

# **Solid-State Interstitial Liquid Sensor for Fiberglass Tanks**

## **Installation Guide**



# Notice

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Contact TLS Systems Technical Support for additional troubleshooting information at 800-323-1799.

## **DAMAGE CLAIMS / LOST EQUIPMENT**

Thoroughly examine all components and units as soon as they are received. If any cartons are damaged or missing, write a complete and detailed description of the damage or shortage on the face of the freight bill. The carrier's agent must verify the inspection and sign the description. Refuse only the damaged product, not the entire shipment.

Veeder-Root must be notified of any damages and/or shortages within 30 days of receipt of the shipment, as stated in our Terms and Conditions.

## **VEEDER-ROOT'S PREFERRED CARRIER**

1. Contact Veeder-Root Customer Service at 800-873-3313 with the specific part numbers and quantities that were missing or received damaged.
2. Fax signed Bill of Lading (BOL) to Veeder-Root Customer Service at 800-234-5350.
3. Veeder-Root will file the claim with the carrier and replace the damaged/missing product at no charge to the customer. Customer Service will work with production facility to have the replacement product shipped as soon as possible.

## **CUSTOMER'S PREFERRED CARRIER**

1. It is the customer's responsibility to file a claim with their carrier.
2. Customer may submit a replacement purchase order. Customer is responsible for all charges and freight associated with replacement order. Customer Service will work with production facility to have the replacement product shipped as soon as possible.
3. If "lost" equipment is delivered at a later date and is not needed, Veeder-Root will allow a Return to Stock without a restocking fee.
4. Veeder-Root will NOT be responsible for any compensation when a customer chooses their own carrier.

## **RETURN SHIPPING**

For the parts return procedure, please follow the appropriate instructions in the "General Returned Goods Policy" pages in the "Policies and Literature" section of the Veeder-Root **North American Environmental Products** price list. Veeder-Root will not accept any return product without a Return Goods Authorization (RGA) number clearly printed on the outside of the package.

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# Introduction

This manual contains procedures for installing Veeder-Root solid-state interstitial liquid sensors in fiberglass tanks.

This manual assumes field wiring has been run from the console to the tank in which the sensor will be installed following instructions in the appropriate console's site prep manual.

## Contractor Certification Requirements

Veeder-Root requires the following minimum training certifications for contractors who will install and program the equipment discussed in this manual:

**Service Technician Certification (Previously known as Level 2/3):** Contractors holding valid Technician Certifications are approved to perform installation checkout, startup, programming and operations training, system tests, troubleshooting and servicing for all Veeder-Root Series Tank Monitoring Systems, including Line Leak Detection. This certification includes TLS-3xx and TLS4xx certification training.

**In-Station Diagnostics (ISD-PMC) Technician Certification:** ISD PMC Contractors holding a valid ISD/PMC Certification are approved to perform (ISD/PMC) installation checkout, startup, programming, and operations training. This training also includes troubleshooting and service techniques for the Veeder-Root In-Station Diagnostics system. A current Veeder-Root Technician Certification is a prerequisite for the ISD/PMC course.

All service personal on site must comply with all recommended safety practices identified by OSHA and your employer.

Review and comply with all the safety warnings in the manuals listed in this document above and any other Federal, State or Local requirements.

