening vanes to calm turbulent flows, smaller stem guides for less flow obstruction, and extra clearance to allow direct butterfly valve installation on the outlet side.

Center Guided
Threaded

CV 20 - BR
Threaded
WOG 400
Bronze
Sizes 1/4" - 2"

CV 80 - SS
Threaded
Class 300
Stainless Steel
Sizes 3/8" - 3"
Factors For Consideration

Water Hammer

The term water hammer refers to a pressure surge in a pipeline that is created when a closing check valve stops reverse flow suddenly. This surge causes a slamming sound and it potentially can damage pipelines and buildings that house the pipelines, especially when the fluid has a high velocity or mass or when the pipeline's elevation fluctuates greatly.

Because quick closure is the key to the prevention of water hammer, it is important to consider the speed at which the check valve will close and the distance it has to travel to close. Features like Titan's independent torsion springs on large double disk check valves allow the valves to respond quickly to fluctuations in pipeline flow. As illustrated below, because a center guided check valve that is almost closed will only have a small amount of reverse flow, water hammer is less likely in any specific application. Conversely, a single disc or double disc check valve's flow rate may be greater than its percentage open, meaning that more reverse flow is present. Consult Titan with any concerns or questions about water hammer before selecting a check valve.

Head Loss

Head loss can be an important factor in check valve selection because energy loss in a pipeline can increase expenses significantly over time in certain applications. The main design features that affect head loss are the internal shape of the body and obstructions to the flow. Titan's Check Valves are designed with the following features to minimize head loss:

- **Large cross-sectional area** of center-guided check valves exceed that of the adjacent pipeline
- **Specially contoured bodies** on globe check valves are designed to allow a smooth flow across the valve
- **Short, straight flow paths** on double and single disk check valves prevent unnecessary head loss
- **Compression springs with a small boss** obstruct flow less than typical conical constructions by other manufacturer's
- **Low cracking pressure** on single and double disc check valves minimally slows the pipeline flow

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### Technical Information

**Design Specifications**

The following specifications are referenced in the design of Titan Flow Control, Inc's Check Valves. Please contact a Titan Engineer with any questions about design requirements or specifications.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>API 594</td>
<td>General Valve Design</td>
<td>ASME B16.34</td>
</tr>
<tr>
<td>API 598</td>
<td>Valve Pressure Testing and Inspection</td>
<td>Flanged, Threaded, and Welding Ends</td>
</tr>
<tr>
<td>API 6A</td>
<td>Production Valves</td>
<td>ASME B16.42</td>
</tr>
<tr>
<td>API 6D</td>
<td>Pipeline Valves</td>
<td>ASME B16.47</td>
</tr>
<tr>
<td>ASME B16.1</td>
<td>Cast Iron Pipe Flanges &amp; Flanged Fittings</td>
<td>ASME B16.43</td>
</tr>
<tr>
<td>ASME B16.5</td>
<td>Pipe Flanges and Flanged Fittings</td>
<td>ASME B16.47</td>
</tr>
<tr>
<td>ASME B16.10</td>
<td>Face-to-Face &amp; End-to-End Dimensions</td>
<td>ASME B31.1</td>
</tr>
<tr>
<td>ASME B16.24</td>
<td>Cast Copper Alloy Pipe Flanges</td>
<td>ASTM</td>
</tr>
</tbody>
</table>

**Center-guided Check Valves**

A.K.A "SILENT" Check Valves because they are less likely to SLAM as a result of water hammer!
**RESILIENT/SOFT SEAT OPTIONS**

**BUNA-N**
- Max Temp: 250 °F
- Buna-N is the most widely used elastomer. It works well for most petroleum oils and fluids, silicone greases and oils, and cold water. It also has an excellent compression set, tear, and abrasion resistance, but has poor weather resistance and moderate heat resistance. Buna-N is not recommended for ozone-resistant applications.

**PTFE (TEFLON)**
- Max Temp: 425 °F
- PTFE works well in most chemical environments. It has excellent tear, abrasive, chemical, acid, and alkali resistance. PTFE is not recommended for high pressure steam or large temperature variations.

**VITON**
- Max Temp: 400 °F
- Viton offers a broad range of chemical resistance and excellent heat resistance. Viton has good mechanical properties and compression set resistance, fair low temperature resistance, and limited hot-water resistance and shrinkage. Viton seats are often used in applications where nothing else will work.

**EPDM**
- Max Temp: 300 °F
- EPDM is likely the most water resistant rubber available. EPDM has good resistance to mild acids, alkalis, ketones, alcohols, and other polar solvents; however, it is not recommended for use with petroleum oils, di-ester lubricants, mineral oils, non-polar solvents, or aromatic fuels.

**NEOPRENE**
- Max Temp: 250 °F
- Neoprene is a durable & versatile synthetic rubber that was developed as an oil-resistant replacement for natural rubber. It is also resistant to the effects of moderate chemicals and acids, ozone, fats, greases, and solvents. It displays good chemical stability and is moderately resistant to heat. Neoprene is not recommended for use with strong oxidizing acids, esters, ketones, or chlorinated, aromatic and nitro hydrocarbons oils, non-polar solvents, or aromatic fuels.

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**TITAN FOOT VALVES**

Titan Flow Control, Inc. also offers foot valves, unique check valves with straining elements on the check valves’ inlet sides. Check Valve Series 20, 80, and 50 are all available as foot valves.

