The Cla-Val Model 100-02 is a hydraulically operated, diaphragm actuated, globe, or angle pattern valve. It consists of four major components: body, intermediate chamber, diaphragm assembly, and cover. The diaphragm assembly is the only moving part.

The diaphragm assembly which is guided top and center by a precision machined stem, utilizes a non-wicking diaphragm of nylon fabric bonded with synthetic rubber. The diaphragm forms a seal between the cover chamber and intermediate chamber. A synthetic rubber disc retained on three and one half sides forms a drip-tight seal with the renewable seat when pressure is applied above the diaphragm. As pressure above the diaphragm is relieved and pressure is applied below the diaphragm, the valve opens wide for full flow. The rate of closing or opening can be controlled by modulating flow into or out of the diaphragm chambers.

The Model 100-02 is recommended where independent operating pressure is desired. Available in various materials and in a full range of sizes, with either threaded or flanged ends, its applications are many and varied.

**Principle of Operation**

**Full Open Operation**
When operating pressure below the diaphragm is applied and operating, pressure is relieved from the cover chamber and, the valve is held open, allowing full flow.

**Tight Closing Operation**
When pressure below the diaphragm is relieved and operating pressure is applied to the cover chamber, the valve closes drip-tight.

**Modulating Action**
The valve holds any intermediate position when operating pressure is equal above and below the diaphragm. A Cla-Val four-way pilot control with "lock" position can maintain this balance by stopping flow in the pilot control system.
Specifications

Available Sizes

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Threaded</th>
<th>Flanged</th>
<th>Grooved End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Globe</td>
<td>⅜&quot; - 3&quot;</td>
<td>⅜&quot; - 24&quot;</td>
<td>⅜&quot;-2&quot;, ⅝&quot;-3&quot;, 1&quot;-4&quot;, 2&quot;-8&quot;</td>
</tr>
<tr>
<td>Angle</td>
<td>1½&quot; - 3&quot;</td>
<td>2&quot; - 16&quot;</td>
<td>2&quot; - 4&quot;</td>
</tr>
</tbody>
</table>

Operating Temp. Range

| Fluids | -40° to 180° F |

Pressure Ratings  (Recommended Maximum Pressure - psi)

<table>
<thead>
<tr>
<th>Valve Body &amp; Cover</th>
<th>Pressure Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flanged</td>
</tr>
<tr>
<td>Grade</td>
<td>ANSI Standards*</td>
</tr>
<tr>
<td>ASTM A536</td>
<td>Ductile Iron</td>
</tr>
<tr>
<td>ASTM A216-WCB</td>
<td>Cast Steel</td>
</tr>
<tr>
<td>UNS 87850</td>
<td>Bronze</td>
</tr>
</tbody>
</table>

Note: * ANSI standards are for flange dimensions only.
† End Details machined to ANSI B2.1 specifications.
‡ Consult factory when Maximum Operating Pressure Differential (MOPD) is greater than 400 PSID

“Valves for higher pressure are available; consult factory for details”

Materials

<table>
<thead>
<tr>
<th>Component</th>
<th>Standard Material Combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body &amp; Cover</td>
<td>Ductile Iron Cast Steel Bronze</td>
</tr>
<tr>
<td>Available Sizes</td>
<td>1½&quot; - 24&quot; 1½&quot; - 16&quot; 1½” - 16”</td>
</tr>
<tr>
<td>Disc Retainer &amp; Diaphragm Washer</td>
<td>Cast Iron Cast Steel Bronze</td>
</tr>
<tr>
<td>Trim: Disc Guide, Seat &amp; Cover Bearing</td>
<td>Bronze is Standard Stainless Steel is Optional</td>
</tr>
<tr>
<td>Disc</td>
<td>Buna-N® Rubber</td>
</tr>
<tr>
<td>Diaphragm</td>
<td>Nylon Reinforced Buna-N® Rubber</td>
</tr>
<tr>
<td>Stem, Nut &amp; Spring</td>
<td>Stainless Steel</td>
</tr>
</tbody>
</table>

For material options not listed, consult factory.
Cla-Val manufactures valves in more than 50 different alloys.

Options

Epoxy Coating - suffix KC

The NSF/ANSI 61 fusion bonded epoxy coating option is for use with cast iron, ductile iron or steel valves. This coating is resistant to various water conditions, certain acids, chemicals, solvents and alkalies. epoxy coatings are applied in accordance with AWWA coating specifications C116-03. Do not use with temperatures above 175°F

Viton® Rubber Parts - suffix KB

Optional diaphragm, disc and o-ring fabricated with Viton® synthetic rubber. Viton® is well suited for use with mineral acids, salt solutions, chlorinated hydrocarbons, and petroleum oils; and is primarily used in high temperature applications up to 250° F. Do not use with epoxy coating above 175°F.

Heavy Spring - suffix KH

The heavy spring option is used in applications where there is low differential pressure across the valve, and the additional spring force is needed to help the valve close. The option is best suited for valves used in on-off (non-modulating) service.

