CLA-VAL™

MODEL 90-72 (Full Internal Port)
690-72 (Reduced Internal Port)

# Pressure Reducing Valve with Low Flow By-Pass

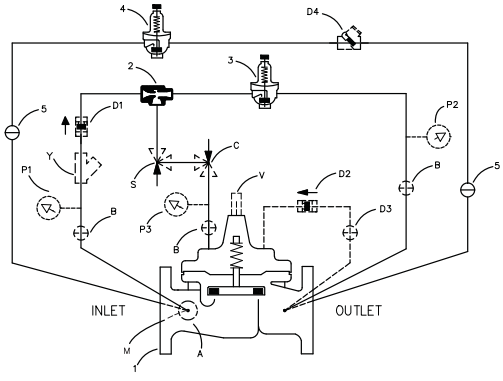
- **Modulating Control**
- **Maintains Constant Outlet Pressure Over a Wide Range of Flows**
- **Durable Construction**
- **Convenient and Space Saving**

The Cla-Val Model 90-72/690-72 Pressure Reducing Valve with Low Flow By-Pass automatically reduces a higher inlet pressure to a steady lower downstream pressure, regardless of changing flow rate. The low flow by-pass capability is achieved by using the Cla-Val Model 990 Direct Acting Pressure Reducing Valve as an integral part of the main valve. By doing this, space is saved and installation and maintenance become much easier.

The pressure reducing valve is hydraulically operated and controlled by a Cla-Val CRD pilot control, which senses pressure at the main valve outlet. An increase in outlet pressure forces the CRD pilot control to close and a decrease in outlet pressure opens the control. This causes the main valve cover pressure to vary, modulating the main valve, thereby, maintaining constant outlet pressure.

The Model 990 low flow pressure reducing by-pass is set to a higher pressure than the CRD pilot control. The 990 responds to pressure changes at the main valve outlet. When the CRD closes, the Model 990 remains open, allowing low flow to by-pass the main valve. The 990 closes when the flow decreases and the downstream pressure reaches its set-point.

The Cla-Val Model 90-72/690-72 is not a substitute for a low flow bypass valve in all cases. This valve is commonly used in building where 1-15 gpm low flows are common in off peak usage.The bypass on this valve is limited to the body tapping size on the main valve.




## Schematic Diagram

| Item | Description |
|---|---|
| 1 | Hytrol (Main Valve) |
| 2 | X47A Ejector |
| 3 | CRD Pressure Reducing Control |
| 4 | 990 Pressure Reducing Valve |
| 5 | CK2 (Isolation Valve) |

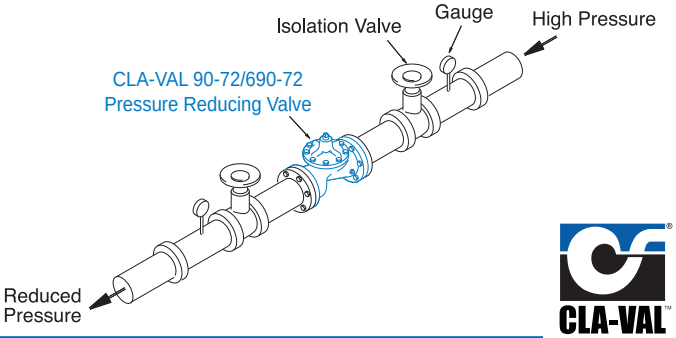
## Optional Features

| Item | Description |
|---|---|
| A | X46A Flow Clean Strainer |
| B | CK2 (Isolation Valve) |
| C | CV Flow Control (Closing)* |
| D | Check Valves with Isolation Valve |
| M | X144 e-FlowMeter |
| P | X141 Pressure Gauge |
| S | CV Speed Control (Opening)* |
| V | X101 Valve Position Indicator |
| Y | X43 "Y" Strainer |

*The optional closing speed control on this valve should always be open at least three (3) turns off its seat.

## Typical Applications

This valve has the flexibility to be installed in a distribution system where the demand varies over a wide range. This frequently occurs in industrial, residential, educational, high-rise buildings and other applications. Another important feature of the valve is its space efficient configuration, allowing easy installation and maintenance.




CLA-VAL™

## Model 90-72 (Uses Basic Valve Model 100-01)

## Pressure Ratings (Recommended Maximum Pressure - psi)

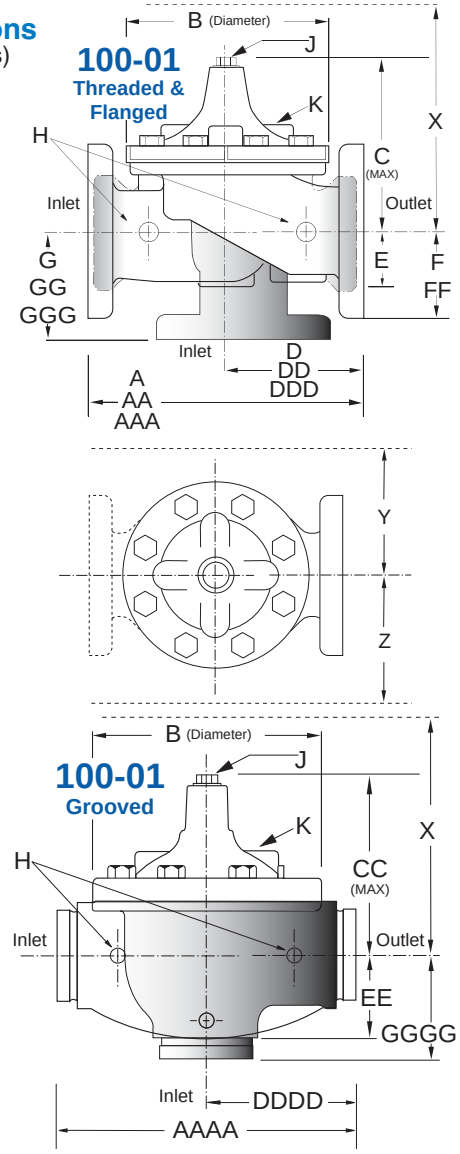
| Valve Body & Cover | | Pressure Class | | | | |
|---|---|---|---|---|---|---|
| | | Flanged | | | Grooved | Threaded |
| Grade | Material | ANSI Standards* | 150 Class | 300 Class | 300 Class | End‡ Details |
| ASTM A536 | Ductile Iron | B16.42 | 250 | 400 | 400 | 400 |
| ASTM A216-WCB | Cast Steel | B16.5 | 285 | 400 | 400 | 400 |
| ASTM B62 | 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 | 1" - 8" | 1" - 8" | 1" - 8" |
| Disc Retainer & Diaphragm Washer | Cast Iron | Cast Steel | Bronze |
| Trim: Disc Guide, Seat & Cover Bearing | Bronze is Standard<br>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.<br>Cla-Val manufactures valves in more than 50 different alloys. | | | |

## Dimensions
(In inches)




## Model 90-72 Dimensions (In Inches) - For larger sizes, consult Factory

| **Valve Size** (Inches) | **1** | **1 1/4** | **1 1/2** | **2** | **2 1/2** | **3** | **4** | **6** | **8** |
|---|---|---|---|---|---|---|---|---|---|
| **A** Threaded | 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 |
| **AAA** 300 ANSI | — | — | 9.00 | 10.00 | 11.62 | 13.25 | 15.62 | 21.00 | 26.38 |
| **AAAA** Grooved End | — | — | 8.50 | 9.00 | 11.00 | 12.50 | 15.00 | 20.00 | 25.38 |
| **B** Dia. | 5.62 | 5.62 | 5.62 | 6.62 | 8.00 | 9.12 | 11.50 | 15.75 | 20.00 |
| **C** Max. | 5.50 | 5.50 | 5.50 | 6.50 | 7.56 | 8.19 | 10.62 | 13.38 | 16.00 |
| **CC** Max. 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 |
| **DDD** 300 ANSI | — | — | 4.25 | 5.00 | 5.88 | 6.38 | 7.88 | 10.50 | 13.25 |
| **DDDD** Grooved End | — | — | — | 4.75 | — | 6.00 | 7.50 | — | — |
| **E** | 1.12 | 1.12 | 1.12 | 1.50 | 1.69 | 2.06 | 3.19 | 4.31 | 5.31 |
| **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 |
| **FF** 300 ANSI | — | — | 3.06 | 3.25 | 3.75 | 4.13 | 5.00 | 6.25 | 7.50 |
| **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 |
| **GGG** 300 ANSI | — | — | 4.25 | 3.50 | 4.31 | 4.38 | 5.31 | 6.50 | 8.50 |
| **GGGG** Grooved End | — | — | — | 3.25 | — | 4.25 | 5.00 | — | — |
| **H** NPT Body Tapping | .375 | .375 | .375 | .375 | .50 | .50 | .75 | .75 | 1 |
| **J** NPT Cover Center Plug | .25 | .25 | .25 | .50 | .50 | .50 | .75 | .75 | 1 |
| **K** NPT Cover Tapping | .375 | .375 | .375 | .375 | .50 | .50 | .75 | .75 | 1 |
| Stem Travel | 0.4 | 0.4 | 0.4 | 0.6 | 0.7 | 0.8 | 1.1 | 1.7 | 2.3 |
| Approx. Ship Wt. Lbs. | 15 | 15 | 15 | 35 | 50 | 70 | 140 | 285 | 500 |
| **X** Pilot System | 11 | 11 | 11 | 13 | 14 | 15 | 17 | 29 | 31 |
| **Y** Pilot System | 9 | 9 | 9 | 9 | 10 | 11 | 12 | 20 | 22 |
| **Z** Pilot System | 9 | 9 | 9 | 9 | 10 | 11 | 12 | 20 | 22 |

