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#### **Schematic Diagram**

#### Item Description

- 1 100-20 Hytrol Main Valve Reduced Port
- 2 X47A Ejector
- 3A&B 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 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, highrise buildings and other applications.

Another important feature of the valve is its space efficient configuration, allowing easy installation and maintenance. A downstream pressure relief valve is also recommended for this type of application.

- Modulating control
- Maintains constant outlet pressure over a wide range of flows
- Durable construction
- · Compact and space saving

The Cla-Val Model 690-23 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 second Cla-Val Model CRD Pressure Reducing Control 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 the primary 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 second Model CRD low flow pressure reducing by-pass is set to a higher pressure than the primary CRD pilot control. It responds to pressure changes at the main valve outlet. When the CRD closes, the secondary CRD remains open, allowing low flow to by-pass the main valve, closing when the flow decreases and the downstream pressure reaches its set-point.

The Cla-Val Model 690-23 is not a substitute for a low flow bypass valve in all cases. This valve is commonly used in buildings 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.





#### Model 690-23 (Uses 100-20 Hytrol Main Valve)

Value Dedu 8	Pressure Class						
Valve body a	Fla	anged	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	
UNS 87850	Low Lead Bronze	B16.24	225	400	400	400	
Note: * ANSI standards are for flange dimensions only. Flanged valves are available faced but not drilled.							

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

‡ End Details machined to ANSI B2.1 specifications.

Valves for higher pressure are available; consult factory for details



Component	Standa	Standard Material Combinations				
Body & Cover	Ductile Iron	Cast Steel	Low Lead Bronze			
Available Sizes	3" -10"	3" -10"	3" -10"			
Available Sizes	80 - 250 mm	80 - 250 mm 80 - 250 mm				
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 <sup>®</sup> Rubber					
Diaphragm	Nylon Reinforced Buna-N <sup>®</sup> Rubber					
Stem, Nut & Spring	ut & Spring Stainless Steel					
For material options not listed, consult factory. Cla-Val manufactures valves in more than 50 different alloys.						

#### Model 690-23 Dimensions (In Inches) - For larger sizes, consult Factory

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 Diameter	6.62	9.12	11.50	15.75	20.00
C Maximum	7.00	8.62	11.62	15.00	17.88
D 150 ANSI	—	6.94	8.88	10.69	CF*
DD 300 ANSI	—	7.25	9.38	11.19	CF*
E 150 ANSI	—	5.50	6.75	7.25	CF*
EE 300 ANSI	_	5.81	7.25	7.75	CF*
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	0.375	0.50	0.75	0.75	1.00
J NPT Cover Center Plug	0.50	0.50	0.75	0.75	1.00
K NPT Cover Tapping	0.375	0.50	0.75	0.75	1.00
Stem Travel	0.60	0.80	1.10	1.70	2.30
Approx. Ship Weight (lbs)	45	85	195	330	625
Approx. X Pilot System	13	15	27	30	33
Approx. Y Pilot System	10	11	18	20	22
Approx. Z Pilot System	10	11	18	20	22

- B (Diameter) 100-20 Flanged Х do a Н C (MAX) Outlet Inlet Æ F ĒΕ Е EE Inlet A ÁÀ



See Cla-Val Model # 90-48 for applications requiring a full port valve.

# Model 690-23 100-20 Hytrol Main Valve





Model 690-23 Metric Dimensions (Uses 100-20 Hytrol Main Valve)





### Model 690-23 Metric Dimensions (in mm) - For larger sizes, consult Factory

Valve Size (mm)	80	100	150	200	250
A 150 ANSI	260	353	451	543	660
AA 300 ANSI	279	368	473	568	695
B Diameter	168	232	292	400	508
C Maximum	178	219	295	381	454
D 150 ANSI	—	176	226	272	CF*
DD 300 ANSI	—	184	238	284	CF*
E 150 ANSI	—	140	171	184	CF*
EE 300 ANSI	—	148	184	197	CF*
F 150 ANSI	95	114	140	171	203
FF 300 ANSI	105	127	159	191	222
H NPT Body Tapping	0.375	0.50	0.75	0.75	1.00
J NPT Cover Center Plug	0.50	0.50	0.75	0.75	1.00
K NPT Cover Tapping	0.375	0.50	0.75	0.75	1.00
Stem Travel	15	20	28	43	58
Approx. Ship Weight (kgs)	20	39	89	150	284
Approx. X Pilot System	331	381	686	762	839
Approx. Y Pilot System	254	280	458	508	559
Approx. Z Pilot System	254	280	458	508	559

#### Valve Selection Guide

690-23 Valve Selection	Inches	1	1¼	1½	2	2½	3	4	6	8
	mm	25	32	40	50	65	80	100	150	200
Main Valve 100-20	Pattern	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G, A
	End Detail	Т	Т	T, F, Gr*	T, F, Gr	T, F, Gr*	T, F, Gr	F, Gr	F, Gr*	F, Gr*
Suggested Flow (gpm)	Maximum	55	93	125	210	300	460	800	1800	3100
	Maximum Intermittent	68	120	160	260	370	580	990	2250	3900
	Minimum	1	1	1	1	1	1	1	1	1
Suggested Flow (Liters/Sec)	Maximum	3.5	6	8	13	19	29	50	113	195
	Maximum Intermittent	4.3	7.6	10	16	23	37	62	142	246
	Minimum	.03	.03	.03	.06	.06	.06	.06	.06	0.95

 100-20 Pattern: Globe (G), Angle (A), End Connections: Threaded (T), Grooved (GR), Flanged (F) Indicate Available Sizes

 100-20 Series is the full internal port Hytrol.

 For Lower Flows Consult Factory

#### **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<sup>®</sup> 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. 690-23
- 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

# Main Valve Options

#### **EPDM Rubber Parts**

Optional diaphragm, disc and o-ring fabricated with EPDM synthetic rubber

Viton<sup>®</sup> Rubber Parts - suffix KB Optional diaphragm, disc and o-ring fabricated with Viton<sup>®</sup> synthetic rubber

**Epoxy Coating - suffix KC** NSF 61 Listed and FDA approved, fusion bonded epoxy coating

Dura-Kleen® Stem - suffix KD Fluted design prevents dissolved minerals build-up on the stem

**LFS Trim** Designed to regulate precisely and smoothly at typical flow rates as well as lower than the industry standard of 1 fps, without decreasing the valve's capacity





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\*Globe Grooved Only