



— MODEL — **92-01**

# Combination Pressure Reducing & Pressure Sustaining Valve



- Accurate Response to Slight Pressure Changes
- Check Feature Available
- Completely Automatic Operation
- Drip-Tight, Positive Seating Action
- Operation is Fully Hydraulic

The Cla-Val Model 92-01 Combination Pressure Reducing and Pressure Sustaining Valve automatically performs two independent functions. It maintains a constant downstream pressure, regardless of fluctuating demand and sustains the upstream pressure to a pre-determined minimum.

The pressure reducing control responds to slight variations in downstream pressure and immediately repositions the main valve to maintain the desired downstream pressure. The pressure sustaining control is normally held open by the upstream pressure, but modulates should the pressure drop to the control set point. This, in turn, modulates the main valve to sustain the desired upstream pressure.

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

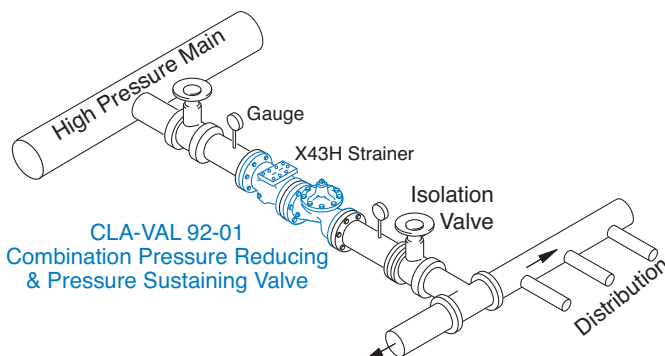
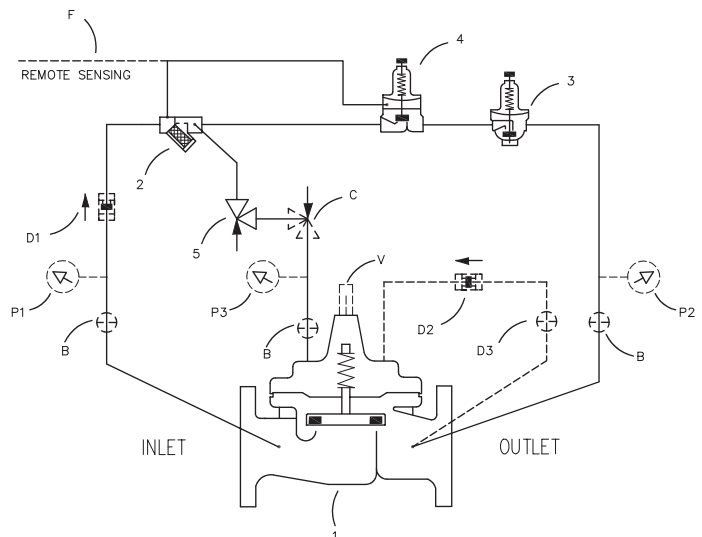
## Schematic Diagram

| Item | Description                    |
|------|--------------------------------|
| 1    | 100-01 Hytrol Main Valve       |
| 2    | X44A Strainer & Orifice        |
| 3    | CRD Pressure Reducing Control  |
| 4    | CRL-60 Pressure Relief Control |
| 5    | CV Flow Control (Opening)      |

## Optional Features

| Item | Description                       |
|------|-----------------------------------|
| B    | CK2 Isolation Valve               |
| C    | CV Flow Control (Closing)*        |
| D    | Check Valves With Isolation Valve |
| F    | Remote Pilot Sensing              |
| P    | X141 Pressure Gauge               |
| V    | X101 Valve Position Indicator     |

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



## Typical Applications

A Combination Pressure Reducing and Pressure Sustaining Valve is typically used to automatically reduce pressure for the downstream distribution network and sustain a minimum pressure in the high pressure main regardless of distribution demand.

## Model 92-01 (Uses 100-01 Hytrol Main Valve)

### 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**

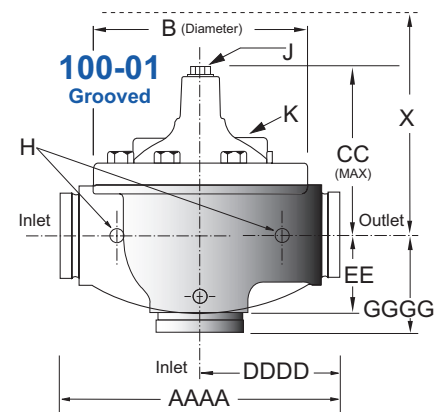
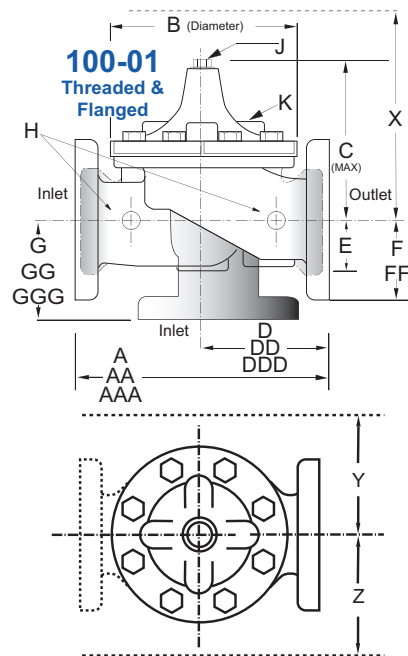
### Materials

