

685 Electric Liquid Level Indicator for Atmospheric Vessels

Application

The Model 685E Liquid Level Transmitter is an electro-mechanical level control device, which accomplishes three (3) main functions. These are remote indication, local liquid level indication, and hi-low adjustable switch outputs. The unit continuously indicates the liquid level and transmits a proportional signal.

Features

- **Complementary Adjustments:** Zero and Span adjustments at transmitter.
- **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. are available.
- **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 transmitter will still read 8'. 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 shaft extending into the explosion proof housing where the electronic transmitter and switches are located. The shaft drives a potentiometer, thereby giving a continuous signal to the plug-in amplifier. The proportional signal is then transmitted to the remote indicating device in proportion to the liquid level which exists in the tank.

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. If elevated or underground vessels exist, use the "bubbler system" installation. For calibration and maintenance purposes, always install an isolation valve between the model 685E and the vessel. Also, install a drain petcock in the liquid inlet bottom, where a plug is generally located.

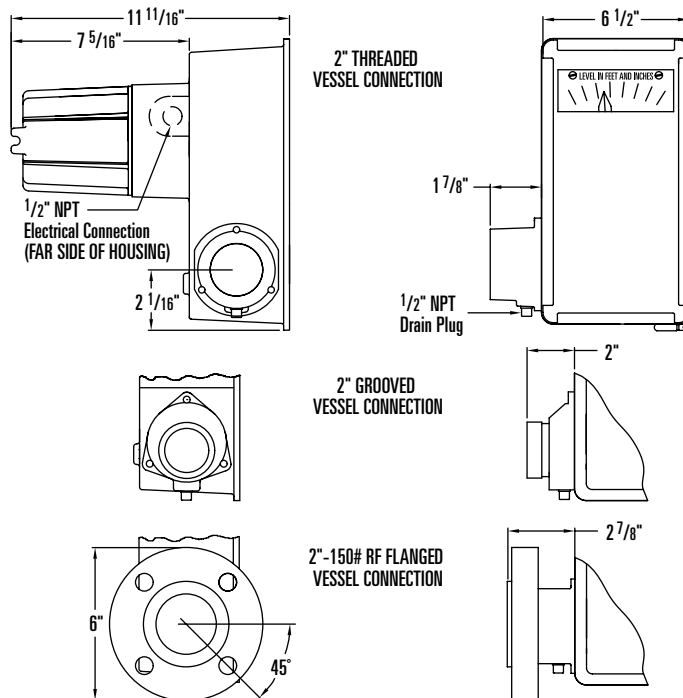
Specifications

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)
 Transmitter Output Four (4) Wires or Two (2) Wire System.



Supply Voltage (at transmitter)120 VAC, 60 Cycle, 1 phase
 Consult factory for other transmitters and voltage requirements.
 Electrical Switches SPDT Micro Switch
 11 Amp at 130 or 250 VAC, 1/2 Amp at 125 VDC
 1/4 Amp at 250 VDC, 4 Amp at 125 VAC Induction
 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 | POINT ASSEMBLY | 1 | 000059-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, 304SS | 1 | 002304-P |
| | PIPE PLUG, 316SS | 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 | 5 | 001504-P |
| 19* | TAG, ALUMINUM | 1 | 005908-B |

*Not shown.

**Recommended spare parts. Other materials available.

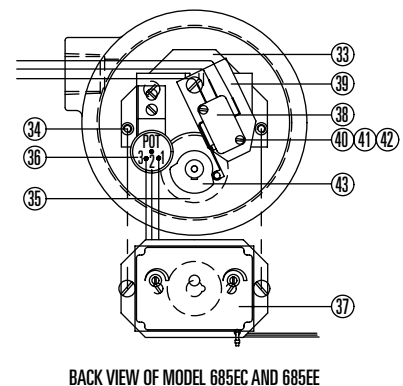
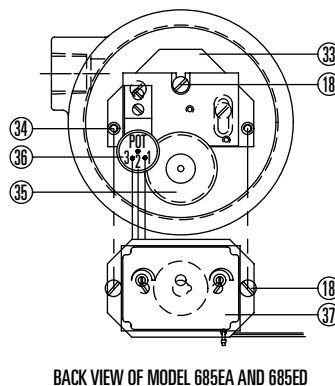
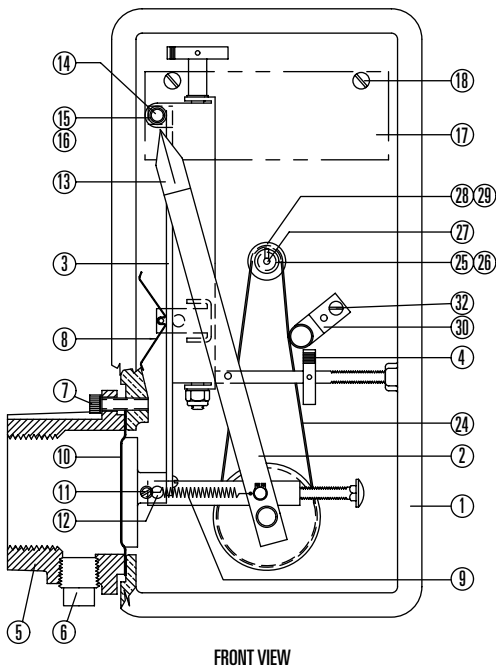
***Specify tank height when ordering.

| Item | Description | Qty. | Part No. |
|------|---------------------------------|------|----------|
| 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 | BELT | 1 | 004310-P |
| 25 | WASHER, TEFLON® | 4 | 001803-P |
| 26 | BUSHING, STAINLESS STEEL | 1 | 002701-M |
| 27 | DRIVE SHAFT, STAINLESS STEEL | 1 | 002810-M |
| 28 | PULLEY, STD. | 1 | 004306-A |
| | PULLEY FOR TEFLON® DIAPH. | 1 | 009680-A |
| 29 | SET SCREW, STAINLESS STEEL | 2 | 001520-P |
| 30 | BRACKET AND CAM, ALUMINUM | 1 | 000064-A |
| 31* | COVER, ALUMINUM | 1 | 000200-M |
| 32 | SCREW, STAINLESS STEEL | 1 | 001807-P |
| 33 | BASE PLATE, ALUMINUM | 1 | 001601-M |
| 34 | SPACER, ALUMINUM | 2 | 001701-M |
| 35 | GEAR, 1 1/2" DIA., PLASTIC | 1 | 004301-P |
| 36 | POT TO PLUG ASSY, 4 WIRE | 1 | 000032-A |
| | POT TO PLUG ASSY, 2 WIRE | 1 | 000033-A |
| 37 | TRANSMITTER, 4 WIRE | 1 | 006500-M |
| | TRANSMITTER, 2 WIRE | 1 | 006502-M |
| 38 | MICRO SWITCH, 685EC AND EE ONLY | 2 | 000615-P |
| 39 | INSULATOR, 685EC AND EE ONLY | 2 | 001216-P |
| 40 | SPACER, 685EC AND EE ONLY | 2 | 002715-P |
| 41 | SCREW, 685EC AND EE ONLY | 2 | 001506-P |
| 42 | WASHER, 685EC AND EE ONLY | 2 | 001805-P |
| 43 | CAM, 685EC AND EE ONLY | 2 | 000016-A |
| 44 | WIRE, 685EC AND EE ONLY | 6 | 000086-A |

Item #5 Part Number

| Vessel Connection | Cad. Plated | Epoxy Coated | Teflon® Coated |
|-------------------|-------------|--------------|----------------|
| 2" NPT, D.I. | 000307-C | 000307-E | 000307-T |
| 2" NPT, 316SS | 000317-M* | 000317-E | 000317-T |
| 2"-150RF, STEEL | 000335-C | 000335-E | 000336-T |
| 2"-150RF, 304SS | 000338-M* | 000338-E | N/A |
| 2"-150RF, 316SS | 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.



