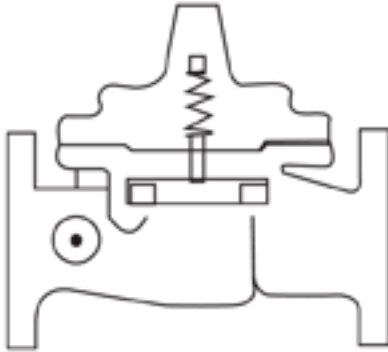


CLA-VAL

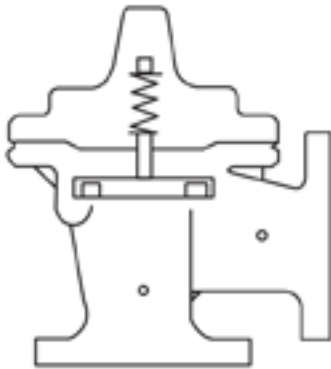
AUTOMATIC CONTROL VALVES

550-01

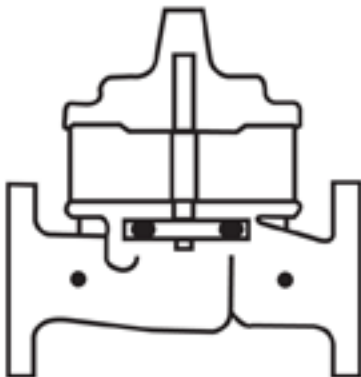
Place this manual with personal responsible
for maintenance of this valve




INSTALLATION



OPERATION

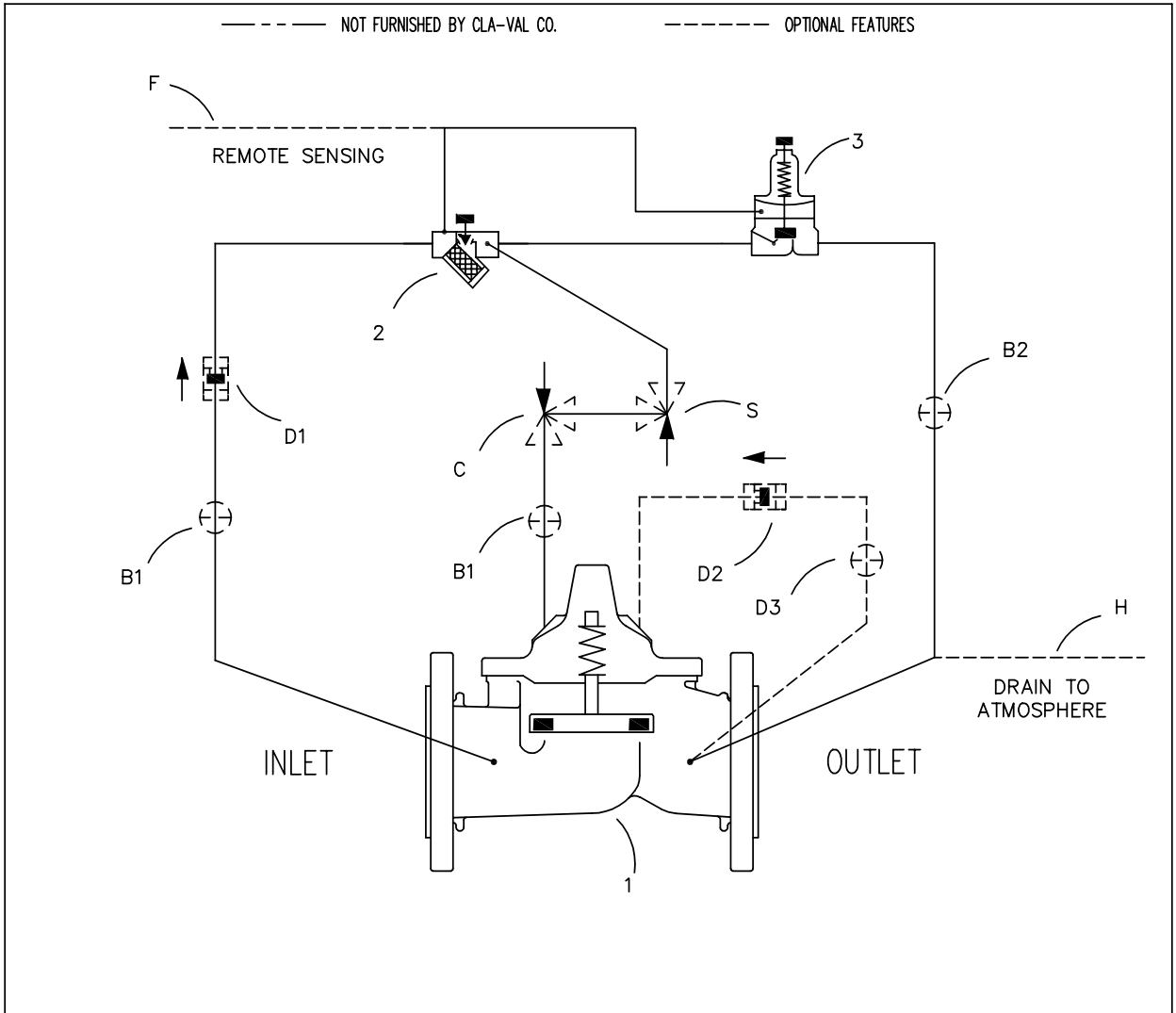


MAINTENANCE

| | | | |
|--|--|-------------|----------|
|  CLA-VAL CO. NEWPORT BEACH, CALIFORNIA | CATALOG NO. | DRAWING NO. | REV. |
| | 550-01/6550-01 | 203909 | A |
| | TYPE OF VALVE AND MAIN FEATURES | | |
| | PRESSURE RELIEF VALVE (EQUIPPED WITH CLOSING SPEED CONTROL) | | |
| DESIGN | DRAWN | AK | 10-06-03 |
| CHK'D | VL | | 10-06-03 |
| APV'D | CH | | 10-06-03 |

| | |
|---|-----------|
| 5-23-2005 | 5-23-2005 |
| ADDED "C" OPTION (CV FLOW CONTROL, CLOSING) (NED 49744) | |


| | | | |
|--|-------------------------------------|----|----------|
| CAD REVISION RECORD - DO NOT REVISE MANUALLY | DESCRIPTION | BY | DATE |
| | RELEASED FOR PRODUCTION (NED 48303) | AK | 10-06-03 |
| | ADDED 6000 SERIES (ECO 20158) | AK | 05-05-05 |



| ITEM NO. | BASIC COMPONENTS | QTY |
|----------|------------------------------------|-----|
| 1 | 100-46 HYTROL (550-01) MAIN VALVE | 1 |
| | 100-44 HYTROL (6550-01) MAIN VALVE | |
| 2 | X42N-2 STRAINER & NEEDLE VALVE | 1 |
| 3 | CRL PRESSURE RELIEF CONTROL | 1 |

| OPTIONAL FEATURE SUFFIX | | ADDED TO CATALOG NUMBER | |
|-------------------------|-----------------------------|-------------------------|--|
| B | CK2 COCK (ISOLATION VALVES) | 3 | |
| C | CV FLOW CONTROL (CLOSING) | 1 | |
| D | CHECK VALVES WITH COCK | 1 | |
| F | REMOTE PILOT SENSING | | |
| H | DRAIN TO ATMOSPHERE | | |
| S | CV FLOW CONTROL (OPENING) | 1 | |

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| | | | |
|---|----------------|-------------|-------------|
|  CLA-VAL CO. NEWPORT BEACH, CALIFORNIA TYPE OF VALVE AND MAIN FEATURES | CATALOG NO. | DRAWING NO. | REV. |
| | 550-01/6550-01 | 203909 | A |
| PRESSURE RELIEF VALVE (EQUIPPED WITH CLOSING SPEED CONTROL) | | DESIGN | |
| | | DRAWN | AK 10-06-03 |
| | | CHK'D | VL 10-06-03 |
| | | APVD | CH 10-06-03 |

OPERATING DATA

I. PRESSURE RELIEF FEATURE:

PRESSURE RELIEF CONTROL (3) IS A NORMALLY CLOSED CONTROL THAT RESPONDS TO MAIN VALVE INLET PRESSURE CHANGES. AN INCREASE IN INLET PRESSURE TENDS TO OPEN CONTROL (3) AND A DECREASE IN INLET PRESSURE TENDS TO CLOSE CONTROL (3). THIS CAUSES MAIN VALVE COVER PRESSURE TO VARY AND THE MAIN VALVE MODULATES (OPENS AND CLOSSES) MAINTAINING A RELATIVELY CONSTANT PRESSURE AT THE MAIN VALVE INLET. WHEN INLET PRESSURE IS LOWER THAN THE SET POINT OF CONTROL (3), CONTROL (3) CLOSSES. THIS PRESSURIZES THE MAIN VALVE COVER CHAMBER AND THE MAIN VALVE CLOSSES. PRESSURE RELIEF CONTROL (3) ADJUSTMENT: TURN THE ADJUSTING SCREW CLOCKWISE TO INCREASE THE SETTING.

II. CLOSING SPEED CONTROL:

NEEDLE VALVE (2) CONTROLS THE CLOSING SPEED OF THE MAIN VALVE. TURN THE ADJUSTING STEM CLOCKWISE TO MAKE THE MAIN VALVE CLOSE SLOWER. DO NOT CLOSE VALVE (2) COMPLETELY OR THE MAIN VALVE WILL NOT CLOSE. (SUGGESTED INITIAL SETTING OF NEEDLE VALVE IS 1/4 TO 1/2 TURN OPEN.)

III. OPTIONAL FEATURE OPERATING DATA:

SUFFIX B (ISOLATION VALVES)

CK2 COCKS (B1) AND (B2) ARE USED TO ISOLATE THE PILOT SYSTEM FROM MAIN LINE PRESSURE. THESE VALVES MUST BE OPEN DURING NORMAL OPERATION.

SUFFIX C (CLOSING SPEED CONTROL)

FLOW CONTROL (C) CONTROLS THE CLOSING SPEED OF THE MAIN VALVE. TURN THE ADJUSTING STEM CLOCKWISE TO MAKE THE MAIN VALVE CLOSE SLOWER.

SUFFIX D (CHECK VALVES WITH COCK):

WHEN OUTLET PRESSURE IS HIGHER THAN INLET PRESSURE, CHECK VALVE (D2) OPENS AND (D1) CLOSSES. THIS DIRECTS THE HIGHER OUTLET PRESSURE INTO THE MAIN VALVE COVER AND THE MAIN VALVE CLOSSES.

SUFFIX F (REMOTE PILOT SENSING)

REMOTE SENSING PRESSURE IS OBTAINED FROM A POINT UPSTREAM OF THE MAIN VALVE INLET. [SENSING PRESSURE IS OBTAINED FROM THE MAIN VALVE INLET IF SUFFIX (F) IS NOT SPECIFIED].

| | | |
|--|-------------|--|
| CAD REVISION RECORD - DO NOT REVISE MANUALLY | DATE | |
| | BY | |
| DESCRIPTION | SEE SHEET 1 | |
| LTR | | |

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| | | | | |
|--|---|---|-----------------------|-----------|
| | CLA-VAL CO. NEWPORT BEACH, CALIFORNIA | CATALOG NO. 550-01/6550-01 | DRAWING NO. 203909 | REV. A |
| | | TYPE OF VALVE AND MAIN FEATURES PRESSURE RELIEF VALVE (EQUIPPED WITH CLOSING SPEED CONTROL) | | |

OPERATING DATA—CONTINUED

SUFFIX H (ATMOSPHERIC DRAIN)

PILOT SYSTEM DRAIN LINE IS DISCHARGED TO ATMOSPHERE. [PILOT SYSTEM DRAIN LINE IS CONNECTED TO THE MAIN VALVE OUTLET BOSS IF SUFFIX (H) IS NOT SPECIFIED.]

SUFFIX S (OPENING SPEED CONTROL)

FLOW CONTROL (S) CONTROLS THE OPENING SPEED OF THE MAIN VALVE. TURN THE ADJUSTING STEM CLOCKWISE TO MAKE THE MAIN VALVE OPEN SLOWER.

IV. CHECK LIST FOR PROPER OPERATION:

- () SYSTEM VALVES OPEN UPSTREAM AND DOWNSTREAM.
- () AIR REMOVED FROM THE MAIN VALVE COVER AND PILOT SYSTEM AT ALL HIGH POINTS.
- () CK2 COCKS (B1), (B2) & (D3) OPEN (OPTIONAL FEATURE).
- () PERIODIC CLEANING OF STRAINER (2) IS RECOMMENDED.
- () CV FLOW (C) & (S) OPEN AT LEAST 4 TURNS (OPTIONAL FEATURE).

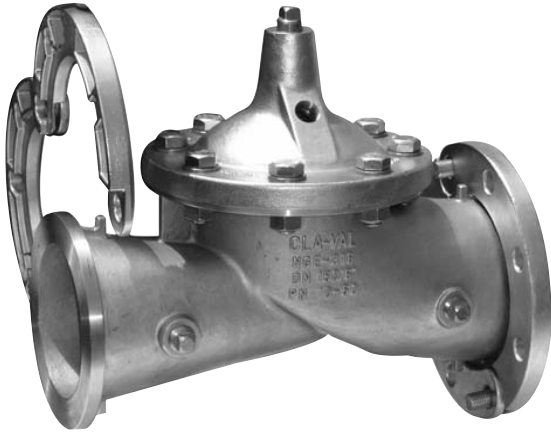
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|--|----|
| CAD REVISION RECORD - DO NOT REVISE MANUALLY | |
| DESCRIPTION | BY |
| SEE SHEET 1 | |
| DATE | |
| LTR | |

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— MODEL — **100-44**
(Reduced Internal Port)

316SS Hytrol Valve

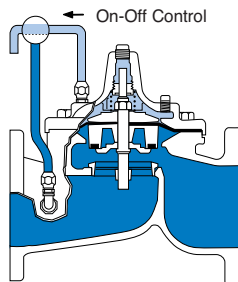


- All 316 Stainless Steel
- Reduced Cavitation Design
- Drip-Tight, Positive Sealing Action
- Service Without Removal From Line
- Every Valve Factory Tested
- Three-Year Warranty

The Cla-Val Model 100-44 Hytrol 316SS Valve is a hydraulically operated, diaphragm actuated, globe pattern valve with all 316 Stainless Steel metal parts. Specially designed 316 Stainless Steel removable slip-on flanges provide 150 or 300 ANSI class flange connections that meet ANSI and ISO standards. This valve is ideal for control valve applications where fluid compatibility is often a problem. The standard Electropolish finish on the 316 Stainless Steel parts offers extreme corrosion resistance to many industrial fluids such as high alkyl or high acid concentrations or other aggressive or corrosive fluids.

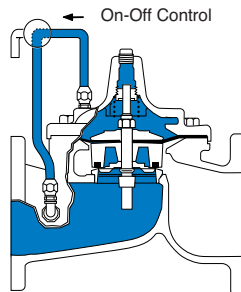
The Model 100-44 Hytrol consists of these major components: body, flanges, diaphragm assembly and cover. The diaphragm assembly is the only moving part and is guided top and bottom by a precision-machined stem. A non-wicking diaphragm of nylon fabric reinforced, synthetic rubber creates the control chamber for the valve. A resilient, synthetic rubber disc forms a drip-tight seal, with the renewable seat, when pressure is applied to the control chamber. The rugged simplicity of design and packless construction assures a long life of dependable, trouble-free operation. Smooth flow passages and fully guided diaphragm assembly assure optimum control, when used in piping systems requiring remote control, pressure regulation, solenoid operation, rate of flow control or check valve operation.

Principle of Operation



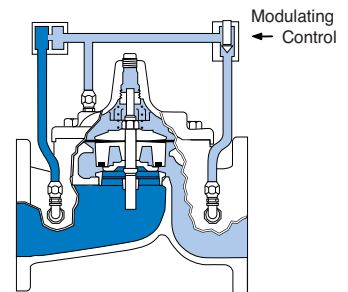
Full Open Operation

When pressure in the cover chamber is relieved to a zone of lower pressure, the line pressure at the valve inlet opens the valve, allowing full flow.



Tight Closing Operation

When pressure from the valve inlet is applied to the cover chamber, the valve closes drip-tight.



Modulating Action

The valve holds any intermediate position when operating pressure is equal above and below the diaphragm. Using a Cla-Val "Modulating" Control will allow the valve to automatically compensate for line pressure changes.



