

**Pressure Transmitter**  
**Informational & Installation**  
**Manual**

**February 24, 2011**

**M374**  
**Rev. E**

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## **Care and Handling**

Our submersible transmitters are designed for rugged use. However, they need protection from over pressure and sharp impact. When lowering them into a liquid, penetrate the surface slowly and only to the depth necessary. Avoid dropping the unit from above the surface. Clean all transmitters by rinsing them in a mild detergent. Direct probing of the diaphragm or attempts to remove protective screens will damage the sensor, voiding the warranty.

## **Calibration**

All pressure transmitters are shipped with calibration information unique to each transducer. Make sure you keep each calibration report. However, should you misplace your calibration sheet, you can contact the factory and request a duplicate.

## **Polyurethane Jacketed Cable**

Most installations of our submersible pressure transducers connect our polyurethane cable to a junction box. From this junction box, users typically run their own cable to the required instrumentation.

- **Chemical resistance of polyurethane:** Potable Water, Wastewater, Borax, Butane, Animal Fat, Carbonic Acid, Citric Acid, Cod Liver Oil, Corn Oil, Glycerin, Glycol, Mineral Oils, Potassium Nitrate, Potassium Sulfate, Silicone Oils, Stoddard Solvent, Tannic Acid (10), Tartaric Acid, Turbine Oil.

The cable attached to this instrument is specifically engineered for submersible applications. The polyurethane outer jacket provides long-term reliability under most conditions. The cable should be handled carefully, however, as the jacket may be subject to cutting should it be “raked” over extremely sharp edges. The cable is fully shielded, with the shield connected to the metal housing at the transmitter end and terminated in a drain wire at the termination or user end. The shield should always be terminated to a good earth ground, unless the transmitter is installed in an area where galvanic corrosion is known to be a serious problem.

## **Cable Hanger**

We can supply an optional cable hanger (Kellems Grip) to help end users secure the cable. The cable hanger can be positioned anywhere on the cable by pushing the ends together. Once positioned, the cable hanger expands and provides a snug grip on the cable. When mounting the transmitter in a well casing, the cable hanger can be secured to a hook on the well plate or an eyebolt may be attached to the side of the well casing. The cable hanger loop is then secured to the eyebolt by using any number of types of fasteners. A similar technique can be used when working in still wells for surface water level measurement. In this case, the loop-end of the cable hanger can be attached directly to a screw or bolt bored into the still well shelf.

## Installation & Maintenance Tips

### General Installation Procedures

The following is important installation and preventive maintenance information. Please contact the factory if you need additional information.

**1. Transmitter Anchors:** Most users either suspend our submersible transmitters in stilling wells or attach them to rigid conduit. This is done to prevent damage to the transmitter from shock caused by water turbulence. It is not advisable to tie your transmitter to a pump or to piping, as any problem with the transmitter could require that the pump be pulled from the installation. This could prove to be *very expensive*. (Please refer to the Cable Anchoring Schemes drawing in **Appendix A**.) Some applications use our optional bracket (P/N 49-06-00PC) to clamp the transmitter to a fixed object (i.e., wall, ladder, step) or require the unit to be suspended without any protective still well or attachment device. In all installations, care should be taken to ensure no damage occurs to the cable as cable damage represents one of the most frequent causes of transmitter failure.

**2. Transmitter Submersion:** Cable damage is one of the most frequent causes of transmitter failure. Lower your transmitter into the liquid slowly, making sure the cable does not drag over sharp edges and only to the depth necessary. Avoid dropping the unit from the surface.

**3. Vent Filter (Desiccant)** (For vented gage):

**Always** install a desiccant vent filter immediately after transmitter installation. Failure to use one could result in premature failure of the transmitter; which would not be covered by warranty. You should establish a regular maintenance schedule for the desiccant filter and change or recharge it when it is 75% spent (pink color). Replacement filters are available at a nominal cost from the factory. Do not remove the old vent filter until a new one is available. The most common failure mode of transmitters is moisture and corrosion damage due to lack of use or maintenance of the vent filter.

**4. Bending of Cable:** The polyurethane jacketed cable is quite flexible. Care needs to be taken to ensure that when bending the cable to suit your installation you do not crimp the vent tube inside the cable. Consequently, do not bend the cable more than a radius of 1 inch.

**5. Cable Compression:** Many users require a compression fitting to secure the polyurethane jacketed cable as it enters a junction box. Care needs to be taken that you do not over-tighten the fitting so as to damage the cable.

