



MODEL **90-01**  
**690-01**

# Pressure Reducing Valve



- Sensitive and Accurate Pressure Control
- Easy Adjustment and Maintenance
- Tamper Resistant
- Optional Check Feature
- Fully Supported Frictionless Diaphragm

The Cla-Val Model 90-01/690-01 Pressure Reducing Valve automatically reduces a higher inlet pressure to a steady lower downstream pressure regardless of changing flow rate and/or varying inlet pressure. This valve is an accurate, pilot-operated regulator capable of holding downstream pressure to a pre-determined limit. When downstream pressure exceeds the pressure setting of the control pilot, the main valve and pilot valve close drip tight.

If a check feature is added, and a pressure reversal occurs, the downstream pressure is admitted in the main valve cover chamber closing the valve to prevent return flow.

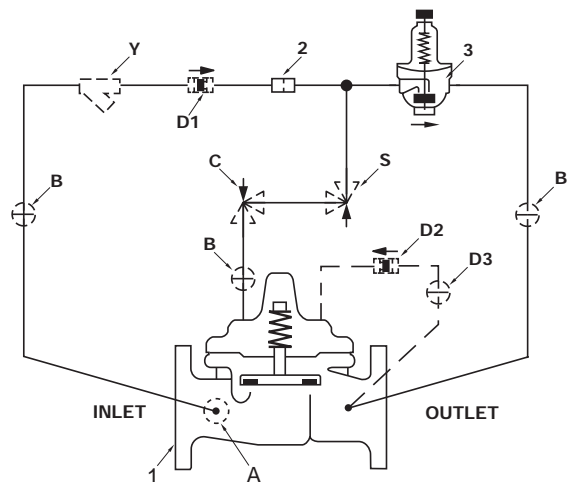
## Schematic Diagram

| Item | Description                   |
|------|-------------------------------|
| 1    | Hytrol (Main Valve)           |
| 2    | X58 Restriction Fitting       |
| 3    | CRD Pressure Reducing Control |

## Optional Features

| Item | Description                |
|------|----------------------------|
| A    | X46A Flow Clean Strainer   |
| B    | CK2 Cock (Isolation Valve) |
| C    | CV Flow Control (Closing)* |
| D    | Check Valves with Cock     |
| S    | CV Flow Control (Opening)  |
| Y    | X43 "Y" Strainer           |

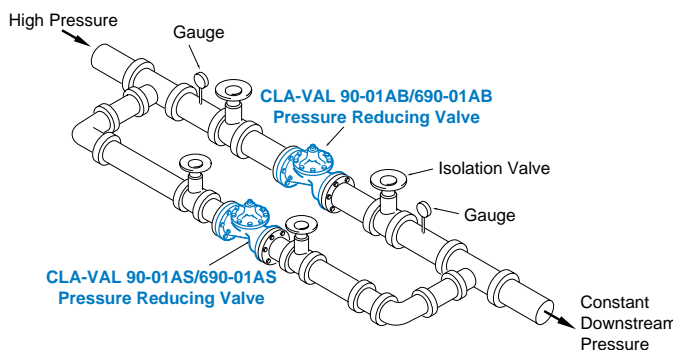
\*The closing speed control (optional) on this valve should always be open at least three (3) turns off its seat.



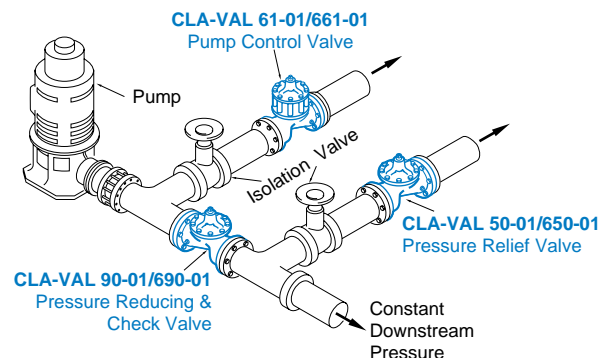
The "D" feature on a vertically installed 6" and larger valve must be horizontally oriented.

## Typical Applications

Typical pressure reducing valve station using Model 90-01AB/690-01AB and Model 90-01AS/690-01AS in parallel to handle wide range of flow rates. Larger Model 90-01AB/690-01AB valve takes care of peak loads and smaller Model 90-01AS/690-01AS handles low flows.



