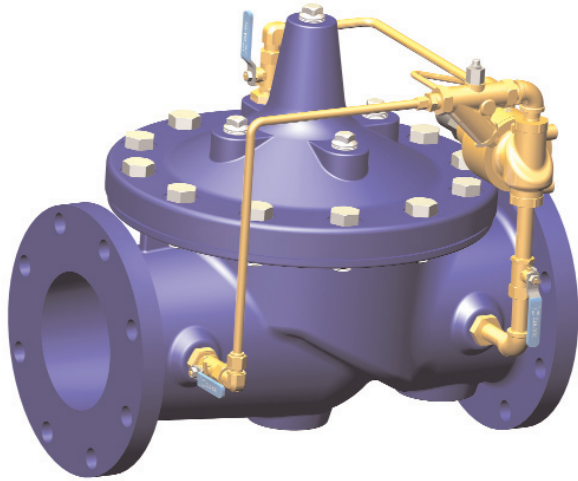




MODEL **50-01**
(Full Internal Port)
650-01
(Reduced Internal Port)
Pressure Relief & Pressure Sustaining Valve



- **Accurate Pressure Control**
- **Optional Check Feature**
- **Fast Opening to Maintain Line Pressure**
- **Slow Closing to Prevents Surges**
- **Completely Automatic Operation**

The Cla-Val Model 50-01/650-01 Pressure Relief Valve is a hydraulically operated, pilot-controlled, modulating valve designed to maintain constant upstream pressure within close limits. This valve can be used for pressure relief, pressure sustaining, back pressure, or unloading functions in a by-pass system.

In operation, the valve is actuated by line pressure through a pilot control system, opening fast to maintain steady line pressure but closing gradually to prevent surges. Operation is completely automatic and pressure settings may be easily changed.

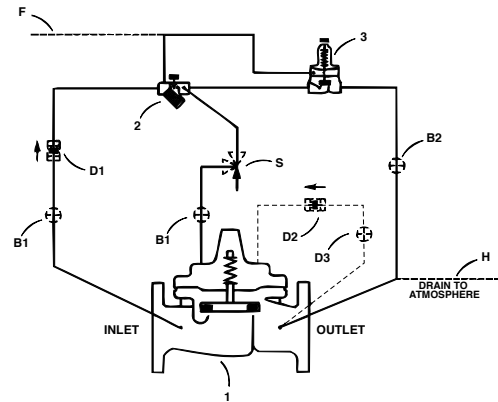
If a check feature is added, and a pressure reversal occurs, the downstream pressure is admitted into the main valve cover chamber, closing the valve to prevent return flow.

Schematic Diagram

| Item | Description |
|------|--------------------------------|
| 1 | Hytrol (Main Valve) |
| 2 | X42N-2 Strainer & Needle Valve |
| 3 | CRL Pressure Relief Control |

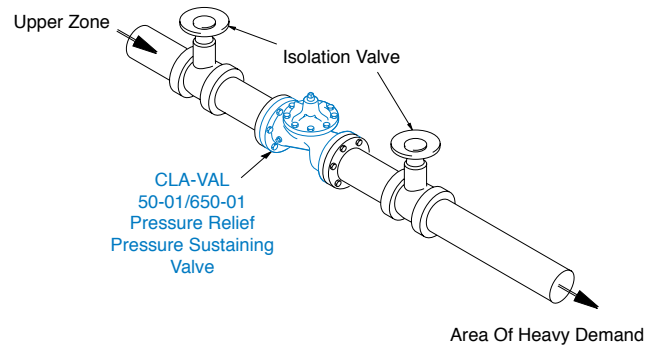
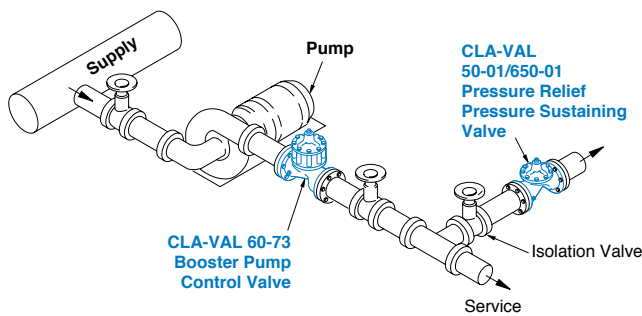
Optional Features

| Item | Description |
|------|-----------------------------------|
| B | CK2 (Isolation Valve) |
| D | Check Valves with Isolation Valve |
| F | Remote Pilot Sensing |
| H | Drain to Atmosphere |
| S | CV Speed Control (Opening) |



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

Typical Applications



Pressure Relief Service

This fast opening, slow closing relief valve provides system protection against high pressure surges on pump start up and pump shut down by dissipating the excess pressure to a safe location.

