
CLA-VAL

AUTOMATIC CONTROL VALVES

750B-4KG1

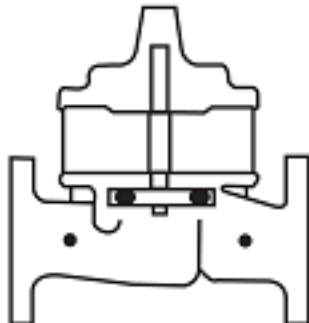
Place this manual with personnel responsible
for maintenance of this valve



Installation



Operation



Maintenance



CLA-VAL CO. NEWPORT BEACH, CALIFORNIA

CATALOG NO.
750B-4KG1

DRAWING NO.
29868

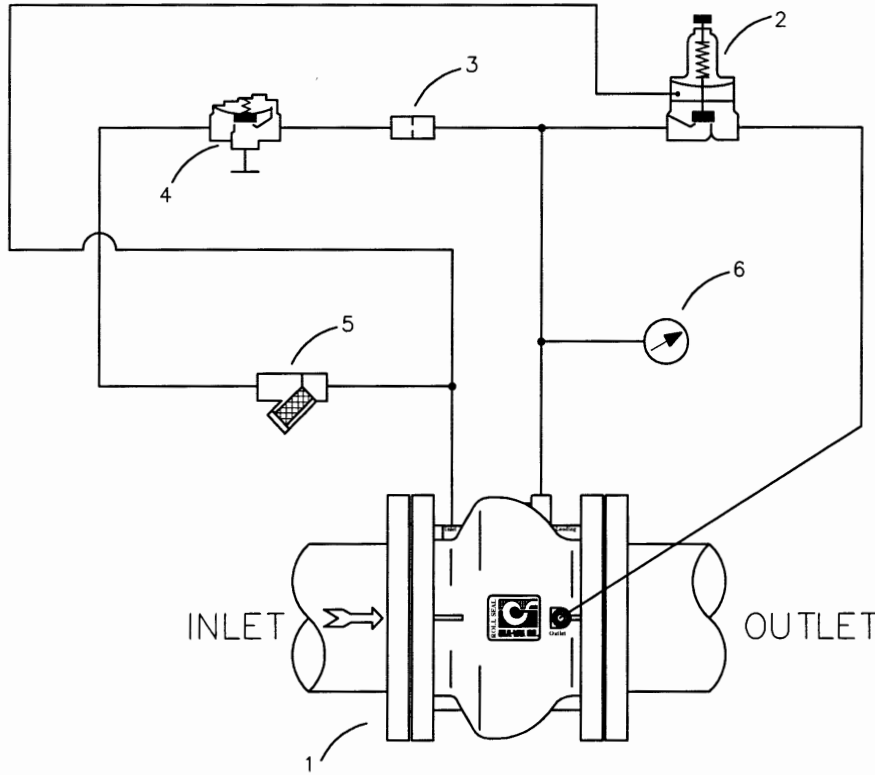
REV
C

TYPE OF VALVE AND MAIN FEATURES

FIRE PUMP RELIEF VALVE
(UL AND FM LISTED)

DESIGN		
DRAW	EK	07-07-98
CHK'D	CH	07-07-98
APVD	BF	07-07-98

----- NOT FURNISHED BY CLA-VAL CO. ----- OPTIONAL FEATURES



ITEM NO.	BASIC COMPONENTS	QTY
1	100-42 ROLL SEAL MAIN VALVE	1
2	CRL5A PRESSURE RELIEF CONTROL	1
3	X58A RESTRICTION	1
4	81-01 CHECK VALVE	1
5	X43 Y-STRAINER	1
6	PRESSURE GAGE	1

OPTIONAL FEATURE SUFFIX	ADDED TO CATALOG NUMBER

11-03-98 AK
02-09-00 AK
02-13-04 I.C.

"Y" STRAINER (ECO 17412)
B ADDED "UL LISTED" (NED 44963)
C ADDED "FM LISTED" (ECO 19696)

CAD REVISION RECORD - DO NOT REVERSE MANUALLY

DESCRIPTION	BY	DATE
RELEASED FOR PRODUCTION. (NED 43426)	EK	7-7-98
REVISD HOOK-UP OF SENSING LINE FROM CRL TO BEFORE		

LTR - A

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OPERATING DATA

I. PRESSURE RELIEF FEATURE:

PRESSURE RELIEF CONTROL (2) IS A NORMALLY CLOSED CONTROL THAT RESPONDS TO MAIN VALVE INLET PRESSURE CHANGES. AN INCREASE IN INLET PRESSURE TENDS TO OPEN CONTROL (2) AND A DECREASE IN INLET PRESSURE TENDS TO CLOSE CONTROL (2). THIS CAUSES LOADING CHAMBER PRESSURE TO VARY AND THE MAIN VALVE MODULATES (OPENS AND CLOSES) MAINTAINING A RELATIVELY CONSTANT PRESSURE AT THE MAIN VALVE INLET. WHEN INLET PRESSURE IS LOWER THAN THE SET POINT OF CONTROL (2), CONTROL (2) CLOSURES. THIS PRESSURIZES THE LOADING CHAMBER AND THE MAIN VALVE CLOSURES. PRESSURE RELIEF CONTROL (2) ADJUSTMENT: TURN THE ADJUSTING SCREW CLOCKWISE TO INCREASE THE SETTING.

II. CHECK VALVE FEATURE:

WHEN LOADING CHAMBER PRESSURE IS HIGHER THAN INLET PRESSURE, CHECK VALVE (4) CLOSURES. THIS MAINTAINS THE HIGHER PRESSURE IN THE MAIN VALVE LOADING CHAMBER KEEPING THE MAIN VALVE CLOSED.

III. CHECK LIST FOR PROPER OPERATION:

- () SYSTEM VALVES OPEN UPSTREAM AND DOWNSTREAM.
- () AIR REMOVED FROM THE LOADING CHAMBER AND PILOT SYSTEM AT ALL HIGH POINTS.
- () PERIODIC CLEANING OF STRAINER (5) IS RECOMMENDED.

CAD REVISION RECORD - DO NOT REVISE MANUALLY

DESCRIPTION

DATE

BY

LTR

SEE SHEET 1



750B – 4KG1
ROLL SEAL FIRE PUMP RELIEF VALVE
INTRODUCTORY INFORMATION

This manual is primarily intended for use as a manual for the UL listed and FM approved Roll Seal 750B–4KG1 Fire Pump Relief Valves. Certain sections may contain information that would be useful for the care installation and maintenance of other Roll Seal products and Valve sizes. This extra data is intended as additional reference information for the Roll Seal product line.

The product literature for the Roll Seal 750B – 4KG1 Fire Pump Relief Valve notes the particular Valve Sizes and configurations that are UL listed or FM approved. Consult the factory or your nearest sales representative if further clarification is required.

UL listed and FM approved products are identified by the appropriate nameplate on the Valve. Drawings of the UL & FM nameplates are enclosed for reference.

The UL nameplate drawing number 86060. The FM nameplate drawing number is 94777. This manual contains information regarding care, installation and maintenance of the Roll Seal Main Valve (100–42) as well as information about the fully piloted product (750B–4KG1 Fire Pump Relief Valve). 100–42 is the identifying nomenclature for the Main Valve. 750B–4KG1 is identifying nomenclature for the fully piloted Fire Pump Relief Valve Assembly. See Schematic Drawing No. 29868 for clarification of the component nomenclature and for a description of Valve Operation.

A capacity flow curve for Valve sizes 3" through 10" is included that shows the flow capacity in the full open valve condition.

Cla-Val recommends that 750B–4KG1 Valves be tested after installation to verify the Relief pressure set point.



— SERIES — **100-42**

700 Series Roll Seal

DESCRIPTION

The Cla-Val Model 100-42 Roll Seal valve is a hydraulically operated valve used to control liquid flow by means of a flexible control element, the liner.

The basic valve consists of only two parts: a one piece, investment cast body and an elastomeric liner. The valve body is constructed with internal ribs and slots forming a grillwork which surrounds the liner to provide support. A normally closed type valve is formed by the installed liner which covers the grillwork and seats against the raised seating surface in the valve body.

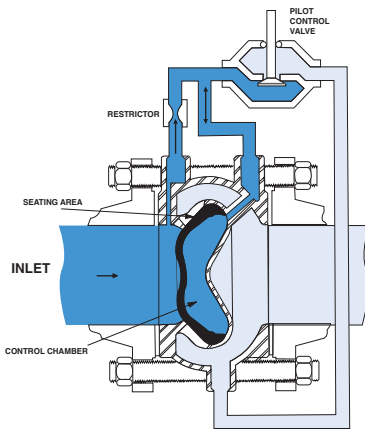
Upstream pressure actuates the valve to produce valve opening by rolling the liner off the seating surface and the slotted grillwork.

The valve is actuated by upstream pressure as the loading pressure (pressure supplied to the control chamber) is varied by an external pilot control system.

A typical pilot control system used to operate the Model 100-42 valve consists of a restriction and a suitable pilot connected to the valve.



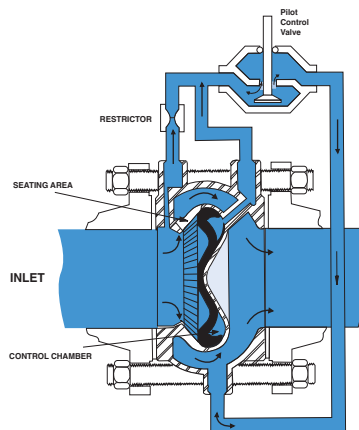
PRINCIPLE OF OPERATION



**Model 100-42 Valve
in Closed Position**

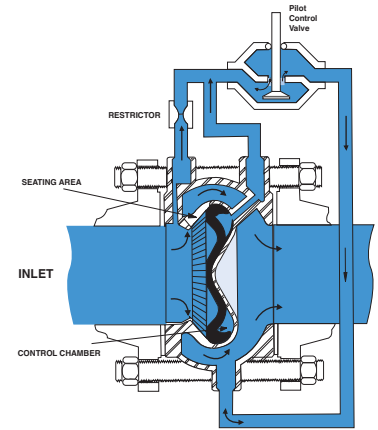
Upstream pressure is introduced to the control chamber (the chamber formed behind the liner) through the control piping and restrictor. When the pilot is closed, full inlet pressure is supplied to the control chamber, thus balancing the force developed by inlet pressure acting on the upstream face on the liner. Under these conditions, the liner remains in the fully closed position.

Since the operating pressure in the control chamber is greater than the outlet pressure, an additional closing force is developed across the liner, pressing the liner against the surrounding slotted grillwork area and seating surface.



**Model 100-42 Valve
in Partially Open Position**

As loading pressure is lowered slightly below inlet pressure, the central portion of the liner is forced to invert and come to rest against the tip of the control chamber cavity. Reducing the loading pressure further (but still higher than outlet pressure) causes the liner to drape over the cone shaped portion of the control chamber cavity. This action causes the outer section of the liner to roll off the seating surface and a portion of the grillwork to partially open the valve.



**Model 100-42 Valve
in Fully Open Position**

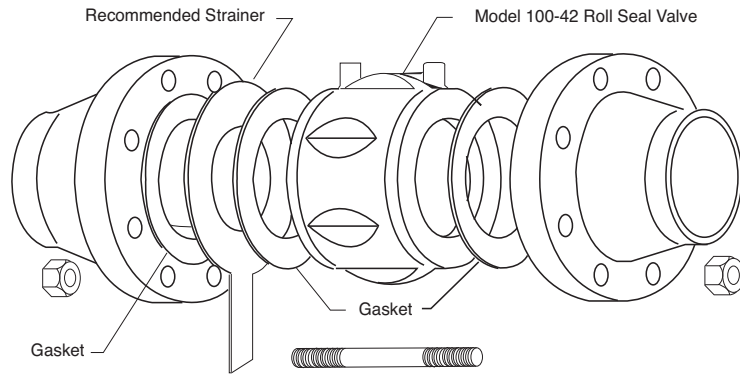
The valve is fully opened when loading pressure is sufficiently reduced to allow the liner to roll back completely and expose the full slot area. Restoring loading pressure reverses the liner rolling action to return the liner to the fully closed position.

INSTALLATION

The Cla-Val Model 100-42 Roll Seal valve in 2", 3", and 4" sizes are designed to mount between standard pipe flanges (ANSI 125, 150, 250, and 300 series) as a wafer type valve. The outer portion of the valve body is constructed with fluted (recessed) sections to provide clearance for the class 125 and 150 flange bolt pattern while the basic outside diameter of the body centers within the class 250 and 300 flange bolt pattern.

The Model 100-42 valve in 6" through 12" sizes are constructed with separable "slip-on" style flanges. Furnished standard in either class 150 or 300 raised face type, the flanges are removable and interchangeable. The class 150 flange may be bolted up to class 125 pipeline flanges and the class 300 flange may be mated against a class 250 flange.

Locate pilot system port connections at the top of valve in pipeline to allow easy air venting. A line size strainer is recommended, mounted on the valve inlet.



PROCEDURE

1. The valve should be given a visual inspection before installation to be sure no foreign materials have collected inside the valve during shipment or storage.
 2. Pipelines should be flushed out before the valve is installed in the system. New systems, especially, should be cleaned as contaminants such as welding beads, scale, rocks, etc. are commonly contained within the pipeline.
 3. The valve should be installed in a location allowing sufficient working space around the valve to provide easy access for maintenance and removal for servicing.
 4. For 2", 3", and 4" sizes only. Insert the lower half pattern of stud bolts through the bolt holes of the upstream and downstream pipeline flanges.
 - 4a. For 2" & 3" valves only. The 125 and 150 series flanges use a different number of bolts than the 250 and 300 series flanges. Hence, the wafer valve body configuration is inherently self centering regardless of the flange used.
 - 4b. For the 4" valve, ANSI pipe flanges use an 8 bolt pattern regardless of pressure ratings, although the 250 and 300 series use larger bolts on a larger bolt circle. The 4" valve can be centered in the larger 250 and 300 class flanges by rotating the valve body into full radial contact with the bolt studs prior to tightening.
 5. If an inline basket type strainer is to be included in the installation, insert the strainer into the upstream pipe, making sure a gasket is placed between the strainer and the upstream flange.
 6. Install the valve between the flanges being sure to include the appropriate flange gaskets between each end of the valve and the mating pipe flange.
- Note: The valve must be installed with the flow arrow on side of body pointing to the downstream piping section. Cla-Val 700 Series valves may be installed in any position in either vertical or horizontal installations without any effect on valve operation.
7. Insert the remaining stud bolts and nuts and tighten evenly using a diagonal cross-over type pattern.

Liner Retainer Removal 2"-12" Sizes

The 2" and 3" liner retainer is secured to the valve with an Allen screw. Loosen the Allen screw, pull the locking pin back towards center of retainer, and remove the retainer from valve.

To install, insert the retainer, (do not block inlet feed hole), push locking pin into position and tighten Allen screw.

The 4"-12" liner retainers are secured with a snap ring. Remove the snap ring and retainer.

To install, insert retainer and install snap ring into the groove of valve. Be sure snap ring is completely inserted into groove.

Liner Removal 2"-12" Sizes

The tool used for removal should be free of sharp edges to prevent damage to the liner, the valve body seat or control chamber surfaces. A motorcycle tire iron or similar tool works well.

1. Insert the tool between the liner and the valve body as deeply as possible.
2. Using the seat edge as a fulcrum, rock the end of the tool away from the valve in a manner to pull the liner bead out of the body. Grasp the liner and remove from the valve body.

Liner Installation 2", 3", 4" Sizes

Thoroughly clean out the interior of the valve body control chamber cavity.

Liberal apply glycerine inside the control chamber cavity and around the seal bead area of the liner.

DO NOT USE ANY HYDROCARBON OR SILICONE BASED LUBRICANTS ON LINERS AS THESE COMPOUNDS CAN SEVERELY ATTACK THE LINER MATERIAL.

3. Fold the liner as shown and install into the valve body control chamber as deeply as possible.
4. Continuing to force the liner into the control chamber cavity, again fold the liner as shown to insert the liner seal bead section under the valve body seat surface.
5. Work the folded section of the liner into place by pushing against the folded area to slide the seal bead down the conical face of the control chamber.

Liner Seating Instructions 2", 3", 4" Sizes

After installing the liner, it must be seated over the manifold ring in the valve body. The objective of this seating procedure is to place the inside lip of the liner over the outside lip of the manifold ring.

6. 4" valve with liner installed.
7. Pinch, pull and knead the liner 360° around to seat the liner on the manifold ring.
8. Using a dull tool or hammer handle, pry the outer part of the liner towards the center to help "seat" the liner.
9. Now push the liner down into the valve, holding your hand on the depressed liner, seal off the loading port with your finger.
10. Remove your hand from liner and continue holding your finger over the loading port. If liner is seated, it will be held in the open position as long as your finger is over the loading port. When you release your finger, the liner will pop up. If not seated, repeat with Step 7.

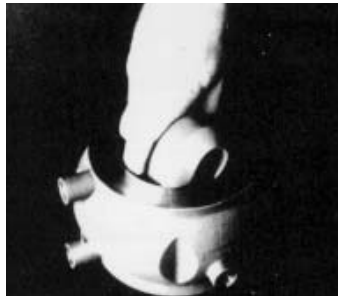
Install liner retainer into body.



1



2



3



4



5



6



7



8



9



10

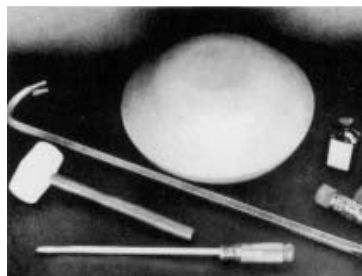
Liner Installation

6", 8", 10", 12" sizes

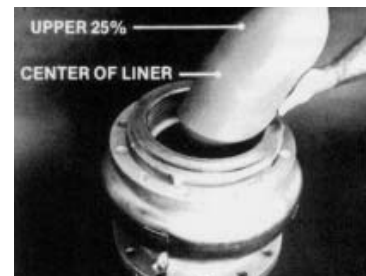
1. Tools required: Bottle of drugstore glycerine, 30" crowbar, double headed plastic hammer with 14" handle, rubber mallet and large flat blade screwdriver.
2. Liberally wipe glycerine on the inside of the valve and on the outer edge of the liner. Fold liner in half and insert into valve body.
3. Push liner in as far as possible forcing it out side ways.
4. Place the crowbar at the upper 25% point of the liner. Take your other hand and push on nose of liner to bend the liner over the crowbar. The less material folded over, the easier it will go into the valve. If too much is folded over, it will be difficult to complete liner installation.
5. Continue bending liner nose down into the valve. Use your hands and/or hammer handle to continue forcing it down into valve. It is important to keep the "V" of the bend near the 25% point. If it goes over the center, The liner won't go in, and it will be necessary to start over at Step 3.
6. Use the hammer to force the liner down and out into the valve body.
7. Use the hammer handle for the final insertion. Sometimes it is helpful to beat on the liner with the hammer for the final step.
8. To seat the liner on the manifold ring use the hammer handle to push down on the liner near bore of valve inlet and pry handle and liner towards the center. Continue this prying action for 360° around the liner for proper seating.
9. To test for liner seating, push down on the center of liner and close the loading port shut-off cock, or block it with your hand. When you release your hand from the liner, it should remain in the down position until the loading port is opened.
10. If liner appears seated, open loading port cock and liner should pop-up to the closed position. Repeat Steps 6-10 if liner is not seated.

When the liner is fully seated, the inside diameter of the liner will be seated over the outside diameter of the manifold ring. The manifold ring is a raised circular ridge at the bottom of the open cavity which provides for even distribution of the fluid coming in and going out the loading port.

Install liner retainer into body.



1



2



3



4



5



6



7



8



9



10

PLACING VALVE INTO OPERATION **Important Procedure for All Installations:**

In most instances, the 700 Series Cla-Val Control valves will be shipped complete with a pilot control system mounted on the Model 100-42 valve. Consult the appropriate start up and operation instructions for the pilot control used before pressurizing the system.

IT IS IMPORTANT THAT THE PRESSURIZATION AND DEPRESSURIZATION OF ALL INSTALLATIONS BE CARRIED OUT IN A MANNER TO PREVENT IMPOSING A REVERSE PRESSURE CONDITION ON THE CLA-VAL MODEL 100-42 VALVE. PRESSURIZATION OF THE SYSTEM SHOULD BE ACCOMPLISHED BY PRESSURIZING THE INLET SIDE FIRST.

DEPRESSURIZATION OF THE SYSTEM SHOULD BE ACCOMPLISHED BY DEPRESSURIZING THE OUTLET SIDE FIRST. FAILURE TO FOLLOW THIS PROCEDURE COULD RESULT IN DISLODGE- MENT AND/OR DESTRUCTION OF THE RUBBER LINER.

START-UP INSTRUCTIONS

Pressure Reducing 790 Series Valves

The following instructions are for valves equipped with a Model CRD Pressure Reducing Pilot Control.

1. Remove the adjustment cap and back off adjustment screw setting (turn counterclockwise) of the CRD Pressure Reducing Pilot Control to fully relieve all loading on the range spring.
2. Slowly open the **upstream** main line block valve to pressurize the **inlet** section of the valve.
3. Bleed any entrapped air from the control chamber of the valve and tubing sections by loosening fittings at the highest points. Retighten fittings. Install gauge on downstream port of CRD.
4. Slowly increase tension on the range spring, by means of the adjustment screw (turn clockwise) until the desired downstream pressure is attained. Use a gauge.
5. Open the downstream main line block valve.
6. If required, reset the pilot adjustment screw setting to obtain the downstream pressure desired.
7. Tighten the adjustment screw lock nut and replace the adjustment cap.

Back Pressure Control 750 Series Valves

The following instructions are for valves equipped with a Model CRL Back Pressure Pilot Control.

1. Remove the adjustment cap and increase tension on the range spring, by means of the adjustment screw (turn clockwise) until maximum spring load is attained.
2. Slowly open the **upstream** main line block valve to pressurize the **inlet** section of the valve.
3. Bleed any entrapped air from the control chamber of the valve and tubing sections by loosening fittings at the highest points. Retighten fittings.
4. Open the downstream main line block valve.
5. Gradually decrease tension on the range spring by means of the adjustment screw (turn counterclockwise) until upstream pressure decreases to the desired setpoint.
6. Tighten the adjustment screw lock nut and replace the adjustment cap.

Relief Valve Applications 750 Series Valves

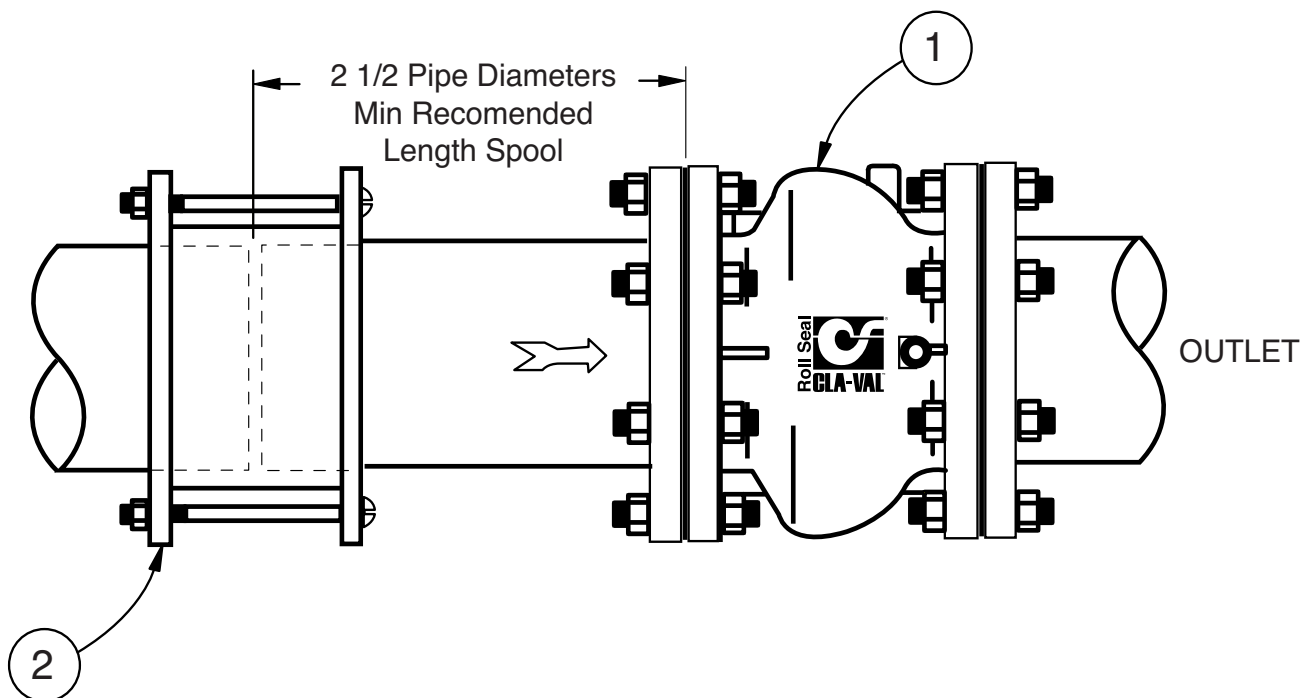
The following instructions are for valves equipped with a Model CRL Pressure Relief Pilot Control.

- Due to the nature of intended use, the system being protected with the relief valve will most likely not be able to furnish the pressure source needed to establish the proper setpoint of the pilot control. Due to this fact, in most instances, the relief valve setting procedures will either have to be carried out at other locations or an auxiliary pressure source will have to be supplied at the site in order to carry out the following procedure.
1. Remove the adjustment cap and increase tension on the range spring by means of the adjustment screw (turn clockwise) until maximum spring load is attained.
 2. Slowly introduce **inlet** pressure to the valve at the desired setpoint value. Bleed all air.
 3. Gradually decrease tension on the range spring by means of the adjustment screw (turn counterclockwise) until flow is initiated through the valve.
 4. Reduce system pressure back to normal value. Tighten the adjustment screw lock nut and replace the adjustment cap. The valve is now ready for service.

Taking Valve Out of Service

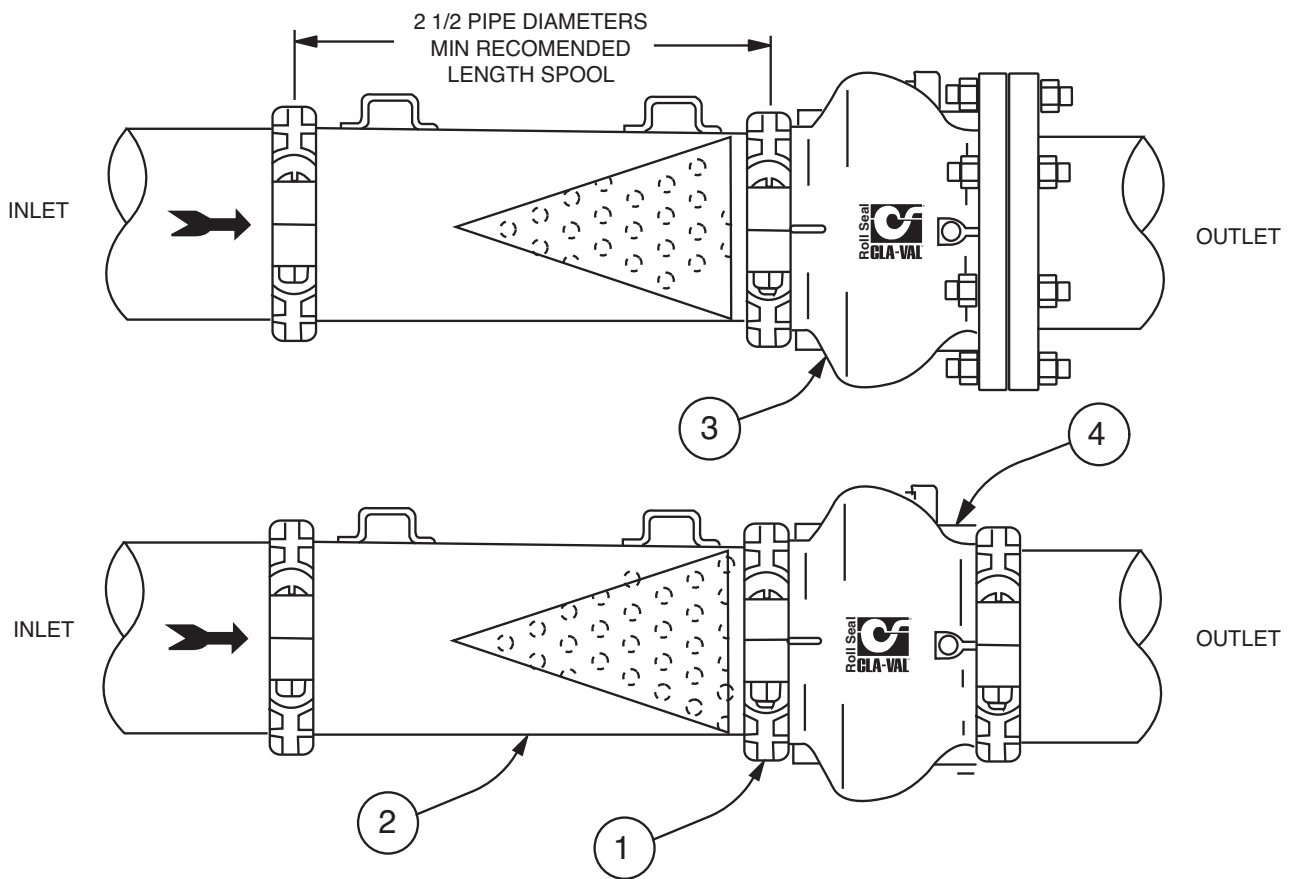
The following procedure should be followed when taking the Model 100-42 valve out of service.

1. Close the upstream main line block valve first. Then close the downstream main line block valve.
 2. Vent the **downstream** section to fully relieve pressure in the outlet section of the valve.
 3. Vent the **upstream** section to fully relieve pressure in the inlet section and control chamber of the Model 100-42 valve.
 4. If the valve liner is to be inspected or replaced, remove the valve from the main line.
-
-



Recommended Pipe layout
6" - 12" Flange style 100-42

- 2 Pipe Coupling (Rubber Gasket Type)
- 1 100-42 Main Valve, Flange X Flange



Recommended Pipe layout
6" - 12" Grooved style 100-42

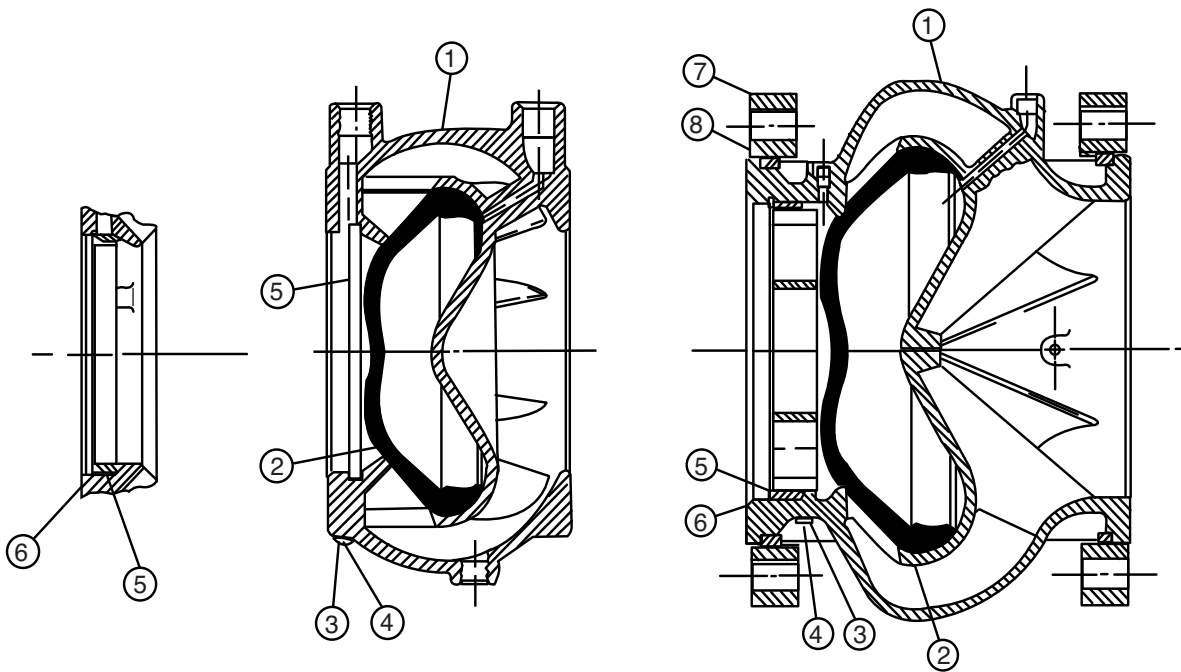
- 1 COUPLER FOR GROOVED PIPE
- 2 SPOOL STRAINER ASSEMBLY (WITH CONE)
- 3 100-42 MAIN VALVE, GROOVE X FLANGE
- 4 100-42 MAIN VALVE, GROOVE X GROOVE

**When ordering
please specify:**

- All nameplate data
- Description
- Part Numbers
- Item Number
- Material

Item No.	Description	No. Req'd	Material (Standard)
1	Body	1	316L Stainless Steel "L"
2*	Liner	1	Natural Rubber
3	Nameplate	1	Aluminum
4	Drive Screw	2	18-8 Stainless Steel
5	Liner Retainer	1	316L Stainless Steel
6	Retaining Ring	1	316L Stainless Steel
7	Slip-on Flange	2	Steel-Cad. Pl.
8	Flange Retainer Ring	2	Steel-Cad. Pl.

*Recommended Spare Part



4" Wafer Style Valve

2-3" Wafer Style Valve

6"-12" Flanged Valve



— MODEL — **CRL5A**
PRESSURE RELIEF CONTROL

DESCRIPTION

The CRL5A 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 Cla-Val valves. It opens and closes within very close pressure limits.

INSTALLATION

The CRL5A Pressure Relief Control may be installed in any position. CRL5A body (7) has one inlet and one outlet ports with two smaller side ports. Side ports are for control connections or gauge installation. A flow direction indicator is cast into body. Control pressure sensing is through small side port in powerunit (6).

OPERATION

The CRL5A Pressure Relief Control is normally held closed by compression spring force above diaphragm, and controlling pressure is applied under diaphragm. When controlling pressure exceeds spring setting, control disc is lifted off its seat permitting flow through the control. When controlling pressure drops below spring setting, spring returns control to normally closed position.

ADJUSTMENT PROCEDURE

The CRL5A Pressure Relief Control can be adjusted to provide relief setting at any pressure within the range found on nameplate. Provision should be made for pressure gauge at CRL5A sensing point.

Pressure adjustment is made by first loosening jam nut (10) and turning adjustment screw (9) to vary spring pressure on diaphragm. Turning adjustment screw clockwise increases pressure required to open control. Counterclockwise decreases pressure required to open control.

When pressure adjustments are complete tighten jam nut (10) and replace protective cap (1). If there is a problem of tampering, lock wire holes are provided in cap and cover. Wire cap to cover and secure with lead seal.

DISASSEMBLY

The CRL5A Pressure Relief Control does not need to be removed from pipeline for disassembly and service. Make sure that CRL5A system pressure is shut down and bleed off before beginning disassembly. If CRL5A is removed from pipeline for disassembly, be sure to use a soft jawed vise to hold body (7) during work.

Refer to Parts List Drawing for Item Numbers.

1. Remove cap (1), loosen jam nut (10) and turn adjusting screw (9) counterclockwise until spring tension is relieved.
2. Remove eight screws (4) holding cover (3), and powerunit (6) to body (7). Note orientation of powerunit sensing port and cover relative to control body for correct reassembly. Hold cover (3) and powerunit together, remove from body (7) and place on suitable work surface.
3. Remove cover (3) from powerunit (6). Remove spring (12) and two spring guides (11) from cover (3). Thinner spring guide should be on spring top.
4. Carefully unthread upper diaphragm washer (15) from stem (19) and remove. Remove diaphragm (16), lower diaphragm washer (17), and upper stem O-ring (5).
5. Pull stem (19) with lower disc assembly attached through bottom of powerunit.
6. Unscrew and carefully remove large hex disc retainer (21) and remove disc assembly (23) from bottom of stem. Use soft jaw pliers or vise to hold stem. The polished surface of stem must not be scored or scratched, because o-ring leaks will occur.
7. The seat (22) need not be removed unless it is damaged. If removal is necessary use proper size socket wrench and turn counterclockwise. NOTE: some models have integral seat in body.

INSPECTION

Inspect all parts for damage, or evidence of cross threading or leaking. Check all rubber parts for tears, abrasions or other damage. Check all metal parts for damage, corrosion, or excessive wear.

REPAIR AND REPLACEMENT

Minor nicks and scratches on metal parts may be polished out using water and 400 grit (or finer) wet or dry sandpaper. CRL5A Repair kit p/n 20666E consists of all rubber parts should be installed. When ordering replacement metal parts or repair kits, be sure to include all nameplate data and to specify desired item description and item number.

Refer to Parts List for Item Numbers.

REASSEMBLY

In general, reassembly is reverse of disassembly steps. However, following steps should be followed.

1. Check that all parts are clean and in good condition before reassembly.
2. Before installing O-rings, lubricate them with waterproof grease (Dow Corning 44 medium grade or equal).
3. Use grease very sparingly and install stem seal O-ring (18) in powerunit (6).
4. Use soft jaw pliers or vise to hold stem (19) with large bottom end facing up. Place disc assembly (23) with rubber facing up, on stem bottom. Thread large hex disc retainer (21) onto stem (19) to hold disc assembly (23) in place. Tighten large hex disc retainer (21) until snug and rubber disc (23) remains flat. Do not overtighten.
5. Use grease very sparingly and install upper stem O-ring (5) on stem. Install stem (19) from below through powerunit. Use a rotating motion with slight pressure to let stem pass through O-ring without damage. Do not cut O-ring with stem.
6. With stem (19) all the way up, place lower diaphragm washer (17) on stem with serrated side up. Place diaphragm (16) on stem, then upper diaphragm washer (15). Tighten upper diaphragm washer (15) onto stem (19) until snug.
7. Position powerunit (6) with stem assembly on body (7). Locate powerunit (6) sensing port as shown on parts list drawing.
8. Continue reassembly in reverse of disassembly steps 1, 2, and 3.

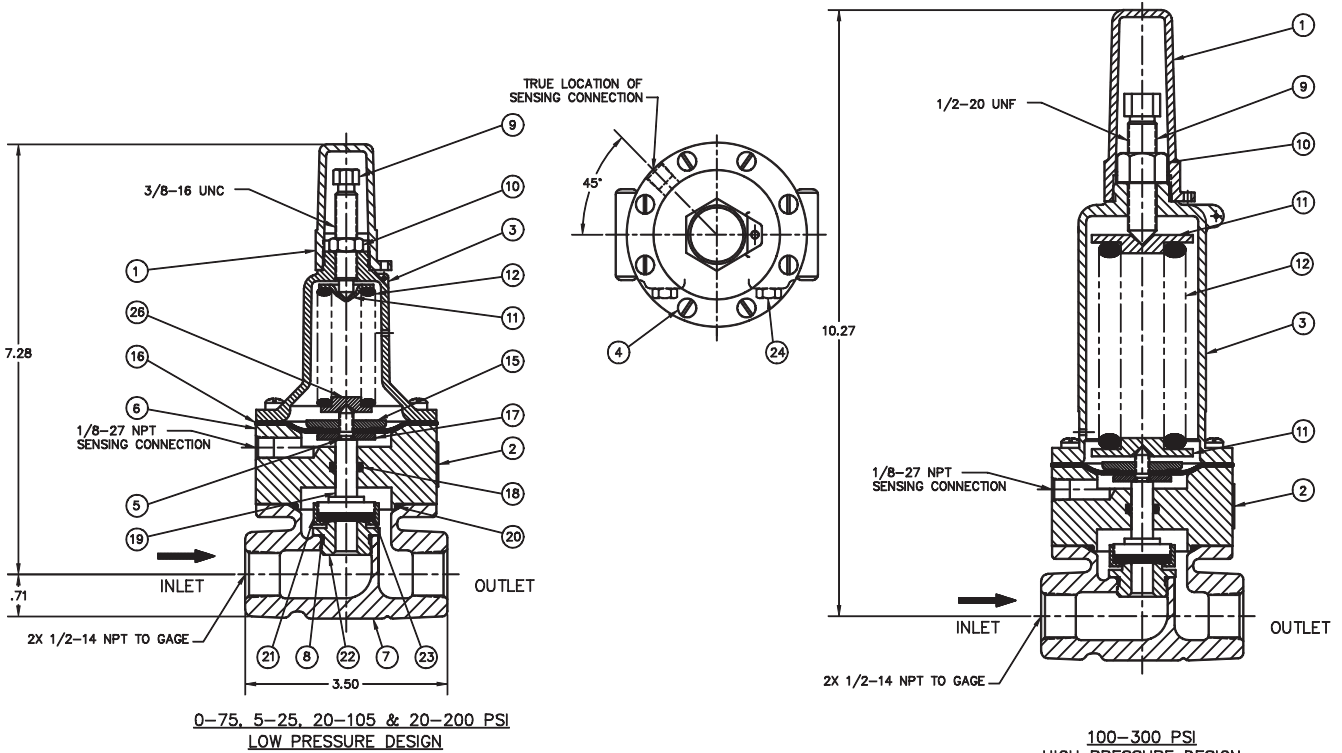
Note: Before 1985, high-pressure design CRL5A controls used different spring and spring guides that created a pre-load on assembly. During disassembly, four regular screws were removed first. Then four longer screws were used to "push" assembly apart. During reassembly, four longer screws were used to "pull" assembly together. Then remaining four regular screws were installed. Now with new spring and spring guides, eight regular screws (4) are used and control does not have pre-load to overcome.

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.



CRL5A

PRESSURE RELIEF CONTROL



CRL5A Range PSI	Approximate Increase for Each Clockwise Turn of Adjusting Screw (Item No. 9)
0 - 75	8.5 PSI
5 - 25	4.0 PSI
20 - 105	13.0 PSI
20 - 200	28.0 PSI
100 - 300	19.0 PSI



Item No.	Description	Qty			
			15	Washer, Diaphragm, Upper (Threaded Hole)	1
1	Cap	1	16	Diaphragm	1
2	Nameplate	1	17	Washer, Diaphragm, Lower	1
3	Cover	1	18	O-Ring (Stem Seal)	1
4	Screw, Fil HD	8	19	Stem	1
5	O-Ring (Stem, Upper)	1	20	O-Ring (Body)	1
6	Body, Powerunit	1	21	Retainer, Disc (Hex)	1
7	Body	1	22	Seat	1
8	O-Ring (Seat)	1	23	Disc Assembly	1
9	Screw, Adjusting	1	24	Plug, Pipe	2
10	Nut, Jam	1	26	Guide, Spring, Lower (For Low Pressure Design Only)	1
11	Guide, Spring	A/R		Repair Kit # 20666E includes:	
12	Spring	1		(Buna-N®, Diaphragm, Disc Assembly, O-rings)	



— MODEL — 700 Series

Capacity Information

Valve Sizing Coefficient - C_v

A very useful expression often used in determining the head loss and/or flow rate capacity of control valves is the C_v factor. Commonly referred to as the flow coefficient or valve sizing coefficient, this empirically determined factor describes the flow capacity of a valve.

The C_v factor is defined as the number of U.S. gallons per minute of water (at 60°F flowing temperature) discharged through a flow restriction with a head loss of one psi. In the case of a control valve, the C_v value is normally stated for the valve in the fully open position. For conditions other than full open, (i.e. modulating valves), contact Cla-Val Technical Services.

Cla-Val 700 Series Valves - Full Open C_v Factors

Valve Size	2"	3"	4"	6"	8"	10"	12"
Cv Factor	48	84	128	451	764	1443	2048

Liquid Flow Equation

The basic flow to pressure drop relationship for liquid service is expressed by the formula:

$$Q = C_v \sqrt{\frac{P}{G}} \quad \text{or} \quad Q = C_v \sqrt{P} \times \sqrt{\frac{1}{G}}$$

- Where:
- Q = Flow rate in U.S. gallons per minute (GPM).
 - C_v = Valve sizing coefficient.
 - P = Head loss across valve in psi.
 - G = Specific gravity of liquid at flowing temperature referred to water (1.0) at standard conditions (60°F).

However, the above stated relationship only remains valid if the flowing conditions are both turbulent (non-viscous) and non-cavitating. Fortunately, these conditions are the most common encountered in liquid flow applications. In those cases where viscous or cavitating ⁽¹⁾ flow conditions are possible, consult factory for guidance in selection of valve size.

Example:

Determine the maximum flow rate capability of a 4" Cla-Val Roll Seal valve in fresh water service with an upstream pressure of 90 psi and downstream pressure of 77 psi. From table, a 4" Cla-Val 700 Series valve has a full open C_v factor of 128; hence:

$$Q = 128 \sqrt{13} \times \text{or} \frac{1}{\sqrt{1}} = 128 (3.61) = 462 \text{ GPM}$$

(1) Note: For further information on cavitation, see technical data sheet "RS-Cavitation".

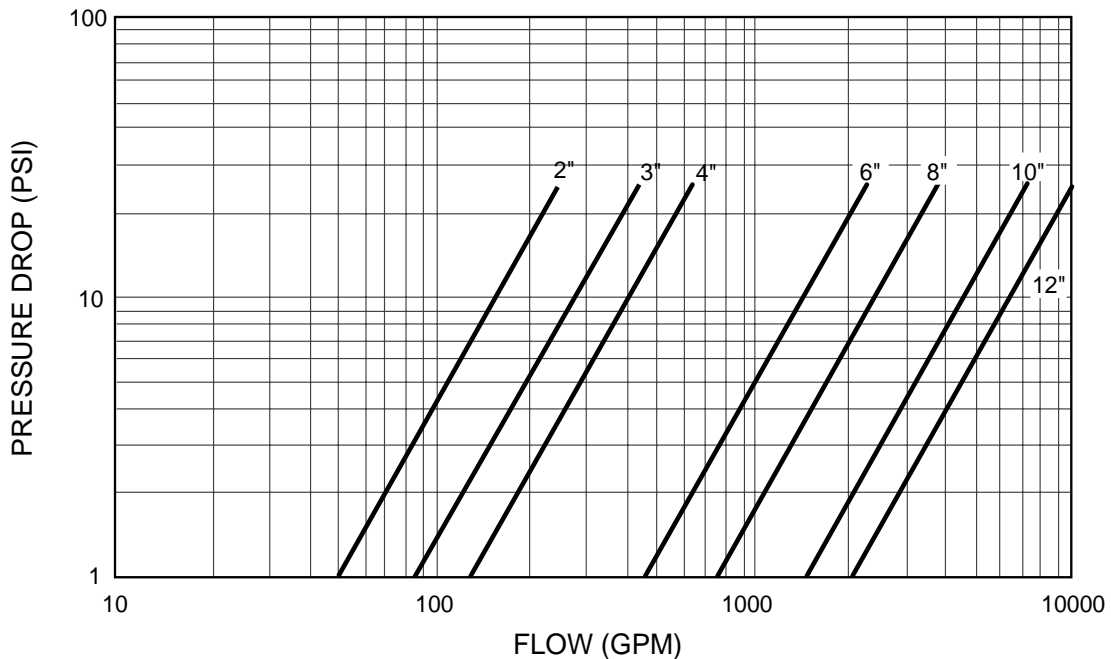


Specific Gravity Correction Table

Specific Gravity "G"	0.75	0.80	0.85	0.90	0.95	1.00	1.05	1.10	1.15	1.20	1.30	1.40
Correction Factor $\frac{1}{\sqrt{G}}$	1.15	1.12	1.08	1.05	1.03	1.00	0.98	0.95	0.93	0.91	0.88	0.85

To obtain flow capacity of a liquid other than water (specific gravity of 1.00), multiply water flow capacity obtained by the appropriate specific gravity correction factor.

2" THRU 12" ROLL SEAL FLOW CURVES STANDARD VERSION WITH LINER RETAINER (COVER TO ATMOSPHERE)



NOTE: The flow rate vs. head loss data presented here is based on a fully open valve condition. The maximum recommended velocity is 20 ft./sec.

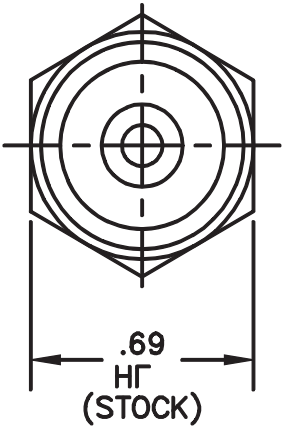
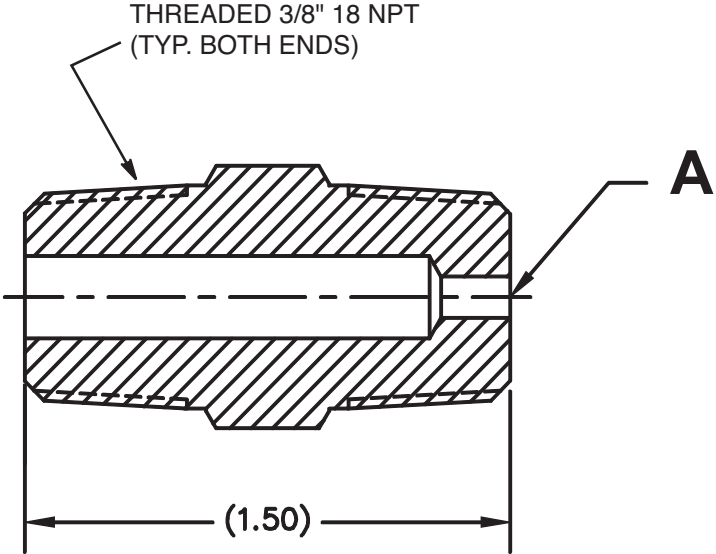
Maximum Continuous Flow (U.S. GPM)

Valve Size	2"	3"	4"	6"	8"	10"	12"
Maximum Continuous Flow	224	469	794	1787	3177	4964	7148



X58A

Restriction Pipe Fitting



When ordering parts, please specify:

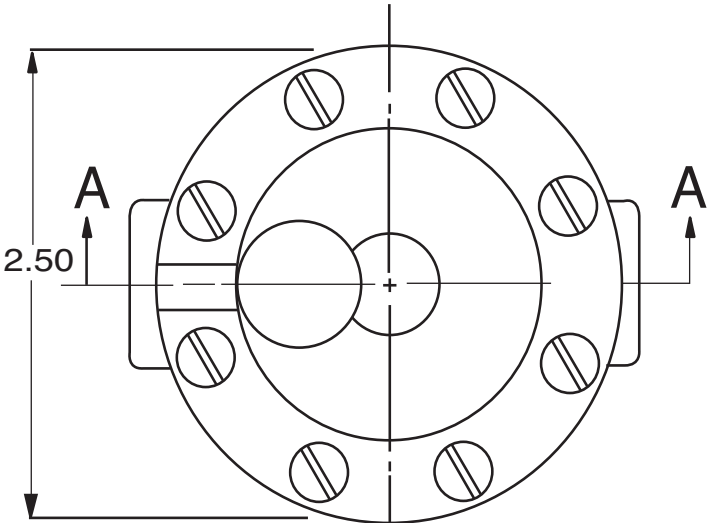
- All Nameplate Data
- Description
- Size

Part No.	Material	"A" Orifice Dia.
74894-07C	Brass	3/32" (.093)
74894-06E	303 SS	1/16" (.062)
74894-05G	Brass	1/16" (.062)
74894-04K	303 SS	1/8" (.125)
74894-03B	Brass	1/8" (.125)



81-01

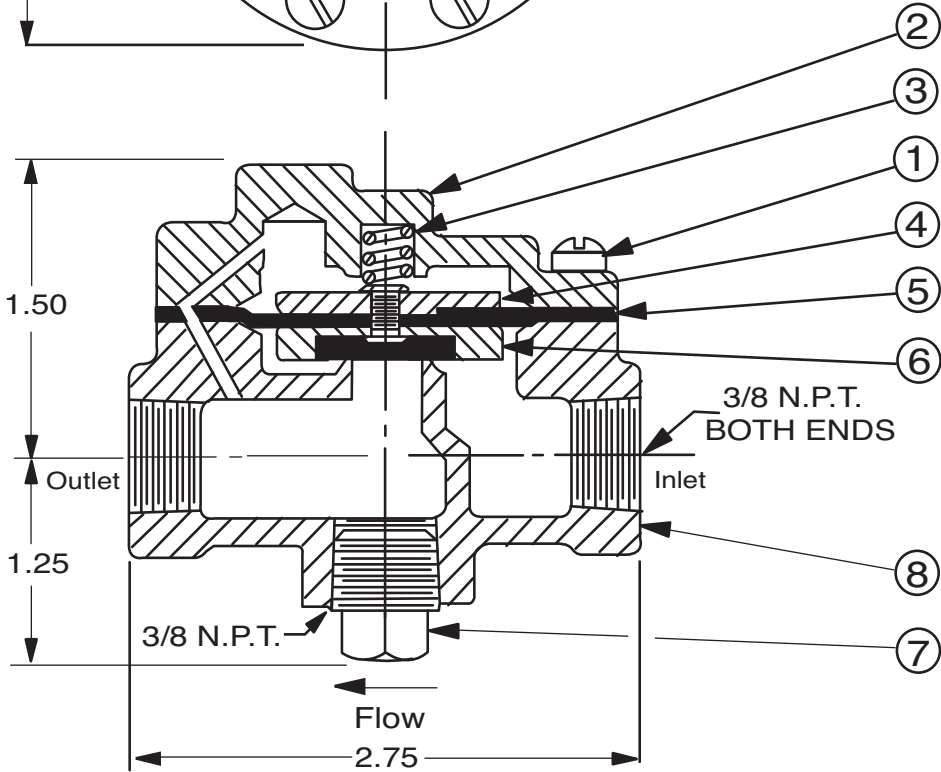
3/8" Check Valve



ITEM DESCRIPTION

1.	Cover Screw (8 Required)
2.	Cover
*3.	Spring
4.	Diaphragm Washer
*5.	Diaphragm
*6.	Disc Retainer Assembly
7.	Body Plug (3/8 NPT)
8.	Body (Threaded)

*Recommended Spare Parts



SECTION AA

When ordering parts, please specify:

- All nameplate data
- Description
- Part Number
- Item Number
- Material



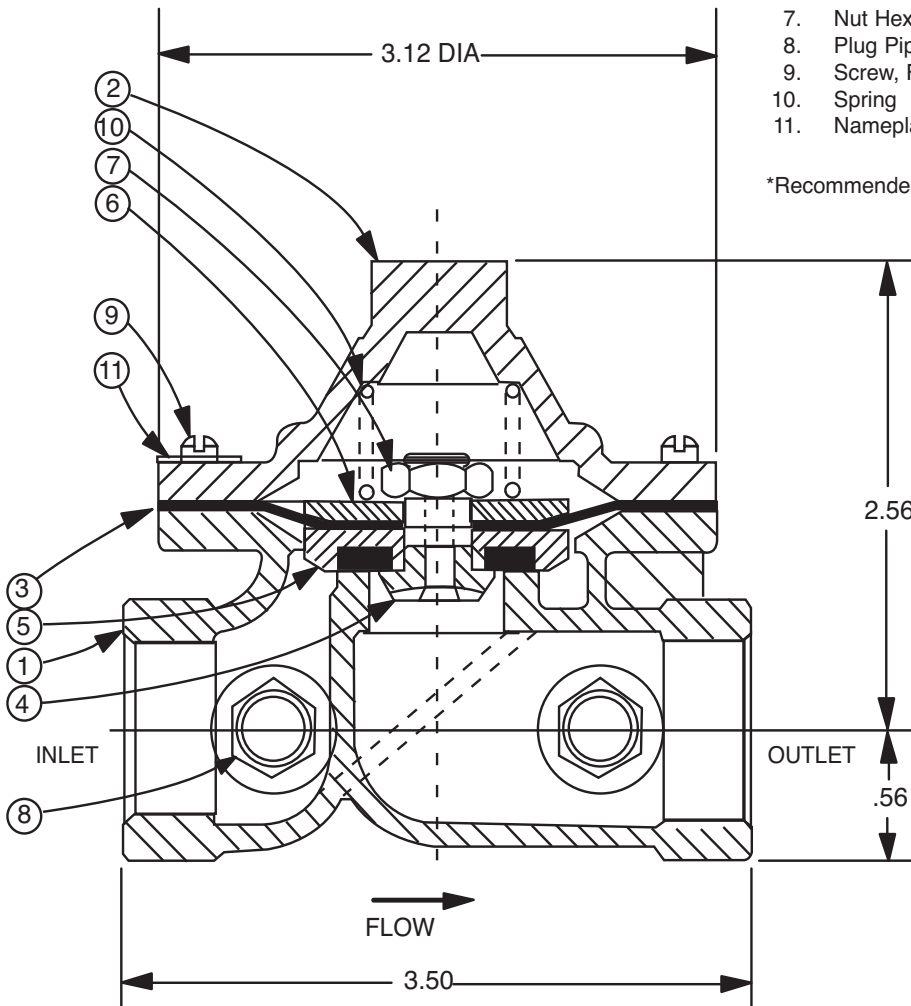
81-01

1/2" & 3/4 Check Valve

ITEM DESCRIPTION

1.	Body	1
2.	Cover	1
*3.	Diaphragm	1
4.	Guide Disc	1
*5.	Disc Retainer Assembly	1
7.	Nut Hex 3/8 - 24UNF 28	1
8.	Plug Pipe Hex NPT	2
9.	Screw, Fil HD 10 32UNF 2 x 2LG	8
10.	Spring	1
11.	Nameplate	1

*Recommended Spare Parts



When ordering parts, please specify:

- All nameplate data
- Description
- Part Number
- Item Number
- Material



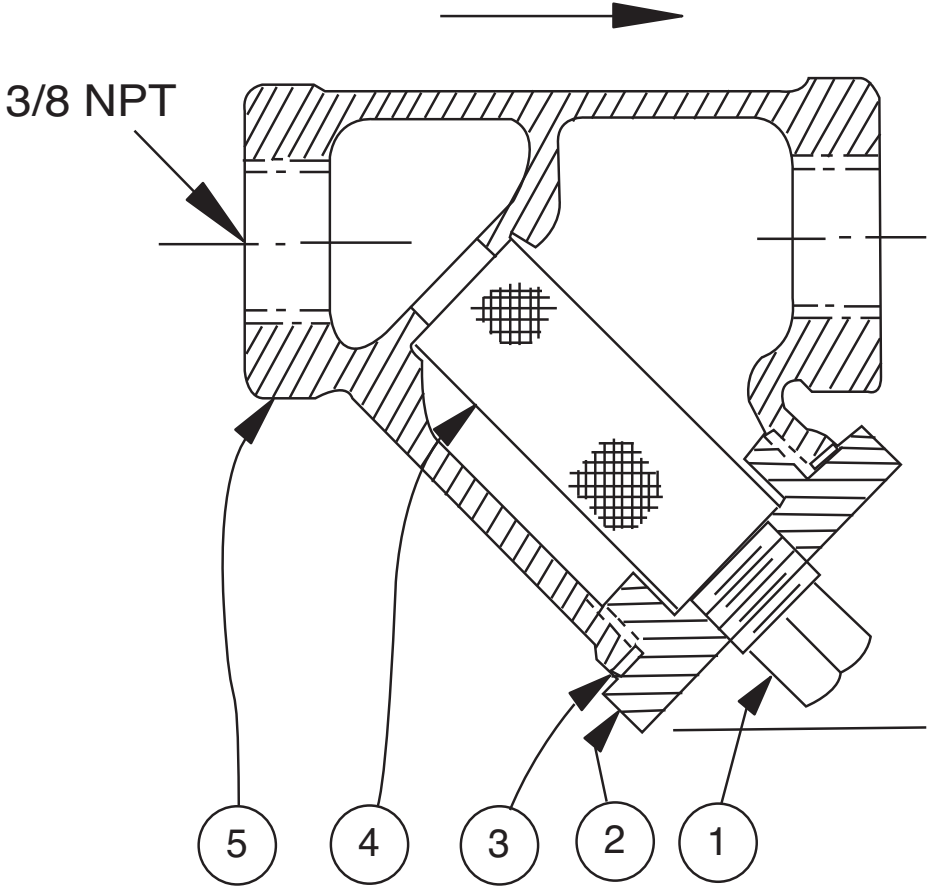
X43 Strainer

ITEM	DESCRIPTION	MATERIAL
1	Pipe Plug	Steel
2	Strainer Plug	Brass
3	Gasket	Copper
4	Screen	SST
5	Body	Brass

No parts available. Replacement assembly only.

Standard 60 mesh pilot system strainer for fluid service.

Size	Stock Number
3/8 x 3/8	33450J

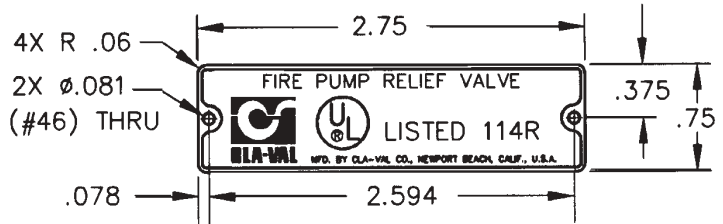


Proper Identification

For ordering repair kits, replacement parts, or for inquiries concerning valve operation it is important to properly identify Cla-Val products already in service. Include 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 Plate

For product identification, cast in body markings are supplemented by the identification plate illustrated on this page. The plate is mounted in the most practical position. **It is extremely important that this identification plate is not painted over, removed, or in any other way rendered illegible.**



Specify when ordering

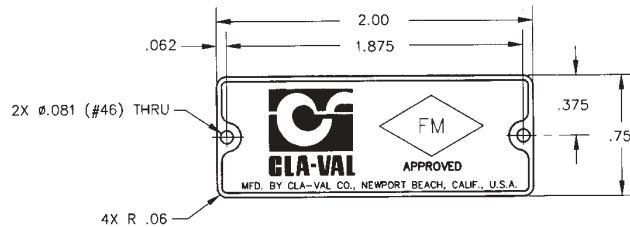
- Model Number
- Adjustment Range (As Applicable)
- Valve Size
- Optional Features
- Pressure Class

How To Order

There are many valves and controls manufactured by Cla-Val that are not listed due to the sheer volume. For information not listed, please contact your local Cla-Val representative.

Unless Otherwise Specified

- X43 "Y" Strainer is included.
- CK2 Isolation Valves is included in price on 6" and larger valve sizes.



Limited Warranty

Automatic valves and controls as manufactured by Cla-Val are warranted for one year from date of shipment against manufacturing defects in material and workmanship which develop in the service for which they are designed, provided the products are installed and used in accordance with all applicable instructions and limitations issued by Cla-Val.

We will repair or replace defective material, free of charge, which is returned to our factory, transportation charges prepaid, provided that, after inspection, the material is found to have been defective at time of shipment. This warranty is expressly conditioned on the purchaser's giving Cla-Val immediate written notice upon discovery of the defect.

Components used by Cla-Val but manufactured by others, are warranted only to the extent of that manufacturer's guarantee.

This warranty shall not apply if the product has been altered or repaired by others, and Cla-Val shall make no allowance or credit for such repairs or alterations unless authorized in writing by Cla-Val.

Terms Of Sale

ACCEPTANCE OF ORDERS

All orders are subject to acceptance by our main office at Newport Beach, California.

CREDIT TERMS

Credit terms are net thirty (30) days from date of invoice.

PURCHASE ORDER FORMS

Orders submitted on customer's own purchase order forms will be accepted only with the express understanding that no statements, clauses, or conditions contained in said order form will be binding on the Seller if the buyer in any way modify the Seller's own terms and conditions of sales.

PRODUCT CHANGES

The right is reserved to make changes in pattern, design or materials when deemed necessary, without prior notice.

PRICES

All prices are F.O.B. Newport Beach, California, unless expressly stated otherwise on our acknowledgement of the order. Prices are subject to change without notice. The prices at which an order is accepted are subject to adjustment to the Seller's price in effect at the time of shipment. Prices do not include sales, excise, municipal, state or any other Government taxes. Minimum order charge \$75.00.

RESPONSIBILITY

We will not be responsible for delays resulting from strikes, accidents, negligence of carriers, or other causes beyond our control. Also, we will not be liable for any unauthorized product alterations or charges accruing there from.

Disclaimer Of Warranties And Limitations Of Liability

The foregoing warranty is exclusive and in lieu of all other warranties and representations, whether expressed, implied, oral or written, including but not limited to any implied warranties or merchantability or fitness for a particular purpose. All such other warranties and representations are hereby cancelled.

Cla-Val shall not be liable for any incidental or consequential loss, damage or expense arising directly or indirectly from the use of the product. Cla-Val shall not be liable for any damages or charges for labor or expense in making repairs or adjustments to the product. Cla-Val shall not be liable for any damages or charges sustained in the adaptation or use of its engineering data and services. No representative of Cla-Val may change any of the foregoing or assume any additional liability or responsibility in connection with the product. The liability of Cla-Val is limited to material replacements F.O.B. Newport Beach, California.

Risk

All goods are shipped at the risk of the purchaser after they have been delivered by us to the carrier. Claims for error, shortages, etc., must be made upon receipt of goods.

EXPORT SHIPMENTS

Export shipments are subject to an additional charge for export packing.

RETURNED GOODS

1. Customers must obtain written approval from Cla-Val prior to returning any material.
2. Cla-Val reserves the right to refuse the return of any products.
3. Products more than six (6) months old cannot be returned for credit.
4. Specially produced, non-standard models cannot be returned for credit.
5. Rubber goods cannot be returned for credit, unless as part of an unopened repair kit which is less than six months old.
6. Goods authorized for return are subject to a 35% (\$75 minimum) restocking charge and a service charge for inspection, reconditioning, replacement of rubber parts, retesting and repackaging as required.
7. Authorized returned goods must be packaged and shipped prepaid to Cla-Val., 1701 Placentia Avenue, Costa Mesa, California 92627-4475.



750B-4KG1 Repair Kits

The Cla-Val 700 Series valve repair kit for the 750B-4KG1 is the only recommended spare part. The valve series is highly reliable due to fewer parts to create problems.

Valve repair kits are recommended over individual liner sales. Kits offer all essentials for easy installation to include: liner, lubricant, liner retainer hardware, and instructions.

REPAIR KIT PART NUMBERS:

	2"	3"	4"	6"	8"	10"	12"
Natural Rubber 65 Durometer	R2001501A	R2001502A	R2001503J	R2001504G	R2001505A	R2001506A	R2001507K
EPDM 70 Durometer	R2002201J	R2002202G	R2002203E	R2002204C	R2002205K	R2002206H	R2002207F
Nitrile 70 Durometer	R2002301G	R2002302E	R2002303C	R2002304A	R2002305H	R20012306F	R2002307D
Silicone 70 Durometer	R2001401F	R2001402D	R2001403B	R2001404K	R2001405G	R2001406E	R2001407C
Viton 70 Durometer	R2002101A	R2002102J	R22002103G	R2002104E	R2002105A	R2002106K	R2002107H

LINER PART NUMBERS:

	2"	3"	4"	6"	8"	10"	12"
Natural Rubber 65 Durometer	R940001	R940101	R940201	R940301	R940401	R940501	R940601
EPDM 70 Durometer	R940006	R940106	R940206	R940306	R940406	R940506	R940606
Nitrile 70 Durometer	R940007	R940107	R940207	R940307	R940407	R940507	R940607
Silicone 70 Durometer	R940003	R940103	R940203	R940303	R940403	R940503	R940603
Viton 70 Durometer	R940005	R940105	R940205	R940305	R940405	R940505	R940605

REPAIR KIT PART NUMBERS: (FOR UL LISTED 750B-4KG1 VALVE ASSEMBLY

	3"	4"	6"	8"	10"
Nitrile 70 Durometer	R2002302E	R2002303C	R2002304A	R2002305H	R20012306F

LINER PART NUMBERS: (FOR UL LISTED 750B-4KG1 VALVE ASSEMBLY

Nitrile 70 Durometer	R940107	R940207	R940307	R940407	R940507
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**When ordering, please give complete nameplate data of the valve and/or control being repaired.
MINIMUM ORDER CHARGE APPLIES.**