



TSP-DIS & TSP-EIS

Interstitial BriteSensor® & Standard Sensor

Installation Instructions

Franklin Fueling Systems • 3760 Marsh Rd. • Madison, WI 53718 USA

Tel: +1 608 838 8786 • 800 225 9787 • Fax: +1 608 838 6433 • www.franklinfueling.com

Overview

The TSP-EIS is a Standard sensor and the TSP-DIS is an intelligent BriteSensor.® These sensors are used to detect the presence of liquids in the normally dry interstitial (annular) areas of double-wall fuel storage tanks (a Class 1, Division 1, Group D Hazardous Area). Both types of sensors use electro-optical technology (LED & Prism) for liquid-detection.

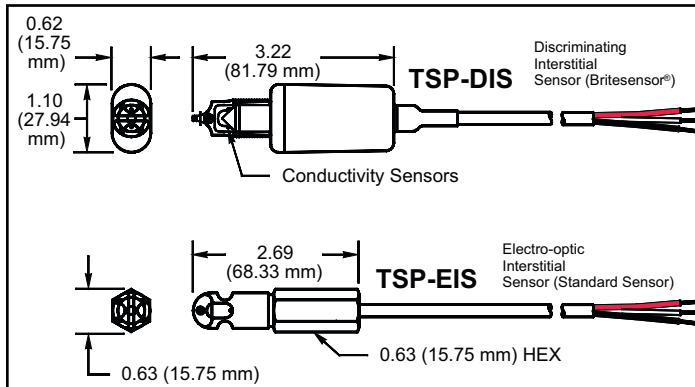


Figure 1: TSP-DIS and TSP-EIS Dimensions

The TSP-EIS communicates its identification code and current detection status to the ATG console (water present or normal – no liquids detected). An open-circuit is recognized as an alarm-condition at the intrinsically safe (I.S) leak detection circuits of the FFS (Franklin Fueling Systems) ATG (Automatic Tank Gauge).

The TSP-DIS sensor is enhanced with conductivity sensors and a small microprocessor which allows it to discriminate between water and product. The TSP-DIS also communicates its identification code and current detection status to the ATG console (water present, product present, or normal – no liquids detected).

Both sensors are supplied with no-strip electrical wire connectors, 25 feet of cable, a Model ID tag, and a cord-grip fitting for connection to a weatherproof electrical junction box (see diagrams).

Testing the Sensors

Dip the tip of the sensor in a clean cup of water – a standard sensor alarm is generated for a TSP-EIS sensor and a water alarm is generated for the TSP-DIS sensor. When dipped in isopropyl alcohol, the TSP-DIS sensor will produce a product alarm.

Test sensors on a yearly basis, or more frequently — per local code.

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.
- 1/2 or 3/4 inch NPT (National Pipe Thread, tapered), Rigid Metal Conduit (RMC) or nonmetallic (PVC) conduit if allowed by local codes.

- 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, 0.131 O.D. – 1,500 feet (457 meters) maximum length. Alpha cable #58113 (INCON P/N 600-0063) must be used when using nonmetallic (PVC) conduit.
- Slip joint pliers to seat the no-strip, self-sealing wire connectors (connectors included with the sensor).
- Thread UL approved sealant or pipe dope as required for installation in UST interstitial areas (Figure 2).

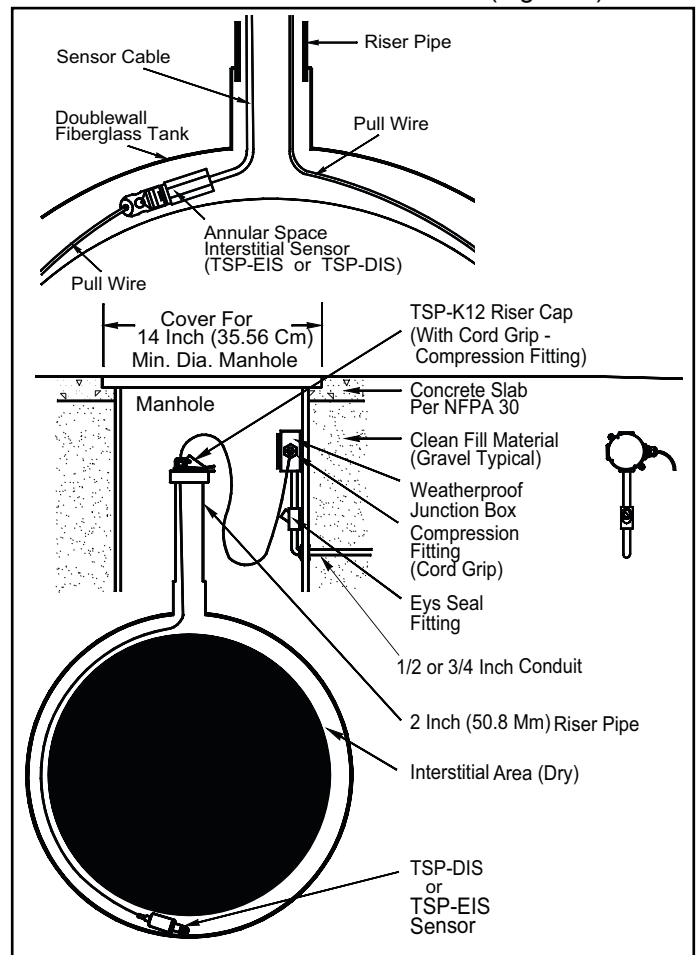



Figure 2: Installation in Double-Walled Fiberglass Tanks

- *TSP-K12 Riser Cap for 2-inch riser pipes, includes a pre-installed 1/2 inch NPT compression gland (cord grip) fitting. Other riser caps are available for different riser pipe sizes – consult your factory rep.
- * Riser pipe – 2 inch diameter (OD), threaded at one end (NPT-14) with all rough edges removed / deburred from the inner edges.

Installation Sequence:

1. * Install riser pipe, manhole.
 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. Interstitial installation – Figure 2, measure the length of the riser pipe + 1.5 x diameter of tank = _____ total length. Mark this length on the cable and pull it through the TSP-KI2 riser cap cord-grip until the mark is 12 inches (30.5 cm) above the fitting. Tie one end of the pull-wire to the sensor pull cap and pull the wire until the sensor cable moves just above the cord-grip (leave the pull wire in place: loop the wire around the cable) and then tighten the fitting.
 5. Interstitial installation (Figure 3), measure the INSTALL HEIGHT needed and add 1.5 inches for the riser cap = total height.

Mark the total height required on the sensor cable, and pull the cable through the TSP-KI2 riser cap until the mark shows at the top of the cord grip fitting. Tighten the fitting and lower the sensor into the interstitial area of the tank as shown in Figure 3.

