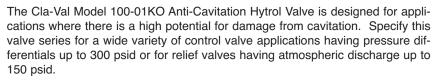


Anti-Cavitation Hytrol Valve



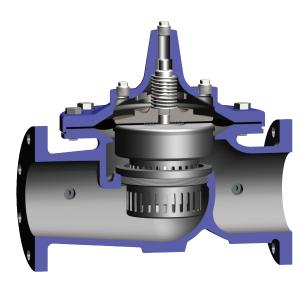
- Severe Service Design High Pressure Differentials
- Reduced Noise and Vibration
- 316 Stainless Steel Disc Guide and Seat Standard
- Drip-Tight, Positive Sealing
- Service Without Removal From Line
- Retrofit to Standard Hytrol Valves



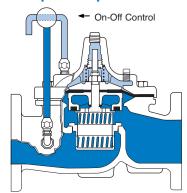
The 100-01KO Hytrol main valve provides optimum internal pressure control through a unique anti-cavitation trim design. Constructed of 316 Stainless Steel, the seat and disc guide trim components feature dual interlocked sleeves containing radial slots that deflect internal flow to impinge upon itself in the center of the flow path, harmlessly dissipating the potential cavitation damage. This unique design also lessens the possibility of fouling if large particles in the water are present due to the large flow path of the radial slots.

The 100-01KO Hytrol is the basic valve used in Cla-Val Automatic Control Valves for high differential applications requiring remote control, pressure regulation, solenoid operation, rate of flow control, or liquid level control.

The Anti-Cavitation Trim components can be retrofitted to existing valves if the application indicates an appropriate need. Please consult factory for details.

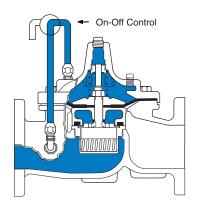


Principle of Operation



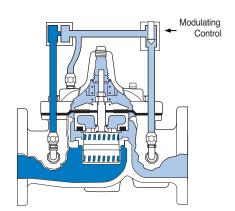
Full Open Operation

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

Pattern	Globe	Angle	Grooved End
Size	1-¼" - 36"	1-¼" - 16" & 24"	1-½" - 8"

Pressure Ratings (Recommended Maximum Pressure - psi)

Valve Body & Cover Pressure Class Flanged Grooved Threaded Brade Material Standards* ANSI Standards* 150 Class Class Class Class Class Details Class Class Details ASTM A536 Ductile Iron B16.42 250 400 400 400 400 ASTM A216-WCB Cast Steel B16.5 285 400 400 400 400 ASTM B62 Bronze B16.24 225 400 400 400 400													
Flanged Grooved Threaded Threaded Grade Material ANSI Standards* Class 150 Class Class 300 Class Class End‡ Details ASTM A536 Ductile Iron B16.42 250 400 400 400 ASTM A216-WCB Cast Steel B16.5 285 400 400 400	Valva Body 8	Cover	Pressure Class										
Grade Material Standards* Class Class Class Details ASTM A536 Ductile Iron B16.42 250 400 400 400 ASTM A216-WCB Cast Steel B16.5 285 400 400 400	valve body &	Cover	Fla	anged		Grooved	Threaded						
ASTM A216-WCB Cast Steel B16.42 250 400 400 400 ASTM A216-WCB Cast Steel B16.5 285 400 400 400	Grada	Motorial	ANSI	150	300	300	End‡						
ASTM A216-WCB Cast Steel B16.5 285 400 400 400	Grade	Ivialeriai	Standards*	Class	Class	Class	Details						
	ASTM A536	Ductile Iron	B16.42	250	400	400	400						
ASTM B62 Bronze B16.24 225 400 400 400	ASTM A216-WCB	Cast Steel	B16.5	285	400	400	400						
	ASTM B62	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

Operating Temp. Range

Fluids -40 to 180 F

Materials

NSF.

