BEHIND THE NAME

With a renewed focus on product leadership through innovation and quality, C&C is your world class provider of flow solutions.

Pulsating and surging pressures can cause damage to the valves and piping systems associated with reciprocating service. C&C’s Guardian Series Piston Check Valve is the critical safety component you need to protect your valuable assets from back-flow with minimal maintenance throughout its service life.
FLOW CONTROL SOLUTIONS FOR THE PETROLEUM & NATURAL GAS INDUSTRIES

Industry Specific Solutions
Production, transportation, storage and processing of oil and gas require the highest quality piping components. This is our world.

In conjunction with our sister companies we supply customers with valves, hammer unions, couplings, connectors, actuators and other valve accessories for high pressure process and piping for oil and gas facilities, both above ground and offshore.

World Class & Worldwide Service
We are dedicated to providing our customers with the best — the best brands, the best service and the best quality. Whether you require an automated valve for a highly engineered project or a replacement valve delivered same day, we are here to help. Our industry experience, product selection and access to a global network of partners enable us to tailor a solution to solve your most difficult problem.

Expanding Our Product Portfolio
While others are collapsing their portfolios and cutting costs, we have an aggressive strategy to provide complimentary products to currently served markets and increase service levels in order to establish ourselves as your single source provider for valve and flow control solutions.
**DESIGN HIGHLIGHTS**

1. **ACCESSIBILITY**
   Full accessibility to valve internals through the cover means reduced maintenance down time.

2. **SPRING LOADED**
   Valve is spring assisted to ensure piston is seated and positive shutoff is achieved.

3. **SLEEVE**
   Positively retained sleeve with smooth finish provides long lasting, trouble free operation.

4. **FAST ACTING**
   Quick opening is achieved by installation of a ball check valve located inside the piston.

5. **ORIFICE**
   By dampening the piston’s response to changes in flow, the orifice is able to control the closing speed of the non-slam piston design.

6. **BACKFLOW**
   The design of the piston is such that the greater the backflow pressure, the tighter the seal between the body and piston.

7. **APPLICATION SPECIALIST**
   The piston check valve succeeds where other check valves fail - pulsating and reciprocating applications. The unique design of the piston check orifice is specially suited to dampen the piston’s response to sudden or rapid changes in flow, typically found immediately downstream of a pump or compressor.
EXAMPLE:
A 6”, Class 600, API 6D Non-Slam Piston Check Valve with Raised Face Flanged End Connections, WCC Carbon Steel Body, 410 SS Piston with Integral Seats and HNBR 90 Seals is written as 606PCNRC41B.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>06</td>
<td>PC</td>
<td>N</td>
<td>R</td>
<td>C</td>
<td>4</td>
<td>I</td>
<td>B</td>
</tr>
</tbody>
</table>

**A**
- Size
- Inches | DN
- 2 | 2” | 50
- 3 | 3” | 80
- 4 | 4” | 100
- 6 | 6” | 150
- 8 | 8” | 200
- 10 | 10” | 250
- 12 | 12” | 300

**B**
- Pressure Class
- 01 | Class 150
- 03 | Class 300
- 06 | Class 600
- 09 | Class 900
- 15 | Class 1500

**C**
- Valve Type
- PC | API 6D Non-Slam Piston Check Valve

**D**
- Port
- N | Full (Non-Piggable)

**E**
- End Connection
- R | RF Flange
- J | RTJ Flange

**F**
- Body Material
- C | Carbon Steel ASTM A216 WCC
- L | Low Temperature Carbon Steel ASTM A352 LCC
- S | Stainless Steel ASTM A351 CF8M

**G**
- Piston Material
- 4 | 410 Stainless Steel ASTM A182 F6a
- 5 | 316 Stainless Steel ASTM A182 F316

**H**
- Seat Material
- I | Integral

**I**
- Seal Material
- B | HNBR 90
- N | BUNA
- V | Viton® GLT 90

Warning: Metallic materials selected using ANSI/NACE MR0175/ISO 15156 are resistant to cracking in defined H2S containing environments in oil and gas production but not necessarily immune to cracking under all service conditions. It is the equipment user’s responsibility to select materials suitable for the intended service.

Consult factory for list of material options.

Viton is a registered trademark of DuPont Dow Elastomers.
# PISTON CHECK VALVE

## STANDARD MATERIALS OF CONSTRUCTION

<table>
<thead>
<tr>
<th>Item</th>
<th>Component</th>
<th>Material</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Carbon Steel + 410 Overlay</td>
<td>ASTM A216 WCC+ UNS S41000</td>
</tr>
<tr>
<td>2</td>
<td>Liner</td>
<td>Carbon Steel AISI 1020 + ENP</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Piston Seal</td>
<td>Rubber</td>
<td>HNBR 90</td>
</tr>
<tr>
<td>4</td>
<td>Piston</td>
<td>Stainless Steel</td>
<td>ASTM A182 F6a</td>
</tr>
<tr>
<td>5</td>
<td>Ball Check Valve</td>
<td>Stainless Steel</td>
<td>ASTM A276 316</td>
</tr>
<tr>
<td>6</td>
<td>Orifice Screw</td>
<td>Carbon Steel</td>
<td>ASTM A193 B7M</td>
</tr>
<tr>
<td>7</td>
<td>Piston Ring</td>
<td>Carbon Steel AISI 1066/Nitriding</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Spring</td>
<td>Inconel® X-750</td>
<td>UNS N07750</td>
</tr>
<tr>
<td>9</td>
<td>Cover Seal</td>
<td>Rubber</td>
<td>HNBR 90</td>
</tr>
<tr>
<td>10</td>
<td>Cover</td>
<td>Carbon Steel</td>
<td>ASTM A105N</td>
</tr>
<tr>
<td>11</td>
<td>Stud</td>
<td>Carbon Steel</td>
<td>ASTM A193 B7M</td>
</tr>
<tr>
<td>12</td>
<td>Nut</td>
<td>Carbon Steel</td>
<td>ASTM A194 2HM</td>
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<tr>
<td>13</td>
<td>Plug</td>
<td>Stainless Steel</td>
<td>ASTM A276 316</td>
</tr>
<tr>
<td>14</td>
<td>Lifting Lug</td>
<td>Carbon Steel</td>
<td>ASTM A283 Gr.D</td>
</tr>
</tbody>
</table>

Consult factory for list of material options and specifications per valve size and pressure class, as components may vary according to design.
**Dimensions in Inches (in)**

<table>
<thead>
<tr>
<th>Class</th>
<th>Size</th>
<th>A</th>
<th>ØB</th>
<th>ØD</th>
<th>E</th>
<th>f x ØG</th>
<th>Weight (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>2&quot;</td>
<td>10.50*</td>
<td>6.00</td>
<td>1.94</td>
<td>8.03</td>
<td>4 x 3/4</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>3&quot;</td>
<td>12.50*</td>
<td>7.50</td>
<td>2.94</td>
<td>8.94</td>
<td>4 x 3/4</td>
<td>107</td>
</tr>
<tr>
<td></td>
<td>4&quot;</td>
<td>14.00*</td>
<td>9.00</td>
<td>3.94</td>
<td>10.76</td>
<td>8 x 3/4</td>
<td>165</td>
</tr>
<tr>
<td></td>
<td>6&quot;</td>
<td>17.50*</td>
<td>11.00</td>
<td>5.94</td>
<td>13.82</td>
<td>8 x 7/8</td>
<td>281</td>
</tr>
<tr>
<td></td>
<td>8&quot;</td>
<td>19.50</td>
<td>13.50</td>
<td>7.94</td>
<td>16.46</td>
<td>8 x 7/8</td>
<td>484</td>
</tr>
<tr>
<td></td>
<td>10&quot;</td>
<td>24.50</td>
<td>16.00</td>
<td>9.94</td>
<td>18.50</td>
<td>12 x 1</td>
<td>730</td>
</tr>
<tr>
<td></td>
<td>12&quot;</td>
<td>27.50</td>
<td>19.00</td>
<td>11.94</td>
<td>22.50</td>
<td>12 x 1</td>
<td>966</td>
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</tbody>
</table>

