



90-48
(Full Internal Port)
MODEL
690-48
(Reduced 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 and Space Saving**

The Cla-Val Model 90-48/690-48 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 the Cla-Val Model CRD-40 Direct Acting Pressure Reducing Valve as an integral part of the main valve. By doing this, space is saved and installation and maintenance become much easier.

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 Model CRD-40 low flow pressure reducing by-pass is preset to a higher pressure than the CRD pilot control. The CRD-40 responds to pressure changes at the main valve outlet. When the CRD closes, the Model CRD-40 remains open, allowing low flow to by-pass the main valve. The CRD-40 closes when the flow decreases and the downstream pressure reaches its set-point .

The Cla-Val Model 90-48/690-48 is not a substitute for a low flow bypass valve in all cases. This valve is commonly used in building where 1-15 gpm low flows are common in off peak usage. The bypass on this valve is limited to the body tapping size on the main valve.

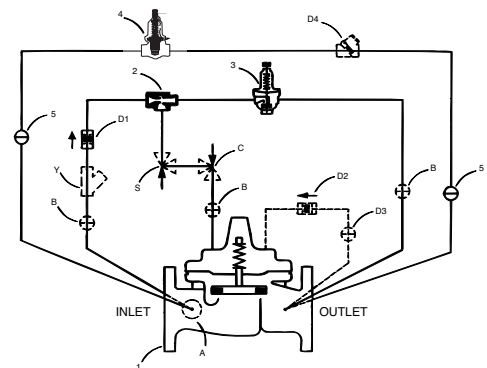
Schematic Diagram

Item	Description
1	Hytrol (Main Valve)
2	X47A Ejector
3	CRD Pressure Reducing Control
4	CRD-40 Pressure Reducing Valve
5	CK2 (Isolation Valve)

Optional Features

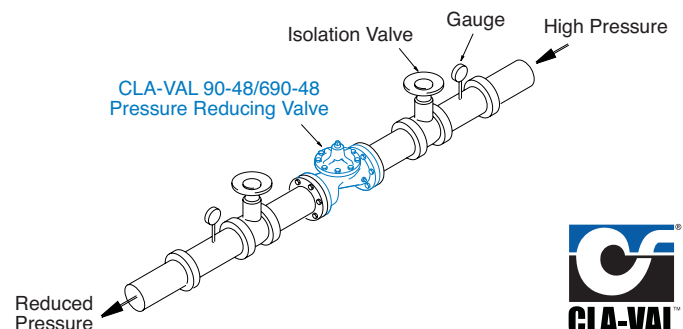
Item	Description
A	X46A Flow Clean Strainer
B	CK2 (Isolation Valve)
C	CV Flow Control (Closing)*
D	Check Valves with Isolation Valve
S	CV Flow Control (Opening)*
Y	X43 "Y" Strainer

*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.



Model 90-48 (Uses Basic Valve Model 100-01)

Pressure Ratings (Recommended Maximum Pressure - psi)

Valve Body & Cover		Pressure Class			
		Flanged		Threaded	
Grade	Material	ANSI Standards*	150 lb.	300 lb.	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.

Materials

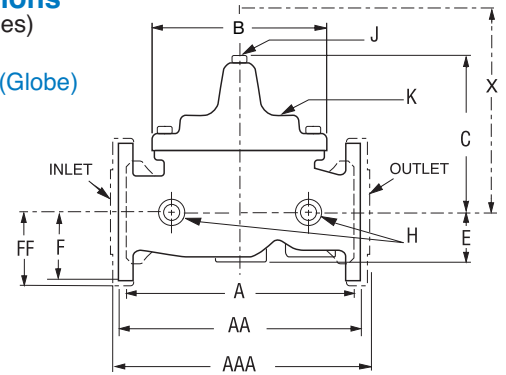
Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes	2½" - 8"	2½" - 8"	2½" - 8"
Disc Retainer & Diaphragm Washer	Cast Iron	Cast Steel	Bronze
Trim: Disc Guide, Seat & Cover Bearing	Bronze is Standard Stainless Steel is Optional		
Disc	Buna-N® Rubber		
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.

