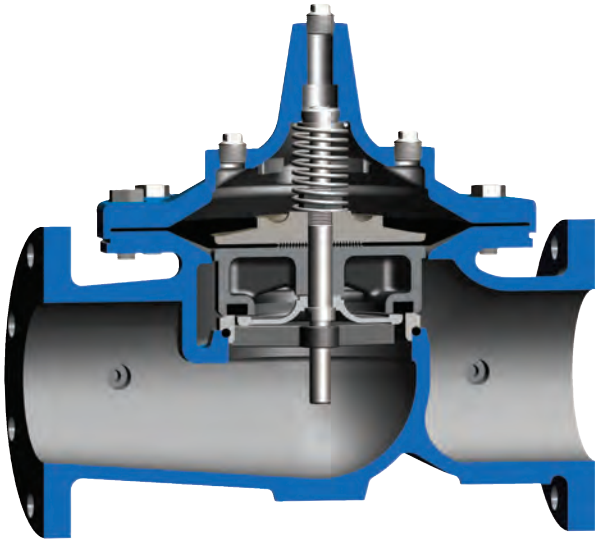
100-01 — MODEL —

(Full Internal Port)

(Sizes 3/8"-36")

Hytrol Valve



NSF/ANSI 372: National Lead Free Mandate "Reduction of Lead in Drinking Water Act"

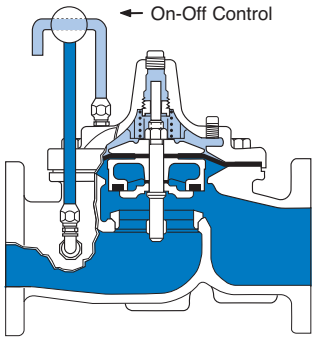
- **Drip-Tight, Positive Seating**
- **Service Without Removal From Line**
- **Threaded, Flanged or Grooved Ends**
- **Globe or Angle Pattern**
- **100% Factory Tested**

The Cla-Val Model 100-01 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. 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.

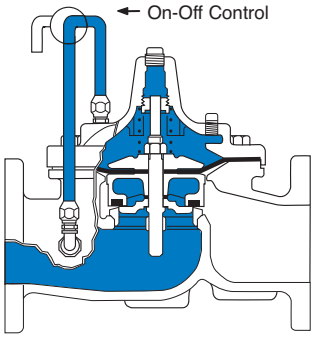
The Model 100-01 is the basic valve used in nearly all Cla-Val Automatic Control Valves. It is the valve of choice for system applications requiring remote control, pressure regulation, solenoid operation, rate of flow control, liquid level control or check valve operation. The rugged simplicity of design 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 threaded, flanged or grooved ends. Its applications are unlimited.

Principle of Operation



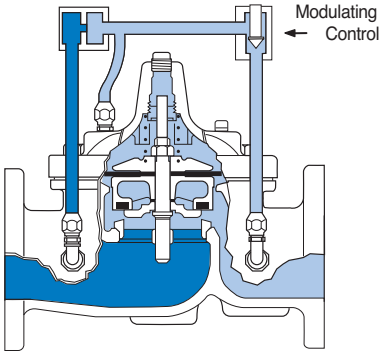
Full Open Operation

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.

Specifications

Model 100-01

Available Sizes

Pattern	Threaded	Flanged	Grooved End
Globe	⅜" - 3"	1½" - 36"	1½"-2"- 2½"- 3"- 4"- 6"- 8"
Angle	1" - 3"	1½" - 16" & 24"	2" - 3" - 4"

Operating Temp. Range

Fluids
-40° to 180° F

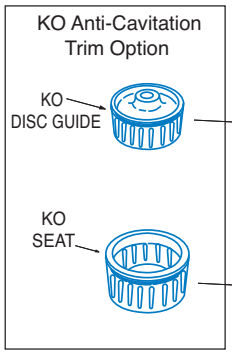
Pressure Ratings (Recommended Maximum Pressure - psi)

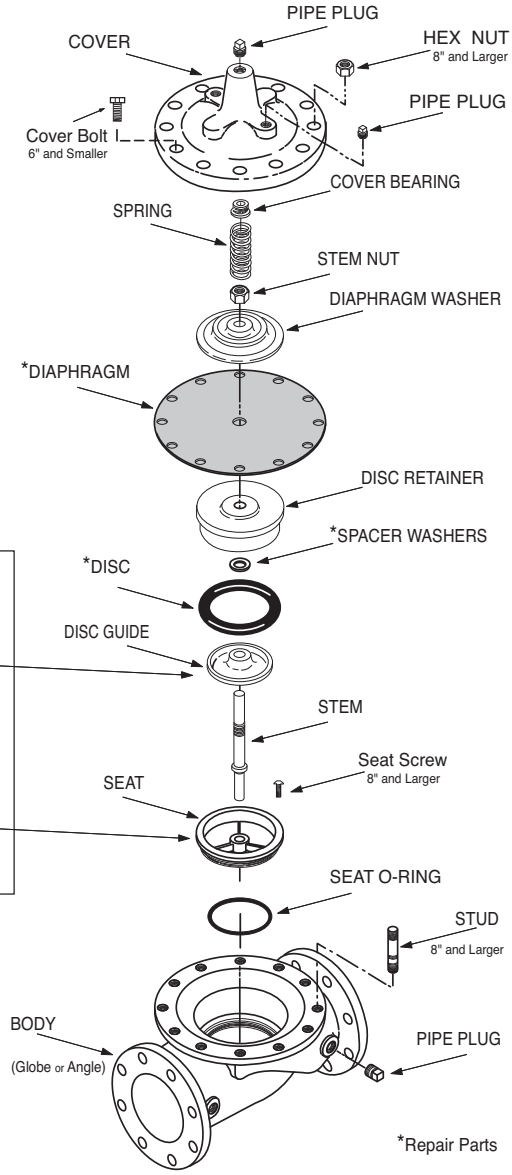
Valve Body & Cover		Pressure Class				
		Flanged			Grooved	Threaded
Grade	Material	ANSI Standards*	150 Class	300 Class	300 Class	End‡ Details
ASTM A536	Ductile Iron	B16.42	250	400	400	400
ASTM A216-WCB	Cast Steel	B16.5	285	400	400	400
UNS 87850	Bronze	B16.24	225	400	400	400

Note: * ANSI standards are for flange dimensions only.
Flanged valves are available faced but not drilled.
‡ End Details machined to ANSI B2.1 specifications.
Valves for higher pressure are available; consult factory for details

Materials

Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes	3/8" - 36" 10 - 900mm	1" - 16" 25 - 40mm	1" - 16" 25 - 40mm
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.			





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
This option NSF 61 Listed and FDA approved, fusion bonded epoxy coating is 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.

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

Functional Data

† Non Guided Stem

Model 100-01

Valve Size		Inches	⅜†	½†	¾†	1†	1	1¼	1½	2	2½	3	4	6	8	10	12	14	16	18	20	24	30	36
		mm.	10	15	20	25	25	32	40	50	65	80	100	150	200	250	300	350	400	450	500	600	750	900
C_V Factor	Globe Pattern	Gal./Min.(gpm.)	1.8	6	8.5	13.3	20	30	32	54	85	115	200	440	770	1245	1725	2300	3130	4463	5345	7655	10150	14020
		Litres/Sec. (l/s.)	.11	.38	.54	.84	1.26	1.89	2	3.4	5.4	7.3	13	28	49	79	109	145	198	282	337	483	640	885
	Angle Pattern	Gal./Min.(gpm.)	—	—	—	—	21	27	29	61	101	139	240	541	990	1575	2500*	3060*	4200*	—	—	9950*	—	—
		Litres/Sec. (l/s.)	—	—	—	—	1.32	1.70	1.83	3.8	6.4	8.8	15	34	62	99	158	193	265	—	—	628	—	—
Equivalent Length of Pipe	Globe Pattern	Feet (ft.)	25	7	16	23	10	19	37	51	53	85	116	211	291	347	467	422	503	612	595	628	1181	2285
		Meters (m.)	7.6	2.2	4.8	7.1	3.1	5.7	12	15.5	16	26	35	64	89	106	142	129	154	187	181	192	360	696
	Angle Pattern	Feet (ft.)	—	—	—	—	9.0	28	46	40	37	58	80	139	176	217	222*	238*	247*	—	—	372*	—	—
		Meters (m.)	—	—	—	—	2.8	8.7	14	12	11	18	25	43	54	66	68	73	75	—	—	113	—	—
K Factor	Globe Pattern		16.3	3.7	5.7	6.1	2.7	3.6	5.9	5.6	4.6	6.0	5.9	6.2	6.1	5.8	6.1	5.0	4.6	5.2	3.9	4.0	6.4	6.4
	Angle Pattern		—	—	—	—	2.5	4.4	7.1	4.4	3.3	4.1	4.1	4.1	3.7	3.6	2.9	2.8	2.6	—	—	2.4	—	—
Liquid Displaced from Cover Chamber When Valve Opens		Fl. Oz	.12	.34	.34	.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		U.S. Gal.	—	—	—	—	.02	.02	.02	.03	.04	.08	.17	.53	1.26	2.51	4.0	6.5	9.6	11	12	29	42	90
		ml	3.5	10.1	10.1	20.7	75.7	75.7	75.7	121	163	303	643	—	—	—	—	—	—	—	—	—	—	—
		Litres	—	—	—	—	—	—	—	—	—	—	—	2.0	4.8	9.5	15.1	24.6	36.2	41.6	45.4	109.8	159	340

*Estimated

C_V Factor

Formulas for computing C_V Factor, Flow (Q) and Pressure Drop ($\triangle P$):

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

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)

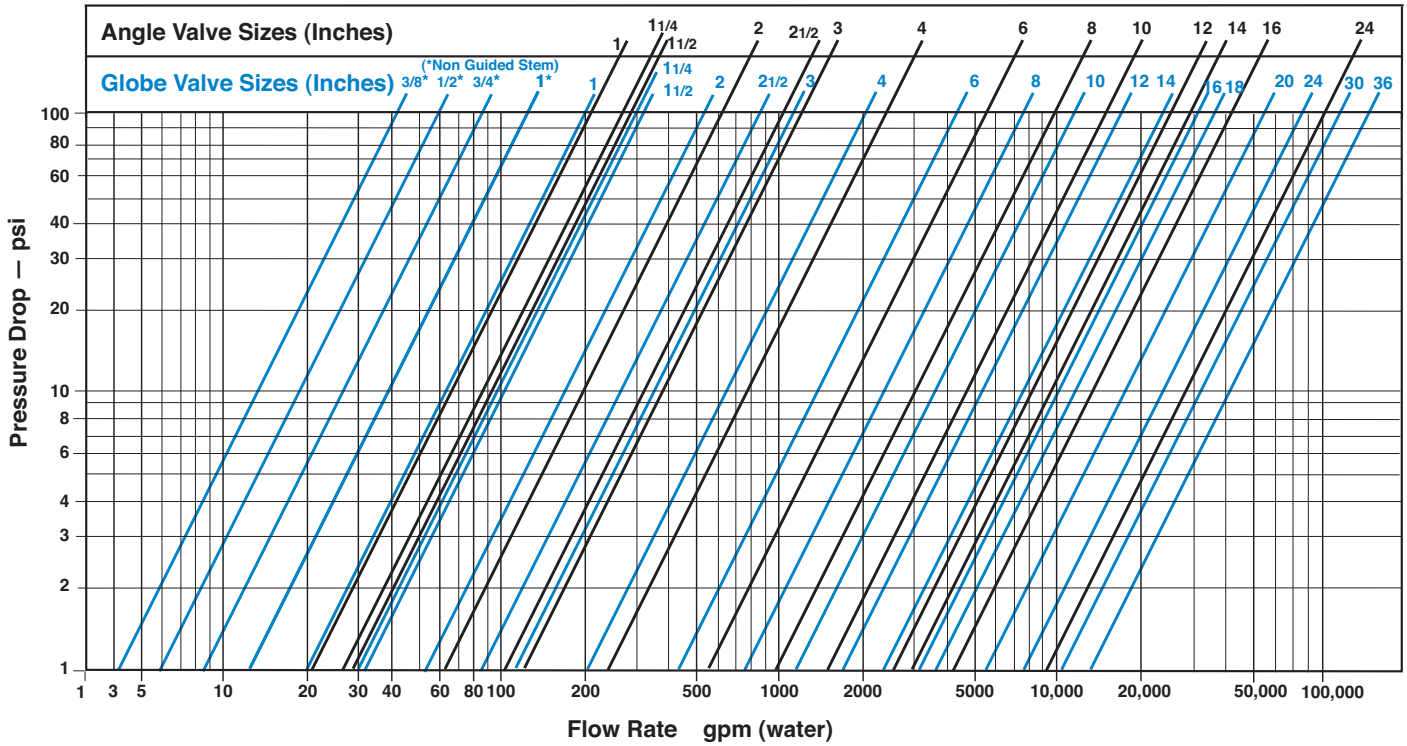
L = Equivalent Length of Pipe (feet)

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

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

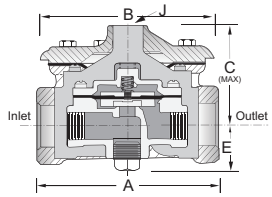
$\triangle P$ = Pressure Drop in (psi) or (bar)

Model 100-01 Flow Chart (Based on normal flow through a wide open valve)

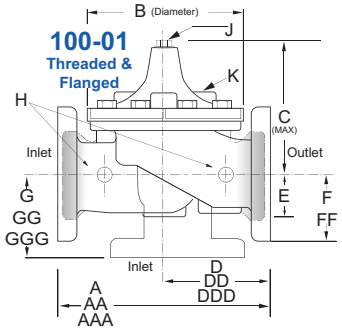


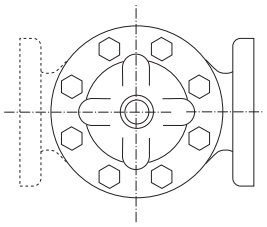
Dimensions

100-01
3/8", 1/2", 3/4", 1"
Auxillary Hytrol Valves with non Guided Stems

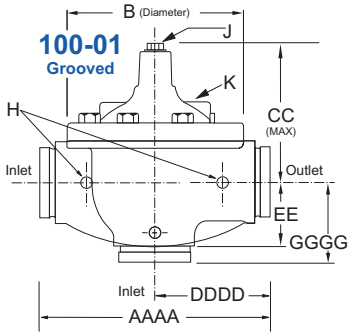


100-01
Threaded & Flanged





100-01
Grooved



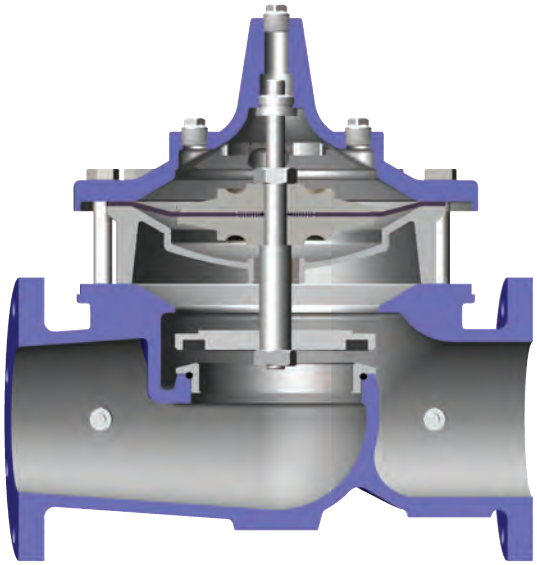
Valve Size (Inches)	3/8*	1/2*	3/4*	1*	1	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24	30	36
A Threaded	2.75	3.50	3.50	5.12	7.25	7.25	7.25	9.38	11.00	12.50	—	—	—	—	—	—	—	—	—	—	—	—
AA 150 ANSI	—	—	—	—	—	—	8.50	9.38	11.00	12.00	15.00	20.00	25.38	29.75	34.00	39.00	41.38	46.00	52.00	61.50	63.00	72.75
AAA 300 ANSI	—	—	—	—	—	—	9.00	10.00	11.62	13.25	15.62	21.00	26.38	31.12	35.50	40.50	43.50	47.64	53.62	63.24	64.50	74.75
AAAA Grooved End	—	—	—	—	—	—	8.50	9.00	11.00	12.50	15.00	20.00	25.38	—	—	—	—	—	—	—	—	—
B Diameter	2.50	3.12	3.12	4.38	5.62	5.62	5.62	6.62	8.00	9.12	11.50	15.75	20.00	23.62	28.00	32.75	35.50	41.50	45.00	53.16	56.00	66.00
C Maximum	2.33	5.88	5.88	6.25	5.50	5.50	5.50	6.50	7.56	8.19	10.62	13.38	16.00	17.12	20.88	24.19	25.00	39.06	41.90	43.93	54.60	59.00
CC Maximum Grooved End	—	—	—	—	—	—	4.75	5.75	6.88	7.25	9.31	12.12	14.62	—	—	—	—	—	—	—	—	—
D Threaded	—	—	—	—	3.25	3.25	3.25	4.75	5.50	6.25	—	—	—	—	—	—	—	—	—	—	—	—
DD 150 ANSI	—	—	—	—	—	—	4.00	4.75	5.50	6.00	7.50	10.00	12.69	14.88	17.00	19.50	20.81	—	—	30.75	—	—
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	—	—	31.62	—	—
DDDD Grooved End	—	—	—	—	—	—	—	4.75	—	6.00	7.50	—	—	—	—	—	—	—	—	—	—	—
E	1.25	0.88	0.88	1.63	1.12	1.12	1.12	1.50	1.69	2.06	3.19	4.31	5.31	9.25	10.75	12.62	15.50	12.95	15.00	17.75	21.31	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	15.00	16.50	19.25	22.50	28.50
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	15.00	16.50	19.25	24.00	30.00
G Threaded	—	—	—	—	1.88	1.88	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	—	—	22.06	—	—
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	—	—	22.90	—	—
GGGG Grooved End	—	—	—	—	—	—	—	3.25	—	4.25	5.00	—	—	—	—	—	—	—	—	—	—	—
H NPT Body Tapping	—	0.125	0.125	0.25	0.375	0.375	0.375	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
J NPT Cover Center Plug	0.125	0.125	0.125	0.25	0.25	0.25	0.25	0.50	0.50	0.50	0.75	0.75	1.00	1.00	1.25	1.50	2.00	1.00	1.00	1.00	2.00	2.00
K NPT Cover Tapping	—	0.125	0.125	0.25	0.375	0.375	0.375	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Valve Stem Int. Thread UNF	—	—	—	—	10-32	10-32	10-32	10-32	10-32	1/4-28	1/4-28	3/8-24	3/8-24	3/8-24	3/8-24	3/8-24	1/2-20	3/4-16	3/4-16	3/4-16	3/4-16	3/4-16
Stem Travel	—	—	—	—	0.40	0.40	0.40	0.60	0.70	0.80	1.10	1.70	2.30	2.80	3.40	4.00	4.50	5.10	5.63	6.75	7.50	8.50
Approx. Ship Weight (lbs)	3	3	8	8	15	15	15	35	50	70	140	285	500	780	1165	1600	2265	2982	3900	6200	7703	11720

Valve Size (mm)	10*	15*	20*	25*	25	32	40	50	65	80	100	150	200	250	300	350	400	450	500	600	750	900
A Threaded	70	89	89	130	184	184	184	238	279	318	—	—	—	—	—	—	—	—	—	—	—	—
AA 150 ANSI	—	—	—	—	—	—	216	238	279	305	381	508	645	756	864	991	1051	1168	1321	1562	1600	1848
AAA 300 ANSI	—	—	—	—	—	—	229	254	295	337	397	533	670	790	902	1029	1105	1210	1326	1606	1638	1899
AAAA Grooved End	—	—	—	—	—	—	216	228	279	318	381	508	645	—	—	—	—	—	—	—	—	—
B Diameter	64	80	80	111	143	143	143	168	203	232	292	400	508	600	711	832	902	1054	1143	1350	1422	1676
C Maximum	59	149	149	159	140	140	140	165	192	208	270	340	406	435	530	614	635	992	1064	1116	1387	1499
CC Maximum Grooved End	—	—	—	—	—	—	120	146	175	184	236	308	371	—	—	—	—	—	—	—	—	—
D Threaded	—	—	—	—	83	83	83	121	140	159	—	—	—	—	—	—	—	—	—	—	—	—
DD 150 ANSI	—	—	—	—	—	—	102	121	140	152	191	254	322	378	432	495	528	—	—	781	—	—
DDD 300 ANSI	—	—	—	—	—	—	108	127	149	162	200	267	337	395	451	514	549	—	—	803	—	—
DDDD Grooved End	—	—	—	—	—	—	—	121	—	152	191	—	—	—	—	—	—	—	—	—	—	—
E	32	23	23	42	29	29	29	38	43	52	81	110	135	235	273	321	394	329	381	451	541	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	381	419	489	572	724
FF 300 ANSI	—	—	—	—	—	—	78	83	95	105	127	159	191	222	260	292	324	381	419	489	610	762
G Threaded	—	—	—	—	48	48	48	83	102	114	—	—	—	—	—	—	—	—	—	—	—	—
GG 150 ANSI	—	—	—	—	—	—	102	83	102	102	127	152	203	219	349	378	399	—	—	560	—	—
GGG 300 ANSI	—	—	—	—	—	—	102	89	110	111	135	165	216	236	368	397	419	—	—	582	—	—
GGGG Grooved End	—	—	—	—	—	—	—	83	—	108	127	—	—	—	—	—	—	—	—	—	—	—
H NPT Body Tapping	—	0.125	0.125	0.25	0.375	0.375	0.375	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
J NPT Cover Center Plug	0.125	0.125	0.125	0.25	0.25	0.25	0.25	0.50	0.50	0.50	0.75	0.75	1.00	1.00	1.25	1.50	2.00	1.00	1.00	1.00	2.00	2.00
K NPT Cover Tapping	—	0.125	0.125	0.25	0.375	0.375	0.375	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Stem Travel	—	—	—	—	10	10	10	15	18	20	28	43	58	71	86	102	114	130	143	171	190	216
Approx. Ship Weight (kgs)	1.4	1.4	1.4	6	7	7	7	16	23	32	64	129	227	354	528	726	1027	1353	1769	2812	3494	5316

100-02 — MODEL —

(Full Internal Port)

Powertrol Valve



- **Drip-Tight, Positive Seating**
- **Service Without Removal From Line**
- **Threaded or Flanged Ends**
- **Globe or Angle Pattern**
- **Every Valve Factory Tested**

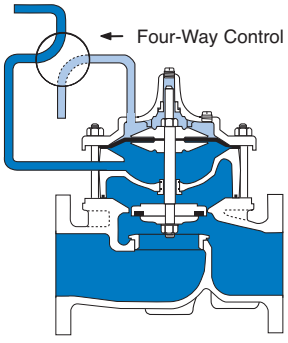
The Cla-Val Model 100-02 is a hydraulically operated, diaphragm actuated, globe, or angle pattern valve. It consists of four major components: body, intermediate chamber, diaphragm assembly, and cover. The diaphragm assembly is the only moving part.

The diaphragm assembly which is guided top and center by a precision machined stem, utilizes a non-wicking diaphragm of nylon fabric bonded with synthetic rubber. The diaphragm forms a seal between the cover chamber and intermediate chamber. A synthetic rubber disc retained on three and one half sides forms a drip-tight seal with the renewable seat when pressure is applied above the diaphragm. As pressure above the diaphragm is relieved and pressure is applied below the diaphragm, the valve opens wide for full flow. The rate of closing or opening can be controlled by modulating flow into or out of the diaphragm chambers.

