The Series PLT Piezoresistive Level Transmitters provide reliable measurement and control of process levels by sensing the hydrostatic pressure in a tank. The pressure is dependent on the level in the tank and the specific gravity of the liquid. The loop-powered level transmitter delivers a proportional 4 to 20 mA output signal for indicating, recording or control purposes. Units are equipped with EMI and reverse polarity protection.

**INSTALLATION**

The standard Series PLT transmitters include a dual diaphragm assembly to isolate the process from the sensor. The diaphragm is located inside the process connection (flange or female NPT) and can easily be deformed by uneven pressure. Even pressure should be applied across the entire surface of the diaphragm. Touching the diaphragm with your finger or any other object may damage the diaphragm. Do not apply any undue mechanical stress to the transmitter (strike, twist, or abuse).

The Series PLT transmitters should be mounted in a horizontal position. The transmitters are factory calibrated and failure to mount the unit horizontally will result in inaccurate measurements. If mounting the unit vertically, the unit must be recalibrated. See "Calibration" section.

It is strongly recommended to install an isolation valve and drain between the transmitter and the tank or process pipe. The isolation valve should be a ball valve of appropriate size. The drain should be installed between the valve and the transmitter. See figure 1. Field calibration is simpler with a valve and drain system installed. The tank will not require draining if the transmitter must be removed for service. When installing the transmitter at the top of a pipe or elbow, point the drain valve upwards to allow any trapped air or gas to escape.

**PHYSICAL DATA**

- **Accuracy:** ±0.25% of calibrated span.
- **Repeatability & Hysteresis:** ±0.10% full scale.
- **Overrange:** 300% upper range limit.
- **Supply Voltage:** 18 to 40 VDC.
- **Output:** 4-20 mA, 2-wire.
- **Maximum Loop Resistance:** 1000Ω.
- **Zero Elevation:** 25% standard.
- **Zero Suppression:** 25% standard.
- **Vibration Limits:** ±1 g, 10 to 200 Hz.
- **Temperature Compensation:** 0 to 180°F (-18 to 82°C).
- **Operating Temperature:** 0 to 200°F (-18 to 93°C).
- **Fill Solution:** Silicon oil.
- **Wetted Parts:** 304 stainless steel.
- **Housing:** NEMA 4, 7, & 9. Explosion proof; Class I, Groups B,C,D; Class II, Groups E,F,G; Class III.
- **Mounting:** 1≤NPT(F) or 150# flange.
- **Electrical Connection:** 1/2≤NPT(F) conduit connection.
Trapped air bubbles can cause incorrect readings. To release trapped air or gas, open the isolation valve and open the drain valve until all the trapped air has escaped. Be sure to close the drain valve before operation. NOTE: An isolation/drain valve system cannot be installed with units having an extended diaphragm.

**Flange Mounted Transmitters**
When mounting a transmitter with flange be sure all bolts are straight and mounting is clear of obstructions. Tighten bolts evenly and torque in increasing steps to ensure a secure mounting. If it is necessary to apply force to mount the transmitter, apply force only to the flange itself. (If necessary use a hammer and place a block of wood between the flange and the hammer).

**NPT Mounted Transmitters**
Use a crescent or pipe wrench only on the mounting connection. Placing a wrench on any other part of the unit or tightening the connection by applying force to the head or area other than the connection will damage the unit and void the warranty.

**Extended Diaphragm Transmitters**
Be sure the area in the tank where the unit is to be installed is free of obstructions such as agitators, heaters, thermowells, etc.

**ELECTRICAL CONNECTIONS**
The Series PLT has a 1/2 \( \leq \) female NPT conduit connection located at the top of the head. To gain access to the wiring connections and electronics, unscrew the front cover. It may be necessary to remove the electronic circuit board to thread the connecting wires into the head. Unscrew the two screws holding the circuit board in place, then pull the circuit board out of the way. Take extreme care not to excessively flex or stress the attached wires. Replace the circuit board and the two securing screws. A removable terminal strip is included for easy wiring connections. Simply pull the terminal strip off the circuit board, attach wires and replace the terminal strip onto the circuit board. Use 18 AWG two-conductor shielded wire for wiring connections. Do not run wire in the same conduit as any AC power or near any source of AC interference.

The Series PLT Level Transmitter is a loop-powered device. The two output wires also carry the power needed to run the unit. See figure 2 for wiring details. A source of 18 to 40 VDC capable of providing at least 20 mA must be wired in series with the transmitter and the display or other device being used for level monitoring.

**CALIBRATION**
The Series PLT has been factory calibrated for a specific gravity of 1.00 and a tank height or pressure range specified by the model number. Units should not require recalibration unless used in an application where the specific gravity is different from 1.00, the unit is mounted in an orientation other than horizontal, or if the specific gravity of the liquid being measured changes. The unit can only be calibrated within the pressure range of the sensor. The unit may be calibrated in or out of the process with a known pressure source.

If necessary, remove the transmitter from the process. Relieve all pressure by emptying the tank or stopping the process. If an isolation valve was installed, close the valve, carefully drain the liquid from the Series PLT and remove.

If calibrating the unit while it is mounted on the process, be sure to relieve the pressure exerted on the diaphragm. This can be accomplished by emptying the tank or closing the isolation valve and draining all liquid.

Obtain access to the ZERO and SPAN adjustments by removing the cover. See figure 2 for adjustment locations. Connect a loop calibrator, power supply and milliammeter, or power supply and readout display to the Series PLT. Position the transmitter in the orientation it will be operating (vertical or horizontal). With zero pressure applied to the diaphragm, set the ZERO adjustment until the output reads 4 mA on the calibrator, ammeter, or the display reads minimum.

Simulate a full or maximum condition on the unit. If the unit is still installed in the process, fill the tank. Remember to close the drain valve and open the isolation valve if installed. If the unit was removed from the process, connect a source of regulated air to the process connection and apply the desired full pressure. To calculate full pressure, measure the height of the tank (from the location of the transmitter to the full tank level) in inches, multiply the height by 0.036. Multiply the subtotal by the specific gravity of the fluid to obtain the pressure in psi. Apply pressure in the calculated amount and set the SPAN adjustment until a reading of 20 mA is displayed.

Counterclockwise rotation of the SPAN adjustment increases the output.

In some cases, it may not be practical to completely fill a tank or it may not be possible to apply the desired maximum pressure. For these situations, measure the tank or the highest possible pressure and calculate what percentage of full scale value is represented. To calculate the calibration point multiply the percentage value by 16 (not 20) and then add 4 to get the desired milliamps. For example, if an isolation valve is opened on a tank that is 60% full, multiply 60% by 16 to get 9.6, add 4, the desired calibration point for the span is 13.6 mA. When using this method, use a value greater than 50% to achieve better accuracy.

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