

Booster Pump Control Valve



- Simple Hydraulic Operation
- Low Head Loss
- Built-in Check Valve
- Proven Reliable Design

The Cla-Val Model 60-31/660-31 Booster Pump Control valve is a pilot-operated valve designed for installation on the discharge of booster pumps to eliminate pipeline surges caused by the starting and stopping of the pump.

The pump starts against a closed valve. When the pump is started, the solenoid control is energized and the valve begins to open slowly, gradually increasing line pressure to full pumping head. When the pump is signaled to shut-off, the solenoid control is de-energized and the valve begins to close slowly, gradually reducing flow while the pump continues to run. When the valve is closed, a limit switch assembly, which serves as an electrical interlock between the valve and the pump, releases the pump starter and the pump stops.

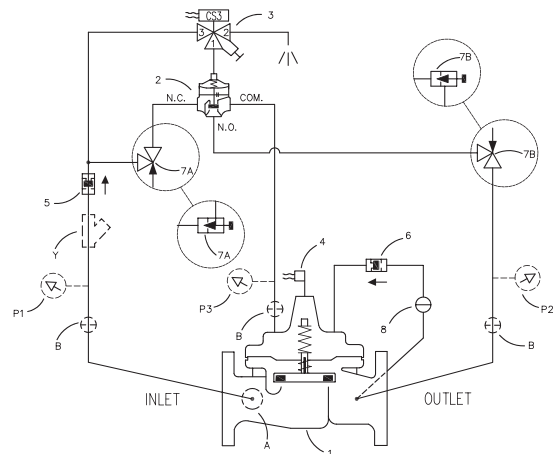
The Model 60-31/660-31 is an automatic valve of a modified globe-type design with a built-in, lift type, check feature. It is hydraulically operated and diaphragm-actuated. A three-way solenoid valve controls the valve operation. Flow control valves located in the pilot control system provide regulation of both the opening and closing rate. Pilot system strainer insures that the pilot control supply is clean.

Schematic Diagram

Item	Description
1	Hycheck (Main Valve)
2	102C-3H Three Way Hytrol
3	CS3SM Solenoid Control
4	X105LCW Switch Assembly
5	CDC Disk Check Valve
6	CDC/CSC Check Valve
7	CNA Angle Valve
8	CK2 Cock (Isolation Valve)

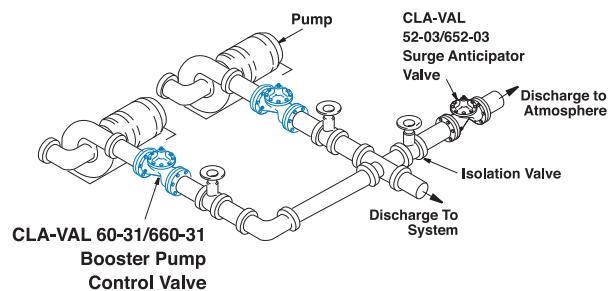
Item	Description
A	X46A Flow Clean Strainer
B	CK2 Cock (Isolation Valve)
P	X141 Pressure Gauge
Y	X43 "Y" Strainer

Note: For main valve option descriptions, refer to the 100-04 (60-31) or 100-23 (660-31) Technical Data Sheet.

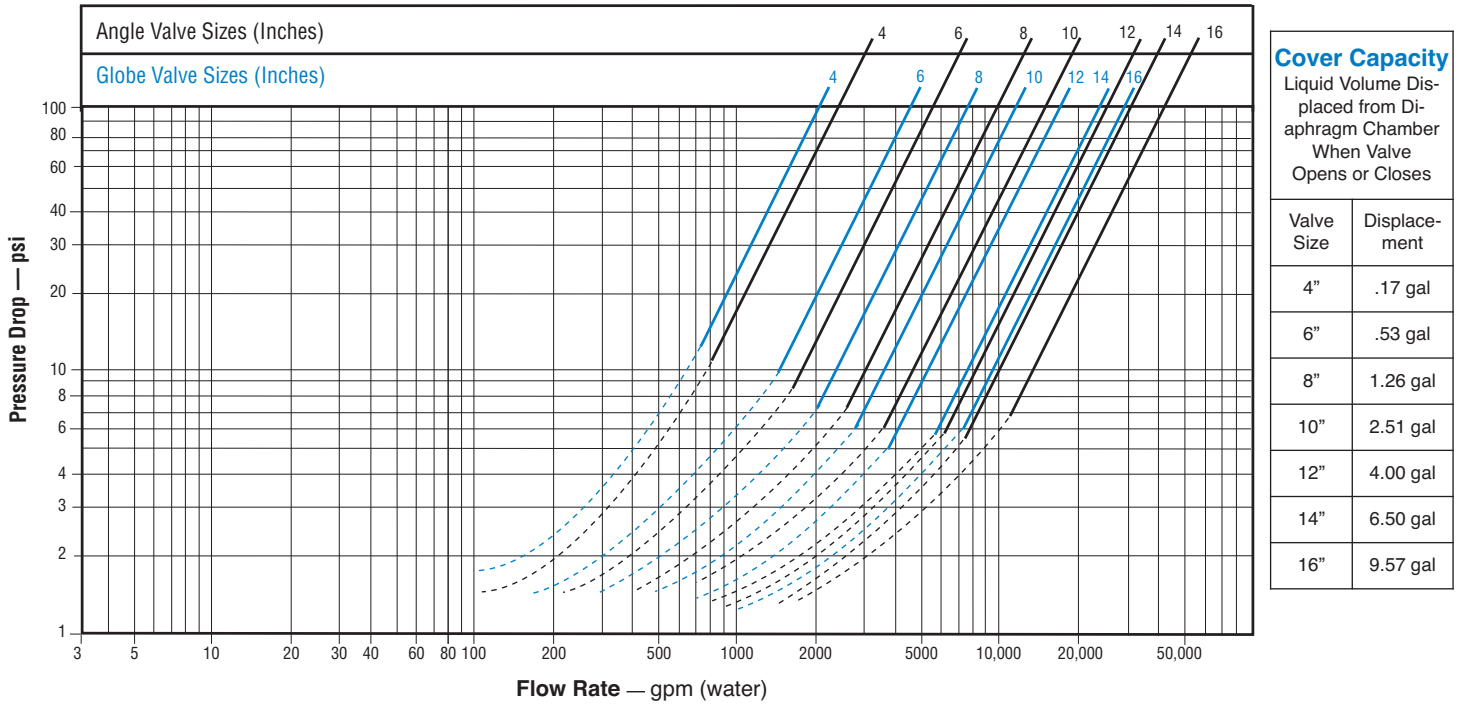


Typical Application

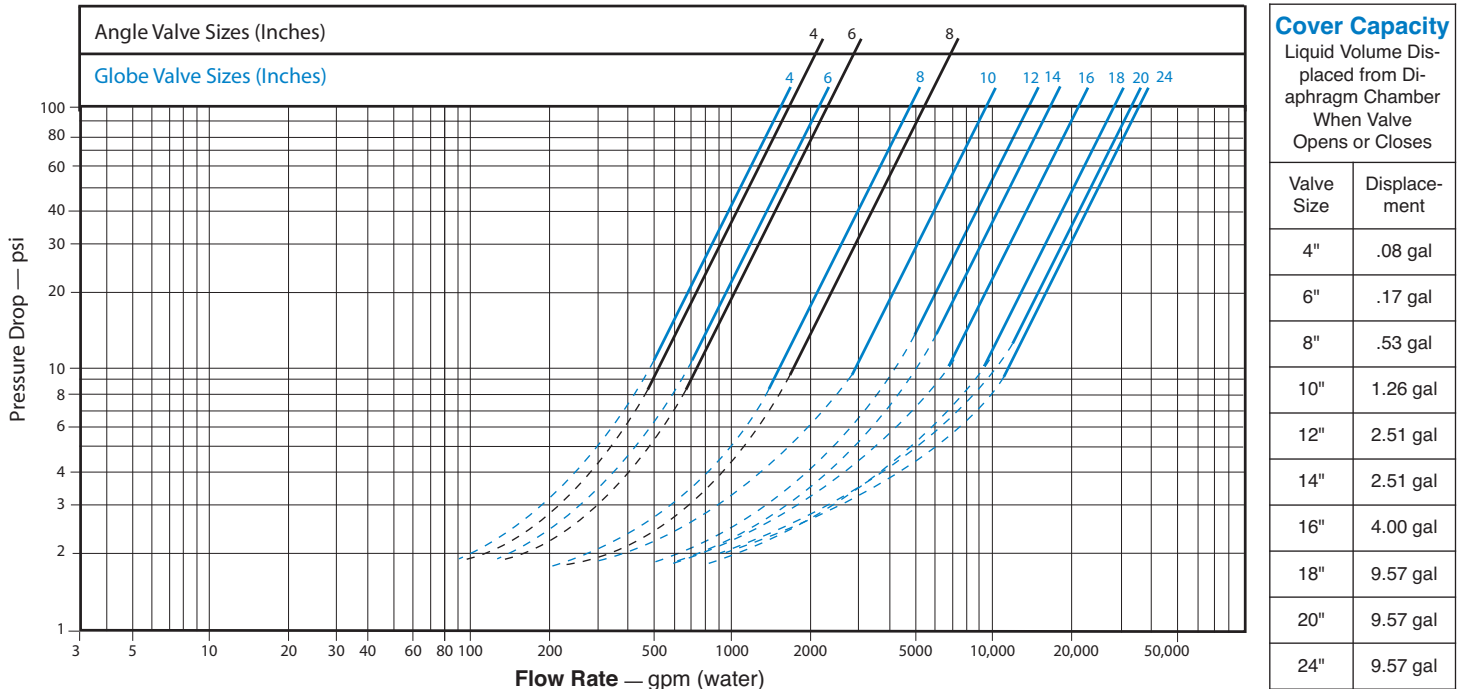
Install Model 60-31/660-31 valve as shown in multiple pump applications. Flexible conduit should be used for electrical connections to the solenoid control and the limit switch. A Model 52-03/652-03 Surge Anticipator Valve is recommended for power failure protection.



Model 60-31 Flow Chart (Uses Basic Valve Model 100-04)



Model 660-31 Flow Chart (Uses Basic Valve Model 100-23)



