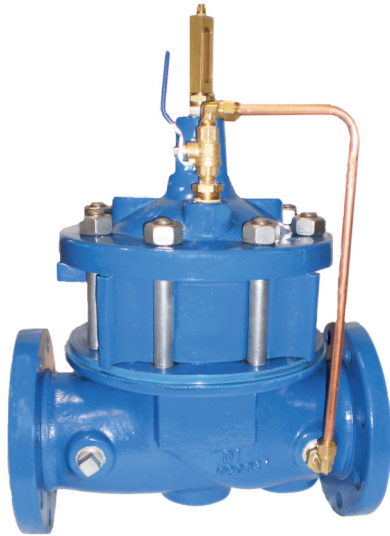




95-01
(Full Internal Port)

695-01
(Reduced Internal Port)

Ratio Reduction Control Valve



- Accurate Proportional Pressure Control
- Completely Automatic Operation
- Simple Construction - No Pilot Controls
- Serial Pressure Reducing in Long Pipelines
- Eliminates Most Cavitation on Piloted Valves
- No Adjustments Necessary
- Low Noise Potential
- Built-In Check Feature

The Cla-Val Model 95-01/695-01 Ratio Reduction Control Valve automatically reduces a higher inlet pressure to a lower outlet pressure at a fixed ratio within certain range of flow rate. It is simple in design for long service life featuring double control chambers for precise diaphragm actuation.

Inlet pressure acting on stem assembly to open valve is proportionally balanced by outlet pressure acting on top of diaphragm and stem assembly to close valve. These two forces position the stem assembly allowing the valve to reduce the pressure in ratio to these internal forces. The valve will close drip-tight when downstream pressure is higher than inlet pressure.

Applications include reducing delivery pressure in long transmission pipelines with gravity-powered pressure build-up. Also, high differential pressure control systems such as pressure reducing stations, high pressure supply to ground storage reservoirs, and off-loading pump delivery pressure to atmosphere.

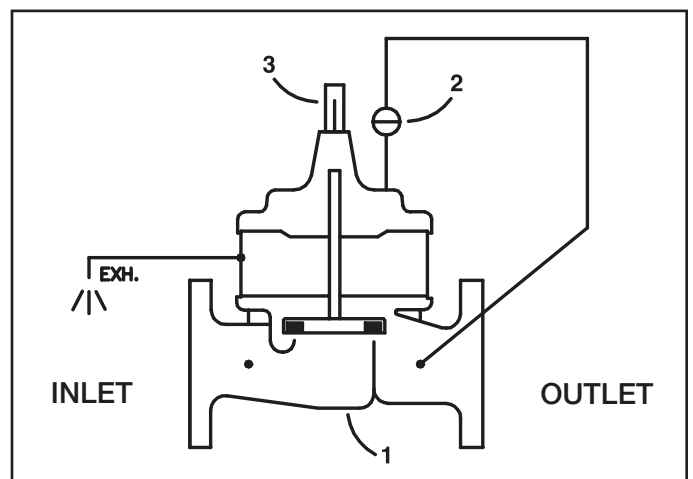
Pressure Reduction Ratio Factor

| Valve Size | Low Flows (0-5 fps*) | High Flows (5-10 fps*) |
|------------|----------------------|------------------------|
| 1.5" | 5.0 | 5.3 |
| 2.0" | 5.0 | 5.3 |
| 2.5" | 3.7 | 4.0 |
| 3.0" | 3.4 | 3.7 |
| 4.0" | 3.0 | 3.3 |
| 6.0" | 3.0 | 3.3 |
| 8.0" | 3.2 | 3.5 |
| 10.0" | 3.0 | 3.3 |
| 12.0" | 2.8 | 3.1 |
| 14.0" | 3.0 | 3.3 |
| 16.0" | 3.0 | 3.3 |
| 18 - 36" | 3.0 | 3.0 |

The pressure reduction ratio factor is based on inlet pressure relative to outlet pressure. For example, with a 6" 95-01 valve, if inlet pressure is 135 psi, then inlet pressure divided by reduction ratio factor equals outlet pressure of 45 psi. As inlet pressure increases, outlet pressure will proportionately increase. As flow demand downstream increases, outlet pressure will proportionately decrease. Optimal valve performance is related to correctly locating valve in pipeline hydraulic grade line (HGL). Place 95-01 in system where it will provide needed pressure break. Also, for simple pressure break applications, the 95-01 breaks head pressure with a predicable ratio rather than variable ratio when using an orifice plate. Consult Cla-Val technical sales staff for assistance.

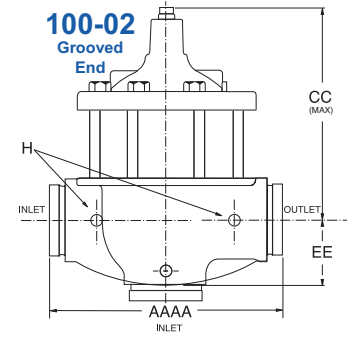
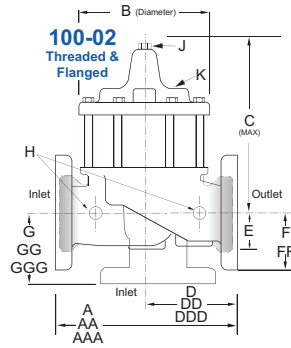
* Approximate

Schematic Diagram



1. Model 100-02 Powertrol (95-01) Main Valve - Full Port
Model 100-21 Powertrol (695-01) Main Valve - Reduced Port
2. CK2 Isolation Valve
3. X101

**Dimensions
Main Powerrol Valve
Model 100-02 Full Port**

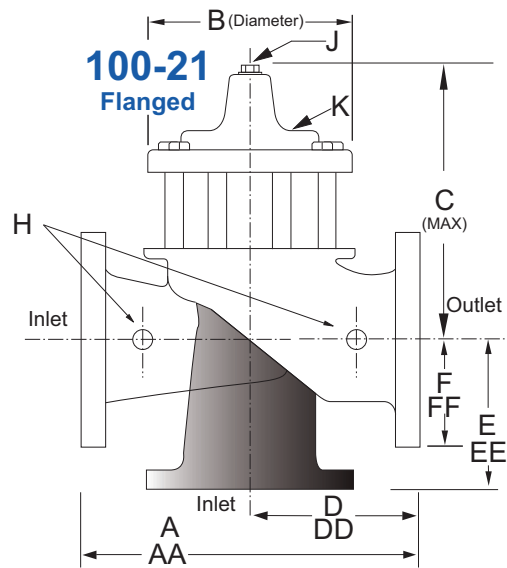


Model 95-01

| Valve Size (Inches) | 1½ | 2 | 2½ | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| A Threaded | 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 | 41.38 |
| AAA 300 ANSI | — | 9.00 | 10.00 | 11.62 | 13.25 | 15.62 | 21.00 | 26.38 | 31.12 | 35.50 | 43.50 |
| AAAA Grooved End | — | 8.50 | 9.00 | 11.00 | 12.50 | 15.00 | 20.00 | 25.38 | — | — | — |
| B Dia. | 5.62 | 6.62 | 8.00 | 9.12 | 11.50 | 15.75 | 20.00 | 23.62 | 28.00 | 32.75 | 35.50 |
| C Max. | 7.62 | 8.56 | 10.31 | 11.19 | 14.25 | 18.44 | 21.81 | 23.38 | 29.31 | 32.12 | 35.00 |
| CC Max. Grooved End | — | 6.87 | 7.81 | 9.63 | 10.25 | 13.50 | 17.18 | 20.43 | — | — | — |
| D Threaded | 3.25 | 4.75 | 5.50 | 6.25 | — | — | — | — | — | — | — |
| DD 150 ANSI | — | 4.00 | 5.50 | 6.00 | 7.50 | 10.00 | 12.69 | 14.88 | 17.00 | 19.50 | 20.81 |
| DDD 300 ANSI | — | 4.25 | 5.88 | 6.38 | 7.88 | 10.50 | 13.25 | 15.56 | 17.75 | 20.25 | 21.62 |
| DDDD Grooved End | — | — | — | 6.00 | 7.50 | — | — | — | — | — | — |
| E | 1.12 | 1.50 | 1.69 | 2.06 | 3.19 | 4.31 | 5.31 | 9.25 | 10.75 | 12.62 | 15.50 |
| EE Grooved End | — | 2.00 | 2.88 | 3.12 | 4.25 | 6.00 | 7.56 | — | — | — | — |
| F 150 ANSI | — | 2.50 | 3.50 | 3.75 | 4.50 | 5.50 | 6.75 | 8.00 | 9.50 | 10.50 | 11.75 |
| FF 300 ANSI | — | 3.06 | 3.75 | 4.13 | 5.00 | 6.25 | 7.50 | 8.75 | 10.25 | 11.50 | 12.75 |
| G Threaded | 1.88 | 3.25 | 4.00 | 4.50 | — | — | — | — | — | — | — |
| GG 150 ANSI | — | 4.00 | 4.00 | 4.00 | 5.00 | 6.00 | 8.00 | 8.62 | 13.75 | 14.88 | 15.69 |
| GGG 300 ANSI | — | 4.25 | 4.31 | 4.38 | 5.31 | 6.50 | 8.50 | 9.31 | 14.50 | 15.62 | 16.50 |
| GGGG Grooved End | — | — | — | 4.25 | 5.00 | — | — | — | — | — | — |
| H NPT Body Tapping | .375 | .375 | .50 | .50 | .75 | .75 | 1 | 1 | 1 | 1 | 1 |
| J NPT Cover Center Plug | .25 | .50 | .50 | .50 | .75 | .75 | 1 | 1 | 1.25 | 1.50 | 2 |
| K NPT Cover Tapping | .375 | .375 | .50 | .50 | .75 | .75 | 1 | 1 | 1 | 1 | 1 |
| Valve Stem Internal Thread UNF | 10-32 | 10-32 | 10-32 | 10-32 | ¼-28 | ¼-28 | ⅜-24 | ⅜-24 | ⅜-24 | ⅜-24 | ½-20 |
| Stem Travel | 0.4 | 0.6 | 0.7 | 0.8 | 1.1 | 1.7 | 2.3 | 2.8 | 3.4 | 4.0 | 4.5 |
| Approx. Ship Wt. Lbs. | 22 | 40 | 65 | 95 | 190 | 320 | 650 | 940 | 1675 | 2460 | 3100 |

| Valve Size (mm) | 32 | 40 | 50 | 65 | 80 | 100 | 150 | 200 | 250 | 300 | 350 | 400 |
|--------------------------------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|
| A Threaded | 184 | 238 | 279 | 318 | — | — | — | — | — | — | — | — |
| AA 150 ANSI | — | 216 | 238 | 279 | 305 | 381 | 508 | 645 | 756 | 864 | 991 | 1051 |
| AAA 300 ANSI | — | 229 | 254 | 295 | 337 | 397 | 533 | 670 | 790 | 902 | 1029 | 1105 |
| AAAA Grooved End | 216 | 216 | 279 | 318 | 381 | 508 | 645 | — | — | — | — | — |
| B Dia. | 143 | 168 | 203 | 232 | 292 | 400 | 508 | 600 | 711 | 832 | 902 | — |
| C Max. | 194 | 217 | 262 | 284 | 362 | 468 | 554 | 594 | 744 | 816 | 889 | — |
| CC Max. Grooved End | 174 | 174 | 245 | 260 | 343 | 436 | 519 | — | — | — | — | — |
| D Threaded | 83 | 121 | 140 | 159 | — | — | — | — | — | — | — | — |
| DD 150 ANSI | — | 102 | 140 | 152 | 191 | 254 | 322 | 378 | 432 | 495 | 528 | — |
| DDD 300 ANSI | — | 108 | 149 | 162 | 200 | 267 | 337 | 395 | 451 | 514 | 549 | — |
| DDDD Grooved End | — | — | — | 152 | 191 | — | — | — | — | — | — | — |
| E | 29 | 38 | 43 | 52 | 81 | 110 | 135 | 235 | 273 | 321 | 394 | — |
| EE Grooved End | 52 | 64 | 73 | 79 | 108 | 152 | 192 | — | — | — | — | — |
| F 150 ANSI | — | 64 | 89 | 95 | 114 | 140 | 171 | 203 | 241 | 267 | 298 | — |
| FF 300 ANSI | — | 78 | 95 | 105 | 127 | 159 | 191 | 222 | 260 | 292 | 324 | — |
| G Threaded | 48 | 83 | 102 | 114 | — | — | — | — | — | — | — | — |
| GG 150 ANSI | — | 102 | 102 | 102 | 127 | 152 | 203 | 219 | 349 | 378 | 399 | — |
| GGG 300 ANSI | — | 102 | 110 | 111 | 135 | 165 | 216 | 236 | 368 | 397 | 419 | — |
| GGGG Grooved End | — | — | — | 108 | 127 | — | — | — | — | — | — | — |
| H NPT Body Tapping | .375 | .375 | .50 | .50 | .75 | .75 | 1 | 1 | 1 | 1 | 1 | 1 |
| J NPT Cover Center Plug | .25 | .50 | .50 | .50 | .75 | .75 | 1 | 1 | 1.25 | 1.50 | 2 | — |
| K NPT Cover Tapping | .375 | .375 | .50 | .50 | .75 | .75 | 1 | 1 | 1 | 1 | 1 | — |
| Valve Stem Internal Thread UNF | 10-32 | 10-32 | 10-32 | 10-32 | ¼-28 | ¼-28 | ⅜-24 | ⅜-24 | ⅜-24 | ⅜-24 | ⅜-24 | ½-20 |
| Stem Travel | 10 | 15 | 18 | 20 | 28 | 43 | 58 | 71 | 86 | 102 | 114 | — |
| Approx. Ship Wt. Kgs. | 10 | 18 | 30 | 43 | 86 | 145 | 295 | 426 | 760 | 1116 | 1406 | — |

**Dimensions Main
Powertrol Valve
Model 100-02 Reduced Port**



Model 695-01

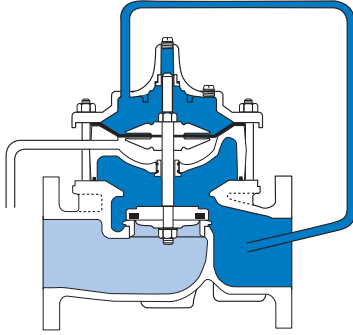
| Valve Size (Inches) | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| A 150 ANSI | 10.25 | 13.88 | 17.75 | 21.38 | 26.00 | 30.00 | 34.25 | 35.00 |
| AA 300 ANSI | 11.00 | 14.50 | 18.62 | 22.38 | 27.38 | 31.50 | 35.75 | 36.62 |
| B Dia. | 6.62 | 9.12 | 11.50 | 15.75 | 20.00 | 23.62 | 28.00 | 28.00 |
| C Max. | 9.25 | 11.75 | 15.25 | 20.25 | 23.75 | 27.25 | 29.31 | 34.12 |
| 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 | 3.25 | 4.50 | 5.50 | 6.75 | 8.00 | 9.50 | 11.00 | 11.75 |
| FF 300 ANSI | 4.12 | 5.00 | 6.25 | 7.50 | 8.75 | 10.25 | — | 12.75 |
| H NPT Body Tapping | .375 | .50 | .75 | .75 | 1 | 1 | 1 | 1 |
| J NPT Cover Center Plug | .50 | .50 | .75 | .75 | 1 | 1 | 1.25 | 1.25 |
| K NPT Cover Tapping | .375 | .50 | .75 | .75 | 1 | 1 | 1 | 1 |
| Valve Stem Internal Thread UNF | 10-32 | ¼-28 | ¼-28 | ¾-24 | ¾-24 | ¾-24 | ¾-24 | ¾-24 |
| Stem Travel | 0.6 | 0.8 | 1.1 | 1.7 | 2.3 | 2.8 | 3.4 | 3.4 |
| Approx. Ship Wt. Lbs. | 70 | 135 | 230 | 480 | 785 | 1410 | 2215 | 2215 |

