CLA-VAL™

— MODEL — **90-99**

(Full Internal Port)

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.

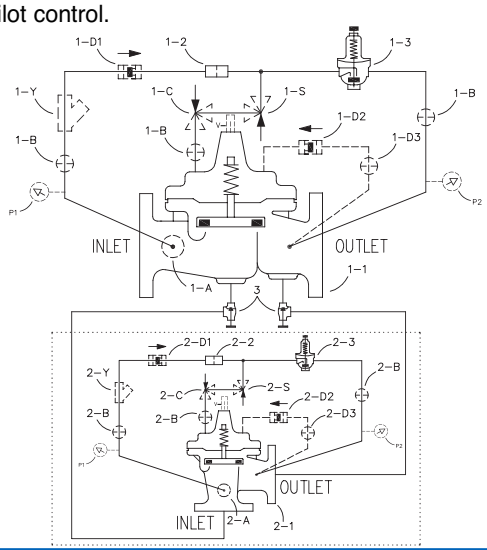
Schematic Diagram

Item	Description
1	90-01 Pressure Reducing Valve
1-1	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

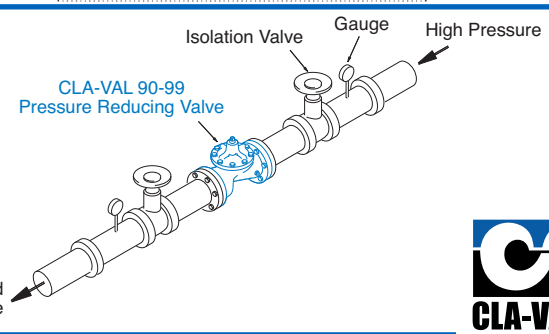
*The optional closing speed control on this valve should always be open at least three (3) turns off its seat.



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



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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
	mm	100	150	200	250
Basic Valve 100-01	Pattern	G, A	G, A	G, A	G, A
	End Detail	F, Gr	F, Gr*	F, Gr*	F
Suggested Flow (gpm)	Maximum	800	1800	3100	4900
	Maximum Intermittent	990	2250	3900	6150
	Minimum	1	1	1	1
Suggested Flow (Liters/Sec)	Maximum	50	113	195	309
	Maximum Intermittent	62	142	246	387
	Minimum	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: Bronze ASTM B62
Trim: Stainless Steel Type 303
Rubber: Buna-N® Synthetic

Rubber

Optional Pilot System Materials

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

Note: Available with remote sensing control

100-01 Series is the full internal port Hytrol

For 100-01 basic valves
- Suggested flow calculations are based on flow through Schedule 40 Pipe.
- Max continuous flow is approx. 20 ft/sec (6.1 meters/sec).
- Max intermittent is approx. 25 ft/sec (7.6 meters/sec).

*Globe Grooved Only

Materials

Component	Standard Material Combinations		
Body & Cover	Ductile Iron Epoxy	Cast Steel	Bronze
Available Sizes	4" - 10"	4" - 10"	4" - 10"
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
ASTM B62	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**
A Threaded	—	—	—	—
AA 150 ANSI	15.00	20.00	25.38	29.75
AAA 300 ANSI	15.62	21.00	26.38	31.12
AAAA Grooved End	15.00	20.00	25.38	—
B Dia.	11.50	15.75	20.00	23.62
C Max.	10.62	13.38	16.00	17.12
CC Max. Grooved End	9.31	12.12	14.62	—
D Threaded	—	—	—	—
DD 150 ANSI	7.50	10.00	12.69	14.88
DDD 300 ANSI	7.88	10.50	13.25	15.56
DDDD Grooved End	7.50	—	—	—
E	—	—	—	—
EE Grooved End	4.25	6.00	7.56	—
F 150 ANSI	4.50	5.50	6.75	8.00
FF 300 ANSI	5.00	6.25	7.50	8.75
G Threaded	—	—	—	—
GG 150 ANSI	5.00	6.00	8.00	8.62
GGG 300 ANSI	5.31	6.50	8.50	9.31
GGGG Grooved End	5.00	—	—	—
H NPT Body Tapping	.75	.75	1	1
J NPT Cover Center Plug	.75	.75	1	1
K NPT Cover Tapping	.75	.75	1	1
Stem Travel	1.1	1.7	2.3	2.8
Approx. Ship Wt. Lbs.	140	285	500	780
X Pilot System	17	29	31	33
Y Pilot System	12	20	22	24
Z Pilot System	12	20	22	24
W Pilot System	34	34	36	38

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.