## Model 690-72 (Uses Basic Valve Model 100-20)

## Pressure Ratings (Recommended Maximum Pressure - psi)

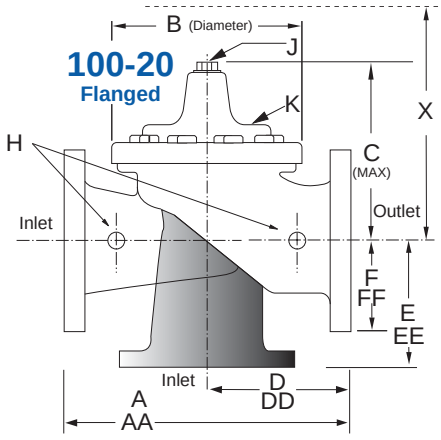
| Valve Body & Cover | | Pressure Class | | |
|---|---|---|---|---|
| | | Flanged | | |
| Grade | Material | ANSI Standards* | 150 Class | 300 Class |
| ASTM A536 | Ductile Iron | B16.42 | 250 | 400 |
| ASTM A216-WCB | Cast Steel | B16.5 | 285 | 400 |
| ASTM B62 | Bronze | B16.24 | 225 | 400 |

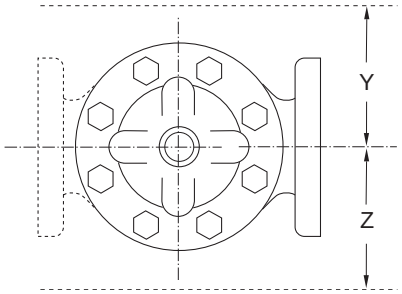
Note: * ANSI standards are for flange dimensions only.
Flanged valves are available faced but not drilled.
***Valves for higher pressure are available; consult factory for details***

## Materials

| Component | Standard Material Combinations | | |
|---|---|---|---|
| Body & Cover | Ductile Iron | Cast Steel | Bronze |
| Available Sizes | 3" - 10" | 3" - 10" | 3" - 10" |
| Disc Retainer & Diaphragm Washer | Cast Iron | Cast Steel | Bronze |
| Trim: Disc Guide, Seat & Cover Bearing | Bronze is Standard<br>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.<br>Cla-Val manufactures valves in more than 50 different alloys. | | | |

## Dimensions
(In inches)




## Model 690-72 Dimensions (In Inches) - For larger sizes, consult Factory

| **Valve Size** (Inches) | **3** | **4** | **6** | **8** | **10** |
|---|---|---|---|---|---|
| **A** 150 ANSI | 10.25 | 13.88 | 17.75 | 21.38 | 26.00 |
| **AA** 300 ANSI | 11.00 | 14.50 | 18.62 | 22.38 | 27.38 |
| **B** Dia. | 6.62 | 9.12 | 11.50 | 15.75 | 20.00 |
| **C** Max. | 7.00 | 8.62 | 11.62 | 15.00 | 17.88 |
| **D** 150 ANSI | — | 6.94 | 8.88 | 10.69 | CF* |
| **DD** 300 ANSI | — | 7.25 | 9.38 | 11.19 | CF* |
| **E** 150 ANSI | — | 5.50 | 6.75 | 7.25 | CF* |
| **EE** 300 ANSI | — | 5.81 | 7.25 | 7.75 | CF* |
| **F** 150 ANSI | 3.75 | 4.50 | 5.50 | 6.75 | 8.00 |
| **FF** 300 ANSI | 4.12 | 5.00 | 6.25 | 7.50 | 8.75 |
| **H** NPT Body Tapping | .375 | .50 | .75 | .75 | 1 |
| **J** NPT Cover Center Plug | .50 | .50 | .75 | .75 | 1 |
| **K** NPT Cover Tapping | .375 | .50 | .75 | .75 | 1 |
| Stem Travel | 0.6 | 0.8 | 1.1 | 1.7 | 2.3 |
| Approx. Ship Wt. Lbs. | 45 | 85 | 195 | 330 | 625 |
| **X** Pilot System | 13 | 15 | 27 | 30 | 33 |
| **Y** Pilot System | 10 | 11 | 18 | 20 | 22 |
| **Z** Pilot System | 10 | 11 | 18 | 20 | 22 |

