

Differential Pressure Relief Valve



- Accurate Differential Pressure Control
- Controls Maximum Flow Through Pumps
- Circulating Loop Flow Control
- Completely Automatic Operation

The Cla-Val Model 250-01/605-01 Differential Pressure Relief Valve is a hydraulically operated, pilot-controlled, modulating valve. It is designed to maintain a constant pressure differential between any two pressure points in a system where the closing of the valve directly causes the differential pressure to increase. The valve tends to open on an increase in differential pressure and close on a decrease in differential pressure.

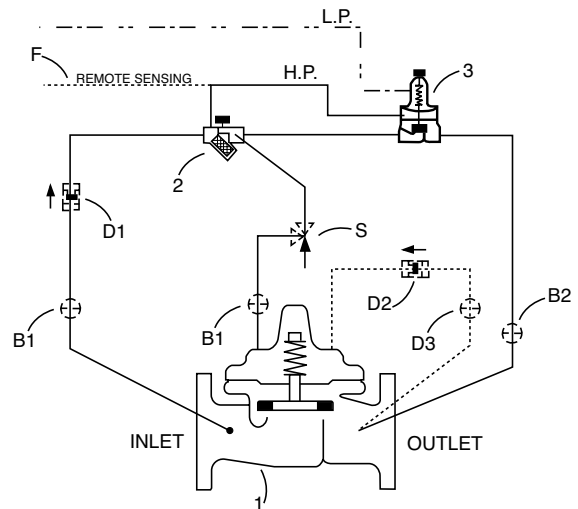
In operation, the valve is actuated by line pressure through a pilot control system sensing from two points across which a differential is to be maintained. Operation is completely automatic and pressure settings may be easily changed.

Schematic Diagram

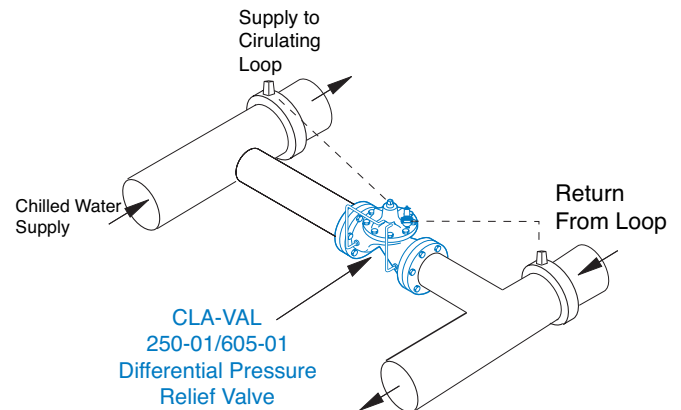
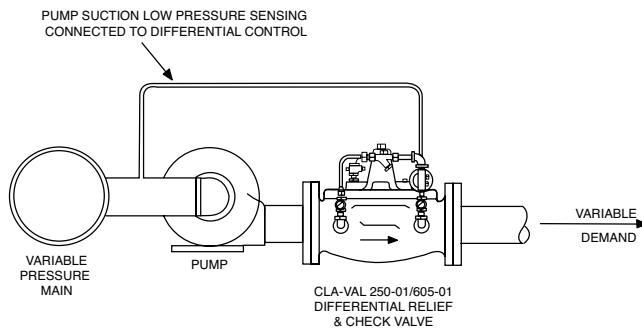
Item	Description
1	Hytrol (Main Valve)
2	X42N-2 Strainer & Needle Valve
3	CDB-7 Differential Control

Optional Features

Item	Description
B	CK2 (Isolation Valve)
D	Check Valves with Isolation Valve
F	Remote Pilot Sensing (H.P.)
S	CV Speed Control (Opening)



Typical Applications



The Model 250-01/605-01 Differential Pressure Relief Valve maintains a constant differential across centrifugal pump regardless of variable upstream pressures or downstream demand. By maintaining a constant differential pressure across a centrifugal pump operating at a known capacity, the maximum flow rate is controlled.

