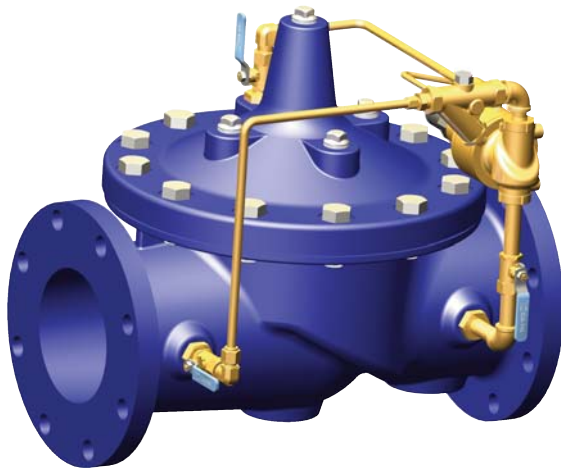




50-AE
(Full Internal Port)
—MODEL—
650-AE
(Reduced Internal Port)

Pressure Relief Valve (Equipped with X44A)



- 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-AE/650-AE 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

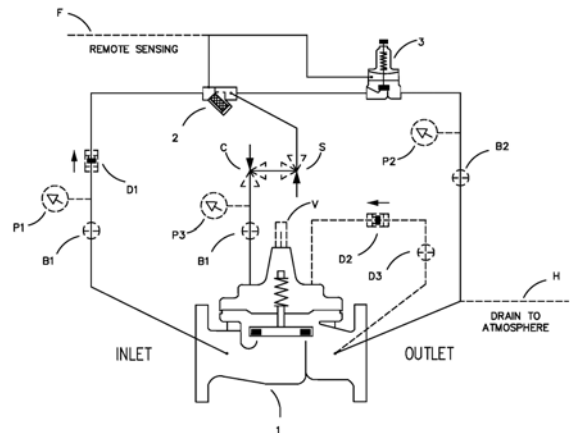
Item Description

- 1 Hytrol (Main Valve)
- 2 X44A Strainer & Orifice Assembly
- 3 CRL Pressure Relief Control

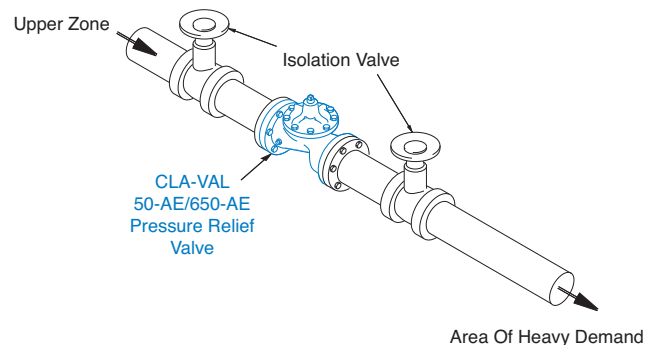
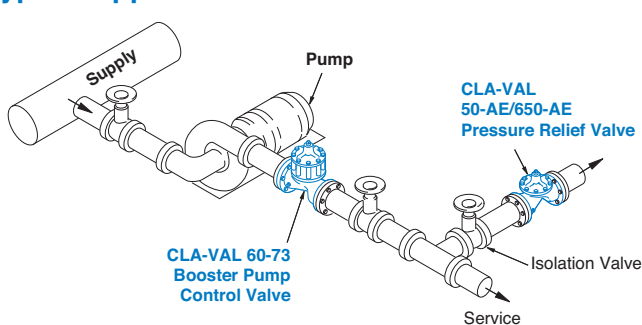
Optional Features

Item Description

- B CK2 (Isolation Valve)
- C CV Flow Control (Closing)
- D Check Valves with Isolation Valve
- F Remote Pilot Sensing
- H Drain to Atmosphere
- P X141 Pressure Gauge
- S CV Speed Control (Opening)
- V X101 Valve Position Indicator



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-AE (Uses Basic Valve Model 100-01)

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 |
| ASTM B62 | Bronze | B16.24 | 225 | 400 | 400 | 400 |

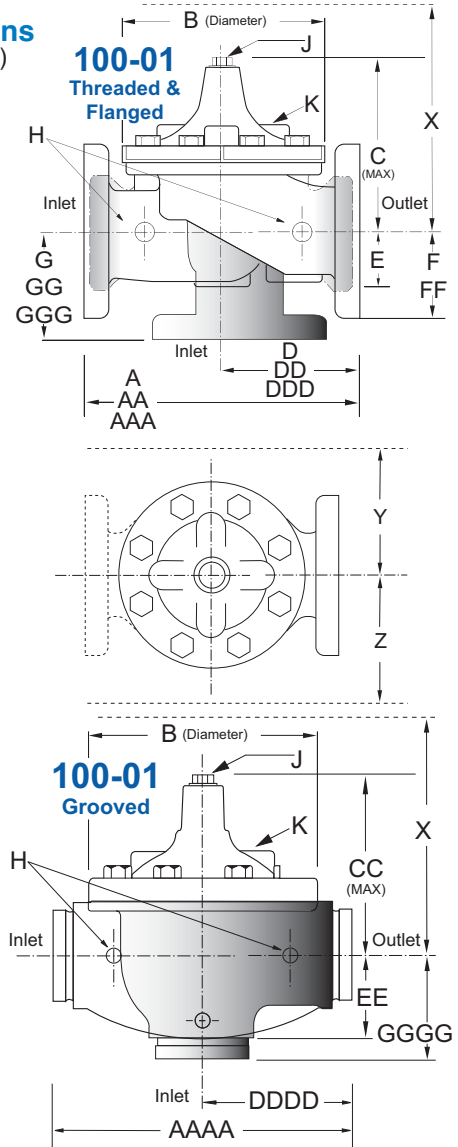
Note: * ANSI standards are for flange dimensions only.
 Flanged valves are available faced but not drilled.
 ‡ End Details machined to ANSI B2.1 specifications.
Valves for higher pressure are available; consult factory for details

Materials

| Component | Standard Material Combinations | | |
|--|---|------------|----------|
| Body & Cover | Ductile Iron | Cast Steel | Bronze |
| Available Sizes | 1" - 36" | 1" - 16" | 1" - 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)



Model 50-AE 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 | 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 | 47.64 | 53.62 | 63.24 | 64.50 | 76.00 |
| AAAA Grooved End | — | — | 8.50 | 9.00 | 11.00 | 12.50 | 15.00 | 20.00 | 25.38 | — | — | — | — | — | — | — | — | — |
| B Dia. | 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 Max. | 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 | 61.50 |
| CC Max. 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 | 2.56 | 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 | 25.60 |
| 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 | 25.60 |
| 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 | .375 | .375 | .375 | .375 | .50 | .50 | .75 | .75 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| J NPT Cover Center Plug | .25 | .25 | .25 | .50 | .50 | .50 | .75 | .75 | 1 | 1 | 1.25 | 1.5 | 2 | 1.5 | 1.5 | 1.5 | 2 | 2 |
| K NPT Cover Tapping | .375 | .375 | .375 | .375 | .50 | .50 | .75 | .75 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| Stem Travel | 0.4 | 0.4 | 0.4 | 0.6 | 0.7 | 0.8 | 1.1 | 1.7 | 2.3 | 2.8 | 3.4 | 4.0 | 4.5 | 5.1 | 5.63 | 6.75 | 7.5 | 8.5 |
| Approx. Ship Wt. Lbs. | 15 | 15 | 15 | 35 | 50 | 70 | 140 | 285 | 500 | 780 | 1165 | 1600 | 2265 | 2982 | 3900 | 6200 | 7703 | 11720 |
| X Pilot System | 11 | 11 | 11 | 13 | 14 | 15 | 17 | 29 | 31 | 33 | 36 | 40 | 40 | 43 | 47 | 68 | 79 | 85 |
| Y Pilot System | 9 | 9 | 9 | 9 | 10 | 11 | 12 | 20 | 22 | 24 | 26 | 29 | 30 | 32 | 34 | 39 | 40 | 45 |
| Z Pilot System | 9 | 9 | 9 | 9 | 10 | 11 | 12 | 20 | 22 | 24 | 26 | 29 | 30 | 32 | 34 | 39 | 42 | 47 |

Note: The top two flange holes on valve size 36 are threaded to 1 1/2"-6 UNC.

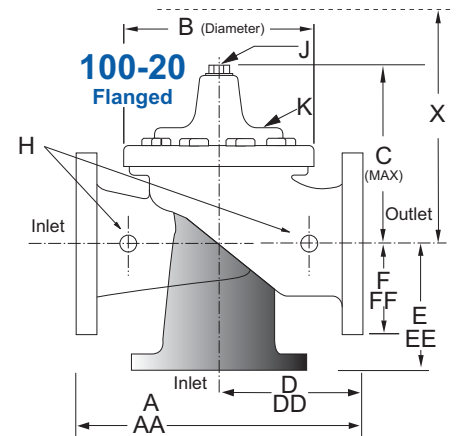
Model 650-AE (Uses Basic Valve Model 100-20)

Dimensions
(In inches)

Pressure Ratings (Recommended Maximum Pressure - psi)

| Valve Body & Cover | | Pressure Class | | |
|--------------------|--------------|-----------------|-----------|-----------|
| | | Flanged | | |
| Grade | Material | ANSI Standards* | 150 Class | 300 Class |
| ASTM A536 | Ductile Iron | B16.42 | 250 | 400 |
| ASTM A216-WCB | Cast Steel | B16.5 | 285 | 400 |
| ASTM B62 | Bronze | B16.24 | 225 | 400 |

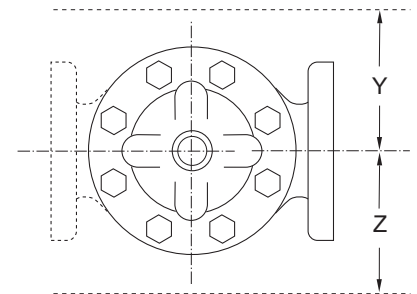
Note: * ANSI standards are for flange dimensions only.
Flanged valves are available faced but not drilled.
Valves for higher pressure are available; consult factory for details



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-AE Dimensions (In Inches)

| Valve Size (Inches) | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 | 42 | 48 |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 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 | 65.00 | 76.00 | 94.50 |
| AA 300 ANSI | 11.00 | 14.50 | 18.62 | 22.38 | 27.38 | 31.50 | 35.75 | 36.62 | 43.63 | 49.62 | 49.75 | 63.75 | 67.00 | 76.00 | 94.50 |
| B Dia. | 6.62 | 9.12 | 11.50 | 15.75 | 20.00 | 23.62 | 27.47 | 28.00 | 35.44 | 35.44 | 35.44 | 53.19 | 56.00 | 66.00 | 66.00 |
| 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 | 54.60 | 61.50 | 61.50 |
| D 150 ANSI | — | 6.94 | 8.88 | 10.69 | CF* | CF* | CF* | CF* | CF* | CF* | CF* | — | — | — | — |
| DD 300 ANSI | — | 7.25 | 9.38 | 11.19 | CF* | CF* | CF* | CF* | CF* | CF* | CF* | — | — | — | — |
| E 150 ANSI | — | 5.50 | 6.75 | 7.25 | CF* | CF* | CF* | CF* | CF* | CF* | CF* | — | — | — | — |
| EE 300 ANSI | — | 5.81 | 7.25 | 7.75 | CF* | CF* | CF* | CF* | CF* | CF* | CF* | — | — | — | — |
| 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 | 25.50 | 28.00 | 31.50 |
| FF 300 ANSI | 4.12 | 5.00 | 6.25 | 7.50 | 8.75 | 10.25 | 11.50 | 12.75 | 15.88 | 16.06 | 19.00 | 22.00 | 27.50 | 28.00 | 31.50 |
| H NPT Body Tapping | .375 | .50 | .75 | .75 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| J NPT Cover Center Plug | .50 | .50 | .75 | .75 | 1 | 1 | 1.25 | 1.25 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| K NPT Cover Tapping | .375 | .50 | .75 | .75 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| Stem Travel | 0.6 | 0.8 | 1.1 | 1.7 | 2.3 | 2.8 | 3.4 | 3.4 | 4.5 | 4.5 | 4.5 | 6.5 | 7.5 | 8.5 | 8.5 |
| Approx. Ship Wt. Lbs. | 45 | 85 | 195 | 330 | 625 | 900 | 1250 | 1380 | 2365 | 2551 | 2733 | 6500 | 8545 | 12450 | 13100 |
| X Pilot System | 13 | 15 | 27 | 30 | 33 | 36 | 36 | 41 | 40 | 46 | 55 | 68 | 79 | 85 | 86 |
| Y Pilot System | 10 | 11 | 18 | 20 | 22 | 24 | 26 | 26 | 30 | 30 | 30 | 39 | 40 | 45 | 47 |
| Z Pilot System | 10 | 11 | 18 | 20 | 22 | 24 | 26 | 26 | 30 | 30 | 30 | 39 | 42 | 47 | 49 |

*Consult Factory

Note: The top two flange holes on valve sizes 36 thru 48 are threaded to 1 1/2"-6 UNC.

| 50-AE Valve 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 |
| Basic Valve 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, Gr* | T, F, Gr | T, F, Gr* | T, F, Gr | F, Gr | F, Gr* | F, Gr* | F | F | F | F | F | F | F | F | F |
| Suggested Flow (gpm) | Maximum | 55 | 93 | 125 | 210 | 300 | 460 | 800 | 1800 | 3100 | 4900 | 7000 | 8400 | 11000 | 14000 | 17000 | 25000 | 42000 | 50000 |
| | Maximum Surge | 120 | 210 | 280 | 470 | 670 | 1000 | 1800 | 4000 | 7000 | 11000 | 16000 | 19000 | 25000 | 31000 | 39000 | 56500 | 63000 | 85000 |
| Suggested Flow (Liters/Sec) | Maximum | 3.5 | 6 | 8 | 13 | 19 | 29 | 50 | 113 | 195 | 309 | 442 | 530 | 694 | 883 | 1073 | 1577 | 2650 | 3150 |
| | Maximum Surge | 7.6 | 13 | 18 | 30 | 42 | 63 | 113 | 252 | 441 | 693 | 1008 | 1197 | 1577 | 1956 | 2461 | 3560 | 3975 | 5360 |

100-01 Series is the full internal port Hytrol.

*Globe Grooved Only

| 650-AE Valve Selection | 100-20 Pattern: Globe (G), Angle (A), End Connections: Flanged (F) Indicate Available Sizes | | | | | | | | | | | | | | | |
|-----------------------------------|---|-----|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Inches | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 | 42 | 48 |
| | mm | 80 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 750 | 900 | 1000 | 1200 |
| Basic Valve 100-20 | Pattern | G | G, A | G, A | G, A | G | G | G | G | G | G | G | G | G | G | G |
| | End Detail | F | F | F | F | F | F | F | F | F | F | F | F | F | F | F |
| Suggested Flow (gpm) | Maximum | 260 | 580 | 1025 | 2300 | 4100 | 6400 | 9230 | 9230 | 16500 | 16500 | 16500 | 28000 | 33500 | 33500 | 33500 |
| | Maximum Surge | 440 | 990 | 1760 | 3970 | 7050 | 11000 | 15900 | 15900 | 28200 | 28200 | 28200 | 56500 | 58600 | 58600 | 58600 |
| Suggested Flow (Liters/Sec) | Maximum | 16 | 37 | 65 | 145 | 258 | 403 | 581 | 581 | 1040 | 1040 | 1040 | 1764 | 2115 | 2115 | 2115 |
| | Maximum Surge | 28 | 62 | 111 | 250 | 444 | 693 | 1002 | 1002 | 1777 | 1777 | 1777 | 3560 | 3700 | 3700 | 3700 |

100-20 Series is the reduced internal port size version of the 100-01 Series.

Pilot System Specifications

Adjustment Ranges

0 to 75 psi Max.
 20 to 105 psi
 20 to 200 psi
 100 to 300 psi

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.

When Ordering, Please Specify

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



CLA-VAL

PO Box 1325 Newport Beach CA 92659-0325
 Phone: 949-722-4800 • Fax: 949-548-5441

CLA-VAL CANADA

4687 Christie Drive
 Beamsville, Ontario
 Canada L0R 1B4
 Phone: 905-563-4963
 Fax: 905-563-4040

CLA-VAL EUROPE

Chemin des Mesanges 1
 CH-1032 Romanel/
 Lausanne, Switzerland
 Phone: 41-21-643-15-55
 Fax: 41-21-643-15-50

©COPYRIGHT CLA-VAL 2013 Printed in USA
 Specifications subject to change without notice.

www.cla-val.com

Represented By: