

# Wellmark Series 685S

## Multiswitch liquid level indicator for atmospheric vessels



### Application

The Model 685S Multiswitch is a liquid head pressure type control, which continuously indicates the liquid level and supplies on and off signal as adjusted. Each switch may be set at different set points to control a separate device, such as an auxiliary or motor control relay, alarms, etc.

### Features

- **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
- **Special Scales:** gallons, pounds, percent, etc. is available
- **Long life:** all bearings are Teflon<sup>®</sup>, Delrin<sup>®</sup>, 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 feet of heavy liquid exerts more pressure on the diaphragm than 8 feet of lighter liquid, the spring can be "stiffened" by moving the fulcrum down by the gravity adjustment knob (red), so the unit will still read 8 feet. The zero knob (green) moves the entire spring assembly and pointer, having the same effect as shifting the scale. The movement of the pointer rotates a linkage connected to a shaft extending into the explosion proof housing where the switches are located. The shaft drives a gear, which is connected to cams that actuate each switch individually.

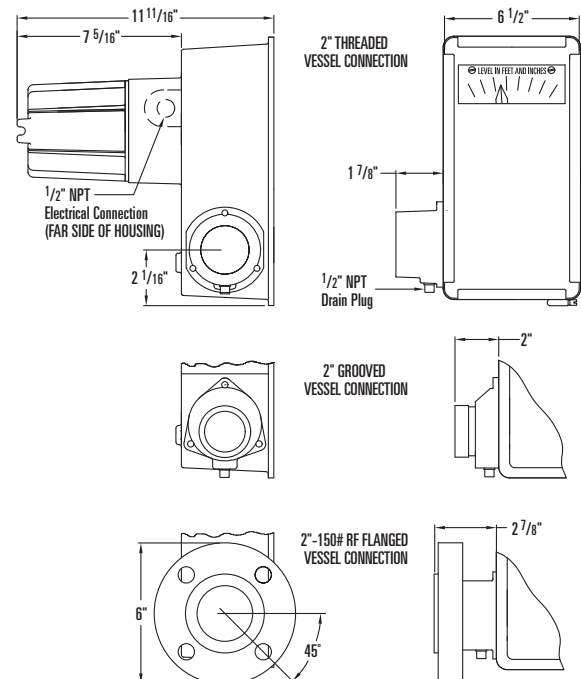
### Installation

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 calibration and maintenance purposes always install an isolation valve between the Model 685 and the vessel. Also, install a drain petcock in the liquid inlet bottom, where a plug is generally located.

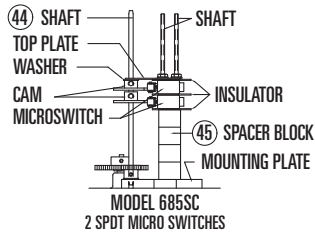
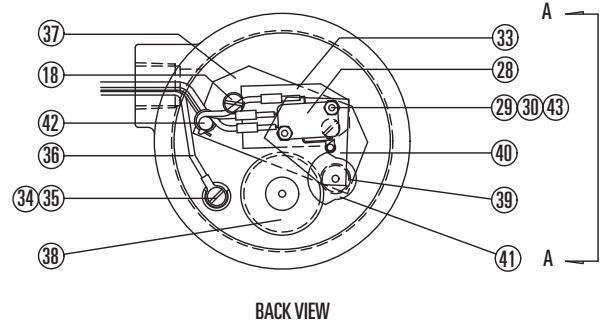
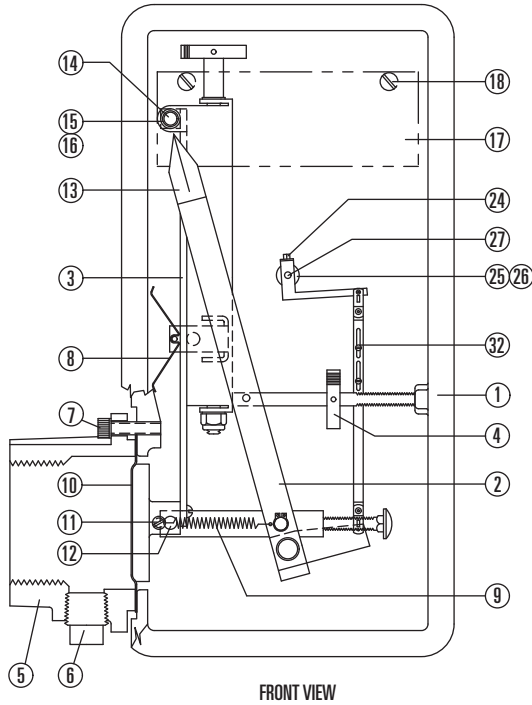
### Specifications

Explosion proof	CSA approved Class I: groups C and 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 feet thru 60 feet (see 685 code sheet)
Electrical switches	SPDT micro switch 11 Amp @ 130 or 250 VAC 1/2 Amp @ 125 VDC 1/4 Amp @ 250 VDC 4 Amp @ 125 VDC induction
Electrical connections	1/2-in female pipe thread, 3/4-in female pipe thread is also available as an option

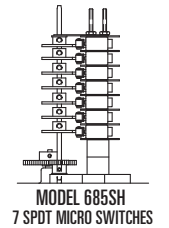
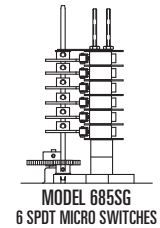
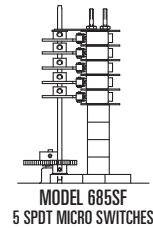
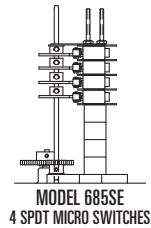
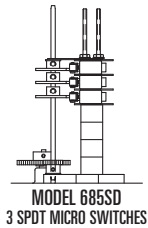
### Dimensional data



# Series 685S parts breakdown



MODEL 685 MULTISWITCH • BACK VIEW • VIEW A-A



# Parts list

ITEM	DESCRIPTION		PART NO.
1	Housing, aluminum	1	1119085
2	Point assembly	1	1120412
3	Main spring assembly, std.	1	1124948
	Main spring assembly, thin	1	1121098
	Main spring assembly, double	1	1120171
4	Zero knob, shaft & pin	1	1123497
5	Adapter	1	SEE ITEM #5 TABLE
6	Pipe plug, steel plated	1	1125505
	Pipe plug, 304 S.S.	1	1120425
	Pipe plug, 316 S.S.	1	1120426
	Pipe plug, PVC	1	1123419
7	Screw, steel plated	3	1121154
	Screw, 2-in NPT PVC adapter only	3	1123956
	Screw, 2-in 150RF PVC only	3	1127255
8	Zero spring, stainless steel	1	1120944
9	Wear spring, stainless steel	1	1119953
10**	Diaphragm, Buna-N	1	1122986
	Diaphragm, Viton <sup>†</sup>	1	1123500
	Diaphragm, Compound W	1	1126578
	Diaphragm, Teflon	1	1120942
11	Screw, 18-8 stainless steel	1	1124162
12	Follower bearing, stainless steel	1	1123421
13	Point decal	1	1121486
14	Spring bearing, stainless steel	1	1120342
15	Washer, Teflon	1	1126591
16	Retainer O-ring, neoprene	1	1126209
17***	Scale, aluminum	1	SEE ITEM #17 TABLE
18	Screw, 18-8 stainless steel	5	1122988
19*	Tag, aluminum	1	1118849
20*	Bezel frame, stainless steel	1	1123492
21*	Bezel seal	1	1122196
22*	Window, acrylic	1	1119375
23*	Washer, PVC adapter only	1	1119456
24	Linkage arm, stainless steel	1	1121455
25	Washer, Teflon	4	1126279
26	Bushing, stainless steel	1	1119837
27	Driver shaft	1	1123134
28	Micro switch	AR	1122930
29	Shaft, all thread, S.S.	2	1121890
30	Hex nut	2	1126580
31*	Cover, aluminum	1	1119453
32	Linkage, stainless steel	1	1124024
33	Insulator, fiber	AR	1120884
34	Ground screw, stainless steel	1	1118882

ITEM	DESCRIPTION		PART NO.
35	Ground cup, brass	1	1124484
36	Ground wire	1	1121376
37	Mounting plate, aluminum	1	1126581
38	Gear, 1.5-inch dia., plastic	1	1126112
39	Gear, 0.5-inch dia., plastic	1	1123519
40	Top plate, aluminum	1	1125111
41	Cam assembly, aluminum	AR	1126204
42	Wire support, aluminum	1	1125504
43	Lock washer, stainless steel	2	1120436
44	Actuator shaft, stainless steel	1	1122989
45	Spacer block, aluminum	AR	1121026

\*Not shown on model  
 \*\*Recommended spare parts. Other materials available.  
 \*\*\*Specify tank height when ordering.  
<sup>†</sup>Teflon™ is a registered trademark and a brand name (Teflon®) owned by Chemours  
<sup>†</sup>Viton™ is a registered trademark and a brand name (Viton®) owned by Chemours  
<sup>†</sup>Delrin® is a registered trademark of DuPont

## Item #5 Table

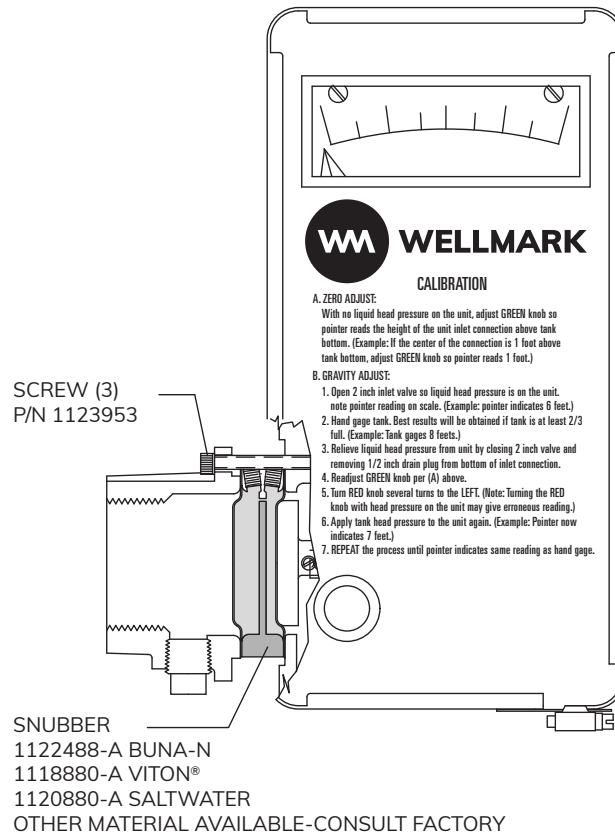
VESSEL CONNECTION	CAD. PLATED	EPOXY COATED	TEFLON COATED
2" NPT, D.I.	1118938	1119154	1119155
2" NPT, 316 S.S.	1122491*	1122490	1120112
2" 150RF, Steel	1122929	1124471	1141347
2" 150RF, 304 S.S.	1123954*	1125502	N/A
2" 150RF, 316 S.S.	1125108*	1125107	1126567
3" 150RF, Steel	1121957	1122492	N/A
2" Groove, D.I.	1120174	1121152	1127030
2" NPT, PVC	1120345*	N/A	N/A

\*Plating not required.

## Item #17 Table

DESCRIPTION	PART NO.
Scale, 0-16FT	1118823
Scale, 0-10FT	1121159
Scale, 0-30FT	1122428
Scale, 0-15FT	1123135
Scale, 0-48FT	1123136
Scale, 0-8FT	1123194
Scale, 0-20FT	1123195
Scale, 0-40FT	1123903
Scale, 0-60FT	1123962
Scale, 0-24FT	1124399
Scale, 0-36FT	1125418
Scale, 0-6FT	1126280
Scale, 0-12FT	1126602
Scale, 0-3FT	1177420

# “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.

## 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.

# Model code

## Determining the model code

Example given: Standard model 685I-1G8-RN\* (Cad Plated Ductile) Tank Connection, Buna-N Diaphragm, 0 to 16 Foot Indicator Scale, Standard Aluminum Housing.

**685 I-1 G 8-R N \***



**A**

CODE	TYPE OF SWITCH
I	Indication of Level Only (No Switches)
S	SPDT Micro Switch
SA	2 SPDT Micro Switches (Actuating at same time)
SS	(1) Sep. Adj. SPDT Micro Switch
SC	(2) Sep. Adj. SPDT Micro Switches
SD	(3) Sep. Adj. SPDT Micro Switches
SE	(4) Sep. Adj. SPDT Micro Switches
SF	(5) Sep. Adj. SPDT Micro Switches
SG	(6) Sep. Adj. SPDT Micro Switches
SH	(7) Sep. Adj. SPDT Micro Switches
ED	Electronic Transmitter (Proportional Signal) 24 VDC, 4-20 MADC Output 2-Wire
EE	Electronic Transmitter (Proportional Signal) 24 VDC, 4-20 MADC Output 2-Wire w/ 2 Adj. SPDT Micro Switches

**B**

CODE	VESSEL CONNECTION
1	2-inch NPT, Cad Plated Ductile
3	2-inch NPT, 316 S.S.
4	2-inch -150# RF Flange, Cad Pltd. Steel
5	2-inch -150# RF Flange, 304 S.S.
6	2-inch -150# RF Flange, 316 S.S.
7	3-inch -150# RF Flange, Cad Pltd. Steel
10	2-inch Grooved, Cad Plated Ductile
11	2-inch NPT, PVC

**C**

CODE	DIAPHRAGM MATERIAL
A	Viton®
G	Buna-N
W	Compound W (Saltwater Service)
Z	Teflon®

Consult factory for other materials.

**D**

CODE	SCALES (VESSEL HEIGHTS)
1	0 to 3 Feet
2	0 to 4 Feet
3	0 to 6 Feet
4	0 to 8 Feet
5	0 to 10 Feet
6	0 to 12 Feet
7	0 to 15 Feet
8	0 to 16 Feet
9	0 to 20 Feet
10	0 to 24 Feet
11	0 to 30 Feet
12	0 to 36 Feet
13	0 to 40 Feet
14	0 to 48 Feet
15	0 to 60 Feet
18	0 to 100% (Specify Vessel Height)
19	Special Scale: Gallons, Pounds, Etc.
20	Special Scale: Dual Units

**E**

CODE	HOUSING AVAILABLE
R	S.S. Bezel
B	Bolt - On Cover
H	Hinged cover

**F**

CODE	TYPE OF COATING
N	None Required
E	Epoxy
T	Teflon®

**G**

CODE	OPTIONS & ADDITIONS
a	Factory Calibration
i	Snubber (Pulsation Dampener)
j	Epoxy Coated Housing
k	Teflon® Coated Housing
l	Pipe Stand Mount
s	Tag, Stainless Steel
t	3/4-inch NPT Conduit Connection

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