



**60-32**  
(Full Internal Port)  
— MODEL —  
**660-32**  
(Reduced Internal Port)

# Combination Pump Control and Back Pressure Valve (4" and Larger)



- Built-in Check Valve
- Accurate Pressure Control
- Low Head Loss
- Smooth Control of Pump Surges
- Easy Maintenance Design

The Cla-Val Model 60-32/660-32 Combination Pump Control and Back Pressure Valve is a pilot-operated control valve designed for booster pump discharge installation to eliminate pipeline surges caused by starting and stopping of pump and to provide adjustable back pressure on pump while it is running. The valve features a modified globe-design with diaphragm-actuation, and hydraulic operation for smooth, reliable automatic operation during pump starting and stopping. A built-in lift-type check feature automatically closes valve on electric power failure or any time pressure reversal occurs to protect pump from back spinning.

In operation, when pump is off, the pump control valve is closed by downstream system pressure. When pump is started, the solenoid control is energized and valve opens slowly to gradually increase pump flow and line pressure to desired back pressure setting for pumping conditions. When pump is signaled to shut-off, the solenoid control is de-energized and the valve begins to slowly close, gradually reducing flow while pump continues to run. When valve is closed, the included limit switch assembly turns off pump. Adjustable flow controls are included to easily regulate valve opening and closing speed to prevent surges. Using Cla-Val wiring diagram (see page 4) ensures safe electrical interlock control of pump and valve.

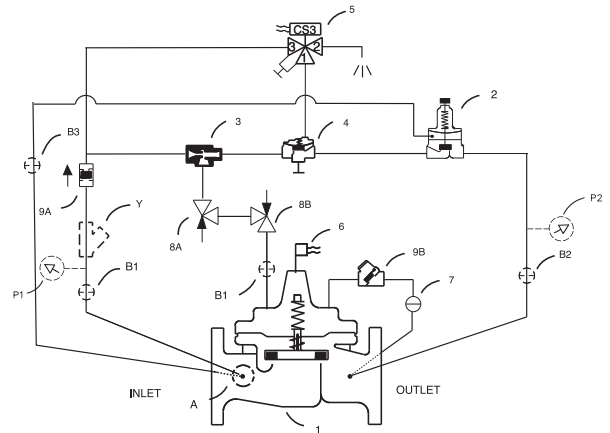
## Schematic Diagram

Item	Description
1	Hycheck (Main Valve)
2	CRL Pressure Relief Control
3	X47A Ejector
4	100-01 Hytrol (Reverse Flow)
5	CS3M Solenoid Control
6	X105LCW Switch Assembly
7	CK2 Cock (Isolation Valve)
8	CV Flow Control (Opening and Closing Speed)
9	CDC/CSC Check Valve

## Optional Features

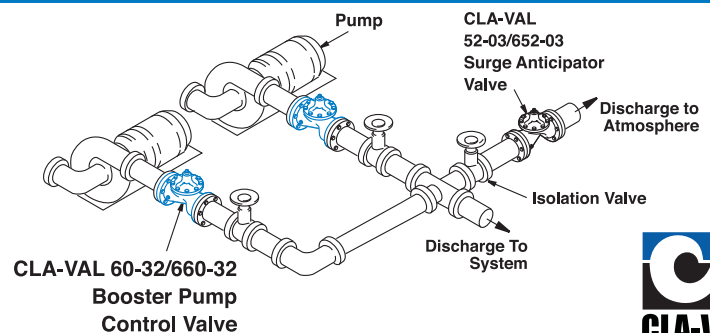
Item	Description
A	X46A Flow Clean Strainer
B	CK2 Cock (Isolation Valve)
P	X141 Pressure Gauge
Y	X43 "Y" Strainer

Note: For main valve option descriptions, refer to the 100-04 (60-32) or 100-23 (660-32) Technical Data Sheet.

