INCON®

Franklin Fueling Systems

TSP-MWS

(Discriminating Monitoring Well Sensor BriteSensor®)

Installation Instructions

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Overview

The TSP-MWS sensor is an intelligent BriteSensor ® that is used to monitor groundwater for the presence of liquid hydrocarbons (product).

These sensors are installed suspended in the groundwater of monitoring wells around tanks and use intrinsically safe (I.S) leak detection circuits – approved for use in these Class 1, Division 1, Group D Hazardous Areas.

The TSP-MWS sensors have a float at the base that monitors for the presence of ground water—a dry sensor cannot detect liquid hydrocarbons that float on the surface of groundwater. The sensors also have a conductive polymer strip along its length, which reacts specifically with liquid hydrocarbons (causing an increase in the electrical resistance of the polymer strip).

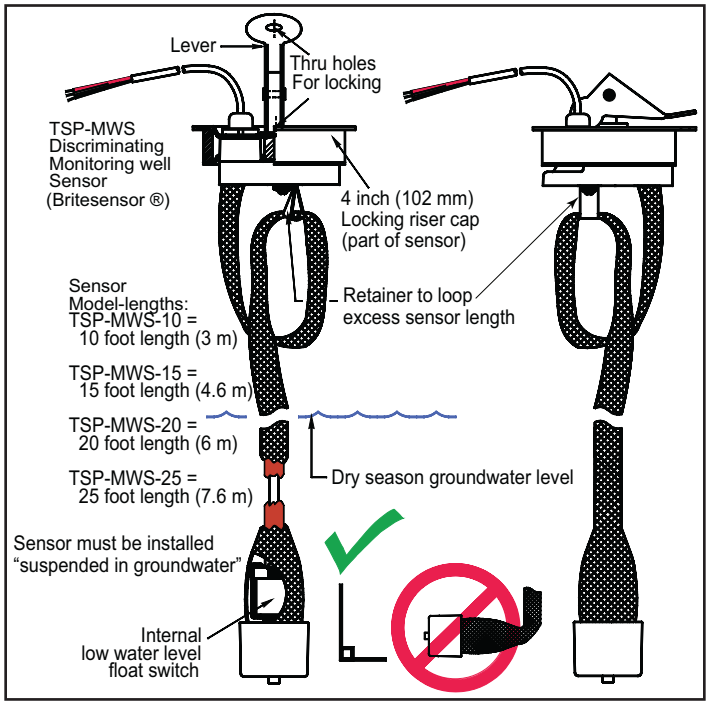

Figure 1: TSP-MWS Sensor Dimensions

Like other BriteSensors, The TSP-MWS sensors have a microprocessor that analyzes the environmental conditions at the sensor and transmits this data to the Automatic Tank Gauge console. The TSP-MWS sensors detect and communicates:

- A dry well alarm (from the float at its base),
- PRODUCT present (from the polymer strip),
- NORMAL no-alarm state (no product present and sensor is submerged in groundwater),
- Plus it transmits a specific sensor ID code.

An attached 4 inch riser cap, no-strip electrical wire connectors, 25 feet of cable attached to the sensor, a Model ID tag, and a cord-grip fitting (for connection to a weatherproof electrical junction box) are supplied with the TSP-MWS sensor (see diagrams).

Testing the Sensor

Turn the bottom of the sensor up 180 degrees so the bottom faces up, wait 5 seconds, and let the sensor hang dry again – a DRY WELL alarm will be generated. Although sensors may be washed and recovered after exposure to liquid hydrocarbons, we recommend not testing for product alarms because of the long after-test recovery period involved.

Test sensors on a yearly basis, or more frequently if required by local code.

Test the groundwater for the presence of liquid hydrocarbons BEFORE installing the monitoring well sensor (give copy of results to site owner / manager).

Materials Required

- Optional – TSP-DB1 Epoxy Seal kit for no-strip electrical connectors – recommended for sites: within flood zones, high groundwater tables, with poor drainage, or when Junction Boxes are not used.
- Well Screen Pipe – Schedule 40 PVC, 4 inch (102 mm) diameter.
- 1/2 or 3/4 inch NPT (National Pipe Thread, tapered), Rigid Metal Conduit (RMC) or nonmetallic (PVC) if allowed by local code.
- EYS Seal fittings and epoxy to fill the fitting after operational testing is completed.
- Weatherproof junction box, gasket, and cover, plus a 3/4 to 1/2 inch NPT reducing bushing if 1/2 inch RMC is used – see the ATG Installation Guide for recommended electrical Junction Boxes.
- Wire: THHN, TFFN or THWN, 18 AWG: Red, White, & Black, or Alpha Cable # 58113,(3.3 mm) 0.131" O.D. – 1,500 feet (457 meters) max. length. Alpha cable 58113 must be used if using non-metallic (PVC) conduit.
- Slip joint pliers to seat the no-strip, self-sealing wire connectors – connectors are supplied with the sensor.
- U.L. classified thread sealant or pipe dope.

Installation Sequence

1. Install Sump.
2. Install conduit, EYS fittings, and weatherproof junction box.
3 Shut off power.

ELECTRICAL DANGER Avoid electrical shock hazards: ensure all power going to the ATG console is turned off, tagged, and locked-out at the power panel before doing any maintenance or installation work at the ATG console.