For assistance in selecting appropriate valve options or valves manufactured with special design requirements, please contact our Regional Sales Office or Factory.
The Value of K is calculated from the formula:

\[ K = \frac{894d^4}{C_v^2} \]

**K Factor** (Resistance Coefficient)
The Value of K is calculated from the formula: \[ K = \frac{894d^4}{C_v^2} \]

(\(d\) in inches, \(C_v\) in ft/\(s\))

**Equivalent Length of Pipe**
Equivalent lengths of pipe (\(L\)) are determined from the formula:

\[ L = \frac{Kd}{12f} \]

\(L\) = Equivalent Length of Pipe (feet)

\(d\) = inside pipe diameter of Schedule 40 Steel Pipe (inches)

\(f\) = friction factor for clean, new Schedule 40 pipe (dimensionless) (from Cameron Hydraulic Data, 18th Edition, P 3-119)

**Fluid Velocity**
Fluid velocity can be calculated from the following formula:

\[ V = \frac{4085Q}{d^2} \]

\(V\) = Fluid Velocity (feet per second) or (meters per second)

\(Q\) = Flow Rate in U.S. (gpm) or (l/s)

\(d\) = inside pipe diameter of Schedule 40 Steel Pipe (inches)

\(\Delta P\) = Pressure Drop in psi or bar

**Model 100-02 Flow Chart** (Based on normal flow through a wide open valve)
Cla-Val Control Valves operate with maximum efficiency when mounted in horizontal piping with the main valve cover UP, however, other positions are acceptable. Due to component size and weight of 8 inch and larger valves, installation with cover UP is advisable. We recommend isolation valves be installed on inlet and outlet for maintenance. Adequate space above and around the valve for service personnel should be considered essential. A regular maintenance program should be established based on the specific application data. However, we recommend a thorough inspection be done at least once a year. Consult factory for specific recommendations.

### Dimensions

**100-02 Threaded & Flanged**

**100-02 Grooved End**

---

**Valve Size (Inches)** | 3/8 | 1/2 | 3/4 | 1 | 1 1/2 | 2 | 2 1/2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30
---
**A Threaded** | 2.75 | 3.50 | 3.50 | 5.12 | 7.25 | 7.25 | 9.38 | 11.00 | 12.50 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**AA 150 ANSI** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**AAA 300 ANSI** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**AAA Grooved End** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**B Diameter** | 2.50 | 3.12 | 3.12 | 4.38 | 5.62 | 5.62 | 6.62 | 8.00 | 9.12 | 11.50 | 15.75 | 20.00 | 23.82 | 28.00 | 32.75 | 35.50 | 40.50 | 43.50 | 47.64 | 53.62 | 63.24 | 64.50 | — |
**C Maximum** | 2.33 | 5.88 | 5.88 | 6.25 | 7.62 | 7.62 | 8.56 | 10.31 | 11.19 | 14.25 | 18.44 | 21.81 | 23.38 | 29.31 | 32.12 | 35.00 | 49.43 | 53.09 | 56.50 | 68.70 | — |
**CC Maximum Grooved End** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**D Threaded** | — | — | — | — | 3.25 | 3.25 | 4.75 | 5.50 | 6.25 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**DD 150 ANSI** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**DDD 300 ANSI** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**DDD Grooved End** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**E** | 1.25 | 0.88 | 0.88 | 1.63 | 1.12 | 1.12 | 1.50 | 1.69 | 2.06 | 3.19 | 4.31 | 5.31 | 9.25 | 10.75 | 12.62 | 15.50 | 12.95 | 15.00 | 17.75 | 21.31 |
**EE Grooved End** | — | — | — | — | 2.00 | 2.50 | 2.88 | 3.12 | 4.25 | 6.00 | 7.56 | — | — | — | — | — | — | — | — | — | — | — | — |
**F 150 ANSI** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**FF 300 ANSI** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**G Threaded** | — | — | — | — | 1.88 | 1.88 | 3.25 | 4.00 | 4.50 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**GG 150 ANSI** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**GGG 300 ANSI** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**GGGG Grooved End** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**H NPT Body Tapping** | — | 0.125 | 0.125 | 0.25 | 0.375 | 0.375 | 0.375 | 0.50 | 0.50 | 0.75 | 0.75 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 |
**J NPT Cover Center Plug** | 0.125 | 0.125 | 0.125 | 0.25 | 0.25 | 0.25 | 0.25 | 0.50 | 0.50 | 0.75 | 0.75 | 1.00 | 1.00 | 1.25 | 1.50 | 2.00 | 1.50 | 1.50 | 1.50 | 2.00 |
**K NPT Cover Tapping** | — | 0.125 | 0.125 | 0.25 | 0.375 | 0.375 | 0.375 | 0.50 | 0.50 | 0.75 | 0.75 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 |
**Valve Stem Int. Thread UNF** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**Valve Stem Thread UNF** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
**Approx. Ship Weight (lbs)** | 8 | 8 | 8 | 13 | 22 | 22 | 40 | 65 | 95 | 190 | 320 | 650 | 940 | 1675 | 2460 | 3100 | 4300 | 5400 | 8150 | 10300 |

Note: The top two flange holes on valve size 36 are threaded to 1 1/2"-6 UNC.