The 90-01D/690-01D Combination Pressure Reducing and Check Valve is installed downstream of a pump where a constant system pressure is required. The check feature is to prevent reverse flow through the pump and to hold system pressure when the pump is off.



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

### Pressure Ratings (Recommended Maximum Pressure - psi)

| Valve Body & Cover |                 | Pressure Class  |         |         |               |
|--------------------|-----------------|-----------------|---------|---------|---------------|
|                    |                 | Flanged         |         |         | Screwed       |
| Grade              | Material        | ANSI Standards* | 150 lb. | 300 lb. | End** Details |
| ASTM A-536         | Ductile Iron    | B16.42          | 250     | 400     | 400           |
| ASTM A216-WCB      | Cast Steel      | B16.5           | 285     | 400     | 400           |
| ASTM B62           | Bronze          | B16.24          | 225     | 400     | 400           |
| Type 304           | Stainless Steel | B16.5           | 285     | 400     | 400           |
| 356-T6             | Aluminum        | B16.1           | 275     | —       | —             |

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



2" Globe, Screwed

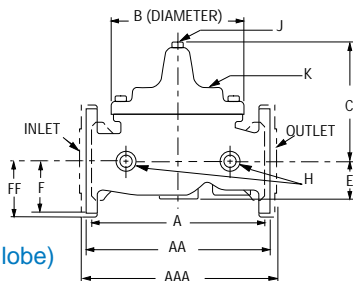
### Materials

| Component                              | Material Options                                 |                   |                   |                              |                   |
|--|--|-------------------|-------------------|------------------------------|-------------------|
| Body & Cover                           | Ductile Iron                                     | Cast Steel        | Bronze            | Stainless Steel              | Aluminum          |
| Available Sizes                        | 1 1/4" - 16", 24"                                | 1 1/4" - 16", 24" | 1 1/4" - 16", 24" | 1 1/4" - 16", 24"            | 1 1/4" - 16", 24" |
| Disc Retainer & Diaphragm Washer       | Cast Iron  | Cast Steel        | Bronze            | Stainless Steel              | Aluminum          |
| Trim: Disc Guide, Seat & Cover Bearing | Bronze is standard. Stainless Steel is optional. |                   |                   | Stainless Steel is standard. |                   |
| Disc                                   | Buna-N® Rubber                                   |                   |                   |                              |                   |
| Diaphragm                              | Nylon Reinforced Buna-N® Rubber                  |                   |                   |                              |                   |
| Stem, Nut & Spring                     | Stainless Steel                                  |                   |                   |                              |                   |

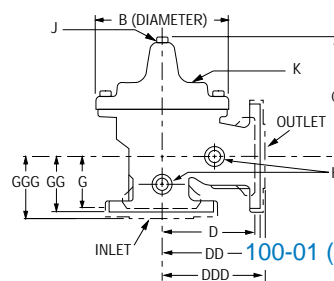


4" Globe, Flanged

### Dimensions (In inches)



100-01 (Globe)



100-01 (Angle)



4" Angle, Flanged

| Valve Size (Inches)     | 1 1/2 | 2     | 2 1/2 | 3      | 4      | 6      | 8      | 10     | 12     | 14     | 16     | 24    |
|-------------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| A Screwed               | 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  | 61.50 |
| 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  | —     |
| B Dia.                  | 5.62  | 6.62  | 8.00  | 9.12   | 11.50  | 15.75  | 20.00  | 23.62  | 28.00  | 32.75  | 35.50  | 53.16 |
| C Max.                  | 5.50  | 6.50  | 7.56  | 8.19   | 10.62  | 13.38  | 16.00  | 17.12  | 20.88  | 24.19  | 25.00  | 43.93 |
| D Screwed               | 3.25  | 4.69  | 5.50  | 6.25   | —      | —      | —      | —      | —      | —      | —      | —     |
| DD 150 ANSI             | —     | 4.69  | 5.50  | 6.00   | 7.50   | 10.00  | 12.69  | 14.88  | 17.00  | 19.50  | 20.69  | —     |
| DDD 300 ANSI            | —     | 5.00  | 5.81  | 6.63   | 7.81   | 10.50  | 13.19  | 15.56  | 17.75  | 20.25  | 21.75  | —     |
| E                       | 1.12  | 1.50  | 1.69  | 2.06   | 3.19   | 4.31   | 5.31   | 9.25   | 10.75  | 12.62  | 15.50  | 17.75 |
| 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  | 19.25 |
| 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  | —     |
| G Screwed               | 1.88  | 3.25  | 4.00  | 4.50   | —      | —      | —      | —      | —      | —      | —      | —     |
| GG 150 ANSI             | —     | 3.25  | 4.00  | 4.00   | 5.00   | 6.00   | 8.00   | 8.62   | 13.75  | 14.88  | 15.69  | —     |
| GGG 300 ANSI            | —     | 3.50  | 4.31  | 4.38   | 5.31   | 6.50   | 8.50   | 9.31   | 14.50  | 15.62  | 16.50  | —     |
| H NPT Body Tapping      | 3/8   | 3/8   | 1/2   | 1/2    | 3/4    | 3/4    | 1      | 1      | 1      | 1      | 1      | 1 1/2 |
| J NPT Cover Center Plug | 1/4   | 1/2   | 1/2   | 1/2    | 3/4    | 3/4    | 1      | 1      | 1 1/4  | 1 1/2  | 2      | 4-1/4 |
| K NPT Cover Tapping     | 3/8   | 3/8   | 1/2   | 1/2    | 3/4    | 3/4    | 1      | 1      | 1      | 1      | 1      | 1-1/2 |
| Valve Stem Internal     |       |       |       |        |        |        |        |        |        |        |        |       |
| Thread UNF              | 10-32 | 10-32 | 10-32 | 1/4-28 | 1/4-28 | 3/8-24 | 3/8-24 | 3/8-24 | 3/8-24 | 3/8-24 | 1/2-20 | 3-12  |
| Stem Travel             | 0.4   | 0.6   | 0.7   | 0.8    | 1.1    | 1.7    | 2.3    | 2.8    | 3.4    | 4.0    | 4.5    | 6.50  |
| Approx. Ship Wt. Lbs.   | 15    | 35    | 50    | 70     | 140    | 285    | 500    | 780    | 1165   | 1500   | 2265   | 3000  |

## Model 690-01 (Uses Basic Valve Model 100-20)

### Pressure Ratings (Recommended Maximum Pressure - psi)

| Valve Body & Cover |                 | Pressure Class  |         |         |
|--------------------|-----------------|-----------------|---------|---------|
|                    |                 | Flanged         |         |         |
| Grade              | Material        | ANSI Standards* | 150 lb. | 300 lb. |
| ASTM A-536         | Ductile Iron    | B16.42          | 250     | 400     |
| ASTM A216-WCB      | Cast Steel      | B16.5           | 285     | 400     |
| ASTM B62           | Bronze          | B16.24          | 225     | 400     |
| Type 304           | Stainless Steel | B16.5           | 285     | 400     |
| 356-T6             | Aluminum        | B16.1           | 275     | —       |

Note: \*ANSI standards are for flange dimensions only.  
Flanged valves are available faced but not drilled.



3" Globe, Flanged



6" Globe, Flanged

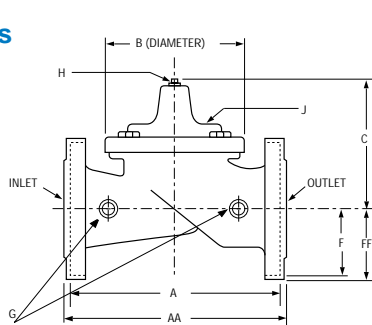


6" Angle, Flanged

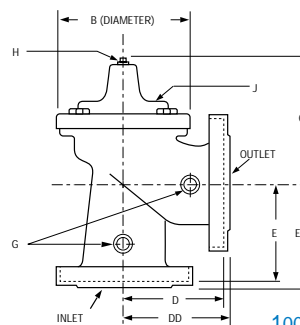
### Materials

| Component                              | Material Options                                 |            |        |                              |          |
|--|--|------------|--------|------------------------------|----------|
| Body & Cover                           | Ductile Iron                                     | Cast Steel | Bronze | Stainless Steel              | Aluminum |
| Available Sizes                        | 3"-24"   | 3"-24"     | 3"-24" | 3"-24"                       | 3"-24"   |
| Disc Retainer & Diaphragm Washer       | Cast Iron  | Cast Steel | Bronze | Stainless Steel              | Aluminum |
| Trim: Disc Guide, Seat & Cover Bearing | Bronze is standard. Stainless Steel is optional. |            |        | Stainless Steel is standard. |          |
| Disc                                   | Buna-N® Rubber                                   |            |        |                              |          |
| Diaphragm                              | Nylon Reinforced Buna-N® Rubber                  |            |        |                              |          |
| Stem, Nut & Spring                     | Stainless Steel                                  |            |        |                              |          |

### Dimensions (In inches)











































100-20 (Globe)



100-20 (Angle)

| VALVE SIZE (Inches)              | 3     | 4      | 6      | 8      | 10     | 12     | 16     | 20     | 24     |
|----------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| A 150 ANSI                       | 10.25 | 13.88  | 17.75  | 21.38  | 26.00  | 30.00  | 35.00  | 48.00  | 48.00  |
| AA 300 ANSI                      | 11.00 | 14.50  | 18.62  | 22.38  | 27.38  | 31.50  | 36.62  | 49.62  | 49.75  |
| B DIA.                           | 6.62  | 9.12   | 11.50  | 15.75  | 20.00  | 23.62  | 28.00  | 35.44  | 35.44  |
| C MAX.                           | 7.00  | 8.62   | 11.62  | 15.00  | 17.88  | 21.00  | 25.75  | 31.00  | 31.00  |
| D 150 ANSI                       | —     | 6.94   | 8.88   | 10.69  | —      | —      | —      | —      | —      |
| DD 300 ANSI                      | —     | 7.25   | 9.38   | 11.19  | —      | —      | —      | —      | —      |
| E 150 ANSI                       | —     | 5.50   | 6.75   | 7.25   | —      | —      | —      | —      | —      |
| EE 300 ANSI                      | —     | 5.81   | 7.25   | 7.75   | —      | —      | —      | —      | —      |
| F 150 ANSI                       | 3.75  | 4.50   | 5.50   | 6.75   | 8.00   | 9.50   | 11.75  | 14.56  | 17.00  |
| FF 300 ANSI                      | 4.12  | 5.00   | 6.25   | 7.50   | 8.75   | 10.25  | 12.75  | 16.06  | 19.00  |
| G NPT Body Tapping               | 3/8   | 1/2    | 3/4    | 3/4    | 1      | 1      | 1      | 1      | 1      |
| H NPT Cover Center Plug          | 1/2   | 1/2    | 3/4    | 3/4    | 1      | 1      | 1 1/4  | 2      | 2      |
| J NPT Cover Tapping              | 3/8   | 1/2    | 3/4    | 3/4    | 1      | 1      | 1      | 1      | 1      |
| Valve Stem Internal Thread UNF   | 10-32 | 1/4-28 | 1/4-28 | 3/8-24 | 3/8-24 | 3/8-24 | 3/8-24 | 1/2-20 | 1/2-20 |
| Stem Travel                      | 0.6   | 0.8    | 1.1    | 1.7    | 2.3    | 2.8    | 3.4    | 4.5    | 4.5    |
| Approximate Shipping Weight Lbs. | 45    | 85     | 195    | 330    | 625    | 900    | 1380   | 2551   | 2733   |

# Valve Selection

|                     |                    | These Symbols  and  Indicate Available Sizes |   |   |   |   |  |   |   |   |   |   |   |   |   |   |
|---------------------|--------------------|--|---|---|---|---|--|---|---|---|---|---|---|---|---|---|
|                     |                    | Size   | 1¼"   | 1½"   | 2"  | 2½"   | 3"   | 4"  | 6"  | 8"  | 10"   | 12"   | 14"   | 16"   | 20"   | 24"   |
|                     |                    | End Details  | Screwed   | Screwed or Flanged  |   |   |  |   |   | Flanged   |   |   |   |   |   |   |
| <b>Model 90-01</b>  | Basic Valve 100-01 | Globe  |  |    |    |    |     |    |    |    |     |    |    |    |    |    |
|                     |                    | Angle  |   |  * |  * |  * |  *  |  * |  * |  * |  *  |  * |  * |  * |  * |   |
|                     | Suggested Flow GPM | Max. Continuous  | 93  | 125   | 208   | 300   | 460  | 800   | 1800  | 3100  | 4900  | 7000  | 8500  | 11000   |   | 28000   |
|                     |                    | Max. Intermittent  | 120   | 160   | 260   | 370   | 580  | 990   | 2250  | 3900  | 6150  | 8720  | 10340   | 13700   |   | 35000   |
| Min. Continuous     |                    | 15   | 15  | 15  | 20  | 30  | 50   | 115   | 200   | 300   | 400   | 500   | 650   |   | 3000  |   |
| <b>Model 690-01</b> | Basic Valve 100-20 | Globe  |   |   |   |   |  ** |  * |  * |  * |  * |  * |   |  * |  * |  * |
|                     |                    | Angle  |   |   |   |   |  |  * |  * |  * |   |   |   |   |   |   |
|                     | Suggested Flow-GPM | Max. Continuous  |   |   |   |   | 260  | 580   | 1025  | 2300  | 4100  | 6400  |   | 9230  | 16500   | 16500   |
|                     |                    | Min. Continuous  |   |   |   |   | 15   | 30  | 50  | 115   | 200   | 300   |   | 500   | 850   | 1000  |

