



**MODEL** **90-01**  
(Full Internal Port)  
**690-01**  
(Reduced Internal Port)

# Pressure Reducing Valve



- Sensitive and Accurate Pressure Control
- Easy Adjustment and Maintenance
- Tamper Resistant
- Optional Check Feature
- Fully Supported Frictionless Diaphragm

The Cla-Val Model 90-01/690-01 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.

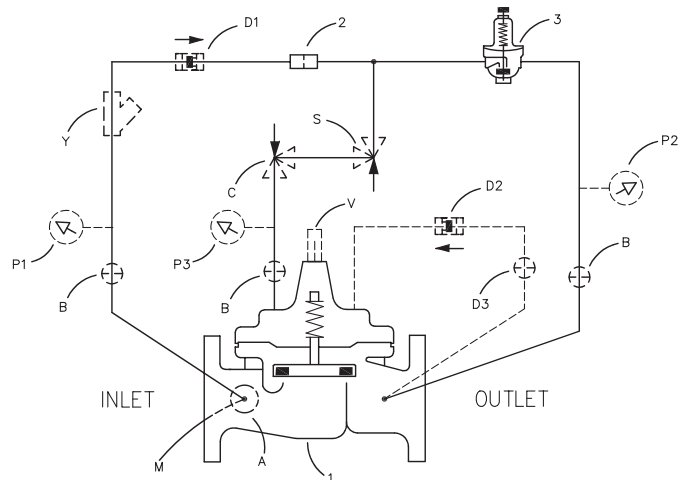
## Schematic Diagram

Item	Description
1	Hytrol (Main Valve)
2	X58 Restriction Fitting
3	CRD Pressure Reducing Control

## Optional Features

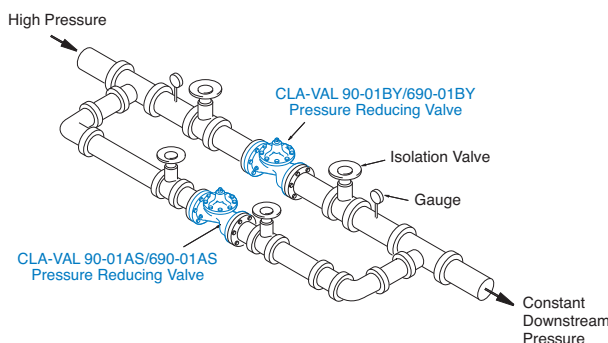
Item	Description
A	X46A Flow Clean Strainer
B	CK2 (Isolation Valve)
C	CV Flow Control (Closing)*
D	Check Valves with Isolation Valve
M	X144 e-FlowMeter
P	X141 Pressure Gauge
S	CV Flow Control (Opening)
V	X101 Valve Position Indicator
Y	X43 "Y" Strainer

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



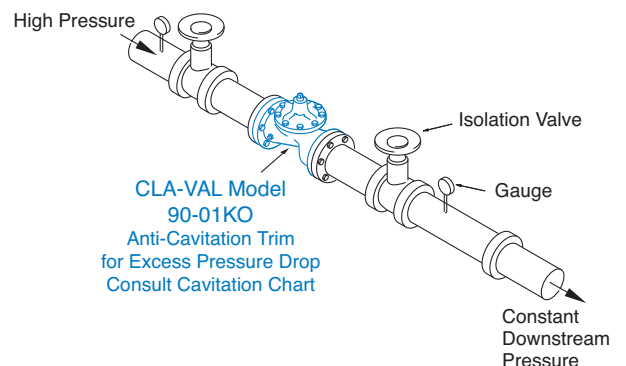
## Typical Applications

Typical applications include pressure reducing valve station using Model 90-01BY/690-01BY and Model 90-01AS/690-01AS in parallel to handle wide range of flow rates. Larger Model 90-01BY/690-01BY valve meets requirements of peak loads and smaller Model 90-01AS/690-01AS handles low flows.



Cla-Val Model 90-01KO/690-01KO Pressure Reducing Valve with Anti-Cavitation Trim provides for 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.