Pressure Sustaining Service

When installed in a line between an upper zone and a lower area of heavy demand, the valve acts to maintain desired upstream pressure to prevent "robbing" of the upper zone. Water in excess of pressure setting is allowed to flow to an area of heavy demand, control is smooth, and pressure regulation is positive.



Model 50-01 (Uses Basic Valve Model 100-01)

Pressure Ratings (Recommended Maximum Pressure - psi)

| Valve Body & Cover | | Pressure Class | | | |
|--------------------|--------------|-----------------|---------|---------|---------------|
| | | Flanged | | | Threaded |
| Grade | Material | ANSI Standards* | 150 lb. | 300 lb. | End** Details |
| ASTM A536 | 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 |

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

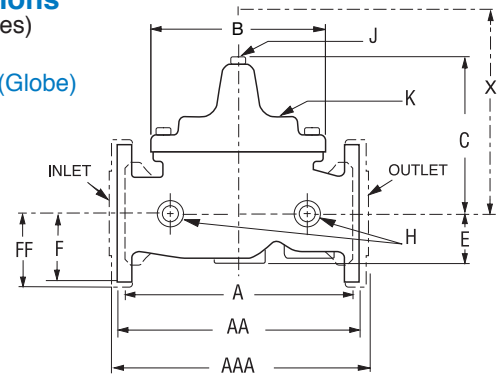
Materials

| Component | Standard Material Combinations | | |
|--|---|------------|-----------|
| Body & Cover | Ductile Iron | Cast Steel | Bronze |
| Available Sizes | 1¼" - 36" | 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 | | |

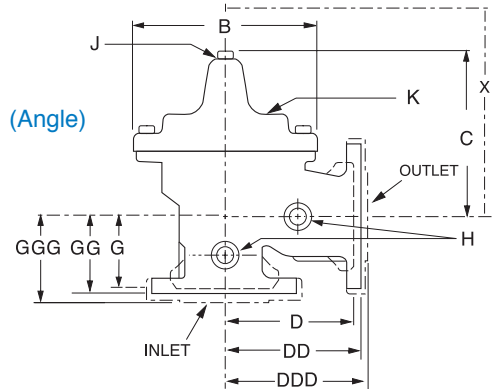
For material options not listed, consult factory.
 Cla-Val manufactures valves in more than 50 different alloys.

Dimensions (In inches)

100-01 (Globe)



100-01 (Angle)



Model 50-01 Dimensions (In Inches)

| Valve Size (Inches) | 1¼-1½ | 2 | 2 ½ | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 24 | 36 |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 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 | 39.00 | 41.38 | 61.50 | 76.00 |
| 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 | 63.24 | 78.00 |
| 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 | 66.00 |
| 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 | 61.50 |
| D Threaded | 3.25 | 4.75 | 5.50 | 6.25 | — | — | — | — | — | — | — | — | — |
| DD 150 ANSI | 4.00* | 4.75 | 5.50 | 6.00 | 7.50 | 10.00 | 12.75 | 14.88 | 17.00 | 19.50 | 20.81 | — | — |
| 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 | — | — |
| E | 1.12 | 1.50 | 1.69 | 2.56 | 3.19 | 4.31 | 5.31 | 9.25 | 10.75 | 12.62 | 15.50 | 17.75 | 24.56 |
| 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 | 19.25 | 28.00 |
| 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 Threaded | 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 | — | — |
| 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 | — | — |
| H NPT Body Tapping | ¾ | ¾ | ½ | ½ | ¾ | ¾ | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| J NPT Cover Center Plug | ¼ | ½ | ½ | ½ | ¾ | ¾ | 1 | 1 | 1¼ | 1½ | 2 | 1½ | 2 |
| K NPT Cover Tapping | ¾ | ¾ | ½ | ½ | ¾ | ¾ | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| Valve Stem Internal Thread UNF | 10-32 | 10-32 | 10-32 | ¼-28 | ¼-28 | ¾-24 | ¾-24 | ¾-24 | ¾-24 | ¾-24 | ¾-24 | ½-20 | ¾-16 |
| Stem Travel | 0.4 | 0.6 | 0.7 | 0.8 | 1.1 | 1.7 | 2.3 | 2.8 | 3.4 | 4.0 | 4.5 | 6.75 | 10.12 |
| Approx. Ship Wt. Lbs. | 15 | 35 | 50 | 70 | 140 | 285 | 500 | 780 | 1165 | 1600 | 2265 | 6200 | 11470 |
| X Pilot System | 11.00 | 13.00 | 14.00 | 15.00 | 17.00 | 29.00 | 31.00 | 33.00 | 36.00 | 40.00 | 40.00 | 68.00 | 86.00 |
| Y Pilot System | 9.00 | 9.00 | 10.00 | 11.00 | 12.00 | 20.00 | 22.00 | 24.00 | 26.00 | 29.00 | 30.00 | 39.00 | 45.00 |
| Z Pilot System | 9.00 | 9.00 | 10.00 | 11.00 | 12.00 | 20.00 | 22.00 | 24.00 | 26.00 | 29.00 | 30.00 | 39.00 | 45.00 |

*1½" Size Only

Model 650-01 (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 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.

Materials

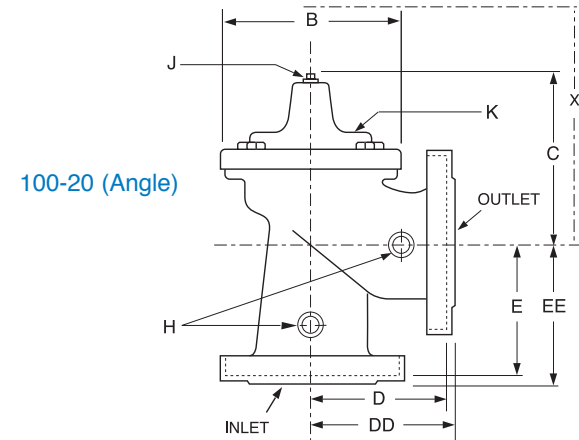
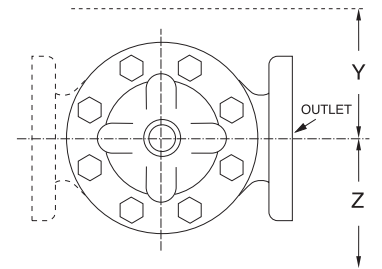
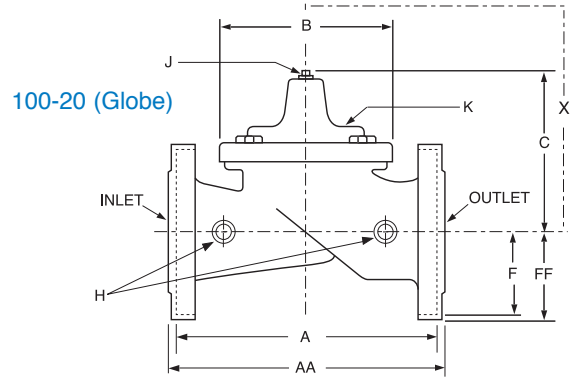
| Component | Standard Material Combinations | | |
|--|---|------------|----------|
| Body & Cover | Ductile Iron | Cast Steel | Bronze |
| Available Sizes | 3" - 48" | 3" - 16" | 3" - 16" |
| Disc Retainer & Diaphragm Washer | Cast Iron | Cast Steel | Bronze |
| Trim: Disc Guide, Seat & Cover Bearing | Bronze is Standard Stainless Steel is Optional | | |
| Disc | Buna-N® Rubber | | |
| Diaphragm | Nylon Reinforced Buna-N® Rubber | | |
| Stem, Nut & Spring | Stainless Steel | | |





















































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

Model 650-01 Dimensions (In Inches)

| Valve Size (Inches) | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 |
|--------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| A 150 ANSI | 10.25 | 13.88 | 17.75 | 21.38 | 26.00 | 30.00 | 34.25 | 35.00 | 42.12 | 48.00 | 48.00 | 63.25 |
| AA 300 ANSI | 11.00 | 14.50 | 18.62 | 22.38 | 27.38 | 31.50 | — | 36.62 | 43.63 | 49.62 | 49.75 | — |
| B Dia. | 6.62 | 9.12 | 11.50 | 15.75 | 20.00 | 23.62 | 28.00 | 28.00 | 35.44 | 35.44 | 35.44 | 53.19 |
| C Max. | 7.00 | 8.62 | 11.62 | 15.00 | 17.88 | 21.00 | 20.88 | 25.75 | 25.00 | 31.00 | 31.00 | 43.94 |
| 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 | 11.00 | 11.75 | 15.88 | 14.56 | 17.00 | 19.88 |
| FF 300 ANSI | 4.12 | 5.00 | 6.25 | 7.50 | 8.75 | 10.25 | — | 12.75 | 15.88 | 16.06 | 19.00 | — |
| H NPT Body Tapping | 3/8 | 1/2 | 3/4 | 3/4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| J NPT Cover Center Plug | 1/2 | 1/2 | 3/4 | 3/4 | 1 | 1 | 1 1/4 | 1 1/4 | 2 | 2 | 2 | 2 |
| K NPT Cover Tapping | 3/8 | 1/2 | 3/4 | 3/4 | 1 | 1 | 1 | 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 | 3/8-24 | 1/2-20 | 1/2-20 | 1/2-20 | 3/4-16 |
| Stem Travel | 0.6 | 0.8 | 1.1 | 1.7 | 2.3 | 2.8 | 3.4 | 3.4 | 3.4 | 4.5 | 4.5 | 6.5 |
| Approx. Ship Wt. Lbs. | 45 | 85 | 195 | 330 | 625 | 900 | 1250 | 1380 | 1500 | 2551 | 2733 | 6500 |
| X Pilot System | 13.00 | 15.00 | 27.00 | 30.00 | 33.00 | 36.00 | 36.00 | 41.00 | 40.00 | 46.00 | 55.00 | 68.00 |
| Y Pilot System | 10.00 | 11.00 | 18.00 | 20.00 | 22.00 | 24.00 | 26.00 | 26.00 | 30.00 | 30.00 | 30.00 | 39.00 |
| Z Pilot System | 10.00 | 11.00 | 18.00 | 20.00 | 22.00 | 24.00 | 26.00 | 26.00 | 30.00 | 30.00 | 30.00 | 39.00 |