**6. 4-20 mA Wiring:** When connecting a 2-wire 4-20 mA transmitter to a typical power supply and milliammeter, verify that the meter has an input impedance of at least 10 Ohms. If you are unsure of the input impedance, then a 10-Ohm resistor may be placed in series with the meter and transmitter. Connect the + (red) lead of the transmitter to the + terminal of the power supply. If the 10 Ohm resistor is required, connect it to the - (black) lead of the transmitter. Use a short length of 22-24 AWG wire to connect the + terminal of the meter to the resistor (if it is required) or the - (black) wire of the

transmitter. Connect the – terminal of the meter to the - terminal of the power supply with a length of 22-24 AWG wire. Connect the drain wire from the transmitter to a good earth ground. (See **Appendix A** for wiring diagram.)

**7. Position Sensitivity** The transmitter should be installed so that the diaphragm located behind the nose cap is oriented in a vertical position; otherwise the unit could exhibit an offset.

## **General Maintenance Tips**

### **1. Desiccant Maintenance**

You should establish a regular maintenance schedule for the desiccant vent filter, changing it when it is 75% spent (pink color). Replacement filters are available at a nominal cost from the factory. Do not remove the old vent filter until a new one is available.

### **2. Clogged Nose Piece or Dirty Diaphragm**

Either of these conditions could result in erroneous readings from your transmitter. **NEVER** attempt to clean your transmitter's nosepiece or diaphragm with a sharp or hard object. This could dent the sensor diaphragm and cause permanent damage to the transmitter. Your transmitter may be cleaned in accordance with the procedures listed in step 4, below.

### **3. Cleaning your transmitter**

Materials required:

Plastic bowls 8-12 inches (200-300 mm) in diameter and 4-6 inches (100 - 150 mm) deep

Supply of clean, lint-free cleaning rags

32-ounce bottle of "The Works-Tub and Shower Cleaner" (a mild detergent)

manufactured by Lime-O-Sol Company in Ashley, IN 46705 and available locally through Wal-Mart, KMart, Target, and Ace Hardware stores at \$2 to \$4 per bottle.

**Preparation:** Prior to cleaning your pressure transmitter, ensure that all procedures have been followed in the proper cleaning of the cable and transmitter to remove any hazardous materials. The vent filter must be properly attached. The cable should be coiled to ensure ease of handling and it must be protected against the possibility of accidental abrasion and/or penetration of the cable jacket by sharp objects. A lead length of 1 to 1 ½ feet (0.3 - 0.45 m) of cable from the transmitter should be allowed to facilitate handling during cleaning. The protective covering (or similar protective device) that is shipped with each transmitter should be attached to the transmitter at all times. It should only be removed prior to installation or cleaning. Your work surface needs to be clean and free of clutter and large enough to accommodate all materials required in addition to the transmitter and cable. Fill one of the bowls with fresh water, one with a mild detergent mixed with water and the last with 16 ounces (0.45 kg) of "The Works".

## **Cleaning:**

**Step 1:** Holding the cable 6 inches (150 mm) from the transmitter, immerse the unit in the bowl containing the mild detergent and stir for 20-30 seconds. Remove and rinse in the bowl containing the fresh water, using the same stirring motion used in the mild detergent. Rinse and wipe dry.

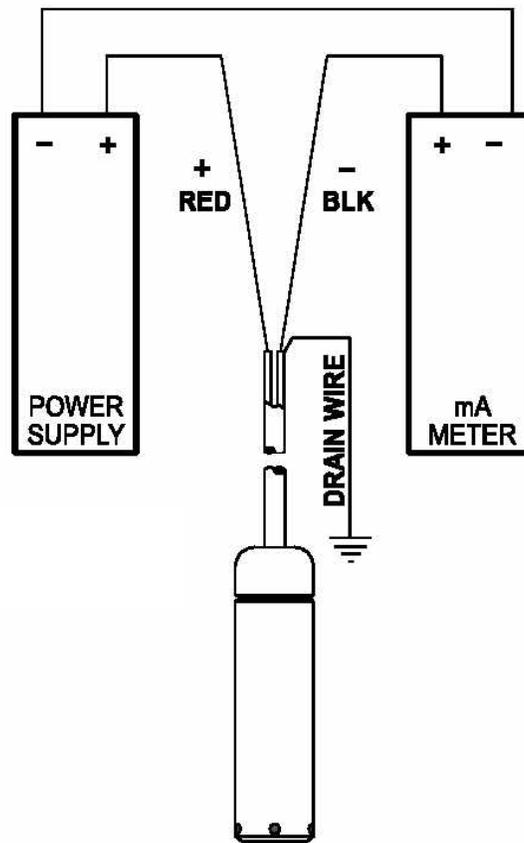
**Step 2:** Holding the body of the transmitter with one hand so that you are looking at the retaining screen protecting the sensor, carefully remove the sensor nose piece by simply unscrewing it from the sensor body. *Do not touch the sensor diaphragm with your finger or any other object. Also, do not try to dry the inside portion of the transmitter, as you risk damaging the pressure sensor.*

**Step 3:** Place the transmitter in a vertical position with the pressure-sensing end facing downward in the bowl containing "The Works" solution for approximately 15-20 seconds. Rinse in the bowl containing clean water and wipe dry the external casing only. Place the protective screen in the same solution for 15-20 seconds, rinse and wipe dry.

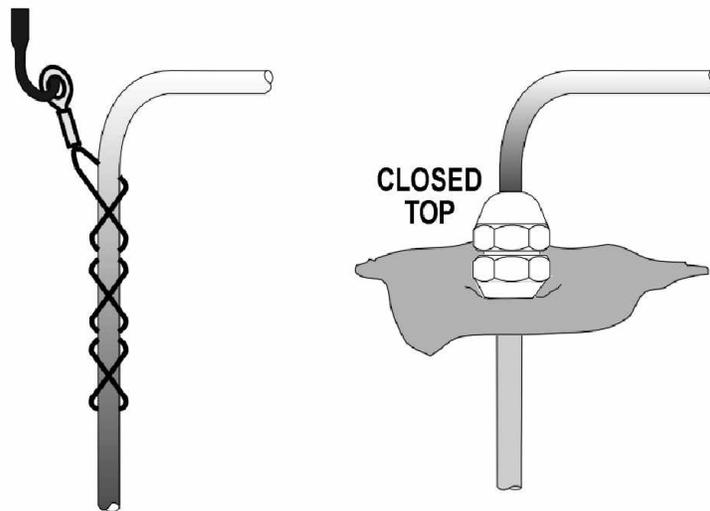
**Step 4:** Holding the transmitter in a vertical position so that you can see the face of the pressure sensor, screw the protective nosepiece back into place.

## Appendix A

### Wiring Diagrams:

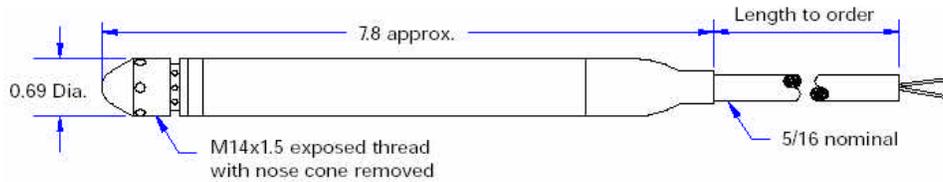


## CABLE ANCHORING SCHEMES



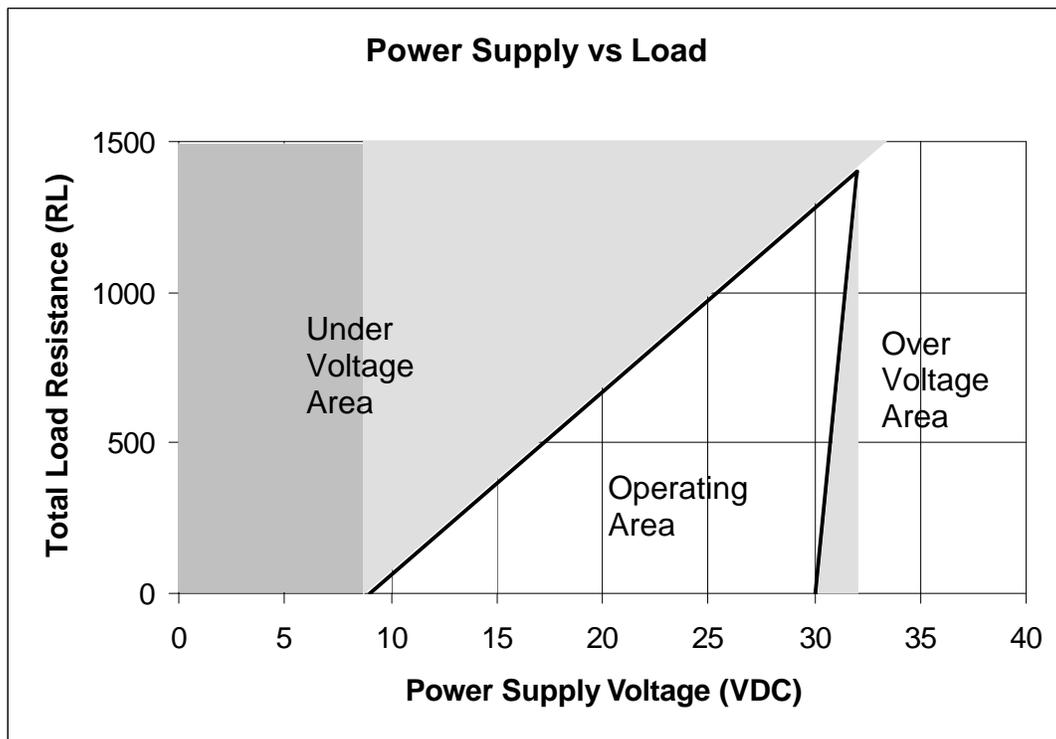
# Installation and Application Notes For Pressure Cell with Surge Suppressor

## Pressure Transmitter

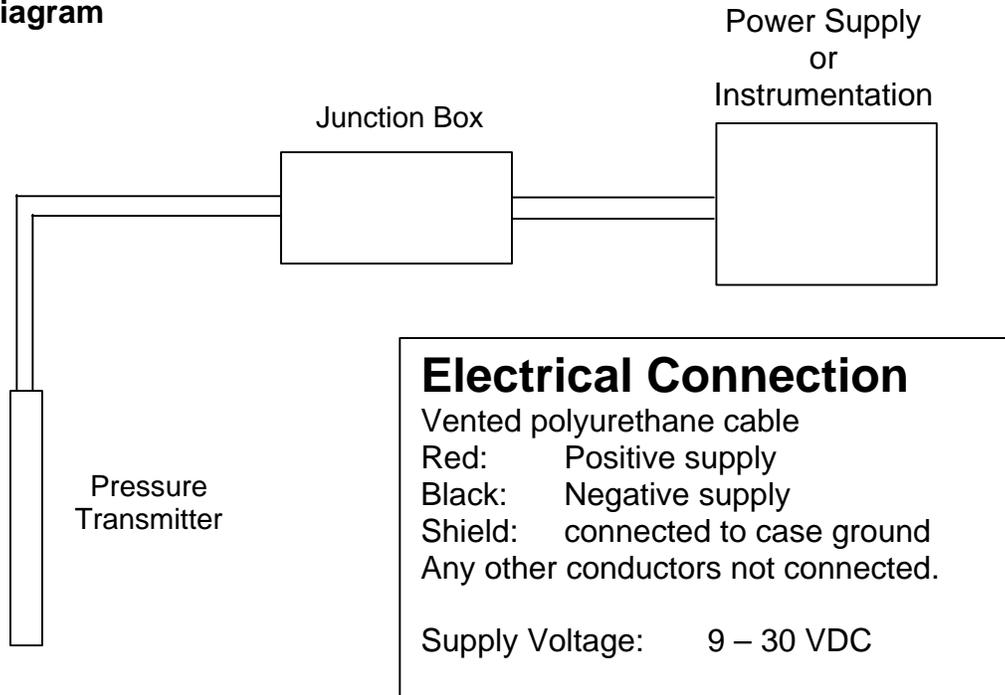


### Application Notes:

1. The power supply must be between 9 and 30 VDC. Care should be taken when selecting this voltage to ensure that, with the load resistance the transmitter is operating within the areas as indicated on the Power Supply vs. Load graph.
2. Maintain electrical termination and breather tube in a clean, dry environment

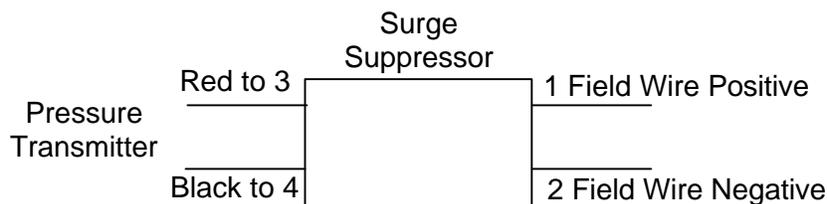


## Block Diagram



Inside the Junction box will be the surge protection which will have the “IN” terminals label 1 & 2 and the OUT terminals labeled 3 & 4. Connect the device so that the “IN” points in the direction from which the surge is expected (the field wire). Connect the “OUT” terminals (3 & 4) to the Pressure Transmitter wires. Terminal 1 on the “IN” corresponds to terminal 3 on the “OUT” and terminal 2 on the “IN” corresponds to terminal 4 on the “OUT”. Polarity does not matter on this device.

We suggest that you connect the Red wire from the Pressure transmitter to terminal 3 and the Black wire to terminal 4. The field wire would then have the Positive supply connect to terminal 1 and the ground or negative side to terminal 2.



Attach a #12 grounding wire (typically green with yellow stripe) to the grounding connector on the DIN rail. Route the wire through the center gland at the bottom of the enclosure. Attached the other end to earth ground in the direct vicinity.