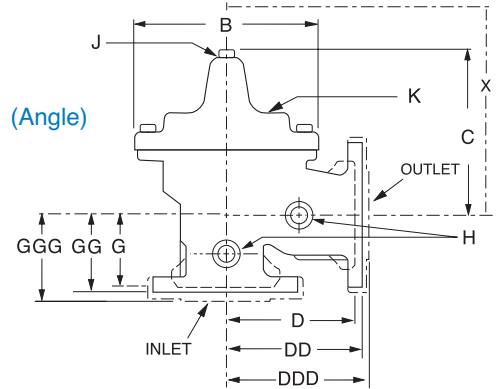
Dimensions

(In inches)

100-01 (Globe)



100-01 (Angle)



Model 90-48 Dimensions (In Inches)

Valve Size (Inches)	2 ½	3	4	6	8
A Threaded	11.00	12.50	—	—	—
AA 150 ANSI	11.00	12.00	15.00	20.00	25.38
AAA 300 ANSI	11.62	13.25	15.62	21.00	26.38
B Dia.	8.00	9.12	11.50	15.75	20.00
C Max.	7.56	8.19	10.62	13.38	16.00
D Threaded	5.50	6.25	—	—	—
DD 150 ANSI	5.50	6.00	7.50	10.00	12.75
DDD 300 ANSI	5.88	6.38	7.88	10.50	13.25
E	1.69	2.56	3.19	4.31	5.31
F 150 ANSI	3.50	3.75	4.50	5.50	6.75
FF 300 ANSI	3.75	4.13	5.00	6.25	7.50
G Threaded	4.00	4.50	—	—	—
GG 150 ANSI	4.00	4.00	5.00	6.00	8.00
GGG 300 ANSI	4.31	4.38	5.31	6.50	8.50
H NPT Body Tapping	½	½	¾	¾	1
J NPT Cover Center Plug	½	½	¾	¾	1
K NPT Cover Tapping	½	½	¾	¾	1
Valve Stem Internal Thread UNF	10-32	¼-28	¼-28	¾-24	¾-24
Stem Travel	0.7	0.8	1.1	1.7	2.3
Approx. Ship Wt. Lbs.	50	70	140	285	500
X Pilot System	14.00	15.00	17.00	29.00	31.00
Y Pilot System	10.00	11.00	12.00	20.00	22.00
Z Pilot System	10.00	11.00	12.00	20.00	22.00

Model 690-48 (Uses Basic Valve Model 100-20)

Dimensions
(In inches)

Pressure Ratings (Recommended Maximum Pressure - psi)

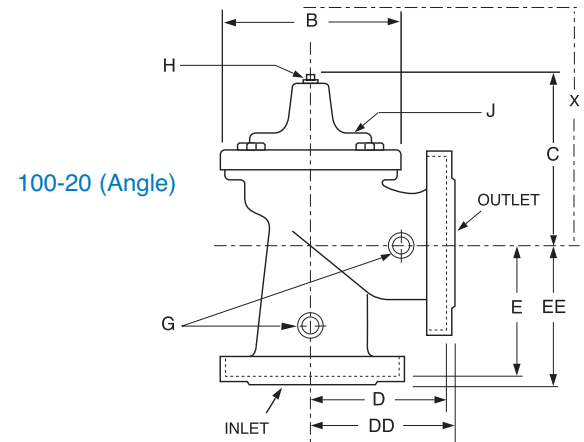
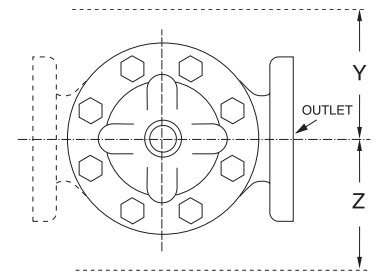
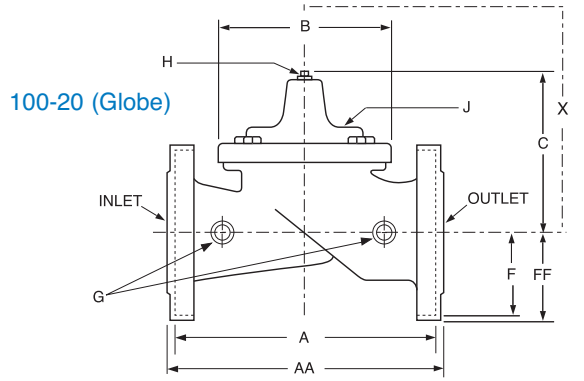
Valve Body & Cover		Pressure Class		
		Flanged		
Grade	Material	ANSI Standards*	150 lb.	300 lb.
ASTM A536	Ductile Iron	B16.42	250	400
ASTM A216-WCB	Cast Steel	B16.5	285	400
ASTM B62	Bronze	B16.24	225	400

Note: *ANSI standards are for flange dimensions only.
Flanged valves are available faced but not drilled.

Materials























Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes	3" - 10"	3" - 10"	3" - 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.
Cla-Val manufactures valves in more than 50 different alloys.



Model 690-48 Dimensions (In Inches)

Valve Size (Inches)	3	4	6	8	10
A 150 ANSI	10.25	13.88	17.75	21.38	26.00
AA 300 ANSI	11.00	14.50	18.62	22.38	27.38
B Dia.	6.62	9.12	11.50	15.75	20.00
C Max.	7.00	8.62	11.62	15.00	17.88
D 150 ANSI	—	6.94	8.88	10.69	—
DD 300 ANSI	—	7.25	9.38	11.19	—
E 150 ANSI	—	5.50	6.75	7.25	—
EE 300 ANSI	—	5.81	7.25	7.75	—
F 150 ANSI	3.75	4.50	5.50	6.75	8.00
FF 300 ANSI	4.12	5.00	6.25	7.50	8.75
H NPT Body Tapping	3/8	1/2	3/4	3/4	1
J NPT Cover Center Plug	1/2	1/2	3/4	3/4	1
K NPT Cover Tapping	3/8	1/2	3/4	3/4	1
Valve Stem Internal Thread UNF	10-32	1/4-28	1/4-28	3/8-24	1/2-24
Stem Travel	0.6	0.8	1.1	1.7	2.3
Approx. Ship Wt. Lbs.	45	85	195	330	625
X Pilot System	13.00	15.00	27.00	30.00	33.00
Y Pilot System	10.00	11.00	18.00	20.00	22.00
Z Pilot System	10.00	11.00	18.00	20.00	22.00

Valve Selection		These Symbols  and  Indicate Available Sizes																		
		Inches	1¼	1½	2	2½	3	4	6	8	10	12	14	16	18	20	24	30	36	
		mm	32	40	50	65	80	100	150	200	250	300	350	400	450	500	600	750	900	
End Detail		Threaded	Threaded & Flanged					Flanged												
Model 90-48	Basic Valve 100-01	Globe																		
		Angle																		
	Suggested Flow (gpm)	Max. Continuous				300	460	800	1800	3100	4900									
		Max. Intermittent				370	580	990	2250	3900	6150									
		Min. Continuous				5	5	10	50	200	300									
	Suggested Flow (Liters/Sec)	Max. Continuous				19	29	50	113	195	309									
		Max. Intermittent				23	37	62	142	246	387									
		Min. Continuous				.32	.32	.63	3.2	13	19									
	Model 690-48	Basic Valve 100-20	Globe																	
Angle																				
Suggested Flow (gpm)		Max. Continuous				260	580	1025	2300	4100										
		Min. Continuous				5	5	10	50	200										
Suggested Flow (Liters/Sec)		Max. Continuous				16	37	65	145	258										
		Min. Continuous				.32	.32	.63	3.2	13										

690-48 is the reduced internal port size version of the 90-48.

For 100-01 basic valves, suggested flow calculations were based on flow through Schedule 40 Pipe. Maximum continuous flow is approx. 20 ft/sec (6.1 meters/sec) & maximum intermittent is approx. 25 ft/sec (7.6 meters/sec) and minimum continuous flow is approx. 1 ft/sec (.3 meters/sec). For 100-20 basic valve, suggested flow calculations were based on flow through the valve seat. Approx. 26 ft/sec (7.9 meters/sec) was used for maximum continuous flow & 1 ft/sec (.3 meters/sec) is used for minimum continuous flow.

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.

** Flanged End Detail Only

We recommend providing adequate space around valve for maintenance work

Pilot System Specifications

Adjustment Ranges

CRD

- 2 to 30 psi
- 15 to 75 psi
- 30 to 300 psi*

Model CRD-40 (Bypass)

- 15 to 150 psi

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

Temperature Range

- Water: to 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 at additional cost.

Note: Available with remote sensing control

When Ordering, Please Specify

1. Catalog No. 90-48 or No. 690-48
2. Valve Size
3. Pattern - Globe or Angle
4. Pressure Class
5. Threaded or Flanged
6. Trim Material
7. Adjustment Range
8. Desired Options
9. When Vertically Installed



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