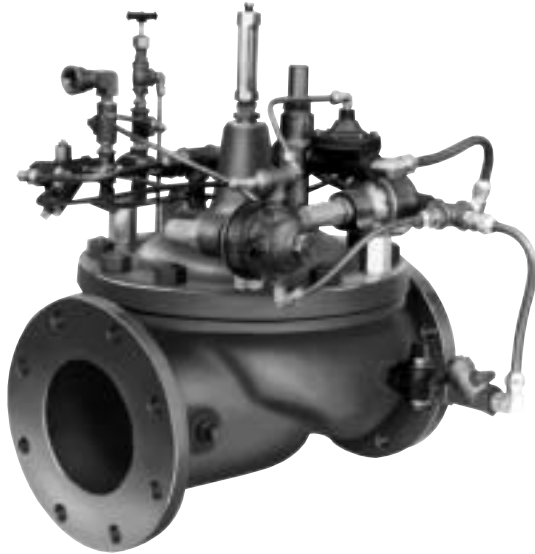




— **MODEL** — **52-03**
652-03 ✂

Pressure Relief & Surge Anticipator Valve



Schematic Diagram

Item	Description
1	Hytrol (Main Valve)
2	X102F Flow Limiter
3	X101 Valve Position Indicator *
4	CK2 Cock (Isolation Valve)
5	100-01 Hytrol (Reverse Flow)
6	CRL Pressure Relief Control
7	CRA Pressure Reducing Control
8	X58B Restriction Tube Assembly
9	CSC Swing Check Valve
10	X42N-3 Strainer Needle Valve
11	Bell Reducer
12	Pipe Plug
13	CK2 Cock (Isolation Valve)
14	CK2 Cock (Isolation Valve)

***Note: X101 or X105L Accessories not available in 4" and smaller sizes.**

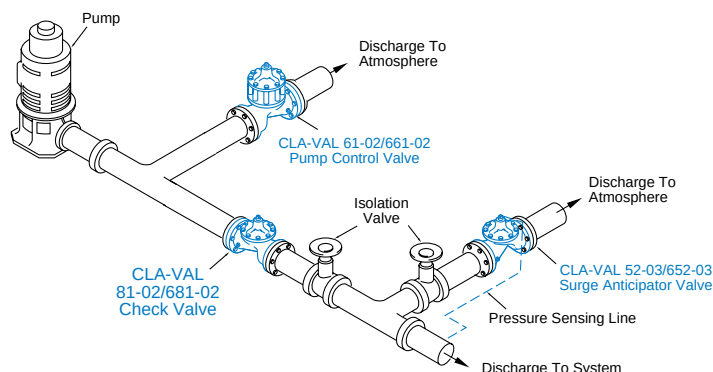
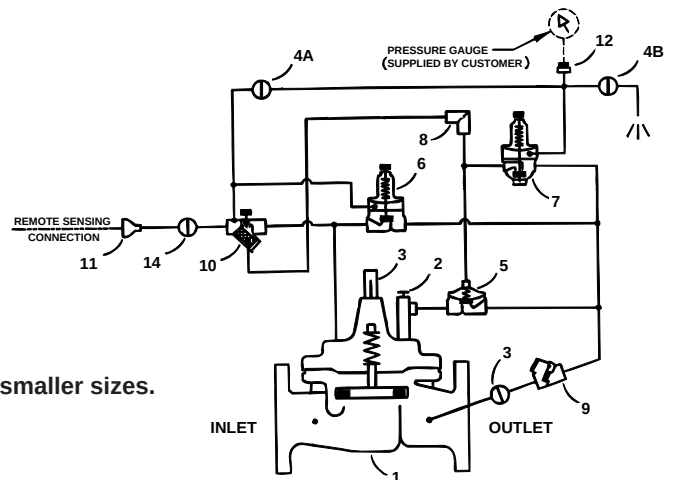
- **System Saver**
- **Protects Against Water Hammer Surges**
- **Opens On Initial Low Pressure Wave**
- **Closes Slowly To Prevent Subsequent Surges**
- **Adjustable Over A Wide Range of Settings**

The Cla-Va Model 52-03/652-03 Surge Anticipator Valve is indispensable for protecting pumps, pumping equipment and all applicable pipelines from dangerous pressure surges caused by rapid changes of flow velocity within a pipeline.