The Model 100-02 is recommended where independent operating pressure is desired. Available in various materials and in a full range of sizes, with either threaded or flanged ends, its applications are many and varied.

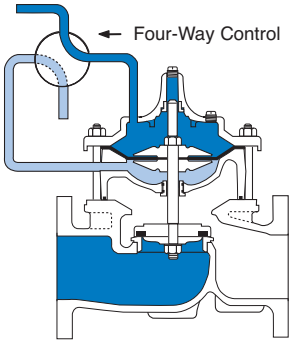
see page 2 for approvals

Principle of Operation



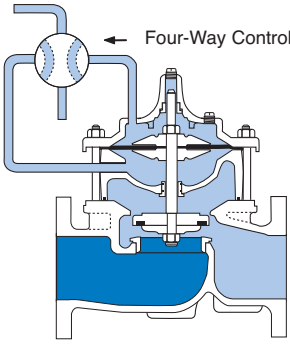
Full Open Operation

When operating pressure below the diaphragm is applied and operating, pressure is relieved from the cover chamber and, the valve is held open, allowing full flow.



Tight Closing Operation

When pressure below the diaphragm is relieved and operating pressure 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. A Cla-Val four-way pilot control with "lock" position can maintain this balance by stopping flow in the pilot control system.

Available Sizes

Pattern	Threaded	Flanged	Grooved End
Globe	⅜" - 3"	1½" - 24"	1½"-2"- 2½"- 3"- 4"- 6"- 8"
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
Grade	Material	ANSI Standards*	150 Class	300† Class	End‡ Details
ASTM A536	Ductile Iron	B16.42	250	400	400
ASTM A216-WCB	Cast Steel	B16.5	285	400	400
UNS 87850	Bronze	B16.24	225	400	400

Note: * ANSI standards are for flange dimensions only. Flanged valves are available faced but not drilled.
‡ End Details machined to ANSI B2.1 specifications.
† Consult factory when Maximum Operating Pressure Differential (MOPD) is greater than 400 PSID

"Valves for higher pressure are available; consult factory for details"

Materials

Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes	1¼" - 24" 32 - 600mm	1¼" - 16" 32 - 400mm	1¼" - 16" 32 - 400mm
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

Epoxy Coating - suffix KC

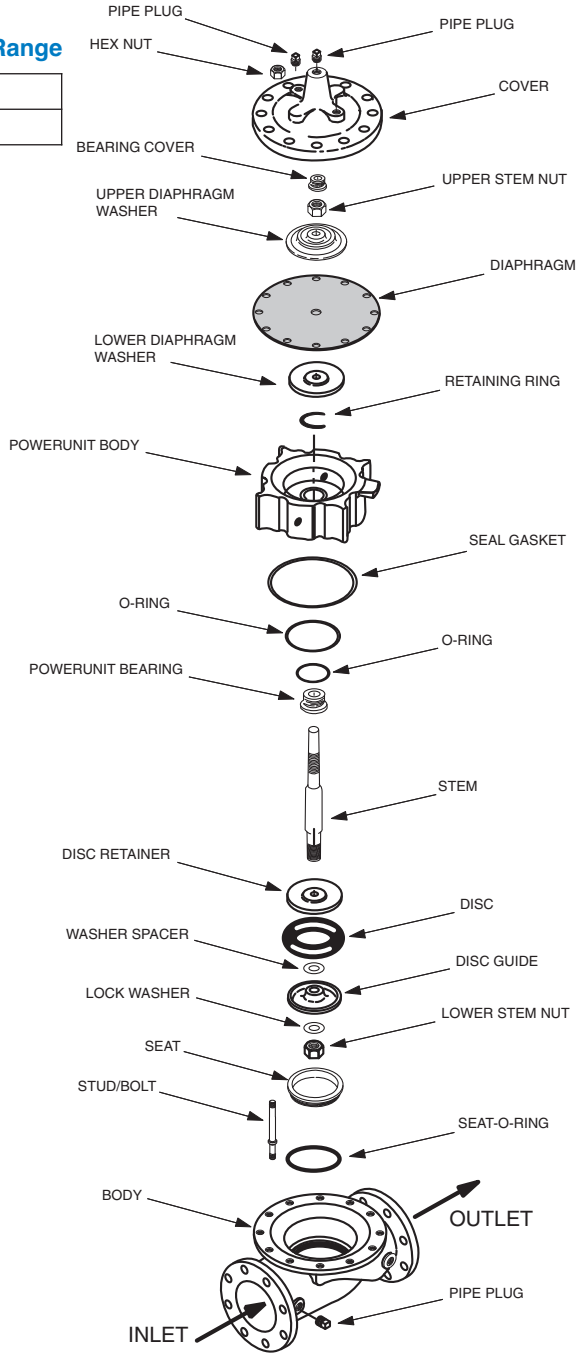
This option NSF 61 Listed and FDA approved, fusion bonded epoxy coating is for use with cast iron, ductile iron or steel valves. This coating is resistant to various water conditions, certain acids, chemicals, solvents and alkalies. Epoxy coatings are applied in accordance with AWWA coating specifications C116-03. Do not use with temperatures above 175° F

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 coating above 175°F.

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. The option is best suited for valves used in on-off (non-modulating) service.



Approvals

NSF/ANSI 372: National Lead Free Mandate "Reduction of Lead in Drinking Water Act"

NSF International recognizes Cla-Val as complying with NSF/ANSI 61 and all applicable requirements.

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

Functional Data

Model 100-02

Valve Size		Inches	⅜	½	¾	1	1¼	1½	2	2½	3	4	6	8	10	12	14	16	18	20	24	30
		mm.	10	15	20	25	32	40	50	65	80	100	150	200	250	300	350	400	450	500	600	750
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	3725	5345	7655	10150
		Litres/Sec. (l/s.)	.43	1.44	2.04	3.2	7.2	7.7	13	20	28	48	106	185	299	414	552	706	894	1286	1837	2436
	Angle Pattern	Gal./Min. (gpm.)	—	—	—	—	—	29	61	101	139	240	541	990	1575	2500*	3060*	4200*	—	—	—	—
		Litres/Sec. (l/s.)	—	—	—	—	—	7	15	24	33	58	130	238	378	600	734	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	612	595	628	1181
		Meters (m.)	7.6	2.2	4.8	7.1	5.7	12	15.5	16	26	35	64	89	106	142	129	154	187	181	192	552
	Angle Pattern	Feet (ft.)	—	—	—	—	—	46	40	37	58	80	139	176	217	222*	238*	247*	—	—	—	—
		Meters (m.)	—	—	—	—	—	14	12	12	18	25	43	54	66	68	73	75	—	—	—	—
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	5.2	4.6	4.0	5.3
	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	11	12	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	41.6	45.4	109.8	197

*Estimated

C_V Factor

Formulas for computing C_V Factor, Flow (Q) and Pressure Drop ($\triangle P$):

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

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)

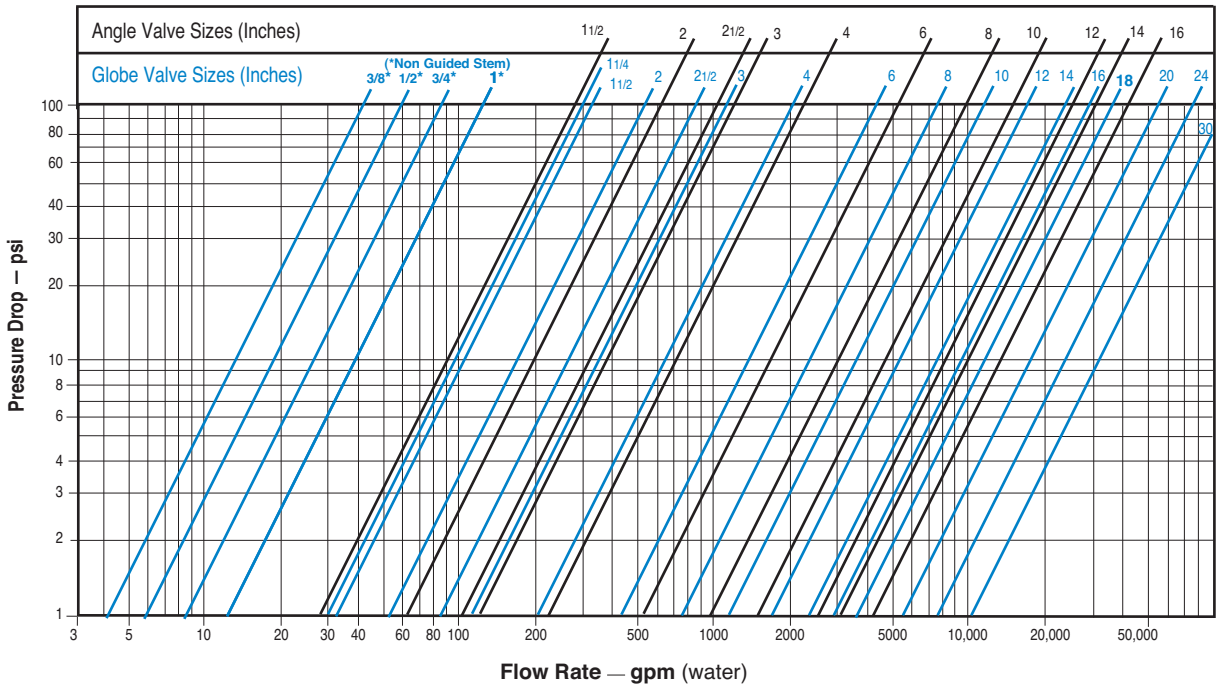
L = Equivalent Length of Pipe (feet)

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

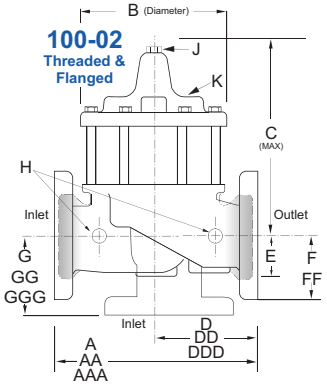
V = Fluid Velocity (feet per second) or (meters per second)

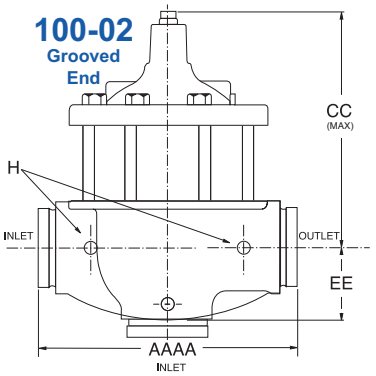
$\triangle P$ = Pressure Drop in (psi) or (bar)

Model 100-02 Flow Chart (Based on normal flow through a wide open valve)



Dimensions





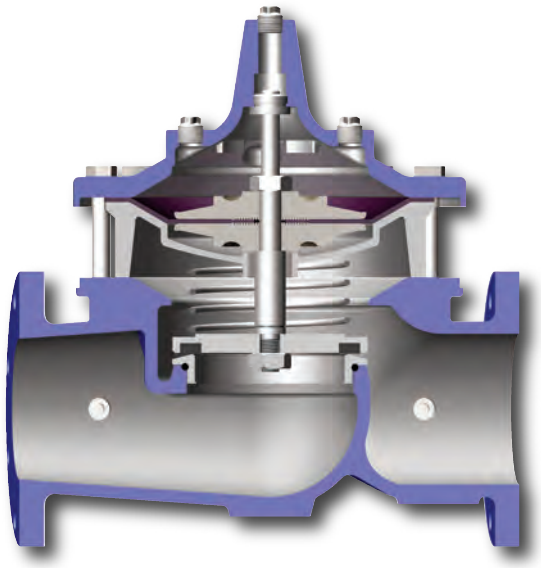
Valve Size (Inches)	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24	30
A Threaded	2.75	3.50	3.50	5.12	7.25	7.25	9.38	11.00	12.50	—	—	—	—	—	—	—	—	—	—	—
AA 150 ANSI	—	—	—	—	—	8.50	9.38	11.00	12.00	15.00	20.00	25.38	29.75	34.00	39.00	41.38	46.00	52.00	61.50	63.00
AAA 300 ANSI	—	—	—	—	—	9.00	10.00	11.62	13.25	15.62	21.00	26.38	31.12	35.50	40.50	43.50	47.64	53.62	63.24	64.50
AAAA Grooved End	—	—	—	—	—	8.50	9.00	11.00	12.50	15.00	20.00	25.38	—	—	—	—	—	—	—	—
B Diameter	2.50	3.12	3.12	4.38	5.62	5.62	6.62	8.00	9.12	11.50	15.75	20.00	23.62	28.00	32.75	35.50	41.50	45.00	53.16	56.00
C Maximum	2.33	5.88	5.88	6.25	7.62	7.62	8.56	10.31	11.19	14.25	18.44	21.81	23.38	29.31	32.12	35.00	49.43	53.09	56.50	68.70
CC Maximum Grooved End	—	—	—	—	—	6.87	7.81	9.63	10.25	13.50	17.18	20.43	—	—	—	—	—	—	—	—
D Threaded	—	—	—	—	3.25	3.25	4.75	5.50	6.25	—	—	—	—	—	—	—	—	—	—	—
DD 150 ANSI	—	—	—	—	—	4.00	4.75	5.50	6.00	7.50	10.00	12.69	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	0.88	1.63	1.12	1.12	1.50	1.69	2.06	3.19	4.31	5.31	9.25	10.75	12.62	15.50	12.95	15.00	17.75	21.31
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	15.00	16.50	22.06	22.50
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	15.00	16.50	22.90	24.00
G Threaded	—	—	—	—	1.88	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	—	0.125	0.125	0.25	0.375	0.375	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00
J NPT Cover Center Plug	0.125	0.125	0.125	0.25	0.25	0.25	0.50	0.50	0.50	0.75	0.75	1.00	1.00	1.25	1.50	2.00	1.50	1.50	1.50	2.00
K NPT Cover Tapping	—	0.125	0.125	0.25	0.375	0.375	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00
Valve Stem Int. Thread UNF	—	—	—	—	10-32	10-32	10-32	10-32	1/4-28	1/4-28	3/8-24	3/8-24	3/8-24	3/8-24	3/8-24	1/2-20	3/4-16	3/4-16	3/4-16	3/4-16
Stem Travel	—	—	—	—	0.40	0.40	0.60	0.70	0.80	1.10	1.70	2.30	2.80	3.40	4.00	4.50	5.10	5.63	6.75	7.50
Approx. Ship Weight (lbs)	8	8	8	13	22	22	40	65	95	190	320	650	940	1675	2460	3100	4300	5400	8150	10300

Valve Size (mm)	10	15	20	25	32	40	50	65	80	100	150	200	250	300	350	400	450	500	600	750
A Threaded	70	89	89	130	184	184	238	279	318	—	—	—	—	—	—	—	—	—	—	—
AA 150 ANSI	—	—	—	—	—	216	238	279	305	381	508	645	756	864	991	1051	1168	1321	1562	1600
AAA 300 ANSI	—	—	—	—	—	229	254	295	337	397	533	670	790	902	1029	1105	1210	1326	1606	1638
AAAA Grooved End	—	—	—	—	—	216	228	279	318	381	508	645	—	—	—	—	—	—	—	—
B Diameter	64	80	80	111	143	143	168	203	232	292	400	508	600	711	832	902	1054	1143	1350	1422
C Maximum	59	149	149	159	194	194	217	262	284	362	468	554	594	744	816	889	1255	1348	1435	1745
CC Maximum Grooved End	—	—	—	—	—	174	174	198	245	260	343	436	—	—	—	—	—	—	—	—
D Threaded	—	—	—	—	83	83	121	140	159	—	—	—	—	—	—	—	—	—	—	—
DD 150 ANSI	—	—	—	—	—	102	121	140	152	191	254	322	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	23	42	29	29	38	43	52	81	110	135	235	273	321	394	329	381	451	541
EE Grooved End	—	—	—	—	—	52	64	73	79	108	152	192	—	—	—	—	—	—	—	—
F 150 ANSI	—	—	—	—	—	64	76	89	95	114	140	171	203	241	267	298	381	419	489	572
FF 300 ANSI	—	—	—	—	—	78	83	95	105	127	159	191	222	260	292	324	381	419	489	610
G Threaded	—	—	—	—	48	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	—	0.125	0.125	0.25	0.375	0.375	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00
J NPT Cover Center Plug	0.125	0.125	0.125	0.25	0.25	0.25	0.50	0.50	0.50	0.75	0.75	1.00	1.00	1.25	1.50	2.00				2.00
K NPT Cover Tapping	—	0.125	0.125	0.25	0.375	0.375	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00
Valve Stem Int. Thread UNF	—	—	—	—	10-32	10-32	10-32	10-32	1/4-28	1/4-28	3/8-24	3/8-24	3/8-24	3/8-24	3/8-24	1/2-20	3/4-16	3/4-16	3/4-16	3/4-16
Stem Travel	—	—	—	—	10	10	15	18	20	28	43	58	71	86	102	114	130	143	171	190
Approx. Ship Weight (kgs)	1.4	1.4	1.4	6	10	10	18	30	43	86	145	295	426	760	1116	1406	1950	2449	3696	4672

100-03 — MODEL —

(Full Internal Port)

Powercheck Valve



- **Built-in Automatic Check Valve**
- **Globe or Angle Pattern**
- **Drip-Tight, Positive Seating**
- **Threaded or Flanged Ends**
- **Packless Construction**

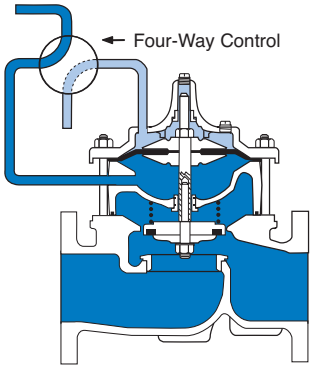
The Cla-Val Model 100-03 Powercheck Valve is a hydraulically operated diaphragm valve with a built-in check feature to prevent return flow. Available in globe or angle pattern, it consists of four major components: body, intermediate chamber, diaphragm assembly, and cover. The diaphragm assembly is the only moving part.

The diaphragm assembly is guided top and center by a precision machined stem and utilizes a non-wicking diaphragm of nylon fabric bonded with synthetic rubber. A synthetic rubber disc retained on three and one half sides forms a drip-tight seal with the renewable seat when pressure is applied above the diaphragm. When pressure above the diaphragm is relieved, the valve opens wide. The rate of closing or opening can be controlled by modulating flow into or out of the diaphragm chambers.

When a pressure reversal occurs, the valve will immediately close, preventing reverse flow thru the valve. The split stem will allow the disc retainer assembly to check closed regardless of the position of the diaphragm.

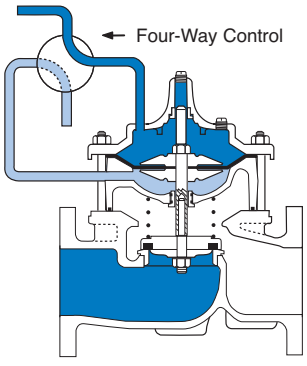
NSF/ANSI 372: National Lead Free Mandate "Reduction of Lead in Drinking Water Act"

Principle of Operation



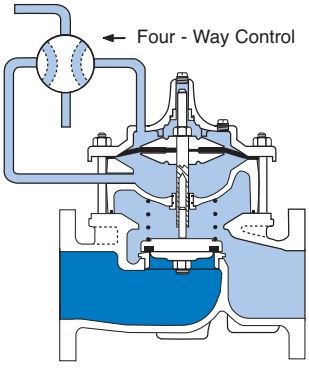
Full Open Operation

When operating pressure below the diaphragm is applied and pressure is relieved from the cover chamber, the valve is held open allowing full flow.



Tight Closing Operation

When pressure below the diaphragm is relieved and operating pressure is applied to the cover chamber, the valve closes drip-tight.



Check Action

When a static condition or pressure reversal occurs, the split stem design allows the valve to instantly check closed. Return flow is prevented regardless of the diaphragm's position.

Note: For optimum operation of built-in check feature, installation with stem vertically up is recommended.

Specifications

Available Sizes

Pattern	Threaded	Flanged
Globe	2 ½" - 3"	2 ½" - 16"
Angle	2 ½" - 3"	2 ½" - 16"

Operating Temp. Range

Fluids
-40° to 180° F

Pressure Ratings (Recommended Maximum Pressure - psi)

Valve Body & Cover		Pressure Class				
		Flanged			Grooved	Threaded
Grade	Material	ANSI Standards*	150 Class	300 Class	300 Class	End‡ Details
ASTM A536	Ductile Iron	B16.42	250	400	400	400
ASTM A216-WCB	Cast Steel	B16.5	285	400	400	400
UNS 87850	Bronze	B16.24	225	400	400	400

Note: * ANSI standards are for flange dimensions only.
Flanged valves are available faced but not drilled.
‡ End Details machined to ANSI B2.1 specifications.
Valves for higher pressure are available; consult factory for details

Materials

Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes	2½" - 16" 65 - 400mm	2½" - 16" 65 - 400mm	2½" - 16" 65 - 400mm
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.			

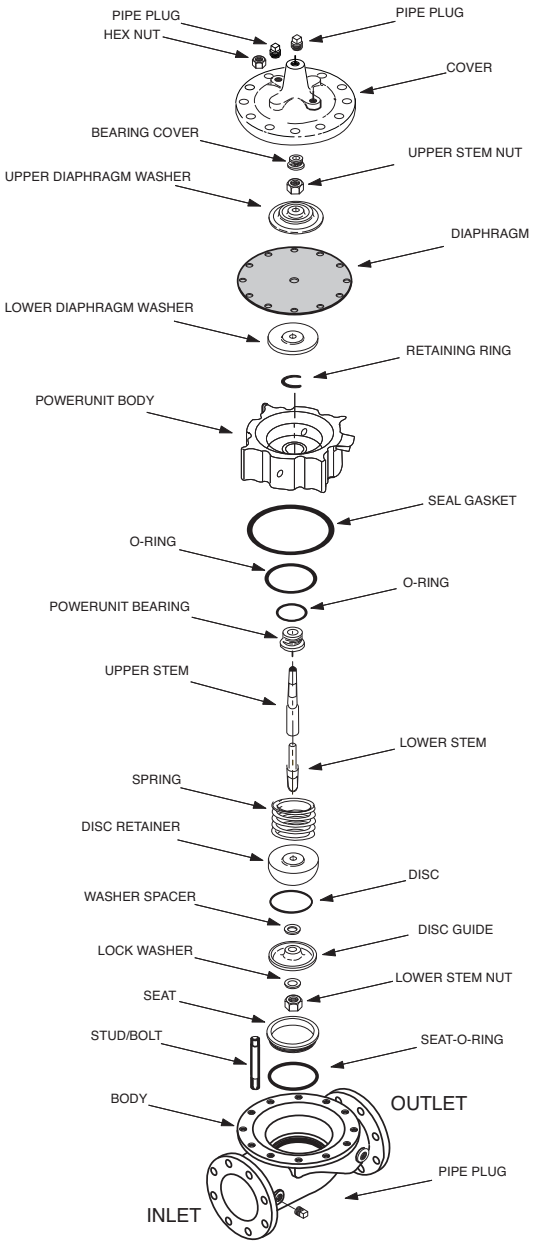
Options

Epoxy Coating - suffix KC

This option NSF 61 Listed and FDA approved, fusion bonded epoxy coating is 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

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 coating above 175° F.



