

▲ Model 118-3 shown

The OCV Series 118/108SA surge anticipation valves are designed to be installed in a bypass line and provide protection against damaging surges that can occur in pumping systems when a pump is suddenly stopped. Unlike conventional relief valves, which open only when a high pressure wave hits, surge anticipation valves sense the precursor of the high pressure wave (pump power failure or low pressure wave) and opens in anticipation of the returning high pressure wave that follows. By opening, the valve prevents the buildup of pressure before it occurs.

## SERIES FEATURES

### Electro-hydraulic Series 118

- ▶ Electrical power connection to pumping system for opening on loss of power or on a pressure switch low pressure signal.
- ▶ Valve closes after (adjustable) predetermined time on power failure or low pressure opening.
- ▶ Hydraulic, pilot operated, high pressure relief opening.
- ▶ Available with Surge Commander electronics package (Model 118-4).

### Hydraulic Model 108SA-3

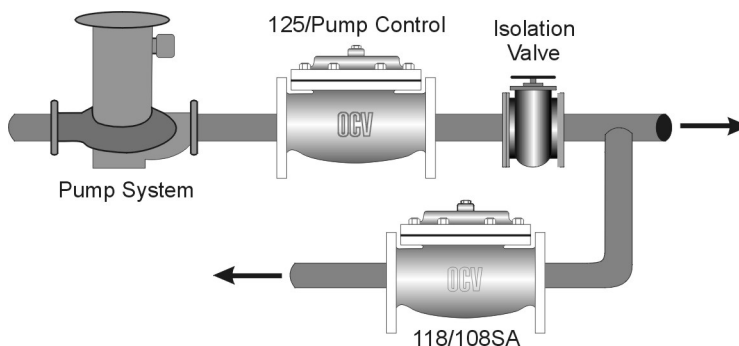
- ▶ No electrical requirements.
- ▶ Low pressure opening pilot.
- ▶ High pressure relief pilot.

## VALVE FEATURES

- ▶ Operates automatically off line pressure.
- ▶ Heavy-duty, nylon-reinforced diaphragm.
- ▶ Rectangular-shaped, soft seat seal provides drip-tight Class VI closure.
- ▶ Diaphragm assembly guided top and bottom.
- ▶ Throttling seat retainer for flow and pressure stability.
- ▶ Easily maintained without removal from the line.
- ▶ Replaceable seat ring.
- ▶ Alignment pins assure proper reassembly after maintenance.
- ▶ Valves are factory tested.
- ▶ Valves are serial numbered and registered to facilitate replacement parts and factory support.

## APPLICATION STATEMENTS

Installed in the bypass line the valve discharges to atmosphere. Valve opens on power failure, low pressure signal or as a high pressure relief valve.



## VALVE OPERATION

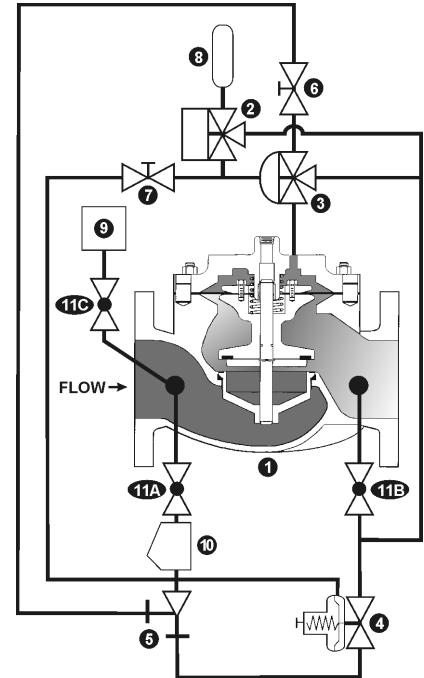
### Electro Hydraulic Model 118-3

The control of the model 118-3 is via a three-way solenoid. This solenoid may be electrically interlocked to either the pump power or pump starter. If wired to the pump starter, the valve will automatically proceed in the opening cycle on each pump shutdown. Wired across pump power it opens only on pump power failure.

Valve opens when solenoid is deenergized - either directly on power failure or through pressure switch on low pressure - remains open for a predetermined time (accumulator fill), then slowly closes.

Valve also opens when set point of relief pilot is exceeded, then slowly closes when pressure returns to normal.

ITEM	DESCRIPTION
1	BASIC VALVE ASSEMBLY
2	THREE-WAY SOLENOID PILOT
3	THREE-WAY AUXILIARY PILOT
4	PRESSURE RELIEF PILOT
5	EJECTOR
6	FLOW CONTROL VALVE
7	METERING VALVE
8	ACCUMULATOR
9	PRESSURE SWITCH
10	Y-STRAINER
11	ISOLATION BALL VALVE



### Electro Hydraulic Model 118-4

The model 118-4, provides the basic functions of the Model 118-3. The electronic Surge Commander, is a self-powered module, designed with two selectable modes of operation allowing for finer tuning of the variables of when to open and how long to stay open.

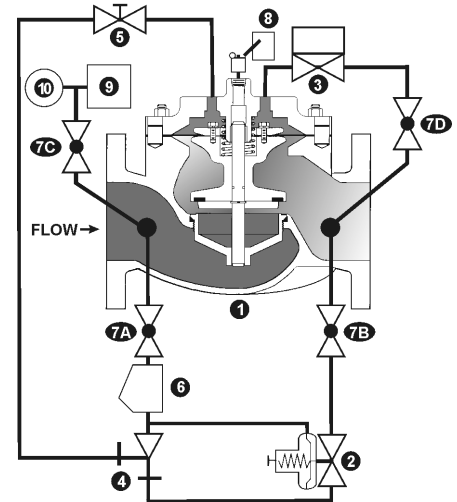
Mode A - Opens valve when there is a power failure during pump run accompanied by a down surge in pressure.

Mode B - Opens valve when there is a power failure or when there is a down surge in pressure.

Both modes prevent unnecessary valve opening caused by power interruptions with no pump running. The time the valve remains open a precise time and is easily adjustable via a digital timer.

The valve also opens when set point of the high pressure relief pilot is exceeded, then slowly closes when pressure returns to normal.

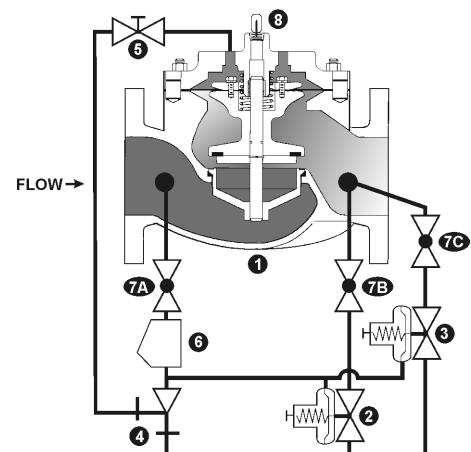
ITEM	DESCRIPTION
1	BASIC VALVE ASSEMBLY
2	PRESSURE RELIEF PILOT
3	TWO-WAY SOLENOID PILOT, N.C.
4	EJECTOR
5	FLOW CONTROL VALVE
6	Y-STRAINER
7	ISOLATION BALL VALVE
8	LIMIT SWITCH ASSEMBLY
9	PRESSURE SWITCH
10	PRESSURE GAUGE



### Hydraulic Model 108-SA-3

The control of the model 108SA-3 is via two hydraulic control pilots. A normally open, low pressure pilot that opens the valve when system pressure drops to its set point. This setting is typically 25 psi less than static pressure. The valve also opens when set point of the high pressure relief pilot is exceeded. The valve slowly closes when system pressure returns to normal (pressure is between the settings of the two pilots).

ITEM	DESCRIPTION
1	BASIC VALVE ASSEMBLY
2	PRESSURE RELIEF PILOT
3	LOW PRESSURE OPENING PILOT
4	EJECTOR
5	FLOW CONTROL VALVE
6	Y-STRAINER
7	ISOLATION BALL VALVE
8	VISUAL INDICATOR



## SIZING CONSIDERATIONS

For the most comprehensive procedure in sizing Series 118/108SA control valves, it is best to use our ValveMaster software or the guidelines shown here in conjunction with the Performance Charts in the Engineering Section of the OCV catalog.

The flow required through a surge anticipation valve can be difficult to determine, so a general guideline is to use 60% of the rated pump flow. The 118/108SA Series valve is capable of intermittent flows up to 45 ft. per second. Surge Anticipation Valve sizes are typically 50-60% of the mainline size.

$$C_v = \frac{Q_{\max}}{\sqrt{DP/sg}}$$

where    Q<sub>max</sub> = maximum flow rate, gallons per minute  
              DP = pressure drop, psi\*  
              sg = liquid specific gravity (water = 1.00)

\* For valves which exhaust to atmosphere, the DP will be numerically equal to the low pressure setting.

From the chart below, pick the smallest valve that has at least the Cv determined above, and where the velocity does not exceed 45 ft/sec.

Flow chart for full port valve.

Valve size	1 ¼	1 ½	2	2 ½	3	4	6	8	10	12	14	16	24
GLOBE Cv	23	27	47	68	120	200	450	760	1250	1940	2200	2850	6900
ANGLE Cv	30	35	65	87	160	270	550	1000	1600	2400	--	4000	--
FLOW @ 45 FT/SEC	210	280	460	650	1000	1800	4000	7000	11,000	16,000	19,000	25,000	56,000

## CAVITATION CONCERNS

Many surge anticipation valves are, by their application, subject to pressure differentials that may induce cavitation. When these conditions exist, it may be only on an intermittent basis, causing minimum concern for valve deterioration.

This complex phenomenon cannot be predicted by charts, which index only inlet and outlet pressures. The easiest way to predict cavitation is to let us do the calculation.

Simply fax, e-mail or call us and we will provide a graphical analysis and a solution.

Provide us:

APPLICATION (i.e., surge anticipation)  
 VALVE SIZE  
 PRESSURE - INLET and OUTLET  
 FLOW RANGE - Minimum and Maximum  
 FLUID TYPE  
 FLUID VAPOR PRESSURE (if other than water)

## VALVE SELECTION GUIDE

Feature	118-2	118-3	118-4	108SA3	Description
Power Failure Opening	X	X	X		Valve opens on loss of power
Low Pressure Opening		X	X	X	Valve opens on low pressure (below normal)
High Pressure Relief	X	X	X	X	Valve opens at high pressure setting (hydraulic pilot)
Electronic Control With Surge Commander Control Panel			X		Simple, accurate control of power failure and low pressure opening modes

**SURGE COMMANDER**--Used with Model 118-4  
 Enclosure: NEMA 4X (weather tight & corrosion resistant)  
 Dimensions: 17 1/2" High x 14" Wide x 8 3/4" Deep  
 Input Power: 120VAC  
 Output Power: 12VDC from internal battery/charger



## ABOUT YOUR VALVE

OCV Control Valves was founded more than 60 years ago with a vision and commitment to quality and reliability. From modest beginnings, the company has grown to be a global leader just a half century later. In fact, OCV Valves can be found in some capacity in nearly every country around the world from fire protection systems in Malaysia to aircraft fueling systems in Africa and from oil refineries in Russia to water supply systems in the USA and Canada. You will also find our valves in irrigation systems in Europe, South America and the Middle East.

The original foundation on which the company was built allows our team of professionals to not only provide the service required to be a worldwide supplier, but more importantly the opportunity to afford the personal touch necessary to be each of our customers' best partner. Simply stated, we take pride in all that we do.

Committed to the work they do, our employees average over 15 years of service. This wealth of knowledge allows us to provide quality engineering, expert support, exacting control and the know-how to create valves known for their long life.

