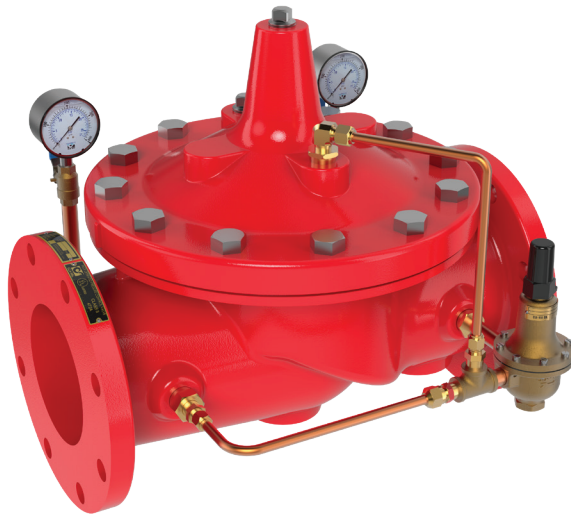




Model 90G-21 (Globe) 90A-21 (Angel)

FIRE PROTECTION PRESSURE REDUCING VALVE



- Dual Guided Stem Internal for Reliable Seating
- Tapered Metal Seat for Drip Tight Shut-off
- Replaceable 316 Stainless Steel Seat
- Single Internal Guided Assembly
- Proven Repeat Functionality in Harsh Conditions
- In-Line Maintenance

Description The Cla-Val Model 90-21 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 into the main valve cover chamber, which closes the valve to prevent return flow.

Typical Applications

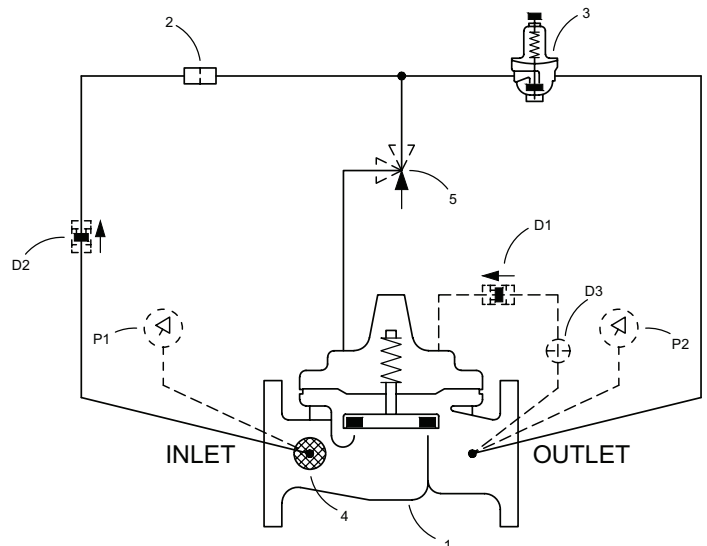
- Fire Pump Regulation
- System Pressure Regulation
- Foam Applications

90-21 Schematic

The Cla-Val Model 90-21 Pressure Reducing Valve pilot control system is very sensitive to slight downstream pressure fluctuations and will automatically modulate to maintain the desired pressure setting. The CRD (Item 3) pilot can be easily field adjusted to a wide range of pressure settings. While monitoring the system's downstream pressure gauge (P2), the CRD adjustment screw can be turned clockwise to INCREASE pressure or counterclockwise to DECREASE pressure. The CRD adjustment screw is protected by a screw-on cover, which can be sealed to discourage tampering.

| Basic Components | |
|-------------------|-------------------------------|
| Item | Description |
| 1 | 100-01 Hytrol (Main Valve) |
| 2 | X58C Restriction Assembly |
| 3 | CRD Pressure Reducing Control |
| 4 | X46A Flow Clean Strainer |
| 5 | CV Flow Control (opening)** |
| **1.5", 3" and 4" | |

| Optional Features | |
|-------------------|---------------------|
| Item | Description |
| D | Check Valves Option |
| P | Gauge Option |