\* 690-01 is the reduced internal port size version of the 90-01.  
 Refer to the 100-01 or the 100-20 Technical Data Sheet basic valve options.  
 Max. Continuous Flow based on 20 fps (100-01), 25 fps (100-20)  
 Max. Intermittent Flow based on 25 fps (100-01)  
 Min. Continuous Flow based on appx. 1 fps (100-01) and (100-20)

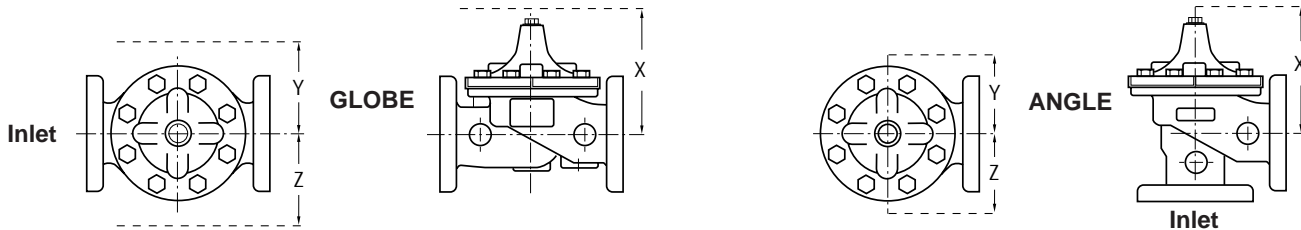
Many factors should be considered in sizing pressure reducing valves including inlet pressure, outlet pressure and flow rates. For sizing questions or cavitation analysis, consult Cla-Val with system details.

\*Screwed End Detail Only    \*\*Flanged End Detail Only

## Pilot System Dimensions (In Inches)

We recommend providing adequate space around valve for maintenance work

| VALVE SIZE |      | 1¼" & 1½" | 2     | 2½"   | 3"    | 4"    | 6"    | 8"    | 10"   | 12"   | 14"   | 16"   | 20"   | 24"   |
|------------|------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X          | Max. | 11.00     | 12.00 | 12.25 | 13.00 | 13.25 | 15.75 | 17.25 | 20.25 | 21.75 | 25.00 | 27.25 | 31.00 | 31.00 |
| Y          | Max. | 4.00      | 4.00  | 4.50  | 5.00  | 6.00  | 8.00  | 10.25 | 12.00 | 14.25 | 16.75 | 18.00 | 18.00 | 27.00 |
| Z          | Max. | 6.50      | 6.50  | 7.00  | 8.00  | 9.00  | 9.50  | 11.50 | 12.50 | 14.75 | 16.75 | 18.00 | 18.00 | 27.00 |



## Pilot System Specifications

### Adjustment Ranges

- 2 to 30 psi
- 15 to 75 psi
- 30 to 300 psi\*

\*Supplied unless otherwise specified  
 Other ranges available, please consult factory

### Temperature Range

Water: to 180°F

### 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 at extra cost.

Note: Available with remote sensing control.

## When Ordering, Please Specify

1. Catalog No. 90-01 or No. 690-01
2. Valve Size
3. Pattern - Globe or Angle
4. Pressure Class
5. Screwed or Flanged
6. Trim Material
7. Adjustment Range
8. Desired Options
9. When Vertically Installed



E-90-01/690-01 (R-5/97)

## CLA-VAL CO.

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