**Warranty Registrations** may only be submitted by selected Distributors.

## Product Marking Information

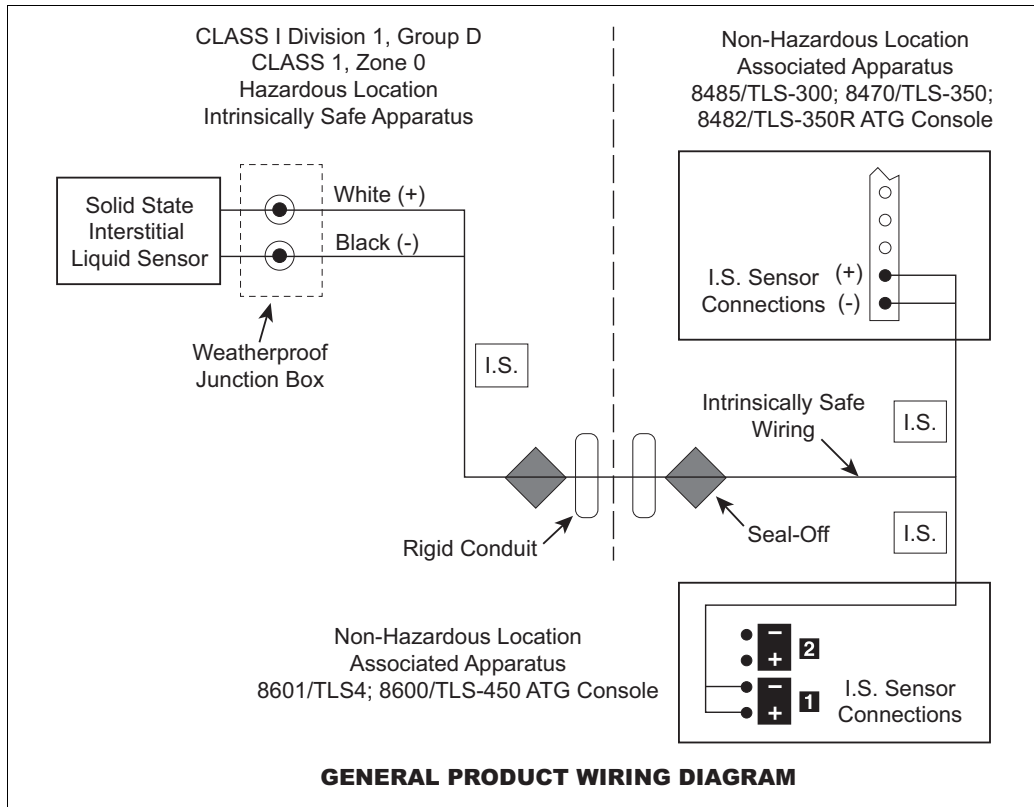
### RELATED DOCUMENTS

#### ***Documents Required to Install Equipment***

This intrinsically safe apparatus is only for use as part of a Veeder-Root Automatic Tank Gauging System (ATG Console with probes and sensors). To install intrinsically safe apparatus, use the specific control drawing that appears on the nameplate of the applicable associated apparatus (ATG Console):

Equipment	UL/cUL Control Drawing Document No.
<b>Associated Apparatus</b>	
TLS-450/8600	331940-008
TLS-350, TLS-350R	331940-011
TLS-300	331940-013
TLS4/8601	331940-018






The control drawings contain information related to the correct installation of the overall intrinsically Safe System. This includes information such as maximum number of apparatus, specific apparatus allowed in the system, maximum cable lengths, references to codes, proper grounding and so on. Control drawings can be found on the Internet at <https://www.veeder.com/us/technical-document-library>.



**Product Label Contents**







	I.S. CIRCUIT FOR HAZLOC SENSOR	
	F/N 794380-XXX	
CL I, DIV. 1, GP.D		S/N XXXXXX
CL I, ZONE 0		
AEx ia IIA	$-40^{\circ}\text{C} \leq \text{Ta} \leq +60^{\circ}\text{C}$	
Ex ia IIA	MANUAL NO. 576013-826	
TC=T4		
SECURITE INTRINSEQUE		

## Safety Warnings

<b>! WARNING</b>	
    	<p>This product is to be installed and operated in the highly combustible environment of a gasoline storage tank where flammable liquids and explosive vapors may be present.</p> <p><b>FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.</b></p> <ol style="list-style-type: none"> <li>1. Read and follow all instructions in this manual, including all safety warnings to protect yourself and others from serious injury, explosion, or electrical shock.</li> <li>2. Comply with all applicable codes including: the National Electrical Code; federal, state, and local codes; and other applicable safety codes.</li> <li>3. To protect yourself and others from being struck by vehicles, block off your work area during installation or service.</li> <li>4. Do not alter or modify any component or substitute components in this kit.</li> <li>5. <b>Warning!</b> Substitution of components may impair intrinsic safety.</li> <li>6. Field wiring to the Sensor must not share a conduit with any non-intrinsically safe device's wiring.</li> <li>7. <b>Warning!</b> To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.</li> <li>8. Before installing or taking the unit into a hazardous area, earth the unit in a safe area to remove any static charge. Then immediately transport the unit to the installation site. Do not rub or clean the unit prior to installation. Cleaning is not required under normal service conditions. Do not rub or clean the unit after installation. If the unit is not fixed to a known earth point when installed, ensure that a separate earth connection is made to prevent the potential of a static discharge. When fitting or removing the unit, use of anti-static footwear or clothing is required.</li> <li>9. Materials used in the construction of this device do not contain, by mass, more than 10% in total of aluminum, magnesium, zirconium and titanium or 7.5% in total of magnesium, titanium and zirconium.</li> </ol>

## Safety Precautions

The following safety symbols are used throughout this manual to alert you to important safety hazards and precautions.

 <p><b>EXPLOSIVE</b> Fuels and their vapors are extremely explosive if ignited.</p>	 <p><b>FLAMMABLE</b> Fuels and their vapors are extremely flammable.</p>
 <p><b>ELECTRICITY</b> High voltage exists in, and is supplied to, the device. A potential shock hazard exists.</p>	 <p><b>TURN POWER OFF</b> Live power to a device creates a potential shock hazard. Turn Off power to the device and associated accessories when servicing the unit.</p>
 <p><b>WEAR EYE PROTECTION</b> Wear eye protection when working with pressurized fuel lines or epoxy sealant to avoid possible eye injury.</p>	 <p><b>GLOVES</b> Wear gloves to protect hands from irritation or injury.</p>

 <p><b>INJURY</b> Careless or improper handling of materials can result in bodily injury.</p>	 <p><b>READ ALL RELATED MANUALS</b> Knowledge of all related procedures before you begin work is important. Read and understand all manuals thoroughly. If you do not understand a procedure, ask someone who does.</p>
 <p><b>WARNING</b> Heed the adjacent instructions to avoid equipment damage or personal injury.</p>	 <p><b>USE SAFETY BARRICADES</b> Unauthorized people or vehicles in the work area are dangerous. Always use safety cones or barricades, safety tape, and your vehicle to block the work area.</p>

## Sensor Description

Veeder-Root's solid-state interstitial sensor accurately detects the presence of fluid in the interstitial space of a double-wall fiberglass tank, and depending on the model installed, differentiates between hydrocarbons and other liquids.

Alarm conditions - fuel, water, sensor out - detected by the sensor are indicated by an audible alarm, a displayed message on the TLS console, and a printed message if the console is equipped with a printer. The alarms are also recorded as part of the console's alarm history report.

## INSTALLATION COMPONENTS

- Solid-state Interstitial Liquid Sensor for Fiberglass Tanks (P/N 794360-343, 794380-343, or 794380-345)
- Installation Kit
- Manual 576013-826

## Sensor Installation



1. Turn Off power to the console.
2. Make sure no liquid is present in the annular space. Do not install the sensor if any liquid is present in the annular space.



**Failure to remove any liquid in the annular space will lead to an alarm.**

3. Measure the length of the riser pipe as shown in Figure 1.
4. Locate the label on the sensor cable that corresponds to the tank size. Add the riser pipe length determined in Step 3 (measuring away from the sensor). Mark this position on the cable with one of the tie-wraps provided, NOT by cutting into the cable jacket with a knife.
5. Attach a pull cord to the eyelet in the sensor and after confirming correct orientation of sensor (ref. Figure 1), pull the sensor through the interstitial space until the cable mark tie-wrap is even with the top of the riser pipe. All sensor types should rest at the bottom of the tank as shown.
6. Get the installation kit. Put the cord grip bushing in the riser cap and screw the cord grip nut onto the fitting. Screw the second cord grip fitting into the junction box.
7. Pass the end of the sensor cable through the cord grip fittings in the riser cap and in the junction box.
8. Secure the riser cap to the riser pipe.
9. Tighten the cable cord grip nuts on the riser cap and junction box to ensure a water-tight seal at the cable entry.
10. Using wire nuts from the kit, connect the two-wire sensor cable to the field wires in the sensor junction box (ref. Figure 2).



**Observe polarity - the black wire from the sensor is ground and the other wire, which could be one of several colors, is positive.**