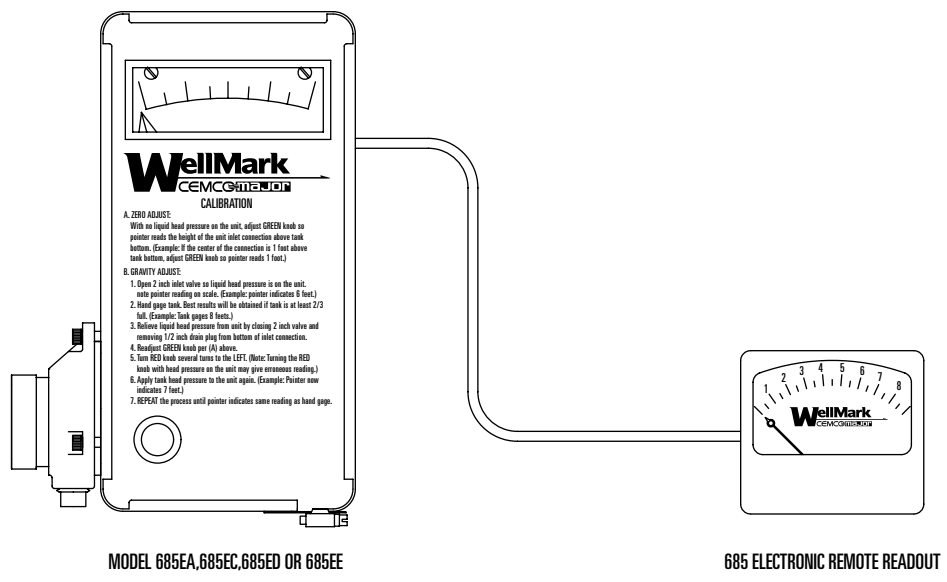
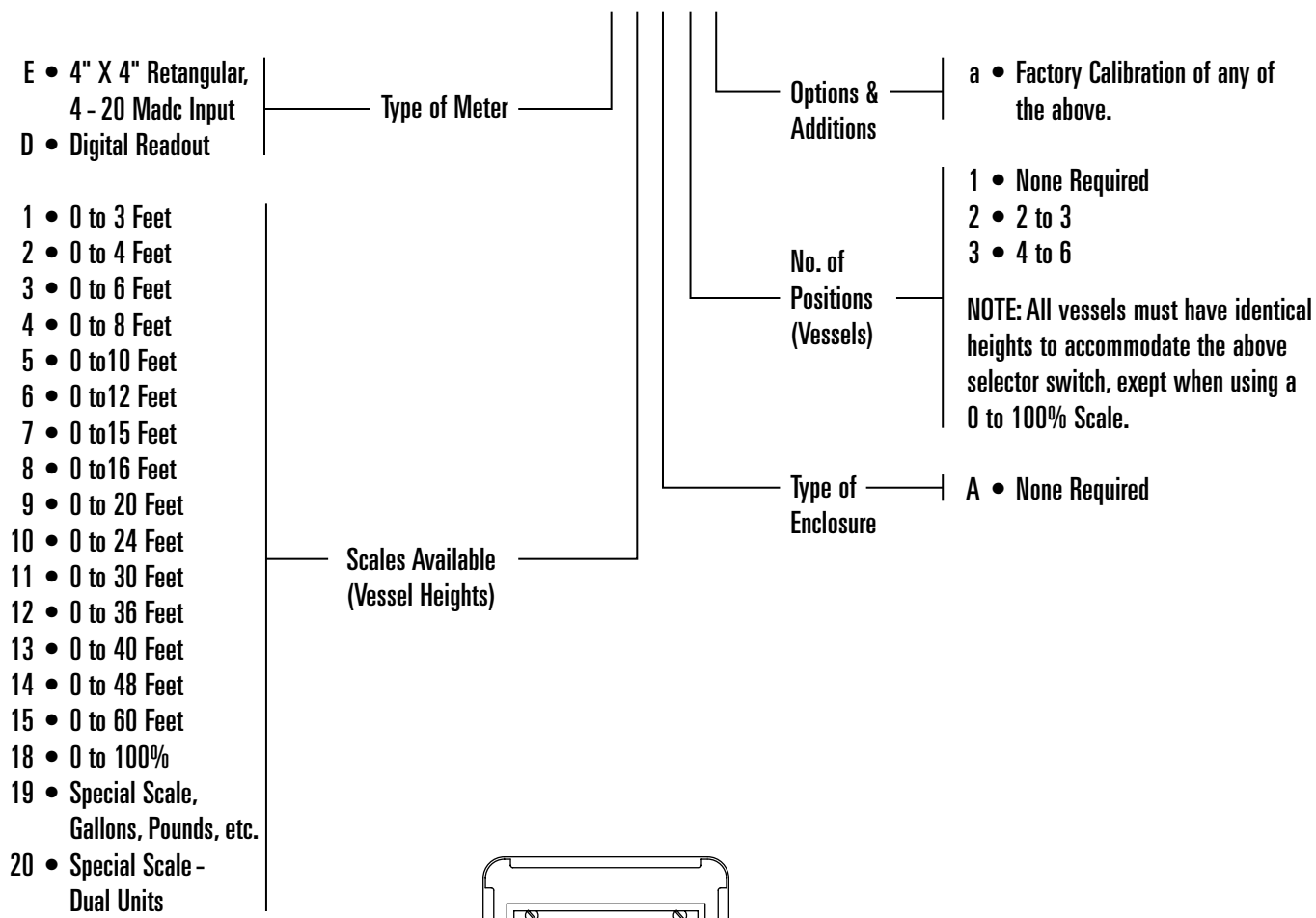
685 Electronic Remote Readout

Determining the Model Number

Example given: Standard Model 685ER-E8A1X - Electronic Remote Readout to Receive Signals from the Models 685EA, 685EC, 685ED or 685EE Transmitters with, 4" X 4" Square Face, 0 to 16 Feet Scale and without Enclosure.

MODEL 685ER-E 8 A 1,X

*For variations, change code to match requirements.



MODEL 685EA,685EC,685ED OR 685EE

685 ELECTRONIC REMOTE READOUT