**Model 90-01** (Uses Basic Valve Model 100-01)

**Dimensions**  
(In inches)

**Pressure Ratings** (Recommended Maximum Pressure - psi)

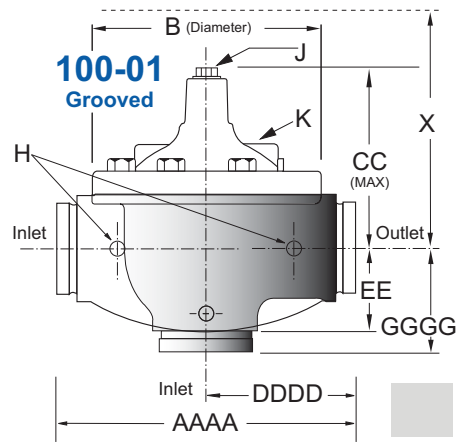
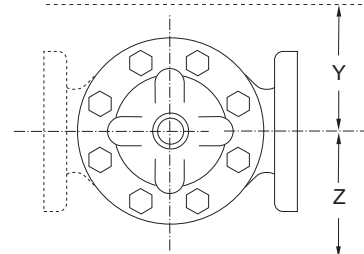
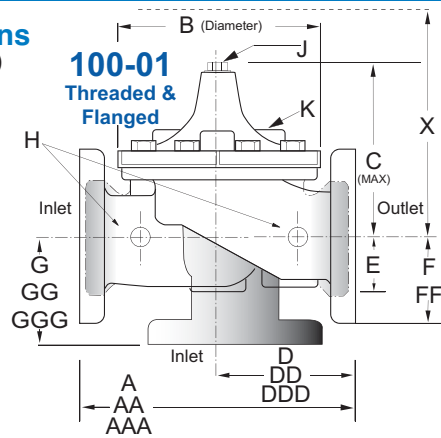
Valve Body & Cover		Pressure Class				
		Flanged		Grooved	Threaded	
Grade	Material	ANSI Standards*	150 Class	300 Class	300 Class	End‡ Details
ASTM A536	Ductile Iron	B16.42	250	400	400	400
ASTM A216-WCB	Cast Steel	B16.5	285	400	400	400
ASTM B62	Bronze	B16.24	225	400	400	400

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**

**Materials**

Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes	1" - 36"	1" - 16"	1" - 16"
Disc Retainer & Diaphragm Washer	Cast Iron	Cast Steel	Bronze
Trim: Disc Guide, Seat & Cover Bearing	Bronze is Standard Stainless Steel is Optional		
Disc	Buna-N® Rubber		
Diaphragm	Nylon Reinforced Buna-N® Rubber		
Stem, Nut & Spring	Stainless Steel		

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



**Model 90-01 Dimensions** (In Inches)

Valve Size (Inches)	1	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24	30	36
<b>A</b> Threaded	7.25	7.25	7.25	9.38	11.00	12.50	—	—	—	—	—	—	—	—	—	—	—	—
<b>AA</b> 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	76.00
<b>AAA</b> 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	76.00
<b>AAAA</b> Grooved End	—	—	8.50	9.00	11.00	12.50	15.00	20.00	25.38	—	—	—	—	—	—	—	—	—
<b>B</b> Dia.	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
<b>C</b> Max.	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	61.50
<b>CC</b> Max. Grooved End	—	—	4.75	5.75	6.88	7.25	9.31	12.12	14.62	—	—	—	—	—	—	—	—	—
<b>D</b> Threaded	3.25	3.25	3.25	4.75	5.50	6.25	—	—	—	—	—	—	—	—	—	—	—	—
<b>DD</b> 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	—	—
<b>DDD</b> 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	—	—
<b>DDDD</b> Grooved End	—	—	—	4.75	—	6.00	7.50	—	—	—	—	—	—	—	—	—	—	—
<b>E</b>	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
<b>EE</b> Grooved End	—	—	2.00	2.50	2.88	3.12	4.25	6.00	7.56	—	—	—	—	—	—	—	—	—
<b>F</b> 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	25.60
<b>FF</b> 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	25.60
<b>G</b> Threaded	1.88	1.88	1.88	3.25	4.00	4.50	—	—	—	—	—	—	—	—	—	—	—	—
<b>GG</b> 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	—	—
<b>GGG</b> 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	—	—
<b>GGGG</b> Grooved End	—	—	—	3.25	—	4.25	5.00	—	—	—	—	—	—	—	—	—	—	—
<b>H</b> NPT Body Tapping	.375	.375	.375	.375	.50	.50	.75	.75	1	1	1	1	1	1	1	1	2	2
<b>J</b> NPT Cover Center Plug	.25	.25	.25	.50	.50	.50	.75	.75	1	1	1.25	1.5	2	1.5	1.5	1.5	2	2
<b>K</b> NPT Cover Tapping	.375	.375	.375	.375	.50	.50	.75	.75	1	1	1	1	1	1	1	1	2	2
Stem Travel	0.4	0.4	0.4	0.6	0.7	0.8	1.1	1.7	2.3	2.8	3.4	4.0	4.5	5.1	5.63	6.75	7.5	8.5
Approx. Ship Wt. Lbs.	15	15	15	35	50	70	140	285	500	780	1165	1600	2265	2982	3900	6200	7703	11720
<b>X</b> Pilot System	11	11	11	13	14	15	17	29	31	33	36	40	40	43	47	68	79	85
<b>Y</b> Pilot System	9	9	9	9	10	11	12	20	22	24	26	29	30	32	34	39	40	45
<b>Z</b> Pilot System	9	9	9	9	10	11	12	20	22	24	26	29	30	32	34	39	42	47

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

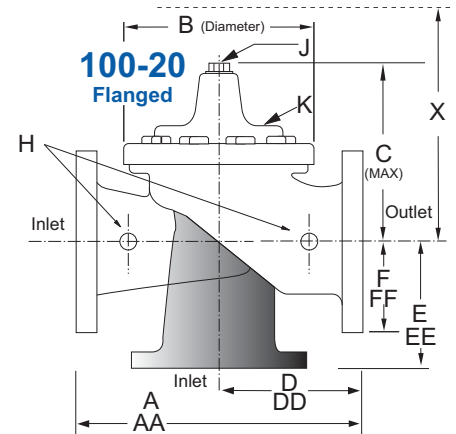
**Model 690-01** (Uses Basic Valve Model 100-20)

**Dimensions**  
(In inches)

**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
ASTM B62	Bronze	B16.24	225	400

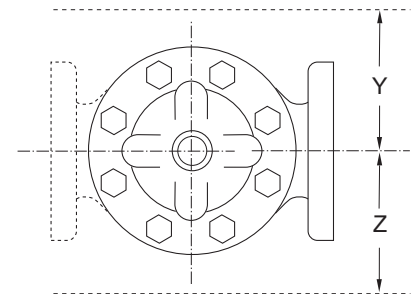
Note: \* ANSI standards are for flange dimensions only.  
Flanged valves are available faced but not drilled.  
**Valves for higher pressure are available; consult factory for details**



**Materials**

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

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



**Model 690-01 Dimensions** (In Inches)

Shaded area use 690-66 E-Sheet

Valve Size (Inches)	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48
<b>A</b> 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	76.00	94.50
<b>AA</b> 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	76.00	94.50
<b>B</b> Dia.	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	66.00
<b>C</b> Max.	7.00	8.62	11.62	15.00	17.88	21.00	20.88	25.75	25.00	31.00	31.00	43.94	54.60	61.50	61.50
<b>D</b> 150 ANSI	—	6.94	8.88	10.69	CF*	CF*	CF*	CF*	CF*	CF*	CF*	—	—	—	—
<b>DD</b> 300 ANSI	—	7.25	9.38	11.19	CF*	CF*	CF*	CF*	CF*	CF*	CF*	—	—	—	—
<b>E</b> 150 ANSI	—	5.50	6.75	7.25	CF*	CF*	CF*	CF*	CF*	CF*	CF*	—	—	—	—
<b>EE</b> 300 ANSI	—	5.81	7.25	7.75	CF*	CF*	CF*	CF*	CF*	CF*	CF*	—	—	—	—
<b>F</b> 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	28.00	31.50
<b>FF</b> 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	28.00	31.50
<b>H</b> NPT Body Tapping	.375	.50	.75	.75	1	1	1	1	1	1	1	1	2	2	2
<b>J</b> NPT Cover Center Plug	.50	.50	.75	.75	1	1	1.25	1.25	2	2	2	2	2	2	2
<b>K</b> NPT Cover Tapping	.375	.50	.75	.75	1	1	1	1	1	1	1	1	2	2	2
Stem Travel	0.6	0.8	1.1	1.7	2.3	2.8	3.4	3.4	3.4	4.5	4.5	6.5	7.5	8.5	8.5
Approx. Ship Wt. Lbs.	45	85	195	330	625	900	1250	1380	2365	2551	2733	6500	8545	12450	13100
<b>X</b> Pilot System	13	15	27	30	33	36	36	41	40	46	55	68	79	85	86
<b>Y</b> Pilot System	10	11	18	20	22	24	26	26	30	30	30	39	40	45	47
<b>Z</b> Pilot System	10	11	18	20	22	24	26	26	30	30	30	39	42	47	49

\*Consult Factory

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

90-01 Valve Selection	100-01 Pattern: Globe (G), Angle (A), End Connections: Threaded (T), Grooved (GR), Flanged (F) Indicate Available Sizes																		
	Inches	1	1¼	1½	2	2½	3	4	6	8	10	12	14	16	18	20	24	30	36
	mm	25	32	40	50	65	80	100	150	200	250	300	350	400	450	500	600	750	900
Basic Valve 100-01	Pattern	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G	G	G, A	G	G
	End Detail	T	T	T, F, Gr*	T, F, Gr	T, F, Gr*	T, F, Gr	F, Gr	F, Gr*	F, Gr*	F	F	F	F	F	F	F	F	F
Suggested Flow (gpm)	Maximum	55	93	125	210	300	460	800	1800	3100	4900	7000	8400	11000	14000	17000	25000	42000	50000
	Maximum Intermittent	68	120	160	260	370	580	990	2250	3900	6150	8720	10540	13700	17500	21700	31300	48000	62500
	Minimum	1	1	1	1	2	2	4	10	15	35	50	70	95	120	150	275	450	650
Suggested Flow (Liters/Sec)	Maximum	3.5	6	8	13	19	29	50	113	195	309	442	530	694	883	1073	1577	2650	3150
	Maximum Intermittent	4.3	7.6	10	16	23	37	62	142	246	387	549	664	863	1104	1369	1972	3028	3940
	Minimum	.03	.03	.03	.06	.09	0.13	0.25	0.63	0.95	2.2	3.2	4.4	6.0	7.6	9.5	17.4	28.4	41.0

100-01 Series is the full internal port Hytrol.

For Lower Flows Consult Factory

\*Globe Grooved Only

690-01 Valve Selection	100-20 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	42	48
	mm	80	100	150	200	250	300	350	400	450	500	600	750	900	1000	1200
Basic Valve 100-20	Pattern	G	G, A	G, A	G, A	G	G	G	G	G	G	G	G	G	G	G
	End Detail	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Suggested Flow (gpm)	Maximum	260	580	1025	2300	4100	6400	9230	9230	16500	16500	16500	28000	33500	57000	57000
	Minimum	1	2	4	10	15	35	50	50	95	95	95	275	450	450	450
Suggested Flow (Liters/Sec)	Maximum	16	37	65	145	258	403	581	581	1040	1040	1040	1764	2115	3596	3596
	Minimum	.06	.13	.25	.63	.95	2.2	3.2	3.2	6.0	6.0	6.0	17.4	28.4	41.0	41.0

100-20 Series is the reduced internal port size version of the 100-01 Series.

For Lower Flows Consult Factory

Shaded areas use 90-66 and 690-66 E-Sheet

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

### Temperature Range

Water: to 180°F

### Materials

#### Standard Pilot System Materials

Pilot Control: Bronze ASTM B62  
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, Please Specify

1. Catalog No. 90-01 or No. 690-01
2. Valve Size
3. Pattern - Globe or Angle
4. Pressure Class
5. Threaded, Flanged or Grooved
6. Trim Material
7. Adjustment Range
8. Desired Options
9. When Vertically Installed
10. Product Enhancements