When pumping systems are started and stopped gradually, harmful surges do not occur. However, should a power failure take place, the abrupt stopping of the pump can cause dangerous surges in the system which could result in severe equipment damage.

Power failure to a pump will usually result in a down surge in pressure, followed by an up surge in pressure. The surge control valve opens on the initial low pressure wave, diverting the returning high pressure wave from the system.*In effect, the valve has anticipated the returning high pressure wave and is open to dissipate the damage causing surge. The valve will then close slowly without generating any further pressure surges.

* An adjustable hydraulic flow control limits the valve opening for a controlled initial surge relief.



Typical Application

The 52-03/652-03 discharges to atmosphere from a tee in the pump discharge header. The valve anticipates surges caused by power failure as well as acting as a standard over pressure relief valve.



Model 52-03 (Uses Basic Valve Model 100-01)

Pressure Ratings (Recommended Maximum Pressure - psi)

Valve Body & Cover		Pressure Class			
		Flanged			Screwed
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
ASTM A743	Stainless Steel	B16.5	285	400	400
356-T6	Aluminum	B16.1	275	—	—

Note: *ANSI standards are for flange dimensions only.
Flanged valves are available faced but not drilled.
** End Details machined to ANSI B2.1 specifications.



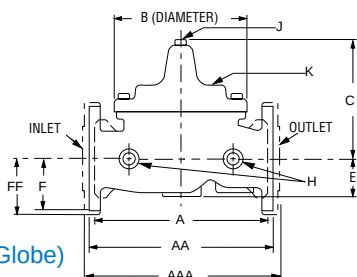
2" Globe, Screwed



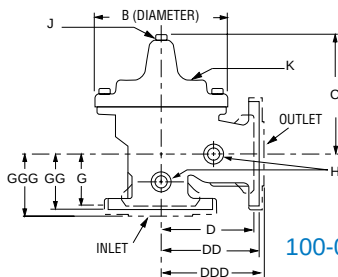
4" Globe, Flanged

Materials

Component	Material Options						
Body & Cover	Ductile Iron	Cast Steel	Bronze	Stainless Steel	Aluminum		
Available Sizes	2½" - 24"	2½" - 24"	2½" - 16"	2½" - 16"	2½" - 16"		
Disc Retainer & Diaphragm Washer	Cast Iron	Cast Steel	Bronze	Stainless Steel	Aluminum		
Trim: Disc Guide, Seat & Cover Bearing	Bronze is standard. Stainless Steel is optional.			Stainless Steel is standard.			
Disc	Buna-N® Rubber						
Diaphragm	Nylon Reinforced Buna-N® Rubber						
Stem, Nut & Spring	Stainless Steel						



100-01 (Globe)



100-01 (Angle)



4" Angle, Flanged

Model 52-03 Dimensions (In inches)

Valve Size (Inches)	2 ½	3	4	6	8	10	12	14	16	24
A Screwed	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
AAA 300 ANSI	11.62	13.25	15.62	21.00	26.38	31.12	35.50	40.50	43.50	63.24
B Dia.	8.00	9.12	11.50	15.75	20.00	23.62	28.00	32.75	35.50	53.16
C Max.	7.56	8.19	10.62	13.38	16.00	17.12	20.88	24.19	25.00	43.93
D Screwed	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
F 150 ANSI	3.50	3.75	4.50	5.50	6.75	8.00	9.50	10.50	11.75	19.25
FF 300 ANSI	3.75	4.13	5.00	6.25	7.50	8.75	10.25	11.50	12.75	—
G Screwed	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
J NPT Cover Center Plug	½	½	¾	¾	1	1	1 ¼	1 ½	2	1½
K NPT Cover Tapping	½	½	¾	¾	1	1	1	1	1	1
Valve Stem Internal										
Thread UNF	10-32	¼-28	¼-28	⅜-24	⅜-24	⅜-24	⅜-24	⅜-24	½-20	3/4-16
Stem Travel	0.7	0.8	1.1	1.7	2.3	2.8	3.4	4.0	4.5	6.50
Approx. Ship Wt. Lbs.	50	70	140	285	500	780	1165	1600	2265	6200