Specifications

Approved Sizes

Flanged: 1.5" - 12"

Grooved: 1.5" - 8" (1.5" - 6" Angle)

Threaded: 1.5" - 3"

Pressure Ratings

150 class, 250 psi maximum (Ductile Iron)

150 class, 285 psi maximum (All other materials)

300 class, 300 psi maximum (All materials)

Temperature Range

Water: to 180° F. Max

Fluids

Water

Materials

Main Valve Body & Cover: Standard Epoxy Coated Ductile Iron ASTM A-536*

Main Valve Trim: Stainless Steel

Pilot Control System: Cast Bronze

Rubber Parts: Buna-N® Synthetic Rubber

Optional UL Listed Materials for Seawater and Severe Service Applications:

- **Nickel Aluminum Bronze (NAB)** ASTM B148 Alloy C95800
- **Monel - QQ-N-288 Comp B** ASTM A494 Grade M30H
- **Cast Steel** ASTM A216 Grade WCB
- **316 Stainless Steel** ASTM A743 Grades CF3M and CF8M
- **Super Austenitic Stainless Steel** ASTM A351 Grade CK3MCuN (SMO 254)
- **Super Duplex Stainless Steel** ASTM A890 Grade 5A (CE3MN)

Functional Data

| Value Size | Inches | 1.5 | 2 | 2.5 | 3 | 4 | 6 | 8 | 10 | 12 |
|---------------|-----------------|-----|-----|-----|-----|-----|------|------|------|------|
| | mm | 40 | 50 | 65 | 80 | 100 | 150 | 200 | 250 | 300 |
| Globe Pattern | Cv | 32 | 50 | 85 | 115 | 200 | 440 | 770 | 1245 | 1725 |
| | Kv | 28 | 43 | 73 | 99 | 173 | 380 | 665 | 1076 | 1490 |
| Angle Pattern | Cv | 29 | 61 | 101 | 139 | 240 | 541 | 990 | 1575 | 2500 |
| | Kv | 25 | 53 | 87 | 120 | 207 | 467 | 855 | 1361 | 2160 |
| Max Flow Rate | Gla./Min. (gpm) | 110 | 196 | 306 | 441 | 783 | 1763 | 3133 | 4896 | 7050 |

Note: (1) Minimum Pressure Differential decreases as flow rates decrease. (2) All sizes are designed to meet minimum flow of system components.

| Pressure Adjustment Ranges | |
|----------------------------|----------|
| Size | UL/ULC |
| 1.5", 2.5" - 12" | 50 - 175 |
| 2" | 30 - 165 |

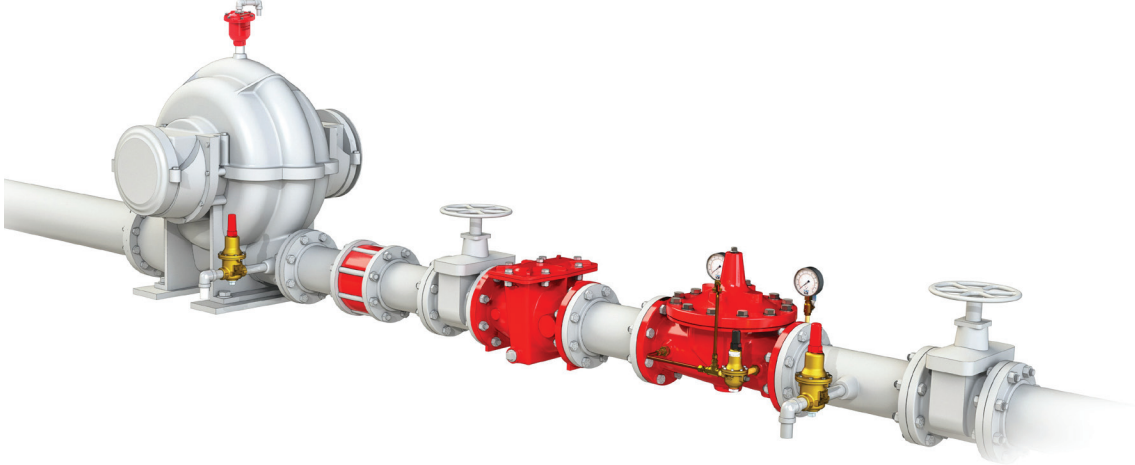
| Minimum Pressure Differential (at Max Flow) | |
|---|--------|
| Size | PSI |
| 1.5", 2.5" - 12" | 20 psi |
| 2" | 10 psi |