Pressure Ratings (Recommended Maximum Pressure - psi)

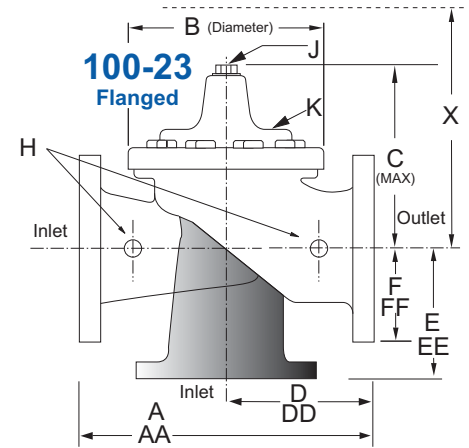
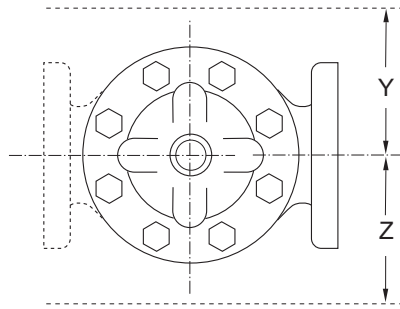
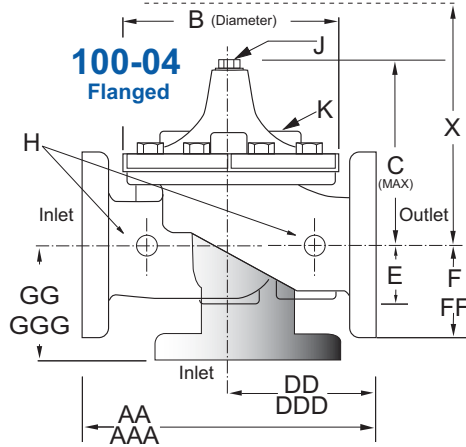
Valve Body & Cover		Pressure Class		
		Flanged		
Grade	Material	ANSI Standards*	150 Class	300 Class
ASTM A536	Ductile Iron	B16.42	250	400
ASTM A216-WCB	Cast Steel	B16.5	285	400
ASTM B62	Bronze	B16.24	225	400

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.



60-31 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	3/4	3/4	1	1	1	1	1
J NPT Cover Center Plug	3/4	3/4	1	1	1 1/4	1 1/2	2
K NPT Cover Tapping	3/4	3/4	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

660-31 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	—	—	—	—	—	—	—
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
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

60-31 Valve Selection	100-04 Pattern: Globe (G), Angle (A), End Connections: Threaded (T), Flanged (F) Indicate Available Sizes									
	Inches	2	2½	3	4	6	8	10	12	14
	mm	50	65	80	100	150	200	250	300	350
Basic Valve 100-04	Pattern	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G, A
	End Detail	T, F	T, F	T, F	T, F	T, F	T, F	F	F	F
Suggested Flow (gpm)	Maximum	210	300	460	800	1800	3100	4900	7000	8400
	Maximum Intermittent	260	370	580	990	2250	3900	6150	8720	10540
Suggested Flow (Liters/Sec)	Maximum	13	19	29	50	113	195	309	442	530
	Maximum Intermittent	16	23	37	62	142	246	387	549	664

100-04 Series is the full internal port Hycheck.

660-31 Valve Selection	100-23 Pattern: Globe (G), Angle (A), End Connections: Flanged (F) Indicate Available Sizes											
	Inches	3	4	6	8	10	12	14	16	18	20	24
	mm	80	100	150	200	250	300	350	400	450	500	600
Basic Valve 100-23	Pattern	G	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	F
Suggested Flow (gpm)	Maximum	260	580	1025	2300	4100	6400	9230	9230	16500	16500	16500
Suggested Flow (Liters/Sec)	Maximum	16	37	65	145	258	403	581	581	1040	1040	1040

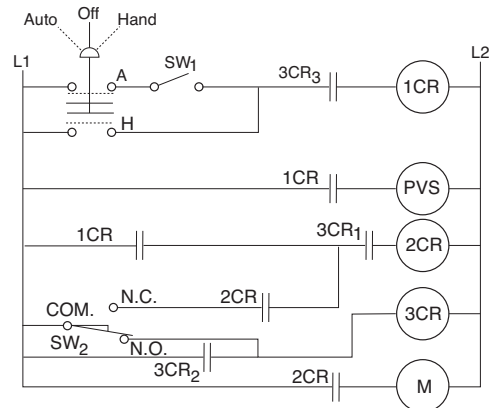
100-23 Series is the reduced internal port size version of the 100-04 Series.

Wiring Diagram

Auto-Off-Hand = Selector Switch
 1CR = Relay, DPST Normally Open
 2CR = Relay, DPST Normally Open
 3CR = Relay, TPST Normally Open
 SW₁ = Switch, Remote Start, Automatic
 SW₂ = Switch, SPDT, Valve Limit Switch Connect to N.C. Terminal
 PVS = Pilot Valve Solenoid
 M = Pump Motor Starter

Note: SW₂ and PVS supplied by Cla-Val Co. All other electrical items supplied by customer. SW₂ is included in the X105L switch assembly which is mounted on the pump control valve cover.

Shown In Pump Off Position



Pilot System Specifications

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:

100-240 V 50-60 Hz AC or DC

24-99 V 50-60 Hz AC or DC

2-24 V DC

Manual Operator Standard

Max. operating pressure differential: 300 psi

Coil:

Insulation molded Class F
 Watts AC 2

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

When Ordering, Please Specify

- Catalog No. 60-31 or No. 660-31
- Valve Size
- Pattern - Globe or Angle
- Pressure Class (Flanged)
- Trim Material
- Electrical Selection
- Desired Options
- When Vertically Installed (Flow Direction)