Model 652-03 (Uses Basic Valve Model 100-20)

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
ASTM A743	Stainless Steel	B16.5	285	400
356-T6	Aluminum	B16.1	275	—

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



3" Globe, Flanged



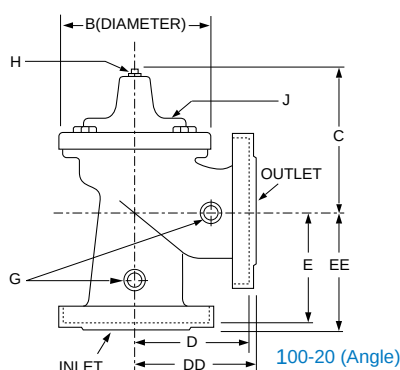
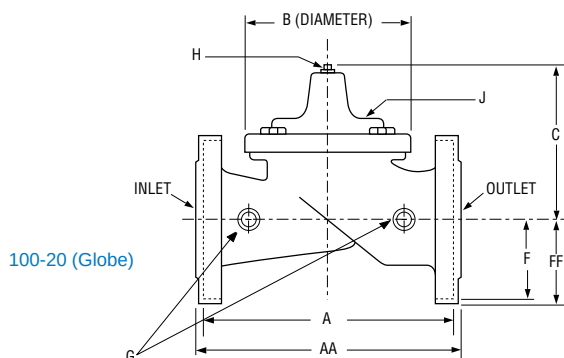
6" Globe, Flanged



6" Angle, Flanged

Materials

Component	Material Options						
Body & Cover	Ductile Iron	Cast Steel	Bronze	Stainless Steel	Aluminum		
Available Sizes	3"-30"	3"-30"	3"-16"	3"-16"	3"-16"		
Disc Retainer & Diaphragm Washer	Cast Iron	Cast Steel	Bronze	Stainless Steel	Aluminum		
Trim: Disc Guide, Seat & Cover Bearing	Bronze is standard. Stainless Steel is optional.			Stainless Steel is standard.			
Disc	Buna-N® Rubber						
Diaphragm	Nylon Reinforced Buna-N® Rubber						
Stem, Nut & Spring	Stainless Steel						



Model 652-03 Dimensions (In inches)

VALVE SIZE (Inches)	3	4	6	8	10	12	14	16	18	20	24	30
A 150 ANSI	10.25	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	11.00	14.50	18.62	22.38	27.38	31.50	—	36.62	43.63	49.62	49.75	—
B DIA.	6.62	9.12	11.50	15.75	20.00	23.62	28.00	28.00	35.44	35.44	35.44	53.19
C MAX.	7.00	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	3.75	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	4.12	5.00	6.25	7.50	8.75	10.25	—	12.75	15.88	16.06	19.00	—
G NPT Body Tapping	3/8	1/2	3/4	3/4	1	1	1	1	1	1	1	1
H NPT Cover Center Plug	1/2	1/2	3/4	3/4	1	1	1 1/4	1 1/4	2	2	2	2
J NPT Cover Tapping	3/8	1/2	3/4	3/4	1	1	1	1	1	1	1	1
Valve Stem Internal Thread UNF	10-32	1/4-28	1/4-28	3/8-24	3/8-24	3/8-24	3/8-24	3/8-24	1/2-20	1/2-20	1/2-20	3/4-16
Stem Travel	0.6	0.8	1.1	1.7	2.3	2.8	3.4	3.4	4.5	4.5	4.5	6.5
Approx Ship Wt. Lbs.	45	85	195	330	625	900	1250	1380	2733	2551	2733	6500