**SAVE TIME!** In a piping situation as pictured here, a check valve closes when the flow stops, preventing a pump from losing its prime and enabling the pump to function properly as flow returns and the check valve re-opens.

**PROTECT YOUR EQUIPMENT!** Because foot valves have built in strainers, the pump and other pipeline components are protected from debris that may cause damage.

Contact the Titan factory for more information and options available for Titan Foot Valves.
Below are the typical ordering constructions for Titan Flow Control, Inc.’s **Dual Disc Check Valves**, **Center Guided Check Valves**, and **Single Disc Check Valves**. Please call Titan Flow Control or your nearest sales representative with any questions about Titan Check Valves related to ordering, availability, etc.

### Dual Disc Check Valves

<table>
<thead>
<tr>
<th>Series</th>
<th>Body</th>
<th>Disc</th>
<th>Shaft</th>
<th>Seat</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV 41  (ANSI 150)</td>
<td>DI (Ductile Iron)</td>
<td>S (Stainless Steel)</td>
<td>1 (Buna-N)</td>
<td>S (Stainless Steel)</td>
<td></td>
</tr>
<tr>
<td>CV 42  (ANSI 150)</td>
<td>CS (Carbon Steel)</td>
<td>B (Aluminum Bronze)</td>
<td>2 (EPDM)</td>
<td>R (Inconel)</td>
<td></td>
</tr>
<tr>
<td>CV 42L (ANSI 150)</td>
<td>SS (Stainless Steel)</td>
<td>S (Stainless Steel)</td>
<td>3 (Viton)</td>
<td>X (Inconel-X)</td>
<td></td>
</tr>
<tr>
<td>CV 44  (ANSI 300)</td>
<td>DI (Ductile Iron)</td>
<td>S (Stainless Steel)</td>
<td>1 (Buna-N)</td>
<td>S (Stainless Steel)</td>
<td></td>
</tr>
<tr>
<td>CV 46  (ANSI 600)</td>
<td>CS (Carbon Steel)</td>
<td>B (Aluminum Bronze)</td>
<td>2 (EPDM)</td>
<td>4 (PTFE/Teflon)</td>
<td></td>
</tr>
<tr>
<td>CV 47  (ANSI 900)</td>
<td>SS (Stainless Steel)</td>
<td>S (Stainless Steel)</td>
<td>3 (Viton)</td>
<td>5 (Neoprene)</td>
<td></td>
</tr>
</tbody>
</table>

**Description**

Dual Disc Wafer Type Check Valve (Class 150), Carbon Steel Body, Stainless Steel Disc, Stainless Steel Shaft, Buna Seat, and Inconel-X Spring

### Center Guided and Single Disc Valves

<table>
<thead>
<tr>
<th>Series</th>
<th>Body</th>
<th>Disc</th>
<th>Shaft</th>
<th>Seat</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV 12  (ANSI 150)</td>
<td>DI (Ductile Iron)</td>
<td>S (Stainless Steel)</td>
<td>1 (Buna-N)</td>
<td>S (Metal to Metal, Stainless Steel)</td>
<td></td>
</tr>
<tr>
<td>CV 20  (WOG 400)</td>
<td>CS (Carbon Steel)</td>
<td>B (Aluminum Bronze)</td>
<td>2 (EPDM)</td>
<td>3 (Viton)</td>
<td>4 (PTFE/Teflon)</td>
</tr>
<tr>
<td>CV 30  (150 / 300)</td>
<td>SS (Stainless Steel)</td>
<td>S (Stainless Steel)</td>
<td>3 (Viton)</td>
<td>4 (PTFE/Teflon)</td>
<td></td>
</tr>
<tr>
<td>CV 31  (ANSI 150)</td>
<td>DI (Ductile Iron)</td>
<td>S (Stainless Steel)</td>
<td>1 (Buna-N)</td>
<td>S (Metal to Metal, Stainless Steel)</td>
<td></td>
</tr>
<tr>
<td>CV 50  (ANSI 150)</td>
<td>CS (Carbon Steel)</td>
<td>B (Aluminum Bronze)</td>
<td>2 (EPDM)</td>
<td>3 (Viton)</td>
<td>4 (PTFE/Teflon)</td>
</tr>
<tr>
<td>CV 51  (ANSI 150)</td>
<td>SS (Stainless Steel)</td>
<td>S (Stainless Steel)</td>
<td>3 (Viton)</td>
<td>5 (Neoprene)</td>
<td></td>
</tr>
<tr>
<td>CV 52  (ANSI 300)</td>
<td>DI (Ductile Iron)</td>
<td>S (Stainless Steel)</td>
<td>1 (Buna-N)</td>
<td>S (Metal to Metal, Stainless Steel)</td>
<td></td>
</tr>
<tr>
<td>CV 53  (ANSI 600)</td>
<td>CS (Carbon Steel)</td>
<td>B (Aluminum Bronze)</td>
<td>2 (EPDM)</td>
<td>4 (PTFE/Teflon)</td>
<td></td>
</tr>
<tr>
<td>CV 54  (ANSI 900)</td>
<td>SS (Stainless Steel)</td>
<td>S (Stainless Steel)</td>
<td>3 (Viton)</td>
<td>6 (Metal to Metal, Stainless Steel)</td>
<td></td>
</tr>
</tbody>
</table>

**Description**

Wafer Type, Center Guided, Check Valve (Class 150/300) Stainless Steel Body, Stainless Steel Disc, Viton Seat