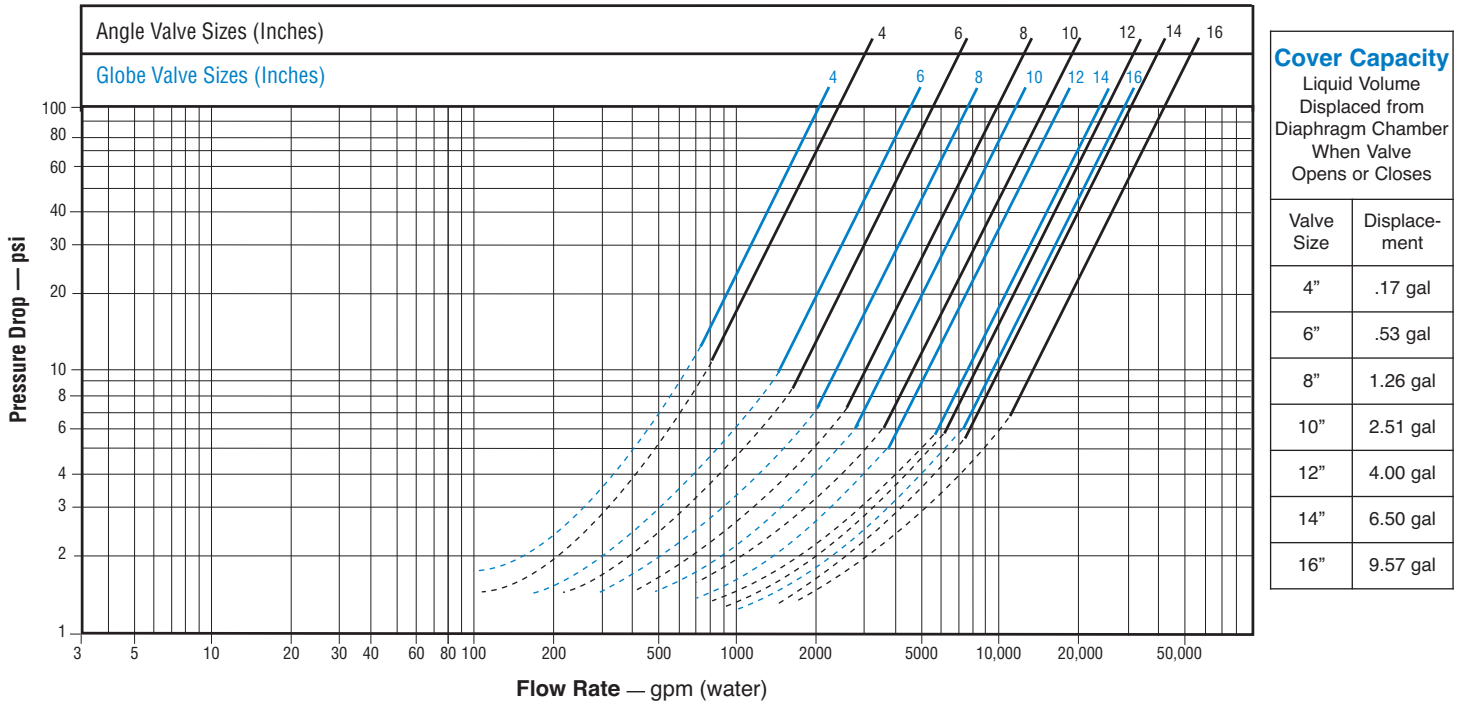


## Typical Application

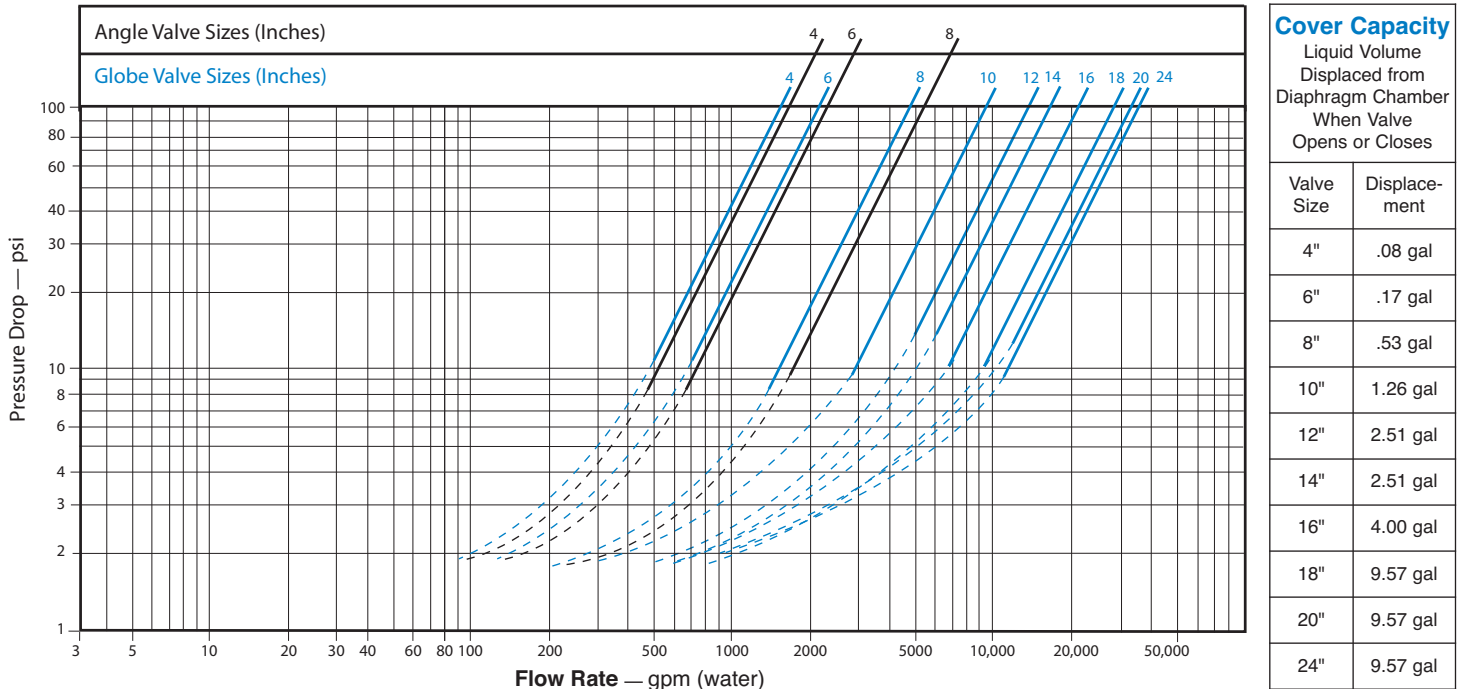
Install Model 60-32/660-32 valve as shown in multiple pump applications. Flexible water-tight conduit should be used for electrical connections to the solenoid control and the limit switch. A Model 52-03/652-03 Surge Anticipator Valve is recommended for power failure protection.



**Model 60-32 Flow Chart** (Uses Basic Valve Model 100-04)



**Model 660-32 Flow Chart** (Uses Basic Valve Model 100-23)



## Pressure Ratings (Recommended Maximum Pressure - psi)

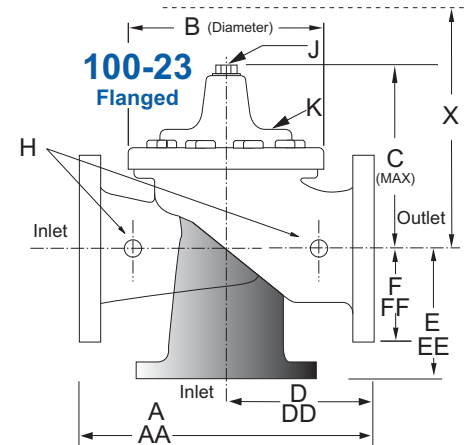
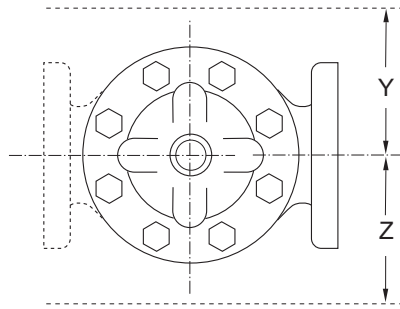
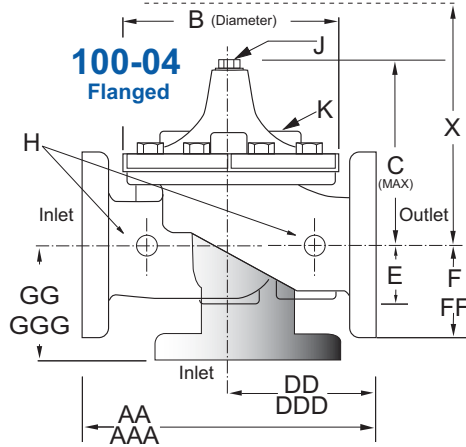
Valve Body & Cover		Pressure Class		
		Flanged		
Grade	Material	ANSI Standards*	150 Class	300 Class
ASTM A536	Ductile Iron	B16.42	250	400
ASTM A216-WCB	Cast Steel	B16.5	285	400
ASTM B62	Bronze	B16.24	225	400

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
100-04 Available Sizes	4" - 16"	4" - 16"	4" - 16"
100-23 Available Sizes	4" - 24"	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.



## 60-32 Series Dimensions (Full Internal Port 100-04) (In Inches)

Valve Size (Inches)	4	6	8	10	12	14	16
AA 150 ANSI	15.00	20.00	25.38	29.75	34.00	39.00	41.38
AAA 300 ANSI	15.62	21.00	26.38	31.12	35.50	40.50	43.50
B Dia.	11.50	15.75	20.00	23.62	28.00	32.75	35.50
C Max.	10.62	13.38	16.00	17.12	20.88	24.19	25.00
DD 150 ANSI	7.50	10.00	12.69	14.88	17.00	19.50	20.69
DDD 300 ANSI	7.81	10.50	13.19	15.56	17.75	20.25	21.75
E	3.19	4.31	5.31	9.25	10.75	12.62	15.50
F 150 ANSI	4.50	5.50	6.75	8.00	9.50	10.50	11.75
FF 300 ANSI	5.00	6.25	7.50	8.75	10.25	11.50	12.75
GG 150 ANSI	5.00	6.00	8.00	8.62	13.75	14.88	15.69
GGG 300 ANSI	5.31	6.50	8.50	9.31	14.50	15.62	16.50
H NPT Body Tapping	¾	¾	1	1	1	1	1
J NPT Cover Center Plug	¾	¾	1	1	1¼	1½	2
K NPT Cover Tapping	¾	¾	1	1	1	1	1
Stem Travel	1.1	1.7	2.3	2.8	3.4	4.0	4.5
Approx. Ship Wt. Lbs.	140	285	500	780	1165	1500	2265
X Pilot System	17	29	31	33	36	40	40
Y Pilot System	12	20	22	24	26	29	30
Z Pilot System	12	20	22	24	26	29	30

## 660-32 Series Dimensions (Reduced Internal Port 100-23) (In Inches)

Valve Size (Inches)	4	6	8	10	12	14	16	18	20	24
A 150 ANSI	13.88	17.75	21.38	26.00	30.00	34.25	35.00	42.12	48.00	48.00
AA 300 ANSI	14.50	18.62	22.38	27.38	31.50	35.75	36.62	43.63	49.62	49.75
B Dia.	9.12	11.50	15.75	20.00	23.62	27.47	28.00	35.44	35.44	35.44
C Max.	8.62	11.62	15.00	17.88	21.00	20.88	25.75	25.00	31.50	31.50
D 150 ANSI	6.94	8.88	10.69	CF*	CF*	CF*	CF*	CF*	CF*	CF*
DD 300 ANSI	7.25	9.38	11.19	CF*	CF*	CF*	CF*	CF*	CF*	CF*
E 150 ANSI	5.50	6.75	7.25	CF*	CF*	CF*	CF*	CF*	CF*	CF*
EE 300 ANSI	5.81	7.25	7.75	CF*	CF*	CF*	CF*	CF*	CF*	CF*
F 150 ANSI	4.50	5.50	6.75	8.00	9.50	11.00	11.75	15.88	14.56	17.00
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	.50	.75	.75	1	1	1	1	1	1	1
J NPT Cover Center Plug	.50	.75	.75	1	1	1.25	1.25	2	2	2
K NPT Cover Tapping	.50	.75	.75	1	1	1	1	1	1	1
Stem Travel	0.8	1.1	1.7	2.3	2.8	3.4	3.4	4.5	4.5	4.5
Approx. Ship Wt. Lbs.	85	195	330	625	900	1250	1380	1500	2551	2733
X Pilot System	15	27	30	33	36	36	41	40	46	55
Y Pilot System	11	18	20	22	24	26	26	30	30	30
Z Pilot System	11	18	20	22	24	26	26	30	30	30

60-32 Valve Selection	100-04 Pattern: Globe (G), Angle (A), End Connections: Threaded (T), Flanged (F) Indicate Available Sizes							
	Inches	4	6	8	10	12	14	16
	mm	100	150	200	250	300	350	400
Basic Valve 100-04	Pattern	G, A	G, A	G, A	G, A	G, A	G, A	G, A
	End Detail	F	F	F	F	F	F	F
Suggested Flow (gpm)	Maximum	800	1800	3100	4900	7000	8400	11000
	Maximum Intermittent	990	2250	3900	6150	8720	10540	13700
Suggested Flow (Liters/Sec)	Maximum	50	113	195	309	442	530	694
	Maximum Intermittent	62	142	246	387	549	664	863

100-04 Series is the full internal port Hycheck.

660-32 Valve Selection	100-23 Pattern: Globe (G), Angle (A), End Connections: Flanged (F) Indicate Available Sizes										
	Inches	4	6	8	10	12	14	16	18	20	24
	mm	100	150	200	250	300	350	400	450	500	600
Basic Valve 100-23	Pattern	G, A	G, A	G, A	G	G	G	G	G	G	G
	End Detail	F	F	F	F	F	F	F	F	F	F
Suggested Flow (gpm)	Maximum	580	1025	2300	4100	6400	9230	9230	16500	16500	16500
Suggested Flow (Liters/Sec)	Maximum	37	65	145	258	403	581	581	1040	1040	1040

100-23 Series is the reduced internal port size version of the 100-04 Series.

## Wiring Diagram

Auto-Off-Hand = Selector Switch

1CR = Relay, DPST Normally Open

2CR = Relay, DPST Normally Open

3CR = Relay, TPST Normally Open

SW<sub>1</sub> = Switch, Remote Start/ Stop

SW<sub>2</sub> = Switch, SPDT, Valve Limit Switch

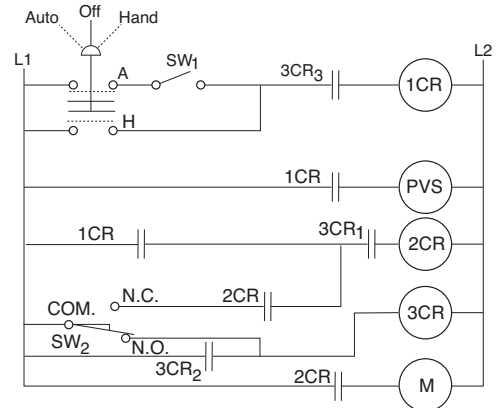
PVS = Pilot Valve Solenoid

M = Pump Motor Starter

**Note:** SW<sub>2</sub> and PVS supplied by Cla-Val Co. All other electrical items supplied by customer. SW<sub>2</sub> is included in the X105L switch assembly which is mounted on the pump control valve cover.

Shown In Pump Off Position

Optional Model PC-1 Pump Control Panel has flexible control settings for maximum electrical interlock control. It is pre-wired and ready for easy field hook-up wiring. See E-PC-1 data sheet.



## Pilot System Specifications

### Adjustment Ranges

- 0 to 75 psi
- 20 to 105 psi
- 20 to 200 psi\*
- 100 to 300 psi

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

**Temperature Range** Water: to 180°F Max

### 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  
Stainless Steel or Monel materials

### Solenoid Control

Body:  
Brass ASTM B283

Enclosure:  
General Purpose, Watertight 1,2,3,3S,4,4X  
Optional: Class I, Division 2, Hazardous Locations  
and Watertight Type 3, 3S, 4, 4X

### Voltages:

100-240V / 50-60 Hz AC or DC  
24-99V / 50-60Hz AC or DC  
2-24VDC  
Manual Operator Standard  
Max. operating pressure differential: 350 psi

### Coil:

Insulation molded Class F  
Watts AC 2

## When Ordering, Please Specify

1. Catalog No. 60-32 or No. 660-32
2. Valve Size
3. Pattern - Globe or Angle
4. Pressure Class (Flanged)
5. Trim Material
6. Electrical Selection
7. Desired Options
8. When Vertically Installed (Flow Direction)

Note: For optimum operation of built-in check feature, installation with valve stem vertically position is recommended.

**CLA-VAL**

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