**Dimensions in Millimeters (mm)**

<table>
<thead>
<tr>
<th>Class</th>
<th>Size (DN)</th>
<th>A</th>
<th>ØB</th>
<th>ØD</th>
<th>E</th>
<th>f x ØG</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>50</td>
<td>267*</td>
<td>150</td>
<td>49</td>
<td>204</td>
<td>4 x 19</td>
<td>32</td>
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<tr>
<td></td>
<td>80</td>
<td>318*</td>
<td>190</td>
<td>74</td>
<td>227</td>
<td>4 x 19</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>356*</td>
<td>230</td>
<td>100</td>
<td>273</td>
<td>8 x 19</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>150</td>
<td>445*</td>
<td>280</td>
<td>150</td>
<td>351</td>
<td>8 x 22</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>495</td>
<td>345</td>
<td>201</td>
<td>418</td>
<td>8 x 22</td>
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<td>250</td>
<td>622</td>
<td>405</td>
<td>252</td>
<td>470</td>
<td>12 x 25</td>
<td>331</td>
</tr>
<tr>
<td></td>
<td>300</td>
<td>699</td>
<td>485</td>
<td>303</td>
<td>572</td>
<td>12 x 25</td>
<td>438</td>
</tr>
</tbody>
</table>

* Length exceeds dimension given in ASME B16.10

All weights listed are estimated.
TECHNICAL DATA

PRESSURE LOSS CURVES

Flow Rate (gal/min of water)

Dotted lines represent pressure loss for valves without springs

\[
\text{Differential Pressure (psi)}
\]

\[
\text{Flow Rate (gal/min of water)}
\]

\[
\begin{align*}
2" & : 43 \\
3" & : 106 \\
4" & : 205 \\
6" & : 470 \\
8" & : 855 \\
10" & : 1350 \\
12" & : 1935
\end{align*}
\]

\[CV\] FOR PISTON CHECK VALVE

C\text{v}\] Value of Fully Open Valve

<table>
<thead>
<tr>
<th>Size</th>
<th>Cv</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot;</td>
<td>43</td>
</tr>
<tr>
<td>3&quot;</td>
<td>106</td>
</tr>
<tr>
<td>4&quot;</td>
<td>205</td>
</tr>
<tr>
<td>6&quot;</td>
<td>470</td>
</tr>
<tr>
<td>8&quot;</td>
<td>855</td>
</tr>
<tr>
<td>10&quot;</td>
<td>1350</td>
</tr>
<tr>
<td>12&quot;</td>
<td>1935</td>
</tr>
</tbody>
</table>

PRESSURE RATINGS

<table>
<thead>
<tr>
<th>Material</th>
<th>Specification</th>
<th>Fahrenheit (°F)</th>
<th>Celsius (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Body</strong></td>
<td></td>
<td>Min.</td>
<td>Max.</td>
</tr>
<tr>
<td>Carbon Steel</td>
<td>ASTM A216 WCC</td>
<td>20</td>
<td>800</td>
</tr>
<tr>
<td>Low Temp Carbon Steel</td>
<td>ASTM A352 LCC</td>
<td>-50</td>
<td>650</td>
</tr>
<tr>
<td>Stainless Steel</td>
<td>ASTM A351 CF8M</td>
<td>-425</td>
<td>1500</td>
</tr>
<tr>
<td><strong>Seal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BUNA</td>
<td>BUNA</td>
<td>-40</td>
<td>248</td>
</tr>
<tr>
<td>HNBR 90</td>
<td>HNBR 90</td>
<td>-50</td>
<td>302</td>
</tr>
<tr>
<td>Viton® GLT 90</td>
<td>Viton® GLT 90</td>
<td>-50</td>
<td>392</td>
</tr>
</tbody>
</table>

Standard valve configurations use seals compatible with temperatures down to -40°F (-40°C).
WHAT YOU NEED. WHEN YOU NEED IT.

Our extensive product and application expertise allows us to be more than just a supplier. Our customers view us as the people they trust to integrate flow controls with their equipment and ensure the successful achievement of their project goals. Our increased involvement with a diverse range of projects, spanning an array of industries provides us with a multitude of references for successful integration.

