



TSP-HLS

(Standard Sensor) High Level Sensor

Installation Instructions

Overview

The TSP-HLS is a standard sensor that is used to detect a high liquid level condition within storage tanks (for Class 1, Division 1, Group D Hazardous Area / Environments such as fuel storage tanks). The sensor is available in two standard lengths: TSP-HLS-15 = 15 inch (381 mm) and TSP-HLS-30 = 30 inch (762 mm). The sensor is supplied with electrical connectors, 25 feet (7.5 meters) of attached cable, and a cord-grip fitting.

The **TSP-HLS** sensor uses magnetic-float / reed-switch technology for liquid detection. The wetted portion of the sensor is constructed of stainless steel and nitrophenyl (float). When the float rises about ½ inch (12.5 mm), the magnetically-sensitive reed switch opens (see **Figure 1**). An open circuit is an alarm-condition (at the *intrinsically-safe*, **sensor** interface terminals inside the Franklin Fueling Systems ATG console).

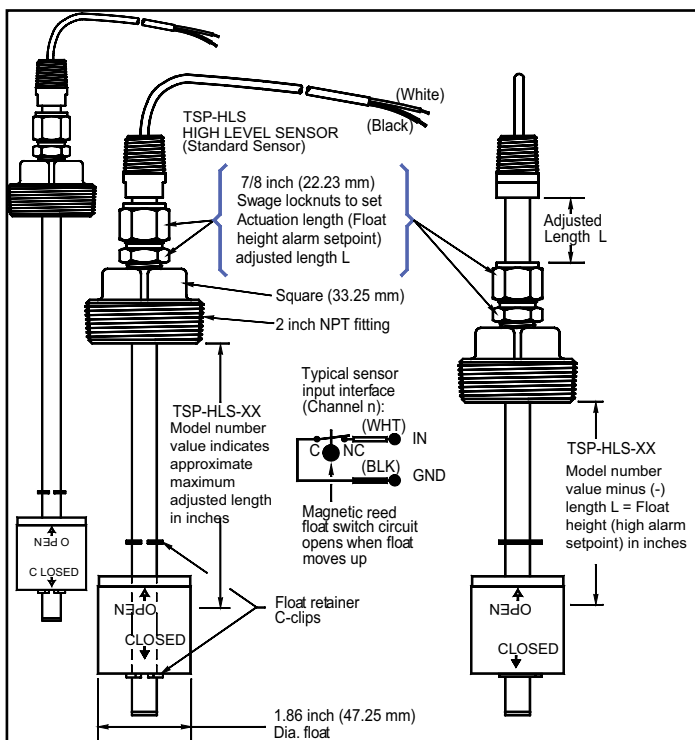


Figure 1: TSP-HLS Dimensions and Setup

Testing the TSP-HLS

Rotate the sensor 180 degrees (float up) to cause an alarm at the ATG console. *Test the sensor for proper operation on a yearly basis, or as required per local code.*

Materials & Data 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 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, White & Black, or Alpha Cable # 58411, 0.114" O.D. (2.9 mm) – *1,500 feet (457 meters) max. length* If using nonmetallic (PVC) conduit, Alpha cable 58411 must be used.
- Slip joint pliers to seat the no-strip, self-sealing wire connectors – *connectors are supplied with the sensor*
- Standard adjustable or pipe wrench for a 2 inch square fitting
- U.L. classified thread sealant or pipe dope.
- Tank Strapping Table (Tank Chart) to set the **High Level Alarm**
- Two 7/8 inch (23 mm) hex wrenches to adjust **FLOAT HEIGHT**.

Installation Sequence:

1. Install manhole.
2. Install conduit, EYS fittings, and weatherproof junction box

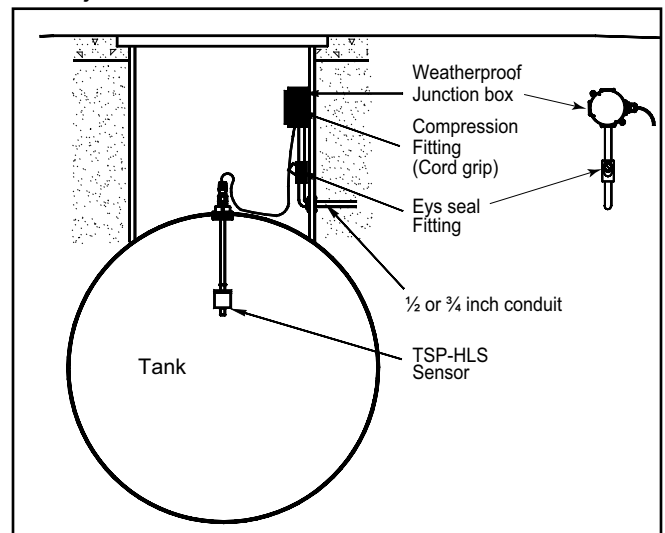


Figure 2: TSP-HLS Installation

3. Turn 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. Pull the sensor cables through the cord grip fitting at the junction box. Leave enough cable to allow installation of the sensor in the tank: the sensor will be tested before actual in-tank installation.
5. Tighten cord-grip fitting at the junction box and trim the wire / cables within the junction box to a 6 or 8 inch (15 or 20 cm) length, then splice the sensor and console cable / wires together as shown in Figure 3.
6. Turn console power on for sensor testing.

7. Test sensor (rotate float end up to verify that an alarm is produced at ATG console). If the sensor does produce an alarm, seal EYS seal fittings with epoxy.
8. Turn power off again if other devices are to be installed (Repeat Step 3)
9. Reinstall all safety covers and guards, junction box gasket and covers – *use pipe-dope to seal all fitting threads.*
10. Adjust the ACTUATION LEVEL (**FLOAT HEIGHT**) to **equal the High Level Alarm level for this Tank.**
 - a. Loosen the 7/8 inch swage locknuts
 - b. Move the shaft to set float height
 - c. Retighten the swage locknuts to hold position.
11. Install the manhole cover.
12. **Record** the location where the sensor was installed (TANK), and the *Float Height = High Level Alarm Level* on the back page of this document. This information is needed when programming the ATG.
13. Turn power on and program the ATG – Refer to Sensors in the console Setup/Programming & Installation manuals.

Note: Seal all threaded fittings and conduit fittings to produce a weatherproof seal.

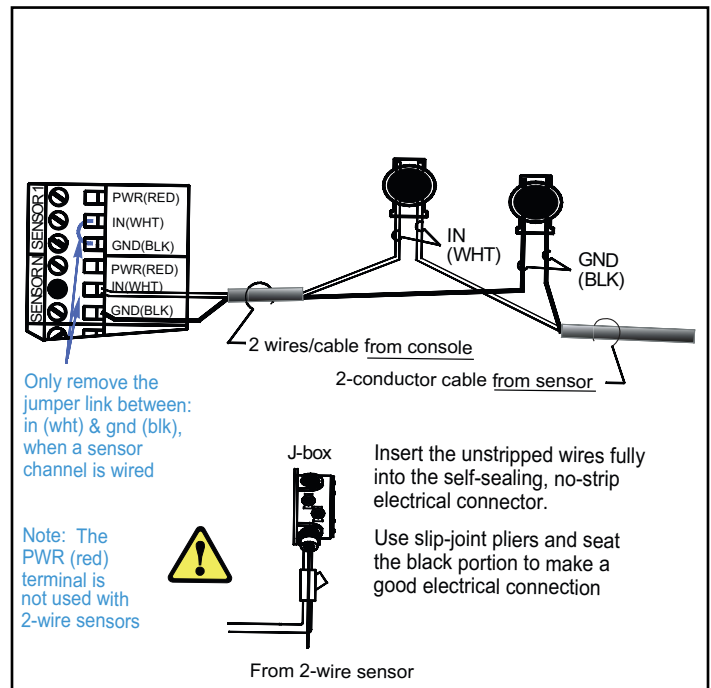



Figure 3: Sensor Wiring

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.**

Fill the bottom of the manhole with crushed stone to facilitate drainage. Do not cover the sensor or bung access hole with fill material, it must remain accessible for sensor installation and for service/testing.

Plan your conduit routing. Dig trenches as necessary to install conduit from each manhole junction box to the Intrinsically Safe (I.S.) knockouts at the ATG console. The conduit may enter the manhole either from its bottom or through its side. A junction box 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  **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.**

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.

Electrical Wiring

Reference the ATG Installation Manual and see **Figure 3** (above) for TSP-HLS sensor wiring details. The two-wire TSP-HLS sensor does not have a red (power) conductor, therefore, the PWR (RED) interface terminal at the console is not used. *If a 3-conductor Alpha cable is used, the red conductor can be clipped or taped back on both ends.*

Sensor Location	Float Height/ Notes



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