| Component                              | Standard Material Combinations                    |                        |                        |
|----------------------------------------|---------------------------------------------------|------------------------|------------------------|
| Body & Cover                           | Ductile Iron                                      | Cast Steel             | Bronze                 |
| Available Sizes                        | 1" - 36"<br>25 - 900mm                            | 1" - 16"<br>25 - 400mm | 1" - 16"<br>25 - 400mm |
| 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                                   |                        |                        |

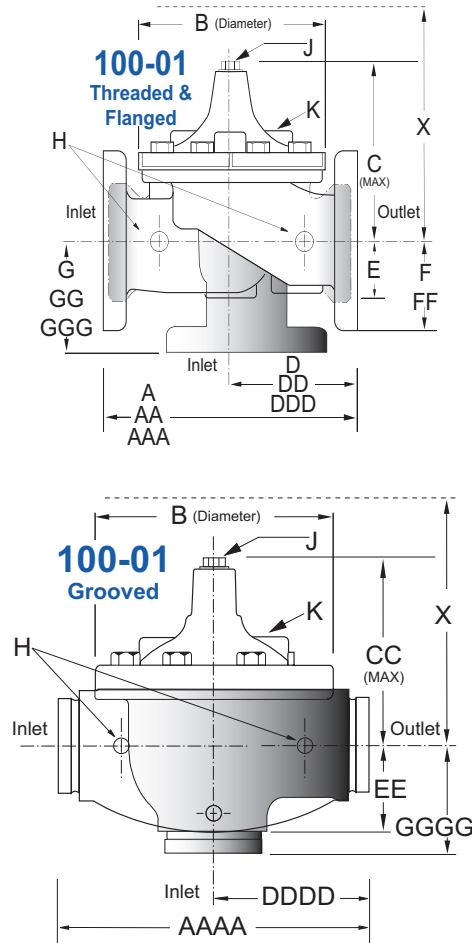
For material options not listed, consult factory.  
 Cla-Val manufactures valves in more than 50 different alloys.

### Model 92-01 Dimensions (In Inches)

| Valve Size (Inches)       | 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                | 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                | 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                 | 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                         | 1.12  | 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        | 0.375 | 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   | 0.25  | 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       | 0.375 | 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  |
| 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) | 15    | 15    | 15    | 35    | 50    | 70    | 140   | 285   | 500   | 780   | 1165  | 1600  | 2265  | 2982  | 3900  | 6200  | 7703  | 11720 |
| Approx. X Pilot System    | 11    | 11    | 11    | 13    | 14    | 15    | 17    | 29    | 31    | 33    | 36    | 40    | 40    | 43    | 47    | 68    | 79    | 85    |
| Approx. Y Pilot System    | 9     | 9     | 9     | 9     | 10    | 11    | 12    | 20    | 22    | 24    | 26    | 29    | 30    | 32    | 34    | 39    | 40    | 45    |
| Approx. Z Pilot System    | 9     | 9     | 9     | 9     | 10    | 11    | 12    | 20    | 22    | 24    | 26    | 29    | 30    | 32    | 34    | 39    | 42    | 47    |



## Model 92-01 Metric Dimensions (Uses the 100-01 Hytrol Main Valve)



### Valve Options

X141  
Pressure  
Gauge



X101AR Valve  
Position Indicator  
with Air Release



X101  
Valve Position  
Indicator



X144 e-FlowMeter



X43H  
Strainer



Stainless  
Steel Pilot



## 92-01 Dimensions (In mm)

| Valve Size (mm)           | 25    | 32    | 40    | 50    | 65   | 80   | 100  | 150  | 200  | 250  | 300  | 350  | 400  | 450  | 500  | 600  | 750  | 900  |
|---------------------------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| A Threaded                | 184   | 184   | 184   | 238   | 279  | 318  | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    |
| AA 150 ANSI               | —     | —     | 216   | 238   | 279  | 305  | 381  | 508  | 645  | 756  | 864  | 991  | 1051 | 1168 | 1321 | 1562 | 1600 | 1848 |
| AAA 300 ANSI              | —     | —     | 229   | 254   | 295  | 337  | 397  | 533  | 670  | 790  | 902  | 1029 | 1105 | 1210 | 1326 | 1606 | 1638 | 1899 |
| AAAA Grooved End          | —     | —     | 216   | 228   | 279  | 318  | 381  | 508  | 645  | —    | —    | —    | —    | —    | —    | —    | —    | —    |
| B Diameter                | 143   | 143   | 143   | 168   | 203  | 232  | 292  | 400  | 508  | 600  | 711  | 832  | 902  | 1054 | 1143 | 1350 | 1422 | 1676 |
| C Maximum                 | 140   | 140   | 140   | 165   | 192  | 208  | 270  | 340  | 406  | 435  | 530  | 614  | 635  | 992  | 1064 | 1116 | 1387 | 1499 |
| CC Maximum Grooved End    | —     | —     | 120   | 146   | 175  | 184  | 236  | 308  | 371  | —    | —    | —    | —    | —    | —    | —    | —    | —    |
| D Threaded                | 83    | 83    | 83    | 121   | 140  | 159  | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    |
| DD 150 ANSI               | —     | —     | 102   | 121   | 140  | 152  | 191  | 254  | 322  | 378  | 432  | 495  | 528  | —    | —    | 781  | —    | —    |
| DDD 300 ANSI              | —     | —     | 108   | 127   | 149  | 162  | 200  | 267  | 337  | 395  | 451  | 514  | 549  | —    | —    | 803  | —    | —    |
| DDDD Grooved End          | —     | —     | —     | 121   | —    | 152  | 191  | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    |
| E                         | 29    | 29    | 29    | 38    | 43   | 52   | 81   | 110  | 135  | 235  | 273  | 321  | 394  | 329  | 381  | 451  | 541  | 624  |
| EE Grooved End            | —     | —     | 52    | 64    | 73   | 79   | 108  | 152  | 192  | —    | —    | —    | —    | —    | —    | —    | —    | —    |
| F 150 ANSI                | —     | —     | 64    | 76    | 89   | 95   | 114  | 140  | 171  | 203  | 241  | 267  | 298  | 381  | 419  | 489  | 572  | 724  |
| FF 300 ANSI               | —     | —     | 78    | 83    | 95   | 105  | 127  | 159  | 191  | 222  | 260  | 292  | 324  | 381  | 419  | 489  | 610  | 762  |
| G Threaded                | 48    | 48    | 48    | 83    | 102  | 114  | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    |
| GG 150 ANSI               | —     | —     | 102   | 83    | 102  | 102  | 127  | 152  | 203  | 219  | 349  | 378  | 399  | —    | —    | 560  | —    | —    |
| GGG 300 ANSI              | —     | —     | 102   | 89    | 110  | 111  | 135  | 165  | 216  | 236  | 368  | 397  | 419  | —    | —    | 582  | —    | —    |
| GGGG Grooved End          | —     | —     | —     | 83    | —    | 108  | 127  | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    |
| H NPT Body Tapping        | 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   | 0.25  | 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       | 0.375 | 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 |
| Stem Travel               | 10    | 10    | 10    | 15    | 18   | 20   | 28   | 43   | 58   | 71   | 86   | 102  | 114  | 130  | 143  | 171  | 190  | 216  |
| Approx. Ship Weight (kgs) | 7     | 7     | 7     | 16    | 23   | 32   | 64   | 129  | 227  | 354  | 528  | 726  | 1027 | 1353 | 1769 | 2812 | 3494 | 5316 |
| Approx. X Pilot System    | 280   | 280   | 280   | 331   | 356  | 381  | 432  | 737  | 788  | 839  | 915  | 1016 | 1016 | 1093 | 1194 | 1728 | 2007 | 2159 |
| Approx. Y Pilot System    | 229   | 229   | 229   | 229   | 254  | 280  | 305  | 508  | 559  | 610  | 661  | 737  | 762  | 813  | 864  | 991  | 1016 | 1143 |
| Approx. Z Pilot System    | 229   | 229   | 229   | 229   | 254  | 280  | 305  | 508  | 559  | 610  | 661  | 737  | 762  | 813  | 864  | 991  | 1067 | 1194 |

| 92-01<br>Valve<br>Selection                     | 100-01 Pattern: Globe (G), Angle (A), End Connections: Threaded (T), Grooved (GR), Flanged (F) Indicate Available Sizes |      |      |              |             |              |             |          |           |           |      |      |       |       |       |       |       |       |                                 |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|------|------|--------------|-------------|--------------|-------------|----------|-----------|-----------|------|------|-------|-------|-------|-------|-------|-------|---------------------------------|
|                                                 | Inches                                                                                                                  | 1    | 1¼   | 1½           | 2           | 2½           | 3           | 4        | 6         | 8         | 10   | 12   | 14    | 16    | 18    | 20    | 24    | 30    | 36                              |
|                                                 | mm                                                                                                                      | 25   | 32   | 40           | 50          | 65           | 80          | 100      | 150       | 200       | 250  | 300  | 350   | 400   | 450   | 500   | 600   | 750   | 900                             |
| Main Valve<br>100-01                            | Pattern                                                                                                                 | G, A | G, A | G, A         | G, A        | G, A         | G, A        | G, A     | G, A      | G, A      | G, A | G, A | G, A  | G, A  | G     | G     | G, A  | G     | G                               |
|                                                 | End Detail                                                                                                              | T    | T    | T, F,<br>Gr* | T, F,<br>Gr | T, F,<br>Gr* | T, F,<br>Gr | F,<br>Gr | F,<br>Gr* | F,<br>Gr* | F    | F    | F     | F     | F     | F     | F     | F     | F                               |
| Suggested<br>Flow<br>(gpm)                      | Maximum                                                                                                                 | 55   | 93   | 125          | 210         | 300          | 460         | 800      | 1800      | 3100      | 4900 | 7000 | 8400  | 11000 | 14000 | 17000 | 25000 | 42000 | 50000                           |
|                                                 | Maximum Intermittent                                                                                                    | 68   | 120  | 160          | 260         | 370          | 580         | 990      | 2250      | 3900      | 6150 | 8720 | 10540 | 13700 | 17500 | 21700 | 31300 | 48000 | 62500                           |
|                                                 | Minimum                                                                                                                 | 1    | 1    | 1            | 1           | 2            | 2           | 4        | 10        | 15        | 35   | 50   | 70    | 95    | 120   | 150   | 275   | 450   | 650                             |
| Suggested<br>Flow<br>(Liters/Sec)               | Maximum                                                                                                                 | 3.5  | 6    | 8            | 13          | 19           | 29          | 50       | 113       | 195       | 309  | 442  | 530   | 694   | 883   | 1073  | 1577  | 2650  | 3150                            |
|                                                 | Maximum Intermittent                                                                                                    | 4.3  | 7.6  | 10           | 16          | 23           | 37          | 62       | 142       | 246       | 387  | 549  | 664   | 863   | 1104  | 1369  | 1972  | 3028  | 3940                            |
|                                                 | Minimum                                                                                                                 | .03  | .03  | .03          | .06         | .09          | 0.13        | 0.25     | 0.63      | 0.95      | 2.2  | 3.2  | 4.4   | 6.0   | 7.6   | 9.5   | 17.4  | 28.4  | 41.0                            |
| 100-01 Series is the full internal port Hytrol. |                                                                                                                         |      |      |              |             |              |             |          |           |           |      |      |       |       |       |       |       |       | For Lower Flows Consult Factory |

\*Globe Grooved Only

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.

## CRD Pressure Reducing Pilot Control



The CRD Pilot is held open by the force of the compression spring above the diaphragm, and closes when the downstream pressure acting on the underside of the diaphragm exceeds the spring setting. The CRD senses downstream pressure directly.

Flow through the control responds to changes in downstream pressure. Turning the adjusting screw clockwise increases the delivery pressure. Turning it counterclockwise decreases the pressure. A resilient disc assures tight shut-off on dead-end service.

See the E-CRD E-Sheet for more details.

## CRL-60 Pressure Relief Pilot Control



The Model CRL-60 is normally held closed by the force of the compression spring above the diaphragm. Control pressure is applied under the diaphragm. When the controlling pressure exceeds the spring setting, the disc is lifted off its seat, permitting flow through the control. When control pressure drops below the spring setting, the spring forces the control back to its normally closed position. The controlling pressure is applied to the chamber beneath the diaphragm through a sensing port on the CRL-60 body.

See the E-CRL-60 E-Sheet for more details.

## Pilot System Specifications

### Adjustment Ranges

| CRD            | CRL-60         |
|----------------|----------------|
| 2 to 30 psi    | 0 to 75 psi    |
| 15 to 75 psi   | 20 to 105 psi* |
| 20 to 105 psi  | 20 to 200 psi  |
| 30 to 300 psi* | 100 to 300 psi |

\*Supplied unless otherwise specified

Other ranges available, please consult factory.

### Temperature Range

Water: to 180°F

Consult factory for hot water applications.

### Materials

#### Standard Pilot System Materials

Pilot Control: Low Lead Bronze

Trim: Brass & Stainless Steel Type 303

Rubber: Buna-N® Synthetic Rubber

#### Optional Pilot System Materials

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

Note: Available with remote sensing control.

### When Ordering, Specify:

1. Catalog No. 92-01
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