On a chilled water circulating loop system the 250-01/605-01 Differential Pressure Relief Valve is installed between loop supply and return lines to maintain a constant differential across the loop. The loop differential pressure remains constant regardless of the loop demand change thereby increasing cooling system efficiency.

Model 250-01 (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.

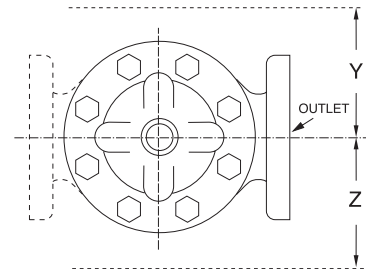
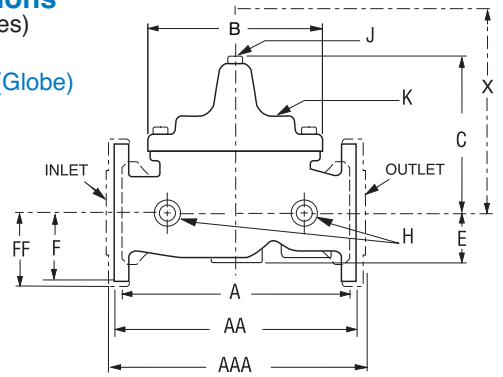
Materials

Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes	2½" - 36"	2½" - 16"	2½" - 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		

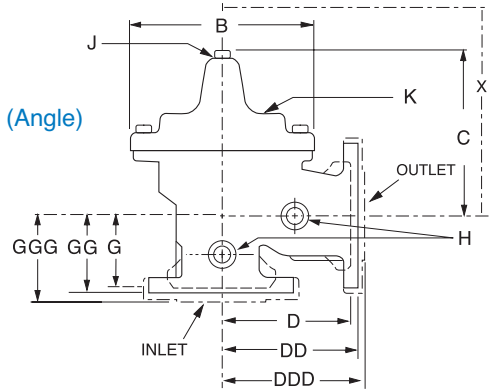
For material options not listed, consult factory.
 Cla-Val manufactures valves in more than 50 different alloys.

Dimensions
(In inches)

100-01 (Globe)



100-01 (Angle)



Model 250-01 Dimensions (In Inches)

Valve Size (Inches)	2 ½	3	4	6	8	10	12	14	16	24	36
A Threaded	11.00	12.50	—	—	—	—	—	—	—	—	—
AA 150 ANSI	11.00	12.00	15.00	20.00	25.38	29.75	34.00	39.00	41.38	61.50	76.00
AAA 300 ANSI	11.62	13.25	15.62	21.00	26.38	31.12	35.50	40.50	43.50	63.24	78.00
B Dia.	8.00	9.12	11.50	15.75	20.00	23.62	28.00	32.75	35.50	53.16	66.00
C Max.	7.56	8.19	10.62	13.38	16.00	17.12	20.88	24.19	25.00	43.93	61.50
D Threaded	5.50	6.25	—	—	—	—	—	—	—	—	—
DD 150 ANSI	5.50	6.00	7.50	10.00	12.75	14.88	17.00	19.50	20.81	—	—
DDD 300 ANSI	5.88	6.38	7.88	10.50	13.25	15.56	17.75	20.25	21.62	—	—
E	1.69	2.56	3.19	4.31	5.31	9.25	10.75	12.62	15.50	17.75	24.56
F 150 ANSI	3.50	3.75	4.50	5.50	6.75	8.00	9.50	10.50	11.75	19.25	28.00
FF 300 ANSI	3.75	4.13	5.00	6.25	7.50	8.75	10.25	11.50	12.75	—	—
G Threaded	4.00	4.50	—	—	—	—	—	—	—	—	—
GG 150 ANSI	4.00	4.00	5.00	6.00	8.00	8.62	13.75	14.88	15.69	—	—
GGG 300 ANSI	4.31	4.38	5.31	6.50	8.50	9.31	14.50	15.62	16.50	—	—
H NPT Body Tapping	½	½	¾	¾	1	1	1	1	1	1	2
J NPT Cover Center Plug	½	½	¾	¾	1	1	1¼	1½	2	1½	2
K NPT Cover Tapping	½	½	¾	¾	1	1	1	1	1	1	2
Valve Stem Internal Thread UNF	10-32	¼-28	¼-28	¾-24	¾-24	¾-24	¾-24	¾-24	¾-24	½-20	¾-16
Stem Travel	0.7	0.8	1.1	1.7	2.3	2.8	3.4	4.0	4.5	6.75	10.12
Approx. Ship Wt. Lbs.	50	70	140	285	500	780	1165	1600	2265	6200	11470
X Pilot System	14.00	15.00	17.00	29.00	31.00	33.00	36.00	40.00	40.00	68.00	86.00
Y Pilot System	10.00	11.00	12.00	20.00	22.00	24.00	26.00	29.00	30.00	39.00	45.00
Z Pilot System	10.00	11.00	12.00	20.00	22.00	24.00	26.00	29.00	30.00	39.00	45.00

Model 605-01 (Uses Basic Valve Model 100-20)

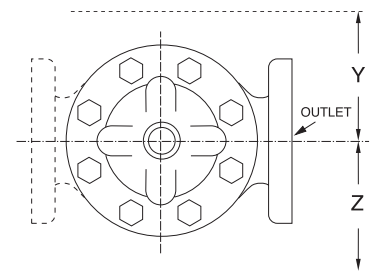
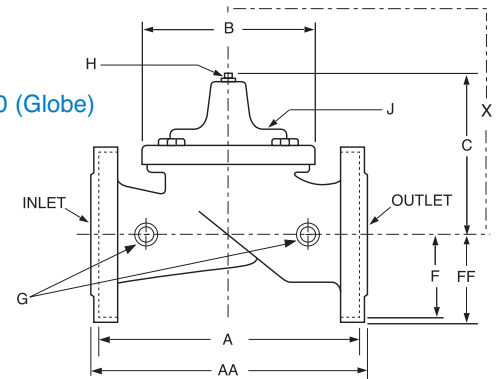
Dimensions (In inches)

Pressure Ratings (Recommended Maximum Pressure - psi)

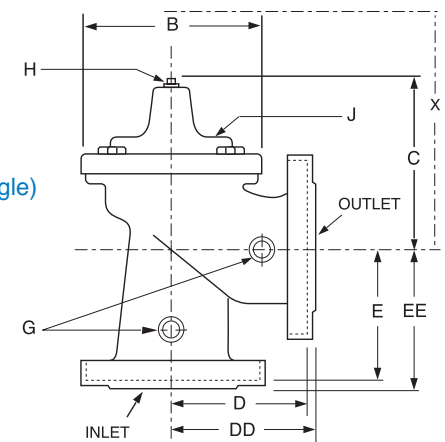
Valve Body & Cover		Pressure Class		
		Flanged		
Grade	Material	ANSI Standards*	150 lb.	300 lb.
ASTM A536	Ductile Iron	B16.42	250	400
ASTM A216-WCB	Cast Steel	B16.5	285	400
ASTM B62	Bronze	B16.24	225	400

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

100-20 (Globe)



100-20 (Angle)








































Materials

Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes	4" - 48"	4" - 16"	4" - 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		

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

Model 605-01 Dimensions (In Inches)

Valve Size (Inches)	4	6	8	10	12	14	16	18	20	24	30
A 150 ANSI	13.88	17.75	21.38	26.00	30.00	34.25	35.00	42.12	48.00	48.00	63.25
AA 300 ANSI	14.50	18.62	22.38	27.38	31.50	—	36.62	43.63	49.62	49.75	—
B Dia.	9.12	11.50	15.75	20.00	23.62	28.00	28.00	35.44	35.44	35.44	53.19
C Max.	8.62	11.62	15.00	17.88	21.00	20.88	25.75	25.00	31.00	31.00	43.94
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	4.50	5.50	6.75	8.00	9.50	11.00	11.75	15.88	14.56	17.00	19.88
FF 300 ANSI	5.00	6.25	7.50	8.75	10.25	—	12.75	15.88	16.06	19.00	—
H NPT Body Tapping	½	¾	¾	1	1	1	1	1	1	1	1
J NPT Cover Center Plug	½	¾	¾	1	1	1 ¼	1 ¼	2	2	2	2
K NPT Cover Tapping	½	¾	¾	1	1	1	1	1	1	1	1
Valve Stem Internal Thread UNF	¼-28	¼-28	⅜-24	⅜-24	⅜-24	⅜-24	⅜-24	½-20	½-20	½-20	¾-16
Stem Travel	0.8	1.1	1.7	2.3	2.8	3.4	3.4	3.4	4.5	4.5	6.5
Approx. Ship Wt. Lbs.	85	195	330	625	900	1250	1380	1500	2551	2733	6500
X Pilot System	15.00	27.00	30.00	33.00	36.00	36.00	41.00	40.00	46.00	55.00	68.00
Y Pilot System	11.00	18.00	20.00	22.00	24.00	26.00	26.00	30.00	30.00	30.00	39.00
Z Pilot System	11.00	18.00	20.00	22.00	24.00	26.00	26.00	30.00	30.00	30.00	39.00

Valve Selection		These Symbols  and  Indicate Available Sizes																		
		Inches	1 ¼	1 ½	2	2 ½	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 250-01 Series	Basic Valve 100-01	Globe																		
		Angle																		
	Suggested Flow (gpm)	Max. Continuous	93	125	210	300	460	800	1800	3100	4900	7000	8400	11000				25000		50000
		Max. Surge	120	280	470	670	1000	1800	4000	7000	11000	16000	19000	25000				56500		120000
	Suggested Flow (Liters/Sec)	Max. Continuous	6	8	13	19	29	50	113	195	309	441	529	693				1575		3150
		Max. Surge	13	18	30	42	63	113	252	441	693	1008	1197	1575				3560		7570
Model 605-01 Series	Basic Valve 100-20	Globe																		
		Angle																		
	Suggested Flow (gpm)	Max. Continuous					260	580	1025	2300	4100	6400	9230	9230	16500	16500	16500	31300		
		Max. Surge					440	990	1760	3970	7050	11000	15900	15900	28200	28200	28200	56500		
	Suggested Flow (Liters/Sec)	Max. Continuous					16	37	65	145	258	403	581	581	1040	1040	1040	1972		
		Max. Surge					28	62	111	250	444	693	1002	1002	1777	1777	1777	3560		

**Flanged End Detail Only

605-01 is the reduced internal port size version of the 250-01.

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 surge is approx. 45 ft/sec (13.7 meters/sec). For 100-20 basic valves, suggested, flow calculations were based on flow through the valve seat. Approx. 26 ft/sec (7.9 meters/sec) is used for continuous flow & 45 ft/sec (13.7 meters/sec) is used for surge flow. Maximum continuous flow through the valve seat for the 30" 100-20 is approx. 22 ft/sec (6.7 meters/sec).

Pilot System Specifications		When Ordering, Please Specify
<p>Adjustment Ranges (Differential Pressure)</p> <p>0 to 7 psi 50 to 150 psi 5 to 25 psi 65 to 180 psi 20 to 80 psi</p> <p>Temperature Range</p> <p>Water: to 180°F</p>	<p>Materials</p> <p><u>Standard Pilot System Materials</u> Pilot Control: Bronze ASTM B62 Trim: Stainless Steel Type 303 Rubber: Buna-N® Synthetic Rubber Tubing & Fittings: Copper and Bronze</p> <p><u>Optional Pilot System Materials</u> Pilot Systems are available with optional Aluminum, Stainless Steel or Monel materials at additional cost.</p>	<ol style="list-style-type: none"> 1. Catalog No. 250-01 or No. 605-01 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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CLA-VAL™
 E-250-01/605-01 (R-8/05)