



95-01
(Full Internal Port)

695-01
(Reduced Internal Port)

Ratio Reduction Control Valve



- Accurate Proportional Pressure Control
- Completely Automatic Operation
- Simple Construction - No Pilot Controls
- Serial Pressure Reducing in Long Pipelines
- Eliminates Most Cavitation on Piloted Valves
- No Adjustments Necessary
- Low Noise Potential
- Built-In Check Feature

The Cla-Val Model 95-01/695-01 Ratio Reduction Control Valve automatically reduces a higher inlet pressure to a lower outlet pressure at a fixed ratio within certain range of flow rate. It is simple in design for long service life featuring double control chambers for precise diaphragm actuation.

Inlet pressure acting on stem assembly to open valve is proportionally balanced by outlet pressure acting on top of diaphragm and stem assembly to close valve. These two forces position the stem assembly allowing the valve to reduce the pressure in ratio to these internal forces. The valve will close drip-tight when downstream pressure is higher than inlet pressure.

Applications include reducing delivery pressure in long transmission pipelines with gravity-powered pressure build-up. Also, high differential pressure control systems such as pressure reducing stations, high pressure supply to ground storage reservoirs, and off-loading pump delivery pressure to atmosphere.

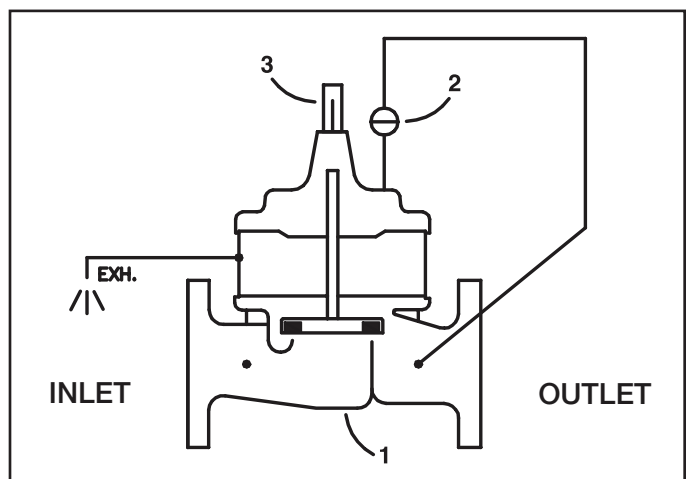
Pressure Reduction Ratio Factor

Valve Size	Low Flows (0-5 fps*)	High Flows (5-10 fps*)
1.5"	5.0	5.3
2.0"	5.0	5.3
2.5"	3.7	4.0
3.0"	3.4	3.7
4.0"	3.0	3.3
6.0"	3.0	3.3
8.0"	3.2	3.5
10.0"	3.0	3.3
12.0"	2.8	3.1
14.0"	3.0	3.3
16.0"	3.0	3.3
18 - 36"	3.0	3.0

The pressure reduction ratio factor is based on inlet pressure relative to outlet pressure. For example, with a 6" 95-01 valve, if inlet pressure is 135 psi, then inlet pressure divided by reduction ratio factor equals outlet pressure of 45 psi. As inlet pressure increases, outlet pressure will proportionately increase. As flow demand downstream increases, outlet pressure will proportionately decrease. Optimal valve performance is related to correctly locating valve in pipeline hydraulic grade line (HGL). Place 95-01 in system where it will provide needed pressure break. Also, for simple pressure break applications, the 95-01 breaks head pressure with a predicable ratio rather than variable ratio when using an orifice plate. Consult Cla-Val technical sales staff for assistance.

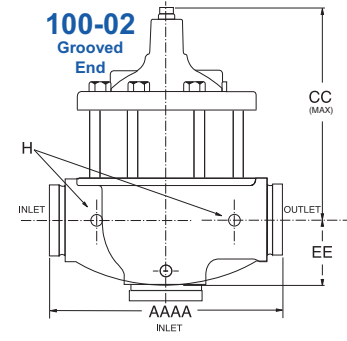
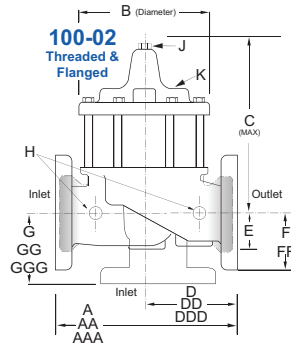
* Approximate

Schematic Diagram



1. Model 100-02 Powertrol (95-01) Main Valve - Full Port
Model 100-21 Powertrol (695-01) Main Valve - Reduced Port
2. CK2 Isolation Valve
3. X101

Dimensions
Main Powerrol Valve
Model 100-02 Full Port

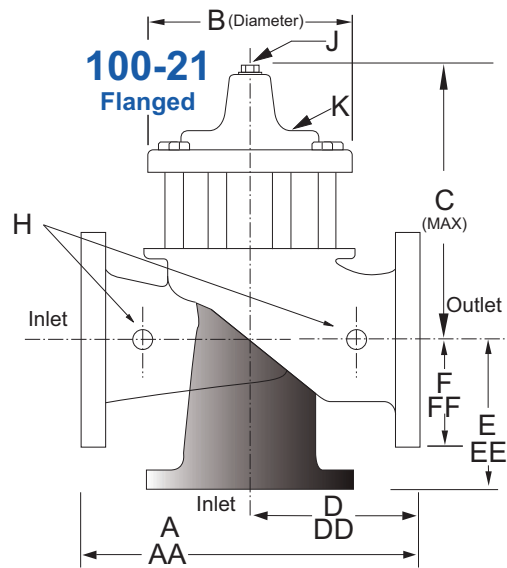


Model 95-01

Valve Size (Inches)	1½	2	2½	3	4	6	8	10	12	14	16
A Threaded	7.25	9.38	11.00	12.50	—	—	—	—	—	—	—
AA 150 ANSI	—	8.50	9.38	11.00	12.00	15.00	20.00	25.38	29.75	34.00	41.38
AAA 300 ANSI	—	9.00	10.00	11.62	13.25	15.62	21.00	26.38	31.12	35.50	43.50
AAAA Grooved End	—	8.50	9.00	11.00	12.50	15.00	20.00	25.38	—	—	—
B Dia.	5.62	6.62	8.00	9.12	11.50	15.75	20.00	23.62	28.00	32.75	35.50
C Max.	7.62	8.56	10.31	11.19	14.25	18.44	21.81	23.38	29.31	32.12	35.00
CC Max. Grooved End	—	6.87	7.81	9.63	10.25	13.50	17.18	20.43	—	—	—
D Threaded	3.25	4.75	5.50	6.25	—	—	—	—	—	—	—
DD 150 ANSI	—	4.00	5.50	6.00	7.50	10.00	12.69	14.88	17.00	19.50	20.81
DDD 300 ANSI	—	4.25	5.88	6.38	7.88	10.50	13.25	15.56	17.75	20.25	21.62
DDDD Grooved End	—	—	—	6.00	7.50	—	—	—	—	—	—
E	1.12	1.50	1.69	2.06	3.19	4.31	5.31	9.25	10.75	12.62	15.50
EE Grooved End	—	2.00	2.88	3.12	4.25	6.00	7.56	—	—	—	—
F 150 ANSI	—	2.50	3.50	3.75	4.50	5.50	6.75	8.00	9.50	10.50	11.75
FF 300 ANSI	—	3.06	3.75	4.13	5.00	6.25	7.50	8.75	10.25	11.50	12.75
G Threaded	1.88	3.25	4.00	4.50	—	—	—	—	—	—	—
GG 150 ANSI	—	4.00	4.00	4.00	5.00	6.00	8.00	8.62	13.75	14.88	15.69
GGG 300 ANSI	—	4.25	4.31	4.38	5.31	6.50	8.50	9.31	14.50	15.62	16.50
GGGG Grooved End	—	—	—	4.25	5.00	—	—	—	—	—	—
H NPT Body Tapping	.375	.375	.50	.50	.75	.75	1	1	1	1	1
J NPT Cover Center Plug	.25	.25	.50	.50	.75	.75	1	1	1.25	1.50	2
K NPT Cover Tapping	.375	.375	.50	.50	.75	.75	1	1	1	1	1
Valve Stem Internal Thread UNF	10-32	10-32	10-32	10-32	¼-28	¼-28	⅜-24	⅜-24	⅜-24	⅜-24	½-20
Stem Travel	0.4	0.6	0.7	0.8	1.1	1.7	2.3	2.8	3.4	4.0	4.5
Approx. Ship Wt. Lbs.	22	40	65	95	190	320	650	940	1675	2460	3100