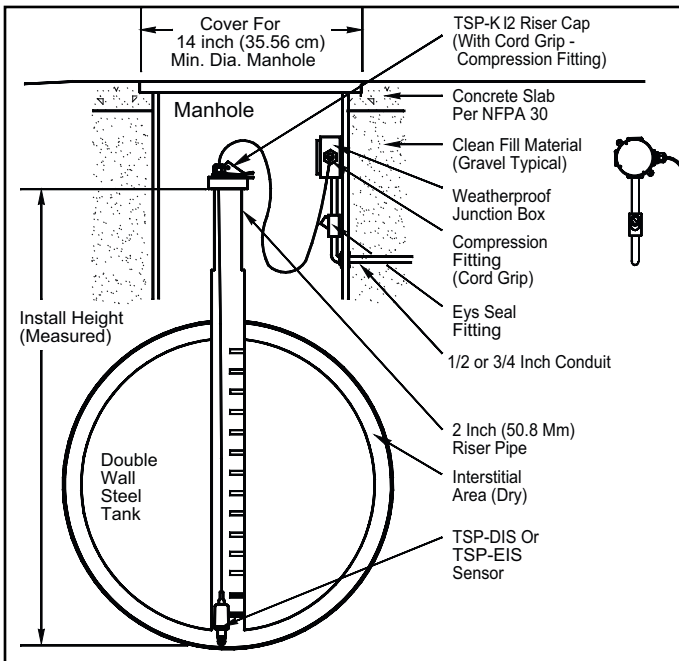


Figure 3: Installation in double-Walled Steel Tanks

6. Pull the sensor cables through the cord grip fitting at the junction box and tighten all remaining cord-grip fittings. Trim wire/cables to a 6 or 8 inch (15 or 20 cm) service-loop and splice the sensor and console wires together per Figure 4 .
7. Power up console for next step.

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 off power again if other devices are to be installed (Repeat Step 3).
10. Reinstall all safety covers and guards, junction box gasket and covers – use pipe-dope to seal all fitting threads.
11. Install the manhole cover.
12. Record the location where the sensor was installed on the chart on the back page of these instructions. This information will be needed when programming the ATG.
13. Turn on power and program the ATG – Ref: all relating to Sensors in the Setup/Programming & Installation manuals.

General Installation Notes

* Steel double-walled tanks: codes may require a non-conductive isolation-bushing be installed between the tank and riser pipe.


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 manhole. The junction box should be installed high on the manhole wall to prevent it from being submerged during heavy rains.

* Fill the bottom of the manhole with crushed stone to facilitate drainage when the sensor is installed in the interstitial space of a steel tank. Do not cover the top of the riser cap with fill material, it must remain accessible for service/sensor installation.

The conduit may enter the manhole either from the bottom or the side.

A junction box may be used inside of the building as a pull box to combine several sensor cables. If this is done, then only one I.S. conduit knockout will be used.

Warning  **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 

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

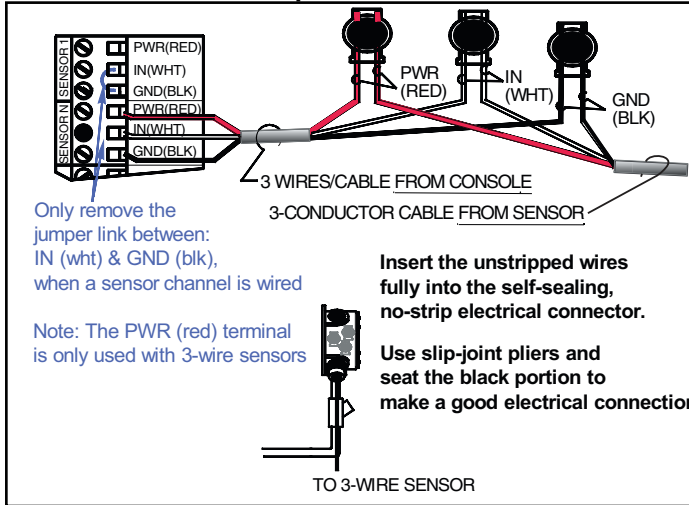


Figure 4: TSP-DIS/TSP-EIS Wire Splicing and Console Wiring

Electrical Wiring

Reference the ATG Installation Manual and see Figure 4 for sensor wiring details.

Record Sensor Location

Sensor	Channel # / Notes



Franklin Fueling Systems

www.franklinfueling.com

3760 Marsh Road • Madison, WI 53718, U.S.A.
 Tel: +1 608 838 8786 • Fax: +1 608 838 6433
 Tel: USA & Canada 1 800 225 9787 • Tel: México 001 800 738 7610

Franklin Fueling Systems GmbH
 Rudolf-Diesel-Strasse 20 • 54516 Wittlich, GERMANY
 Tel: +49-6571-105-380 • Fax: +49-6571-105-510