4. Install the sensor cable through the supplied compression fitting.
5. Install the compression fitting at the waterproof junction box and tighten the cord-grip fitting.
6. Trim wire/cables at the junction box to a 6 or 8 inch length (15 or 20 cm) or service-loop, and splice the sensor and console wires together per Figure 3.

7. Turn power on to console to test sensor.
8. Test sensor (verify that an alarm is produced at ATG console), if it does produce an alarm, seal EYS seal fittings and electrical connectors with epoxy.
9. Turn power off again if other devices are to be installed (Repeat Step 3).
10. Install the TSP-MWS sensor in the well screen pipe and latch the riser cap (ref. Figure 1 & 2).

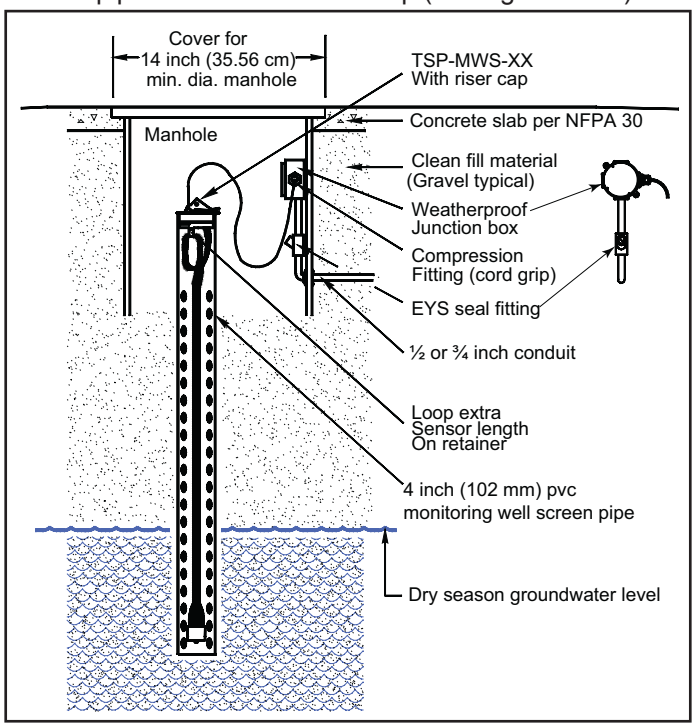

Figure 2: TSP-MWS Installation

11. Reinstall all safety covers and guards, junction box gasket and covers – use pipe-dope to seal all fitting threads.
12. Install the manhole cover.
13. Record the location where the sensor was installed (Tank #,Sensor Channel #, and other data) on the table on the back page of these instructions.
14. Turn power on and program the ATG – Refer to Sensors in the ATG Setup / Programming & Installation manuals.

General Installation Notes

Warning **It is the installer's responsibility to comply with all applicable federal, state and local codes. Failure to do so may create an Environmental Hazard.**

Plan your conduit routing. Dig trenches as necessary to install conduit from each junction box to the Intrinsically Safe (I.S.) knockouts at the ATG console. You must install a weatherproof, electrical junction box inside each sump. Access to sumps must be done so all entries are liquid-proof (to keep product in the sump if a spill or leak occurs). The junction box should be installed high on the sidewall to prevent it from being submerged during heavy rains.

A junction box may be used inside of the building and used as a I.S. pull box to combine several sensor cables. If this is done, then only one I.S. conduit knockout may be used at the console. Before pulling wires, mark them to avoid confusion when connecting to the console.

Warning **Conduits must have EYS seal fittings installed in accordance with NFPA 70 (National Electric Code) and NFPA 30A (Automotive and Marine Service Station Code). Failure to seal conduits in accordance with NFPA 30A, and NFPA 70 could allow flammable vapors to travel through the conduit in the ATG console. An explosion could result causing serious injury, property loss, or death.**

CAUTION Seal all threaded fittings and conduit threads to produce a weatherproof seal during installation.

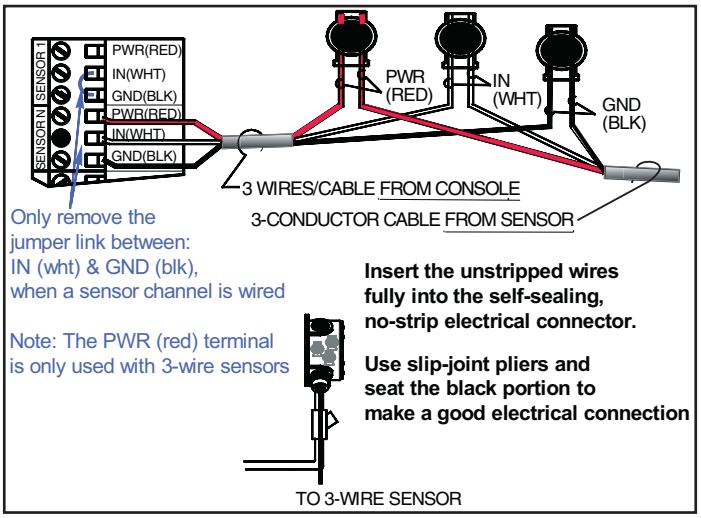

Figure 3: Sensor Wiring

Electrical Wiring

Reference the ATG Installation Manual and see Figure 3 (above) for TSP-MWS sensor wiring details.

Tank #	Notes

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