



—MODEL— **100-01**

Hytrol Valve



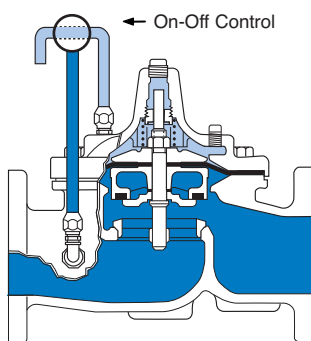
- Drip-Tight, Positive Seating
- Service Without Removal From Line
- Threaded, Flanged or Grooved Ends
- Globe or Angle Pattern
- 100% Factory Tested

The Cla-Val Model 100-01 Hytrol Valve is a hydraulically operated, diaphragm actuated, globe or angle pattern valve. It consists of three major components: body, diaphragm assembly, and cover. The diaphragm assembly is the only moving part.

The diaphragm assembly is guided top and bottom by a precision machined stem. It utilizes a non-wicking diaphragm of nylon fabric bonded with synthetic rubber. A resilient synthetic rubber disc retained on three and one half sides by a disc retainer forms a drip-tight seal with the renewable seat when pressure is applied above the diaphragm.

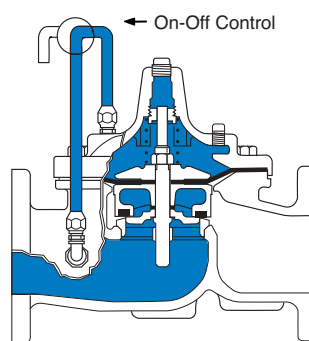
The Model 100-01 is the basic valve used in nearly all Cla-Val Automatic Control Valves. It is the valve of choice for system applications requiring remote control, pressure regulation, solenoid operation, rate of flow control, liquid level control or check valve operation. The rugged simplicity of design and packless construction assure a long life of dependable, trouble-free operation. It is available in various materials and in a full range of sizes, with either threaded, flanged or grooved ends. Its applications are unlimited.

Principle of Operation



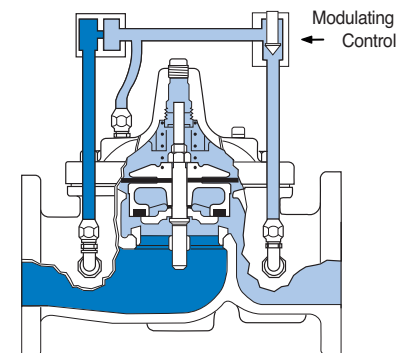
Full Open Operation

When pressure in the cover chamber is relieved to a zone of lower pressure, the line pressure at the valve inlet opens the valve, allowing full flow.



Tight Closing Operation

When pressure from the valve inlet is applied to the cover chamber, the valve closes drip-tight.



Modulating Action

The valve holds any intermediate position when operating pressures are equal above and below the diaphragm. A Cla-Val "Modulating" Pilot Control will allow the valve to automatically compensate for line pressure changes.

Specifications

Available Sizes

| Pattern | Threaded | Flanged | Grooved End |
|---------|-----------|--------------------|-----------------------------------|
| Globe | 3/8" - 3" | 1 1/2" - 36" | 1 1/2"-2"- 2 1/2"- 3"- 4"- 6"- 8" |
| Angle | 1" - 3" | 1 1/2" - 16" & 24" | 2" - 3" - 4" |

Operating Temp. Range

| Fluids |
|----------------|
| -40° to 180° F |

Pressure Ratings (Recommended Maximum Pressure - psi)

| Valve Body & Cover | | Pressure Class | | | | |
|--------------------|--------------|-----------------|-----------|-----------|-----------|--------------|
| | | Flanged | | Grooved | Threaded | |
| Grade | Material | ANSI Standards* | 150 Class | 300 Class | 300 Class | End‡ Details |
| ASTM A536 | Ductile Iron | B16.42 | 250 | 400 | 400 | 400 |
| ASTM A216-WCB | Cast Steel | B16.5 | 285 | 400 | 400 | 400 |
| UNS 87850 | Bronze | B16.24 | 225 | 400 | 400 | 400 |

Note: * ANSI standards are for flange dimensions only.
 Flanged valves are available faced but not drilled.
 ‡ End Details machined to ANSI B2.1 specifications.

Valves for higher pressure are available; consult factory for details

Materials

| Component | Standard Material Combinations | | |
|--|---|------------|----------|
| Body & Cover | Ductile Iron | Cast Steel | Bronze |
| Available Sizes | 3/8" - 36" | 1" - 16" | 1" - 16" |
| Disc Retainer & Diaphragm Washer | Cast Iron | Cast Steel | Bronze |
| Trim: Disc Guide, Seat & Cover Bearing | Bronze is Standard Stainless Steel is optional | | |
| Disc | Buna-N® Rubber | | |
| Diaphragm | Nylon Reinforced Buna-N® Rubber | | |
| Stem, Nut & Spring | Stainless Steel | | |
| For material options not listed, consult factory. Cla-Val manufactures valves in more than 50 different alloys. | | | |

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 coatings above 175° F.

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 alkalis. epoxy coatings are applied in accordance with AWWA coating specifications C116-03. Do not use with temperatures above 175° F.

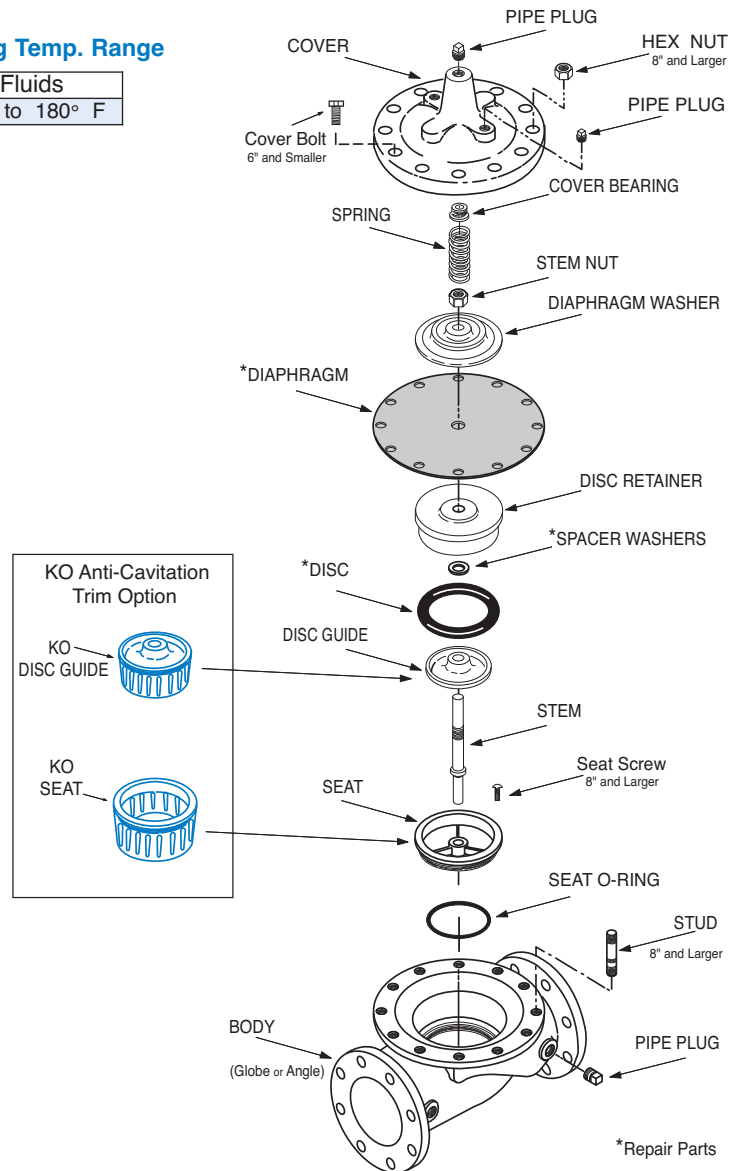
Dura-Kleen® Stem - suffix KD

This stem is designed for applications where water supplies containing dissolved minerals create deposits that build-up on a standard stem and hamper valve operation. A patented, self-cleaning design on the stem allows all valve sizes to operate freely in the harshest conditions.

Delrin® Sleeved Stem - suffix KG

The Delrin® sleeved stem is designed for applications where water supplies contain dissolved minerals which can form deposits that build up on the valve stem and hamper valve operation. Scale build-up will not adhere to the Delrin® sleeve stem. Delrin® sleeved stems are not recommended for valves in continuous operation where differential pressures are in excess of 80 psi (2" and larger Hytrol valves).

Model 100-01



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. This option is best suited for valves used in on-off (non-modulating) service.

