

50-01

(Full Internal Port)

MODEL

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

- 1 100-01 Hytrol Main Valve
- 2 X42N-2 Strainer & Needle Valve
- 3 CRL-60 Pressure Relief Control



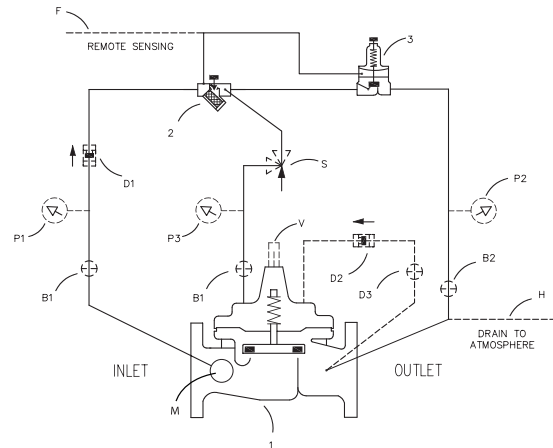
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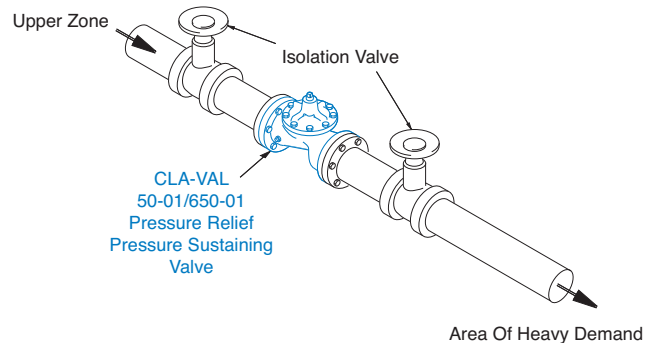
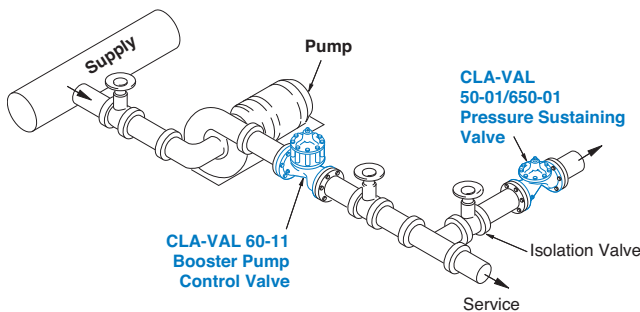
Optional Features

Item Description

- B CK2 Isolation Valve
- 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.

| 50-01 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

| 650-01 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 | 57000 | 57000 |
| | Maximum Surge | 440 | 990 | 1760 | 3970 | 7050 | 11000 | 15900 | 15900 | 28200 | 28200 | 28200 | 56500 | 58600 | 90000 | 90000 |
| Suggested Flow (Liters/Sec) | Maximum | 16 | 37 | 65 | 145 | 258 | 403 | 581 | 581 | 1040 | 1040 | 1040 | 1764 | 2115 | 3596 | 3596 |
| | Maximum Surge | 28 | 62 | 111 | 250 | 444 | 693 | 1002 | 1002 | 1777 | 1777 | 1777 | 3560 | 3700 | 5678 | 5678 |

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

Product Dimensions Data:

For the 50-01 Main Valve (100-01) dimensions, see pages 17.
For the 650-01 Main Valve (100-20) dimensions, see pages 29.

Pilot System Specifications

Adjustment Ranges

- 0 to 75 psi Max.
- 20 to 105 psi
- 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: Low Lead Bronze
- 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



Anti-Cavitation Pressure Relief and Pressure Sustaining Valve



- Virtually Cavitation Free Operation
- Sensitive and Accurate Pressure Control
- Easy Adjustment and Maintenance
- Tamper Resistant
- Optional Check Feature
- Fully Supported Frictionless Diaphragm

The Cla-Val Model 50-01KO Anti-Cavitation 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 | 100-01KO Hytrol Main Valve |
| 2 | X42N-2 Strainer & Needle Valve |
| 3 | CRL-60 Pressure Relief Control |



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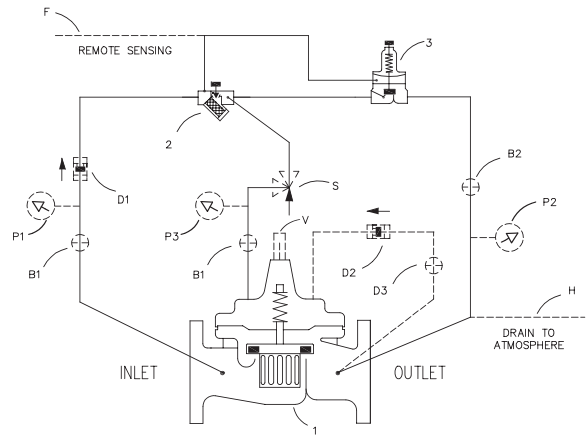


Optional Features

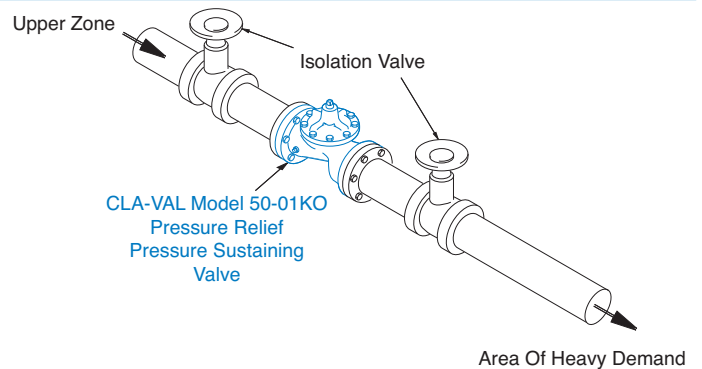
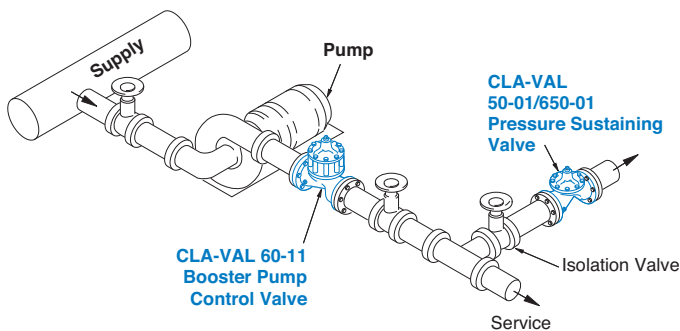
| Item | Description |
|------|-----------------------------------|
| B | CK2 Isolation Valve |
| D | Check Valves with Isolation Valve |
| F | Remote Pilot Sensing |
| H | Drain to Atmosphere |
| P | X141 Pressure Gauge |
| S | CV Speed Control (Opening) |
| V | X101 Valve Position Indicator |

Product Dimensions Data:

For the 50-01KO Main Valve (100-01) dimensions, see pages 17.



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.

52-03

(Full Internal Port)

MODEL

652-03

(Reduced Internal Port)



Pressure Relief & Surge Anticipator Valve



- System Saver
- Protects Against Water Hammer Surges
- Opens on Initial Low Pressure Wave
- Closes Slowly to Prevent Subsequent Surges
- Adjustable Over a Wide Range of Settings

The Cla-Val Model 52-03/652-03 Surge Anticipator Valve is indispensable for protecting pumps, pumping equipment and all applicable pipelines from dangerous pressure surges caused by rapid changes of flow velocity within a pipeline.

When pumping systems are started and stopped gradually, harmful surges do not occur. Should a power failure take place, however the abrupt stopping of the pump can cause dangerous surges in the system which could result in severe equipment damage.

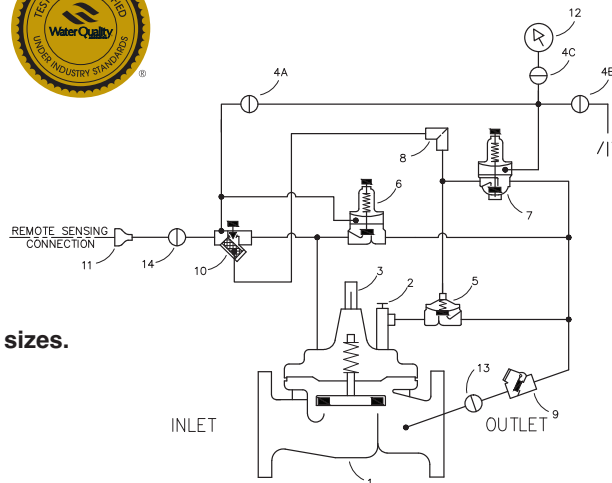
Power failure to a pump will usually result in a down surge in pressure, followed by an up surge in pressure. The surge control valve opens on the initial low pressure wave, diverting the returning high pressure wave from the system.*In effect, the valve has anticipated the returning high pressure wave and is open to dissipate the damage causing surge. The valve will then close slowly without generating any further pressure surges.

* An adjustable hydraulic flow control limits the valve opening for a controlled initial surge relief.

Schematic Diagram

| Item | Description |
|------|---------------------------------|
| 1 | 100-01 Hytrol Main Valve |
| 2 | X102F Flow Limiter |
| 3 | X101 Valve Position Indicator * |
| 4 | CK2 Isolation Valve |
| 5 | 100-01 Hytrol (Reverse Flow) |
| 6 | CRL-60 Pressure Relief Control |
| 7 | CRA Pressure Reducing Control |
| 8 | X58B Restriction Tube Assembly |
| 9 | CSC Swing Check Valve |
| 10 | X42N-3 Strainer Needle Valve |
| 11 | Bell Reducer |
| 12 | Pressure Gage |
| 13 | CK2 Isolation Valve |
| 14 | CK2 Isolation Valve |

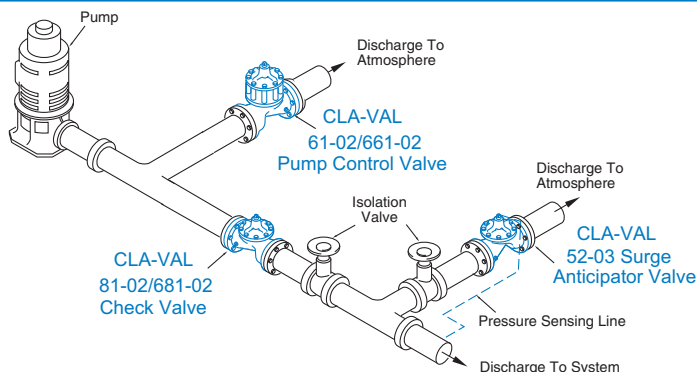
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***Note: X101 or X105L Accessories not available in 4" and smaller sizes.**

Product Dimensions Data:

For the 52-03 Main Valve (100-01) dimensions, see pages 17.
For the 652-03 Main Valve (100-20) dimensions, see pages 29.



Typical Application

The 52-03/652-03 discharges to atmosphere from a tee in the pump discharge header. The valve anticipates surges caused by power failure as well as acting as a standard overpressure relief valve.

Note: The remote pressure sensing line should be 3/4" minimum I.D. installed with a 2° slope from the valve to the pipeline to avoid air pockets.

Note: We recommend protecting tubing and valve from freezing temperatures.



58-01
(Full Internal Port)
MODEL
658-01
(Reduced Internal Port)

Combination Back Pressure & Solenoid Shut-Off Valve



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- Accurate Pressure Control
- Wide Adjustment Ranges
- Optional Check Feature Available
- Quick Acting Solenoid Shut-Off
- Easy Installation and Maintenance

The Cla-Val Model 58-01/658-01 valve performs two separate functions. It maintains a constant back pressure by discharging excess pressure downstream and when the solenoid is activated the valve closes drip-tight.

In operation, the valve is actuated by hydraulic line pressure through the pilot control system. When inlet pressure is greater than the control setting, the valve opens. When inlet pressure is equal to the control setting, the pilot modulates the valve, maintaining the preselected back pressure. When inlet pressure is less than the control setting, the pilot system closes the valve drip tight. Changing the pressure setting simply involves turning an adjusting screw on the pilot control.

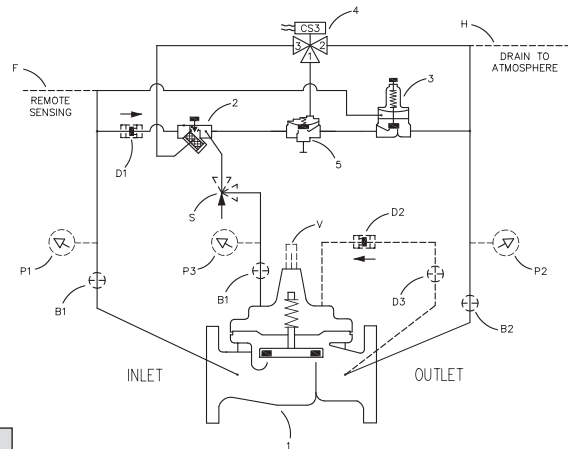
The solenoid control is available in energize to open or de-energize to open models.

Schematic Diagram

| Item | Description |
|------|--------------------------------|
| 1 | 100-01 Hytrol Main Valve |
| 2 | X42N-3 Strainer & Needle Valve |
| 3 | CRL-60 Pressure Relief Control |
| 4 | CS3 Solenoid Control |
| 5 | 100-01 Hytrol (Reverse Flow) |

Optional Features

| Item | Description |
|------|---|
| B | Shutoff Isolation Valve - Isolates Pilot System |
| 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 |

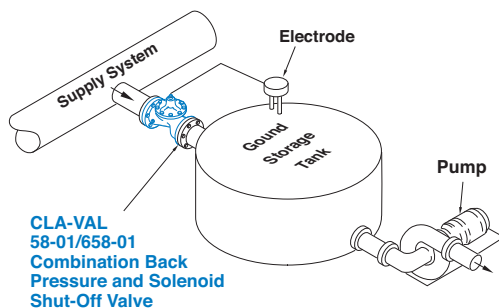


The "D" feature on a vertically installed 6" and larger valve must be horizontally oriented.

Product Dimensions Data:

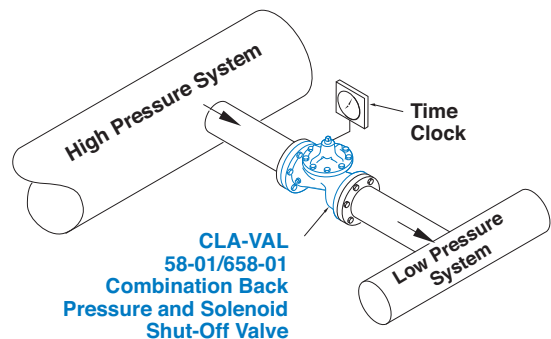
For the 58-01 Main Valve (100-01) dimensions, see pages 17.
For the 658-01 Main Valve (100-20) dimensions, see pages 29.

Typical Applications



Back Pressure Maintenance Service

A frequent application of this valve is to maintain minimum back pressure in the system while supplying water to a reservoir. The electrode in the storage tank activates the solenoid shutoff feature when the tank reaches a preset level.

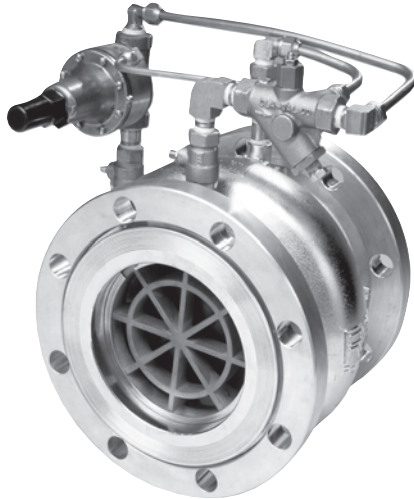


Electronic Control Service

Using a timer connected to the solenoid control of the valve, flow from the high pressure system to the low pressure system can be controlled at certain times during the day.

750-01 — MODEL —

Pressure Relief, Sustaining & Back Pressure Valve



Performance Specification

| | |
|------------------------|-------------------------------------|
| Capacity: | See Technical Data Sheet |
| C _f Factor: | 0.9 |
| Cavitation: | See Technical Data Sheet |
| Rangeability: | 500:1 |
| Bearing Friction: | No friction from slip-type bearings |

Design Specification

| | |
|----------------------------|--|
| Sizes: | 2, 3, and 6 inch wafer style 6, 8, 10, and 12 inch flanged 6, 8, 10, 12, inch Victaulic® Ends |
| End Detail Wafer: | Fits ANSI B16.5 class 125, 150, 250, and 300 flanges |
| End Detail Flanged: | ANSI B16.5 class 150 (fits class 125) or ANSI B16.5 class 300 (fits class 250) |
| End Detail Victaulic®: | Fits standard steel pipe |
| Operating Pressure: | 720 psi maximum Victaulic® Ends - 300 psi max. |
| Maximum Differential: | 150 psid continuous, 225 psid intermittent* |
| Reverse Pressure: | 125 psid maximum |
| Temperature Range: | 32 to 160 degrees F* |
| Flange Operating Pressure: | Class 125-175 psi maximum Class 150-275 psi maximum Class 250-300 psi maximum Class 300-720 psi maximum |
| Victaulic® Ends Rating: | 300 psi maximum |

*Standard natural rubber 65 durometer in water service. Temperature range depends on liner material. Higher differential pressure ratings available.

For other than standard ANSI flanges consult factory

DIN drilling available on all sizes

Product Dimensions Data:

For the 750-01 Main Valve (100-42) dimensions, see pages 31.

Description

The Cla-Val Model 750-01 is a hydraulically operated pilot actuated automatic control valve for pressure sustaining, relief and/or back pressure service. The main valve consists of only two parts, a stainless steel body and an elastomeric liner or control element.

The main valve will open when inlet pressure begins to exceed a preset pressure and will allow enough flow to maintain that inlet pressure. In pressure sustaining service, Model 750-01 will conserve pressure in an upper system during periods of high demand in a system below. In pressure relief service, the Model 750-01 will modulate to exhaust line pressure to keep it below a set point maximum. On a pump bypass system, the valve will allow flow back to the pump suction when pump discharge pressure exceeds the set point.

Cla-Val Model 750-01 will control from no flow to full open flow without any chattering or slamming under low flow conditions. For this reason, on by-pass, relief, and pressure sustaining service, there is never a region of control instability. There is no slip-type friction because the valve has no bearings. Cla-Val Model 750-01 valves have excellent resistance to cavitation with a C_f factor of 0.9.

These valves can be supplied as combination control valve with check. Pilot controls, options, and accessories are fully piped at the factory and the Cla-Val Model 750-01 is shipped ready for installation.

Purchase Specification

Valve and control system shall maintain inlet pressure at a predetermined set point; shall open as pressure starts to increase above the set point, and close as pressure falls below the set point. Control valve shall be constructed of two parts: a stainless steel body and an elastomeric liner or control element. Minimum rangeability shall be 500:1 based on capacity at flowing pressure conditions. C_f shall be greater than or equal to 0.9. Valve and control system shall be similar in all respects to Cla-Val Model 750-01 as manufactured by Cla-Val, Newport Beach, California.

Material Specification

| | |
|-----------------|--|
| Body: | 316L Stainless Steel |
| Liner: | Natural Rubber, 65 durometer (std) Viton, EPDM, Nitrile, Silicone (available) |
| Liner Retainer: | 316 Stainless Steel |

Pilot

| | |
|---------------|---------------------------------|
| Body: | UNS 87850 Bronze* |
| Spring Cover: | UNS 87850 Bronze* |
| Wetted Parts: | Bronze/Stainless Steel* Buna-N® |

Accessories

| | |
|---------------------------|---------|
| Shut-off Isolation Valve: | Brass* |
| Speed Controls: | Brass* |
| Check Controls: | Brass* |
| "Y" Strainer: | Bronze* |
| Control Piping: | Copper* |
| Control Fittings: | Brass* |

*316 stainless steel available



MODEL **250-01**
(Full Internal Port)
605-01
(Reduced Internal Port)

Differential Pressure Relief Valve



- Accurate Differential Pressure Control
- Controls Maximum Flow Through Pumps
- Circulating Loop Flow Control
- Completely Automatic Operation

The Cla-Val Model 250-01/605-01 Differential Pressure Relief Valve is a hydraulically operated, pilot-controlled, modulating valve. It is designed to maintain a constant pressure differential between any two pressure points in a system where the closing of the valve directly causes the differential pressure to increase. The valve tends to open on an increase in differential pressure and close on a decrease in differential pressure.

In operation, the valve is actuated by line pressure through a pilot control system sensing from two points across which a differential is to be maintained. Operation is completely automatic and pressure settings may be easily changed.

Schematic Diagram

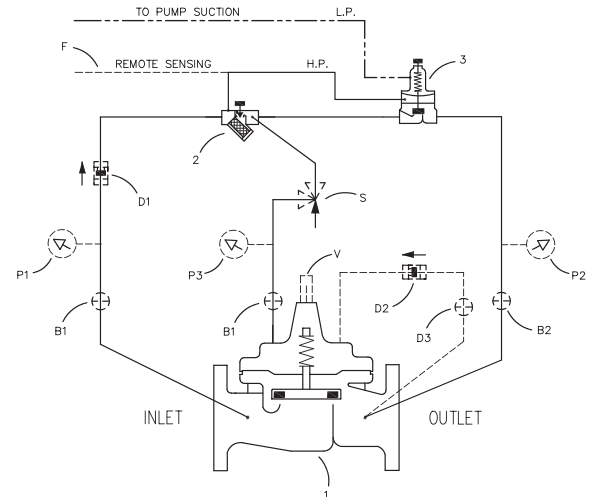
| Item | Description |
|------|--------------------------------|
| 1 | 100-01 Hytrol Main Valve |
| 2 | X42N-2 Strainer & Needle Valve |
| 3 | CDB-7 Differential Control |



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Optional Features

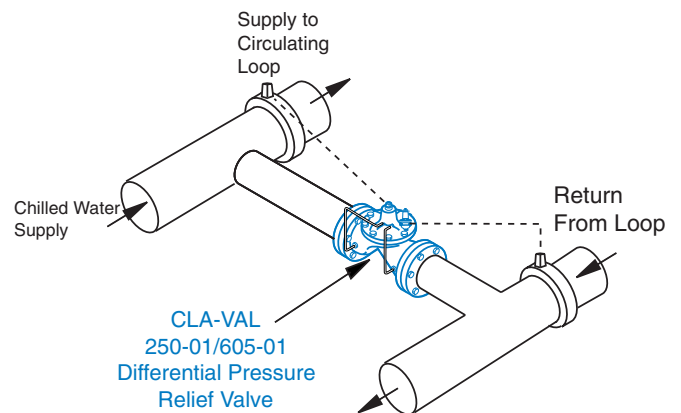
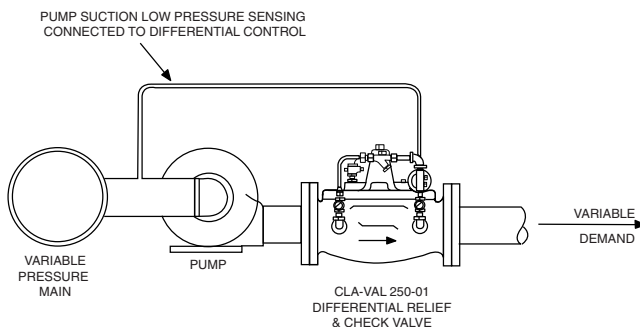
| Item | Description |
|------|-----------------------------------|
| B | CK2 Isolation Valve |
| D | Check Valves with Isolation Valve |
| F | Remote Pilot Sensing (H.P.) |
| P | X141 Pressure Gauge |
| S | CV Speed Control (Opening) |
| V | X101 Valve Position Indicator |



Product Dimensions Data:

For the 250-01 Main Valve (100-01) dimensions, see pages 17.
For the 605-01 Main Valve (100-20) dimensions, see pages 29.

Typical Applications



The Model 250-01/605-01 Differential Pressure Relief Valve maintains a constant differential across centrifugal pump regardless of variable upstream pressures or downstream demand. By maintaining a constant differential pressure across a centrifugal pump operating at a known capacity, the maximum flow rate is controlled.

On a chilled water circulating loop system the 250-01/605-01 Differential Pressure Relief Valve is installed between loop supply and return lines to maintain a constant differential across the loop. The loop differential pressure remains constant regardless of the loop demand change thereby increasing cooling system efficiency.