People
- Product and Application Know-How
- Technically Trained Sales Staff
- Exceptional Customer Service

Products
- Ball, Butterfly, Check, Gate, Needle and Plug Valves
- Adapters, Fittings, Gaskets, Joints, Manifolds, Seals and Unions
- Product Leadership—Quality, Reliable and Innovative Products
- Replacement and Spare Parts
- ISO 9001:2008 Certified Organization

Services
- Distribution Network Located throughout North, Central, and South America
- Customer Specific Labeling and Packaging
- Strategic Account Partnerships
- Express Delivery
- Quality and Materials Assurance
- Valve Customization and Automation

VALVE QUALITY DEVELOPMENT TEAM

Before the decision is made to brand a product C&C, our Valve Quality Development Team conducts comprehensive manufacturers audits and inspections on both the product and the manufacturer’s production process. These stringent audits and inspections ensure the manufacturer’s ability to produce and provide products of consistent quality demanded by our customers and in accordance with documented procedures. Once manufacturers are qualified, the VQDT performs onsite witnessing and inspections of the product prior to releasing it for shipment. This added capability and oversight differentiates us from other suppliers.

Reports providing proof of quality and testing are available to our customers. Additional tests can be provided upon request.

- Positive Material Identification
- Material Test Reports
- Dye Penetrant Testing
- Quality and Technical Documentation
- Supplementary Testing per Customer Requirements
Our company is partnered with many of the largest and most successful valve and actuator manufacturers in the world. These relationships allow us to competently and competitively provide the valve/actuator/accessory packages that you require. Taking it one step further, we are able to marry products we represent with those we don’t and, as a result, provide you with a complete, fully customized flow control solution.

In order to best serve our customers, we have partnered with the industries’ top manufacturers to provide a complete range of valve automation services to keep your process up and running.

- Actuators
- Limit Switches
- Solenoid Valves
- Position Monitors and Transmitters
- Mounting Kits

**ADDITIONAL API 6D OFFERINGS**

**3 Piece Forged Trunnion Ball Valve - Trident Series**
The C&C 3 piece Forged Trunnion Mounted Ball Valve is ideally suited for pipeline and other applications within the global energy infrastructure where zero leakage positive shutoff is critical. API Monogrammed and compliant with all relevant industry specifications, C&C trunnion ball valves should be an integral component of your piping network.

- Sizes 2” to 36”, ASME Class 150 through 2500
- API 6D Monogrammed, ISO 14313, CSA Z245.15-17
- NACE MR0175/ISO 15156-1
- PED 2014/68/EU Annex III, Module H
- Compliant with ASME B16.5, B16.10 and ISO 5211
- Material Traceability to ASME B31.1
- Fire Safe: API 607 7th Edition

**2 Piece Cast Trunnion Ball Valve - Atlas Series**
The C&C Cast Trunnion Mounted Ball Valve’s split body construction complies with API 6D, ASME B16.34, API 608, API 607 and other relevant ASTM specifications. With a variety of material selections available as well as ISO 5211 complaint direct mount actuator pad, the Cast Trunnion Ball Valve can be customized and automated to suit a complete range of oil and gas applications.

- Sizes 2” to 16”, ASME Class 150 through 1500
- API 6D Monogrammed, ISO 14313, CSA Z245.15-17
- NACE MR0175/ISO 15156-1
- Material Traceability to ASME B31.1
- Compliant with ASME B16.5, B16.10 and ISO 52115
- PED 2014/68/EU Annex III, Module H
- Fire Safe: API 607 7th Edition

**Dual Expanding Plug Valve**
The VE® Dual Expanding plug valve was developed to replace the practice of using two inline valves with a drain and/or bleed valve. Traditional gate valves and other valve combinations degrade over time and result in loss of product and frequent maintenance. The special design of the dual expanding plug valve’s sealing mechanism minimizes wear, providing long lasting and safe, zero leakage flow control solution. Available in several different bleed system configurations in conjunction with a pressure relief device, this all in one valve not only meets API 6D requirements, but also provides a space saving, reliable and economical solution.

- Sizes 2” to 36”, ASME Class 150 through 600
- Fugitive Emissions (ISO 15848-1), Fire Safe (API 607), PED (PED 97/23/EC) and ATEX (ATEX 94/23/EC CAT II 3 G/D T1 to T4) Certified
- All Wetted Parts - ENP Protection
- Permanent Integral Thermal Relief and Bleed Function
- Ease of Inline Maintenance in Case of Seal Replacement
- Double Isolation Function According to API 6D/ISO 14313