Valve Size (mm)	32	40	50	65	80	100	150	200	250	300	350	400
A Threaded	184	238	279	318	—	—	—	—	—	—	—	—
AA 150 ANSI	—	216	238	279	305	381	508	645	756	864	991	1051
AAA 300 ANSI	—	229	254	295	337	397	533	670	790	902	1029	1105
AAAA Grooved End	216	216	279	318	381	508	645	—	—	—	—	—
B Dia.	143	168	203	232	292	400	508	600	711	832	902	—
C Max.	194	217	262	284	362	468	554	594	744	816	889	—
CC Max. Grooved End	174	174	245	260	343	436	519	—	—	—	—	—
D Threaded	83	121	140	159	—	—	—	—	—	—	—	—
DD 150 ANSI	—	102	140	152	191	254	322	378	432	495	528	—
DDD 300 ANSI	—	108	149	162	200	267	337	395	451	514	549	—
DDDD Grooved End	—	—	—	152	191	—	—	—	—	—	—	—
E	29	38	43	52	81	110	135	235	273	321	394	—
EE Grooved End	52	64	73	79	108	152	192	—	—	—	—	—
F 150 ANSI	—	64	89	95	114	140	171	203	241	267	298	—
FF 300 ANSI	—	78	95	105	127	159	191	222	260	292	324	—
G Threaded	48	83	102	114	—	—	—	—	—	—	—	—
GG 150 ANSI	—	102	102	102	127	152	203	219	349	378	399	—
GGG 300 ANSI	—	102	110	111	135	165	216	236	368	397	419	—
GGGG Grooved End	—	—	—	108	127	—	—	—	—	—	—	—
H NPT Body Tapping	.375	.375	.50	.50	.75	.75	1	1	1	1	1	1
J NPT Cover Center Plug	.25	.25	.50	.50	.75	.75	1	1	1.25	1.50	2	—
K NPT Cover Tapping	.375	.375	.50	.50	.75	.75	1	1	1	1	1	—
Valve Stem Internal Thread UNF	10-32	10-32	10-32	10-32	¼-28	¼-28	⅜-24	⅜-24	⅜-24	⅜-24	⅜-24	½-20
Stem Travel	10	15	18	20	28	43	58	71	86	102	114	—
Approx. Ship Wt. Kgs.	10	18	30	43	86	145	295	426	760	1116	1406	—