Anti-Cavitation Trim - suffix KO

Anti-Cavitation Trim components consist of a stainless steel radial slotted disc guide and seat. This system is used when high differentials are present across the valve.

Water Treatment Clearance - suffix KW

This additional clearance is beneficial in applications where water treatment compounds can interfere with the closing of the valve. The smaller outside diameter disc guide provides more clearance between the disc guide and the valve seat. This 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.

Functional Data

Model 100-01

† Non Guided Stem

| Valve Size | | Inches | 1/8" | 1/4" | 3/8" | 1/2" | 3/4" | 1" | 1 1/4" | 1 1/2" | 2" | 2 1/2" | 3" | 4" | 6" | 8" | 10" | 12" | 14" | 16" | 18" | 20" | 24" | 30" | 36" |
|--|---------------|-----------------|------|------|------|------|------|------|--------|--------|-----|--------|-----|-----|------|------|-------|-------|-------|------|------|-------|-------|-------|-----|
| | | mm. | 10 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 750 | 900 | | |
| C _V Factor | Globe Pattern | Gal./Min.(gpm.) | 1.8 | 6 | 8.5 | 13.3 | 20 | 30 | 32 | 54 | 85 | 115 | 200 | 440 | 770 | 1245 | 1725 | 2300 | 3130 | 4463 | 5345 | 7655 | 10150 | 14020 | |
| | Angle Pattern | Gal./Min.(gpm.) | — | — | — | — | 21 | 27 | 29 | 61 | 101 | 139 | 240 | 541 | 990 | 1575 | 2500* | 3060* | 4200* | — | — | 9950* | — | — | |
| Equivalent Length of Pipe | Globe Pattern | Feet (ft.) | 25 | 7 | 16 | 23 | 10 | 19 | 37 | 51 | 53 | 85 | 116 | 211 | 291 | 347 | 467 | 422 | 503 | 612 | 595 | 628 | 1181 | 2285 | |
| | | Meters (m.) | 7.6 | 2.2 | 4.8 | 7.1 | 3.1 | 5.7 | 12 | 15.5 | 16 | 26 | 35 | 64 | 89 | 106 | 142 | 129 | 154 | 187 | 181 | 192 | 360 | 696 | |
| | Angle Pattern | Feet (ft.) | — | — | — | — | 9.0 | 28 | 46 | 40 | 37 | 58 | 80 | 139 | 176 | 217 | 222* | 238* | 247* | — | — | — | 372* | — | — |
| | | Meters (m.) | — | — | — | — | 2.8 | 8.7 | 14 | 12 | 11 | 18 | 25 | 43 | 54 | 66 | 68 | 73 | 75 | — | — | — | 113 | — | — |
| K Factor | Globe Pattern | | 16.3 | 3.7 | 5.7 | 6.1 | 2.7 | 3.6 | 5.9 | 5.6 | 4.6 | 6.0 | 5.9 | 6.2 | 6.1 | 5.8 | 6.1 | 5.0 | 4.6 | 5.2 | 3.9 | 4.0 | 6.4 | 6.4 | |
| | Angle Pattern | | — | — | — | — | 2.5 | 4.4 | 7.1 | 4.4 | 3.3 | 4.1 | 4.1 | 4.1 | 3.7 | 3.6 | 2.9 | 2.8 | 2.6 | — | — | 2.4 | — | — | |
| Liquid Displaced from Cover Chamber When Valve Opens | Fl. Oz | | .12 | .34 | .34 | .70 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | |
| | U.S. Gal. | | — | — | — | — | .02 | .02 | .02 | .03 | .04 | .08 | .17 | .53 | 1.26 | 2.51 | 4.0 | 6.5 | 9.6 | 11 | 12 | 29 | 42 | 90 | |
| | ml | | 3.5 | 10.1 | 10.1 | 20.7 | 75.7 | 75.7 | 75.7 | 121 | 163 | 303 | 643 | — | — | — | — | — | — | — | — | — | — | — | — |
| | Litres | | — | — | — | — | — | — | — | — | — | — | — | 2.0 | 4.8 | 9.5 | 15.1 | 24.6 | 36.2 | 41.6 | 45.4 | 109.8 | 159 | 340 | |

*Estimated

C_V Factor

Formulas for computing C_V Factor, Flow (Q) and Pressure Drop (ΔP):

$$C_V = \frac{Q}{\sqrt{\Delta P}} \quad Q = C_V \sqrt{\Delta P} \quad \Delta P = \left(\frac{Q}{C_V}\right)^2$$

