CLA-VAL™

MODEL — 100-01H

Hytrol Valve & X43H Strainer Assembly

- **Drip-Tight, Positive Seating**
- **Service Without Removal From Line**
- **Fusion Bonded Epoxy Coating Standard**
- **Globe and Angle Patterns with Flanged Ends**
- **Low Pressure Drop**
- **100% Factory Tested**

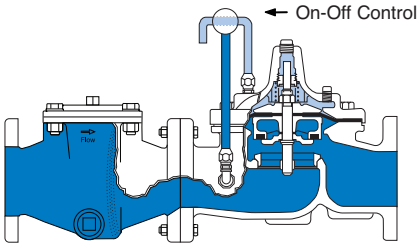
The Model 100-01H valve can be used in the construction of nearly all Cla-Val automatic control valves. Valves with the 100-01H valve body/strainer combination offer an effective means of removing unwanted solid particles in pipeline flow and preventing debris buildup in downstream valves and equipment. 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 where there is a high probably of debris in the pipeline. The entire 100-01H assembly can be serviced without removal from the line.

The Cla-Val Model 100-01H consists of the standard Cla-Val 100-01 Hytrol Valve and the Cla-Val X43 H-Style Strainer. This flanged end, globe or angle pattern valves are available in sizes 1-1/2" through 24".

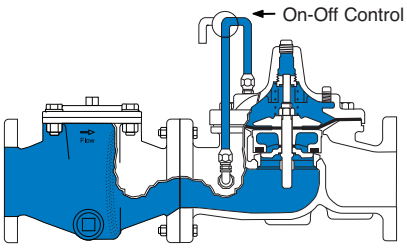
The X43H H-Style Strainer consists of 316 Stainless Steel mesh on an H-style ductile iron fusion bonded epoxy coated frame. Its large flow area design, configured with the mesh perpendicular to flow, produces low pressure drop while effectively protecting piping and equipment from pipeline debris. Maintenance is fast and easy with the compact H-pattern, requiring only top cover removal. The strainer may be installed in any position, however, installation with cover up is recommended.

The 100-01 Hytrol is a hydraulically operated, diaphragm actuated, globe or angle style valve. It consists of three major components: body, diaphragm assembly, and cover. The diaphragm assembly is the only moving part, 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.

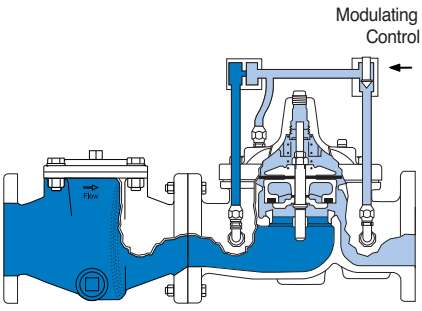
Principle of Operation



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 100-01H

Available Sizes

Pattern	Flanged
Globe	1½" - 24"
ANGLE	1½" - 24"

Operating Temp. Range

Fluids
-40° to 180° F

Pressure Ratings (Recommended Maximum Pressure - psi)

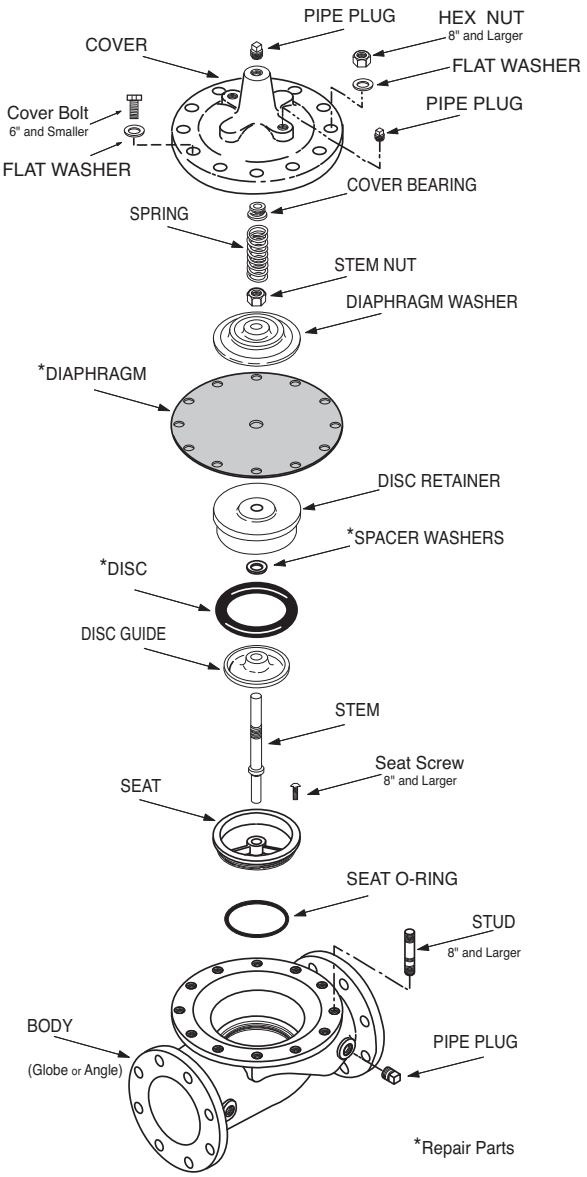
Valve Body & Cover		Pressure Class	
			Flanged
Grade	Material	ANSI Standards*	150 lb.
ASTM A536	Ductile Iron	B16.42	250

Note: *ANSI standards are for flange dimensions only.
"Valves for higher pressure are available; consult factory for details"

Material

Component	Standard Material Combinations		
Body & Cover	Ductile Iron		
Available Sizes	1½" - 24"		
Disc Retainer & Diaphragm Washer	Cast Iron		
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.			
Strainer Mesh Sizes	.078" Std.	.039	.059

X43H Strainer



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*
The NSF/ANSI 61 fusion bonded epoxy coating option 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

***Fusion Bonded Epoxy is standard with Cla-Val Model 100-01H.**

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

Model 100-01H

100-01 Valve		Inches	1½	2	2½	3	4	6	8	10	12	14	16	24
		mm.	40	50	65	80	100	150	200	250	300	350	400	600
C_V Factor	Globe Pattern	Gal./Min. (gpm.)	32	54	85	115	200	440	770	1245	1725	2300	3130	7655
		Litres/Sec. (l/s.)	7.7	13	20.4	27.6	48	105.6	184.8	299	414	552	752	1837
	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	1008	—
Equivalent Length of Pipe	Globe Pattern	Feet (ft.)	37	51	53	85	116	211	291	347	467	422	503	628
		Meters (m.)	11.4	15.5	16.0	25.9	35.3	64.2	88.6	105.8	142.4	129	154	192
	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	73	75	—
K Factor	Globe Pattern		5.9	5.6	4.6	6.0	5.9	6.2	6.1	5.8	6.1	5.0	4.6	4.0
	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	—	—	—	—	—	—	—	—	—	—	—	—
		U.S. Gal.	.02	.03	.04	.08	.17	.53	1.26	2.51	4.0	6.5	9.6	29
		ml	75.7	121	163	303	643	—	—	—	—	—	—	—
		Litres	—	—	—	—	—	2.0	4.8	9.5	15.1	24.6	36.2	109.8

*Estimated

X43H Strainer C_V Factor

Strainer Size (inches)	1 ½	2	2 ½	3	4	6	8	10	12	14	16	24
C_V (Gal/Min. - gpm.)	146	150	254	367	637	1625	3020	4720	6800	8949	11692	18264
C_V (Litres/Sec - l/s.)	35	36	61	88	153	390	725	1135	1634	2150	2809	4388

C_V in gpm = gpm @ 1psid head loss • C_V in l/s = l/s @ 1bar head loss

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)

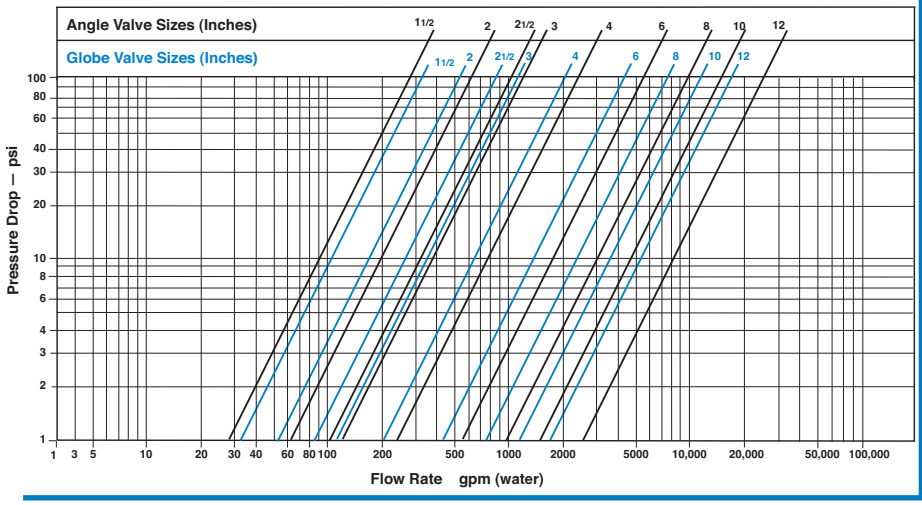
Q = Flow Rate in U.S. (gpm) or (l/s)

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

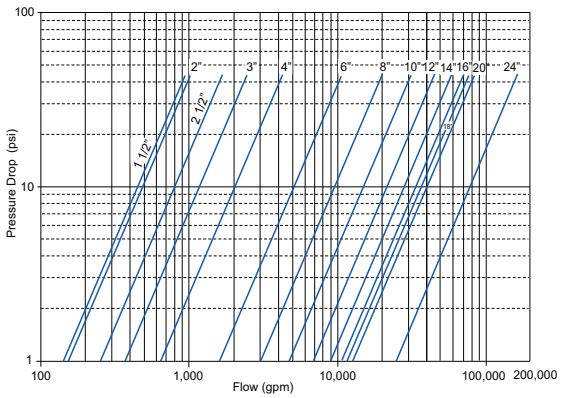
$\triangle P$ = Pressure Drop in (psi) or (bar)

Model 100-01 Flow Chart

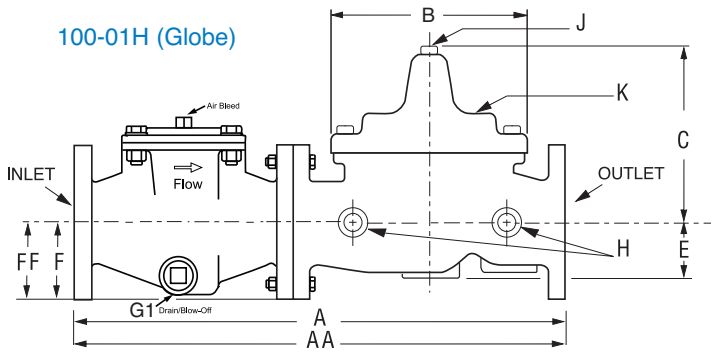
(Based on normal flow through a wide open valve)

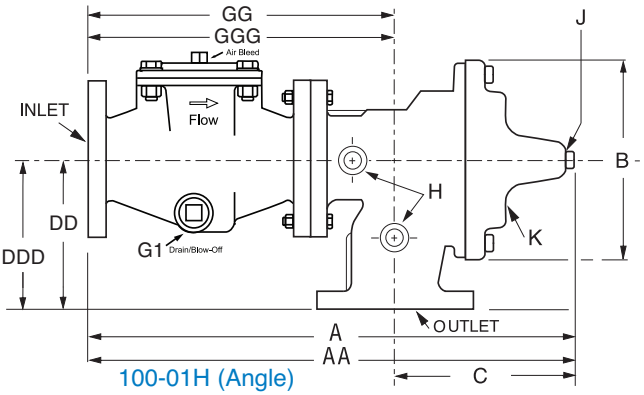


Model X43H Flow Chart



Dimensions





Model 100-01H Dimensions (inches)

Valve Size (Inches)	1½	2	2½	3	4	6	8	10	12	14	16	20	24
AA 150 ANSI	17.56	18.44	20.06	23.81	26.81	35.75	45.07	52.58	52.58	64.59	72.88	89.40	104.81
AAA 300 ANSI	18.13	19.13	20.75	25.14	27.51	36.83	46.14	54.03	54.03	66.17	75.07	91.10	106.63
B Diameter	5.62	6.62	8.00	9.12	11.50	15.75	20.00	23.62	23.62	32.75	35.50	45.00	53.16
C Maximum	5.50	6.50	7.56	8.19	10.62	13.38	16.00	17.12	17.12	24.19	25.00	39.06	43.93
DD 150 ANSI	4.00	4.75	5.50	6.00	7.50	10.00	12.75	14.88	14.88	19.50	20.81	—	—
DDD 300 ANSI	4.25	5.00	5.88	6.38	7.88	10.50	13.25	15.56	15.56	20.25	21.62	—	—
E	1.12	1.50	1.69	2.06	3.19	4.31	5.31	9.25	9.25	12.62	15.50	15.00	17.75
F 150 ANSI	3.26	3.26	3.66	4.06	4.33	5.63	6.69	8.86	8.86	10.24	12.20	19.09	19.09
FF 300 ANSI	3.26	3.26	3.66	4.06	4.33	5.63	6.69	8.86	8.86	10.24	12.20	19.09	19.09
GG 150 ANSI	13.06	13.81	14.56	17.81	19.31	25.75	32.38	37.71	37.71	45.09	52.31	—	—
GGG 300 ANSI	13.38	14.13	15.01	18.27	19.77	26.33	33.01	38.47	38.47	45.92	53.19	—	—
G1 Drain / Blow-Off	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	2	2	2	2	3
H NPT Body Tapping	0.38	0.38	0.50	0.50	0.75	0.75	1	1	1	1	1	1	1
J NPT Cover Center Plug	0.25	0.50	0.50	0.50	0.75	0.75	1	1	1.25	1.50	2	1	1
K NPT Cover Tapping	0.38	0.38	0.50	0.50	0.75	0.75	1	1	1	1	1	1	1
Valve Stem Int. Thread UNF	10-32	10-32	1/4-28	1/4-28	1/4-28	3/8-24	3/8-24	3/8-24	3/8-24	1/2-20	1/2-20	1/2-20	3/4-16
Stem Travel	0.40	0.60	0.70	0.80	1.10	1.70	2.30	2.80	2.80	4.50	4.50	4.50	6.75
Approx. Ship Weight (lbs)	48	71	89	129	213	428	712	1212	1212	2283	3235	5075	8162

Model 100-01H Dimensions (mm)

Valve Size (mm)	**40**	**50**	**65**	**80**	**100**	**150**	**200**	**250**	**300**	**350**	**400**	**500**	**600**
AA 150 ANSI	446	468	510	605	681	908	1145	1336	1474	1641	1851	2271	2662
AAA 300 ANSI	461	486	527	639	699	935	1172	1372	1514	1681	1907	2314	2708
B Diameter	143	168	203	232	292	400	508	600	711	832	902	1143	1350
C Maximum	140	165	192	208	270	340	406	435	530	614	635	1064	1116
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	—	—
E	29	38	43	52	81	110	135	235	273	321	394	381	451
F 150 ANSI	83	83	93	103	110	143	170	225	225	260	310	485	485
FF 300 ANSI	83	83	93	103	110	143	170	225	225	260	310	485	485
GG 150 ANSI	332	351	370	452	490	654	822	958	1041	1145	1329	—	—
GGG 300 ANSI	340	359	381	464	502	669	838	977	1063	1166	1351	—	—
G1 Drain / Blow-Off	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	2	2	2	2	3
H NPT Body Tapping	0.38	0.38	0.50	0.50	0.75	0.75	1	1	1	1	1	1	1
J NPT Cover Center Plug	0.25	0.50	0.50	0.50	0.75	0.75	1	1	1.25	1.50	2	1	1
K NPT Cover Tapping	0.38	0.38	0.50	0.50	0.75	0.75	1	1	1	1	1	1	1
Valve Stem Int. Thread UNF	10-32	10-32	1/4-28	1/4-28	1/4-28	3/8-24	3/8-24	3/8-24	3/8-24	1/2-20	1/2-20	1/2-20	3/4-16
Stem Travel	10	15	18	20	28	43	58	71	86	102	114	143	171
Approx. Ship Weight (kgs)	22	32	41	59	97	194	323	550	812	1036	1467	2579	3702

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.

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