Valve Selection

Valve Selection		These Symbols  and  Indicate Available Sizes																
		Inches	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24	30
		mm	32	40	50	65	80	100	150	200	250	300	350	400	450	500	600	750
		End Detail	Screwed	Screwed & Flanged					Flanged									
Model 52-03	Basic Valve 100-01	Globe																
		Angle																
	Suggested Flow (GPM)	Max. Continuous				300	460	800	1800	3100	4900	7000	8400	11000			25000	
		Max. Surge				670	1000	1800	4000	7000	11000	16000	19000	25000			56500	
	Suggested Flow (Liters/sec)	Max. Continuous				19	29	50	113	195	309	441	529	693			1575	
		Max. Surge				42	63	113	252	441	693	1008	1197	1575			3560	

Model 652-03	Basic Valve 100-20	Globe					 **											
		Angle																
	Suggested Flow (GPM)	Max. Continuous					260	580	1025	2300	4100	6400	9230	9230	16500	16500	16500	28000
		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	1764
		Max. Surge					28	62	111	250	444	693	1002	1002	1777	1777	1777	3560

* 652-03 is the reduced internal port size version of the 52-03.

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. 20 ft/sec (6.1 meters/sec).

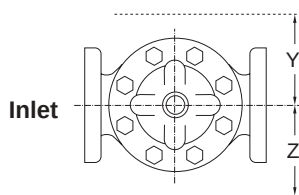
**Flanged End Detail Only

Sizing Information: Because of the many variable conditions that generally exist in any given system, proper sizing is important. Incorrect valve sizing will nullify the ability of the Surge Anticipator Valve. For valve sizing assistance, contact Cla-Val with the following specific pump and system information: number and type of pumps; shutoff head; flow rate; discharge static head and pumping head; pipe size; length; thickness and material.

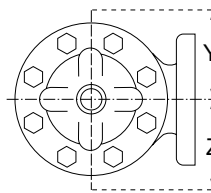
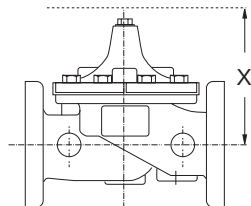
Pilot System Dimensions (In Inches)

We recommend providing adequate space around valve for maintenance work

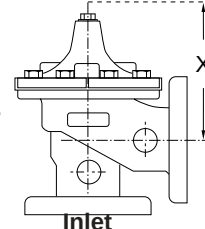
Valve Size	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"
X Max.	12.25	13.00	13.25	15.75	17.25	20.25	20.75	25.00	27.25	27.25	27.25	50.00	50.00
Y Max.	4.50	5.00	6.00	8.00	10.25	12.00	14.25	16.75	18.00	18.00	18.00	30.00	30.00
Z Max.	6.50	8.00	8.50	9.00	11.25	13.00	15.50	17.00	19.00	19.00	19.00	30.00	30.00



GLOBE



ANGLE



Inlet

Pilot System Specifications

Adjustment Ranges

High Pressure Pilot (CRL)

0 to 75 psi
20 to 200 psi*
100 to 300 psi

Low Pressure Pilot (CRA)

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

*Supplied unless otherwise specified

Other ranges available, please consult factory

Materials

Standard Pilot System Materials

Pilot Control: Bronze ASTM B62
Trim: Stainless Steel Type 303
Rubber: Buna-N® Synthetic Rubber
Tubing & Fittings: Copper and Bronze

Optional Pilot System Materials

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

Temperature Range

Water: to 180°F

When Ordering, Please Specify

1. Catalog No. 52-03 or No. 652-03
2. Valve Size
3. Pattern - Globe or Angle
4. Pressure Class
5. Screwed or Flanged
6. Trim Material
7. Adjustment Range
8. Desired Options
9. When Vertically Installed



E-52-03/652-03 (R-03/03)

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