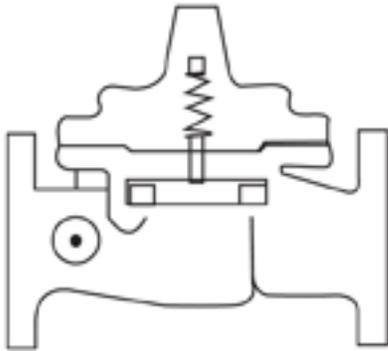

CLA-VAL

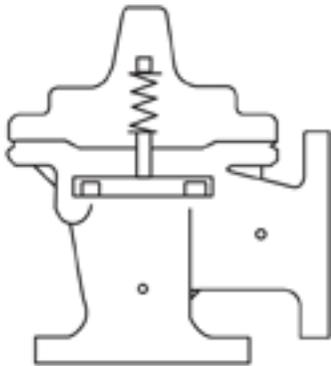
AUTOMATIC CONTROL VALVES

750B-4KG1

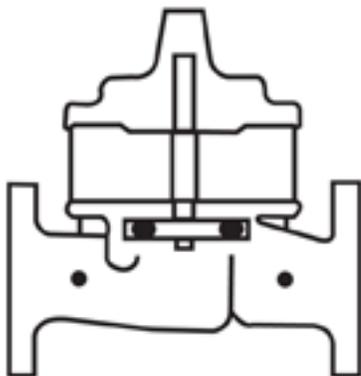
Place this manual with personal responsible
for maintenance of this valve



INSTALLATION



OPERATION



MAINTENANCE

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CVCL 1 ② 3 4

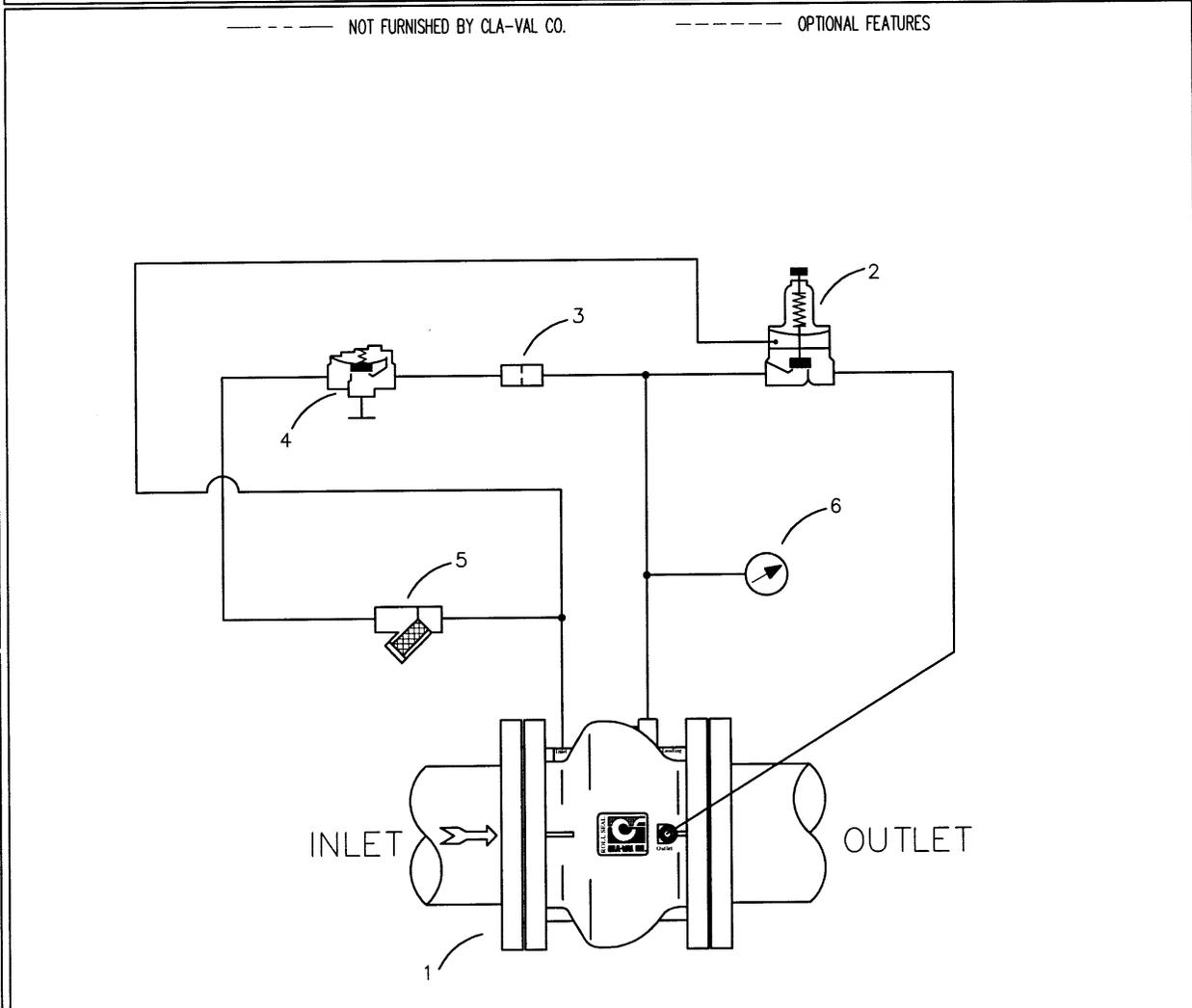
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SHEET 1 OF 2

 CLA-VAL CO. NEWPORT BEACH, CALIFORNIA	CATALOG NO.	DRAWING NO.	REV
	750B-4KG1	29868	C
TYPE OF VALVE AND MAIN FEATURES		DESIGN	
FIRE PUMP RELIEF VALVE (UL AND FM LISTED)		DRAW	EK 07-07-98
		CHK'D	CH 07-07-98
		APVD	BF 07-07-98

AK	11-03-98		
AK	02-09-00	B	"Y" STRAINER (ECO 17412)
I.C.	02-13-04	C	ADDED "UL LISTED" (NED 44963)
			ADDED "FM LISTED" (ECO 19696)

LTR	CAD REVISION RECORD - DO NOT REVISE MANUALLY	
	DESCRIPTION	DATE
-	RELEASED FOR PRODUCTION. (NED 43426)	EK 7-7-98
A	REVISED HOOK-UP OF SENSING LINE FROM CRL TO BEFORE	



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

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CVCL 1 ② 3 4

DIST CODE 050

SHEET 2 OF 2

 CLA-VAL CO. NEWPORT BEACH, CALIFORNIA	CATALOG NO.	750B-4KG1	DRAWING NO.	29868	REV	C
	TYPE OF VALVE AND MAIN FEATURES			DESIGN		
	FIRE PUMP RELIEF VALVE (UL AND FM LISTED)			DRAW	EK	07-07-98
				CHK'D	CH	07-07-98
			APVD	BF	07-07-98	

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) CLOSES. THIS PRESSURIZES THE LOADING CHAMBER AND THE MAIN VALVE CLOSES. 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) CLOSES. 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	BY	DATE
	LTR	SEE SHEET 1

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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.

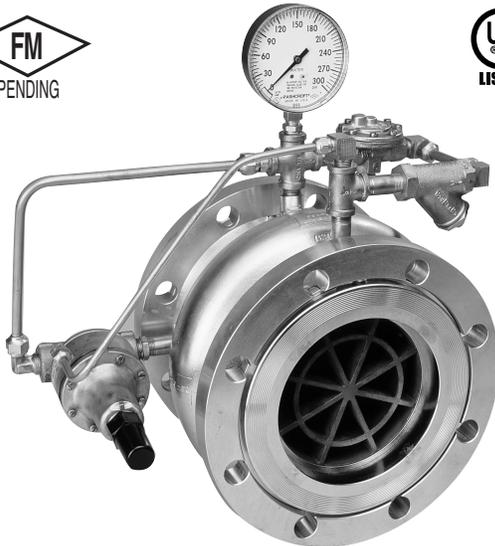
A capacity flow curve for Valve sizes 3" through 10" is included that shows the flow capacity in the full open valve condition.

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



— MODEL — **750B-4KG1**

Fire Protection Pressure Relief Valve



Description

The Cla-Val Model 750B-4KG1 Pressure Relief Valve is a hydraulically operated pilot actuated automatic control valve designed specifically to automatically relieve excess pressure in fire protection pumping systems. Pilot controlled, it maintains constant system pressure at the pump discharge within very close limits as demands change. The main valve consists of a stainless steel body and only one moving part, an elastomeric liner or control element.

Cla-Val Model 750B-4KG1 will control from no flow, to full open flow, without any chattering or slamming. For this reason, there is never a region of control instability. There is no slip-type friction because the valve has no bearings. Cla-Val Model 750B-4KG1 valves have excellent resistance to cavitation with a C_f factor of 0.9.

Pilot controls are fully piped at the factory and the Cla-Val Model 750B-4KG1 is shipped complete, ready for installation.

Operation Sequence

At pump start, the Cla-Val Pressure Relief Valve modulates to relieve excess pump capacity, maintaining positive system pressure at the pump discharge.

When fire demand slows or ceases, the main valve opens, diverting the entire pump output to discharge, allowing the fire pump to be stopped without causing surging in the lines.

(Please note that when the Model 750B-4KG1 is to be used on a continuous duty basis to maintain fire-system pressure, suitable back pressure must be provided on the valve to prevent cavitation damage. Consult the factory for details.)

Material Specification

Body:	316L Stainless Steel
Liner:	Nitrile, 70 durometer
Liner Retainer:	316 Stainless Steel

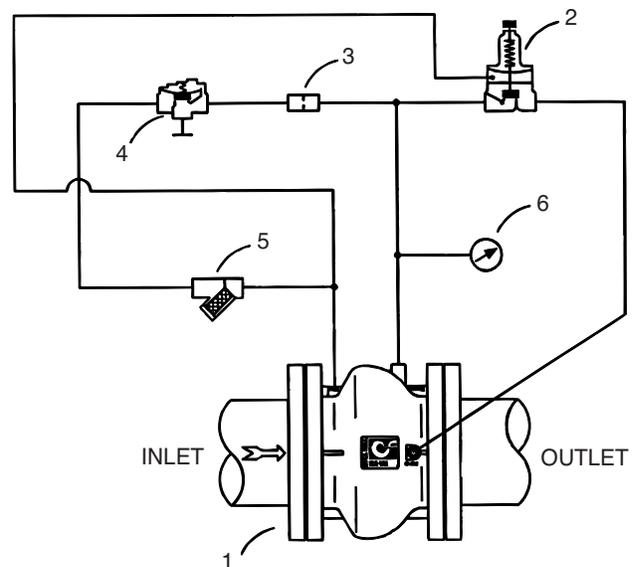
Pilot

Body:	ASTM B62 Bronze*
Spring Cover:	ASTM B62 Bronze*
Wetted Parts:	Bronze/Stainless Steel* Buna-N®

Accessories

Check Control:	Brass*
Control Piping:	Copper*
"Y" Strainer:	Bronze*
Control Fittings:	Brass*

* 316 stainless steel available



750B-4KG1 Basic Components

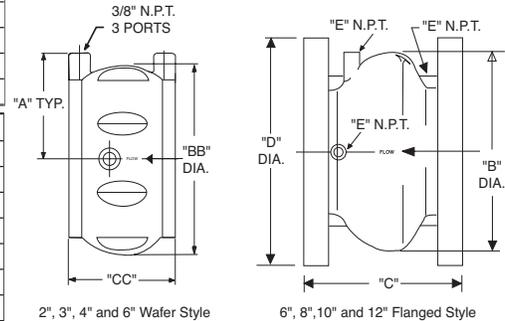
Item	Description
1	100-42 Roll Seal Main Valve
2	CRL5A Pressure Relief Control
3	X58A Restriction
4	81-01 Check Valve (125 psid max. reverse pressure)
5	X43 Y-Strainer
6	Pressure Gauge



Valve Size (Inches)	2	3	4	6	8	10	12
A	2½	3⅝	4⅞	5¼	--	--	--
B	--	--	--	10¼	14¾	18	21¾
BB	4¾	5¾	7¾	9⅝	--	--	--
C	--	--	--	9	11	13	15¼
CC	2½	3¼	4	5½	--	--	--
D (ANSI 150)	--	--	--	11	13½	16	19
D (ANSI 300)	--	--	--	12½	15	17½	20½
E (Ports) NPT	--	--	--	¾	¾	½	½
Approx. Wt. (150 lbs.)	4	7½	14	58	115	190	290
Approx. Wt. (300 lbs.)	4	7½	14	87	155	250	375
Max. Continuous Flow (gpm)	224	469	794	1787	3177	4964	7148

Valve Size (mm for ANSI)	50	80	100	150	200	250	300
A	73	90	105	133	--	--	--
B	--	--	--	276	356	457	549
BB	111	149	187	249	--	--	--
C	--	--	--	229	279	330	387
CC	64	83	102	140	--	--	--
D (ANSI 150)	--	--	--	279	343	406	483
D (ANSI 300)	--	--	--	318	381	445	521
E (Ports) NPT	--	--	--	¾	¾	½	½
Approx. kg. (150 lbs.)	1.81	3.63	6.35	30	54.43	89	151.5
Approx. kg. (150 lbs.)with Studs & Nuts	2.72	4.54	10	--	--	--	--
Approx. kg. (300 lbs.)	1.81	3.63	6.35	41.73	72.57	116.57	191
Approx. kg. (300 lbs.)with Studs & Nuts	5	6.35	11.8	--	--	--	--
Max. Continuous Flow (l/s.)	14	30	50	113	200	301	451

Dimensions (100-42 Main Valve)



Performance Specification

Capacity: See Technical Data Sheet
 Cf 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

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)

Maximum Relief Pressure: 3" thru 10" 150 lb. class - 200 psi
 3" thru 10" 300 lb. class - 300 psi

Approvals: **U.L. Listed.....Sizes 3" thru 10"**
FM Approved....Sizes 3" and 4"
Not UL or FM.... Sizes 2" and 12"

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

*Temperature range depends on liner material. Higher differential pressure ratings available.

When Ordering Please Specify

- Catalog No. 750B-4KG1
- Valve Size
- Fluid Being Handled
- Fluid Temperature Range
- Inlet Pressure Range
- Outlet Pressure Range
- Maximum Differential Pressure
- Minimum Differential Pressure
- Maximum Flow Rate
- Pilot Set Point

Purchase Specification

The Fire Pump Pressure Relief Valve shall modulate to relieve excess pressure in a fire protection system. It shall maintain constant pressure in the system regardless of demand changes. It shall be pilot controlled and back pressure shall not affect its set point. It shall be actuated by line pressure through a pilot control system and open fast in order to maintain steady system pressure as system demand decreases. It shall close gradually to control surges and shall re-seat drip-tight within 5% of its pressure setting. This valve shall be UL Listed and Factory Mutual approved. The control valve shall be constructed of a 316L stainless steel body and only one moving part, an elastomeric liner or control element. Minimum rangeability shall be 500:1 based on capacity at flowing pressure conditions. Cf shall be greater than or equal to 0.9. Valve and control system shall be similar in all respects to Cla-Val Model 750B-4KG1 as manufactured by Cla-Val, Newport Beach, California.



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INSTALLATION / OPERATION / MAINTENANCE

— SERIES — **100-42****700 Series Roll Seal****DESCRIPTION**

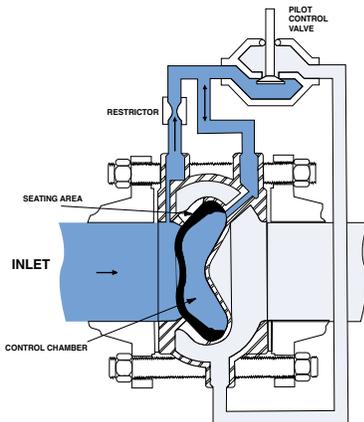
The Cla-Val Model 100-42 Roll Seal valve is a hydraulically operated valve used to control liquid flow by means of a flexible control element, the liner.

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.

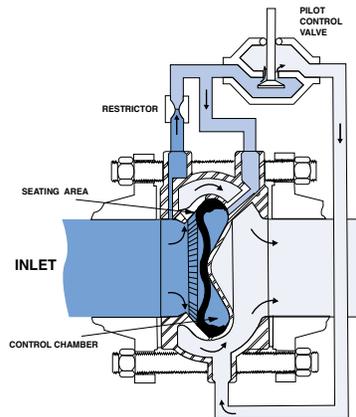
The valve is actuated by upstream pressure as the loading pressure (pressure supplied to the control chamber) is varied by an external pilot control system.

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.

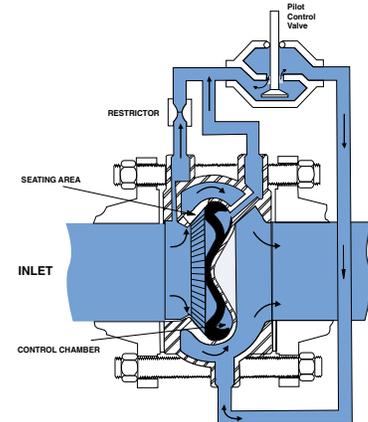
**PRINCIPLE OF OPERATION****Model 100-42 Valve
in Closed Position**

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**

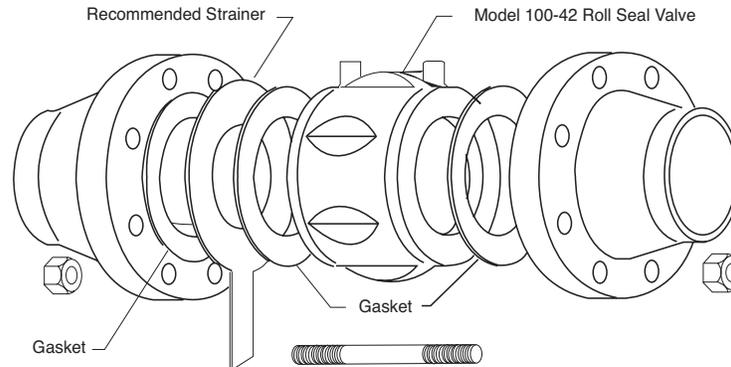
The valve is fully opened when loading pressure is sufficiently reduced to allow the liner to roll back completely and expose the full slot area. Restoring loading pressure reverses the liner rolling action to return the liner to the fully closed position.

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.

Liberaly 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



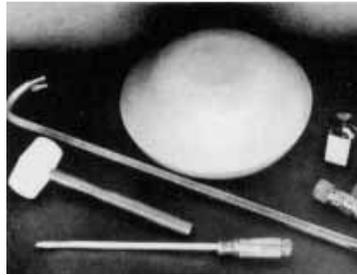
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Liner Installation 6", 8", 10", 12" sizes

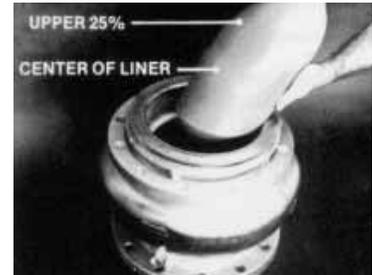
1. Tools required: Bottle of drugstore glycerine, 30" crowbar, double headed plastic hammer with 14" handle, rubber mallet and large flat blade screwdriver.
2. Liberally wipe glycerine on the inside of the valve and on the outer edge of the liner. Fold liner in half and insert into valve body.
3. Push 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.



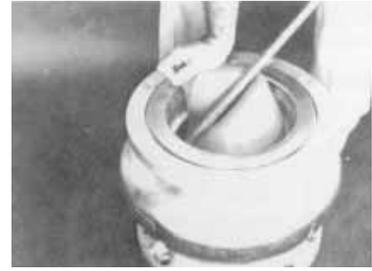
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2



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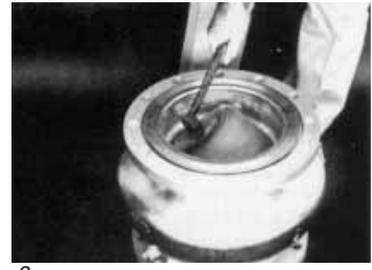
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6



7



8



9



10

PLACING VALVE INTO OPERATION

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.

Important Procedure for All Installations:

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.

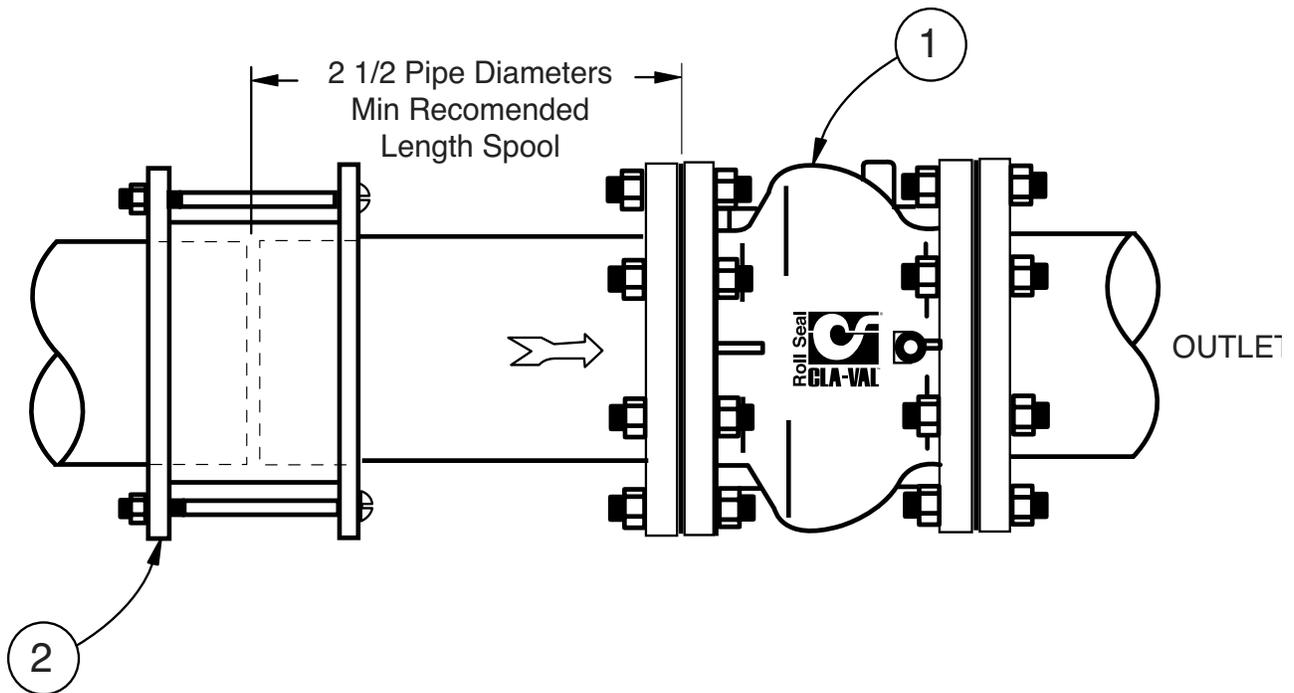
Due to the nature of intended use, the system being protected with the relief valve will most likely not be able to furnish the pressure source needed to establish the proper setpoint of the pilot control. Due to this fact, in most instances, the relief valve setting procedures will either have to be 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.

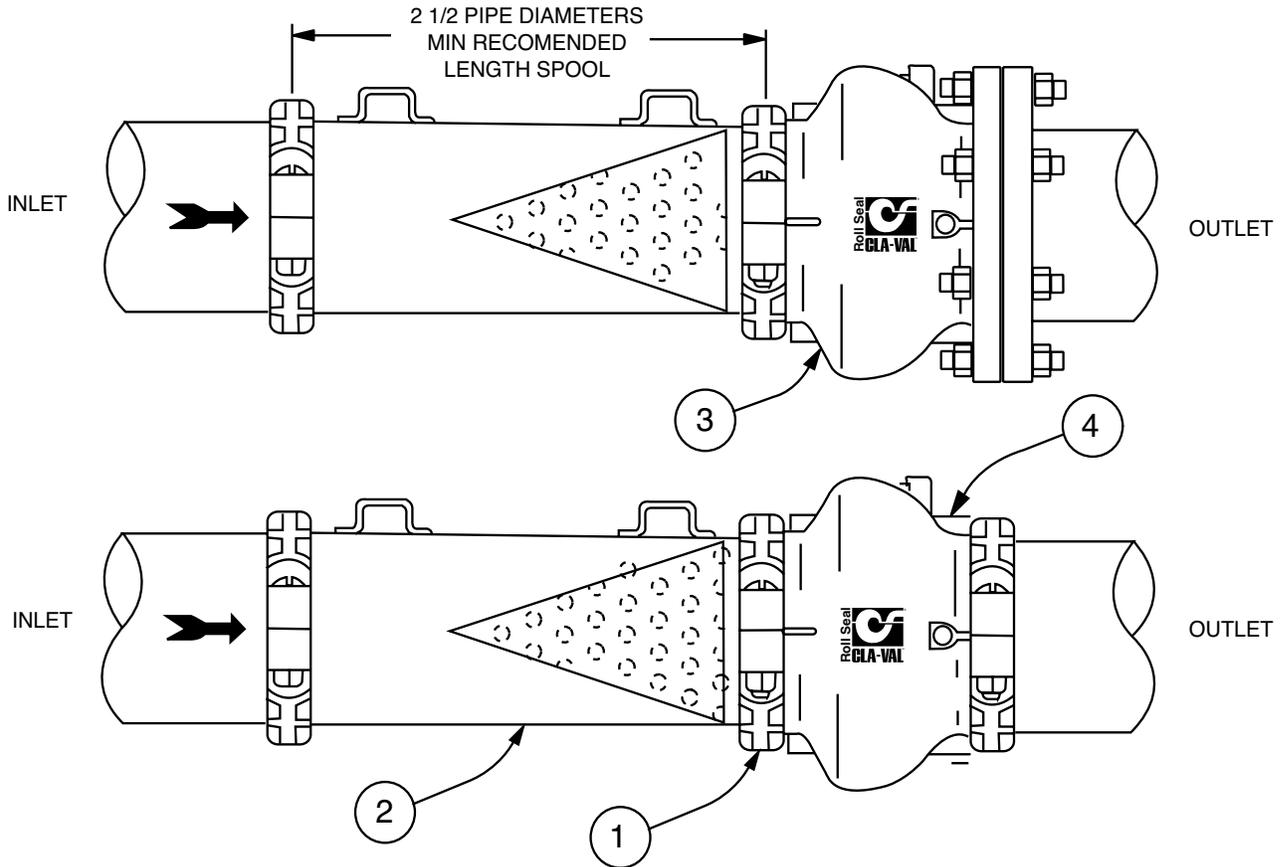
1. Close the upstream main line block valve first. Then close the downstream main line block valve.
2. Vent the **downstream** section to fully relieve pressure in the outlet section of the valve.
3. Vent the **upstream** section to fully relieve pressure in the inlet section and control chamber of the 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

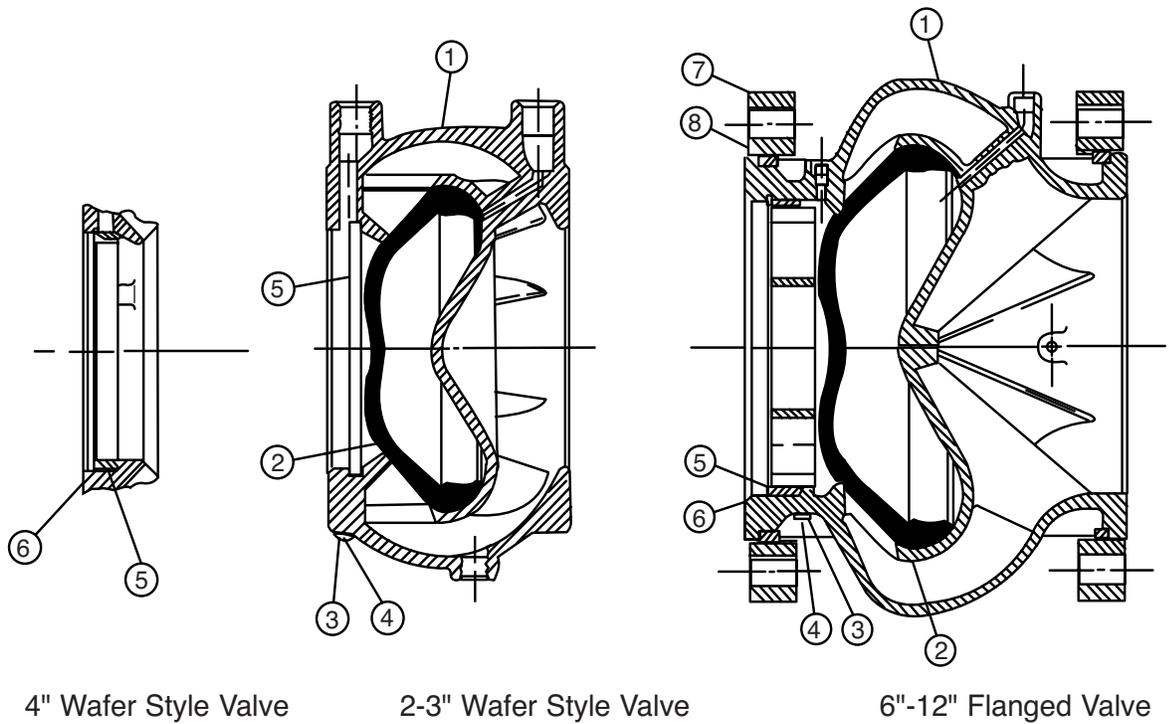
- 1 COUPLER FOR GROOVED PIPE
- 2 SPOOL STRAINER ASSEMBLY (WITH CONE)
- 3 100-42 MAIN VALVE, GROOVE X FLANGE
- 4 100-42 MAIN VALVE, GROOVE X GROOVE

**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	316L Stainless Steel
5	Liner Retainer	1	316L Stainless Steel
6	Retaining Ring	1	316L Stainless Steel
7	Slip-on Flange	2	Steel-Cad. PI.
8	Flange Retainer Ring	2	Steel-Cad. PI.

*Recommended Spare Part



4" Wafer Style Valve

2-3" Wafer Style Valve

6"-12" Flanged Valve

REV. NO. 90846

REV. 1

REV. J

REV. U

REV. V

REV. W

REV. X

REV.	DESCRIPTION	DATE	APPROVED
B	REVISED & REDRAWN	10-14-76	CH
C	REVISED ITEM NO'S 13 & 14, REVISED ITEM NO. 15	01-10-77	D.P.
D	SEE ECO 23820	03-16-78	CH
E	REMOVE NOTE 1 & ITEM NO 25 FROM FACE OF DWG & DELETED ITEM NO. 25 FROM PARTS LIST	01-11-85	G.N.
F	ON VALVES SPEC. CHART (100-300 PSI) 18.0 PSI WAS 18.0 PSI AND CHANGED CONFIGURATION OF ADJUSTING SCREW, SPRING & SPRING GUIDE ON 100-300 PSI DESIGN (ECO 7693)	11-26-85	G.N.
G	CORRECTED LOCATION OF ITEM 12, WAS POINTING TO THE LEFT	10-24-88	JH
H	ADDED "RECOMMENDED SPARE PARTS" (M&M 49378)	03-16-05	PWC
J	REDRAWN ON CAD (ECO 20320)	11-3-05	AK

CRL5A RANGE	APPROXIMATE INCREASE FOR EACH CLOCKWISE TURN OF ADJUSTING SCREW, ITEM NO. 9
0-75	8.5 PSI
5-25	4.0 PSI
20-200	28.0 PSI
100-300	19.0 PSI

RECOMMENDED SPARE PARTS

- 26 GUIDE SPRING, LOWER (FOR LOW PRESSURE DESIGN ONLY)
- 25 SCREW-FIL-HB-10-32-2-14G-140-390-F5H-6NLY
- 24 PLUG, PIPE
- 23 DISC ASSEMBLY
- 22 SEAT
- 21 RETAINER, DISC
- 20 O-RING
- 19 STEM
- 18 WASHER, DIAPHRAGM, LOWER
- 17 DIAPHRAGM
- 16 DIAPHRAGM, UPPER
- 15 WASHER, DIAPHRAGM, UPPER
- 14
- 13 SPRING
- 12 GUIDE, SPRING
- 11 NUT, JAM
- 10 SCREW, ADJUSTING
- 9 BODY
- 8 BODY, POWERUNIT
- 5 O-RING
- 4 SCREW, FIL. HD 10-32 X 1.88 LG
- 3 COVER
- 2 NAMEPLATE
- 1 CAP

CONTRACT NO.	DATE	APPROVALS	DATE
	10-14-76	CH	
	10-19-76	MF	
	10-19-76	J.A.S.	
		EXP.	

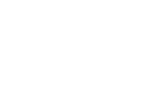
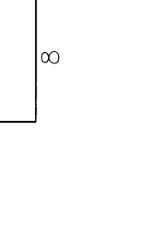
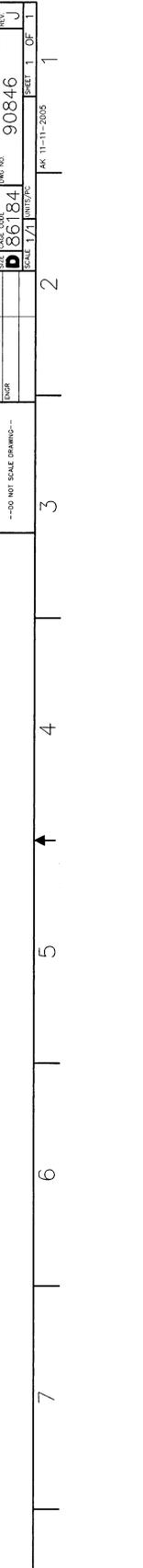
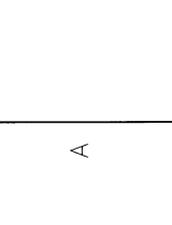
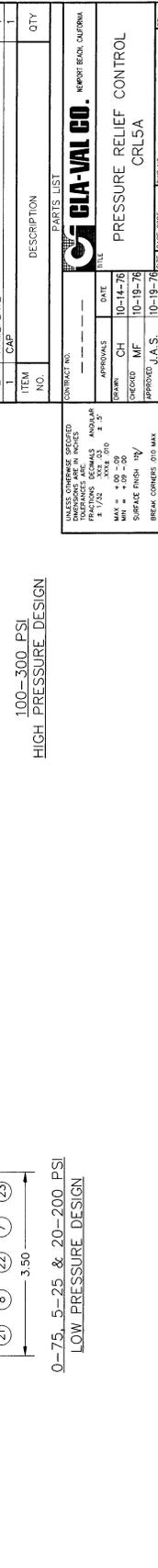
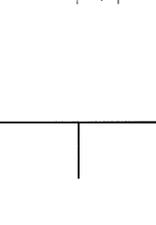
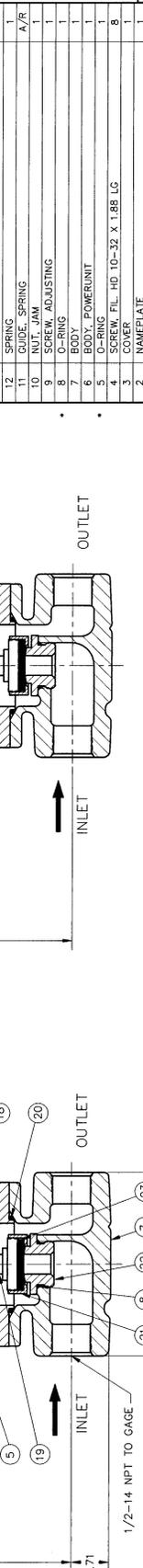
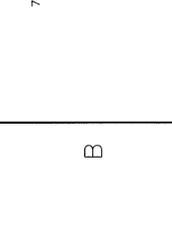
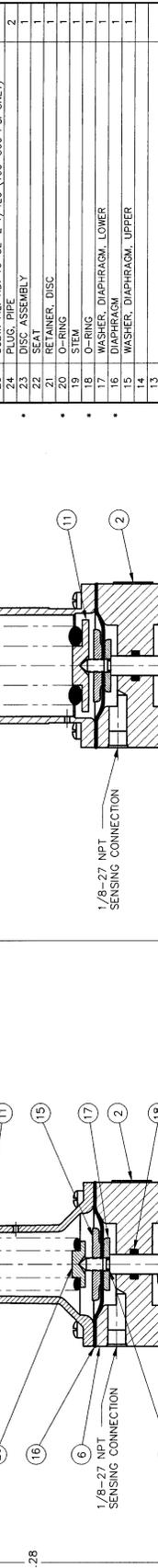
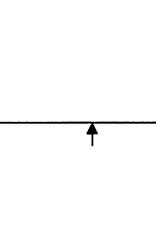
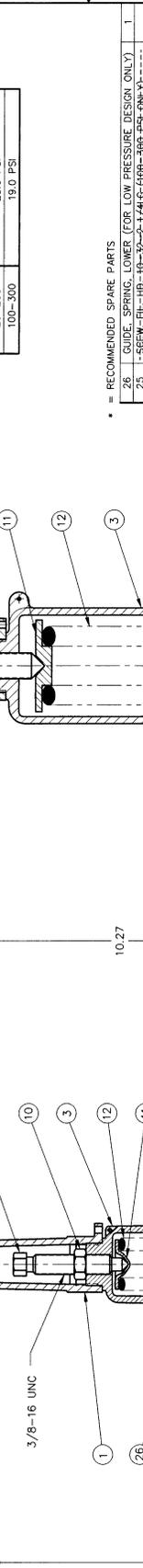
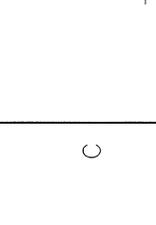
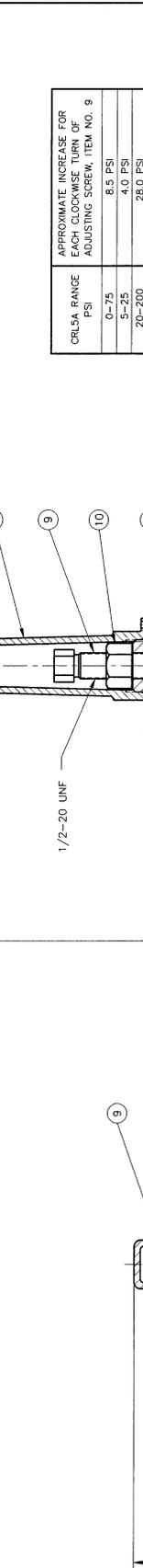
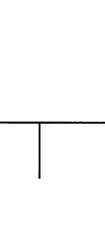
ITEM NO.	DESCRIPTION	QTY.
1	CAP	1
2	NAMEPLATE	1
3	COVER	1
4	SCREW, FIL. HD 10-32 X 1.88 LG	8
5	O-RING	1
6	BODY, POWERUNIT	1
7	BODY	1
8	BODY, POWERUNIT	1
9	SCREW, ADJUSTING	1
10	NUT, JAM	1
11	GUIDE, SPRING	1
12	GUIDE, SPRING	1
13	SPRING	1
14		1
15	WASHER, DIAPHRAGM, UPPER	1
16	DIAPHRAGM	1
17	DIAPHRAGM	1
18	WASHER, DIAPHRAGM, LOWER	1
19	STEM	1
20	O-RING	1
21	RETAINER, DISC	1
22	SEAT	1
23	DISC ASSEMBLY	1
24	PLUG, PIPE	1
25	SCREW-FIL-HB-10-32-2-14G-140-390-F5H-6NLY	1
26	GUIDE SPRING, LOWER (FOR LOW PRESSURE DESIGN ONLY)	1

DATE	APPROVALS	DATE
10-14-76	CH	
10-19-76	MF	
10-19-76	J.A.S.	
	EXP.	

DATE	APPROVALS	DATE
10-14-76	CH	
10-19-76	MF	
10-19-76	J.A.S.	
	EXP.	

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10-14-76	CH	
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	EXP.	

DATE	APPROVALS	DATE
10-14-76	CH	
10-19-76	MF	
10-19-76	J.A.S.	
	EXP.	





— 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"
C_v 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:

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

- Where:
- Q = Flow rate in U.S. gallons per minute (GPM).
 - C_v = Valve sizing coefficient.
 - ΔP = 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:

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

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

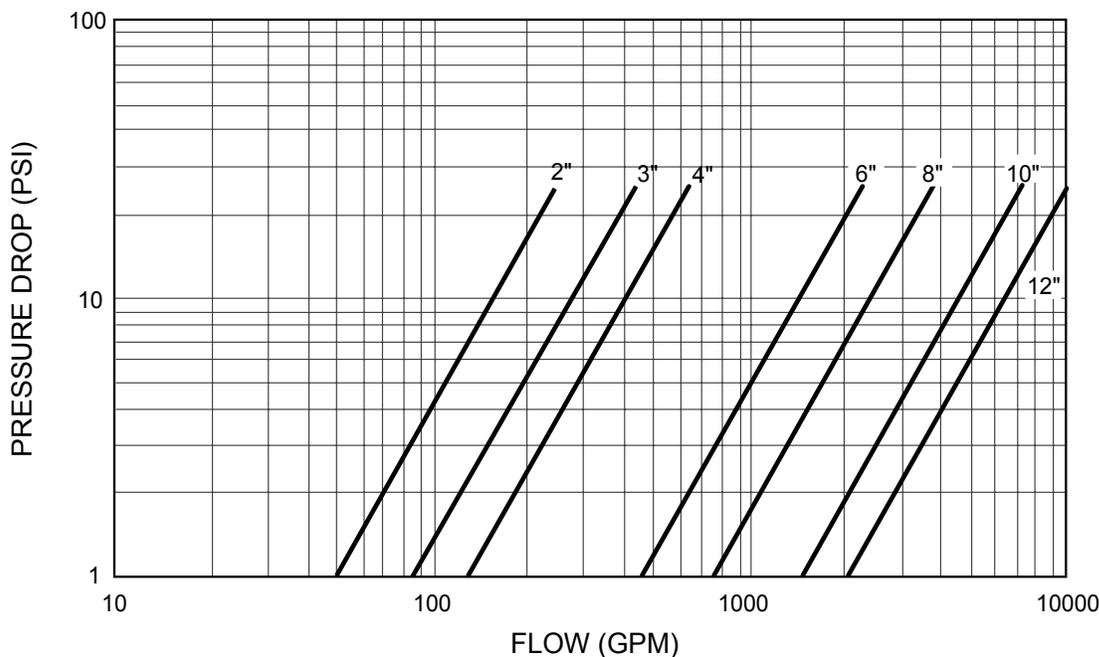


Specific Gravity Correction Table

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

PARTS LIST



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	PSI 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.

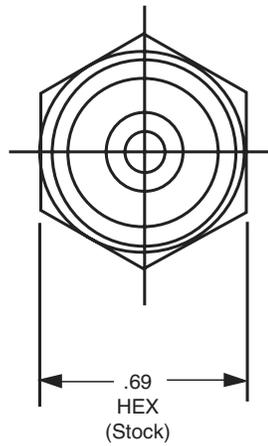
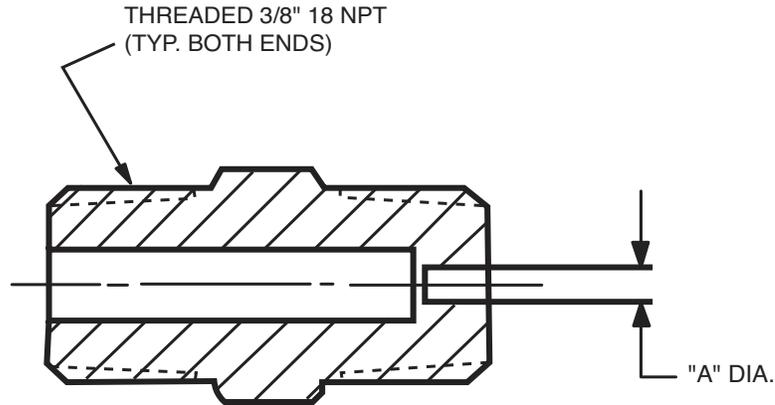
*This drawing is the property of CLA-VAL and same and copies made thereof, if any, shall be returned to it upon demand. Delivery and disclosure hereof are made solely upon condition that the same shall not be used, copied or reproduced, nor shall the subject here of be disclosed in any manner to anyone for any purpose, except as herein authorized, without prior approval of CLA-VAL. Whether or not the equipment or information shown hereon is patented or otherwise protected, full title and copy rights if any, in and to this drawing and/or information delivered or submitted are fully reserved by CLA-VAL.



PARTS LIST

X58A

Restriction Pipe Fitting



When ordering parts, please specify:

- All Nameplate Data
- Description
- Size

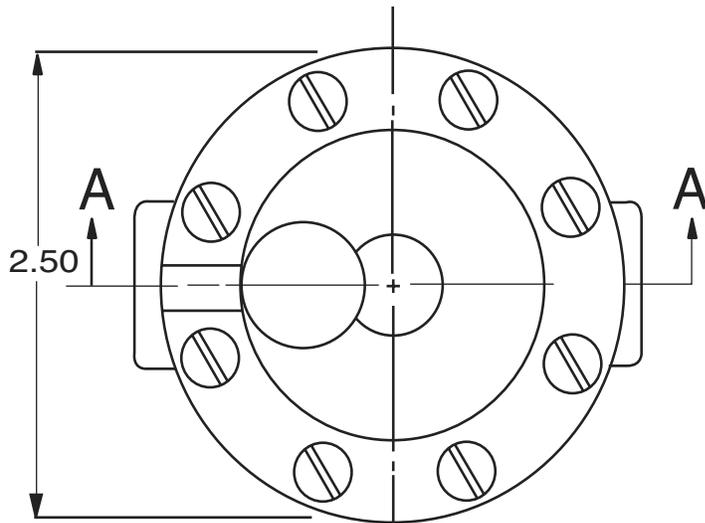
Part No.	Material	"A" Orifice Dia.
74894-07C	Brass	3/32" (.093)
74894-06E	303 SS	1/16" (.062)
74894-05G	Brass	1/16" (.062)
74894-04K	303 SS	1/8" (.125)
74894-03B	Brass	1/8" (.125)

PARTS LIST



81-01

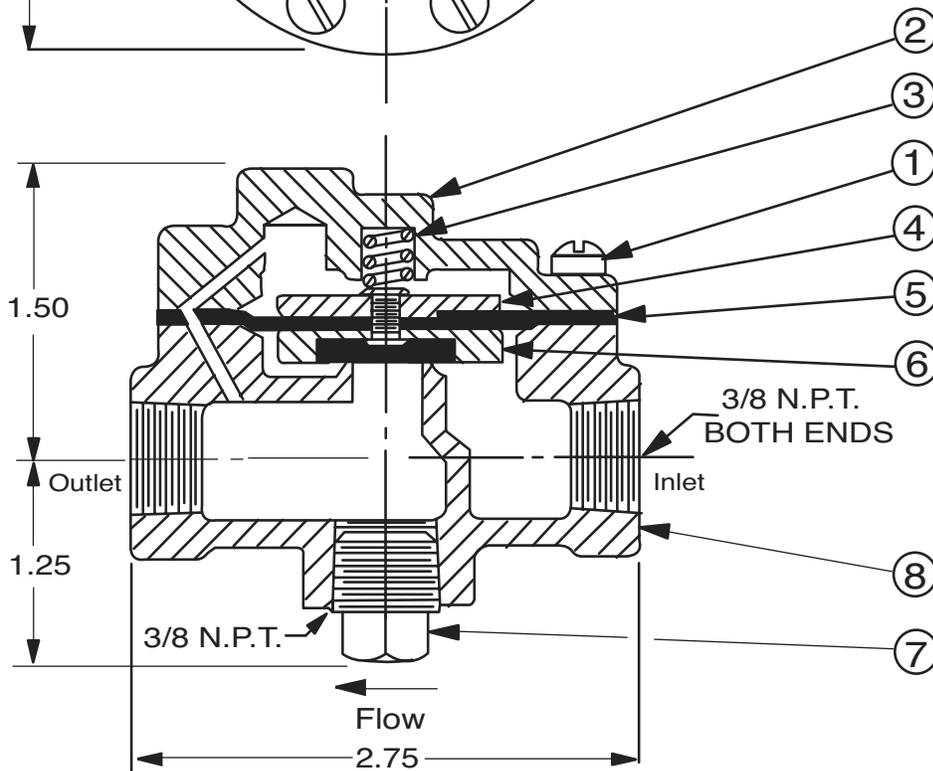
3/8" Check Valve



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



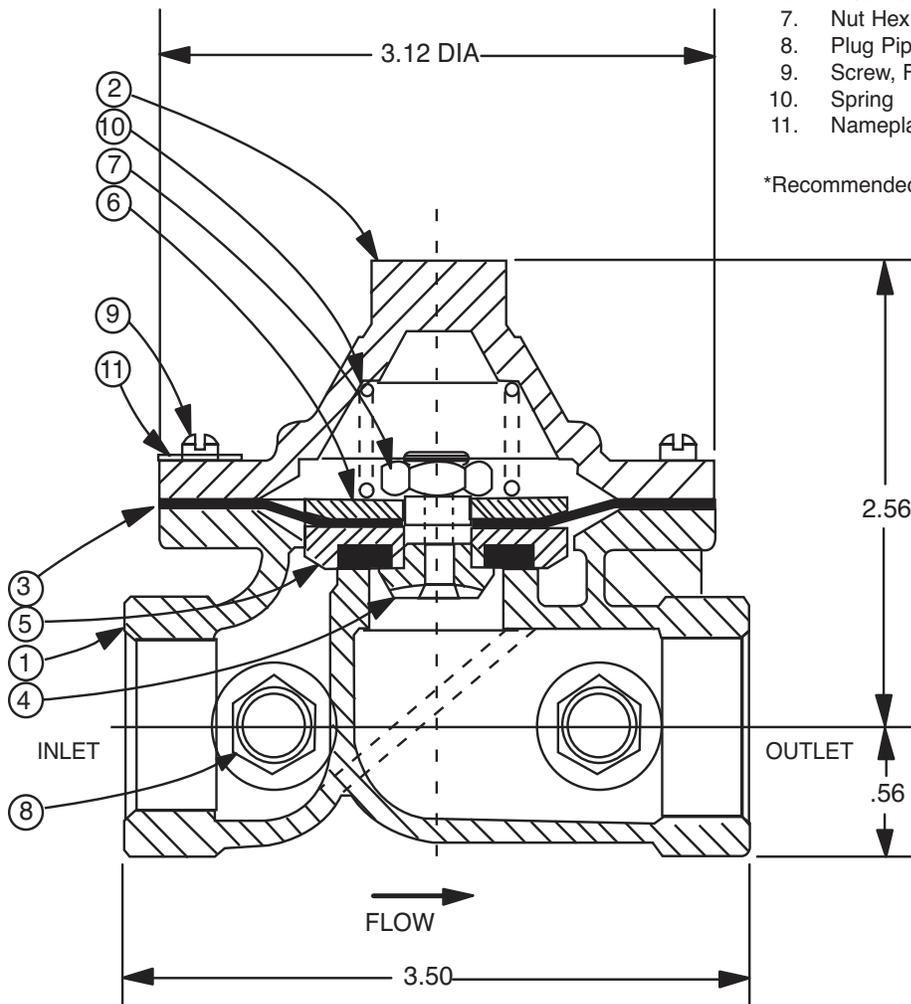
PARTS LIST

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

PARTS LIST



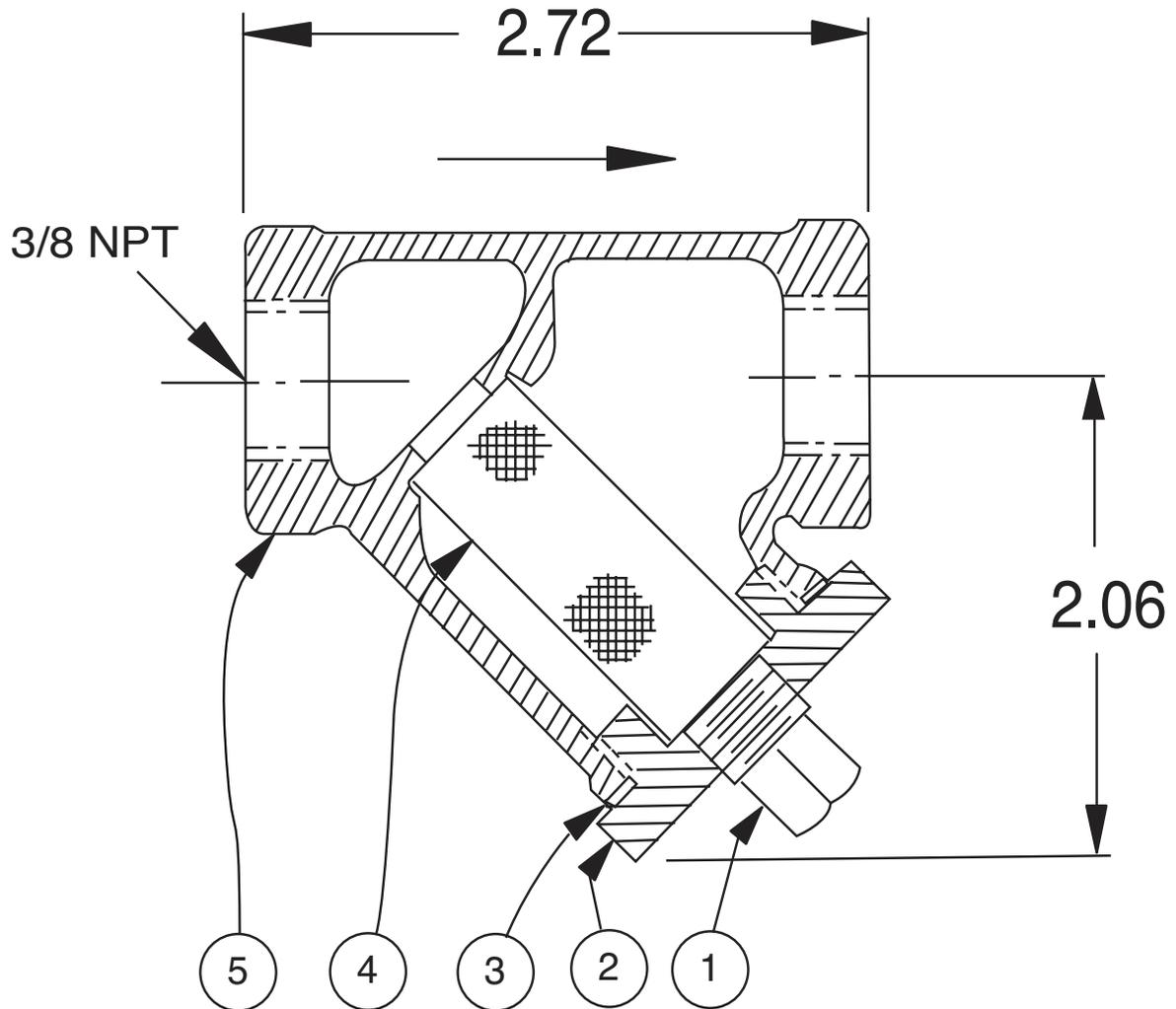
X43 Strainer

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

Standard 60 mesh pilot system strainer for fluid service.

SIZE	STOCK NUMBER
3/8 x 3/8	33450J

No parts available. Replacement assembly only.





750B-4KG1 Product Identification

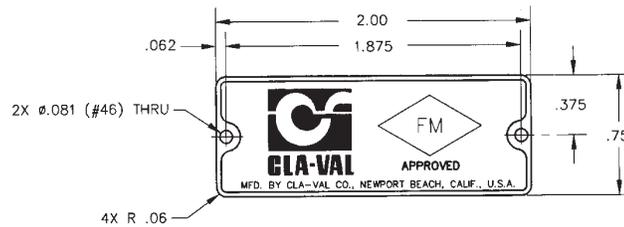
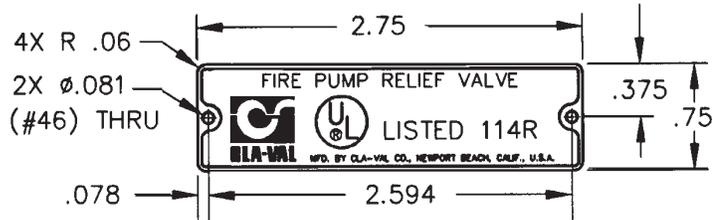
How to Order

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. 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.

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



INSTALLATION / OPERATION / MAINTENANCE

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.**