CLA-VAL™

MODEL 90-99

Pressure Reducing Valve with Low Flow By-Pass

- **Modulating Control**
- **Maintains Constant Outlet Pressure Over a Wide Range of Flows**
- **Durable Construction**
- **Convenient, Compact, Space Saving Design**

The Cla-Val Model 90-99 Pressure Reducing Valve with Low Flow By-Pass automatically reduces a higher inlet pressure to a steady lower downstream pressure, regardless of changing flow rate. The low flow by-pass capability is achieved by using a 2" grooved end 90-01 Pressure Reducing Valve as an integral part of the main valve. This compact design saves space and makes for an easier installation process.

The pressure reducing valve is hydraulically operated and controlled by a Cla-Val CRD pilot control, which senses pressure at the main valve outlet. An increase in outlet pressure forces the CRD pilot control to close and a decrease in outlet pressure opens the control. This causes the main valve cover pressure to vary, modulating the main valve, thereby maintaining constant outlet pressure.

The pressure reducing low flow by-pass valve is also controlled by a Cla-Val CRD pilot control, which is preset to a higher pressure than the CRD pilot control on the main valve. The pressure reducing low flow by-pass valve responds to pressure at the main valve outlet. When the CRD on the main valve closes, the CRD on the pressure reducing low flow by-pass remains open, allowing flow to by-pass the main valve. The bypass valve closes when the flow decreases and the downstream pressure reaches the set-point of its CRD pilot control.

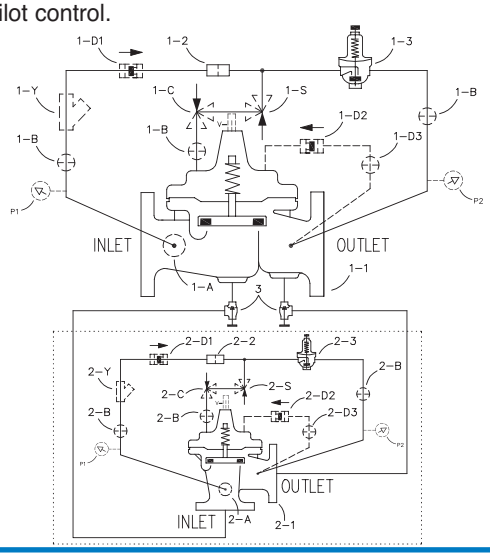
Schematic Diagram

Item	Description
1	90-01 Pressure Reducing Valve
1-1	100-01 Hytrol Main Valve
1-2	X58C Restriction Tube Assembly
1-3	CRD Pressure Reducing Control
2	90-01 Pressure Reducing Valve (Bypass)
2-1	100-01 Hytrol, Grooved End (Main Valve)
2-2	X58C Restriction Tube Assembly
2-3	CRD Pressure Reducing Control
3	CGA Angle Valve

Optional Features

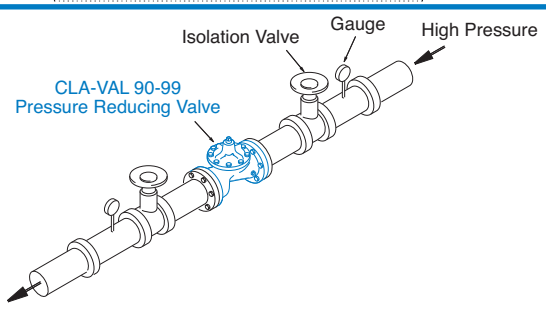
Item	Description
A	X46A Flow Clean Strainer
B	CK2 Isolation Valve
C	CV Flow Control (Closing)*
D	Check Valves with Isolation Valve
P	X141 Pressure Gauge
S	CV Flow Control (Opening)*
V	X101 Valve Position Indicator
Y	X43 "Y" Strainer

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



Typical Applications

This valve has the flexibility to be installed in a distribution system where the demand varies over a wide range. This frequently occurs in industrial, residential, educational, high-rise buildings and other applications. Another important feature of the valve is its space efficient configuration, allowing easy installation and maintenance.



We recommend providing adequate space around valve for maintenance work

90-99 Valve Selection	100-01 Pattern: Globe (G), Angle (A), End Connections: Threaded (T), Grooved (GR), Flanged (F) Sizes					
	Inches	4	6	8	10	12
	mm	100	150	200	250	300
Main Valve 100-01	Pattern	G, A	G, A	G, A	G, A	G, A
	End Detail	F, Gr	F, Gr*	F, Gr*	F	F
Suggested Flow (gpm)	Maximum	800	1800	3100	4900	7000
	Maximum Intermittent	990	2250	3900	6150	8720
	Minimum	1	1	1	1	1
Suggested Flow (Liters/Sec)	Maximum	50	113	195	309	442
	Maximum Intermittent	62	142	246	387	549
	Minimum	0.06	0.06	0.06	0.06	0.06

100-01 Series is the full internal port Hytrol.
For Lower Flows Consult Factory *Globe Grooved Only

Pilot System Specifications

Adjustment Ranges

CRD

2 to 30 psi
15 to 75 psi
20 to 105 psi
30 to 300 psi*

*Supplied unless otherwise specified
Other ranges available, please consult factory.

Temperature Range: Water: 180°

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

Materials

Component	Standard Material Combinations		
Body & Cover	Ductile Iron Epoxy	Cast Steel	Bronze
Available Sizes	4" - 12"	4" - 12"	4" - 12"
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.			

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

Model 90-99 Dimensions (In Inches)

Valve Size (Inches)	4	6	8	10	12
A Threaded	—	—	—	—	—
AA 150 ANSI	15.00	20.00	25.38	29.75	34.00
AAA 300 ANSI	15.62	21.00	26.38	31.12	35.50
AAAA Grooved End	15.00	20.00	25.38	—	—
B Dia.	11.50	15.75	20.00	23.62	28.00
C Max.	10.62	13.38	16.00	17.12	20.88
CC Max. Grooved End	9.31	12.12	14.62	—	—
D Threaded	—	—	—	—	—
DD 150 ANSI	7.50	10.00	12.69	14.88	17.00
DDD 300 ANSI	7.88	10.50	13.25	15.56	17.75
E	3.19	4.31	5.31	9.25	10.75
EE Grooved End	4.25	6.00	7.56	—	—
F 150 ANSI	4.50	5.50	6.75	8.00	9.50
FF 300 ANSI	5.00	6.25	7.50	8.75	10.25
G Threaded	—	—	—	—	—
GG 150 ANSI	5.00	6.00	8.00	8.62	13.75
GGG 300 ANSI	5.31	6.50	8.50	9.31	14.50
H NPT Body Tapping	.75	.75	1	1	1
J NPT Cover Center Plug	.75	.75	1	1	1.25
K NPT Cover Tapping	.75	.75	1	1	1
Stem Travel	1.1	1.7	2.3	2.8	3.40
Approx. Ship Wt. Lbs.	140	285	500	780	1165
X Pilot System	17	29	31	33	36
Y Pilot System	12	20	22	24	26
Z Pilot System	12	20	22	24	26
W Pilot System	34	34	36	38	42

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.