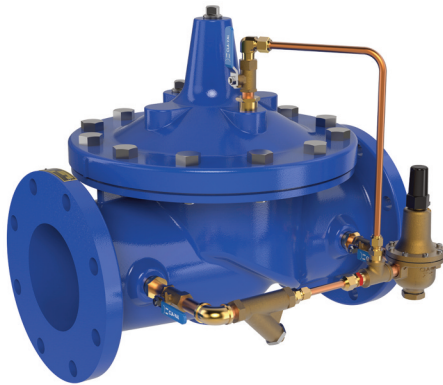




MODEL

690-01KO

Anti-Cavitation Pressure Reducing Valve



Schematic Diagram

Item	Description
1	100-20KO Hytrol Main Valve
2	X58 Restriction Fitting
3	CRD Pressure Reducing Control

Optional Features

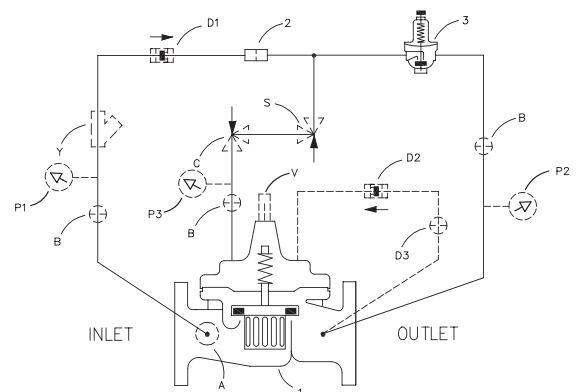
Item	Description
A	X46A Flow Clean Strainer
B	CK2 Isolation Valve
C	CV Flow Control (Closing)*
D	Check Valves with Isolation Valve
P	X141 Pressure Gauge
S	CV Speed Control (Opening)
V	X101 Valve Position Indicator
Y	X43 "Y" Strainer

*The closing speed control (optional) on this valve should always be open at least three (3) turns off its seat.

- Virtually Cavitation Free Operation
- Sensitive and Accurate Pressure Control
- Easy Adjustment and Maintenance
- Optional Check Feature
- Fully Supported Frictionless Diaphragm

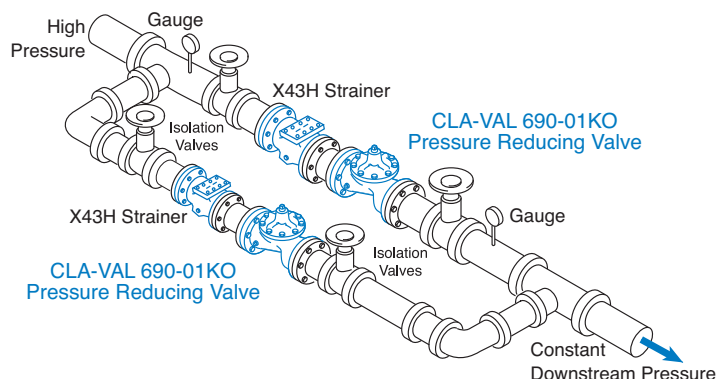
The Cla-Val Model 690-01KO Anti-Cavitation Hytrol Pressure Reducing Valve automatically reduces a higher inlet pressure to a steady lower downstream pressure, regardless of changing flow rate and/or varying inlet pressure. This valve is an accurate, pilot-operated regulator capable of holding downstream pressure to a pre-determined limit. When downstream pressure exceeds the pressure setting of the control pilot, the main valve and pilot valve close drip-tight.

If a check feature is added, and a pressure reversal occurs, the downstream pressure is admitted in the main valve cover chamber, closing the valve to prevent return flow.

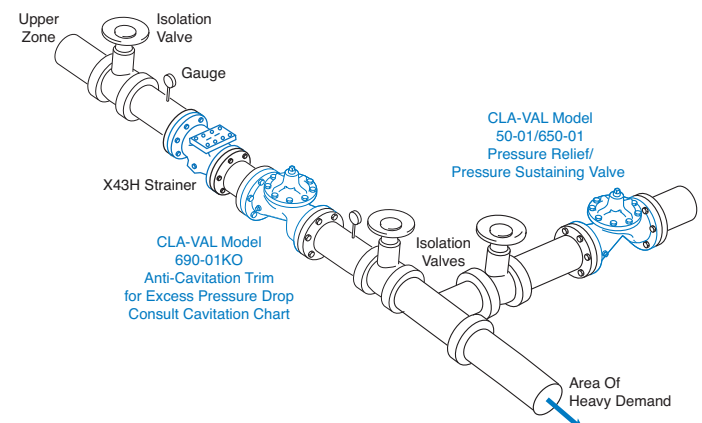


Typical Applications

Typical applications include pressure reducing valve station using Model 690-01KO and Model 690-01KO in parallel to handle wide range of flow rates. Larger valve meets requirements of peak loads. The smaller valve handles low flows. A downstream pressure relief valve is recommended for this type of application.