*Consult Factory

| 90-72 Valve Selection | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 | 6 | 8 |
| | mm | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 150 | 200 |
| Basic Valve 100-01 | Pattern | G, A | G, A | G, A | G, A | G, A | G, A | G, A | G, A | G, A |
| | End Detail | T | T | T, F, Gr* | T, F, Gr | T, F, Gr* | T, F, Gr | F, Gr | F, Gr* | F, Gr* |
| Suggested Flow (gpm) | Maximum | 55 | 93 | 125 | 210 | 300 | 460 | 800 | 1800 | 3100 |
| | Maximum Intermittent | 68 | 120 | 160 | 260 | 370 | 580 | 990 | 2250 | 3900 |
| | Minimum | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Suggested Flow (Liters/Sec) | Maximum | 3.5 | 6 | 8 | 13 | 19 | 29 | 50 | 113 | 195 |
| | Maximum Intermittent | 4.3 | 7.6 | 10 | 16 | 23 | 37 | 62 | 142 | 246 |
| | Minimum | .03 | .03 | .03 | .06 | .06 | .06 | .06 | .06 | 0.95 |

**100-01 Pattern:** Globe (G), Angle (A), **End Connections:** Threaded (T), Grooved (GR), Flanged (F) Indicate Available Sizes

**100-01 Series is the full internal port Hytrol.** **For Lower Flows Consult Factory** *Globe Grooved Only

| 690-72 Valve Selection | 100-20 Pattern: Globe (G), Angle (A), End Connections: Flanged (F) Indicate Available Sizes | | | | | |
|---|---|---|---|---|---|---|
| | Inches | 3 | 4 | 6 | 8 | 10 |
| | mm | 80 | 100 | 150 | 200 | 250 |
| Basic Valve 100-20 | Pattern | G | G, A | G, A | G, A | G |
| | End Detail | F | F | F | F | F |
| Suggested Flow (gpm) | Maximum | 260 | 580 | 1025 | 2300 | 4100 |
| | Minimum | 1 | 1 | 1 | 1 | 1 |
| Suggested Flow (Liters/Sec) | Maximum | 16 | 37 | 65 | 145 | 258 |
| | Minimum | .06 | .06 | .06 | .06 | .95 |

**100-20 Series is the reduced internal port size version of the 100-01 Series.** **For Lower Flows Consult Factory**

## Pilot System Specifications

### Adjustment Ranges

**CRD**

2 to 30 psi
15 to 75 psi
20 to 105 psi
30 to 300 psi

**Model 990 (Bypass)**

7 to 29 psi
29 to 87 psi
87 to 145 psi

### Temperature Range

Water: to 180°

### Materials

Standard Pilot System Materials

Pilot Control: Bronze ASTM B62
Trim: Stainless Steel Type 303
Rubber: Buna-N® Synthetic Rubber

Optional Pilot System Materials

Pilot Systems are available with optional Aluminum, Stainless Steel or Monel materials.

## When Ordering, Please Specify

1. Catalog No. 90-72 or No. 690-72
2. Valve Size
3. Pattern - Globe or Angle
4. Pressure Class
5. Threaded or Flanged
6. Trim Material
7. Adjustment Range
8. Desired Options
9. When Vertically Installed
10. Product Enhancement

CLA-VAL®
CLA-VAL™
E-90-72/690-72 (09/2013)

CLA-VAL
PO Box 1325 Newport Beach CA 92659-0325
Phone: 949-722-4800 • Fax: 949-548-5441

CLA-VAL CANADA
4687 Christie Drive
Beamsville, Ontario
Canada L0R 1B4
Phone: 905-563-4963
Fax: 905-563-4040

CLA-VAL EUROPE
Chemin dés Mesanges 1
CH-1032 Romanel/
Lausanne, Switzerland
Phone: 41-21-643-15-55
Fax: 41-21-643-15-50

www.cla-val.com



Represented By: