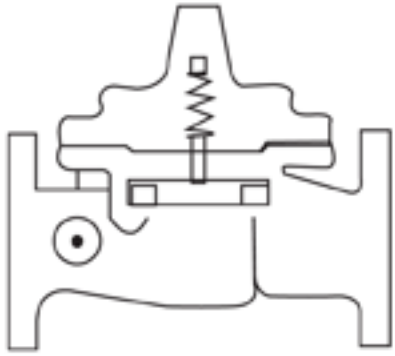
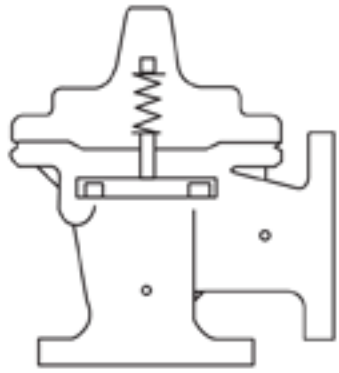
CLA-VAL
AUTOMATIC CONTROL VALVES

50-49/650-49

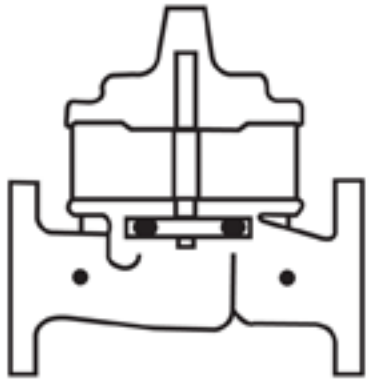
Place this manual with personnal responsible for maintenance of this valve



INSTALLATION



OPERATION



MAINTENANCE

CLA-VAL · P.O. BOX 1325 · NEWPORT, CA 92659-0325 · (949) 722-4800 · FAX: (949) 548-5441
CLA-VAL CANADA LTD. · 4687 Christie Drive · Beamsville, Ontario, LOR 1B4 Canada · (905) 563-4963

CLA-VAL CO. NEWPORT BEACH, CALIFORNIA

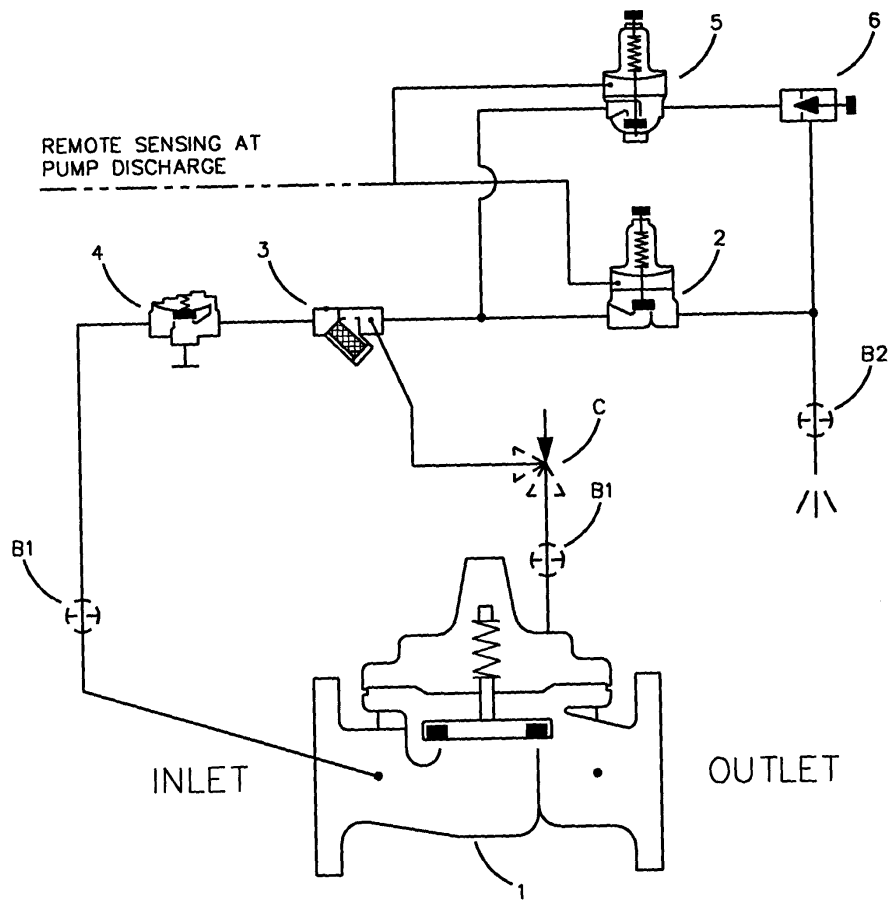
CATALOG NO.	DRAWING NO.	REV.
50-49/650-49	26405	–

TYPE OF VALVE AND MAIN FEATURES

PRESSURE RELIEF VALVE FOR SEA WATER SERVICE WITH PRESSURE SENSITIVE OPENING

DESIGN		
DRAWN	VL	6-19-95
CHK'D	I.C.	6-20-95
APV'D	EB	6-21-95

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



* KX = 100S/100-20S WITH TEFLON COATED SEAT

ITEM NO.	BASIC COMPONENTS	QTY
1	*100SKX HYTROL (50-49) MAIN VALVE *100-20SKX HYTROL (650-49) MAIN VALVE	1
2	CRL PRESSURE RELIEF CONTROL	1
3	X44A STRAINER & ORIFICE ASSY	1
4	81-01 CHECK VALVE	1
5	CRA PRESSURE REDUCING CONTROL	1
6	CNA NEEDLE VALVE (OPENING)	1

OPTIONAL FEATURE SUFFIX		ADDED TO CATALOG NUMBER
B	CK2 COCK (ISOLATION VALVES)	3
C	CV FLOW CONTROL (CLOSING)	1

LTR	DESCRIPTION	BY	DATE
–	RELEASED FOR PRODUCTION. (NED 40147)	VL	6-19-95

CAD REVISION RECORD - DO NOT REVISE MANUALLY

CLA-VAL CO. NEWPORT BEACH, CALIFORNIA

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50-49/650-49	26405	—

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OPERATING DATA

I. PRESSURE REDUCING FEATURE:
PRESSURE REDUCING CONTROL (5) IS NORMALLY OPEN CONTROL THAT SENSES REMOTE SENSING PRESSURE CHANGES. AN INCREASE IN REMOTE SENSING PRESSURE TENDS TO CLOSE CONTROL (5) AND A DECREASE IN REMOTE SENSING PRESSURE TENDS TO OPEN CONTROL (5). THIS CAUSES MAIN VALVE COVER PRESSURE TO VARY AND THE MAIN VALVE MODULATES (OPENS AND CLOSES). PRESSURE REDUCING CONTROL (5) ADJUSTMENT: TURN THE ADJUSTING SCREW CLOCKWISE TO INCREASE THE SETTING.

II. PRESSURE RELIEF FEATURE:
PRESSURE RELIEF CONTROL (2) REMAINS CLOSED WHEN REMOTE SENSING PRESSURE IS LESS THAN THE SET POINT OF CONTROL (2). WHEN REMOTE SENSING PRESSURE EXCEEDS THE SET POINT OF CONTROL (2) IT OPENS. THIS RELIEVES MAIN VALVE COVER PRESSURE TO THE ATMOSPHERE AND THE MAIN VALVE RAPIDLY OPENS. THIS OPERATION OVERRIDES PRESSURE REDUCING CONTROL FEATURE (5). PRESSURE RELIEF CONTROL (2) ADJUSTMENT: TURN THE ADJUSTING SCREW CLOCKWISE TO INCREASE THE SETTING.

NOTE: PRESSURE RELIEF CONTROL (2) MUST BE SET AT LEAST 5 PSI HIGHER THAN PRESSURE REDUCING CONTROL (5).

III. CHECK VALVE FEATURE:
WHEN COVER PRESSURE IS HIGHER THAN INLET PRESSURE, CHECK VALVE (4) CLOSES. THIS MAINTAINS THE HIGHER PRESSURE IN THE MAIN VALVE COVER CHAMBER KEEPING THE MAIN VALVE CLOSED.

IV. OPENING SPEED CONTROL:
CNA ANGLE NEEDLE VALVE (6) CONTROLS THE OPENING SPEED OF THE MAIN VALVE. TURN THE ADJUSTING STEM CLOCKWISE TO MAKE THE MAIN VALVE OPEN SLOWER. DO NOT CLOSE VALVE (6) COMPLETELY OR THE MAIN VALVE WILL NOT OPEN. (SUGGESTED INITIAL SETTING OF NEEDLE VALVE IS 1/4 TO 1/2 TURN OPEN).

V. 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.

CAD REVISION RECORD – DO NOT REVISE MANUALLY

LTR	DESCRIPTION	BY	DATE
	SEE SHEET 1		

CLA-VAL CO. NEWPORT BEACH, CALIFORNIA

CATALOG NO.	DRAWING NO.	REV.
50-49/650-49	26405	—

TYPE OF VALVE AND MAIN FEATURES

PRESSURE RELIEF VALVE FOR SEA WATER SERVICE
WITH PRESSURE SENSITIVE OPENING

DESIGN		
DRAWN	VL	6-19-95
CHK'D	I.C.	6-20-95
APV'D	EB	6-21-95

OPERATING DATA-CONTINUED

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

VI. 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) OPEN (OPTIONAL FEATURE).
( ) PERIODIC CLEANING OF STRAINER (3) IS RECOMMENDED.
( ) CV FLOW CONTROL(C) OPEN AT LEAST 1/4 TURN (OPTIONAL FEATURE).
( ) CNA ANGLE VALVE (6) OPEN AT LEAST 1/4 TURN.
( ) REMOTE SENSING LINE PROPERLY CONNECTED.

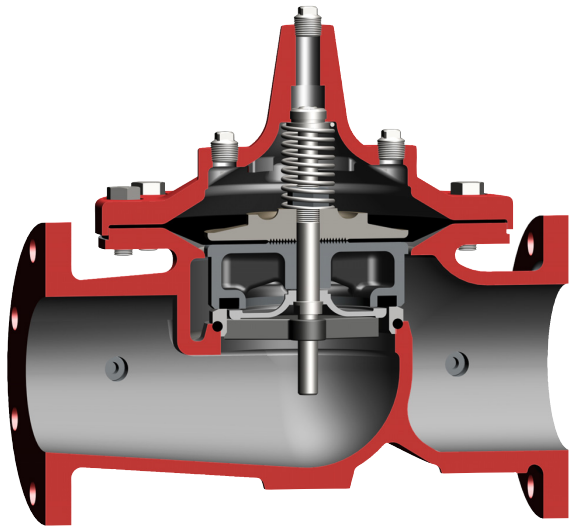
CAD REVISION RECORD - DO NOT REVISE MANUALLY

LTR	DESCRIPTION	BY	DATE
	SEE SHEET 1		

CLA-VAL®

— MODEL 100S
2100S

Seawater Service Hytrol Valve



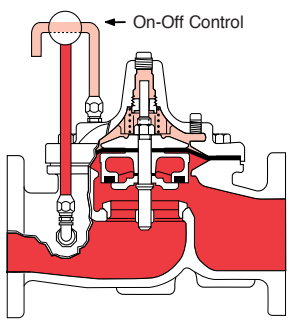
- **Drip - tight, positive seating**
- **Service without removal from line**
- **Screwed or flanged ends**
- **Globe or angle pattern**
- **Every valve factory-tested**

The Cla-Val Model 100S/2100S Seawater Service Hytrol Valve is a hydraulically operated, diaphragm actuated, globe or angle pattern valve. It consists of three major components: body, diaphragm assembly and cover. The diaphragm assembly is the only moving part.

The body (ductile iron or cast steel) is epoxy coated and contains a removable seat insert. The diaphragm assembly is guided top and bottom by a precision machined stem. It utilizes a non-wicking diaphragm of nylon fabric bonded with synthetic rubber. A resilient synthetic rubber disc retained on three and one half sides by a disc retainer forms a drip-tight seal with the renewable seat when pressure is applied above the diaphragm.

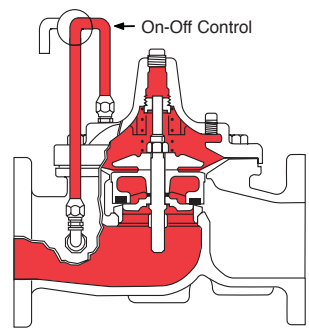
The Model 100S/2100S Seawater Service Hytrol Valve is the basic valve used for seawater applications. It is the valve of choice for system applications requiring deluge, pressure regulation, pressure relief, solenoid operation, rate of flow control, liquid level control or check valve operation. The rugged simplicity of design and packless construction assure a long life of dependable, trouble-free operation. It is available in various materials and in a full range of sizes, with either screwed or flanged ends. Its applications are unlimited.

Principle of Operation



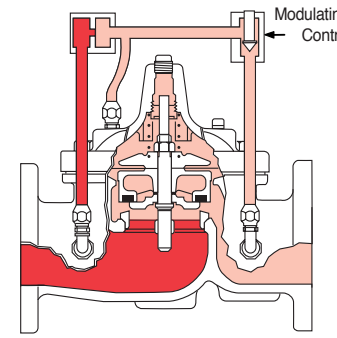
Full Open Operation

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 pressures are equal above and below the diaphragm. A Cla-Val "modulating" pilot control will allow the valve to automatically compensate for line pressure changes.

CLA-VAL®

Specifications

Available Sizes

Pattern	Threaded	Flanged	Grooved End
Globe	⅜" - 3"	1½" - 36"	1½"-2"- 3"- 4"- 6"
Angle	1½" - 3"	2" - 16"	2" - 3" - 4"

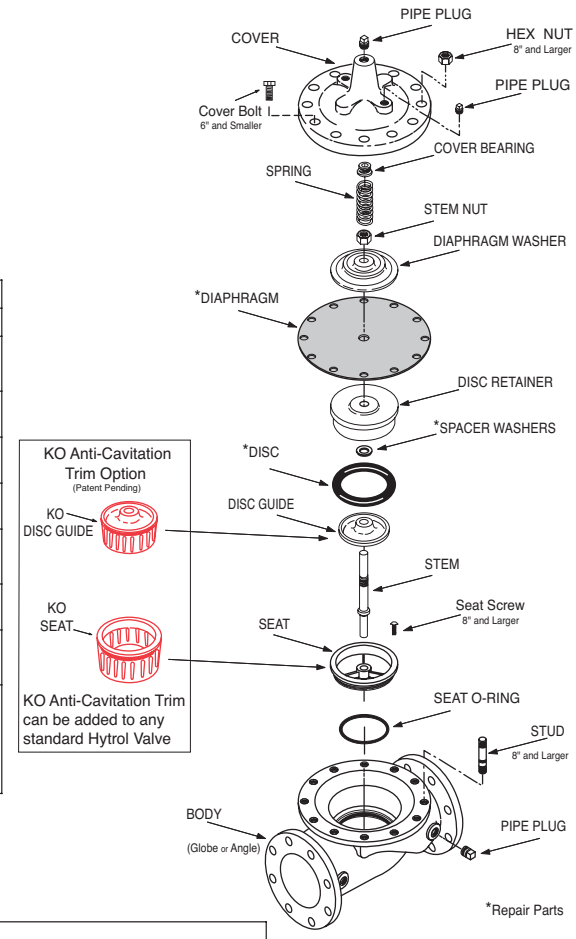
Operating Temp. Range

Fluids
-40° to 180° F

Pressure Ratings (Recommended Maximum Pressure - psi)

Valve Body & Cover		Pressure Class			
		Flanged			Threaded
Material	Material Specifications	ANSI Standards**	150 Lb.	300 Lb.	End*** Details
Ductile Iron*	ASTM-A536	B16.42	250	400	400
Cast Steel*	ASTM A216	B16.5	285	400	400
Naval Bronze	ASTM B61	B16.24	225	400	400
Stainless Steel Type 316	ASTM A743-CF-8M	B16.5	285	400	400
NI.AL.Bronze	ASTM B148	B.16.24	225	400	400
Super Duplex Stainless Steel		B16.5	285	400	400

Note: *Fusion Bonded Epoxy Coated Internal and External.
**ANSI Standards are for flanged dimensions only.
Flanged Valves are available faced but not drilled
***End Details machined to ANSI B2.1 specifications



Materials

Component	Standard Material Combinations					
Body & Cover	Ductile Iron	Cast Steel	Bronze	Stainless Steel Type 316	NI. AL. Bronze	Super Duplex Stainless Steel
Available Sizes	1¼" - 36"	1¼" - 16"	1¼" -16"	1¼" -16"	1¼" -16"	1¼" -16"
Disc Retainer & Diaphragm Washer	Cast Iron	Cast Steel	Bronze	Bronze	Monel	Super Duplex Stainless Steel
Trim: Disc Guide, Seat & Cover Bearing	Bronze is Standard Stainless Steel is optional					
Disc	Buna-N® Rubber					
Diaphragm	Nylon Reinforced Buna-N® Rubber					
Stem, Nut & Spring	Stainless Steel					
For material options not listed, consult factory. Cla-Val manufactures valves in more than 50 different alloys.						

For assistance in selecting appropriate valve options or valves manufactured with special design requirements, please contact our Regional Sales Office or Factory.

Purchase Specifications

The Model 100S/2100S shall be a hydraulically operated, diaphragm-actuated, globe or angle pattern valve. It shall contain a resilient, synthetic rubber disc, having a rectangular cross-section, contained on three and one-half sides by a disc retainer and disc guide, forming a tight seal against a single removable seat insert. The diaphragm assembly, containing a valve stem, shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. This diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. The diaphragm shall consist of nylon fabric bonded with synthetic rubber and shall not be used as a seating surface. Packing glands or stuffing boxes are not permitted and there shall be no pistons operating the valve or its pilot controls. All necessary repairs shall be possible without removing the valve from the line. All materials shall be compatible with seawater.
Valve shall be Model 100S/2100S manufactured by Cla-Val, Newport Beach, CA 92659-0325

When Ordering, Please Specify:

1. Model No. 100S or No. 2100S
2. Valve Size
3. Pattern - Globe or Angle
4. Pressure Class
5. Screwed or Flanged
6. Temperature and fluid to be handled.
7. Static and Flowing Line Pressure.
8. Body & Trim Material
9. Desired Options
10. When Vertically Installed

Functional Data

Model 100S/2100S

Valve Size		Inches	⅜	½	¾	1	1¼	1½	2	2½	3	4	6	8	10	12	14	16	24	36
		mm.	10	15	20	25	32	40	50	65	80	100	150	200	250	300	350	400	600	900
C_V Factor	Globe Pattern	Gal./Min. (gpm.)	1.8	6	8.5	13.3	30	32	54	85	115	200	440	770	1245	1725	2300	2940	7655	13320
		Litres/Sec. (l/s.)	.43	1.44	2.04	3.2	7.2	7.7	13	20.4	27.6	48	105.6	184.8	299	414	552	706	1837	3200
	Angle Pattern	Gal./Min. (gpm.)	—	—	—	—	—	29	61	101	139	240	541	990	1575	2500*	3060*	4200*	—	—
		Litres/Sec. (l/s.)	—	—	—	—	—	7	14.6	24.2	33.4	58	130	238	378	600	734.4	1008	—	—
Equivalent Length of Pipe	Globe Pattern	Feet (ft.)	25	7	16	23	19	37	51	53	85	116	211	291	347	467	422	503	628	1866
		Meters (m.)	7.6	2.2	4.8	7.1	5.7	11.4	15.5	16.0	25.9	35.3	64.2	88.6	105.8	142.4	128.6	153.6	191.6	569
	Angle Pattern	Feet (ft.)	—	—	—	—	—	46	40	37	58	80	139	176	217	222*	238*	247*	—	—
		Meters (m.)	—	—	—	—	—	13.9	12.1	11.4	17.8	24.5	42.5	53.6	66.1	67.8	72.7	75.2	—	—
K Factor	Globe Pattern		16.3	3.7	5.7	6.1	3.6	5.9	5.6	4.6	6.0	5.9	6.2	6.1	5.8	6.1	5.0	5.2	4.0	7.1
	Angle Pattern		—	—	—	—	—	7.1	4.4	3.3	4.1	4.1	4.1	3.7	3.6	2.9	2.8	2.6	—	—
Liquid Displaced from Cover Chamber When Valve Opens		Fl. Oz	.12	.34	.34	.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		U.S. Gal.	—	—	—	—	.02	.02	.03	.04	.08	.17	.53	1.26	2.51	4.0	6.5	9.6	29	42
		ml	3.5	10.1	10.1	20.7	75.7	75.7	121	163	303	643	—	—	—	—	—	—	—	—
		Litres	—	—	—	—	—	—	—	—	—	—	2.0	4.8	9.5	15.1	24.6	36.2	109.8	159

*Estimated

C_V Factor

Formulas for computing C_V Factor, Flow (Q) and Pressure Drop (▲P):

$$C_V = \frac{Q}{\sqrt{\triangle P}} \qquad Q = C_V \sqrt{\triangle P} \qquad \triangle P = \left(\frac{Q}{C_V}\right)^2$$

K Factor (Resistance Coefficient)
The Value of K is calculated from the formula: $K = \frac{894 d^4}{C_v^2}$
(U.S. system units)

Equivalent Length of Pipe
Equivalent lengths of pipe (L) are determined from the formula: $L = \frac{K d}{12 f}$
(U.S. system units)

Fluid Velocity
Fluid velocity can be calculated from the following formula: $V = \frac{.4085\ Q}{d^2}$
(U.S. system units)

Where:

C_V = U.S. (gpm) @ 1 psi differential at 60° F water
or
= (l/s) @ 1 bar (14.5 PSIG) differential at 15° C water

d = inside pipe diameter of Schedule 40 Steel Pipe (inches)

f = friction factor for clean, new Schedule 40 pipe (dimensionless) (from Cameron Hydraulic Data, 18th Edition, P 3-119)

K = Resistance Coefficient (calculated)

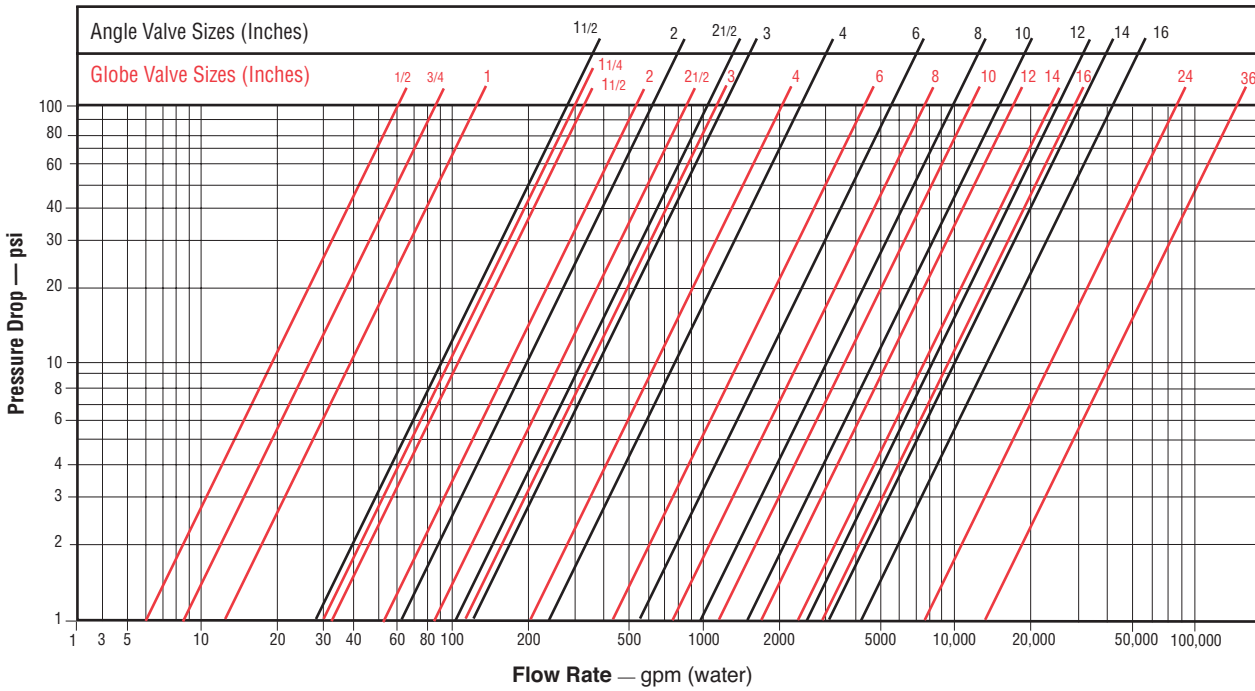
L = Equivalent Length of Pipe (feet)

Q = Flow Rate in U.S. (gpm) or (l/s)

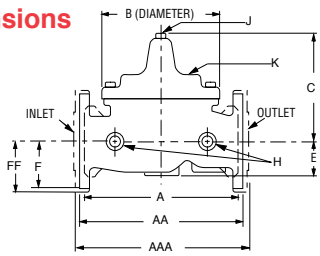
V = Fluid Velocity (feet per second) or (meters per second)

$\triangle P$ = Pressure Drop in (psi) or (bar)

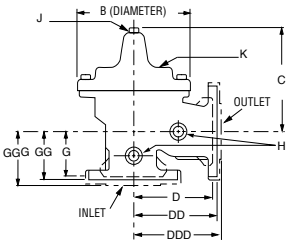
Model 100S/2100S Flow Chart (Based on normal flow through a wide open valve)



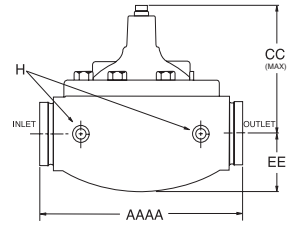
Dimensions



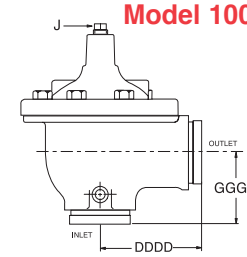
100S (Globe)



2100S (Angle)



100S Grooved (Globe)



2100S Grooved (Angle)

Valve Size (Inches)	⅜	½ - ¾	1	1¼-1½	2	2½	3	4	6	8	10	12	14	16	24	36
A Threaded	2.75	3.50	5.12	7.25	9.38	11.00	12.50	—	—	—	—	—	—	—	—	—
AA 150 ANSI	—	—	—	8.50*	9.38	11.00	12.00	15.00	20.00	25.38	29.75	34.00	39.00	41.38	61.50	76.00
AAA 300 ANSI	—	—	—	9.00*	10.00	11.62	13.25	15.62	21.00	26.38	31.12	35.50	40.50	43.50	63.24	78.00
AAAA Grooved End	—	—	—	8.50	9.00	11.00	12.50	15.00	20.00	25.38	—	—	—	—	—	—
B Dia.	2.50	3.12	4.38	5.62	6.62	8.00	9.12	11.50	15.75	20.00	23.62	28.00	32.75	35.50	53.16	66.00
C Max.	2.00	3.00	2.75	5.50	6.50	7.56	8.19	10.62	13.38	16.00	17.12	20.88	24.19	25.00	43.93	61.50
CC Max. Grooved End	—	—	—	4.75	5.75	6.88	7.25	9.62	12.12	14.62	—	—	—	—	—	—
D Threaded	—	—	—	3.25	4.75	5.50	6.25	—	—	—	—	—	—	—	—	—
DD 150 ANSI	—	—	—	4.00*	4.75	5.50	6.00	7.50	10.00	12.75	14.88	17.00	19.50	20.81	—	—
DDD 300 ANSI	—	—	—	4.25*	5.00	5.88	6.38	7.88	10.50	13.25	15.56	17.75	20.25	21.62	—	—
DDDD Grooved End	—	—	—	—	4.75	—	6.00	7.50	—	—	—	—	—	—	—	—
E	1.25	0.88	1.63	1.12	1.50	1.69	2.56	3.19	4.31	5.31	9.25	10.75	12.62	15.50	17.75	24.56
EE Grooved End	—	—	—	2.00	2.50	2.88	3.12	4.25	6.00	7.56	—	—	—	—	—	—
F 150 ANSI	—	—	—	2.50	3.00	3.50	3.75	4.50	5.50	6.75	8.00	9.50	10.50	11.75	19.25	28.00
FF 300 ANSI	—	—	—	3.06	3.25	3.75	4.13	5.00	6.25	7.50	8.75	10.25	11.50	12.75	—	—
G Threaded	—	—	—	1.88	3.25	4.00	4.50	—	—	—	—	—	—	—	—	—
GG 150 ANSI	—	—	—	4.00*	3.25	4.00	4.00	5.00	6.00	8.00	8.62	13.75	14.88	15.69	—	—
GGG 300 ANSI	—	—	—	4.25*	3.50	4.31	4.38	5.31	6.50	8.50	9.31	14.50	15.62	16.50	—	—
GGGG Grooved End	—	—	—	—	3.25	—	4.25	5.00	—	—	—	—	—	—	—	—
H NPT Body Tapping	—	⅛	¼	⅜	⅜	½	½	¾	¾	1	1	1	1	1	1	2
J NPT Cover Center Plug	⅛	⅛	¼	¼	½	½	½	¾	¾	1	1	1¼	1½	2	1½	2
K NPT Cover Tapping	—	⅛	¼	⅜	⅜	½	½	¾	¾	1	1	1	1	1	1	2
Valve Stem Internal Thread UNF	—	—	—	10-32	10-32	10-32	¼-28	¼-28	⅜-24	⅜-24	⅜-24	⅜-24	⅜-24	½-20	¾-16	¾-16
Stem Travel	—	—	—	0.4	0.6	0.7	0.8	1.1	1.7	2.3	2.8	3.4	4.0	4.5	6.75	10.12
Approx. Ship Wt. Lbs.	3	3	8	15	35	50	70	140	285	500	780	1165	1600	2265	6200	11470

*40mm Size Only

*1½" Size Only

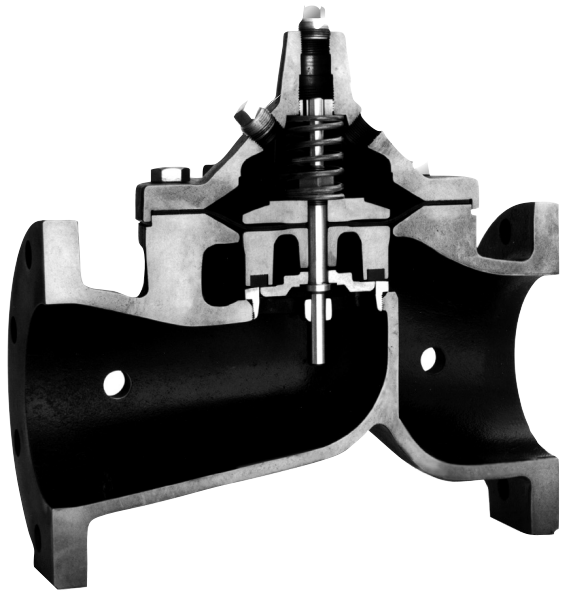
Valve Size (mm)	**10**	**15-20**	**25**	**32-40**	**50**	**65**	**80**	**100**	**150**	**200**	**250**	**300**	**350**	**400**	**600**	**900**
A Threaded	70	89	130	184	238	279	318	—	—	—	—	—	—	—	—	—
AA 150 ANSI	—	—	—	216*	238	279	305	381	508	645	756	864	991	1051	1562	1930
AAA 300 ANSI	—	—	—	229*	254	295	337	397	533	670	790	902	1029	1105	1606	1981
AAAA Grooved End	—	—	—	216	228	279	318	381	508	645	—	—	—	—	—	—
B Dia.	64	80	111	143	168	203	232	292	400	508	600	711	832	902	1350	1676
C Max.	51	76	70	140	165	192	208	270	340	406	435	530	614	635	1116	1562
CC Max. Grooved End	—	—	—	120	146	175	184	244	308	371	—	—	—	—	—	—
D Threaded	—	—	—	83	121	140	159	—	—	—	—	—	—	—	—	—
DD 150 ANSI	—	—	—	102*	121	140	152	191	254	324	378	432	495	528	—	—
DDD 300 ANSI	—	—	—	108*	127	149	162	200	267	337	395	451	514	549	—	—
DDDD Grooved End	—	—	—	—	121	—	152	191	—	—	—	—	—	—	—	—
E	32	23	42	29	38	43	65	81	110	135	235	273	321	394	451	624
EE Grooved End	—	—	—	52	64	73	79	108	152	192	—	—	—	—	—	—
F 150 ANSI	—	—	—	64	76	89	95	114	140	171	203	241	267	298	489	711
FF 300 ANSI	—	—	—	78	83	95	105	127	159	191	222	260	292	324	—	—
G Threaded	—	—	—	48	83	102	114	—	—	—	—	—	—	—	—	—
GG 150 ANSI	—	—	—	102*	83	102	102	127	152	203	219	349	378	399	—	—
GGG 300 ANSI	—	—	—	102*	89	110	111	135	165	216	236	368	397	419	—	—
GGGG Grooved End	—	—	—	—	83	—	108	127	—	—	—	—	—	—	—	—
H NPT Body Tapping	—	⅛	¼	⅜	⅜	½	½	¾	¾	1	1	1	1	1	1	2
J NPT Cover Center Plug	⅛	⅛	¼	¼	½	½	½	¾	¾	1	1	1¼	1½	2	1½	2
K NPT Cover Tapping	—	⅛	¼	⅜	⅜	½	½	¾	¾	1	1	1	1	1	1	2
Valve Stem Internal Thread UNF	—	—	—	10-32	10-32	10-32	¼-28	¼-28	⅜-24	⅜-24	⅜-24	⅜-24	⅜-24	½-20	¾-16	¾-16
Stem Travel	—	—	—	10	15	18	20	28	43	58	71	86	102	114	171	257
Approx. Ship Wt. Kgs.	1.4	1.4	4	7	16	23	32	64	129	227	354	528	726	1027	2812	5200

Cla-Val Control Valves operate with maximum efficiency when mounted in horizontal piping with the main valve cover UP, however, other positions are acceptable. Due to component size and weight of 8 inch and larger valves, installation with cover UP is advisable. We recommend isolation valves be installed on inlet and outlet for maintenance. Adequate space above and around the valve for service personnel should be considered essential. A regular maintenance program should be established based on the specific application data. However, we recommend a thorough inspection be done at least once a year. Consult factory for specific recommendations.

CLA-VAL®

— MODEL — **100-20**
(Reduced Internal Port)

600 Series
Hytrol Valve



- **Reduced Cavitation Design**
- **Drip-Tight, Positive Seating Action**
- **Service Without Removal From Line**
- **Globe or Angle Pattern**
- **Every Valve Factory Tested**

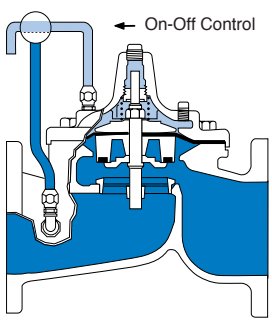
The Cla-Val Model 100-20 Hytrol Valve is a hydraulically operated, diaphragm actuated, globe or angle pattern valve. It consists of three major components: body, diaphragm assembly and cover. The diaphragm assembly is the only moving part.

The diaphragm assembly is guided top and bottom by a precision machined stem which utilizes a non-wicking diaphragm of nylon fabric bonded with synthetic rubber. A resilient synthetic rubber disc, retained on three and one-half sides by a disc retainer, forms a drip-tight seal with the renewable seat when pressure is applied above the diaphragm.

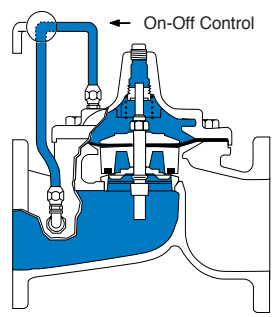
The reduced cavitation characteristics of the 100-20 Hytrol Valve is the basis for the Cla-Val 600 Series. The rugged simplicity of design and packless construction assure a long life of dependable, trouble-free operation. It's smooth flow passages and fully guided disc and diaphragm assembly assure optimum control when used in piping systems requiring remote control, pressure regulation, solenoid operation, rate of flow control or check valve operation.

Available in various materials and in a wide range of sizes. It's applications are unlimited.

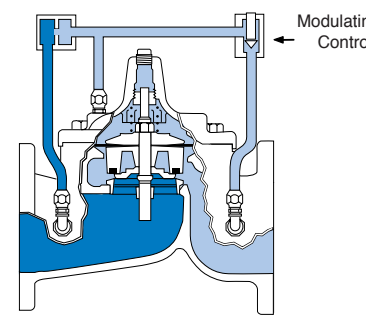
Principle of Operation



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.

CLA-VAL®

Available Sizes

Pattern	Flanged
Globe	3", 4", 6", 8", 10", 12", 14", 16", 18", 20", 24", 30"
Angle	4", 6", 8"

Operating Temp. Range

Fluids
-40° to 180° F

Pressure Ratings (Recommended Maximum Pressure - psi)

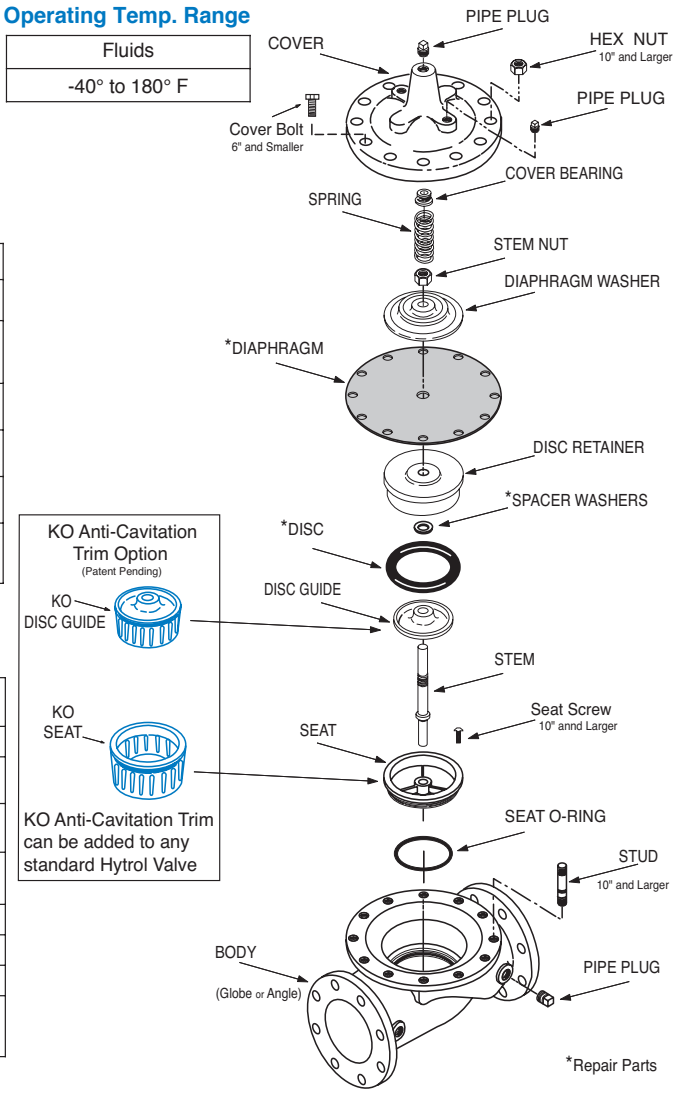
Valve Body & Cover		Pressure Class		
		Flanged		
Grade	Material	ANSI Standards*	150 lb.	300 lb.
ASTM A536	Ductile Iron	B16.42	250	400
ASTM A216-WCB	Cast Steel	B16.5	285	400
ASTM B62	Bronze	B16.24	225	400

Note: *ANSI standards are for flange dimensions only. Flanged valves are available faced but not drilled.

Materials

Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes	3" - 48"	3" - 16"	3" - 16"
Disc Retainer & Diaphragm Washer	Cast Iron	Cast Steel	Bronze
Trim: Disc Guide, Seat & Cover Bearing	Bronze is Standard Stainless Steel is optional		
Disc	Buna-N® Rubber		
Diaphragm	Nylon Reinforced Buna-N® Rubber		
Stem, Nut & Spring	Stainless Steel		

For material options not listed consult factory.
Cla-Val manufactures valves in more than 50 different alloys.



Options

Viton® Rubber Parts - suffix KB
Optional diaphragm, disc and o-ring fabricated with Viton® synthetic rubber. Viton® is well suited for use with mineral acids, salt solutions, chlorinated hydrocarbons, and petroleum oils; and is primarily used in high temperature applications up to 250° F. Do not use with epoxy coatings above 175° F.

Epoxy Coating - suffix KC
An FDA approved fusion bonded epoxy coating for use with cast iron, ductile iron or steel valves. This coating is resistant to various water conditions, certain acids, chemicals, solvents and alkalies. Epoxy coatings are applied in accordance with AWWA coating specifications C116-03. Do not use with temperatures above 175° F.

Dura-Kleen® Stem - suffix KD
This stem is designed for applications where water supplies containing dissolved minerals create deposits that build-up on a standard stem and hamper valve operation. A patented, self-cleaning design on the stem allows all valve sizes to operate freely in the harshest conditions.

Delrin® Sleeved Stem - suffix KG
The Delrin® sleeved stem is designed for applications where water supplies contain dissolved minerals which can form deposits that build up on the valve stem and hamper valve operation. Scale build-up will not adhere to the Delrin® sleeve stem. Delrin® sleeved stems are not recommended for valves in continuous operation where differential pressures are in excess of 80 psi (2" and larger Hytrol valves).

Heavy Spring - suffix KH
The heavy spring option is used in applications where there is low differential pressure across the valve, and the additional spring force is needed to help the valve close. This option is best suited for valves used in on-off (non-modulating) service.

Anti-Cavitation Trim - suffix KO
Anti-Cavitation Trim components consist of a stainless steel radial slotted disc guide and seat. This system is used when high differentials are present across the valve.

Water Treatment Clearance - suffix KW
This additional clearance is beneficial in applications where water treatment compounds can interfere with the closing of the valve. The smaller outside diameter disc guide provides more clearance between the disc guide and the valve seat. This option is best suited for valves used in on-off (non-modulating) service.

Valve Size		Inches	3	4	6	8	10	12	14	16	18	20	24	30
		mm.	80	100	150	200	250	300	350	400	460	500	600	760
C_V Factor	Globe Pattern	Gal./Min. (gpm.)	62	136	229	480	930	1458	1725	2110	2940*	3400*	4020	7900*
		Litres/Sec. (l/s.)	15	32.5	55	115	223	350	414	506	705	816	965	1895
	Angle Pattern	Gal./Min. (gpm.)	—	135	233	545	—	—	—	—	—	—	—	—
		Litres/Sec. (l/s.)	—	32	56	132	—	—	—	—	—	—	—	—
Equivalent Length of Pipe	Globe Pattern	Feet (ft.)	293	251	777	748	621	654	750	977	983	1125	3005	2130
		Meters (m.)	89.3	76.4	237.1	228.1	189.5	199.4	228.7	298.1	299.9	343.2	916.6	649.6
	Angle Pattern	Feet (ft.)	—	254	751	580	—	—	—	—	—	—	—	—
		Meters (m.)	—	77.6	229	176.9	—	—	—	—	—	—	—	—
K Factor	Globe Pattern		20.6	12.7	23.1	15.7	10.4	8.5	8.9	10.2	8.4	8.8	19.1	10.5
	Angle Pattern		—	12.9	22.3	12.2	—	—	—	—	—	—	—	—
Liquid Displaced from Cover Chamber When Valve Opens		Fl. Oz	—	—	—	—	—	—	—	—	—	—	—	—
		U.S. Gal.	0.32	.08	.17	.53	1.26	2.51	4.0	4.0	9.6	9.6	9.6	29.0
		ml	—	—	—	—	—	—	—	—	—	—	—	—
		Litres	.12	.30	.64	2.0	4.8	9.5	15.1	15.1	36.2	36.2	36.2	110

*Estimated

C_V Factor

Formulas for computing C_V Factor, Flow (Q) and Pressure Drop (▲P):

$$C_V = \frac{Q}{\sqrt{\triangle P}} \qquad Q = C_V \sqrt{\triangle P} \qquad \triangle P = \left(\frac{Q}{C_V}\right)^2$$

K Factor (Resistance Coefficient)
The Value of K is calculated from the formula: $K = \frac{894 d^4}{C_v^2}$
(U.S. system units)

Equivalent Length of Pipe
Equivalent lengths of pipe (L) are determined from the formula: $L = \frac{K d}{12 f}$
(U.S. system units)

Fluid Velocity
Fluid velocity can be calculated from the following formula: $V = \frac{.4085 Q}{d^2}$
(U.S. system units)

Where:

C_V = U.S. (gpm) @ 1 psi differential at 60° F water
or
= (l/s) @ 1 bar (14.5 PSIG) differential at 15° C water

d = inside pipe diameter of Schedule 40 Steel Pipe (inches)

f = friction factor for clean, new Schedule 40 pipe (dimensionless) (from Cameron Hydraulic Data, 18th Edition, P 3-119)

K = Resistance Coefficient (calculated)

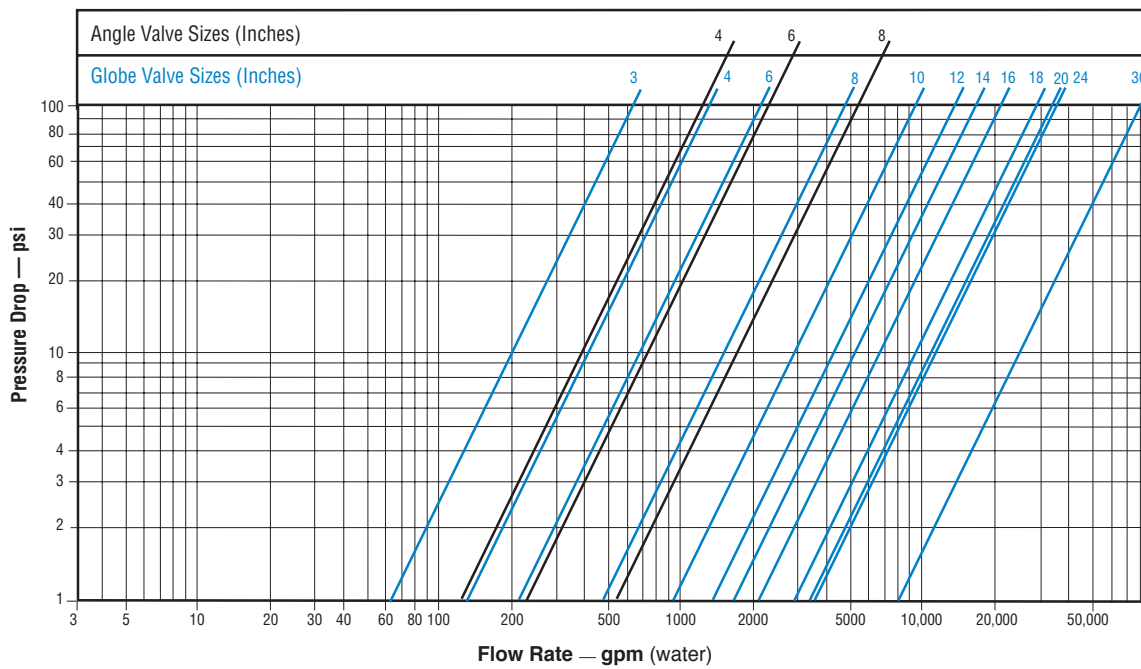
L = Equivalent Length of Pipe (feet)

Q = Flow Rate in U.S. (gpm) or (l/s)

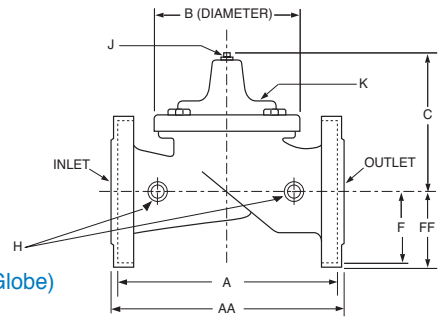
V = Fluid Velocity (feet per second) or (meters per second)

$\triangle P$ = Pressure Drop in (psi) or (bar)

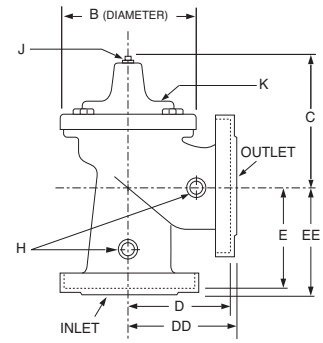
Model 100-20 Flow Chart (Based on normal flow through a wide open valve)



Dimensions



100-20 (Globe)



100-20 (Angle)

Model 100-20

Valve Size (Inches)	**3**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**24**	**30**
A 150 ANSI	10.25	13.88	17.75	21.38	26.00	30.00	34.25	35.00	42.12	48.00	48.00	63.25
AA 300 ANSI	11.00	14.50	18.62	22.38	27.38	31.50	—	36.62	43.63	49.62	49.75	—
B Dia.	6.62	9.12	11.50	15.75	20.00	23.62	28.00	28.00	35.44	35.44	35.44	53.19
C Max.	7.00	8.62	11.62	15.00	17.88	21.00	20.88	25.75	25.00	31.00	31.00	43.94
D 150 ANSI	—	6.94	8.88	10.69	—	—	—	—	—	—	—	—
DD 300 ANSI	—	7.25	9.38	11.19	—	—	—	—	—	—	—	—
E 150 ANSI	—	5.50	6.75	7.25	—	—	—	—	—	—	—	—
EE 300 ANSI	—	5.81	7.25	7.75	—	—	—	—	—	—	—	—
F 150 ANSI	3.75	4.50	5.50	6.75	8.00	9.50	11.00	11.75	15.88	14.56	17.00	19.88
FF 300 ANSI	4.12	5.00	6.25	7.50	8.75	10.25	—	12.75	15.88	16.06	19.00	—
H NPT Body Tapping	⅜	½	¾	¾	1	1	1	1	1	1	1	1
J NPT Cover Center Plug	½	½	¾	¾	1	1	1¼	1¼	2	2	2	2
K NPT Cover Tapping	⅜	½	¾	¾	1	1	1	1	1	1	1	1
Valve Stem Internal Thread UNF	10-32	¼-28	¼-28	⅜-24	⅜-24	⅜-24	⅜-24	⅜-24	½-20	½-20	½-20	¾-16
Stem Travel	0.6	0.8	1.1	1.7	2.3	2.8	3.4	3.4	3.4	4.5	4.5	6.5
Approx. Ship Wt. Lbs.	45	85	195	330	625	900	1250	1380	1500	2551	2733	6500

Valve Size (mm)	**80**	**100**	**150**	**200**	**250**	**300**	**350**	**400**	**450**	**500**	**600**	**750**
A 150 ANSI	260	353	451	543	660	762	870	889	1070	1219	1219	1607
AA 300 ANSI	279	368	473	568	695	800	—	930	1108	1260	1263	—
B Dia.	168	232	292	400	508	600	711	711	900	900	900	1351
C Max.	178	219	295	381	454	533	530	654	635	787	787	1116
D 150 ANSI	—	176	226	272	—	—	—	—	—	—	—	—
DD 300 ANSI	—	184	238	284	—	—	—	—	—	—	—	—
E 150 ANSI	—	140	171	184	—	—	—	—	—	—	—	—
EE 300 ANSI	—	148	184	197	—	—	—	—	—	—	—	—
F 150 ANSI	95	114	140	171	203	241	279	298	403	370	432	505
FF 300 ANSI	105	127	159	191	222	260	—	324	403	408	483	—
H NPT Body Tapping	⅜	½	¾	¾	1	1	1	1	1	1	1	1
J NPT Cover Center Plug	½	½	¾	¾	1	1	1¼	1¼	2	2	2	2
K NPT Cover Tapping	⅜	½	¾	¾	1	1	1	1	1	1	1	1
Valve Stem Internal Thread UNF	10-32	¼-28	¼-28	⅜-24	⅜-24	⅜-24	⅜-24	⅜-24	½-20	½-20	½-20	¾-16
Stem Travel	15	20	28	43	58	71	86	86	86	114	114	165
Approx. Ship Wt. Kgs.	20	39	89	150	284	409	568	627	681	1157	1249	2951

For assistance in selecting appropriate valve options or valves manufactured with special design requirements, please contact our Regional Sales Office or Factory.

Service and Installation

Cla-Val Control Valves operate with maximum efficiency when mounted in horizontal piping with the main valve cover UP, however, other positions are acceptable. Due to component size and weight of 10 inch and larger valves, installation with cover UP is advisable. We recommend isolation valves be installed on inlet and outlet for maintenance. Adequate space above and around the valve for service personnel should be considered essential. A regular maintenance program should be established based on the specific application data. However, we recommend a thorough inspection be done at least once a year. Consult factory for specific recommendations.

CLA-VAL®

CLA-VAL™

E-100-20 (R-8/06)

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www.cla-val.com

Represented By:

CLA-VAL

— 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 counterclockwise. 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.

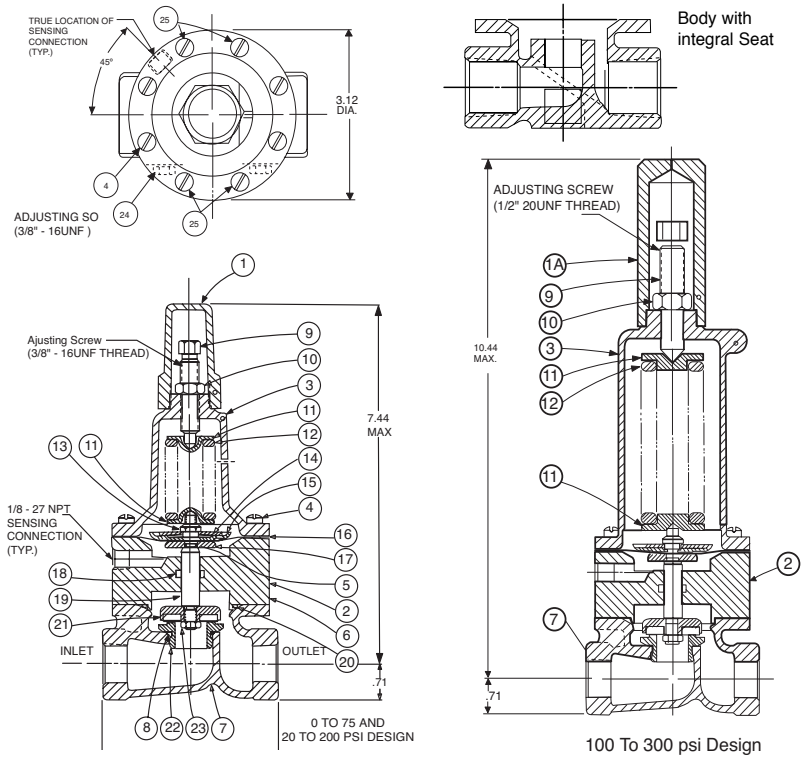
Note: Item (4) Screw will have a quantity of 8 for the 0-75 and 20-200psi design and a quantity of 4 for the 100-300psi design. Item (25) Screw is used on the 100-300psi design only. Install item (25), before item (4) for preload of item (12) spring.

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.

CLA-VAL P.O. Box 1325 • Newport Beach, CA 92659-0325 • Phone: 949-722-4800 • Fax: 949-548-5441 • E-mail: claval@cla-val.com • Website cla-val.com

CRL

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



SIZE	SPRING RANGE	PART NUMBER
1/2"	0-75 PSI	79222-01E
1/2"	20-200 PSI	79222-02C
1/2"	100-300 PSI	82809-01D
3/4"	0-75 PSI	79229-01K
3/4"	20-200 PSI	79229-02H
3/4"	100-300 PSI	86005-01E
For 100-450 PSI Contact Factory		

CRL RANGE PSI	APPROX. INCREASE FOR EACH CLOCK-WISE TURN OF ADJUSTING SCREW
0 to 75	8.5 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
			0-75	**20-200**	**100-300**
1	Cap	Plastic	67628J	67628J	1257601D
1A	Cap 100 to 300 psi Design	Plastic	1257601D	1257601D	1257601D
2	Nameplate	Brass	--	--	--
3	Cover	Bronze	C2544K	C2544K	44587E
4*	Screw Fil.Hd.10-32 x 1.88	303 SS	6757867E	6757867E	6757867E
5*	0-Ring	Rubber	00902H	00902H	00902H
6	Body, Powerunit	Bronze	7920504D	7920504D	7920504D
7	1/2" Body	Bronze	C7928K	C7928K	C7928K
	3/4" Body	Bronze	C9083B	C9083B	C9083B
8*	0-Ring, Seat	Rubber	00718H	00718H	00718H
9	Screw, Adjusting	Brass	7188201D	7188201D	7188201D
10	Nut Hex (Locking)	303 SS	6780106J	6780106J	6780106J
11	Guide, Spring	303 SS	71881H	71881H	1630301J
12	Spring,	CHR/VAN	71884B	71885J	1630201A
13	Nut, Stem, Upper	Bronze	73034B	73034B	73034B
14	Washer, Belleville	Steel	7055007E	7055007E	7055007E
15	Washer, Diaphragm (upper)	303 SS	71891G	71891G	71891G
16*	Diaphragm	Rubber	C1505B	C1505B	C1505B
17	Washer, Diaphragm (lower)	303 SS	45871B	45871B	45871B
18*	0-Ring, Stem	Rubber	00746J	00746J	00746J
19	Stem	303 SS	8982401F	8982401F	8982401F
20*	0-Ring, Body	Rubber	00767E	00767E	00767E
21*	Retainer Assembly, Disc	303 SS	C8964D	C8964D	C8964D
22	Seat	303 SS	62187A	62187A	62187A
23	Nut, hex, Stem, Lower	Bronze	6779806G	6779806G	6779806G
24	Pipe Plug	Bronze	6784701C	6784701C	6784701C
25*	Screw Fil.Hd, 10-32 x 2.25 (Qty 4 on 100-300 psi)	303 SS	6757867E	6757867E	6757867E
	FACTORY SET POINT		**50 PSI**	**60 PSI**	**100 PSI**
	REPAIR KIT*		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 CRL-5A	0-7 0-7	.75 .75
.018 DIA.	82575C	--	S.S.	CRD CRD-10A	1.9-6.5 1.9-6.5	.61 .49
.116 DIA.	81594E	--	S.S.	CRD CRD-10A	2-30 2-30	3.0 2.4
.120 DIA.	V5654J	GREEN	CHR VAN	CRL-5A CRD	5-25 10-40	4.0 4.0
.162 DIA.	32447F	NATURAL	S.S.	CDB-7 CRL-5A CRL-13	10-60 10-60 10-60	12.0 12.0 12.0
.162 DIA.	V5695B	YELLOW	MUSIC WIRE	CDB-7 CRL-5A CRL-13	20-80 20-80 20-80	14.5 14.5 14.5
.207 DIA.	C1124B	CAD PLT	MUSIC WIRE	CDB-7 CRL-13 CRL-5A	50-150 50-150 50-150	29.5 29.5 29.5
.225 DIA.	V6515A	RED	MUSIC WIRE	CDB-7 CRL-13 CRL-5A	65-180 65-180 65-180	44.0 44.0 44.0
.115 X .218	71884B	RED	CHR VAN	CRL CRD CRD-10A	0-75 15-75 15-75	8.5 9.0 7.2
.118 X .225	71886J	GREEN	CHR VAN	CRL CRD CRD-10A	20-200 30-300 30-300	28.0 27.0 22.4
.225 X .295	1630201A	CAD PLT	CHR VAN	CRL CRL-5A	100-300 100-300	18.00 18.00
.440 X .219	48211H	CAD PLT	STEEL	CRA-18 CRD-22 CRL-4A	200-450 200-450 100-450	17.0 17.0 17.0
.187	20561901H	BLACK	STEEL	CRD	20-105	12.0

WIRE SIZE	SPRING NUMBER	COLOR	WIRE MATERIAL	CATALOG NUMBER	PSI RANGE	*FEET PER TURN
.080 DIA.	C0492D	BLUE	S.S.	CRA CRD-2	4.5-15 4.5-15	.82 .82
.375 DIA.	87719B 1 SPRING 2 SPRING 3 SPRING 4 SPRING 5 SPRING	EPOXY COATED	CHROME SILICON	CDS-5	 5-40 30-80 70-120 110-120 150-200	 1.0 2.0 3.0 4.0 5.0
.072 DIA.	V5097A	--	302SS	CVC	1-17	.7
.375 DIA.	2933502H 1 SPRING 2 SPRING 3 SPRING 4 SPRING 5 SPRING	EPOXY COATED	CHROME SILICON	CDS-6	 5-40 30-80 70-120 110-120 150-200	 .75 1.50 2.20 3.00 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.

X44A

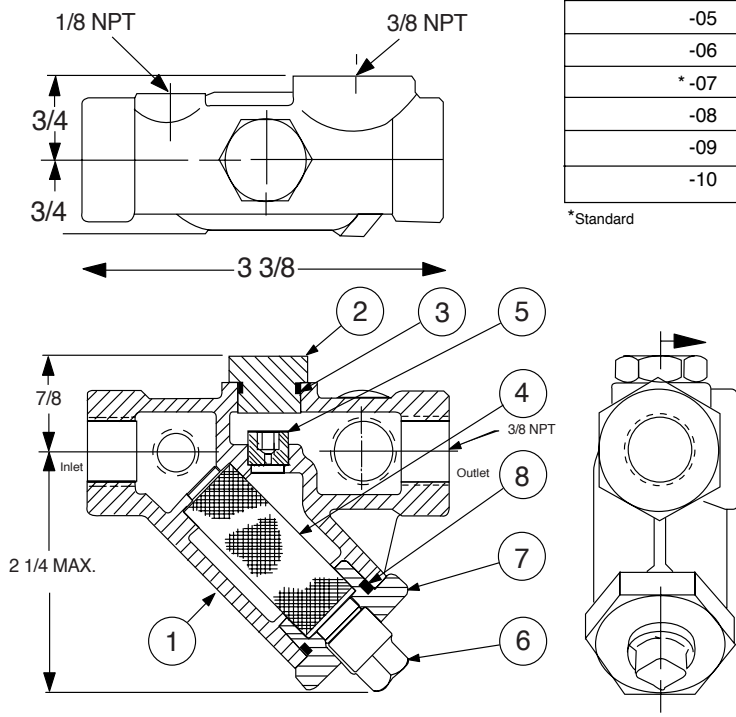
Strainer and Orifice Assembly

BRONZE BODY — S.S. ORIFICE

3/8" x 3/8"

X44A STOCK NO.	ORIFICE DIA.	ORIFICE PLUG PART # (ITEM 5)
71310-01	.031	94132-01
-02	.046	-02
-03	.062	-03
-04	.078	-04
-05	.093	-05
-06	.109	-06
* -07	.125	-07
-08	.140	-08
-09	.156	-09
-10	.187	-10

*Standard



When ordering parts, please specify:

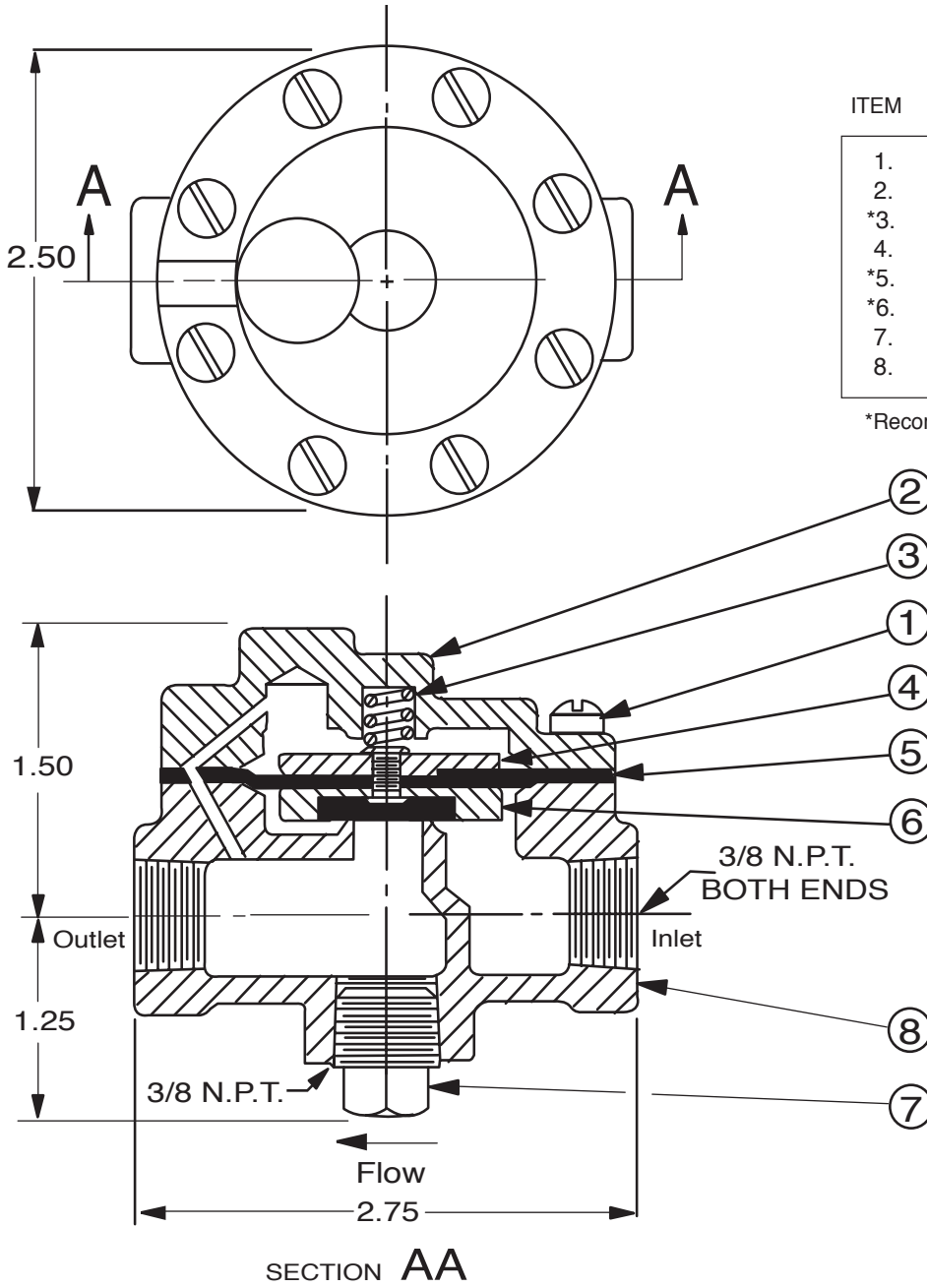
- All Nameplate Data
- Item Number
- Description
- Recommended Spare Parts

ITEM	DESCRIPTION	MATERIAL	QTY.
1	Body	Red Brs.	1
2	Plug, Top	Brass	1
3	"O" Ring, Plug Top	Syn. Rub.	1
4	Screen	Monel	1
5	Orifice Plug	Delrin	1
6	Plug, Pipe	Brass	1
7	Strainer Plug	S.S.	1
8	"O" Ring, Strainer Plug	Syn. Rub.	1

CLA-VAL

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

When ordering parts, please specify:

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

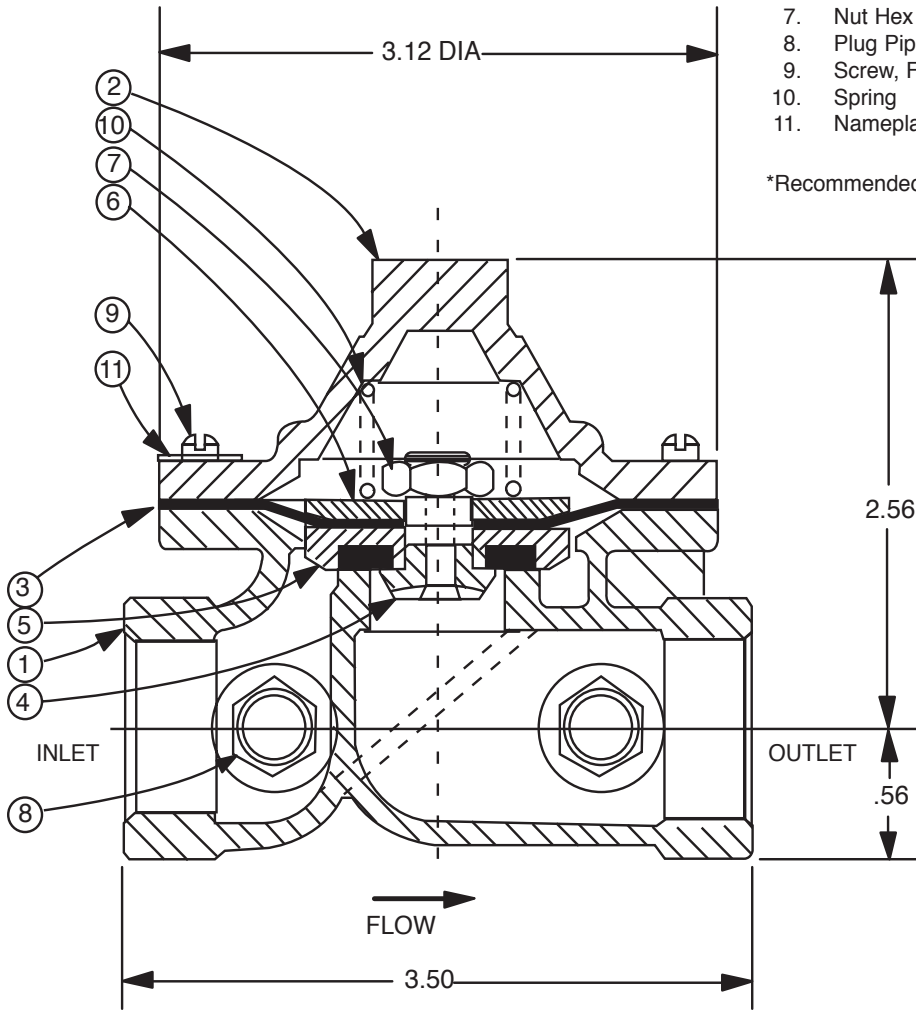
CLA-VAL

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

CLA-VAL

— MODEL — CRA

REMOTE SENSING TYPE

Pressure Reducing Control

DESCRIPTION

The CRA Pressure Reducing Control automatically reduces a higher inlet pressure to a lower outlet pressure. It is a direct acting, spring loaded, diaphragm type valve that operates hydraulically or pneumatically and is designed to sense pressure from a remote point. It may be used as a self-contained valve or as a pilot control for a Cla-Val Co. main valve. It will hold a constant downstream pressure at the remote sensing point within very close pressure limits.

OPERATION

The CRA Pressure Reducing Control is normally held open by the force of the compression spring above the diaphragm; delivery pressure acts on the underside of the diaphragm. Flow through the valve responds to changes in pressure at the the sensing point.

INSTALLATION

The CRA Pressure Reducing Control may be installed in any position. There is one inlet port and two outlets, for either straight or angle installation. The second outlet port can be used for a gauge connection. A flow arrow is marked on the body casting.

ADJUSTMENT PROCEDURE

The CRA Pressure Reducing Control can be adjusted to provide a delivery pressure range as specified on the nameplate.

Pressure adjustment is made by turning the adjustment screw to vary the spring pressure on the diaphragm. The greater the compression on the spring the higher the pressure setting.

1. Turn the adjustment screw in (clockwise) to increase delivery pressure.
2. Turn the adjustment screw out (counter-clockwise) to decrease the delivery pressure. When pressure adjustment is completed, tighten jam nut on adjustment screw and replace protective cap.

Flow rates are not critical during pressure setting. The approximate minimum flow rates given in the table are for the main valve on which the CRA is installed.

Valve Size	1 ¼"-3"	4"-8"	10"-16"
Minimum Flow GPM	15-30	50-200	300-650

MAINTENANCE

Disassembly

To disassemble follow the sequence of the item numbers assigned to parts in the sectional illustration.

Reassembly

Reassembly is the reverse of disassembly. Caution must be taken to avoid having the yoke (17) drag on the inlet nozzle of the body (18). Follow this procedure:

1. Place yoke (17) in body and screw the disc retainer assembly (16) until it bottoms.
2. Install gasket (14) and spring (19) for 2-30 psi range onto plug (13) and screw into body. Disc retainer must enter guide hole in plug as it is assembled. Screw the plug in by hand. Use wrench to tighten only.
3. Place gasket (25) and powertrol body (21) on yoke extension (17). Refer to sectional view for proper reassembly of (21) onto body (18).
4. Place lower diaphragm washer (24), "o" ring (22), diaphragm (12), upper diaphragm washer (11), and belleville washer (20) on yoke extension (17). Screw on diaphragm nut (10) finger tight.
5. Place two machine screws (4) through (21) (25) and screw into body (18). Do not include the diaphragm (12) in this operation. This holds parts aligned for next step, and allows the diaphragm to move and be properly located during tightening of nut (10).
6. Hold the diaphragm so that screw holes in the diaphragm (12) and powertrol body (21) align. Tighten diaphragm nut (10) with a wrench. At the final tightening release the diaphragm and permit it to rotate approximately 5° to 10°. The diaphragm holes should now be properly aligned with the body holes.

To check for proper alignment proceed as follows:

Rotate diaphragm clockwise and counterclockwise as far as possible. Diaphragm screw holes should rotate equal distance on either side of powertrol body screw holes ±1/8".

Repeat assembly procedure until diaphragm and yoke are properly aligned. There must be no contact between yoke and body nozzle during its normal opening and closing movement. To simulate this movement hold powertrol body and diaphragm holes aligned. Move yoke to open and closed positions. There must be no evidence of contact or dragging.

7. Remove machine screws per step 5.
8. Install spring (9) with spring guide (8) on top of spring.
9. Install cover (5) using eight machine screws (4).
10. Replace adjusting screw (2) and nut (3), then cap (1).

SYMPTOM	PROBABLE CAUSE	REMEDY
Fails to open when pressure lowers	No spring compression	Tighten adjusting screw
	Mineral buildup on yoke extension (17)	Disassemble and clean part, Replace "O" rings (22) and (23).
	Damaged spring	Disassemble and replace.
	Spring guide (8) is not in place	Disassemble and place guide (8) on top of spring (9).
	Yoke dragging on inlet nozzle	Disassembled and reassemble use procedure.
Fails to close when delivery pressure rises	Spring compressed	Back off adjusting screw
	Mineral deposit on yoke extension (17)	Disassemble and clean part. Replace "o" rings (22) and (23).
	Mechanical obstruction	Disassemble and remove obstruction
	Worn disc	Disassemble, remove and replace disc retainer assembly. (16)
	Yoke dragging on inlet nozzle	Refer to paragraph 6
Leakage from cover vent hole	Damaged diaphragm (12)	Disassemble and replace
	Loose diaphragm nut (10)	Remove cover and tighten nut

CLA-VAL P.O. Box 1325 • Newport Beach, CA 92659-0325 • Phone: 949-722-4800 • Fax: 949-548-5441 • E-mail: claval@cla-val.com • Website cla-val.com

CLA-VAL

CRA

REMOTE SENSING TYPE

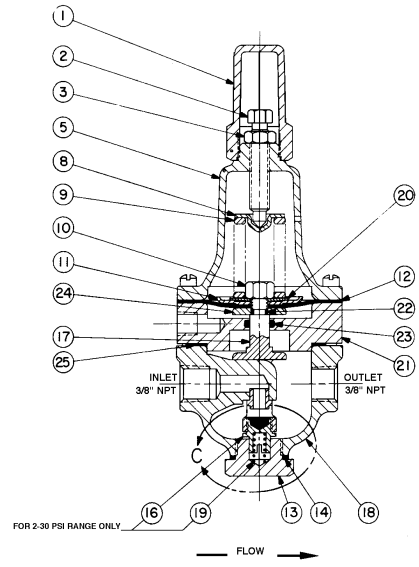
Pressure Reducing Control

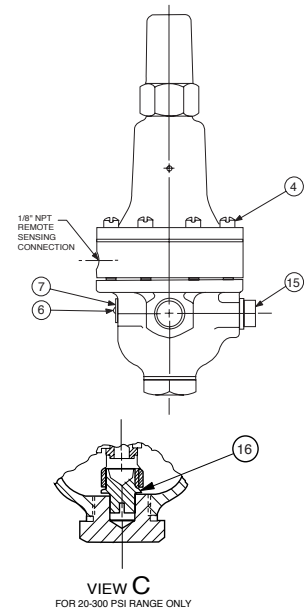
When ordering parts specify:
- All nameplate data
- Description
- Item number

SIZE (inch)	STOCK NUMBER	SEAT DIA	ADJ. RANGE (psi)
3/8	79744-03D	1/4	15-75
3/8	79744-04B	1/4	30-300
3/8	79744-06G	1/4	2-30

Factory set pressure:	PSI*per turn
15-75 set @ 20 psi	9.0
30-300 set @ 60 psi	27.0
2-30@ 10 psi	3.0

* Approximate - Final adjustment should be made with a pressure gauge and with flow.





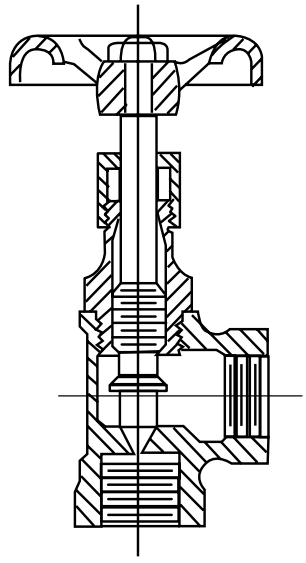
ITEM	**DESCRIPTION**	MATERIAL	PART NUMBER	LIST PRICE
1	Cap	PL	67628J	
2	Adjusting Screw	BRS	7188201D	
3	Jam Nut, 3/8—16	303	6780106J	
4*	Machine Screw 10-32 x 1-1/4"(Fil.Hd.) (8 required)	SS	6757874A	
5	Cover	BRS	C2544K	
6	Nameplate Screw	SS	67999D	
7	Nameplate	BRS	C002201G	
8	Spring Guide	302	71881H	
9	Spring			
	(15-75 psi)	CHR VAN	71884B	
	(30-300 psi)	CHR VAN	71885B	
	(2-30 psi)	SS	81594E	
10	Hex Nut 5/16 - 18	303	71883D	
11	Diaphragm Washer (upper)	302	71891G	
12*	Diaphragm	NBR	C6936D	
13	Plug, Body	BRS	V5653A	
14*	Gasket	FIB	40174F	
15	Plug, 3/8 NPT	BRS	6766003F	
16*	Disc Retainer Assy (15-75 psi & 30-300 psi)	BR/RUB	C5256H	
	Disc Retainer Assy (2-30 psi)	BR/RUB	C5255K	
17	Yoke	VBZ	C1799A	
18	Body & Seat Assy, Seat only 1/4"	BS	8339701J	
19*	Bucking Spring (Required with 2-30 psi)	302	VO5586	
20	Belleville Washer	STL	7055007E	
21	Powertrol Body	BRS	C3388A	
22*	O-Ring	NBR	00708J	
23*	O-Ring	NBR	00746J	
24	Diaphragm Washer (lower)	BRS	C1804J	
25	Gasket	NBC	8059401D	
	Repair Kit (no Bucking Spring) Item 19		9170003K	
	Repair Kit (with Bucking Spring) Item 19		9170001D	

* Suggested Repair Parts

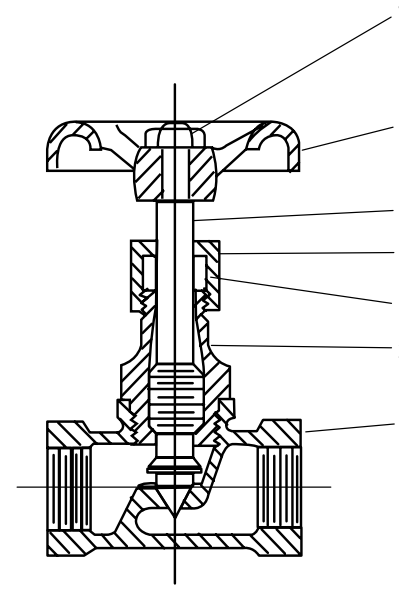
CLA-VAL

CN

Globe and Angle Needle Valves—CN Series

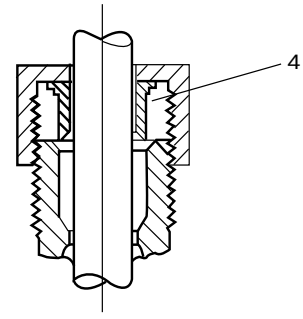


CAT. NO. CNA
ANGLE



CAT. NO. CNB
GLOBE

WHEN USED AS A CONTROL VALVE, HANDWEEL IS REMOVED AND STEM IS SLOTTED FOR SCREW-DRIVER ADJUSTMENT.



3/4" SIZE ONLY

When ordering parts, please specify:

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

Item	Description
1.	Body
2.	Bonnet
3.	Stem
4.	Gland
5.	Nut
6.	Handwheel
7.	Nut
8.	Packing

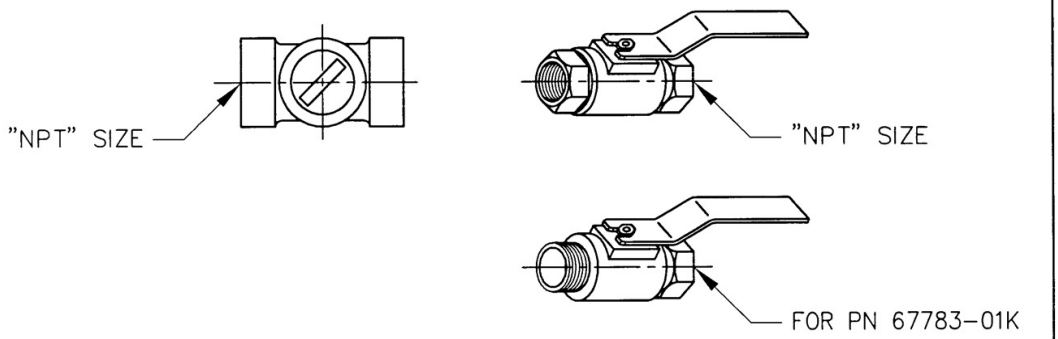
CLA-VAL CO. NEWPORT BEACH, CALIFORNIA	CATALOG NO.	DRAWING NO. 67783	REV AW

TYPE OF VALVE AND MAIN FEATURES

CK2 COCK/BALL VALVE

DESIGN		
DRAWN	MGR	4-02-80
CHK'D	KD	4-03-80
APV'D	CH	4-07-80

SCALE: NONE



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	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*	-11J	-19B	-27E	-46E SUPSD BY-27E -53A	-45G -57B **	-48A SUPSD BY-49J	3/8"
-04D	-12G	-20K	-28C	-54J	-43B SUPSD BY-04D	-49J	1/2"
-05A	-13E	-21H	-29A		-44K SUPSD BY-05A	-56D	3/4"
-06J	-14C	-22F	-30J				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.

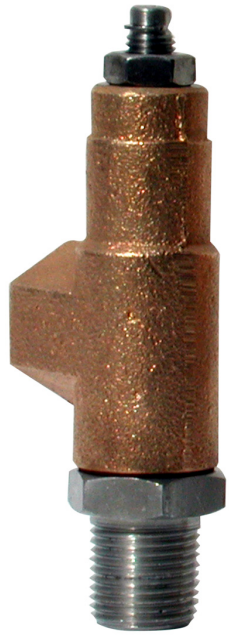
CAD REVISION RECORD - DO NOT REVISE MANUALLY

LTR	DESCRIPTION	BY	DATE
AU	ADDED PN 67783-56D (ECO 19284)	AK	01-31-03
A-AT	SEE REVISION FILE		
AV	REMOVED COLUMN "MONEL W/ LOCKING HANDLE"; RELOCATED PN 67783-56D; ADDED VENDOR INFO FOR PN 67783-56D ON SHEET 2 (ECO 19327)	AK	07-29-03
AW	ADDED PN 67783-57B ON SHEET 1 (ECO 19484)	AK	04-07-03

CLA-VAL

—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.

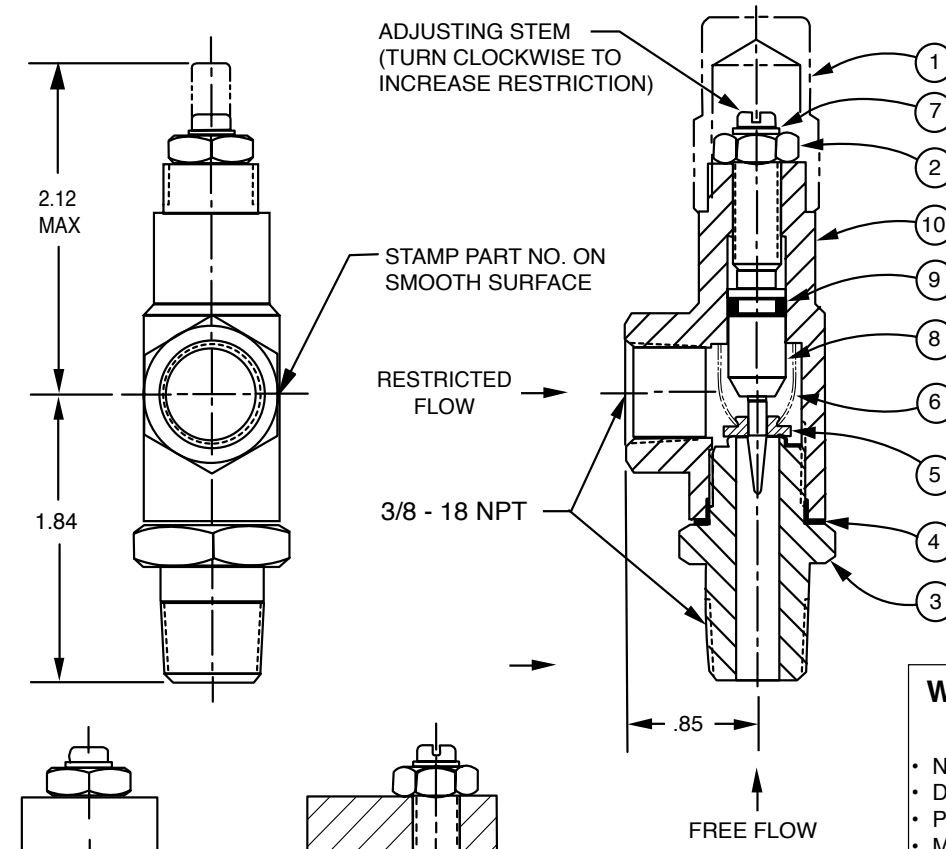
TEST PROCEDURE

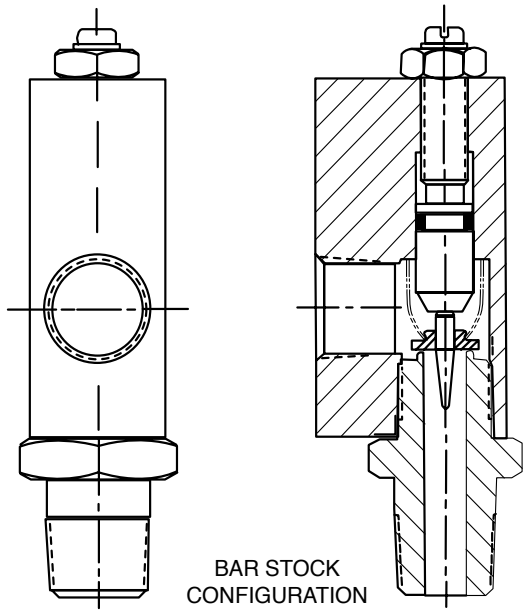
No testing of the flow Control is required prior to reassembly to the pilot control system on Cla-Val Main Valve.

CLA-VAL

CV

3/8" Flow Control





When ordering parts, please specify:

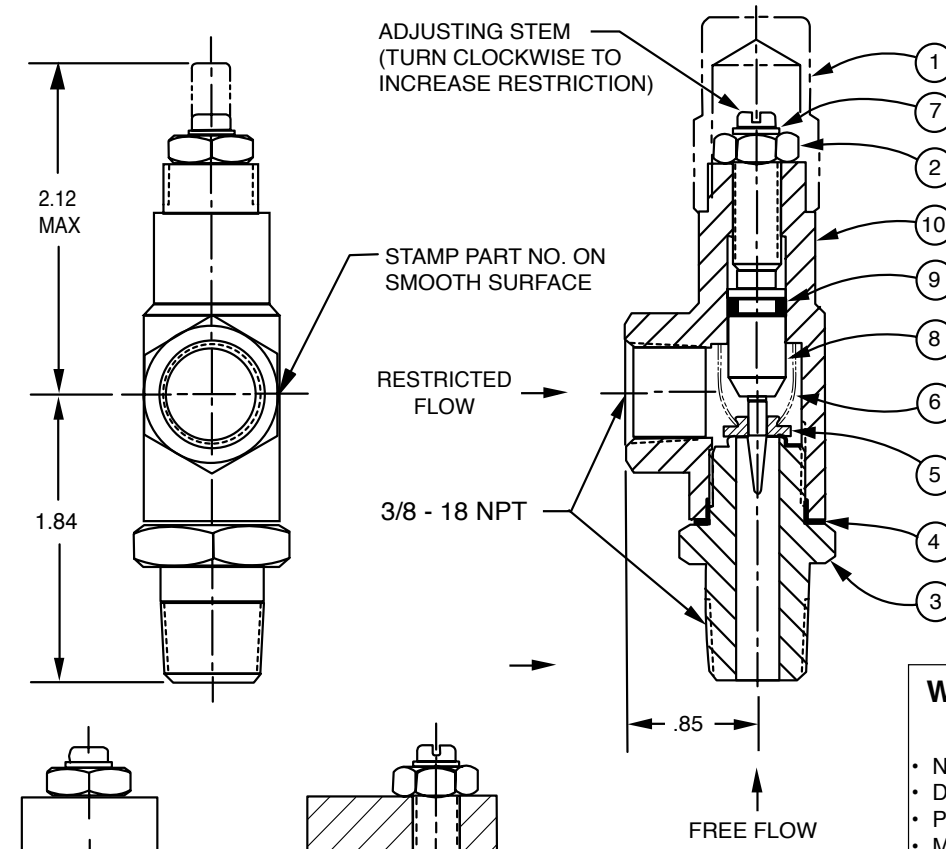
- Number Stamped on Side
- Description (CV Flow Control)
- Part Description
- Material

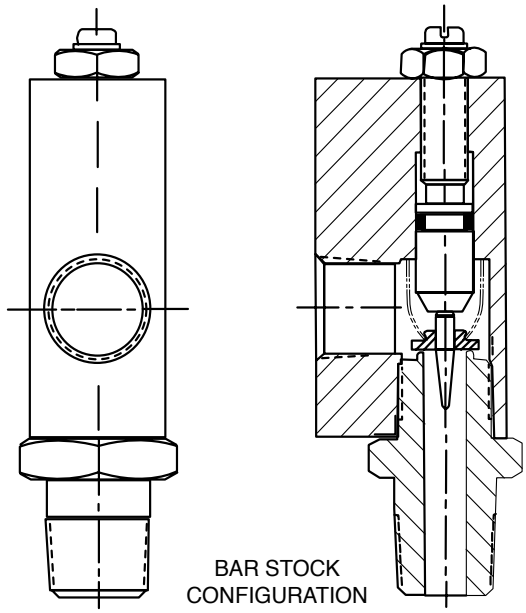
ITEM	DESCRIPTION	QTY
1	Cap (SS only)	1
2	Nut, Jam	1
3	Seat	1
4	Gasket	1
5	Disc	1
6	Spring	1
7	Ring, Retaining	1
8	Stem	1
9	O-Ring	1
10	Housing	1

CLA-VAL

CV

3/8" Flow Control





When ordering parts, please specify:

- Number Stamped on Side
- Description (CV Flow Control)
- Part Description
- Material

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

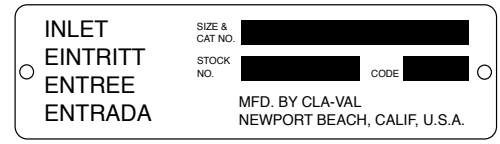
How to Order

Proper Identification

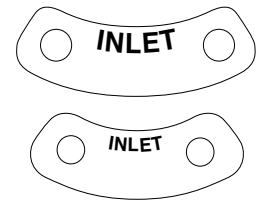
For ordering repair kits, replacement parts, or for inquiries concerning valve operation, it is important to properly identify Cla-Val products already in service by including all nameplate data with your inquiry. Pertinent product data includes valve function, size, material, pressure rating, end details,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

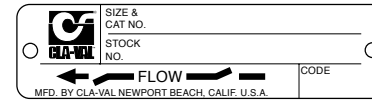


This brass plate appears on valves sized $2^1/_2$" and larger and is located on the top of the inlet flange.

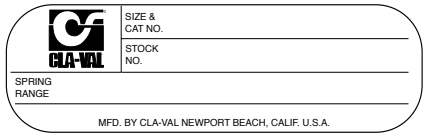


These two brass plates appear on $^3/_8$", $^1/_2$", and $^3/_4$" size valves and are located on the valve cover.

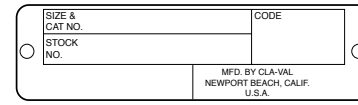
This brass plate appears on altitude valves only and is found on top of the outlet flange.



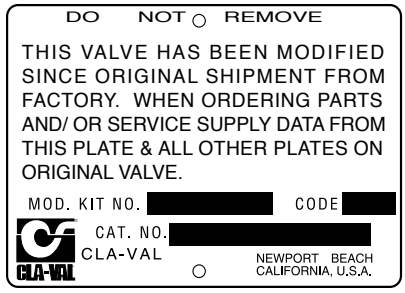
These two brass plates appear on threaded valves 1" through 3" size or flanged valves 1" through 2". It is located on only one side of the valve body.



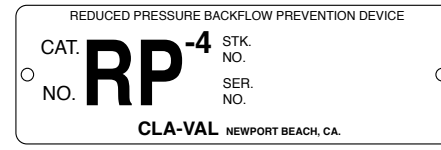
This tag is affixed to the cover of the pilot control valve. The adjustment range appears in the spring range section.



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

Because of the vast number of possible configurations and combinations available, many valves and controls are not shown in published product and price lists. For ordering information, price and availability on product that are not listed, please contact your local Cla-Val office or our factory office located at:

P. O. Box 1325
Newport Beach, California 92659-0325
(949) 722-4800
FAX (949) 548-5441

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)

LIMITED WARRANTY

Automatic valves and controls as manufactured by Cla-Val are warranted for three years from date of shipment against manufacturing defects in material and workmanship that 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, that is returned to our factory, transportation charges prepaid, if upon inspection, the material is found to have been defective at time of original shipment. This warranty is expressly conditioned on the purchaser's providing written notification to Cla-Val immediate 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, Cla-Val shall make no allowance or credit for such repairs or alterations unless authorized in writing by Cla-Val.

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.

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 they 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 any 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.

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 such as diaphragms, discs, o-rings, etc., cannot be returned for credit, unless as part of an unopened vacuum sealed 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, repainting and repackaging as required.
7. Authorized returned goods must be packaged and shipped prepaid to Cla-Val, 1701 Placentia Avenue, Costa Mesa, California 92627.

CLA-VAL™

E-Product I.D. (R-5/05)

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

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

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

www.cla-val.com

Represented By:

CLA-VAL®

— 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 100-01	100-20	Valve Size	Diaphragm Assembly Stock Number 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 100-01	100-20	Valve Size		Repair Kit Stock Number 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	Kit Stock Number 100-21 & 100-22
⅜"	9169901H	2½"	9169910J	N/A
½" & ¾"	9169902F	3"	9169911G	9169905J
1"	9169903D	4"	9169912E	9169911G
1¼" & 1½"	9169904B	6"	9169913C	9169912E
2"	9169905J	8"	99116G	9169913C
		10"	9169939H	99116G
		12"	9169937B	9169939H

Larger Sizes: Consult Factory.

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

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

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

Valve Size	Kit Stock Number 100-04	100-23	Valve Size	Kit Stock Number 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

Larger Sizes: Consult Factory.

Repair Kits for Pilot Control Valves

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

	BUNA-N® (Standard Material)			**VITON** (For KB Control)	
Pilot Control	Kit Stock Number	Pilot Control	Kit Stock Number	Pilot Control	Kit Stock Number
CDB	9170006C	CRM-7	1263901K	CDB-KB	9170012A
CDB-3D	9170023H	CFM-7A	1263901K	CRA-KB	N/A
CDB-3I	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	172601F	CRD Disc Ret. (Spring)	C5255K
		102C-3	172601F		

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

CLA-VAL P.O. Box 1325 • Newport Beach, CA 92659-0325 • Phone: 949-722-4800 • Fax: 949-548-5441 • E-mail: claval@cla-val.com • Website cla-val.com