Cla-Val Model 690-01KO provides optimum downstream pressure control while reducing noise and eliminating damage associated with cavitation. See Cavitation Guide to determine if the valve is a candidate for the KO Anti-Cavitation Trim. A downstream pressure relief valve is recommended for this type of application.



Model 690-01KO (Uses 100-20 Hytrol Main Valve)**Operating Temp. Range**

Pattern	Globe	Angle
Size	3" - 36" 32 - 900 mm	4" - 6" - 8" 100, 150, 200 mm

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

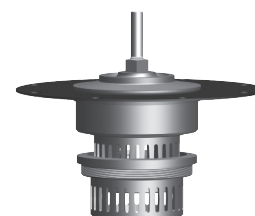
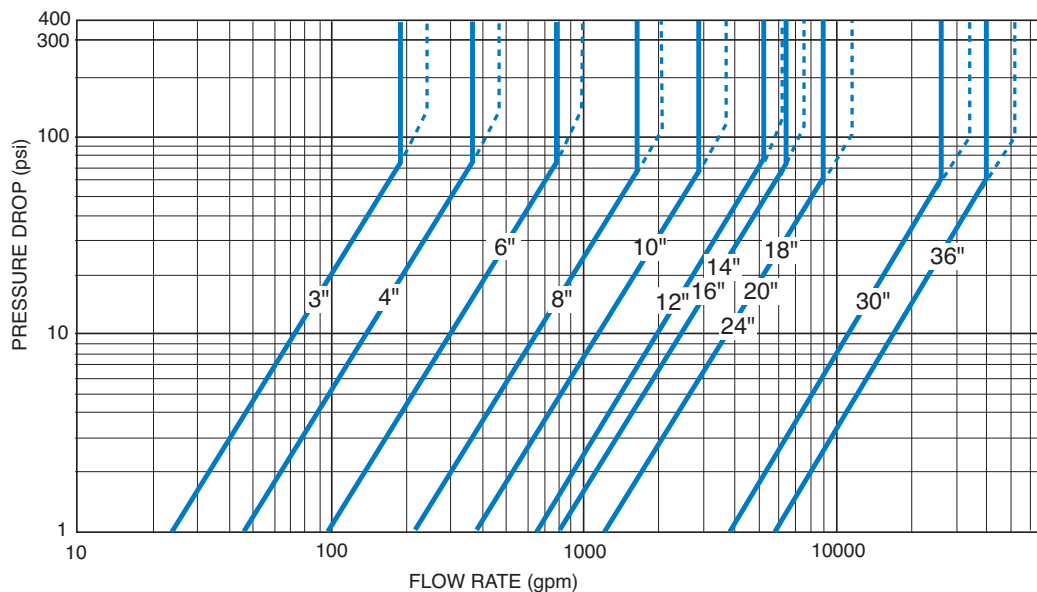
Note: * ANSI standards are for flange dimensions only.
Flanged valves are available faced but not drilled.
‡ End Details machined to ANSI B2.1 specifications.
Valves for higher pressure are available; consult factory for details

Materials

Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes	3" - 36" 80 - 900 mm	3" - 16" 80 - 400 mm	3" - 16" 80 - 400 mm
Disc Retainer & Diaphragm Washer	Cast Iron	Cast Steel	Bronze
Trim: Disc Guide, Seat & Cover Bearing	Stainless Steel is Standard		
Disc	Buna-N® Rubber		
Diaphragm	Nylon Reinforced Buna-N® Rubber		
Stem, Nut & Spring	Stainless Steel		
For material options not listed consult factory.			

100G-20KO ANTI-CAVITATION VALVE CURVES

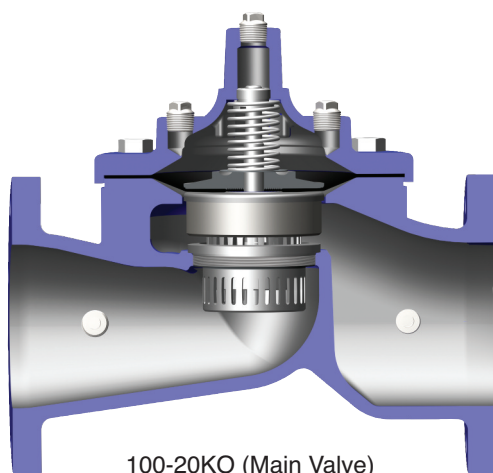
SOLID LINE IS FULL OPEN FLOW CURVES AT 18 FT/SEC FOR CONTINUOUS DUTY APPLICATIONS
DASHED LINE IS FULL OPEN FLOW CURVE AT 25 FT/SEC FOR INTERMITTENT DUTY APPLICATIONS



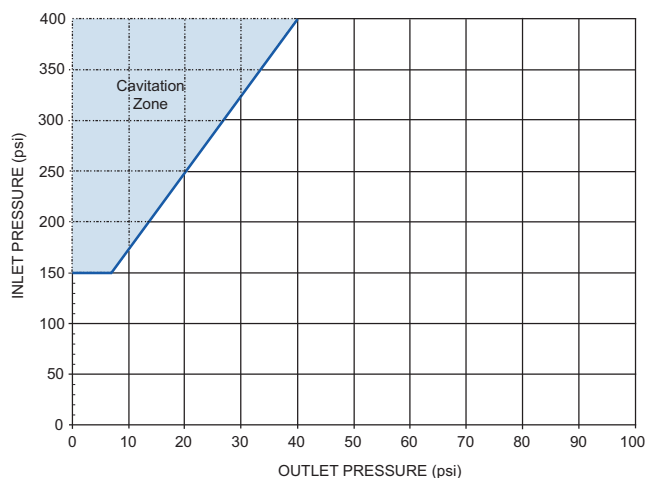
KO Seat Detail

Notes: On Operating Differential

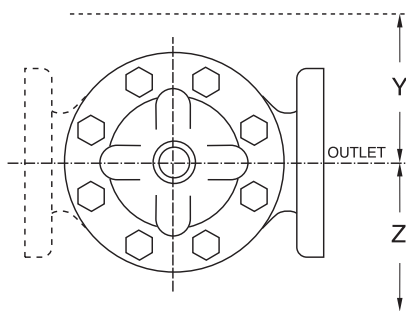
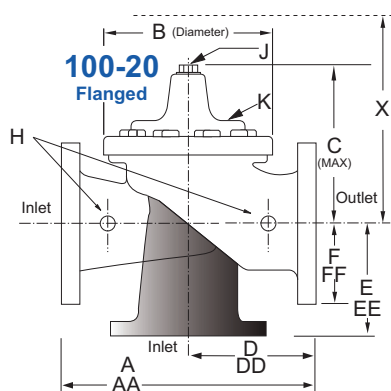
1. For atmospheric discharge, the maximum inlet pressure cannot exceed 150 psi.
2. For pressure differentials greater than 300 psi, the maximum flow velocity should not exceed 18 ft/sec.
3. Flow velocities greater than 25 ft/sec are not recommended.
4. Recommended minimum flow velocity is 1 ft/sec.
5.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



100-20KO (Main Valve)

SELECTION GUIDELINE FOR KO ANTI-CAVITATION VALVES

Model 690-01KO (Uses 100-20 Hytrol Main Valve)



Model 100-20 Reduced Port Hytrol Main Valve

Model 690-01KO Dimensions (In Inches)

Valve Size (Inches)	3	4	6	8	10	12	14	16	18	20	24	30	36
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
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
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
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
D 150 ANSI	—	6.94	8.88	10.69	12.75	14.94	—	—	20.93	21.06	—	—	—
DD 300 ANSI	—	7.25	9.38	11.19	—	—	—	—	—	—	—	—	—
E 150 ANSI	—	5.50	6.75	7.25	8.06	8.68	—	—	15.81	15.94	—	—	—
EE 300 ANSI	—	5.81	7.25	7.75	—	—	—	—	—	—	—	—	—
F 150 ANSI	3.75	4.50	5.50	6.75	8.00	9.50	11.00	11.75	15.88	14.56	17.00	19.88	25.50
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
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
J NPT Cover Center Plug	0.50	0.50	0.75	0.75	1.00	1.00	1.25	1.25	2.00	2.00	2.00	1.00	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
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
Approx. Ship Weight (lbs)	45	85	195	330	625	900	1250	1380	2365	2551	2733	6500	8545
Approx. X Pilot System	13	15	27	30	33	36	36	41	40	46	55	68	79
Approx. Y Pilot System	10	11	18	20	22	24	26	26	30	30	30	39	40
Approx. Z Pilot System	10	11	18	20	22	24	26	26	30	30	30	39	42

Model 690-01 KO Dimensions (In mm)

Valve Size (mm)	80	100	150	200	250	300	350	400	450	500	600	750	900
A 150 ANSI	260	353	451	543	660	762	870	889	1070	1219	1219	1607	1651
AA 300 ANSI	279	368	473	568	695	800	908	930	1108	1260	1263	1619	1702
B Diameter	168	232	292	400	508	600	698	711	900	900	900	1351	1422
C Maximum	178	219	295	381	454	533	530	654	635	800	800	1116	1391
D 150 ANSI	—	176	226	272	324	380	—	—	532	535	—	—	—
DD 300 ANSI	—	184	238	284	—	—	—	—	—	—	—	—	—
E 150 ANSI	—	140	171	184	205	349	—	—	402	405	—	—	—
EE 300 ANSI	—	148	184	197	—	—	—	—	—	—	—	—	—
F 150 ANSI	95	114	140	171	203	241	279	289	403	370	432	505	648
FF 300 ANSI	105	127	159	191	222	260	292	324	403	408	483	559	699
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
J NPT Cover Center Plug	0.50	0.50	0.75	0.75	1.00	1.00	1.25	1.25	2.00	2.00	2.00	1.00	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
Stem Travel	15	20	28	43	58	71	86	86	114	114	114	165	191
Approx. Ship Weight (kgs)	20	39	89	150	284	409	568	627	681	1157	1249	2951	3876
Approx. X Pilot System	331	381	686	762	839	915	915	1042	1016	1169	1397	1728	2007
Approx. Y Pilot System	254	280	458	508	559	610	661	661	762	762	762	991	1016
Approx. Z Pilot System	254	280	458	508	559	610	661	661	762	762	762	991	1067

690-01KO Valve Selection	100-20KO Pattern: Globe (G), Angle (A), End Connections: Flanged (F) Indicate Available Sizes													
	Inches	3	4	6	8	10	12	14	16	18	20	24	30	36
	mm	80	100	150	200	250	300	350	400	450	500	600	750	900
Main Valve 100-20KO	Pattern	G	G, A	G, A	G, A	G	G	G	G	G	G	G	G	G
	End Detail	F	F	F	F	F	F	F	F	F	F	F	F	F
Suggested Flow (gpm)	Maximum Continuous	190	410	710	1620	2810	4420	6280	7590	9920	12550	14900	22600	38000
	Minimum Continuous	15	30	50	115	200	300	400	500	650	560	1073	1577	2650
Suggested Flow (Liters/Sec)	Maximum Continuous	12	26	45	102	177	279	396	479	626	792	940	1426	2098
	Minimum Continuous	1	2	3	7	13	19	25	32	41	35	68	99	167
100-20KO Series is the reduced internal port size version of the 100-01 Series.										For Lower Flows Consult Factory				

Many factors should be considered in sizing pressure reducing valves including inlet pressure, outlet pressure and flow rates.
For sizing questions or cavitation analysis, consult Cla-Val with system details.

Pilot System Specifications



Adjustment Ranges

2 to 30 psi
15 to 75 psi
20 to 105 psi
30 to 300 psi*
150 to 600 psi (CRD-18)

*Supplied unless otherwise specified

Temperature Range
Water: to 180°F

Materials

Standard Pilot System Materials

Pilot Control: Low Lead Bronze
Trim: Stainless Steel Type 303
Rubber: Buna-N® Synthetic Rubber

Optional Pilot System Materials

Pilot Systems are available with optional Stainless Steel or Monel materials.

Note: Available with remote sensing control.

When Ordering, Specify:

1. Catalog No. 690-01KO
2. Valve Size
3. Pattern - Globe or Angle
4. Pressure Class
5. Threaded or Flanged Ends
6. Trim Material
7. Adjustment Range
8. Desired Options
9. When Vertically Installed

Valve Options

X141
Pressure
Gauge



X101AR Valve
Position Indicator
with Air Release



X101
Valve Position
Indicator

X144 e-FlowMeter



X43H
Strainer



Stainless
Steel Pilot



E-690-01KO (R-02/2021)

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