System Parameters

- Underwriters Laboratories requires the installation of pressure gauges upstream and downstream of Pressure Reducing Valves.
- A relief valve of not less than 1/2 inch in size must be installed on the downstream side of pressure reducing valves. Adequate drainage for the relief valve discharge must be provided.
- The Model 90-21 may be installed in either vertical or horizontal positions.

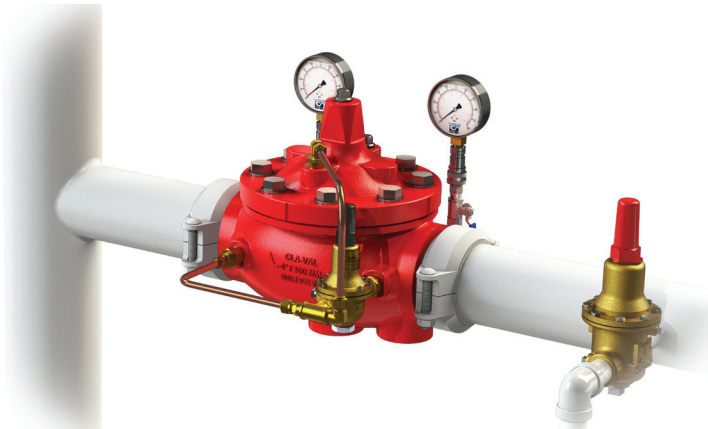
Single Stage



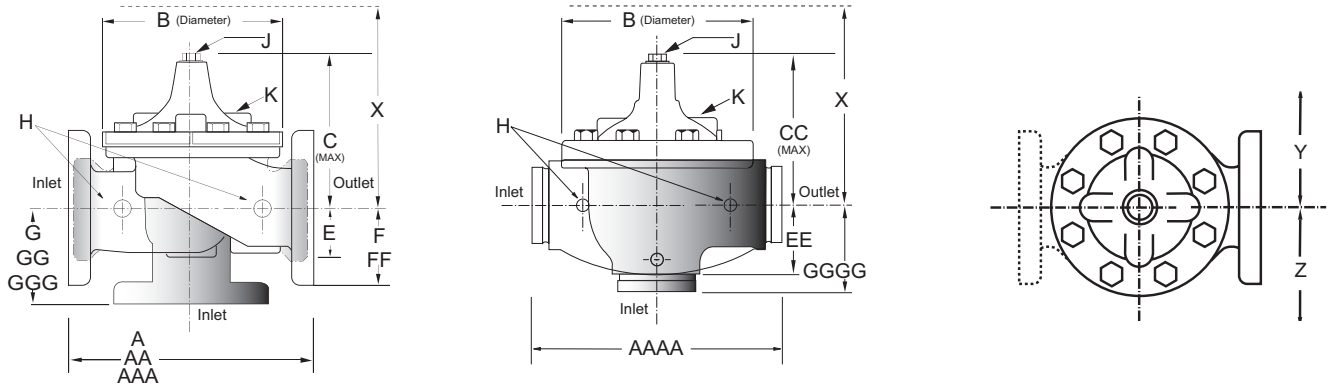
Dual Stage



Standpipe



Dimensions



| Valve Size | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | |
|---------------------------|-------|-------|-------|-------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|------|
| | 1 1/2 | 40 | 2 | 50 | 2 1/2 | 65 | 3 | 80 | 4 | 100 | 6 | 150 | 8 | 200 | 10 | 250 | 12 | 300 | |
| A Threaded | 7.25 | 184 | 9.38 | 238 | 11.00 | 279 | 12.50 | 318 | — | — | — | — | — | — | — | — | — | — | — |
| AA 150 ANSI | 8.50 | 216 | 9.38 | 238 | 11.00 | 279 | 12.00 | 305 | 15.00 | 381 | 20.00 | 508 | 25.38 | 645 | 29.75 | 756 | 34.00 | 864 | — |
| AAA 300 ANSI | 9.00 | 229 | 10.00 | 254 | 11.62 | 295 | 13.25 | 337 | 15.62 | 397 | 21.00 | 533 | 26.38 | 670 | 31.12 | 790 | 35.50 | 902 | — |
| AAAA Grooved End | 8.50 | 216 | 9.00 | 228 | 11.00 | 279 | 12.50 | 318 | 15.00 | 381 | 20.00 | 508 | 25.38 | 645 | 29.75 | — | — | — | — |
| B Diameter | 5.62 | 143 | 6.62 | 168 | 8.00 | 203 | 9.12 | 232 | 11.50 | 292 | 15.75 | 400 | 20.00 | 508 | 23.62 | 600 | 28.00 | 711 | — |
| C Maximum | 5.50 | 140 | 6.50 | 165 | 7.56 | 192 | 8.19 | 208 | 10.62 | 270 | 13.38 | 340 | 16.00 | 406 | 17.12 | 435 | 20.88 | 530 | — |
| CC Maximum Grooved End | 4.75 | 120 | 5.75 | 146 | 6.88 | 175 | 7.25 | 184 | 9.31 | 236 | 12.12 | 308 | 14.62 | 371 | 17.12 | — | — | — | — |
| E | 1.12 | 29 | 1.50 | 38 | 1.69 | 43 | 2.06 | 52 | 3.19 | 81 | 4.31 | 110 | 5.31 | 135 | 9.25 | 235 | 10.75 | 273 | — |
| EE Grooved End | 2.00 | 52 | 2.50 | 64 | 2.88 | 73 | 3.12 | 79 | 4.25 | 108 | 6.00 | 152 | 7.56 | 192 | 14.88 | — | — | — | — |
| F 150 ANSI | 2.50 | 64 | 3.00 | 76 | 3.50 | 89 | 3.75 | 95 | 4.50 | 114 | 5.50 | 140 | 6.75 | 171 | 8.00 | 203 | 9.50 | 241 | — |
| FF 300 ANSI | 3.06 | 78 | 3.25 | 83 | 3.75 | 95 | 4.13 | 105 | 5.00 | 127 | 6.25 | 159 | 7.50 | 191 | 8.75 | 222 | 10.25 | 260 | — |
| G Threaded | 1.88 | 48 | 3.25 | 83 | 4.00 | 102 | 4.50 | 114 | — | — | — | — | — | — | — | — | — | — | — |
| GG 150 ANSI | 4.00 | 102 | 3.25 | 83 | 4.00 | 102 | 4.00 | 102 | 5.00 | 127 | 6.00 | 152 | 8.00 | 203 | 8.62 | 219 | 13.75 | 349 | — |
| GGG 300 ANSI | 4.25 | 102 | 3.50 | 89 | 4.31 | 110 | 4.38 | 111 | 5.31 | 135 | 6.50 | 165 | 8.50 | 216 | 9.31 | 236 | 14.50 | 368 | — |
| GGGG Grooved End | 3.00 | 76 | 3.25 | 83 | 4.31 | 110 | 4.25 | 108 | 5.00 | 127 | 6.00 | 152 | 8.00 | — | — | — | — | — | — |
| H NPT Body Tapping | 0.375 | 0.375 | 0.375 | 0.375 | 0.50 | 0.50 | 0.50 | 0.50 | 0.75 | 0.75 | 0.75 | 0.75 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| J NPT Cover Center Plug | 0.25 | 0.25 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.75 | 0.75 | 0.75 | 0.75 | 1.00 | 1.00 | 1.00 | 1.00 | 1.25 | 1.25 | — |
| K NPT Cover Tapping | 0.375 | 0.375 | 0.375 | 0.375 | 0.50 | 0.50 | 0.50 | 0.50 | 0.75 | 0.75 | 0.75 | 0.75 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Stem Travel | 0.40 | 10 | 0.60 | 15 | 0.70 | 18 | 0.80 | 20 | 1.10 | 28 | 1.70 | 43 | 2.30 | 58 | 2.80 | 71 | 3.40 | 86 | — |
| Approx. Ship Weight (lbs) | 15 | 7 | 35 | 16 | 50 | 23 | 70 | 32 | 140 | 64 | 285 | 129 | 500 | 227 | 780 | 354 | 1165 | 528 | — |
| Approx. X Pilot System | 11 | 280 | 13 | 331 | 14 | 356 | 15 | 381 | 17 | 432 | 29 | 737 | 31 | 788 | 33 | 839 | 36 | 915 | — |
| Approx. Y Pilot System | 9 | 229 | 9 | 229 | 10 | 254 | 11 | 280 | 12 | 305 | 20 | 508 | 22 | 559 | 24 | 610 | 26 | 661 | — |
| Approx. Z Pilot System | 9 | 229 | 9 | 229 | 10 | 254 | 11 | 280 | 12 | 305 | 20 | 508 | 22 | 559 | 24 | 610 | 26 | 661 | — |

Model Number Codes

| | | | | | | | | | | | | | | | | | | | | |
|----------------|--|-------------------|--|--------------------------------|--|------------------------------|--|------------------|--|-------------------|--|-------------|--|--|--|--|--|--|--|--|
| 90 | | 21 | | | | | | | | | | | | | | | | | | |
| Size | | Main Valve | | Options | | Orientation | | | | | | | | | | | | | | |
| 1.5" | | G Globe | | Y Y Strainer | | H Horizontal | | | | | | | | | | | | | | |
| 2" | | A Angle | | D Check Valve | | V Vertical | | | | | | | | | | | | | | |
| 2.5" | | | | P Pressure Gauges | | | | | | | | | | | | | | | | |
| 3" | | | | X105 Limit Switch | | | | | | | | | | | | | | | | |
| 4" | | | | V Position Indicator | | | | | | | | | | | | | | | | |
| 6" | | | | PT Pressure Transmitter | | | | | | | | | | | | | | | | |
| 8" | | | | | | | | | | | | | | | | | | | | |
| 10" | | | | | | | | | | | | | | | | | | | | |
| 12" | | | | | | | | | | | | | | | | | | | | |
| Body | | Trim | | Pilots | | Tubing & Fittings | | Elastomer | | Connection | | Face | | | | | | | | |
| D Ductile Iron | | S Stainless Steel | | B Bronze w/SST | | B Copper with Brass Fittings | | B Buna | | ANSI 150# | | RF | | | | | | | | |
| C Cast Steel | | T 316 SS | | BM Bronze with Monel Internals | | T 316 SS | | | | ANSI 300# | | FF | | | | | | | | |
| T 316 SS | | M Bronze/Monel | | T 316 SS (F) | | M Monel | | | | ISO PN10 | | X Other | | | | | | | | |
| N N.A.B. | | U Super Duplex | | M Monel | | U 2507 | | | | ISO PN16 | | | | | | | | | | |
| U Super Duplex | | X Other | | U Super Duplex | | X Other | | | | ISO PN25 | | | | | | | | | | |
| X Other | | | | X Other | | | | | | V Grooved 300# | | | | | | | | | | |
| | | | | | | | | | | S NPT | | | | | | | | | | |