Specifications

Sizes

Globe (inch):
2", 2½", 3", 4", 6", 8", 10", 12"

End Detail

Slip-on Two Piece Flange
Dimensions Per ANSI B16.5

Pressure Rating

ANSI Class 150:
Maximum 285 psi
ANSI Class 300:
Maximum 400 psi

Higher Pressure Available
Please Contact Factory

Operating Temperature

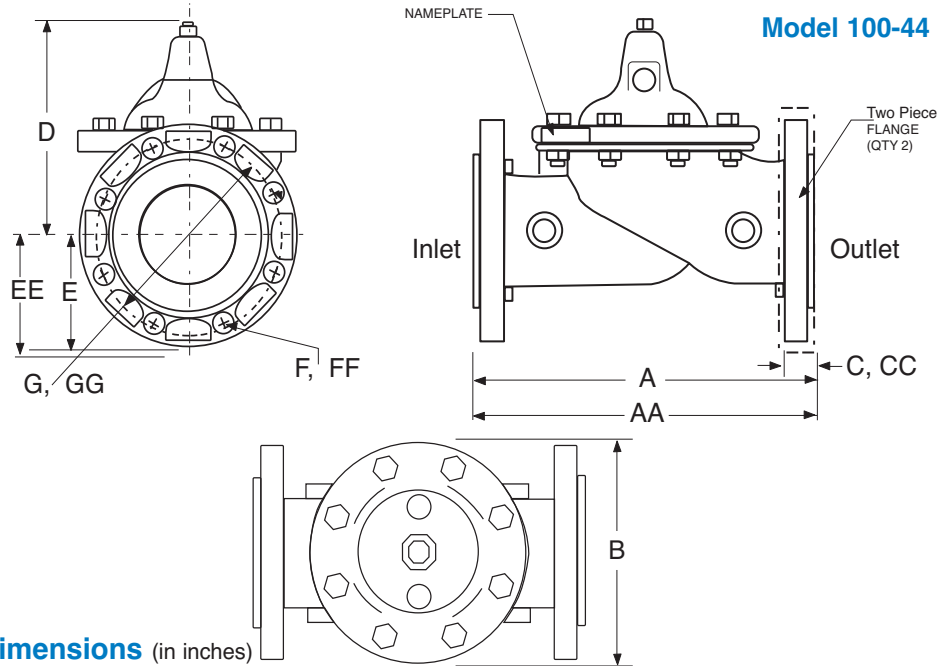
Fluids Compatible with Valve
Materials
-40° to 180° F (-40° to 82° C)

Materials

Body, Cover, Trim,
Diaphragm Assembly,
Flanges, and Fasteners
316 Series
Stainless Steel
Electropolished
Disc:
Buna-N® Rubber*
Diaphragm:
Nylon Fabric Reinforced
Synthetic Buna-N® Rubber*

*Contact Factory for Other
Disc or Diaphragm Materials

Note: 100-44 valve uses the same
internal parts as the basic Cla-Val
standard main reduced internal
port 100-20 Hytrol.



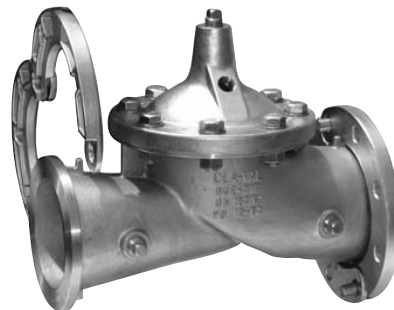
Dimensions (in inches)

| Size (Inches) | 2 | 2 ½ | 3 | 4 | 6 | 8 | 10 | 12 |
|--------------------------|------|-------|-------|-------|-------|-------|-------|-------|
| Size (mm) | 50 | 65 | 80 | 100 | 150 | 200 | 250 | 300 |
| A 150 ANSI | 9.06 | 11.42 | 12.20 | 13.78 | 18.90 | 23.62 | 28.74 | 33.46 |
| AA 300 ANSI | 9.06 | 11.42 | 12.20 | 13.78 | 18.90 | 23.62 | 28.74 | 33.46 |
| B | 5.70 | 8.06 | 6.69 | 9.25 | 11.61 | 15.75 | 20.08 | 23.62 |
| C | .89 | .89 | .93 | .93 | 1.02 | 1.15 | 1.15 | 1.25 |
| CC 300 ANSI | .96 | .96 | 1.00 | 1.00 | 1.10 | 1.15 | 1.46 | 1.50 |
| D | 6.50 | 7.95 | 8.20 | 10.12 | 13.32 | 16.39 | 19.12 | 20.95 |
| E | 3.05 | 3.54 | 3.74 | 4.53 | 5.61 | 6.79 | 7.97 | 9.55 |
| EE 300 ANSI | 3.25 | 3.75 | 4.13 | 5.01 | 6.30 | 7.48 | 8.76 | 10.24 |
| F | .71 | .71 | .71 | .71 | .91 | .87 | 1.02 | 1.02 |
| FF 300 ANSI | .71 | .75 | .87 | .87 | .87 | 1.03 | 1.16 | 1.34 |
| G | 4.75 | 5.50 | 6.00 | 7.50 | 9.50 | 11.75 | 14.25 | 17.00 |
| GG 300 ANSI | 5.00 | 5.88 | 6.62 | 7.88 | 10.62 | 13.00 | 15.25 | 17.72 |
| Flange Bolts (150 Class) | 4 | 4 | 4 | 8 | 8 | 8 | 12 | 12 |
| Flange Bolts (300 Class) | 8 | 8 | 8 | 8 | 12 | 12 | 16 | 16 |
| Approx. Ship Wt. Lbs. | 25 | 40 | 40 | 75 | 160 | 290 | 419 | 728 |
| Approx. Ship Wt. Kgs. | 11.4 | 19 | 19 | 35 | 73 | 132 | 190 | 330 |

Reduced Port Functional Data

| Size (Inches) | Cv (gpm)* | Cv (l/s)** |
|---------------|-----------|------------|
| 2 | 38 | 9 |
| 2½ | 50 | 12 |
| 3 | 67 | 16 |
| 4 | 138 | 33 |
| 6 | 242 | 58 |
| 8 | 555 | 133 |
| 10 | 923 | 222 |
| 12 | 1492 | 359 |

*Cv = gpm flow at 1 psi drop
**Cv = l/s flow at 1 bar drop



When Ordering Please Specify:

1. Catalog No. 100-44
2. Valve Size
3. Fluid Being Handled
4. Fluid Temperature
5. Inlet Pressure Range
6. Outlet Pressure Range
7. Maximum and Minimum Differential Pressure
8. Flow Rate Range



E-100-44 (R-10/2011)

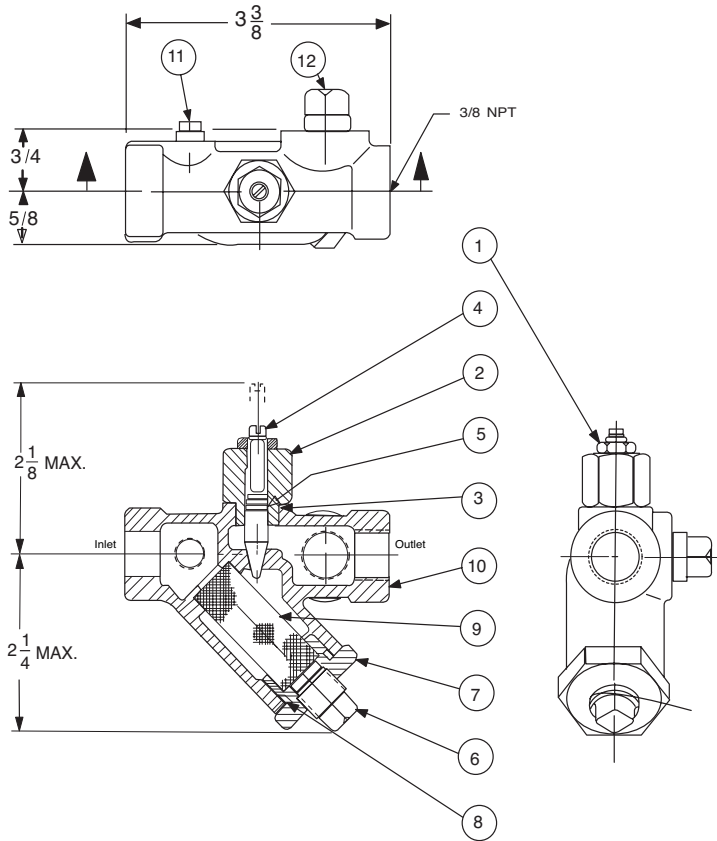
Distributed By:
M&M Control Service, Inc.
Phone: 800-876-0036
Fax: 847-356-0747
Email: sales@mmcontrol.com

Represented By:



X42N-2

Strainer and Needle Valve Assembly



When ordering parts, please specify:

- All nameplate data
- Item Number
- Description

| Size | Stock Number |
|-------------|--------------|
| 3/8" x 3/8" | 68372C |

| ITEM | DESCRIPTION | MATERIAL | PART NO. |
|------|------------------|----------|-----------|
| 1 | Jam Nut - Hex | Sil Brz | 6779806G |
| 2 | Bonnet | S.S. | 67910A |
| 3 | O-Ring - Bonnet | Syn Rub | 00713J |
| 4 | Stem | S.S. | 67907G |
| 5 | O-Ring - Stem | Syn Rub | 00708J |
| 6 | Plug - Pipe 1/4" | Bre. | 6784702A |
| 7 | Strainer Plug | 303 | 67911J |
| 8 | O-Ring - Plug | NBR | 00751J |
| 9 | Screen | Monel | 68373A |
| 10 | Body | Rd Brs | 67905A |
| 11 | Plut - Pipe 1/8 | Brass | 6784701C |
| 12 | Plug - Pipe 3/8 | Brass | 67660-03F |



— MODEL — **CRL**

Pressure Relief Control

DESCRIPTION

The CRL Pressure Relief Control is a direct acting, spring loaded, diaphragm type relief valve. It may be used as a self-contained valve or as a pilot control for a Cla-Val Main valve. It opens and closes within very close pressure limits.

INSTALLATION

The CRL Pressure Relief Control may be installed in any position. The control body (7) has one inlet and one outlet port with a side pipe plug (24) at each port. These plugs are used for control connections or gauge applications. The inlet in the power unit body (6) is the sensing line port. A flow arrow is marked on the body casting.

OPERATION

The CRL Pressure Relief Control is normally held closed by the force of the compression spring above the diaphragm; control pressure is applied under the diaphragm.

When the controlling pressure exceeds the spring setting, the disc is lifted off its seat, permitting flow through the control.

When controlling pressure drops below spring setting, the spring returns the control to its normally closed position.

ADJUSTMENT PROCEDURE

The CRL Pressure Relief Control can be adjusted to provide a relief setting at any point within the range found on the nameplate.

Pressure adjustment is made by turning the adjustment screw (9) to vary the spring pressure on the diaphragm. Turning the adjustment screw clockwise increases the pressure required to open the valve. Counterclockwise decreases the pressure required to open the valve.

When pressure adjustments are complete the jam nut (10) should be tightened and the protective cap (1) replaced. If there is a problem of tampering, lock wire holes have been provided in cap and cover. Wire the cap to cover and secure with lead seal.

DISASSEMBLY

The CRL Pressure Relief Control does not need to be removed from the line for disassembly. Make sure that pressure shut down is accompanied prior to disassembly. If the CRL is removed from the line for disassembly be sure to use a soft jawed vise to hold body during work.

Refer to Parts List Drawing for Item Numbers.

1. Remove cap (1), loosen jam nut (10) and turn adjusting screw counterclockwise until spring tension is relieved.
2. Remove the eight screws (4) holding the cover (3) and powerunit body (6). Hold the cover and powerunit together and place on a suitable work surface.
See NOTE under REASSEMBLY.
3. Remove the cover (3) from powerunit body (6). The spring (12) and two spring guides (11).
4. Remove nut (13) from stem (19) and slide off the belleville washer (14), the upper diaphragm washer (15) and the diaphragm (16).
5. Pull the stem (19) with the disc retainer assembly (21) through the bottom of powerunit. The lower diaphragm washer (17) will slide off of stem top.
6. Remove jam nut (23) and disc retainer assembly (21) from stem. Use soft jawed pliers or vise to hold stem. The polished surface of stem must not be scored or scratched.
7. The seat (22) need not be removed unless it is damaged. If removal is necessary use proper size socket wrench and turn counterclock wise.

Note: Some models have an integral seat in the body (7).

INSPECTION

Inspect all parts for damage, or evidence of cross threading. Check diaphragm and disc retainer assembly for tears, abrasions or other damage. Check all metal parts for damage, corrosion or excessive wear.

REPAIR AND REPLACEMENT

Minor nicks and scratches may be polished out using 400 grit wet or dry sandpaper fine emery or crocus cloth. Replace all O-rings and any damaged parts.

When ordering replacement parts, be sure to specify parts list item number and all nameplate data.

REASSEMBLY

In general, reassembly is the reverse of disassembly. However, the following steps should be observed:

1. Lubricate the O-Ring (18) with a small amount of a good grade of waterproof grease, (Dow Corning 44 medium grade or equal). Use grease sparingly and install O-ring in powerunit body (6).
2. Install stem (19) in powerunit body (6). Use a rotating motion with minimum pressure to let stem pass through O-ring.
Do Not Cut O-Ring.
3. Install O-ring (5) at top of stem (19). Place lower diaphragm washer (17) on the stem with the serrated side up. Position diaphragm (16), upper diaphragm washer (15), with serration down, and belleville washer (14) with concave side down.
4. Position powerunit body (6) as shown on parts list drawing (top view).
5. Continue reassembly as outlined in disassembly steps 1 through 3.

Note: Item (4) Screw will have a quantity of 8 for the 0-75 and 20-200psi design and a quantity of 4 for the 100-300psi design. Item (25) Screw is used on the 100-300psi design only. Install item (25), before item (4) for preload of item (12) spring.

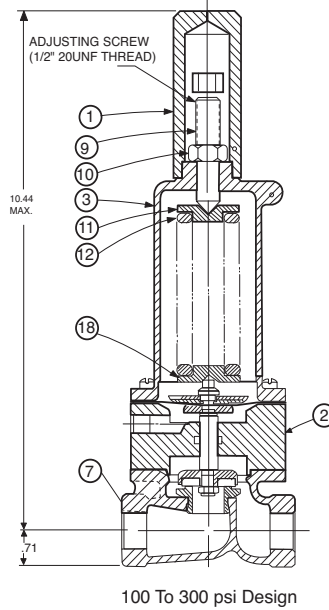
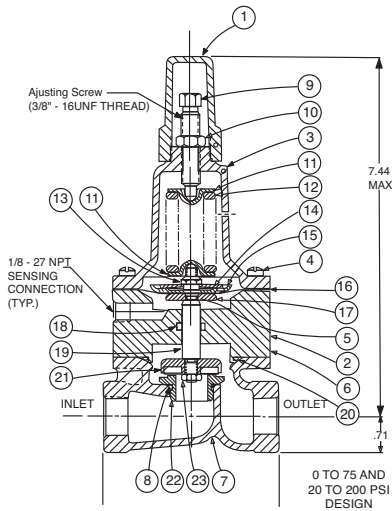
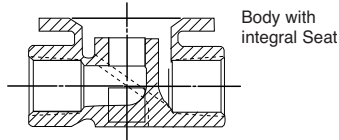
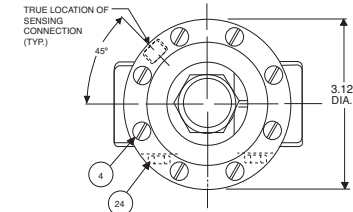
| SYMPTOM | PROBABLE CAUSE | REMEDY |
|--|--|---|
| Fails to open. | Controlling pressure too low. | Back off adjusting screw until valve opens. |
| Fails to open with spring compression removed. | Mechanical obstruction, corrosion, scale build-up on stem. | Disassemble, locate, and remove obstruction, scale. |
| Leakage from cover vent hole when controlling pressure is applied. | Diaphragm Damage | Disassembly replace damaged diaphragm. |
| | Loose diaphragm assembly. | Tighten upper diaphragm washer. |
| Fails to close. | No spring compression. | Re-set pressure adjustment. |
| Fails to close with spring compressed. | Mechanical obstruction. | Disassemble, locate and remove obstruction. |



CRL

1/2" & 3/4" PRESSURE RELIEF CONTROL

(Bronze Body with 303SS Trim)



| SIZE | SPRING | PART NUMBER |
|------|-------------|-------------|
| 1/2" | 0-75 PSI | 7922201E |
| 1/2" | 20-105 PSI | 7922205F |
| 1/2" | 20-200 PSI | 7922202C |
| 1/2" | 100-300 PSI | 8280901D |
| 3/4" | 0-75 PSI | 7922901K |
| 3/4" | 20-105 PSI | 7922903F |
| 3/4" | 20-200 PSI | 7922902H |
| 3/4" | 100-300 PSI | 8600501E |

For 250-600 PSI Contact Factory

| CRL Range PSI | APPROX. INCREASE FOR EACH CLOCKWISE TURN OF ADJUSTING SCREW |
|---------------|---|
| 0 to 75 | 8.5 PSI |
| 20 to 105 | 12.5 PSI |
| 20 to 200 | 28.0 PSI |
| 100 to 300 | 18.0 PSI |

When ordering parts please specify:

1. All Nameplate Data
2. Item Part Number
3. Item Description

| Item | Description | Material | Part Number | Part Number | Part Number | Part Number |
|------|-------------------------------------|----------|---------------|---------------|---------------|----------------|
| | | | 0-75 | 20-105 | 20-200 | 100-300 |
| 1 | Cap | Plastic | 67628J | 67628J | 67628J | 1257601D |
| 2 | Nameplate | Brass | -- | -- | -- | -- |
| 3 | Cover | Bronze | C2544K | C2544K | C2544K | 44587E |
| 4* | Screw Fil. Hd. 10-32 x 1.88 (Qty 8) | 303 SS | 6757867E | 6757867E | 6757867E | 6757867E |
| 5* | O-Ring | Rubber | 00902H | 00902H | 00902H | 00902H |
| 6 | Body, Powerunit | Bronze | 7920504D | 7920504D | 7920504D | 7920504D |
| 7 | 1/2" Body | Bronze | C7928K | C7928K | C7928K | C7928K |
| | 3/4" Body | Bronze | C9083B | C9083B | C9083B | C9083B |
| 8* | O-Ring, Seat | Rubber | 00718H | 00718H | 00718H | 00718H |
| 9 | Screw, Adjusting | Brass | 7188201D | 7188201D | 7188201D | 82811B |
| 10 | Nut Hex (Locking) | 303 SS | 6780106J | 6780106J | 6780106J | 6780606H |
| 11 | Guide, Spring | 303 SS | 71881H | 71881H | 71881H | 1630301J |
| 12 | Spring | CHR/VAN | 71884B | 20632101E | 71885J | 1630201A |
| 13 | Nut, Stem Upper | Bronze | 73034B | 73034B | 73034B | 73034B |
| 14 | Washer, Belleville | Steel | 7055007E | 7055007E | 7055007E | 7055007E |
| 15 | Washer, Diaphragm (upper) | 303 SS | 71891G | 71891G | 71891G | 71891G |
| 16* | Diaphragm | Rubber | C1505B | C1505B | C1505B | C1505B |
| 17 | Washer, Diaphragm (lower) | 303 SS | 45871B | 45871B | 45871B | 45871B |
| 18* | O-Ring, Stem | Rubber | 00746J | 00746J | 00746J | 00746J |
| 19 | Stem | 303 SS | 8982401F | 8982401F | 8982401F | 8982401F |
| 20* | O-Ring, Body | Rubber | 00767E | 00767E | 00767E | 00767E |
| 21* | Retainer Assembly, Disc | 303 SS | C9158B | C9158B | C9158B | C9158B |
| 22 | Seat | 303Rub | 62187A | 62187A | 62187A | 62187A |
| 23 | Nut, Hex, Stem, Lower | Bronze | 6779806G | 6779806G | 6779806G | 6779806G |
| 24 | Pipe Plug | Bronze | 6784701C | 6784701C | 6784701C | 6784701C |
| | FACTORY SET POINT | | 50 PSI | 60 PSI | 60 PSI | 100 PSI |
| | REPAIR KIT* | | 9170007A | 9170007A | 9170007A | 9170007A |



Regulator Spring Color Coding Chart

Dwg#47117

*THESE FIGURES ARE ONLY APPROXIMATE. FINAL ADJUSTMENTS SHOULD BE MADE WITH A PRESSURE GAGE.

| WIRE SIZE | SPRING NUMBER | COLOR | WIRE MATERIAL | CATALOG NUMBER | PSI RANGE | *PSI PER TURN |
|-------------|---------------|--------------|----------------|----------------|------------|----------------|
| .080 DIA. | C0492D | BLUE | S.S. | CDB-7 | 0-7 | .75 |
| | | | | CRL-5A | 0-7 | .75 |
| .018 DIA. | 82575C | -- | S.S. | CRD | 1.9-6.5 | .61 |
| | | | | CRD-10A | 1.9-6.5 | .49 |
| .116 DIA. | 81594E | -- | S.S. | CRD | 2-30 | 3.0 |
| | | | | CRD-10A | 2-30 | 2.4 |
| .120 DIA. | V5654J | GREEN | CHR VAN | CRL-5A | 5-25 | 4.0 |
| | | | | CRD | 10-40 | 4.0 |
| .162 DIA. | 32447F | NATURAL | S.S. | CDB-7 | 10-60 | 12.0 |
| | | | | CRL-5A | 10-60 | 12.0 |
| | | | | CRL-13 | 10-60 | 12.0 |
| .162 DIA. | V5695B | YELLOW | MUSIC WIRE | CDB-7 | 20-80 | 14.5 |
| | | | | CRL-5A | 20-80 | 14.5 |
| | | | | CRL-13 | 20-80 | 14.5 |
| .207 DIA. | C1124B | CAD PLT | MUSIC WIRE | CDB-7 | 50-150 | 29.5 |
| | | | | CRL-13 | 50-150 | 29.5 |
| | | | | CRL-5A | 50-150 | 29.5 |
| .225 DIA. | V6515A | RED | MUSIC WIRE | CDB-7 | 65-180 | 44.0 |
| | | | | CRL-13 | 65-180 | 44.0 |
| | | | | CRL-5A | 65-180 | 44.0 |
| .115 X .218 | 71884B | RED | CHR VAN | CRL | 0-75 | 8.5 |
| | | | | CRD | 15-75 | 9.0 |
| | | | | CRD-10A | 15-75 | 7.2 |
| .118 X .225 | 71885J | GREEN | CHR VAN | CRL | 20-200 | 28.0 |
| | | | | CRD | 30-300 | 27.0 |
| | | | | CRD-10A | 30-300 | 22.4 |
| .225 X .295 | 1630201A | CAD PLT | CHR VAN | CRL | 100-300 | 18.00 |
| | | | | CRL-5A | 100-300 | 18.00 |
| .440 X .219 | 48211H | CAD PLT | STEEL | CRA-18 | 200-450 | 17.0 |
| | | | | CRD-22 | 200-450 | 17.0 |
| | | | | CRL-4A | 100-450 | 17.0 |
| .187 | 20632101E | BLACK | 316 SST | CRD | 20-105 | 13.0 |
| | | | | CRL | 20-105 | 13.0 |
| WIRE SIZE | SPRING NUMBER | COLOR | WIRE MATERIAL | CATALOG NUMBER | FEET RANGE | *FEET PER TURN |
| .080 DIA. | C0492D | BLUE | S.S. | CRA | 4.5-15 | .82 |
| | | | | CRD-2 | 4.5-15 | .82 |
| .375 DIA. | 87719B | EPOXY COATED | CHROME SILICON | CDS-5 | 5-40 | 1.0 |
| | 1 SPRING | | | 30-80 | 2.0 | |
| | 2 SPRING | | | 70-120 | 3.0 | |
| | 3 SPRING | | | 110-120 | 4.0 | |
| | 4 SPRING | | | 150-200 | 5.0 | |
| .072 DIA. | V5097A | -- | 302SS | CVC | 1-17 | .7 |
| | | | | | 5 SPRING | |
| .375 DIA. | 2933502H | EPOXY COATED | CHROME SILICON | CDS-6A | 5-40 | .75 |
| | 1 SPRING | | | 30-80 | 1.50 | |
| | 2 SPRING | | | 70-120 | 2.20 | |
| | 3 SPRING | | | 110-160 | 3.00 | |
| | 4 SPRING | | | 150-200 | 3.70 | |

THE FOLLOWING CONTROL & SPRING P/N'S WERE REMOVED, 32656B, 31554K, 44591G, V65695B, & V5695B. ADDED CRL-13, CRL-5A, CRA, CRA-10A, CHANGED SPRING RANGES TO MATCH CURRENT CONTROLS.

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500 Series 316 SS Hytrol 100-44 and 100-46

Installing two-part flange

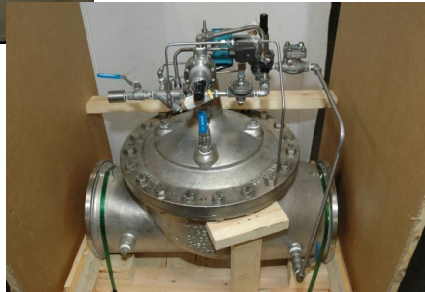
Two-Piece Flange Design



- Easy Conversion from 150 Class to 300 Class
- Four identical half-flanges for each valve
- 316 Stainless Steel



Look for Flange Halves shipped with valve




Two Half-Flanges Held Captive

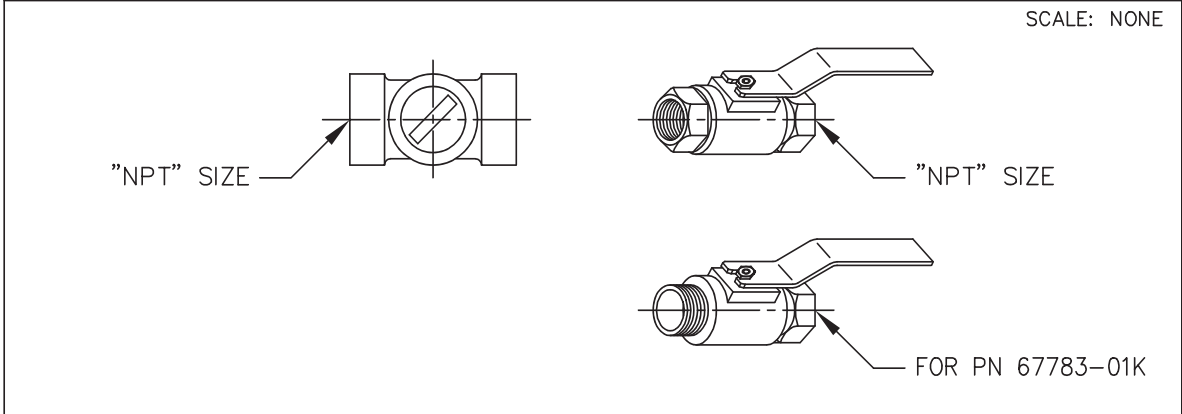


- Flange studs and bolts hold valve flanges in place
- Textured side faces away from valve
- Smooth side faces toward valve



| | | | | | | | |
|--|-----------|---|----------------------------------|----|------|----------|----------|
| AK | 07-10-08 | BB | ADDED PN'S 67783-62B (NED 62200) | BY | DATE | AK | 03-14-06 |
| AK | 08-14-08 | BC | ADDED PN'S 67783-63K (NED 62218) | | | | |
| PC | 10-1-2008 | BD | ADDED PN 67783-64H (NED 62446) | | | | |
| CAD REVISION RECORD - DO NOT REVISE MANUALLY | | DESCRIPTION | | BY | | DATE | |
| LTR | | A-AY SEE REVISION FILE | | AK | | 03-14-06 | |
| BA | | ADDED PN'S 67783-59H, 67783-60F & 67783-61D (ECO 20434) | | | | | |

| | | | |
|--|-------------|-------------|-------------|
|  CLA-VAL CO. NEWPORT BEACH, CALIFORNIA | CATALOG NO. | DRAWING NO. | REV |
| | | 67783 | BD |
| TYPE OF VALVE AND MAIN FEATURES | | DESIGN | |
| <h1 style="text-align: center;">CK2 COCK/BALL VALVE</h1> | | DRAWN | MGR 4-02-80 |
| | | CHK'D | KD 4-03-80 |
| | | APV'D | CH 4-07-80 |



| CLA-VAL PART NO. AND MATERIAL | | | | | | | | |
|-------------------------------|-------------------|------------------|---------------------|---------------------------|--------------------|-------------------|-------------------------|------------|
| BRONZE WITH HANDLE | STEEL WITH HANDLE | IRON WITH HANDLE | 316 SST WITH HANDLE | 316 SST W/ LOCKING HANDLE | BRONZE WITH HANDLE | MONEL WITH HANDLE | MONEL W/ LOCKING HANDLE | SIZE "NPT" |
| 67783-01K* | -09C | -17F | -25J SUPSD BY-26G | | -41F SUPSD BY-01K | | | 1/8" |
| -02H | -10A | -18D | -26G | -51E SUPSD BY-26G -52C | -42D SUPSD BY-02H | -55F | | 1/4" |
| -03F * -59H*** | -11J | -19B | -27E | -46E SUPSD BY-27E -53A | -45G -57B * * | -48A SUPSD BY-49J | -63K | 3/8" |
| -04D -60F *** | -12G | -20K | -28C | -54J | -43B SUPSD BY-04D | -49J | -62B | 1/2" |
| -05A -61D *** | -13E | -21H | -29A | -64H | -44K SUPSD BY-05A | -56D | | 3/4" |
| -06J | -14C | -22F | -30J | | | -58K | | 1" |
| -07G | -15K | -23D | -31G | | | | | 1 1/4" |
| -08E | -16H | -24B | -32E | | | | | 1 1/2" |
| -50G | | | -47C | | | | | 2" |

- * SEE ENGINEERING APPROVED VENDORS TABLE (SHEET 2 OF 2).
- ** HAMMOND VALVE 8501 ONLY.
- *** WILKINS CK2 (SEE SHEET 2 OF 2)

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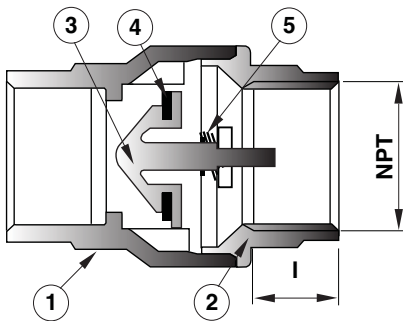


—MODEL— **CDC-1**

Check Valve (Sizes 3/8" and 1/2")



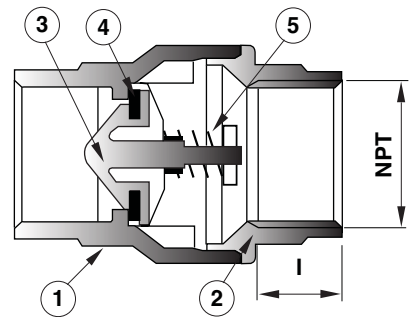
- NSF 61 Approved
- Meets low lead requirements
- Soft Seat for Bubble Tight Shutoff, Spring Loaded for Fast Seating Action
- Compact Design
- Low Cracking Pressure 1/2 psi
- Flow Profile Designed to Minimize Head Loss
- Perfect Seating both at High and Low Pressure, Wide Temperature Range: +10° to 210°F
- Polyetherimide Disc to ensure the Best Resistance for Corrosion and Abrasion
- Patented Disc Guide to Prevent Any Side Loading



Full Open Operation

| Item | Description | Material |
|------|----------------|-----------------|
| 1 | Body | Brass |
| 2 | End Connection | Brass |
| 3 | Disc | Polyetherimide |
| 4 | Seat | NBR |
| 5 | Spring | Stainless Steel |

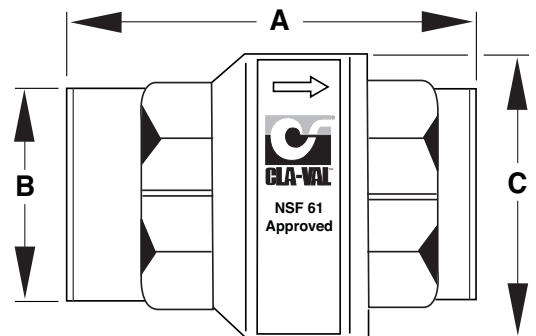
Available only in replacement assembly.



Tight Closing Operation

Dimensions

| Size (NPT) | Stock Number | A | B | C | I | C _v | psi | Wt. |
|------------|--------------|------|------|------|------|----------------|-----|------|
| 3/8" | 9834501A | 1.73 | 0.79 | 1.06 | 0.40 | 4.55 | 400 | 0.37 |
| 1/2" | 9834502J | 2.32 | 0.98 | 1.35 | 0.53 | 6.00 | 400 | 0.32 |





— MODEL — **CV**
Flow Control



DESCRIPTION

The Cla-Val Model CV Flow Control is a simply-designed, spring-loaded check valve. Rate of flow is full flow in one direction and restricted in other direction. Flow is adjustable in the restricted direction. It is intended for use in conjunction with a pilot control system on a Cla-Val Automatic Control Valve.

OPERATION

The CV Flow Control permits full flow from port A to B, and restricted flow in the reverse direction. Flow from port A to B lifts the disc from seat, permitting full flow. Flow in the reverse direction seats the disc, causing fluid to pass through the clearance between the stem and the disc. This clearance can be increased, thereby increasing the restricted flow, by screwing the stem out, or counter-clockwise. Turning the stem in, or clockwise reduces the clearance between the stem and the disc, thereby reducing the restricted flow.

INSTALLATION

Install the CV Flow Control as shown in the valve schematic. All connections must be tight to prevent leakage.

DISASSEMBLY

Follow the sequence of the item numbers assigned to the parts in the cross sectional illustration for recommended order of disassembly.

Use a scriber, or similar sharp-pointed tool to remove O-ring from the stem.

INSPECTION

Inspect all threads for damage or evidence of cross-threading. Check mating surface of seat and valve disc for excessive scoring or embedded foreign particles. Check spring for visible distortion, cracks and breaks. Inspect all parts for damage, corrosion and cleanliness.

CLEANING

After disassembly and inspection, cleaning of the parts can begin. Water service usually will produce mineral or lime deposits on metal parts in contact with water. These deposits can be cleaned by dipping the parts in a 5-percent muriatic acid solution just long enough for deposits to dissolve. This will remove most of the common types of deposits. **Caution: use extreme care when handling acid.** If the deposit is not removed by acid, then a fine grit (400) wet or dry sandpaper can be used with water. Rinse parts in water before handling. An appropriate solvent can clean parts used in fueling service. Dry with compressed air or a clean, lint-free cloth. Protect from damage and dust until reassembled.

REPAIR AND REPLACEMENT

Minor nicks and scratches may be polished out using a fine grade of emery or crocus cloth; replace parts if scratches cannot be removed.

Replace O-ring packing and gasket each time CV Flow Control is overhauled.

Replace all parts which are defective. Replace any parts which create the slightest doubt that they will not afford completely satisfactory operation. Use Inspection steps as a guide.

REASSEMBLY

Reassembly is the reverse of disassembly; no special tools are required.

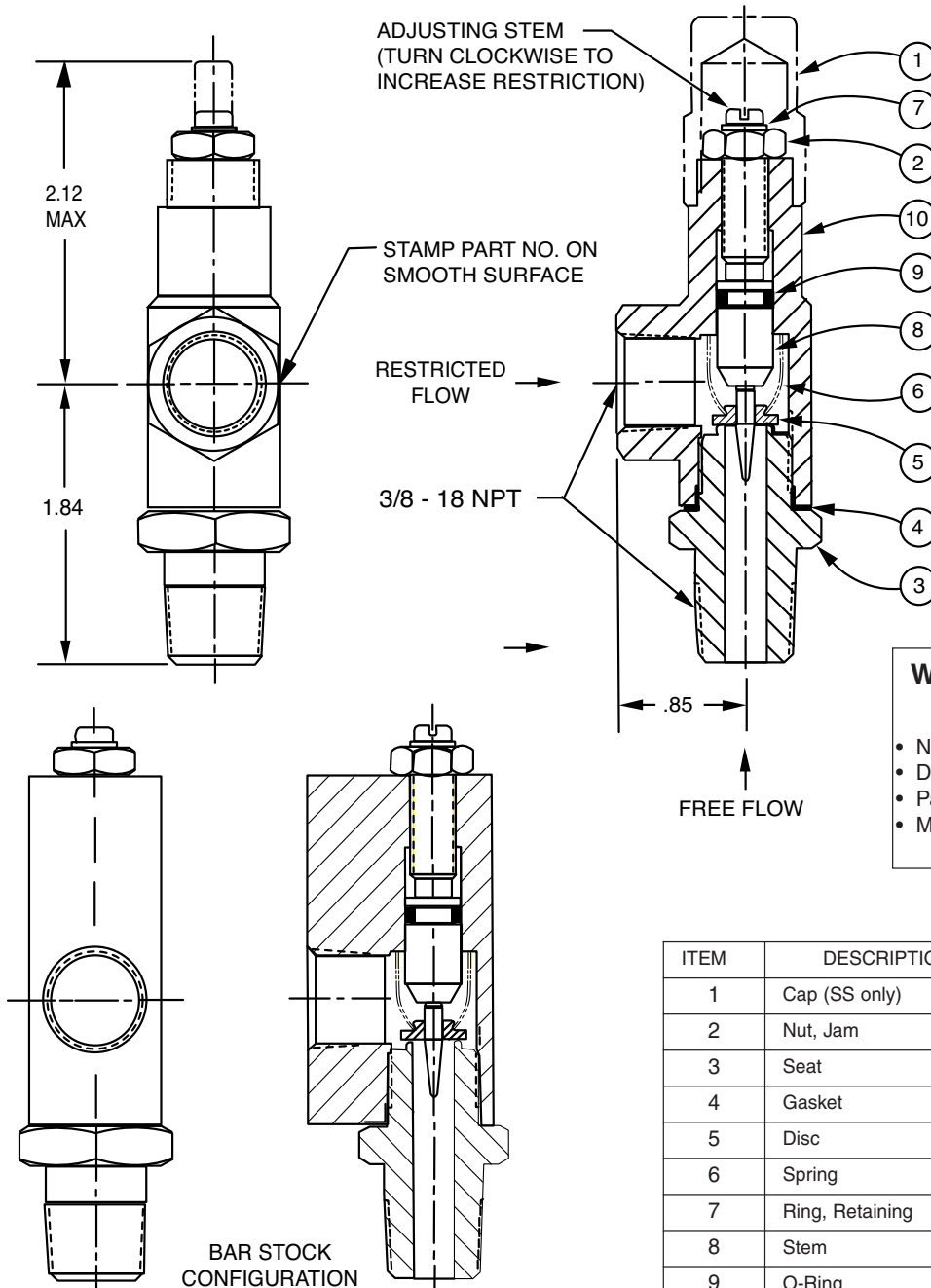
TEST PROCEDURE

No testing of the flow Control is required prior to reassembly to the pilot control system on Cla-Val Main Valve.



CV

3/8" Flow Control



| ITEM | DESCRIPTION | QTY |
|------|-----------------|-----|
| 1 | Cap (SS only) | 1 |
| 2 | Nut, Jam | 1 |
| 3 | Seat | 1 |
| 4 | Gasket | 1 |
| 5 | Disc | 1 |
| 6 | Spring | 1 |
| 7 | Ring, Retaining | 1 |
| 8 | Stem | 1 |
| 9 | O-Ring | 1 |
| 10 | Housing | 1 |



Cla-Val Product Identification

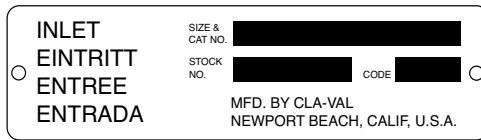
How to Order

Proper Identification

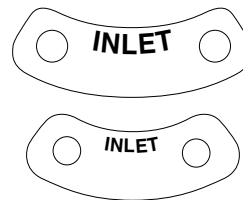
For ordering repair kits, replacement parts, or for inquiries concerning valve operation, it is important to properly identify Cla-Val products already in service by including all nameplate data with your inquiry. Pertinent product data includes valve function, size, material, pressure rating, end details, type of pilot controls used and control adjustment ranges.

Identification Plates

For product identification, cast-in body markings are supplemented by identification plates as illustrated on this page. The plates, depending on type and size of product, are mounted in the most practical position. **It is extremely important that these identification plates are not painted over, removed, or in any other way rendered illegible.**



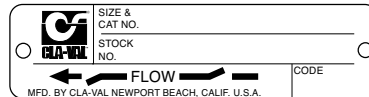
This brass plate appears on valves sized 2 1/2" and larger and is located on the top of the inlet flange.



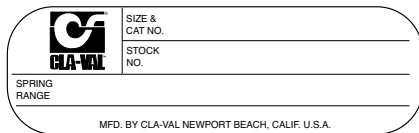
These two brass plates appear on 3/8", 1/2", and 3/4" size valves and are located on the valve cover.



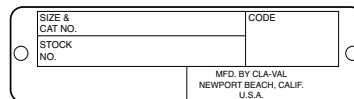
This brass plate appears on altitude valves only and is found on top of the outlet flange.



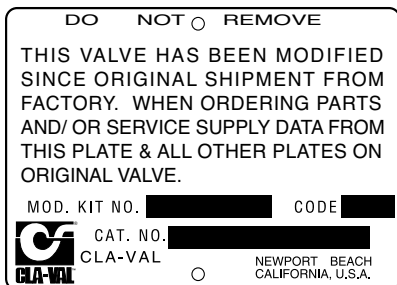
These two brass plates appear on threaded valves 1" through 3" size or flanged valves 1" through 2". It is located on only one side of the valve body.



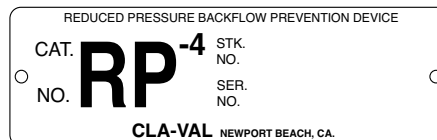
This tag is affixed to the cover of the pilot control valve. The adjustment range appears in the spring range section.



This brass plate is used to identify pilot control valves. The adjustment range is stamped into the plate.



This aluminum plate is included in pilot system modification kits and is to be wired to the new pilot control system after installation.



This brass plate is used on our backflow prevention assemblies. It is located on the side of the Number Two check (2" through 10"). The serial number of the assembly is also stamped on the top of the inlet flange of the Number One check.



HOW TO ORDER

Distributed By:
M&M Control Service, Inc.
Phone: 800-876-0036
Fax: 847-356-0747
Email: sales@mmcontrol.com

SPECIFY WHEN ORDERING

- Model Number
- Globe or Angle Pattern
- Adjustment Range
(As Applicable)
- Valve Size
- Threaded or Flanged
- Body and Trim Materials
- Optional Features
- Pressure Class

UNLESS OTHERWISE SPECIFIED

- Globe or angle pattern are the same price
 - Ductile iron body and bronze trim are standard
 - X46 Flow Clean Strainer or X43 "Y" Strainer are included
 - CK2 Isolation Valves are included in price on 4" and larger valve sizes (6" and larger on 600 Series)
-

NOTES:

NOTES:



CLA-VAL

Distributed By:
M&M Control Service, Inc.
Phone: 800-876-0036
Fax: 847-356-0747
Email: sales@mmcontrol.com

Represented By:



— MODEL — **REPAIR KITS**

Complete Replacement Diaphragm Assemblies for 100-01 and 100-20 Hytrol Main Valves

For: Hytrol Main Valves with Ductile Iron, Bronze Trim Materials—125/150 Pressure Class Only.

FACTORY ASSEMBLED

Includes: Stem, Disc Guide, Disc, Disc Retainer, Spacer Washers, Diaphragm, Diaphragm Washer and Stem Nut.

| Valve Size | Diaphragm Assembly Stock Number | | Valve Size | Diaphragm Assembly Stock Number | |
|---------------------------|---------------------------------|--------|------------|---------------------------------|--------|
| | 100-01 | 100-20 | | 100-01 | 100-20 |
| 3/8" (Also 81-01) | 49097K | N/A | 6" | 40456G | 33273E |
| 1/2" - 3/4" (Also 81-01) | C2518D | N/A | 8" | 45276D | 40456G |
| 1" | C2520K | N/A | 10" | 81752J | 45276D |
| 1 1/4"-1 1/2" | C2522 F | N/A | 12" | 85533J | 81752J |
| 2" | C2524B | N/A | 14" | 89067D | N/A |
| 2 1/2" | C2523D | N/A | 16" | 89068B | 85533J |
| 3" | C2525J | C2524B | 20" | N/A | 89068B |
| 4" | 33273E | C2525J | 24" | N/A | 89068B |

Repair Kits for 100-01/100-20 Hytrol Valves

For: Hytrol Main Valves—125/150 Pressure Class Only.

Includes: Diaphragm, Disc (or Disc Assembly) and spare Spacer Washers.

| Buna-N® Standard Material | | | | Viton (For KB Valves) | | | |
|---------------------------|-------------------------|----------|---------------------------|-------------------------|----------|--|--|
| Valve Size | Repair Kit Stock Number | | Valve Size | Repair Kit Stock Number | | | |
| | 100-01 | 100-20 | | 100-01 | 100-20 | | |
| 3/8" (Also 81-01) | 9169801K | N/A | 3/8" (Also 81-01) | 9169806J | N/A | | |
| 1/2" - 3/4" (Also 81-01) | 9169802H | N/A | 1/2" - 3/4" (Also 81-01) | 9169807G | N/A | | |
| 1" | 9169803F | N/A | 1" | 9169808E | N/A | | |
| 1 1/4" - 1 1/2" | 9169804D | N/A | 1 1/4" - 1 1/2" | 9169809C | N/A | | |
| 2" | 9169805A | N/A | 2" | 9169810A | N/A | | |
| 2 1/2" | 9169811J | N/A | 2 1/2" | 9169817F | N/A | | |
| 3" | 9169812G | 9169805A | 3" | 9169818D | 9169810A | | |
| 4" | 9169813E | 9169812G | 4" | 9169819B | 9169818D | | |
| 6" | 9169815K | 9169813E | 6" | 9169820K | 9169819B | | |
| 8" | 9817901D | 9169815K | 8" | 9169834A | 9169820K | | |
| 10" | 9817902B | 9817901D | | | | | |
| 12" | 9817903K | 9817902B | | | | | |
| 14" | 9817904H | N/A | | | | | |
| 16" | 9817905E | 9817903K | | | | | |
| 20" | N/A | 9817905E | | | | | |
| 24" | 9817906C | 9817905E | | | | | |

When ordering, please give complete nameplate data of the valve and/or control being repaired.
MINIMUM ORDER CHARGE APPLIES.

Repair Kits for 100-02/100-21 Powertrol and 100-03/100-22 Powercheck Main Valves

For: Powertrol and Powercheck Main Valves—125/150 Pressure Class Only

Includes: Diaphragm, Disc (or Disc Assembly) and O-rings and full set of spare Spacer Washers.

| Valve Size | Kit Stock Number 100-02 | Valve Size | Kit Stock Number | |
|-----------------|----------------------------|------------|------------------|-----------------|
| | | | 100-02 & 100-03 | 100-21 & 100-22 |
| 3/8" | 9169901H | 2 1/2" | 9169910J | N/A |
| 1/2" & 3/4" | 9169902F | 3" | 9169911G | 9169905J |
| 1" | 9169903D | 4" | 9169912E | 9169911G |
| 1 1/4" & 1 1/2" | 9169904B | 6" | 9169913C | 9169912E |
| 2" | 9169905J | 8" | 99116G | 9169913C |
| | | 10" | 9169939H | 99116G |
| | | 12" | 9169937B | 9169939H |

Repair Kits for 100-04/100-23 Hy-Check Main Valves

For: Hy-Check Main Valves—125/150 Pressure Class Only

Larger Sizes: Consult Factory.

Includes: Diaphragm, Disc and O-Rings and full set of spare Spacer Washers.

| Valve Size | Kit Stock Number | | Valve Size | Kit Stock Number | |
|------------|------------------|-----------|------------|------------------|-----------|
| | 100-04 | 100-23 | | 100-04 | 100-23 |
| 4" | 20210901B | N/A | 12" | 20210905H | 20210904J |
| 6" | 20210902A | 20210901B | 14" | 20210906G | N/A |
| 8" | 20210903K | 20210902A | 16" | 20210907F | 20210905H |
| 10" | 20210904J | 20210903K | 20" | N/A | 20210907F |
| | | | 24" | N/A | 20210907F |

Repair Kits for Pilot Control Valves (In Standard Materials Only)

Larger Sizes: Consult Factory.

Includes: Diaphragm, Disc (or Disc Assembly), O-Rings, Gaskets or spare Screws as appropriate.

| BUNA-N® (Standard Material) | | | | VITON (For KB Controls) | |
|-----------------------------|------------------|-------------------------|------------------|-------------------------------|------------------|
| Pilot Control | Kit Stock Number | Pilot Control | Kit Stock Number | Pilot Control | Kit Stock Number |
| CDB | 9170006C | CFM-7 | 1263901K | CDB-KB | 9170012A |
| CDB-30 | 9170023H | CFM-7A | 1263901K | CRA-KB | N/A |
| CDB-31 | 9170024F | CFM-9 | 12223E | CRD-KB (w/bucking spring) | 9170008J |
| CDB-7 | 9170017K | CRA (w/bucking spring) | 9170001D | CRL-KB | 9170013J |
| CDH-2 | 18225D | CRD (w/bucking spring) | 9170002B | CDHS-2BKB | 9170010E |
| CDHS-2 | 44607A | CRD (no bucking spring) | 9170003K | CDHS-2FKB | 9170011C |
| CDHS-2B | 9170004H | CRD-18 | 20275401K | CDHS-18KB (no bucking spring) | 9170009G |
| CDHS-2F | 9170005E | CRD-22 | 98923G | 102C-KB | 1726202D |
| CDHS-3C-A2 | 24657K | CRL (55F, 55L) | 9170007A | | |
| CDHS-8A | 2666901A | CRL-4A | 43413E | | |
| CDHS-18 | 9170003K | CRL-5 (55B) | 65755B | | |
| CDS-4 | 9170014G | CRL-5A (55G) | 20666E | | |
| CDS-5 | 14200A | CRL-18 | 20309801C | | |
| CDS-6 | 20119301A | CV | 9170019F | | |
| CDS-6A | 20349401C | X105L (O-ring) | 00951E | Buna-N® | |
| CFCM-M1 | 1222301C | 102B-1 | 1502201F | CRD Disc Ret. (Solid) | C5256H |
| CFM-2 | 12223E | 102C-2 | 1726201F | CRD Disc Ret. (Spring) | C5255K |
| | | 102C-3 | 1726201F | | |

Repair Assemblies (In Standard Materials Only)

| Control | Description | Stock Number |
|-------------|--|--------------|
| CF1-C1 | Pilot Assembly Only | 89541H |
| CF1-CI | Complete Float Control less Ball and Rod | 89016A |
| CFC2-C1 | Disc, Distributor and Seals | 2674701E |
| CSM 11-A2-2 | Mechanical Parts Assembly | 97544B |
| CSM 11-A2-2 | Pilot Assembly Only | 18053K |
| 33A 1" | Complete Internal Assembly and Seal | 2036030B |
| 33A 2" | Complete Internal Assembly and Seal | 2040830J |

When ordering, please give complete nameplate data of the valve and/or control being repaired. **MINIMUM ORDER CHARGE APPLIES**