Dimensions
(In inches)



| Valve Selection | | These Symbols  and  Indicate Available Sizes | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|--------------------------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|
| | | Inches | 1 ¼ | 1 ½ | 2 | 2 ½ | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 | | | | | |
| | | mm | 32 | 40 | 50 | 65 | 80 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 750 | 900 | | | | | |
| | | End Detail | Threaded | | | | | Threaded & Flanged | | | | | | | | | | Flanged | | | | | | |
| Model 50-01 | Basic Valve 100-01 | Globe |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | | | | |
| | | Angle |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | | | | |
| | Suggested Flow (gpm) | Max. Continuous | 93 | 125 | 210 | 300 | 460 | 800 | 1800 | 3100 | 4900 | 7000 | 8400 | 11000 | | | 25000 | | 50000 | | | | | |
| | | Max. Surge | 120 | 280 | 470 | 670 | 1000 | 1800 | 4000 | 7000 | 11000 | 16000 | 19000 | 25000 | | | 56500 | | 120000 | | | | | |
| | Suggested Flow (Liters/Sec) | Max. Continuous | 6 | 8 | 13 | 19 | 29 | 50 | 113 | 195 | 309 | 441 | 529 | 693 | | | 1575 | | 3150 | | | | | |
| | | Max. Surge | 13 | 18 | 30 | 42 | 63 | 113 | 252 | 441 | 693 | 1008 | 1197 | 1575 | | | 3560 | | 7570 | | | | | |
| Model 650-01 | Basic Valve 100-20 | Globe | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  | | | | | |
| | | Angle | | | | |  |  |  | | | | | | | | | | | | | | | |
| | Suggested Flow (gpm) | Max. Continuous | | | | | 260 | 580 | 1025 | 2300 | 4100 | 6400 | 9230 | 9230 | 16500 | 16500 | 16500 | 31300 | | | | | | |
| | | Max. Surge | | | | | 440 | 990 | 1760 | 3970 | 7050 | 11000 | 15900 | 15900 | 28200 | 28200 | 28200 | 56500 | | | | | | |
| | Suggested Flow (Liters/Sec) | Max. Continuous | | | | | 16 | 37 | 65 | 145 | 258 | 403 | 581 | 581 | 1040 | 1040 | 1040 | 1972 | | | | | | |
| | | Max. Surge | | | | | 28 | 62 | 111 | 250 | 444 | 693 | 1002 | 1002 | 1777 | 1777 | 1777 | 3560 | | | | | | |

650-01 is the reduced internal port size version of the 50-01.

For 100-01 basic valves, suggested, flow calculations were based on flow through Schedule 40 Pipe. Maximum continuous flow is approx. 20 ft/sec (6.1 meters/sec) & maximum surge is approx. 45 ft/sec (13.7 meters/sec). For 100-20 basic valves, suggested, flow calculations were based on flow through the valve seat. Approx. 26 ft/sec (7.9 meters/sec) is used for continuous flow & 45 ft/sec (13.7 meters/sec) is used for surge flow. Maximum continuous flow through the valve seat for the 30" 100-20 is approx. 22 ft/sec (6.7 meters/sec).

**Flanged End Detail Only

Pilot System Specifications

Adjustment Ranges

- 0 to 75 psi Max.
- 20 to 200 psi *
- 100 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
- Tubing & Fitting: Copper and Bronze

Optional Pilot System Materials

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

When Ordering, Please Specify

1. Catalog No. 50-01 or No. 650-01
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



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