

## Installation and Operation Instructions for 685 Liquid Level Indicator and Controller



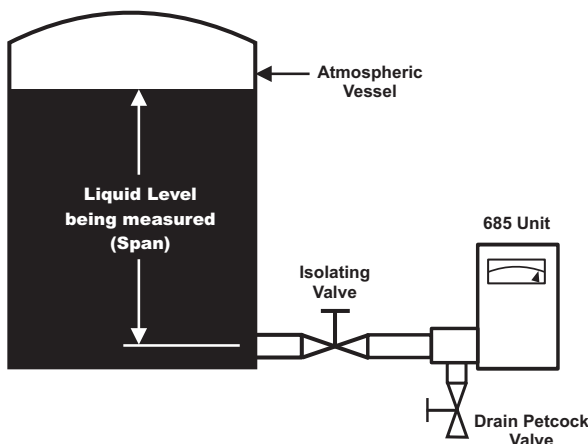
Example: If you install the unit 1 foot above the bottom of an 8 foot vessel, the liquid level from the bottom to the 1 foot mounting will not be measured (or seen). Therefore the indicator should be “zeroed” at 1 foot and the Specific Gravity (Span) Adjust Knob should be calibrated accordingly (1 to 8 feet, or 7 foot span). More specific calibration instructions can be found on Page 2.

Connect the unit at the tank or remote from the tank with a 2” NPT connection, using an appropriate thread sealant. An isolation valve is always recommended between the unit and the vessel to allow convenient isolation for calibration and servicing. Also, install a drain petcock in the liquid inlet bottom, where a plug is generally located. The unit may be installed in a pump suction line if a SNUBBER (WellMark Part No. 4000060A) is used to dampen surges when the pump starts and stops

### Application

The Model 685 is a liquid head pressure type level indicator. It continuously indicates the liquid level in an atmospheric (vented) tank in feet and inches. The scale is also available calibrated for horizontal cylindrical vessels, or in pounds, gallons barrels, percent, etc.

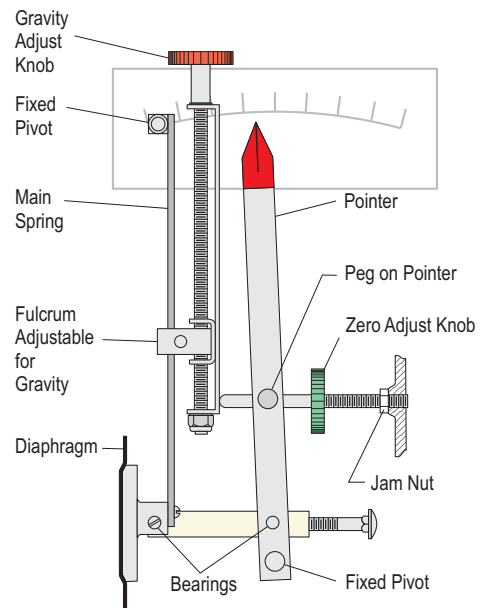
An elastomer diaphragm is the sensing element, also separating the liquid in the vessel from the mechanical working parts of the unit. Units are available with optional SPDT mercury- or micro-switches.



### Installation

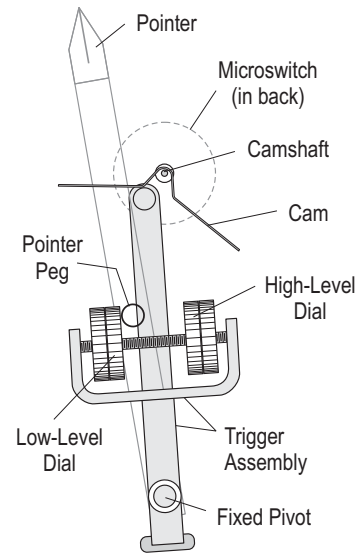
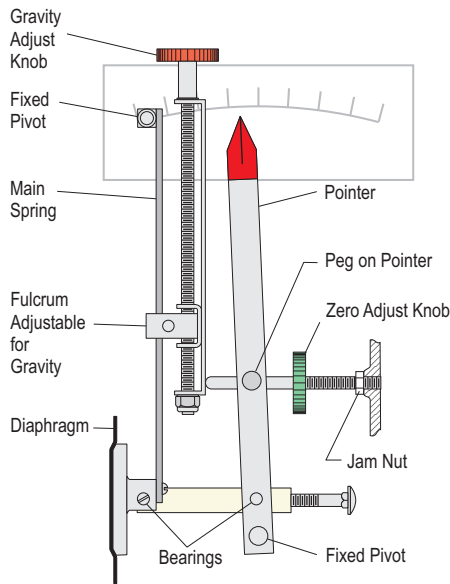
Since the unit measures liquid head pressure, the point at which it is installed on the vessel is the point at which liquid measurement begins.

### Operation



**Gauge Mechanism** • Pressure against the Diaphragm is transmitted directly to the long, flat Main Spring, which has a Fixed Pivot at the upper end and an Adjustable Fulcrum in the middle region.

Because a given column of heavy liquid exerts more head pressure than the same column of light liquid, the spring can be “stiffened” by moving the Fulcrum down, using the **RED** Gravity Adjust Knob. The **GREEN** Zero Adjust Knob moves the entire Spring Assembly and Pointer, having the same effect as shifting the scale.



**Switch Mechanism for Model 685S, 685SB, 685SA** • The Trigger Assembly is normally independent of the gauge mechanism, and is free to tilt around the Fixed Pivot, except that it is weighted to normally assume a vertical position, keeping the switch also in a vertical or “neutral” position. At high or low level, the Pointer Peg, bearing against the High- or Low-Level Dial, tilts the Trigger Assembly, which in turn tilts the Cam and switch attached to the Camshaft.

On Models 685SS and 685SC through 685SH multi-switches, the above trigger mechanism is not utilized. Instead, linkage is attached to the Pointer arm, which rotates a shaft with cams attached in the switch enclosure, in turn actuating the switches.

## Calibration

**Zero Adjust** • With no liquid on the Model 685, loosen the Jam Nut and adjust the **GREEN** Zero Adjust Knob so Pointer reads the height of the Model 685 inlet connection above tank bottom. Re-tighten Jam Nut. Example: If the center of the connection is 1 foot above tank bottom, adjust **GREEN** Zero Adjust Knob so pointer reads 1 foot.

## Gravity Adjust

- 1) Open inlet valve so liquid head pressure is applied to the unit. Note pointer reading on scale. (Example: Pointer reads 6’)
- 2) Gauge tank. (Example: Tank gauges 8’)
- 3) Relieve liquid head from unit by closing the isolation valve and opening 1/2” drain at bottom of Inlet connection.
- 4) Re-adjust the **GREEN** Zero Adjust Knob per “Zero Adjust” above.
- 5) Turn **RED** Gravity Adjust Knob several turns counter-clockwise.
- 6) Open isolation valve, applying tank head pressure to the unit again. (Example: Pointer now indicates 7’)
- 7) Repeat the process until Pointer indicates same as hand tank gauge.

**CAUTION:** Do NOT turn **RED** Gravity Adjust Knob with tank head pressure applied to the unit or calibration will be erroneous.

## Setting High- and Low- Level Set Point

Do not set high and low level control points until after Zero Adjust and Gravity Adjust are completed. If the unit is wired to a motor controller or alarm, the set points can be adjusted by listening to the motor or alarm. If not connected, a circuit tracer or voltmeter can be used to determine when switch MAKES and BREAKS.

**High Level Set Point** • Manually move Pointer to zero, then move slowly to the right until the switch MAKES. Note gauge reading. The level at which the switch MAKES can be adjusted by moving the **right-hand WHITE High Level Dials**, loosening the outboard jam dial and turning in the appropriate direction to increase or decrease MAKE point level. Once the level is set, re-tighten the jam dial against the set dial to lock it into position.

**Low Level Set Point** • Manually move Pointer to the extreme right then move SLOWLY to the left until switch BREAKS. Note gauge reading. The level at which the switch BREAKS can be adjusted by moving the **left-hand WHITE Low Level Dials**, loosening the outboard jam dial and turning in the appropriate direction to increase or decrease BREAK point level. Once the level is set, re-tighten the jam dial against the set dial to lock it into position.

**NOTE:** The **WHITE** Dials are doubled up to allow the user to tighten the two together, one thereby acting as a jam nut. This prevents the dials from moving due to vibration and during long-term operation.

## Specifications

Indicator Housing .....	Weatherproof
Proof Pressure .....	100 psig
Temperature .....	-20°F to +225°F Standard
Pressure .....	0 to 4 ounces pressure (Atmospheric)
Range (Vessel Height) .....	3’ to 60’