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

Valve Size		Inches	2½	3	4	6	8	10	12	14	16
		mm.	65	80	100	150	200	250	300	350	400
C_V Factor	Globe Pattern	Gal./Min. (gpm.)	85	115	200	440	770	1245	1725	2300	2940
		Litres/Sec. (l/s.)	20	28	48	106	185	299	414	552	706
	Angle Pattern	Gal./Min. (gpm.)	101	139	240	541	990	1575	2500*	3060*	4200*
		Litres/Sec. (l/s.)	24	33	58	130	238	378	600	734	1008
Equivalent Length of Pipe	Globe Pattern	Feet (ft.)	53	85	116	211	291	347	467	422	503
		Meters (m.)	16	26	35	64	89	106	142	129	154
	Angle Pattern	Feet (ft.)	37	58	80	139	176	217	222*	238*	247*
		Meters (m.)	12	18	25	43	54	66	68	73	75
K Factor	Globe Pattern		4.6	6.0	5.9	6.2	6.1	5.8	6.1	5.0	5.2
	Angle Pattern		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	—	—	—	—	—	—	—	—	—
		U.S. Gal.	.04	.08	.17	.53	1.26	2.51	4.0	6.5	9.6
		ml	163	303	643	—	—	—	—	—	—
		Litres	—	—	—	2.0	4.8	9.5	15.1	24.6	36.2

*Estimated

C_V Factor

Formulas for computing C_V Factor, Flow (Q) and Pressure Drop ($\triangle P$):

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

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)

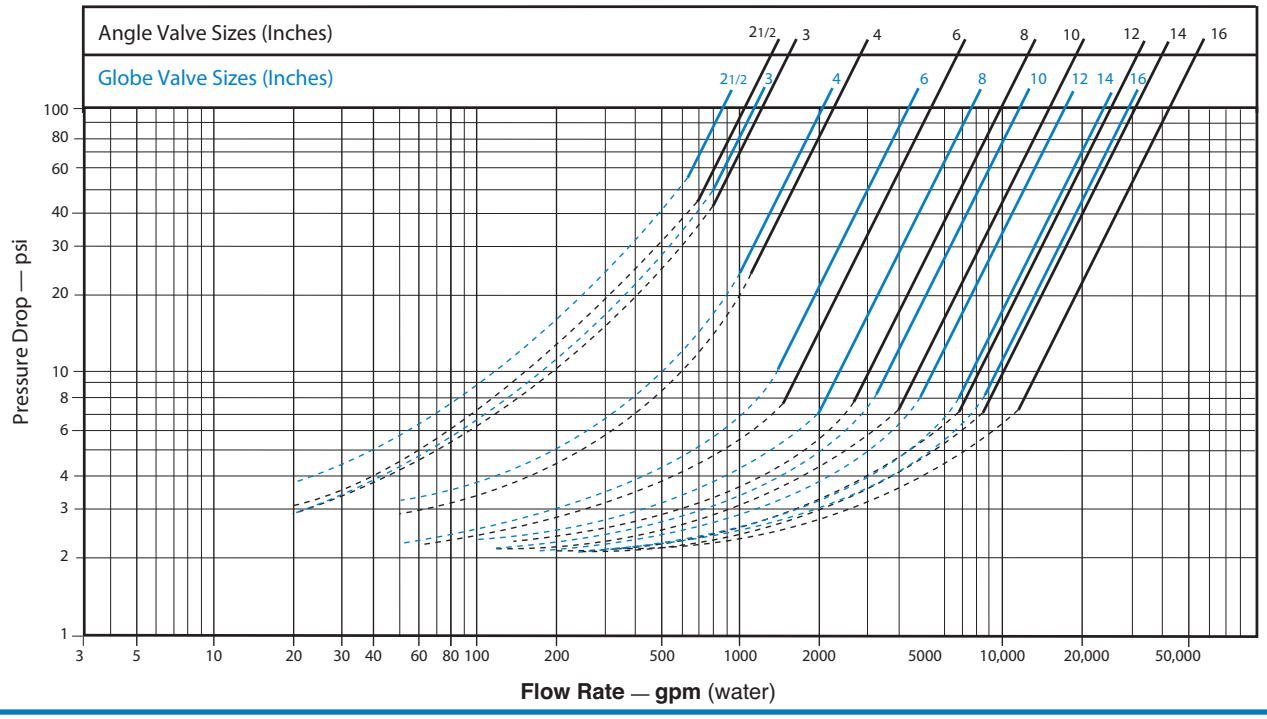
L = Equivalent Length of Pipe (feet)

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

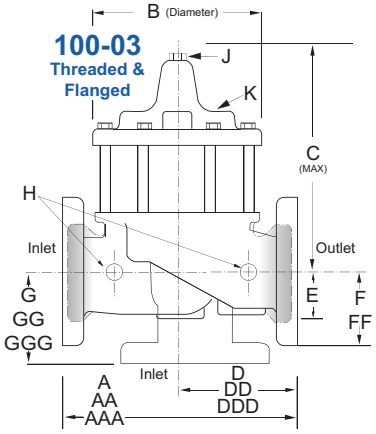
V = Fluid Velocity (feet per second) or (meters per second)

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

Model 100-03 Flow Chart (Based on normal flow through a wide open valve)



Dimensions



Valve Size (Inches)	**2½**	**3**	**4**	**6**	**8**	**10**	**12**	**14**	**16**
A Threaded	11.00	12.50	—	—	—	—	—	—	—
AA 150 ANSI	11.00	12.00	15.00	20.00	25.38	29.75	34.00	39.00	41.38
AAA 300 ANSI	11.62	13.25	15.62	21.00	26.38	31.12	35.50	40.50	43.50
B Diameter	8.00	9.12	11.50	15.75	20.00	23.62	28.00	32.75	35.50
C Maximum	10.31	11.19	14.25	18.44	21.81	23.38	29.31	32.12	35.00
D Threaded	5.50	6.25	—	—	—	—	—	—	—
DD 150 ANSI	5.50	6.00	7.50	10.00	12.69	14.88	17.00	19.50	20.69
DDD 300 ANSI	5.81	6.63	7.81	10.50	13.19	15.56	17.75	20.25	21.75
E	1.69	2.06	3.19	4.31	5.31	9.25	10.75	12.62	15.50
F 150 ANSI	3.50	3.75	4.50	5.50	6.75	8.00	9.50	10.50	11.75
FF 300 ANSI	3.75	4.13	5.00	6.25	7.50	8.75	10.25	11.50	12.75
G Threaded	4.00	4.50	—	—	—	—	—	—	—
GG 150 ANSI	4.00	4.00	5.00	6.00	8.00	8.62	13.75	14.88	15.69
GGG 300 ANSI	4.31	4.38	5.31	6.50	8.50	9.31	14.50	15.62	16.50
H NPT Body Tapping	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00
J NPT Cover Center Plug	0.50	0.50	0.75	0.75	1.00	1.00	1.25	1.50	2.00
K NPT Cover Tapping	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00
Stem Travel	0.70	0.80	1.10	1.70	2.30	2.80	3.40	4.00	4.50
Approx. Ship Weight (lbs)	65	95	190	320	650	940	1675	2460	3100

Valve Size (Inches)	**65**	**80**	**100**	**150**	**200**	**250**	**300**	**350**	**400**
A Threaded	279	318	—	—	—	—	—	—	—
AA 150 ANSI	279	305	381	508	645	756	864	991	1051
AAA 300 ANSI	295	337	397	533	670	790	902	1029	1105
B Diameter	203	232	292	400	508	600	711	832	902
C Maximum	262	284	362	468	554	594	744	816	889
D Threaded	140	159	—	—	—	—	—	—	—
DD 150 ANSI	140	152	191	254	322	378	432	495	526
DDD 300 ANSI	148	168	198	267	335	395	451	514	552
E	43	52	81	109	135	235	273	321	394
F 150 ANSI	89	95	114	140	171	203	241	267	298
FF 300 ANSI	95	105	127	159	191	222	260	292	324
G Threaded	102	114	—	—	—	—	—	—	—
GG 150 ANSI	102	102	127	152	203	219	349	378	399
GGG 300 ANSI	110	111	135	165	216	236	368	397	419
H NPT Body Tapping	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00
J NPT Cover Center Plug	0.50	0.50	0.75	0.75	1.00	1.00	1.25	1.50	2.00
K NPT Cover Tapping	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00
Stem Travel	18	20	28	43	58	71	86	102	114
Approx. Ship Weight (lbs)	30	43	86	145	295	426	760	1116	1406

Note: Various Flange Drilling to a Foreign and intranational Standards and Specifications are Available on Request.

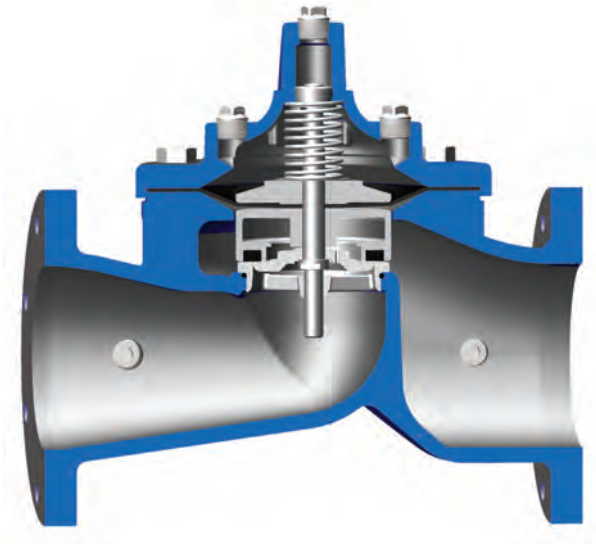
Cla-Val Control Valves operate with maximum efficiency when mounted in horizontal piping with the main valve cover UP, however, other positions are acceptable. Due to component size and weight of 8 inch and larger valves, installation with cover UP is advisable. We recommend isolation valves be installed 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.

100-20 —MODEL—

(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.

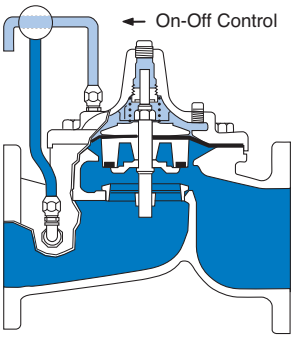
The diaphragm assembly is guided top and bottom by a precision machined stem which utilizes a non-wicking diaphragm of nylon fabric bonded with synthetic rubber. A resilient synthetic rubber disc, retained on three and one-half sides by a disc retainer, forms a drip-tight seal with the renewable seat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

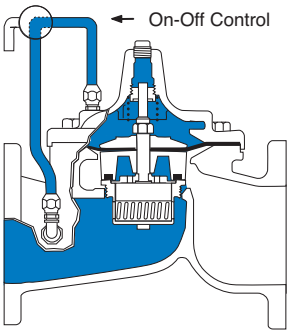
NSF/ANSI 372: National Lead Free Mandate "Reduction of Lead in Drinking Water Act"

Principle of Operation



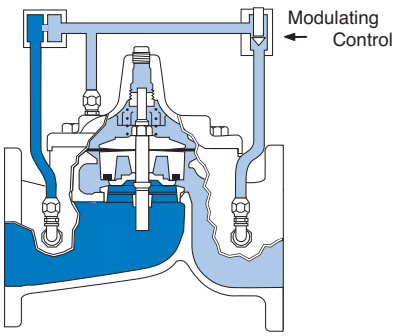
Full Open Operation

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.

Available Sizes

Pattern	Flanged
Globe	3", 4", 6", 8", 10", 12", 14", 16", 18", 20", 24", 30", 36, 42", 48"
Angle	4", 6", 8", 10", 12", 14", 16", 18", 20", 24"

Operating Temp. Range

Fluids
-40° to 180° F

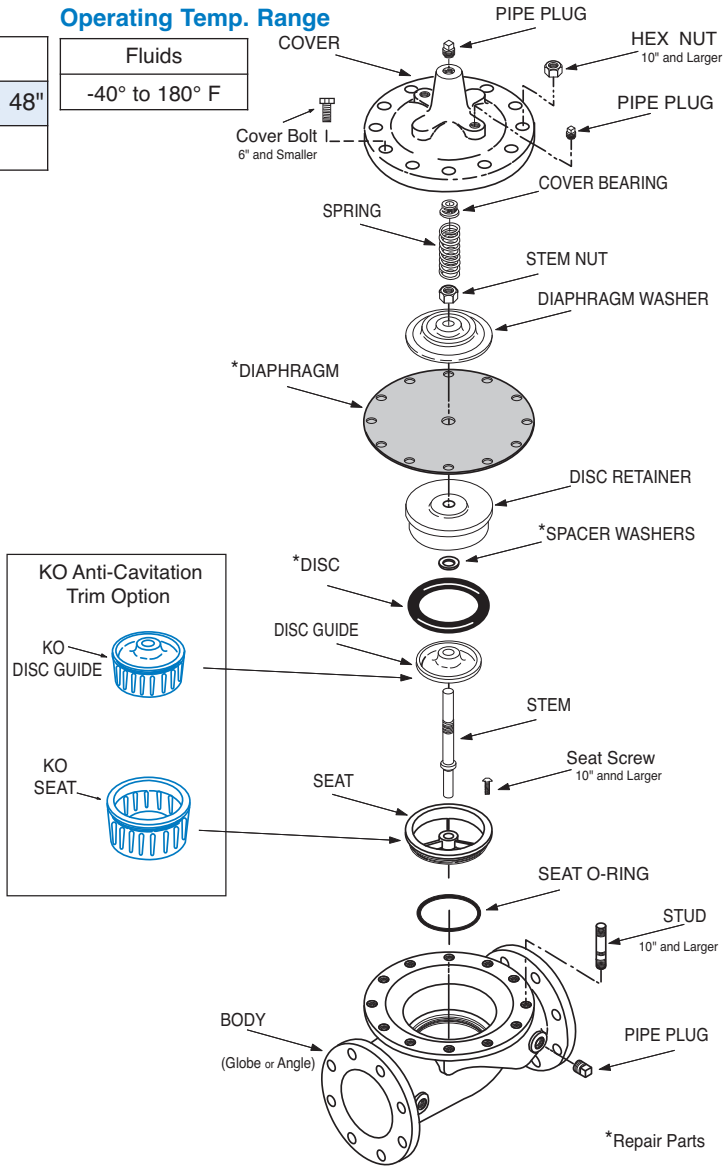
Pressure Ratings (Recommended Maximum Pressure - psi)

Valve Body & Cover		Pressure Class		
		Flanged		
Grade	Material	ANSI Standards*	150 Class	300 Class
ASTM A536	Ductile Iron	B16.42	250	400
ASTM A216-WCB	Cast Steel	B16.5	285	400
UNS 87850	Bronze	B16.24	225	400

Note: * ANSI standards are for flange dimensions only.
Flanged valves are available faced but not drilled.
Valves for higher pressure are available; consult factory for details

Materials

Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes (inches)	3" - 48"	3" - 16"	3" - 16"
Available Sizes (mm)	80 - 1200 mm	80 - 400 mm	80 - 400 mm
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
This option NSF 61 Listed and FDA approved, fusion bonded epoxy coating is 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).

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	36	42	48
		mm.	80	100	150	200	250	300	350	400	460	500	600	750	900	1000	1200
C_V Factor	Globe Pattern	Gal./Min. (gpm.)	62	136	229	480	930	1458	1725	2110	2940*	3400*	4020	7900*	11910*	14500*	15800*
		Litres/Sec. (l/s.)	15	32.5	55	115	223	350	414	506	705	816	966	1895	2858	3483	3796
	Angle Pattern	Gal./Min. (gpm.)	—	135	233	545	CF**	CF**	CF**	CF**	CF**	CF**	CF**	—	—	—	—
		Litres/Sec. (l/s.)	—	32	56	132	CF**	CF**	CF**	CF**	CF**	CF**	CF**	—	—	—	—
Equivalent Length of Pipe	Globe Pattern	Feet (ft.)	293	251	777	748	621	654	750	977	983	1125	3005	2130	2862	4232	7028
		Meters (m.)	89.3	76.4	237.1	228.1	189.5	199.4	229	298	300	343	917	650	872	1290	2142
	Angle Pattern	Feet (ft.)	—	254	751	580	CF**	CF**	CF**	CF**	CF**	CF**	CF**	—	—	—	—
		Meters (m.)	—	77.6	229	176.9	CF**	CF**	CF**	CF**	CF**	CF**	CF**	—	—	—	—
K Factor	Globe Pattern		20.6	12.7	23.1	15.7	10.4	8.5	8.9	10.2	6.9	9.78	14.5	10.5	8.9	11.4	17.8
	Angle Pattern		—	12.9	22.3	12.2	CF**	CF**	CF**	CF**	CF**	CF**	CF**	—	—	—	—
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	42	90	90
		ml	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Litres	.12	.30	.64	2.0	4.8	9.5	15.1	15.1	36.2	36.2	36.2	110	197	340	340

**Consult Factory

*Estimated

C_V Factor

Formulas for computing C_V Factor, Flow (Q) and Pressure Drop ($\triangle P$):

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

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)

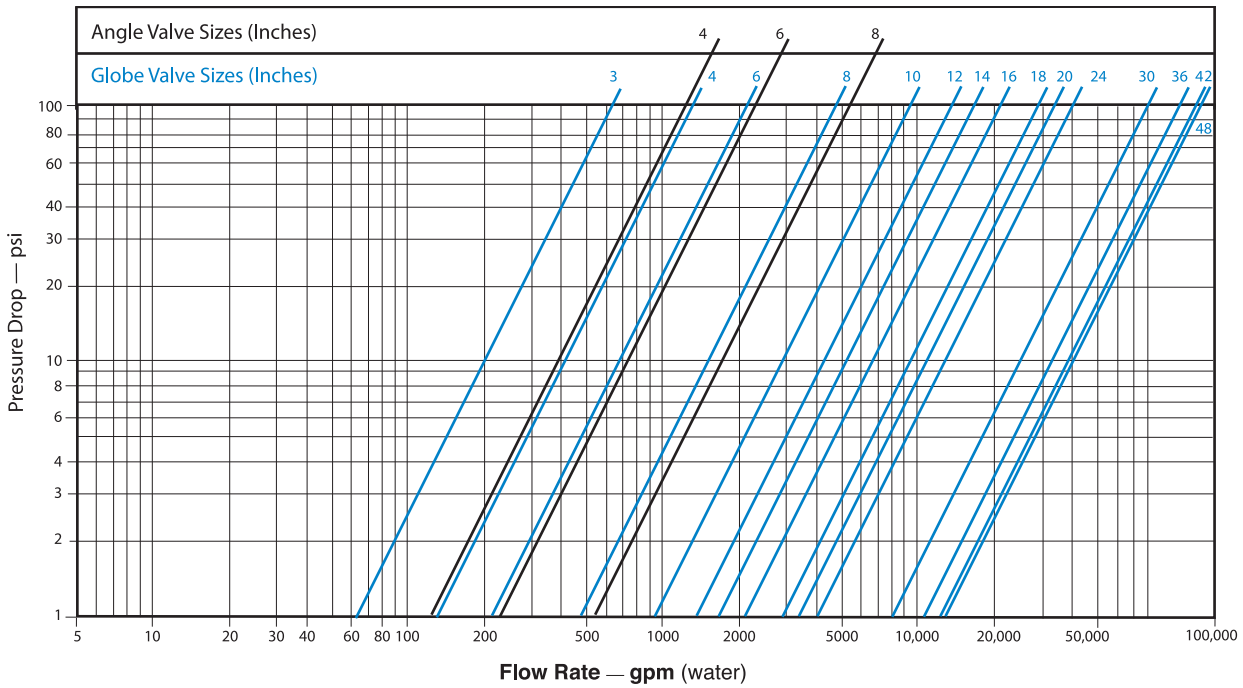
L = Equivalent Length of Pipe (feet)

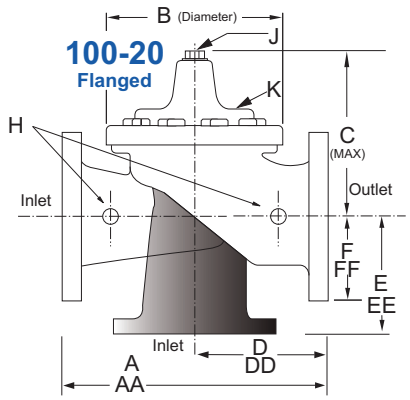
Q = Flow Rate in U.S. (gpm) or (l/s)

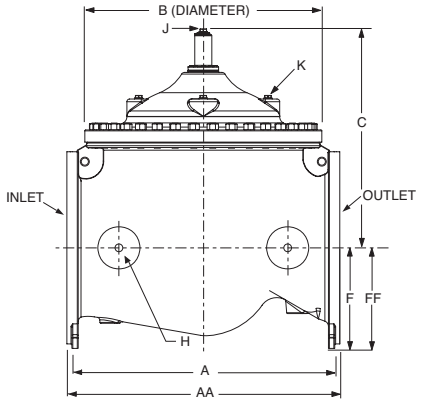
V = Fluid Velocity (feet per second) or (meters per second)

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

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







Valve Size (Inches)	**3**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**24**	**30**	**36**	**48**
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	65.00	88.0
AA 300 ANSI	11.00	14.50	18.62	22.38	27.38	31.50	35.75	36.62	43.63	49.62	49.75	63.75	67.00	90.62
B Diameter	6.62	9.12	11.50	15.75	20.00	23.62	27.47	28.00	35.44	35.44	35.44	53.19	56.00	66.00
C Maximum	7.00	8.62	11.62	15.00	17.88	21.00	20.88	25.75	25.00	31.50	31.50	43.94	54.75	59.00
D 150 ANSI	—	6.94	8.88	10.69	CF*	17.00	CF*	CF*	CF*	CF*	21.06	—	—	—
DD 300 ANSI	—	7.25	9.38	11.19	CF*	17.75	CF*	CF*	CF*	CF*	CF*	—	—	—
E 150 ANSI	—	5.50	6.75	7.25	CF*	13.75	CF*	CF*	CF*	CF*	15.94	—	—	—
EE 300 ANSI	—	5.81	7.25	7.75	CF*	14.75	CF*	CF*	CF*	CF*	CF*	—	—	—
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	25.50	34.00
FF 300 ANSI	4.12	5.00	6.25	7.50	8.75	10.25	11.50	12.75	15.88	16.06	19.00	22.00	27.50	38.50
H NPT Body Tapping	0.375	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
J NPT Cover Center Plug	0.50	0.50	0.75	0.75	1.00	1.00	1.25	2.00	2.00	2.00	2.00	2.00	2.00	2.00
K NPT Cover Tapping	0.375	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Stem Travel	0.60	0.80	1.10	1.70	2.30	2.80	3.40	4.50	4.50	4.50	6.50	7.50	7.50	8.50
Approx. Ship Weight (lbs)	45	85	195	330	625	900	1250	1380	2365	2551	2733	6500	8545	13100
Approx. **X** Pilot System	13	15	27	30	33	36	36	41	40	46	55	68	79	86
Approx. **Y** Pilot System	10	11	18	20	22	24	26	26	30	30	30	39	40	47
Approx. **Z** Pilot System	10	11	18	20	22	24	26	26	30	30	30	39	42	49

*Consult Factory

Note: The top two flange holes on valve sizes 36 thru 48 are threaded to 1 1/2"-6 UNC.

Valve Size (mm)	**80**	**100**	**150**	**200**	**250**	**300**	**350**	**400**	**450**	**500**	**600**	**750**	**900**	**1200**
A 150 ANSI	260	353	451	543	660	762	870	889	1070	1219	1219	1607	1651	2235
AA 300 ANSI	279	368	473	568	695	800	908	930	1108	1260	1263	1619	1702	2302
B Diameter	168	232	292	400	508	600	698	711	900	900	900	1351	1422	1676
C Maximum	178	219	295	381	454	533	530	654	635	800	800	1116	1391	1499
D 150 ANSI	—	176	226	272	CF*	432	CF*	CF*	CF*	CF*	535	—	—	—
DD 300 ANSI	—	184	238	284	CF*	451	CF*	CF*	CF*	CF*	CF*	—	—	—
E 150 ANSI	—	140	171	184	CF*	349	CF*	CF*	CF*	CF*	405	—	—	—
EE 300 ANSI	—	148	184	197	CF*	368	CF*	CF*	CF*	CF*	CF*	—	—	—
F 150 ANSI	95	114	140	171	203	241	279	289	403	370	432	505	648	864
FF 300 ANSI	105	127	159	191	222	260	292	324	403	408	483	559	699	978
H NPT Body Tapping	0.375	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
J NPT Cover Center Plug	0.50	0.50	0.75	0.75	1.00	1.00	1.25	2.00	2.00	2.00	2.00	2.00	2.00	2.00
K NPT Cover Tapping	0.375	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Stem Travel	15	20	28	43	58	71	86	86	114	114	114	165	191	216
Approx. Ship Weight (kgs)	20	39	89	150	284	409	568	627	681	1157	1249	2951	3876	5942
Approx. **X** Pilot System	331	381	686	762	839	915	915	1042	1016	1169	1397	1728	2007	2185
Approx. **Y** Pilot System	254	280	458	508	559	610	661	661	762	762	762	991	1016	1194
Approx. **Z** Pilot System	254	280	458	508	559	610	661	661	762	762	762	991	1067	1245

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

Note: Various Flange Drilling to a Foreign and intranational Standards and Specifications are Available on Request.

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.

100-42 — MODEL —

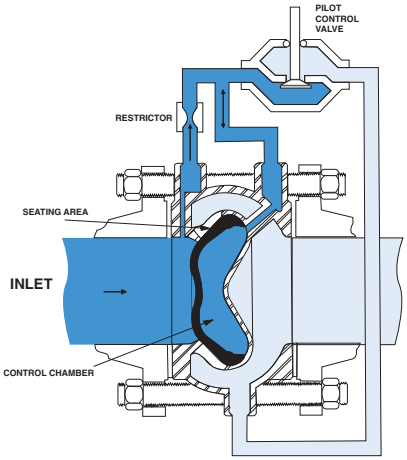
700 SERIES

ROLL SEAL

- **Compact Design, Proven Reliable**
- **Light Weight Materials**
- **High Pressure Rating Availability**
- **Easy Installation and Maintenance**

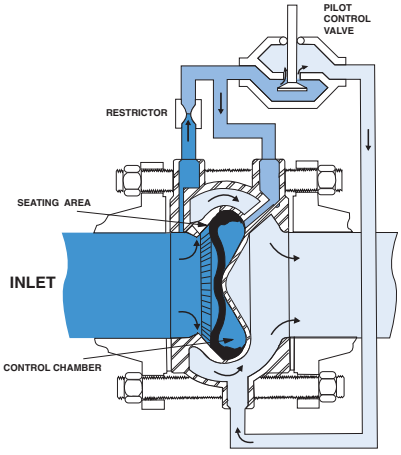
The Cla-Val Model 100-42 Roll Seal valve is a hydraulically operated valve used to control liquid flow by means of a flexible control element: the liner.
The basic valve consists of only two parts: a one piece, investment cast body and an elastomeric liner. The valve body is constructed with internal 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



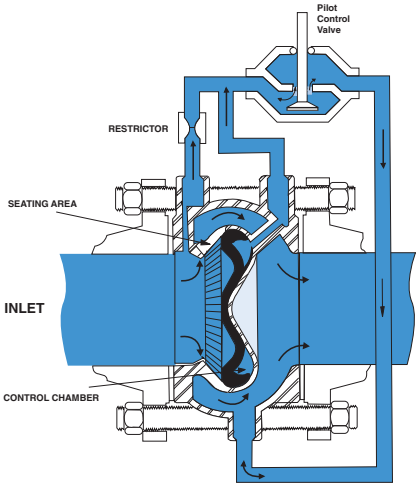
Model 100-42 Valve in Closed Position

Upstream pressure is introduced to the control chamber (the chamber formed behind the liner) of the Cla-Val Model 100-42 Roll Seal valve 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.

Design Specification

Sizes:	2, 3, 4, and 6 inch wafer style 6, 8, 10, and 12 inch flanged 6, 8, 10, 12 inch Victaulic® Ends
End Detail Wafer:	Fits ANSI B16.5 class 125,150, 250, and 300 flanges
End Detail Flanged:	ANSI B16.5 class 150 (fits class 125) or ANSI B16.5 class 300 (fits class 250)
End Detail Victaulic®:	Fits standard steel pipe
Operating Pressure:	720 psi maximum Victaulic® Ends - 300 psi max.
Maximum Differential:	150 psid continuous, 225 psid intermittent*
Reverse Pressure:	125 psid maximum
Temperature Range:	32 to 160 degrees F*
Flange Operating Pressure:	Class 125-175 psi maximum Class 150-275 psi maximum Class 250-300 psi maximum Class 300-720 psi maximum
Victaulic® Ends Rating:	300 psi maximum

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

For other than standard ANSI flanges consult factory

DIN drilling available on all sizes

Performance Specification

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

Material Specification

Body:	316L Stainless Steel
Flanges: (Slip on)	Carbon Steel/Clear Cad. Plated
Bolt Kit:	Carbon Steel/Zinc Plated
Liner:	Natural Rubber, 65 duro (standard) Viton, EPDM, Nitrile, Silicone (available)
Liner Retainer:	316 Stainless Steel

Optional Materials

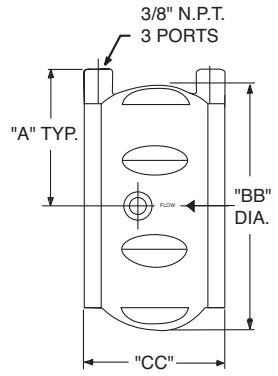
Escoloy 45D
Duplex Stainless Steel
Super Duplex Stainless Steel
Nickel Aluminum Bronze
Titanium

Dimensions (100-42 Main Valve)

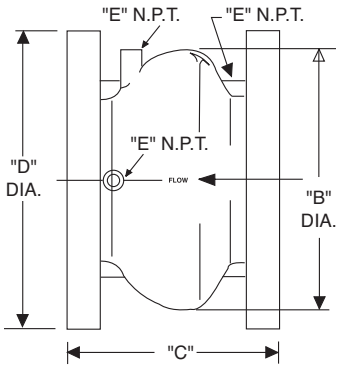
Valve Size (Inches)	2	3	4	6	8	10	12
A	2⅞	3 3/16	4⅛	5¼	--	--	--
B	--	--	--	10⅞	14⅜	18	21⅝
BB	4⅜	5⅞	7⅜	9 13/16	--	--	--
C	--	--	--	9	11	13	15¼
CC	2½	3¼	4	5½	--	--	--
D (ANSI 150)	--	--	--	11	13½	16	19
D (ANSI 300)	--	--	--	12½	15	17½	20½
E (Ports) NPT	--	--	--	⅜	⅜	½	½
Approx. Wt. (150 lbs.)	4	7½	14	58	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	--	--	--	⅜	⅜	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

NSF Approved 2" thru 12"



2", 3", 4" and 6" Wafer Style



6", 8",10" and 12" Flanged Style

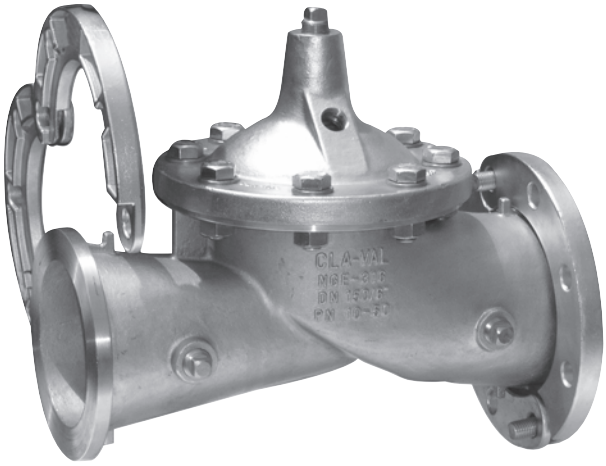
When Ordering, Please Specify

1. Catalog No. 750-01
2. Valve Size
3. Fluid Being Handled
4. Fluid Temperature Range
5. Inlet Pressure Range
6. Outlet Pressure Range
7. Maximum Differential Pressure
8. Minimum Differential Pressure
9. Maximum Flow Rate
10. Pilot Set Point

100-44 — MODEL —

(Reduced Internal Port)

316SS Hytrol Valve

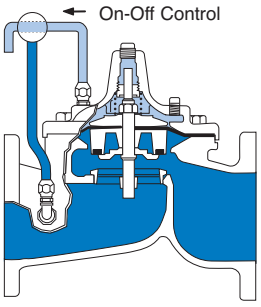


- **All 316 Stainless Steel**
- **Reduced Cavitation Design**
- **Drip-Tight, Positive Sealing Action**
- **Service Without Removal From Line**
- **Every Valve Factory Tested**
- **Three-Year Warranty**

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

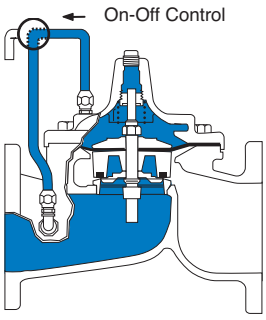
The Model 100-44 Hytrol consists of these major components: body, flanges, diaphragm assembly and cover. The diaphragm assembly is the only moving part and is guided top and bottom by a precision-machined stem. A non-wicking diaphragm of nylon fabric reinforced, synthetic rubber creates the control chamber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

Principle of Operation



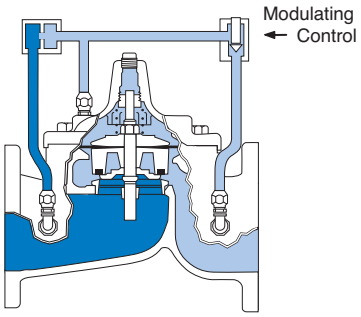
Full Open Operation

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



Tight Closing Operation

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



Modulating Action

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

100-44 Main Valve Specifications

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

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

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

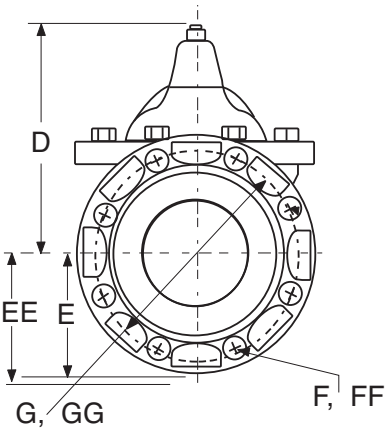
Higher Pressure Available
Please Contact Factory

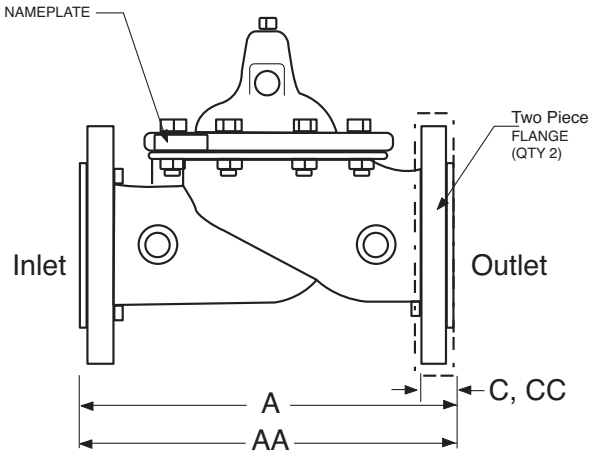
Operating Temperature
Fluids Compatible with Valve Materials
-40° to 180° F (-40° to 82° C)

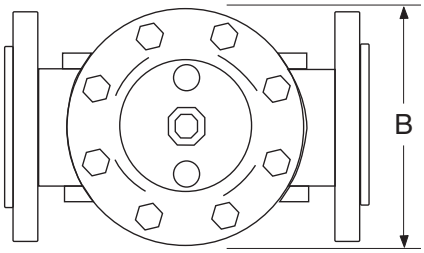
Materials
Body, Cover, Trim, Diaphragm Assembly, Flanges, and Fasteners
316 Series
Stainless Steel
Electropolished
Disc:
Buna-N® Rubber*
Diaphragm:
Nylon Fabric Reinforced
Synthetic Buna-N® Rubber*

*Contact Factory for Other Disc or Diaphragm Materials

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







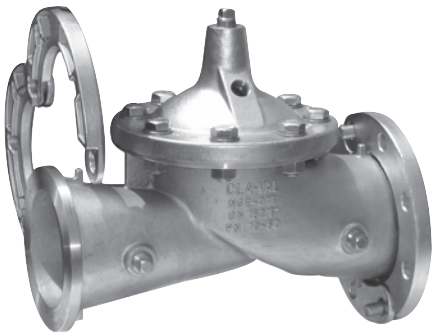
100-44 Main Valve Dimensions (inches)

Valve Size (Inches)	2	2½	3	4	6	8	10	12
A 150 ANSI	9.06	11.42	12.20	13.78	18.90	23.62	28.74	33.46
AA 300 ANSI	9.06	11.42	12.20	13.78	18.90	23.62	28.74	33.46
B	5.70	8.06	6.69	9.25	11.61	15.75	20.08	23.62
C	0.89	0.89	0.93	0.93	1.02	1.15	1.15	1.25
CC 300 ANSI	0.96	0.96	1.00	1.00	1.10	1.15	1.46	1.50
D	6.50	7.95	8.20	10.12	13.32	16.39	19.12	20.95
E	3.05	3.54	3.74	4.53	5.61	6.79	7.97	9.55
EE 300 ANSI	3.25	3.75	4.13	5.01	6.30	7.48	8.76	10.24
F	0.71	0.71	0.71	0.71	0.91	0.87	1.02	1.02
FF 300 ANSI	0.71	0.75	0.87	0.87	0.87	1.03	1.16	1.34
G	4.75	5.50	6.00	7.50	9.50	11.75	14.25	17.00
GG 300 ANSI	5.00	5.88	6.62	7.88	10.62	13.00	15.25	17.72
Flange Bolts (150 Class)	4	4	4	8	8	8	12	12
Flange Bolts (300 Class)	8	8	8	8	12	12	16	16
Approx. Wt. (Lbs.)	25	40	40	75	160	290	419	728

Reduced Port Functional Data

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

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

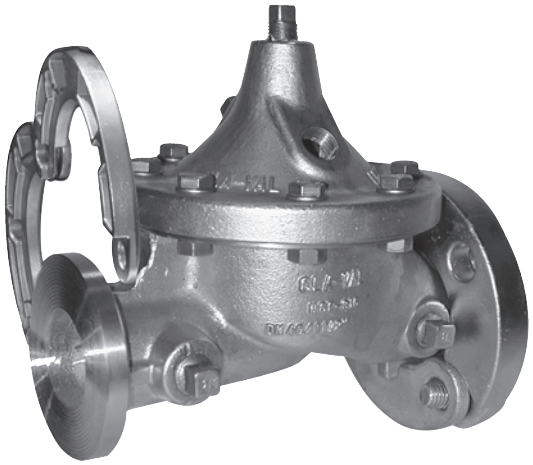


When Ordering Please Specify:
1. Catalog No. 100-44
2. Valve Size
3. Fluid Being Handled
4. Fluid Temperature
5. Inlet Pressure Range
6. Outlet Pressure Range
7. Maximum and Minimum Differential Pressure
8. Flow Rate Range

100-46 — MODEL —

(Full Internal Port)

316SS Hytrol Valve

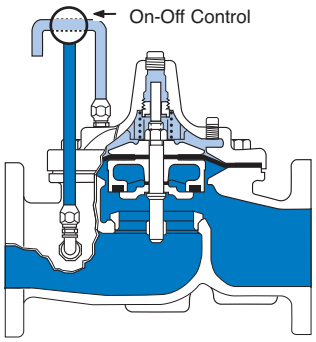


- **All 316 Stainless Steel**
- **Reduced Cavitation Design**
- **Drip-Tight, Positive Sealing Action**
- **Service Without Removal From Line**
- **Every Valve Factory Tested**
- **Three-Year Warranty**

The Cla-Val Model 100-46 Hytrol 316SS Valve is a hydraulically operated, diaphragm actuated, globe pattern valve with all 316 Stainless Steel metal parts. Specially designed 316 Stainless Steel removable slip-on flanges provide 150 or 300 ANSI class flange connections that meet ANSI and ISO standards. This valve is ideal for control valve applications where fluid compatibility is often a problem. The standard Electropolish finish on the 316 Stainless Steel parts offers extreme corrosion resistance to many industrial fluids such as seawater, high alkyl or high acid concentrations or other aggressive or corrosive fluids.

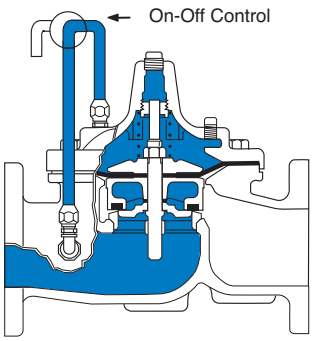
The Model 100-46 Hytrol consists of these major components: body, flanges, diaphragm assembly and cover. The diaphragm assembly is the only moving part and is guided top and bottom by a precision-machined stem. A non-wicking diaphragm of nylon fabric reinforced, synthetic rubber creates the control chamber for the valve. A resilient, synthetic rubber disc forms a drip-tight seal, with the renewable seat, when pressure is applied to the control chamber. The rugged simplicity of design and packless construction assures a long life of dependable, trouble-free operation. Smooth flow passages and fully guided diaphragm assembly assure optimum control, when used in piping systems requiring remote control, pressure regulation, solenoid operation, rate of flow control or check valve operation.

Principle of Operation



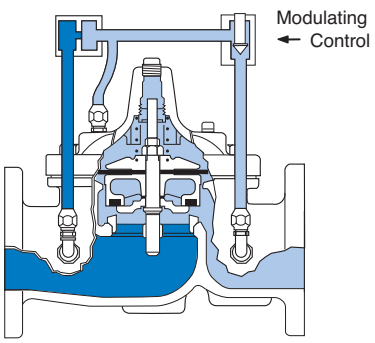
Full Open Operation

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



Tight Closing Operation

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



Modulating Action

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

100-46 Main Valve Specifications

Sizes
Globe (inch):
1½", 2", 2-1/2", 3", 4", 6", 8", 10",12"

Grooved End: 1-1/2" - 6"

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

Grooved End AWWA/ANSI C-606

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

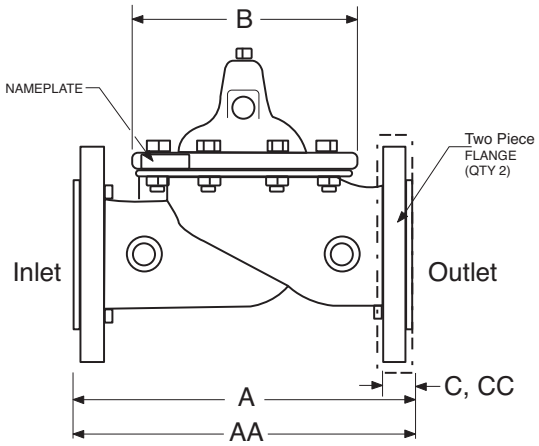
Higher Pressure Available
Please Contact Factory

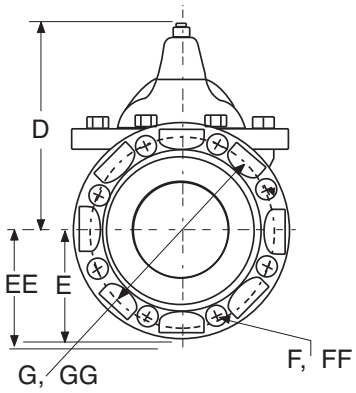
Operating Temperature
Fluids Compatible with Valve Materials
-40° to 180° F (-40° to 82° C)

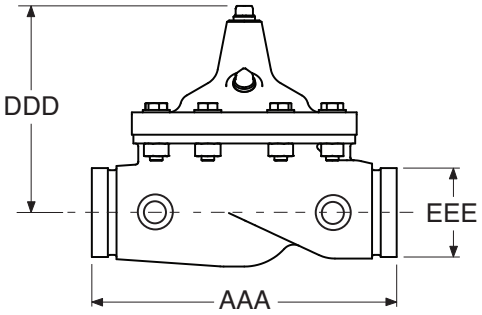
Materials
Body, Cover, Trim, Diaphragm Assembly, Flanges, and Fasteners
316 Series
Stainless Steel
Electropolished
Disc:
Buna-N® Rubber*
Diaphragm:
Nylon Fabric Reinforced
Synthetic Buna-N® Rubber*

*Contact Factory for Other Disc or Diaphragm Materials

Note: 100-46 valve uses the same internal parts as the basic Cla-Val standard main full Internal port 100-01 Hytrol.







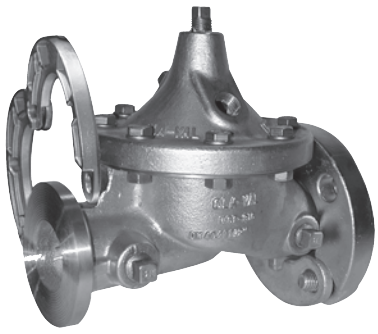
100-46 Dimensions (Inches)

Valve Size (Inches)	1½	2	2½	3	4	6	8	10	12
A 150 ANSI	7.87	9.38	11.00	12.00	15.00	20.00	25.38	29.75	34.00
AA 300 ANSI	7.87	9.38	11.00	12.00	15.00	20.00	25.38	29.75	34.00
AAA Grooved End	8.50	11.00	11.00	12.00	15.00	20.00	—	—	—
B	5.62	6.61	8.00	9.13	11.50	15.75	20.00	23.62	28.00
C	0.56	0.62	0.69	0.75	0.94	1.00	1.12	1.19	1.25
CC 300 ANSI	0.81	0.88	1.00	1.12	1.25	1.44	1.62	1.88	2.00
D	5.90	6.25	7.25	8.20	10.21	13.32	16.38	21.00	25.38
DDD Grooved End	5.29	6.34	7.43	8.14	10.30	13.03	—	—	—
E	2.56	3.05	3.54	3.75	4.53	5.61	6.75	8.00	9.50
EE 300 ANSI	3.05	3.25	3.74	4.13	5.02	6.30	7.50	8.75	10.25
EEE Grooved End	1.13	1.50	1.88	2.13	2.68	3.86	—	—	—
F	0.62	0.75	0.75	0.75	0.75	0.88	0.88	1.00	1.00
FF 300 ANSI	0.88	0.75	0.88	0.88	0.88	0.88	1.00	1.12	1.25
G	3.88	4.75	5.50	6.00	7.50	9.50	11.75	14.25	17.00
GG 300 ANSI	4.50	5.00	5.88	6.62	7.88	10.62	13.00	15.25	17.75
Flange Bolts (150 Class)	4	4	4	4	8	8	8	12	12
Flange Bolts (300 Class)	4	8	8	8	8	12	12	12	16
Approx. Wt. (Lbs.)	25	35	55	75	160	290	340	600	1000

Full Port Functional Data

Size (Inches)	Cv (gpm)*	Cv (l/s)**
1½	32	8
2	54	13
2½	85	20
3	115	27
4	200	48
6	440	105
8	770	185
10	1245	299
12	1725	414

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



When Ordering Please Specify:
1. Catalog No. 100-46
2. Valve Size
3. Fluid Being Handled
4. Fluid Temperature
5. Inlet Pressure Range
6. Outlet Pressure Range
7. Maximum and Minimum Differential Pressure
8. Flow Rate Range