**Dimensions Main
Powertrol Valve
Model 100-02 Reduced Port**



Model 695-01

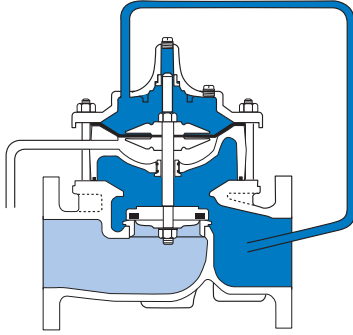
Valve Size (Inches)	3	4	6	8	10	12	14	16
A 150 ANSI	10.25	13.88	17.75	21.38	26.00	30.00	34.25	35.00
AA 300 ANSI	11.00	14.50	18.62	22.38	27.38	31.50	35.75	36.62
B Dia.	6.62	9.12	11.50	15.75	20.00	23.62	28.00	28.00
C Max.	9.25	11.75	15.25	20.25	23.75	27.25	29.31	34.12
D 150 ANSI	—	6.94	8.88	10.69	—	—	—	—
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	3.25	4.50	5.50	6.75	8.00	9.50	11.00	11.75
FF 300 ANSI	4.12	5.00	6.25	7.50	8.75	10.25	—	12.75
H NPT Body Tapping	.375	.50	.75	.75	1	1	1	1
J NPT Cover Center Plug	.50	.50	.75	.75	1	1	1.25	1.25
K NPT Cover Tapping	.375	.50	.75	.75	1	1	1	1
Valve Stem Internal Thread UNF	10-32	¼-28	¼-28	¾-24	¾-24	¾-24	¾-24	¾-24
Stem Travel	0.6	0.8	1.1	1.7	2.3	2.8	3.4	3.4
Approx. Ship Wt. Lbs.	70	135	230	480	785	1410	2215	2215

Valve Size (mm)	80	100	150	200	250	300	350	400
A 150 ANSI	260	353	451	543	660	762	870	889
AA 300 ANSI	279	368	473	568	695	800	908	930
B Dia.	168	232	292	400	508	600	711	711
C Max.	235	298	387	514	603	692	744	867
D 150 ANSI	—	176	226	272	—	—	—	—
DD 300 ANSI	—	184	238	284	—	—	—	—
E 150 ANSI	—	140	171	184	—	—	—	—
EE 300 ANSI	—	148	184	197	—	—	—	—
F 150 ANSI	95	114	140	171	203	241	279	298
FF 300 ANSI	105	127	159	191	222	260	—	324
H NPT Body Tapping	¾	½	¾	¾	1	1	1	1
J NPT Cover Center Plug	½	½	¾	¾	1	1	1¼	1¼
K NPT Cover Tapping	¾	½	¾	¾	1	1	1	1
Valve Stem Internal Thread UNF	10-32	¼-28	¼-28	¾-24	¾-24	¾-24	¾-24	¾-24
Stem Travel	15	20	28	43	58	71	86	86
Approx. Ship Wt. Kgs	32	61	104	218	356	640	1006	1006

Service and Installation

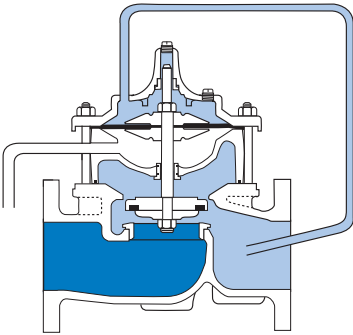
Cla-Val Control Valves operate with maximum efficiency when mounted in horizontal piping with the main valve cover UP, however, other positions are acceptable. Due to component size and weight of 10 inch and larger valves, installation with cover UP is advisable. We recommend isolation valves be installed on inlet and outlet for maintenance. Adequate space above and around the valve for service personnel should be considered essential. A regular maintenance program should be established based on the specific application data. However, we recommend a thorough inspection be done at least once a year. Consult factory for specific recommendations.

Principle of Operation



No Flow-Closed

When no flow occurs, downstream pressure is applied to cover chamber and valve closes drip-tight.



Ratio Pressure Reducing

Inlet pressure forces valve open and outlet pressure forces valve close. The two forces balance the valve at a partially open position that reduces flowing pressure to a controlling ratio.

Specifications

Available Sizes

Pattern	Threaded	Flanged	Grooved End
Globe	1½" - 3"	1½" - 16"	1½"-2"- 2½"- 3"- 4"- 6"- 8"
Angle	1½" - 3"	2" - 16"	2" - 3" - 4"

Full Port Sizes:
1¼" - 16"

Reduced Port Sizes:
3" - 16"

Materials

Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes	1¼" - 16"	1¼" - 16"	1¼" - 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 Standard		
Pilot Tubing	Stainless Steel Standard		

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

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.
† Consult factory when Maximum Operating Pressure Differential (MOPD) is greater than 400 PSID

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

Typical Application