| Valve Size (mm) | 80 | 100 | 150 | 200 | 250 | 300 | 350 | 400 |
|--------------------------------|-------|------|------|------|------|------|------|------|
| A 150 ANSI | 260 | 353 | 451 | 543 | 660 | 762 | 870 | 889 |
| AA 300 ANSI | 279 | 368 | 473 | 568 | 695 | 800 | 908 | 930 |
| B Dia. | 168 | 232 | 292 | 400 | 508 | 600 | 711 | 711 |
| C Max. | 235 | 298 | 387 | 514 | 603 | 692 | 744 | 867 |
| D 150 ANSI | — | 176 | 226 | 272 | — | — | — | — |
| DD 300 ANSI | — | 184 | 238 | 284 | — | — | — | — |
| E 150 ANSI | — | 140 | 171 | 184 | — | — | — | — |
| EE 300 ANSI | — | 148 | 184 | 197 | — | — | — | — |
| F 150 ANSI | 95 | 114 | 140 | 171 | 203 | 241 | 279 | 298 |
| FF 300 ANSI | 105 | 127 | 159 | 191 | 222 | 260 | — | 324 |
| H NPT Body Tapping | ¾ | ½ | ¾ | ¾ | 1 | 1 | 1 | 1 |
| J NPT Cover Center Plug | ½ | ½ | ¾ | ¾ | 1 | 1 | 1¼ | 1¼ |
| K NPT Cover Tapping | ¾ | ½ | ¾ | ¾ | 1 | 1 | 1 | 1 |
| Valve Stem Internal Thread UNF | 10-32 | ¼-28 | ¼-28 | ¾-24 | ¾-24 | ¾-24 | ¾-24 | ¾-24 |
| Stem Travel | 15 | 20 | 28 | 43 | 58 | 71 | 86 | 86 |
| Approx. Ship Wt. Kgs | 32 | 61 | 104 | 218 | 356 | 640 | 1006 | 1006 |

Service and Installation

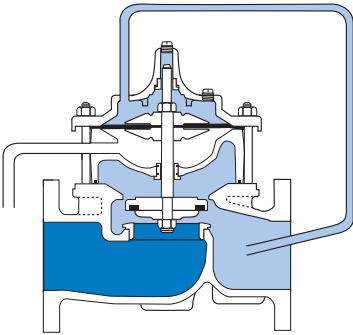
Cla-Val Control Valves operate with maximum efficiency when mounted in horizontal piping with the main valve cover UP, however, other positions are acceptable. Due to component size and weight of 10 inch and larger valves, installation with cover UP is advisable. We recommend isolation valves be installed 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.

Principle of Operation



No Flow-Closed

When no flow occurs, downstream pressure is applied to cover chamber and valve closes drip-tight.



Ratio Pressure Reducing

Inlet pressure forces valve open and outlet pressure forces valve close. The two forces balance the valve at a partially open position that reduces flowing pressure to a controlling ratio.

Specifications

Available Sizes

| Pattern | Threaded | Flanged | Grooved End |
|---------|----------|-----------|--------------------------------|
| Globe | 1½" - 3" | 1½" - 16" | 1½"-2"- 2½"- 3"- 4"- 6"- 8" |
| Angle | 1½" - 3" | 2" - 16" | 2" - 3" - 4" |

Full Port Sizes:
1¼" - 16"

Reduced Port Sizes:
3" - 16"

Materials

| Component | Standard Material Combinations | | |
|--|---|------------|-----------|
| Body & Cover | Ductile Iron | Cast Steel | Bronze |
| Available Sizes | 1¼" - 16" | 1¼" - 16" | 1¼" - 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 Standard | | |
| Pilot Tubing | Stainless Steel Standard | | |

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

Pressure Ratings (Recommended Maximum Pressure - psi)

| Valve Body & Cover | | Pressure Class | | | |
|--------------------|--------------|-----------------|-----------|------------|--------------|
| | | Flanged | | | Threaded |
| Grade | Material | ANSI Standards* | 150 Class | 300† Class | End‡ Details |
| ASTM A536 | Ductile Iron | B16.42 | 250 | 400 | 400 |
| ASTM A216-WCB | Cast Steel | B16.5 | 285 | 400 | 400 |
| UNS 87850 | Bronze | B16.24 | 225 | 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.
† Consult factory when Maximum Operating Pressure Differential (MOPD) is greater than 400 PSID

"Valves for higher pressure are available; consult factory for details"

Typical Application