K Factor (Resistance Coefficient)

The Value of K is calculated from the formula: $K = \frac{894d^4}{C_V^2}$ (U.S. system units)

Equivalent Length of Pipe

Equivalent lengths of pipe (L) are determined from the formula: $L = \frac{Kd}{12f}$ (U.S. system units)

Fluid Velocity

Fluid velocity can be calculated from the following formula: $V = \frac{.4085 Q}{d^2}$ (U.S. system units)

Where:

C_V = U.S. (gpm) @ 1 psi differential at 60° F water
or

= (l/s) @ 1 bar (14.5 PSIG) differential at 15° C water

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)

K = Resistance Coefficient (calculated)

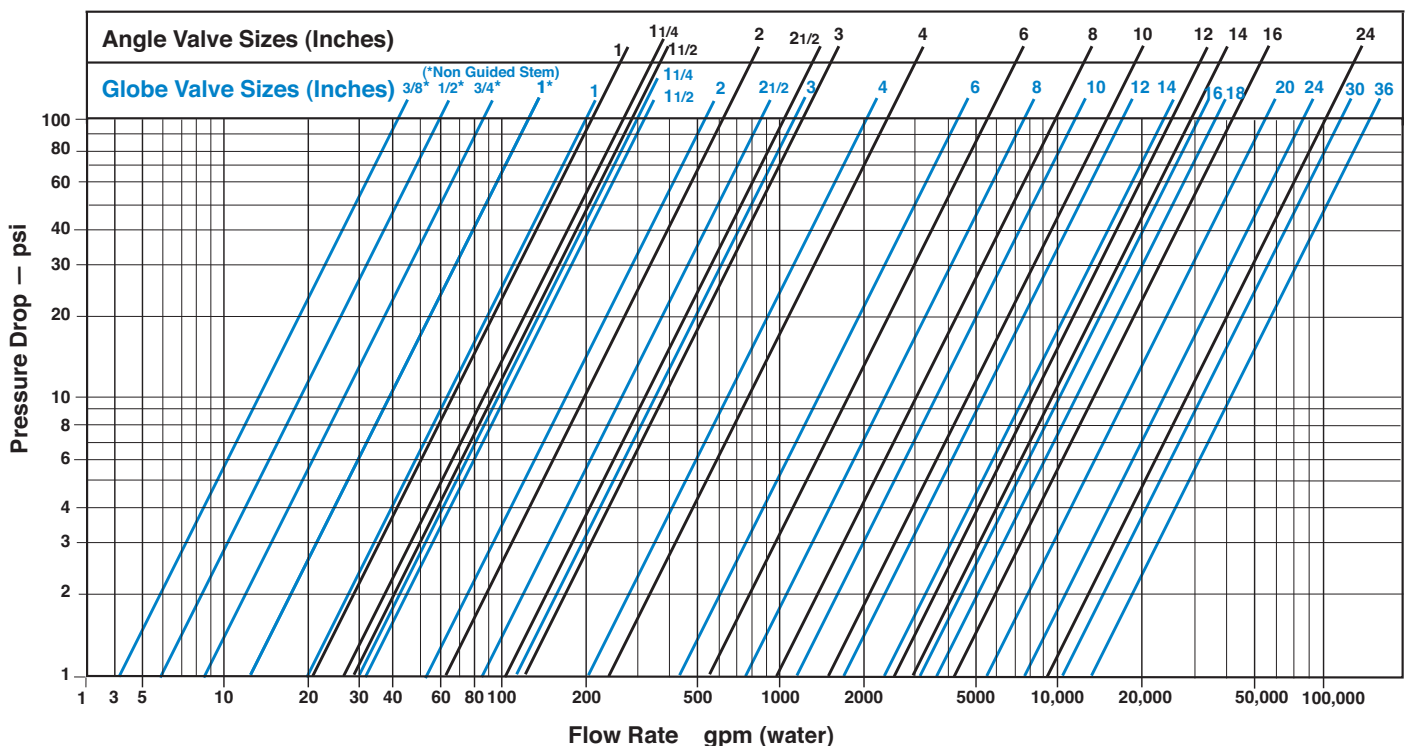
L = Equivalent Length of Pipe (feet)

