

685S Single Switch Liquid Level Indicator for Atmospheric Vessels

Application

The Model 685S is a liquid head pressure type level control. It continuously indicates the liquid level in an atmospheric vessel in feet and inches. It has an adjustable switch which completes an electrical circuit to a solenoid, alarm, or other device when the level rises to the top predetermined point, and breaks the circuit when the level falls to the bottom predetermined point (or the reverse). In addition, the scale on the Model 685S is available calibrated for horizontal cylindrical vessels in pounds, gallons, barrels, percent, etc.

Features

- **Simple Adjustments:** One high adjustment dial for top level set point and one low dial for bottom level set point. One Zero Adjustment Knob and one Specific Gravity (span) Knob. Unit can be factory calibrated for a nominal cost or field adjusted in less than 15 minutes, without having to change the liquid level in the vessel.
- **Easy to Read:** Scale reads the same as a hand tank gauge, making it unnecessary to convert psig of head pressure into feet and inches of liquid to get the correct reading.
- **Long Life:** All bearings are Teflon[®], Delrin[®] or Moly Disulphide baked on Dry Film Lubricated Stainless Steel.
- **Weather Proof and Explosion Proof Housing.**

Operation

Liquid head pressure against a flexible elastomer diaphragm is transmitted directly to a leaf spring, which has a fixed pivot point at the upper end and an adjustable fulcrum point in the mid region of the leaf spring. For example, because 8' of heavy liquid exerts more pressure on the diaphragm than 8' of lighter liquid, the spring can be "stiffened" by moving the fulcrum down by the gravity adjustment knob (red), so the indicator will still read 8'. The zero knob (green) moves the entire spring assembly and pointer, having the same effect as shifting the scale. The switch trigger assembly is normally independent of the indicator mechanism and is free to tilt around the fixed pivot, except that it is weighted to assure a vertical position. At high or low levels, the trigger assembly tilts; thus actuating the cam and engaging the switch.

Installation

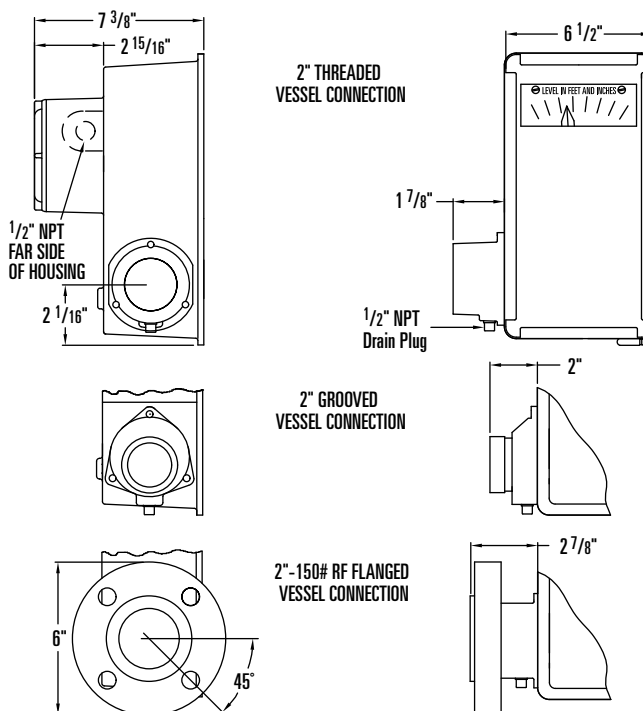
Since the unit measures liquid head pressure, the point at which it is installed on the vessel is the point that liquid measurement begins. For example, if the unit is mounted 1 foot above the bottom of an 8' vessel, the liquid level from the bottom to the 1' mounting will not be measured (or seen); therefore, the indicator should be "zeroed" at 1' and the specific gravity knob should be calibrated accordingly ie. 1 to 8 feet or total of 7 foot span. For calibration and maintenance purposes, always install an isolation valve between the model 685S and the vessel. Also, install a drain petcock in the liquid inlet bottom, where a plug is generally located.



Specifications

Explosion Proof: CSA Approved Class I, Group C & D,
Class II, Groups E, F and G hazardous locations.
Temperature -20°F to +225°F Standard
Pressure 0 to 4 ounces pressure (Atmospheric)
Range (Vessel Height) 3' thru 60' (see 685 code sheet)
Switches SPDT Micro Switch
5 Amp @ 125, 250 or 480 VAC
1/2 Amp @ 125 VDC, 1/4 Amp @ 250 VDC
Electrical Connections 1/2" Female Pipe Thread,
3/4" Female Pipe Thread is also available as an option.

Dimensional Data



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Parts List

Item	Description	Qty.	Part No.
1	HOUSING, ALUMINUM	1	000153-M
2	TRIGGER W/ POINTER ASSEMBLY	1	000070-A
3	MAIN SPRING ASSEMBLY, STD.	1	000053-A
	MAIN SPRING ASSEMBLY, THIN	1	000054-A
	MAIN SPRING ASSEMBLY, DOUBLE	1	000055-A
4	ZERO KNOB, SHAFT & PIN	1	000010-A
5	ADAPTER	1	SEE CHART
6	PIPE PLUG, STEEL PLATED	1	002300-C
	PIPE PLUG, 304 S.S.	1	002304-P
	PIPE PLUG, 316 S.S.	1	002307-P
	PIPE PLUG, PVC	1	002301-P
7	SCREW, STEEL PLATED	3	001508-P
	SCREW, 2" NPT PVC ADAPTER ONLY	3	001542-P
	SCREW, 2"-150RF PVC ONLY	3	001553-P
8	ZERO SPRING, STAINLESS STEEL	1	003102-P
9	WEAR SPRING, STAINLESS STEEL	1	003103-P
10**	DIAPHRAGM, BUNA-N	1	000700-P
	DIAPHRAGM, VITON®	1	000713-P
	DIAPHRAGM, COMPOUND W	1	000720-P
	DIAPHRAGM, TEFLON®	1	000703-P
11	SCREW, 18-8 STAINLESS STEEL	1	001507-P
12	FOLLOWER BEARING, STAINLESS STEEL	1	003909-L
13	POINT DECAL	1	005900-P
14	SPRING BEARING, STAINLESS STEEL	1	000009-A
15	WASHER, TEFLON®	1	001807-P
16	RETAINER O-RING, NEOPRENE	1	003602-P
17***	SCALE, ALUMINUM	1	0030xx-P
18	SCREW, 18-8 STAINLESS STEEL	4	001504-P
19*	TAG, ALUMINUM	1	005908-A
20*	BEZEL FRAME, STAINLESS STEEL	1	000023-P
21*	BEZEL SEAL	1	003400-P
22*	WINDOW, ACRYLIC	1	000204-S
23*	WASHER, PVC ADAPTER ONLY	1	001809-P
24	SWITCH CAM, STAINLESS STEEL	1	000015-W
25	WASHER, TEFLON®	2	001803-P
26	BUSHING, STAINLESS STEEL	1	002700-M
27	BRACKET, ALUMINUM	1	002607-P
28	MICRO SWITCH	1	000604-P
29	SCREW, STAINLESS STEEL	2	001534-P
30	WASHER, STAINLESS STEEL	2	001813-P
31*	COVER, ALUMINUM	1	000201-P
32	FLAT WASHER, STAINLESS STEEL	1	001808-P
33	INSULATOR, FIBER	1	001215-P
34	GROUND SCREW, STAINLESS STEEL	1	001504-G
35	GROUND CUP, BRASS	1	001800-P
36	CAM ASSEMBLY, ALUMINUM	1	000065-A

*Not shown.

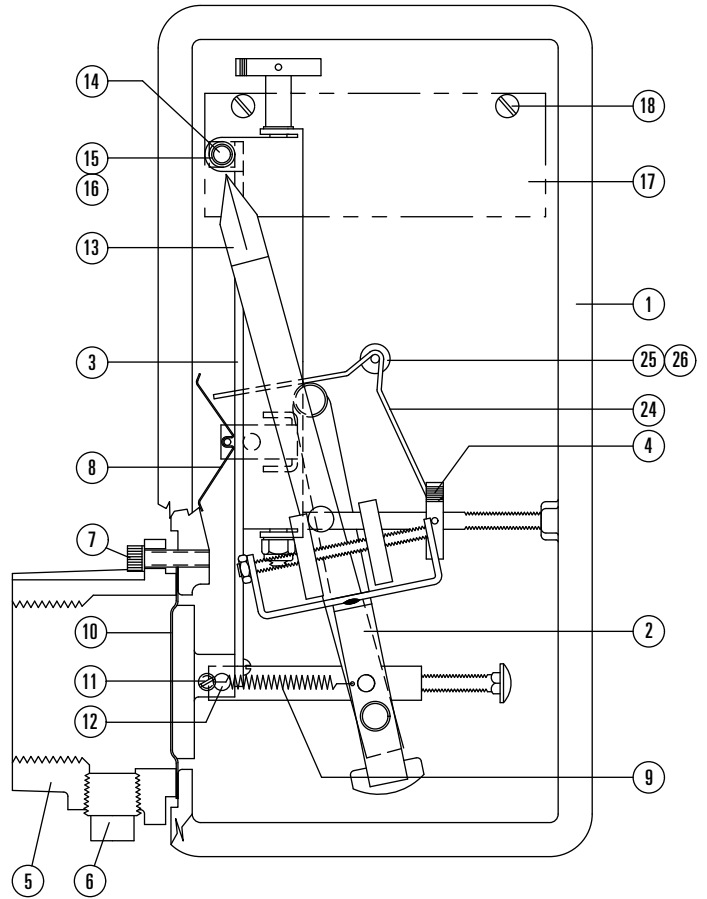
**Recommended spare parts. Other materials available.

***Specify tank height when ordering.

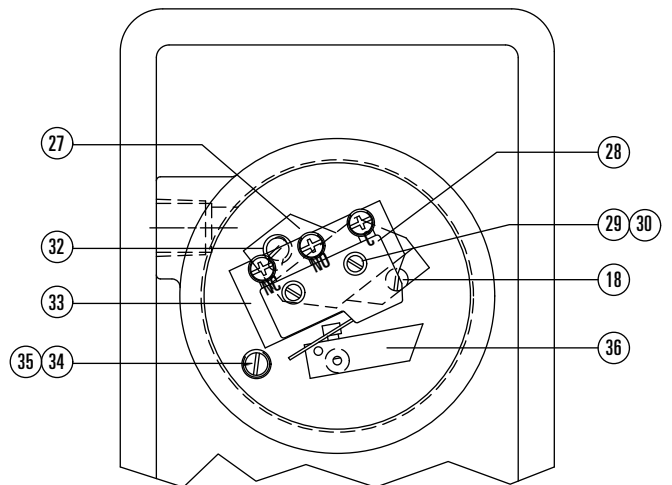
Item #5 Part Number

Vessel Connection	Cad. Plated	Epoxy Coated	Teflon® Coated
2" NPT, D.I.	000307-C	000307-E	000307-T
2" NPT, 316 S.S.	000317-M*	000317-E	000317-T
2"-150RF, STEEL	000335-C	000335-E	000336-T
2"-150RF, 304 S.S.	000338-M*	000338-E	N/A
2"-150RF, 316 S.S.	000341-M*	000341-E	000341-T
3"-150RF, STEEL	000345-C	000345-E	N/A
2" GROOVE, D.I.	000302-C	000303-E	000302-T
2" NPT, PVC	000343-M*	N/A	N/A
2"-150RF, PVC	000342-M*	N/A	N/A

*Plating not required.



MODEL 685S FRONT VIEW



MODEL 685S BACK VIEW

“Snubber” Pulsation Dampener for 685

Application

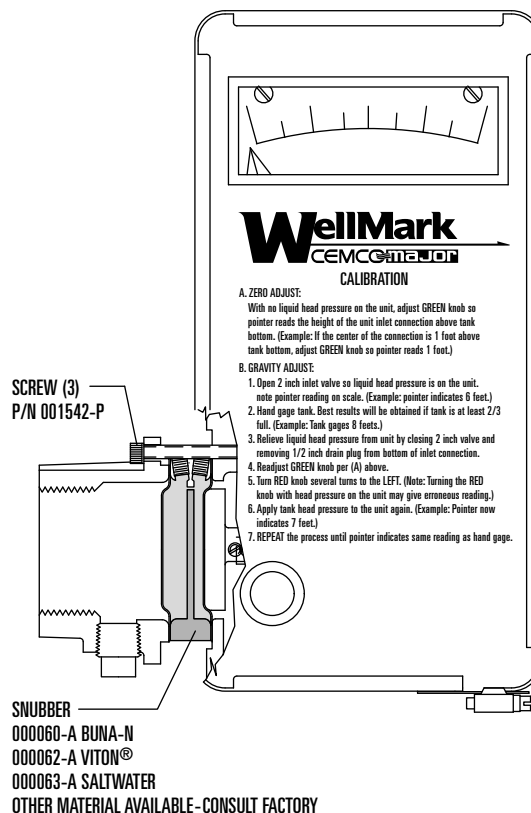
The Snubber is designed to permit the installation of the Major Level Control on a pump suction line without being affected by the surges as the pump starts or stops, or when any other condition results in rapid fluctuation of static head. Of the head type switches in common field use, only the Major Level Control is available with this built-in dampening feature.

Features

- **Dependable:** Factory-sealed snubber assembly eliminates the possibility of orifice plugging from foreign matter.
- **Effective:** Rapid pulsation pressure peaks up to 30 psig resulting in no visible pointer motion.
- **Cost Saving:** The Snubber eliminates the necessity of a separate tank connection and field wiring from the pump unit to the Level Control. The Level Control can be shop mounted and wired on a pump unit skid at a considerable saving in field installation cost.

Operation

Pressure on the upstream diaphragm forces the silicone oil through the orifice and against the downstream diaphragm. The orifice slows the rate of movement of silicone oil. If the head on the upstream diaphragm is suddenly increased from zero to 16', it takes 45 seconds for the pointer to reach the 16' reading. There is no disadvantage to this slowdown, since in normal operation it takes hours for the tank to fill from zero to 16'. The Snubber will operate satisfactorily at all ambient temperatures due to the almost flat viscosity-temperature curve of the silicone oil.



Installation (Snubber to 685)

1. Remove the three cap screws attaching the housing adapter to the level control housing.
2. Remove the diaphragm.
3. Insert the Snubber between the adapter and the housing with the convex (protruding) diaphragm exposed to the liquid.
4. Install the three long screws furnished with the Snubber. **NOTE:** Due to the slow action of the pointer when a Snubber is used, the Level Control can be calibrated more quickly if the Snubber is first removed. Installation of the Snubber will not affect calibration of the Level Control.

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Determining the Model Number

Example given: Standard Model 685I-1G8-RN Liquid Level Indicator for Atmospheric (Vented) Vessels with, Level Indication Output, 2" NPTF (Cad Plated Ductile) Tank Connection, Buna-N Diaphragm, 0 to 16 Foot Indicator Scale, Standard Aluminum Housing.

MODEL 685 I-1 G 8-R N,X