Being ISO 9001 certified means we are committed to a quality assurance program. Our policy is to supply each customer with consistent quality products and ensure that the process is right every time. Our valves meet and exceed industry standards around the world, including approvals by:



Check individual models for availability.

All valves are not created equal. OCV Control Valves proves that day in and day out. We stand behind our valves and are ready to serve your needs.

**TOLL FREE 1.888.628.8258** • phone: (918)627.1942 • fax: (918)622.8916 • 7400 East 42nd Place, Tulsa, OK 74145  
 email: [sales@controlvalves.com](mailto:sales@controlvalves.com) • website: [www.controlvalves.com](http://www.controlvalves.com)

## SPECIFICATIONS

NOTE: ALL waterworks valves meet the Low-Lead laws of the United States, including individual state laws, as of March 2014.

\*Valves 1-1/4" through 24" are certified to NSF/ANSI 372. Valves 4" through 24" are also certified to NSF/ANSI 61-G.

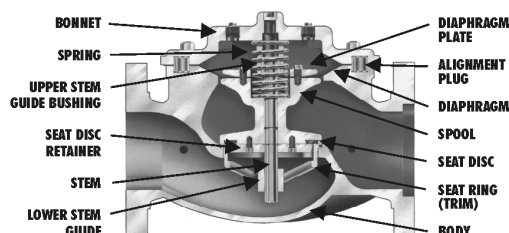


VALVE BODY & BONNET		DUCTILE IRON		CAST STEEL		STAINLESS STEEL	
Material Specification		ASTM A536/65-45-12 (epoxy coated)		ASTM A216/WCB (epoxy coated)		ALL GRADES	
END CONNECTIONS							
Flange Standard (also available in metric)		ANSI B16.42		ANSI B16.5		ANSI B16.5	
Flange Class		150#	300#	150#	300#	150#	300#
Flange Face		Flat	Raised	Raised	Raised	Raised	Raised
Maximum Working Pressure		250 psi	640 psi	285 psi	740 psi	285 psi	740 psi
Screwed Working Pressure: ANSI B1.20.1 640 psi				Grooved End Working Pressure: 300 psi			
INTERNALS							
Stem		STAINLESS STEEL					
Spring		STAINLESS STEEL					
Spool		DUCTILE IRON (epoxy coated) / OPTIONAL - STN. STL.				STAINLESS STEEL	
Seat Disc Retainer		DUCTILE IRON (epoxy coated) (10" & LARGER) STN. STL. (8" & SMALLER / OPTIONAL - ALL SIZES)				STAINLESS STEEL	
Diaphragm Plate		DUCTILE IRON (epoxy coated) / OPTIONAL - STN. STL.				STAINLESS STEEL	
Seat Ring (Trim)		LOW-LEAD BRONZE OR STN. STL.				STN. STL.	
Upper Stem Bushing		BRONZE OR TEFLON®				TEFLON®	
Lower Stem Bushing		NOT APPLICABLE FOR LOW-LEAD BROZE SEAT RINGS / TEFLON FOR FOR STN. STL. SEAT RINGS					
ELASTOMER PARTS (Rubber)							
Diaphragm/Seat Disc/O-Rings		EPDM					
Operating Temperature*		32°F to 230°F					
*Consult factory when temperatures approach low or high temperature allowance.							
COATINGS		NSF-61 EPOXY COATING					
ELECTRICAL SOLENOIDS							
Bodies		BRASS / OPTIONAL - STAINLESS STEEL					
Enclosures		WATER TIGHT, NEMA 1, 3, 4, & 4X					
Power		AC, 60HZ - 24, 120, 240, 480 VOLTS		AC, 50HZ - In 110 VOLT MULTIPLES		DC, 6 12, 24, 240 VOLTS	
Operation		ENERGIZE TO OPEN (NORMALLY CLOSED)		DE-ENERGIZE TO OPEN (NORMALLY OPEN)			
CONTROL PILOTS							
Bodies		LOW-LEAD BRONZE		STN. STL.			
Internal		STAINLESS STEEL		STAINLESS STEEL			
Tubing		COPPER		STAINLESS STEEL			
Fittings		LOW-LEAD BRASS		STAINLESS STEEL			

TEFLON® is a registered trademark of DuPont

The diagram shows a cross-section of a valve assembly. On the left, labels point to the BONNET, SPRING, UPPER STEM GUIDE BUSHING, and SEAT DISC RETAINER. On the right, labels point to the DIAPHRAGM PLATE, ALIGNMENT PLUG, DIAPHRAGM, SPOOL, and SEAT DISC. The assembly is shown in a partially open position, revealing the internal components and the diaphragm mechanism.

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### Globe Flanged Sizes

1.25"	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
32mm	40mm	50mm	65mm	80mm	100mm	150mm	200mm	250mm	300mm	350mm	400mm	450mm	500mm	600mm

\*CONSULT FACTORY



### Angle Flanged Sizes

1.25"	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	16"
32mm	40mm	50mm	65mm	80mm	100mm	150mm	200mm	250mm	300mm	400mm



### Globe/Angle Screwed Sizes

1.25"	1.5"	2"	2.5"	3"
32mm	40mm	50mm	65mm	80mm



### Globe/Angle Grooved Sizes

1.5"	2"	2.5"	3"	4"	6"
32mm	50mm	65mm	80mm	100mm	150mm

\*GLOBE ONLY

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## DIMENSIONS

U.S. DIMENSIONS - INCHES

DIM	END CONN.	1 1/4-1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	24
A	SCREWED	8 3/4	9 7/8	10 1/2	13	--	--	--	--	--	--	--	--
	GROOVED	8 3/4	9 7/8	10 1/2	13	15 1/4	20	--	--	--	--	--	--
	150# FLGD	8 1/2	9 3/8	10 1/2	12	15	17 3/4	25 3/8	29 3/4	34	39	40 3/8	62
	300# FLGD	8 3/4	9 7/8	11 1/8	12 3/4	15 5/8	18 5/8	26 3/8	31 1/8	35 1/2	40 1/2	42	63 3/4
B	SCREWED	1 7/16	1 11/16	1 7/8	2 1/4	--	--	--	--	--	--	--	--
	GROOVED	1*	1 3/16	1 7/16	1 3/4	2 1/4	3 5/16	--	--	--	--	--	--
	150# FLGD	2 5/16-2 1/2	3	3 1/2	3 3/4	4 1/2	5 1/2	6 3/4	8	9 1/2	10 5/8	11 3/4	16
	300# FLGD	2 5/8-3 1/16	3 1/4	3 3/4	4 1/8	5	6 1/4	7 1/2	8 3/4	10 1/4	11 1/2	12 3/4	18
C	SCREWED	4 3/8	4 3/4	6	6 1/2	--	--	--	--	--	--	--	--
	GROOVED	4 3/8*	4 3/4	6	6 1/2	7 5/8	--	--	--	--	--	--	--
	150# FLGD	4 1/4	4 3/4	6	6	7 1/2	10	12 11/16	14 7/8	17	--	20 13/16	--
	300# FLGD	4 3/8	5	6 3/8	6 3/8	7 13/16	10 1/2	13 3/16	15 9/16	17 3/4	--	21 5/8	--
D	SCREWED	3 1/8	3 7/8	4	4 1/2	--	--	--	--	--	--	--	--
	GROOVED	3 1/8*	3 7/8	4	4 1/2	5 5/8	--	--	--	--	--	--	--
	150# FLGD	3	3 7/8	4	4	5 1/2	6	8	11 3/8	11	--	15 11/16	--
	300# FLGD	3 1/8	4 1/8	4 3/8	4 3/8	5 13/16	6 1/2	8 1/2	12 1/16	11 3/4	--	16 1/2	--
E	ALL	6	6	7	6 1/2	8	10	11 7/8	15 3/8	17	18	19	27
F	ALL	3 7/8	3 7/8	3 7/8	3 7/8	3 7/8	3 7/8	6 3/8	6 3/8	6 3/8	6 3/8	6 3/8	8
G	ALL	6	6 3/4	7 11/16	8 3/4	11 3/4	14	21	24 1/2	28	31 1/4	34 1/2	52
H	ALL	10	11	11	11	12	13	14	17	18	20	20	28 1/2

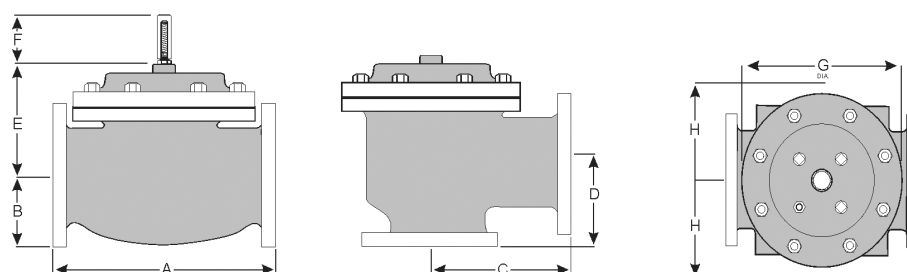
\*GROOVED END NOT AVAILABLE IN 1 1/4"

METRIC DIMENSIONS - M.M.

DIM	END CONN.	DN32-DN40	DN50	DN65	DN80	DN100	DN150	DN200	DN250	DN300	DN350	DN400	DN600
A	SCREWED	222	251	267	330	--	--	--	--	--	--	--	--
	GROOVED	222	251	267	330	387	508	--	--	--	--	--	--
	150# FLGD	216	238	267	305	381	451	645	756	864	991	1026	1575
	300# FLGD	222	251	283	324	397	473	670	791	902	1029	1067	1619
B	SCREWED	37	43	48	57	--	--	--	--	--	--	--	--
	GROOVED	25*	30	37	44	57	84	--	--	--	--	--	--
	150# FLGD	59-64	76	89	95	114	140	171	203	241	270	298	406
	300# FLGD	67-78	83	95	105	127	159	191	222	260	292	324	457
C	SCREWED	111	121	152	165	--	--	--	--	--	--	--	--
	GROOVED	111*	121	152	165	194	--	--	--	--	--	--	--
	150# FLGD	108	121	152	152	191	254	322	378	432	--	529	--
	300# FLGD	111	127	162	162	198	267	335	395	451	--	549	--
D	SCREWED	79	98	102	114	--	--	--	--	--	--	--	--
	GROOVED	79*	98	102	114	143	--	--	--	--	--	--	--
	150# FLGD	76	98	102	102	140	152	203	289	279	--	398	--
	300# FLGD	79	105	111	111	148	165	216	306	298	--	419	--
E	ALL	152	152	178	165	203	254	302	391	432	457	483	686
F	ALL	98	98	98	98	98	162	162	162	162	162	162	203
G	ALL	152	171	195	222	298	356	533	622	711	794	876	1321
H	ALL	254	279	279	279	305	330	356	432	457	508	508	724

\*GROOVED END NOT AVAILABLE IN DN32

For maximum efficiency, the OCV control valve should be mounted in a piping system so that the valve bonnet (cover) is in the top position. Other positions are acceptable but may not allow the valve to function to its fullest and safest potential. In particular, please consult the factory before installing 8" and larger valves, or any valves with a limit switch, in positions other than described. Space should be taken into consideration when mounting valves and their pilot systems.



A routine inspection & maintenance program should be established and conducted yearly by a qualified technician. Consult our factory @ 1-888-628-8258 for parts and service.

Represented by:

### How to order your valve

When Ordering please provide:  
 Series Number - Valve size - Globe or Angle -  
 Pressure Class - Screwed, Flanged, Grooved -  
 Trim Material - Adjustment Range - Pilot  
 Options - Special needs / or installation  
 requirements.

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