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

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

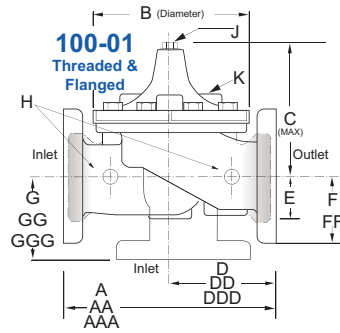
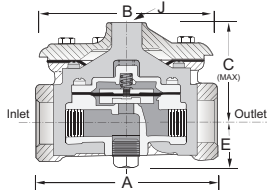
ΔP = Pressure Drop in (psi) or (bar)

Model 100-01 Flow Chart (Based on normal flow through a wide open valve)

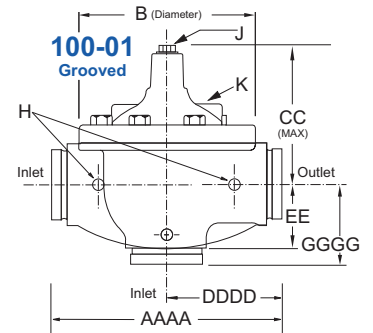
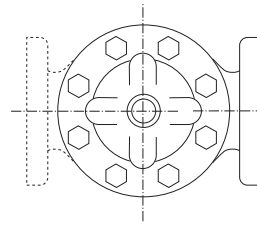


Dimensions

100-01 3/8", 1/2", 3/4", 1" Auxiliary Hytrol Valves with non Guided Stems



Model 100-01



| Valve Size (Inches) | 3/8* | 1/2* | 3/4* | 1* | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18† | 20† | 24† | 30† | 36† | |
|----------------------------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| A Threaded | 2.75 | 3.50 | 3.50 | 5.12 | 7.25 | 7.25 | 7.25 | 9.38 | 11.00 | 12.50 | — | — | — | — | — | — | — | — | — | — | — | — | |
| AA 150 ANSI | — | — | — | — | — | — | 8.50 | 9.38 | 11.00 | 12.00 | 15.00 | 20.00 | 25.38 | 29.75 | 34.00 | 39.00 | 41.38 | 46.00 | 52.00 | 61.50 | 63.00 | 72.75 | |
| AAA 300 ANSI | — | — | — | — | — | — | 9.00 | 10.00 | 11.62 | 13.25 | 15.62 | 21.00 | 26.38 | 31.12 | 35.50 | 40.50 | 43.50 | 47.64 | 53.62 | 63.24 | 64.50 | 74.75 | |
| AAAA Grooved End | — | — | — | — | — | — | 8.50 | 9.00 | 11.00 | 12.50 | 15.00 | 20.00 | 25.38 | — | — | — | — | — | — | — | — | — | |
| B Diameter | 2.50 | 3.12 | 3.12 | 4.38 | 5.62 | 5.62 | 5.62 | 6.62 | 8.00 | 9.12 | 11.50 | 15.75 | 20.00 | 23.62 | 28.00 | 32.75 | 35.50 | 41.50 | 45.00 | 53.16 | 56.00 | 66.00 | |
| C Maximum | 2.33 | 5.88 | 5.88 | 6.25 | 5.50 | 5.50 | 5.50 | 6.50 | 7.56 | 8.19 | 10.62 | 13.38 | 16.00 | 17.12 | 20.88 | 24.19 | 25.00 | 39.06 | 41.90 | 43.93 | 54.60 | 59.00 | |
| CC Maximum Grooved End | — | — | — | — | — | — | 4.75 | 5.75 | 6.88 | 7.25 | 9.31 | 12.12 | 14.62 | — | — | — | — | — | — | — | — | — | |
| D Threaded | — | — | — | — | 3.25 | 3.25 | 3.25 | 4.75 | 5.50 | 6.25 | — | — | — | — | — | — | — | — | — | — | — | — | |
| DD 150 ANSI | — | — | — | — | — | — | 4.00 | 4.75 | 5.50 | 6.00 | 7.50 | 10.00 | 12.69 | 14.88 | 17.00 | 19.50 | 20.81 | — | — | 30.75 | — | — | |
| DDD 300 ANSI | — | — | — | — | — | — | 4.25 | 5.00 | 5.88 | 6.38 | 7.88 | 10.50 | 13.25 | 15.56 | 17.75 | 20.25 | 21.62 | — | — | 31.62 | — | — | |
| DDDD Grooved End | — | — | — | — | — | — | 4.75 | — | 6.00 | 7.50 | — | — | — | — | — | — | — | — | — | — | — | — | |
| E | 1.25 | 0.88 | 0.88 | 1.63 | 1.12 | 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 | 24.56 | |
| EE Grooved End | — | — | — | — | — | — | 2.00 | 2.50 | 2.88 | 3.12 | 4.25 | 6.00 | 7.56 | — | — | — | — | — | — | — | — | — | |
| F 150 ANSI | — | — | — | — | — | — | 2.50 | 3.00 | 3.50 | 3.75 | 4.50 | 5.50 | 6.75 | 8.00 | 9.50 | 10.50 | 11.75 | 15.00 | 16.50 | 19.25 | 22.50 | 28.50 | |
| FF 300 ANSI | — | — | — | — | — | — | 3.06 | 3.25 | 3.75 | 4.13 | 5.00 | 6.25 | 7.50 | 8.75 | 10.25 | 11.50 | 12.75 | 15.00 | 16.50 | 19.25 | 24.00 | 30.00 | |
| G Threaded | — | — | — | — | 1.88 | 1.88 | 1.88 | 3.25 | 4.00 | 4.50 | — | — | — | — | — | — | — | — | — | — | — | — | |
| GG 150 ANSI | — | — | — | — | — | — | 4.00 | 3.25 | 4.00 | 4.00 | 5.00 | 6.00 | 8.00 | 8.62 | 13.75 | 14.88 | 15.69 | — | — | 22.06 | — | — | |
| GGG 300 ANSI | — | — | — | — | — | — | 4.25 | 3.50 | 4.31 | 4.38 | 5.31 | 6.50 | 8.50 | 9.31 | 14.50 | 15.62 | 16.50 | — | — | 22.90 | — | — | |
| GGGG Grooved End | — | — | — | — | — | — | 3.25 | — | 4.25 | 5.00 | — | — | — | — | — | — | — | — | — | — | — | — | |
| H NPT Body Tapping | — | 0.125 | 0.125 | 0.25 | 0.375 | 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 | 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 | 0.50 | 0.75 | 0.75 | 1.00 | 1.00 | 1.25 | 1.50 | 2.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | |
| K NPT Cover Tapping | — | 0.125 | 0.125 | 0.25 | 0.375 | 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 | 2.00 | |
| Valve Stem Int. Thread UNF | — | — | — | — | 10-32 | 10-32 | 10-32 | 10-32 | 10-32 | 10-32 | 1/4-28 | 1/4-28 | 3/8-24 | 3/8-24 | 3/8-24 | 3/8-24 | 1/2-20 | 3/4-16 | 3/4-16 | 3/4-16 | 3/4-16 | 3/4-16 | 3/4-16 |
| Stem Travel | — | — | — | — | 0.40 | 0.40 | 0.40 | 0.60 | 0.70 | 0.80 | 1.10 | 1.70 | 2.30 | 2.80 | 3.40 | 4.00 | 4.50 | 5.10 | 5.63 | 6.75 | 7.50 | 8.50 | |
| Approx. Ship Weight (lbs) | 3 | 3 | 8 | 8 | 15 | 15 | 15 | 35 | 50 | 70 | 140 | 285 | 500 | 780 | 1165 | 1600 | 2265 | 2982 | 3900 | 6200 | 7703 | 11720 | |

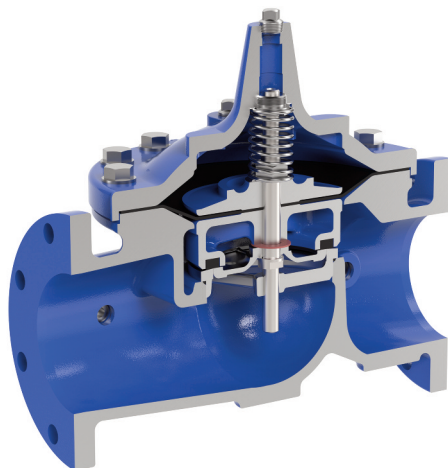
Note: The top two flange holes on valve size 36 are threaded to 1 1/2"-6 UNC.

*Non Guided Stem Auxiliary Hytrol Controls

†18 inch and larger 100-01 series Hytrol valves are equipped with flange feet for safety and convenience.

Consult Cla-Val representative for details.

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.



go to www.cla-val.com and click on the YouTube link to view a 3D animation demonstrating how the 100-01 operates