11. Seal wire nuts with epoxy sealant following the instructions in Figure 3.



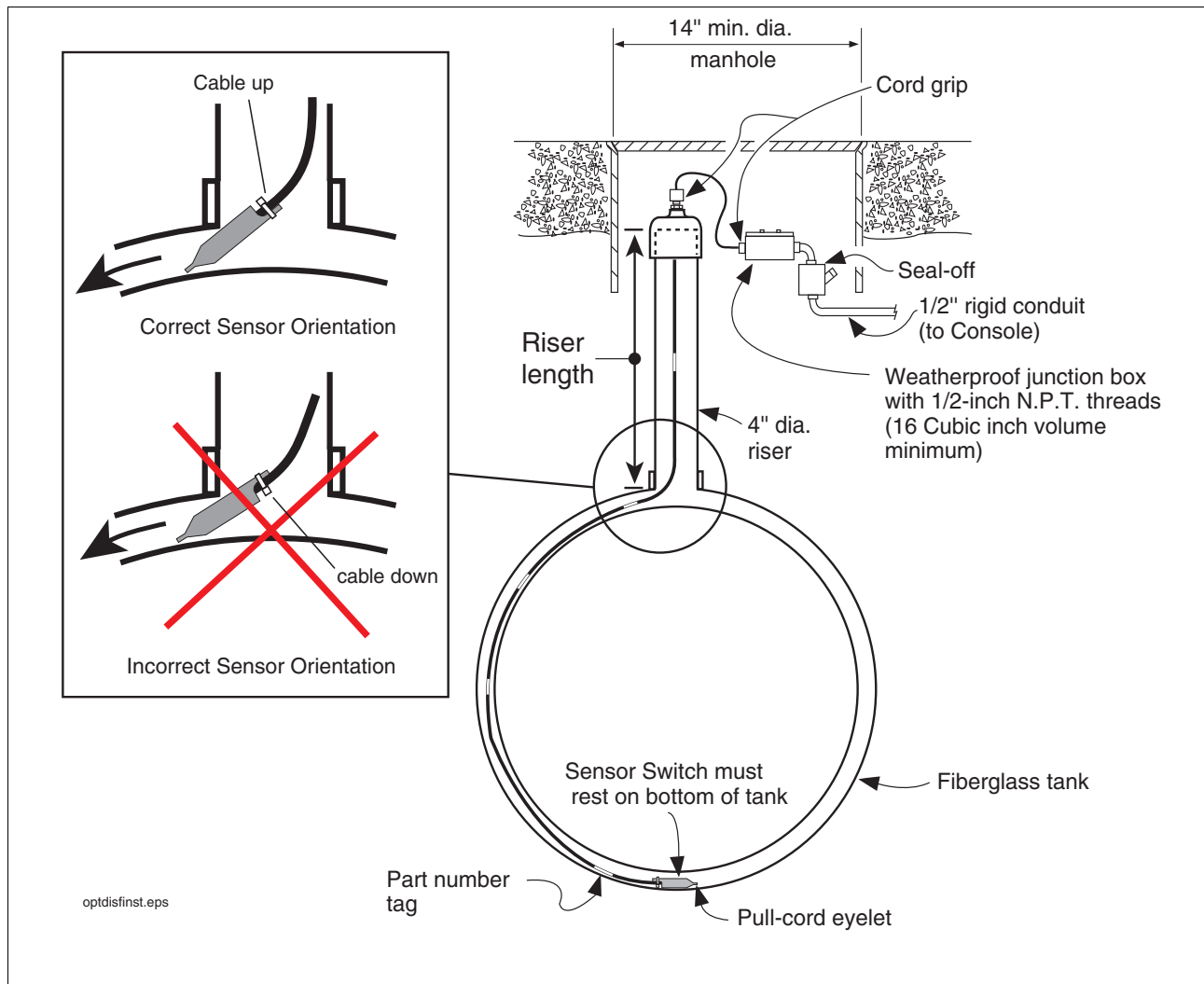


Figure 1. Sensor installation example

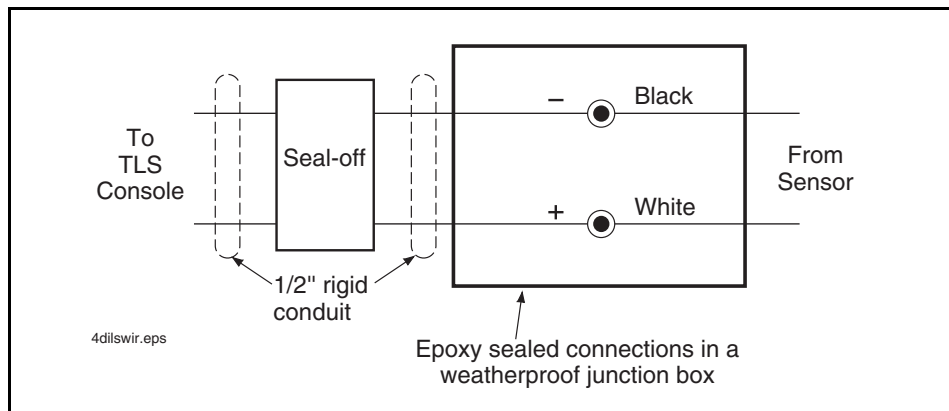
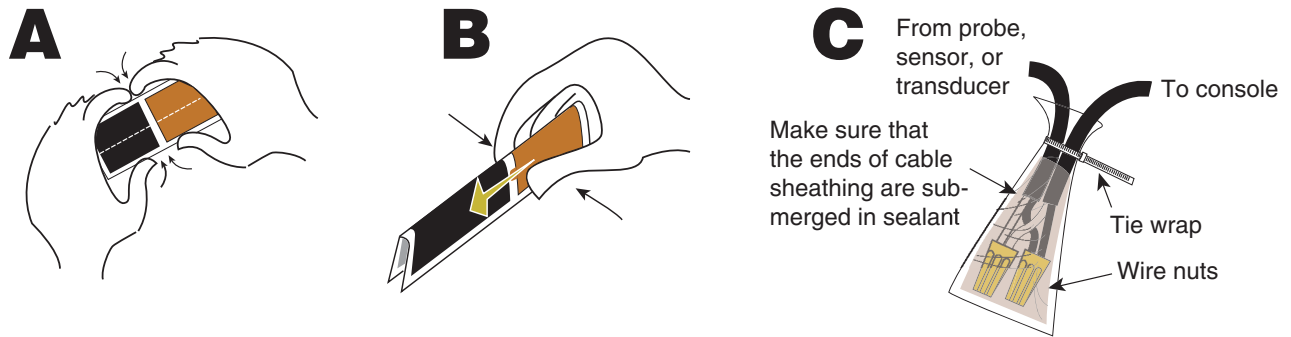


Figure 2. Sensor field wiring diagram




**Instructions:**

NOTE: When temperature is below 50°F (10°C), keep resin in a warm place prior to mixing (e.g., in an inside pocket next to body).

1. Open epoxy sealant package, and remove resin pak.
2. Holding resin pak as shown in A, bend pak along long length.
3. As shown in B, firmly squeeze the RED SIDE of the resin, forcing it through the center seal and into BLACK SIDE.

4. Mix thoroughly to a uniform color by squeezing contents back and forth 25-30 times.
5. Squeeze mixed, warm resin into one end of bag and cutoff other end.
6. Slowly insert wiring connections into sealing pak until they fit snugly against the opposite end as shown in C.
7. Twist open end of bag and use tie wrap to close it off and position the tie wrapped end up until the resin jells.



**CAUTION:** Epoxy sealant is irritating to eyes, respiratory system, and skin. Can cause allergic skin reaction. Contains: epoxy resin and Cycloaliphatic epoxy-carboxylate.

**Precautions:** Wear suitable protective clothing, gloves, eye, and face protection. Use only in well ventilated areas. Wash thoroughly before eating, drinking, or smoking.

consoles\epxy2w.eps

**Figure 3. Epoxy sealing field wiring connections**

## Appendix A: CCC Certification

本产品经认证符合 CNCA-C23-01: 2019《强制性产品认证实施规则 防爆电气》的要求。

*The product(s) is verified and certified according to CNCA-C23-01: 2019 China Compulsory Certification Implementation Rule on Explosion Protected Electrical Product.*



#	产品名称 Product 型号 Type	防爆标志 Ex Marking	3C 证书编号 CCC Certificate No.
1	光电传感器 79436X-343	Ex ia IIA T4 Ga, Ex ia IIB T4 Ga	2020312315000387

### 依据标准

Series standards GB/T 3836.1-2021, GB/T 3836.4-2021

<b>安全使用条件</b> <i>Specific conditions of safety use:</i>	<p>-使用环境温度: <math>-40^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}</math>。</p> <p>- 该设备必须作为已认证的液位控制器的本质安全系统的一部分进行安装。在安装过程中, 必须遵循随附的描述性系统文件。</p> <p>- Ambient temperature range: <math>-40^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}</math>.</p> <p>- This device must be installed as part of the certified intrinsic safety system defined in Inventory Measurement/Leak Detection System. The descriptive system documents included with the aforementioned certificate must be followed during installation.- Do not rub or clean the unit after installation. If the unit is not fixed to a known earth point when installed, ensure that a separate earth connection is made to prevent the potential of static discharge. When fitting or removing the unit, use of anti-static footwear and clothing is required.</p>
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