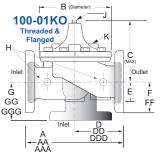
Model 100-01KO

APPROVED (4" - 24")

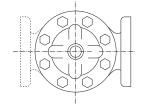
Component	Standard Material Combinations								
Body & Cover	Ductile Iron	Cast Steel	Bronze						
Available Sizes	1-1/4" - 36"	3" - 16"	3" 16"						
Disc Retainer & Diaphragm Washer	Cast Iron	Cast Iron Cast Steel							
Trim: Disc Guide, Seat & Cover Bearing	Stainle	ss Steel is St	andard						
Disc	Buna-N® Rubber								
Diaphragm	Nylon Reinforced Buna-N® Rubber								
Stem, Nut & Spring		Stainless Steel							
For motorial antions not listed consult factors									

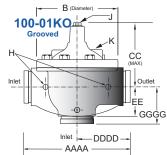
For material options not listed consult factory.

Cla-Val manufactures valves in more than 50 different alloys.



Note: Consult Factory on 10",12", 16" angle pattern





Valve Size (Inches)	ÁĀĀ	AAA																
A Threaded	Valve Size (Inches)	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24	30	36
AAA 300 ANSI																		
AAA 300 ANSI — 9.00 10.00 11.62 13.25 15.62 21.00 26.38 31.12 35.5 40.50 43.50 47.64 53.62 63.24 64.50 76.00 AAAA Grooved End — 8.50 9.00 11.00 11.62 13.25 15.00 20.00 25.38 — — — — — — — — — — — — — — — — — — —							15.00	20.00	25.38	29.75	34.00	39.00	41.38	46.00	52.00	61.50	63.00	76.00
BAAA Grooved End	AAA 300 ANSI																	
B Dia. 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 Max. 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 54.66 61.50 CC Max. Grooved End - 4.00 4.75 5.50 6.25 - <td></td> <td>5.62</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>23 62</td> <td>28.00</td> <td>32 75</td> <td>35 50</td> <td>41 50</td> <td>45 00</td> <td>53 16</td> <td>56.00</td> <td>66.00</td>		5.62								23 62	28.00	32 75	35 50	41 50	45 00	53 16	56.00	66.00
CC Max. Grooved End																		
DT DT ST ST ST ST ST ST																		
DD 30 ANS																		
DDDD GOVERNO							7.50	10.00	12 69	14 88	17 00	19.50	20.81			30.75		
DDDD Grooved End																		
EE Groved End																		
EE Grooved End											10.75	12 62	15 50		15.00	17 75		24 56
F150 ANS											10.73	12.02	15.50	12.33	13.00	17.75	21.01	24.50
FF 300 ANS											9.50	10.50	11 75	15.00	16 50	10.25	22.50	25.60
G Tineaded																		
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 — - 20.66 — - 20.66 — - 32.55 — 4.25 3.50 4.31 4.38 5.31 6.50 8.50 9.31 14.50 15.62 16.50 — - 2.06 — - 2.07 — - 2.07 — 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1																		
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 - 31.62 -																		
GGG Grooved End																		
H NPT Body Tapping										9.31	14.50	15.62	16.50			31.62		
J NPT Cover Center Plug																		
K NPT Cover Tapping	7 - 1-1- 3								-							<u> </u>		
Stem Travel																		
Approx. Ship Wt. Lbs. 15 15 35 50 70 140 285 500 780 1165 1600 2265 2982 3900 6200 7703 11720																•		
Valve Size (mm) 32 40 50 65 80 100 150 200 250 300 350 400 450 500 600 750 900 A Threaded 184 184 238 279 318 — <td></td>																		
AThreaded 184 184 238 279 318 -	Approx. Ship Wt. Lbs.	15	15	35	50	70	140	285	500	780	1165	1600	2265	2982	3900	6200	7703	11720
AThreaded 184 184 238 279 318 -	Valve Size (mm)	32	40	50	65	80	100	150	200	250	300	350	400	450	500	600	750	900
AA 150 ANSI — 216 238 279 305 381 508 645 756 864 991 1051 1168 1321 1562 1600 1930 AAAA Grooved End — 229 254 295 337 397 533 670 790 902 1029 1105 110 1362 1606 1638 1930 AAAA Grooved End — 216 228 279 318 381 508 645 —		184	184	238	279	318	_	_	_	_	_	_	_	_	_	_	_	
AAA 300 ANSI — 229 254 295 337 397 533 670 790 902 1029 1105 1210 1362 1606 1638 1930 AAAA Grooved End — 216 228 279 318 381 508 645 —	AA 150 ANSI	_	216	238	279	305	381	508	645	756	864	991	1051	1168	1321	1562	1600	1930
AAAA Grooved End — 216 228 279 318 381 508 645 — <th< td=""><td>AAA 300 ANSI</td><td>_</td><td>229</td><td>254</td><td>295</td><td>337</td><td>397</td><td>533</td><td>670</td><td></td><td>902</td><td>1029</td><td>1105</td><td>1210</td><td>1362</td><td>1606</td><td>1638</td><td>1930</td></th<>	AAA 300 ANSI	_	229	254	295	337	397	533	670		902	1029	1105	1210	1362	1606	1638	1930
B Dia. 143 143 168 203 232 292 400 508 600 711 832 902 1054 1143 1350 1422 1676 C Max. 140 140 165 192 208 270 340 406 435 530 614 635 992 1064 1116 1387 1562 CC Max. Grooved End 120 146 175 184 236 308 371 — </td <td></td> <td></td> <td>216</td> <td>228</td> <td></td> <td></td> <td></td> <td></td> <td>645</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>			216	228					645									
C Max. 140 140 165 192 208 270 340 406 435 530 614 635 992 1064 1116 1387 1562 CC Max. Grooved End 120 120 146 175 184 236 308 371 —		143								600	711	832	902	1054	1143	1350	1422	1676
CC Max. Grooved End 120 146 175 184 236 308 371 —																		
D Threaded 83 83 121 140 159 -																		
DD 150 ANS																		
DDD 300 ANSI — 108 127 149 162 200 267 337 395 451 514 549 — — 803 — — DDDD Grooved End — — 152 191 —											432							
DDDD Grooved End — 121 — 152 191 —																		
E 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 -											451	314	349			803		
EE Grooved End — 52 64 73 79 108 152 192 — <td></td> <td>272</td> <td>221</td> <td>201</td> <td>220</td> <td>201</td> <td>451</td> <td><u></u></td> <td>624</td>											272	221	201	220	201	451	<u></u>	624
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G Threaded 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 - - - - - - 582 - - H NPT Body Tapping .375 .375 .50 .50 .50 .75 .75 1 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>																		
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GGGG Grooved End - - 83 - 108 127 -																		
H NPT Body Tapping .375 .375 .50 .50 .75 .75 1																		
J NPT Cover Center Plug .25 .25 .50 .50 .75 .75 1 1 1.25 1.5 2 1 1 1 2 2 K NPT Cover Tapping .375 .375 .375 .50 .50 .75 .75 1																		
K NPT Cover Tapping .375 .375 .50 .50 .75 .75 1																		
Stem Travel 10 10 15 18 20 28 43 58 71 86 102 114 130 143 171 190 216																		
Approx. Ship Wt. Kgs. 7 7 16 23 32 64 129 227 354 528 726 1027 1353 1769 2812 3494 5316																		
	Approx. Ship Wt. Kgs.	7	7	16	23	32	64	129	227	354	528	726	1027	1353	1769	2812	3494	5316

Cla-Val Control Valves with KO ANTI-CAVITATION Trim operate with maximum efficiency when mounted in horizontal piping with the main valve cover Up. 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.

Functional Data													Mo	odel	100-0)1KO			
Valve Size		Inches	1¼	1½	2	2½	3	4	6	8	10	12	14	16	18	20	24	30	36
vaive	JIZE	mm.	32	40	50	65	80	100	150	200	250	300	350	400	450	500	600	750	900
	Globe	Gal./Min. (gpm.)	14	14	25	37	52	90	218	362	602	900	1100	1200	1550	1950	3900	4660	7100
CV	Pattern	Litres/Sec. (I/s.)	3.4	3.4	6.0	8.9	12.5	21.6	52	87	144	216	264	288	360	469	938	1120	1706
Factor	Angle	Gal./Min. (gpm.)	15	15	26	39	55	95	232	388	560	790	1075	1175	_	_	3775	_	_
	Pattern	Litres/Sec. (I/s.)	3.6	3.6	6.2	9.4	13.2	22.8	56	93	134	190	258	282	_	_	906	_	_
	Globe	Feet (ft.)	196	196	237	277	416	572	858	1315	1483	2118	1937	3022	3537	4199	4532	6678	6567
Equivalent Length of	Pattern	Meters (m.)	60	60	72	84	127	174	262	401	452	646	590	921	1078	1280	1381	2035	2002
Pipe	Angle	Feet (ft.)	171	171	219	250	372	514	757	1145	1714	2226	2021	3152	_	_	2583	_	_
	Pattern	Meters (m.)	52	52	67	76	113	157	231	349	522	678	616	961	_	_	787	_	_
K Factor	GI	Globe Pattern		30.6	26.1	24.3	29.3	29.0	25.5	27.7	24.9	27.7	22.8	31.4	30.2	29.5	15.4	30.1	25.1
	Angle Pattern		26.7	26.7	24.1	21.8	26.2	26.0	22.5	24.1	28.7	29.1	23.8	32.8	_	_	16.4	_	_
Liquid Displ		U.S. Gal.	0.2	0.2	.03	.04	.08	.17	.53	1.26	2.5	4.0	6.5	9.6	11	12	29	65	90
Valve Opens		Litres	0.8	0.8	.12	.16	.30	.64	2.0	4.8	9.5	15.1	25.6	36.2	41.6	45.4	110	246	340

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

C_V Factor

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

$$c_{v} = \frac{Q}{\sqrt{\triangle P}}$$
 $Q = C_{v} \sqrt{\triangle P}$ $\triangle P = \left(\frac{Q}{C_{v}}\right)^{2}$

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

Equivalent Length of Pipe

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

Fluid Velocity

400

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

C_V = U.S. (gpm) @ 1 psi differential at 60° F water

= (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)

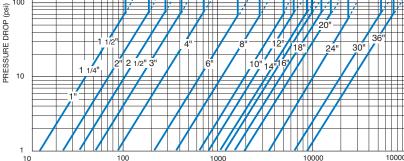
Q = Flow Rate in U.S. (gpm) or (l/s)

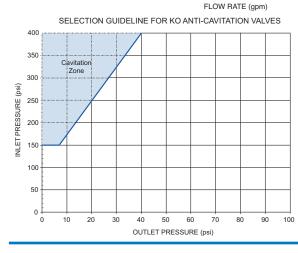
V = Fluid Velocity (feet per second) or (meters per second)

△ P = Pressure Drop in (psi) or (bar)



DASHED LINE IS FULL OPEN FLOW CURVE FOR 25 FT/SEC INTERMITTENT DUTY APPLICATIONS

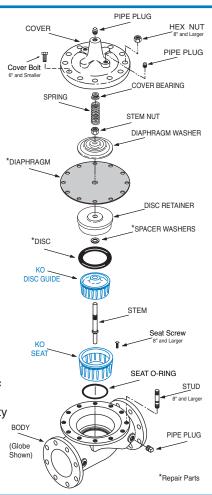




Notes: On Operating Differential

- 1. For atmospheric discharge, the maximum inlet pressure cannot exceed 150 psi.
- 2. For pressure differentials greater than 300 psi the maximum flow velocity should not exceed 18 ft/sec.
- 3. Flow velocities greater than 25 ft/sec are not recommended.
- 4. Recommended minimum flow velocity is 1 ft/sec.

5. Consult factory for conditions exceeding these recommendations.



100-01KO Hytrol Main Valve with Anti-Cavitation Trim Purchase Specifications

Function

The valve shall be hydraulically operated, single diaphragm actuated, globe pattern. The valve shall consist of three major components: the body with seat installed, the cover with bearing installed, and the diaphragm assembly. The 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. Packing glands and/or stuffing boxes are not permitted and there shall be no pistons operating the main valve or pilot controls. Ductile Iron is standard, other materials shall be available. No fabrication or welding shall be used in the manufacturing process.

Description

The anti-cavitation features of the seat and disc guide detail shall have flow slots equally spaced around their perimeters. The seat slots shall be orientated around the perimeter of the seat so that fluid entering the valve shall flow through the seat slot detail such that the fluid flow converges in the center chamber of the seat allowing potential cavitation to dissipate. The disc guide slots shall be positioned around the perimeter of the disc guide, configured and oriented in an angular direction so that fluid flow exiting through the slots is diverted away from direct impact into pressure boundary surfaces. Flow exiting the disc guide slots is directed in an angular path to increase the distance between the slot geometry and pressure boundary surfaces. If cavitation conditions exist, the increased distance between the slots and pressure boundary surfaces minimizes the potential for damage by allowing the cavitation bubbles to dissipate before they come in contact with pressure boundary surfaces. Anti-cavitation characteristics shall be controlled by the described slotted seat and disc guide components. The disc guide shall slide in the seat and allow controlled flow through the seat slots into the central seat chamber where flow shall continue from the seat chamber and exit through the angularly oriented slots of the disc guide. The seat and disc guide features used together shall provide anti-cavitation characteristics suitable for applications where a large controlled pressure drop is desired.

The flexible, non-wicking, FDA approved diaphragm shall consist of nylon fabric bonded with synthetic rubber compatible with the operating fluid. The diaphragm must withstand a Mullins burst test of a minimum of 600 psi per layer of nylon fabric and shall be cycle tested 100,000 times to insure longevity. The diaphragm shall be fully supported in the valve body and cover by machined surfaces which support no less than one-half of the total surface area of the diaphragm in either the fully open or fully closed position. The valve seat in six inch and smaller size valves shall be threaded into the body. Valve seat in eight inch and larger size valves shall be retained by flat head machine screws for ease of maintenance. The seat shall be of the solid, one-piece design and shall have a minimum of a five degree taper on the seating surface for positive drip-tight shut-off. Pressed-in bearings and/or multi-piece seats shall not be permitted.

To insure proper alignment of the valve stem, the valve body and cover shall be machined with a locating lip. No "pinned" covers to the valve body shall be permitted. All necessary repairs and/or modifications other than replacement of the main valve body shall be possible without removing the valve from the pipeline.

The valve manufacturer shall warrant the valve to be free of defects in material and workmanship for a period of three years from date of shipment, provided the valve is installed and used in accordance with all applicable instructions. The valve manufacturer shall be able to supply a complete line of equipment from 1½" through 48" sizes and a complete selection of complementary equipment.

Material Specification

Valve Size: Pressure Rating: Main Valve Body and Cover: Temperature Range: Main Valve Trim: Coating: End Detail: **Desired Options:**

Application Information

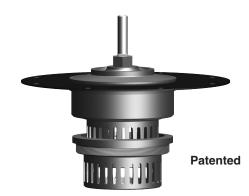
Inlet/Outlet Pressures:

Flow Rate: Pipe Diameter:

Function (i.e. - Pressure Reducing, Pressure Relief, etc.):

This valve shall be a Cla-Val Model No. 100-01KO Hytrol Main Valve with Anti-Cavitation Trim as manufactured by Cla-Val, Newport Beach, CA

Note: Add this Hytrol Anti-Cavitation Trim Purchase Specification to main valve specification for control valves where there is a high potential for cavitation damage. Please contact our Regional Sales Offices or Factory for assistance.



The Anti-Cavitation Trim components can be retrofitted to existing Hytrol valves if the application indicates an appropriate need. Please consult factory for details.



CLA-VAL

1701 Placentia Ave. Costa Mesa, CA 92627-4475 Phone: 949-722-4800 • Fax: 949-548-5441

CLA-VAL CANADA 4687 Christie Drive

Beamsville, Ontario Canada L0R 1B4 Phone: 905-563-4963 905-563-4040 ©COPYRIGHT CLA-VAL 2015 Printed in USA Specifications subject to change without notice

www.cla-val.com

Chemin dés Mesanges 1 CH-1032 Romanel/ Lausanne Switzerland Phone: 41-21-643-15-55 41-21-643-15-50

CLA-VAL EUROPE

Represented By: