

MicroSensor

Installation Guide



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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 to install the Veeder-Root MicroSensor in a double-walled steel tank or a contained riser interstice space. This manual assumes all preliminary site preparation is completed, and that field wiring from the monitor to the sensor junction box is in place. For new installations, and for wiring requirements, see the "Site Preparation and Installation Instructions" manual provided with the system.

The MicroSensor uses solid-state technology to detect liquids. When used as a contained riser sensor, it fits in the 5/8" interstice space between the 4" and 6" riser. When used as a steel tank interstitial monitor, it fits into risers as small as 1" diameter or 1" square.

Contractor Certification Requirements

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

Installer (Level 1) Certification: Contractors holding valid Installer Certification are approved to perform wiring and conduit routing; equipment mounting; probe, sensor and carbon canister vapor polisher installation; wireless equipment installation; tank and line preparation; and line leak detector installation.

ATG Technician (Level 2/3 or 4) Certification: Contractors holding valid ATG 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. In addition, Contractors with the following sub-certification designations are approved to perform installation checkout, startup, programming, system tests, troubleshooting, service techniques and operations training on the designated system.

- Wireless 2
- Tall Tank

Warranty Registrations may only be submitted by selected distributors.

Product Marking Information

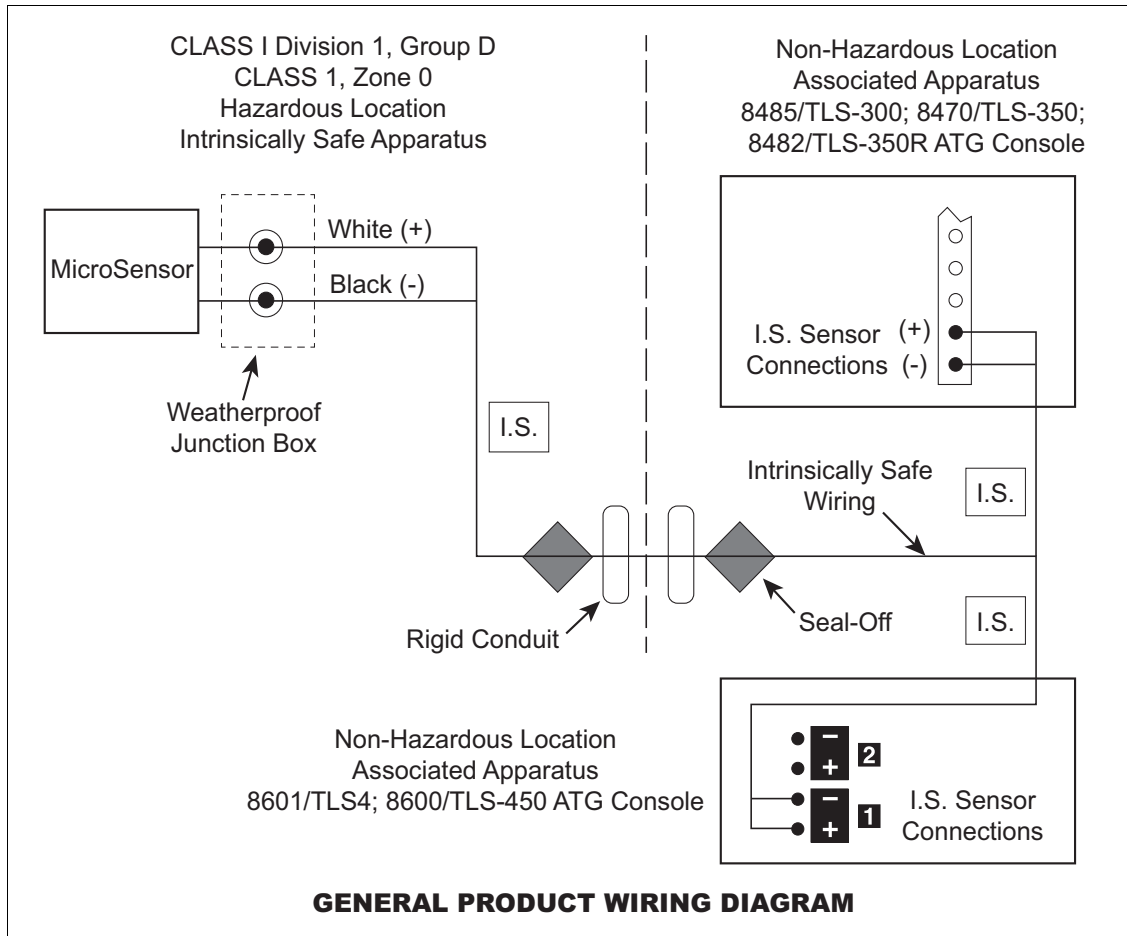
RELATED DOCUMENTS

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.
Associated Apparatus	
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 accompanying Compact Disk (TECH DOCS CD) or on the internet at veeder.com under SUPPORT; VR TECHNICAL DOCUMENTS; DRAWINGS.









Product Label Contents

 VEEDER-ROOT CL I, DIV. 1, GP.D CL I, ZONE 0 AEx ia IIA Ex ia IIA TC=T4 SECURITE INTRINSEQUE	I.S. CIRCUIT FOR HAZLOC SENSOR F/N 794380-XXX S/N XXXXXX $-40^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$	2466  LISTED
	MANUAL NO. 576013-285	

Safety Warnings





To protect yourself and your equipment, observe the following warnings and important information:



 WARNING	
    	<p>This product is to be installed in systems operating near locations where highly combustible fuels or vapors may be present.</p> <p>FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.</p> <ol style="list-style-type: none"> 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. 2. Comply with all applicable codes including: the National Electrical Code; federal, state, and local codes; and other applicable safety codes. 3. To protect yourself and others from being struck by vehicles, block off your work area during installation or service. 4. Do not alter or modify any component or substitute components in this kit. 5. Warning! Substitution of components may impair intrinsic safety. 6. Field wiring to the Sensor must not share a conduit with any non-intrinsically safe device's wiring 7. Warning! To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing. 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. 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.

NOTE Failure to install this product in accordance with its instructions and warnings will result in voiding of all warranties with this product.

Safety Precautions

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

 <p>EXPLOSIVE Fuels and their vapors are extremely explosive if ignited.</p>	 <p>FLAMMABLE Fuels and their vapors are extremely flammable.</p>
 <p>TURN POWER OFF 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>INJURY Careless or improper handling of materials can result in bodily injury.</p>

	<p>WEAR EYE PROTECTION Wear eye protection when working with pressurized fuel lines or epoxy sealant to avoid possible eye injury.</p>		<p>GLOVES Wear gloves to protect hands from irritation or injury.</p>
	<p>READ ALL RELATED MANUALS 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>USE SAFETY BARRICADES 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>

National Electrical Code Compliance

The following information is for general reference and is not intended to replace recommended National Electric Code (NEC) procedures. It is important for the installer to understand that electrical equipment and wiring located in Class I, Division 1 and 2 installations shall comply with the latest appropriate Articles found in the National Electric Code (NFPA 70) and the Code for Motor Fuel Dispensing Facilities and Repair Garages (NFPA 30A).

INSTALLATION COMPONENTS

- MicroSensor for Fiberglass Tanks P/N 7943X0-34X
- Installation Kit - P/N 312020-949 (Figure 1)
- Optional 2" riser cap and adaptor kit - P/N 312020-928
- Manual 576013-285

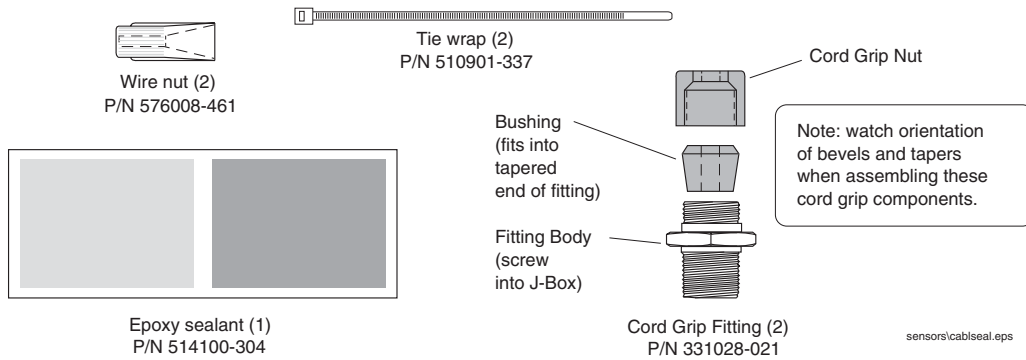


Figure 1. Installation kit

Installation Procedures

⚠ WARNING



Before installing this device, turn OFF power to the system.

Sensor wiring connects components of an intrinsically safe circuit. Conduit containing sensor wiring must not contain any other wires and must enter the console only through designated knockouts.

Sensor Installation - Containment Riser

1. Turn OFF power to the console.
2. Make sure no liquid is present in the annular space.
3. Install the sensor in the conduit by pushing the cable until it cannot be pushed any further. When fully inserted, you should be able to feel the sensor contact the bottom of the containment riser (see Figure 2). To function correctly, the sensor must rest as close as possible to the bottom of the riser annulus. The MicroSensor uses a stiff cable to provide the required stiffness for ease of installation.

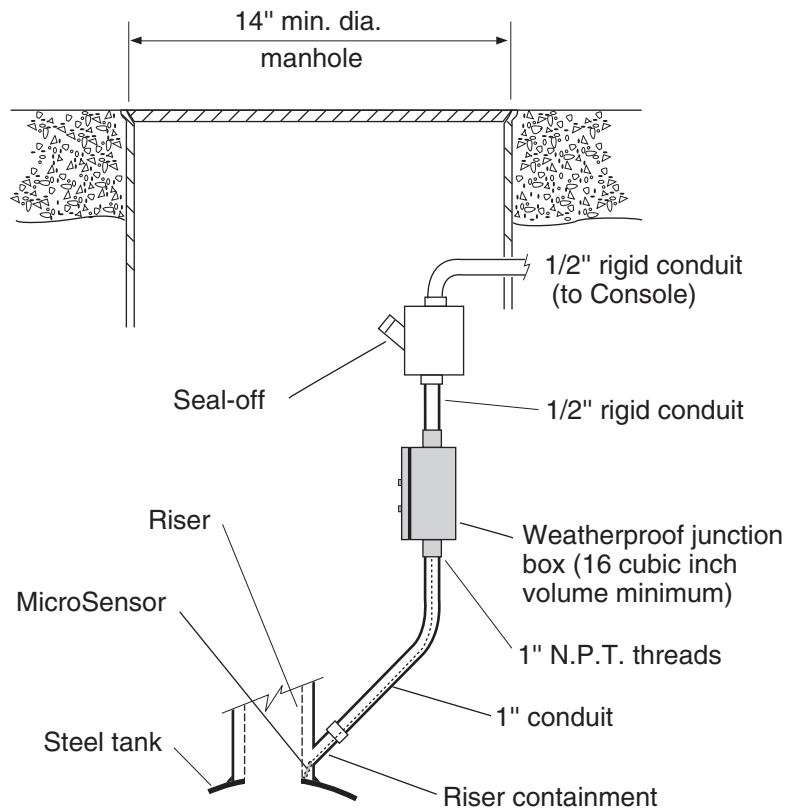


Figure 2. MicroSensor Installation - Containment Riser

- Using wire nuts, connect the two-wire sensor cable to the console field wires in the sensor junction box. For proper polarity, the black wire from the sensor is ground and the other wire, which could be one of several colors, is positive (See Figure 3).

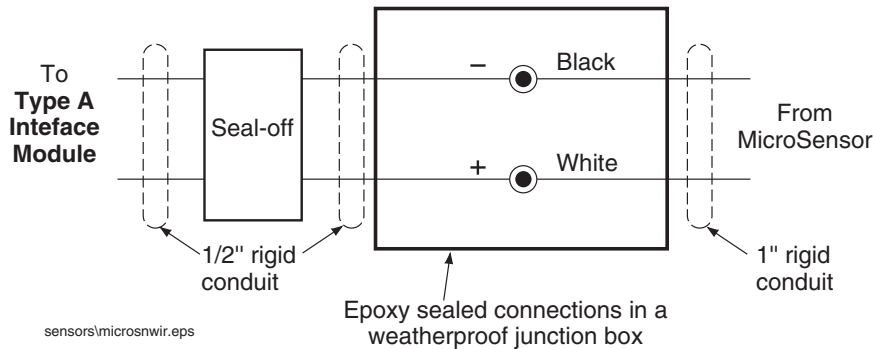
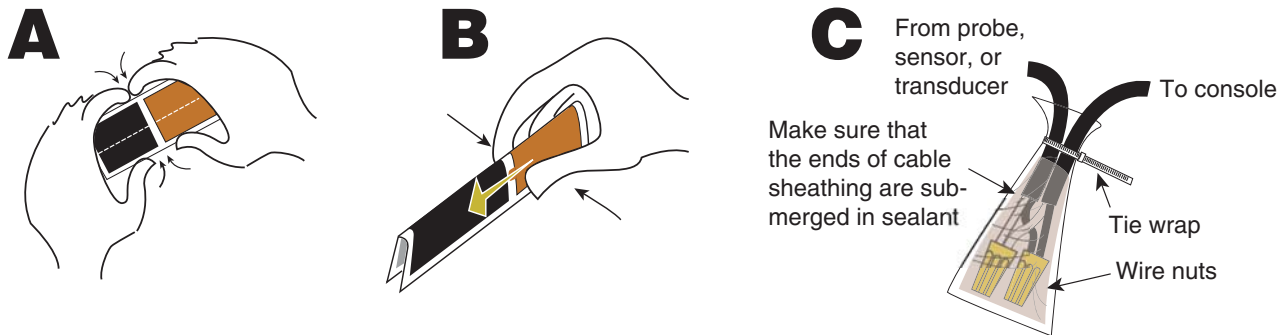


Figure 3. MicroSensor Field Wiring Diagram

- Seal wire nuts with epoxy sealant following the instructions below.




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).

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

- Mix thoroughly to a uniform color by squeezing contents back and forth 25-30 times.
- Squeeze mixed, warm resin into one end of bag and cutoff other end.
- Slowly insert wiring connections into sealing pack until they fit snugly against the opposite end as shown in C.
- 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\epoxy2w.eps

Sensor Installation - Steel Tank

1. Make sure no liquid is present in the annular space.
2. To be sure the sensor will reach the bottom of the annular space, first measure the sensor riser pipe from the bottom of the pipe to the top. (See *Distance to Measure* in Figure 4.) Then measure the same distance up the sensor leader cable from its connection to the sensing element and mark the leader cable. Do not use a knife or other sharp object to mark the leader cable to avoid damaging wire. Use instead, a marker, piece of tape, or a twist tie.
3. Install a cord grip into the junction box.

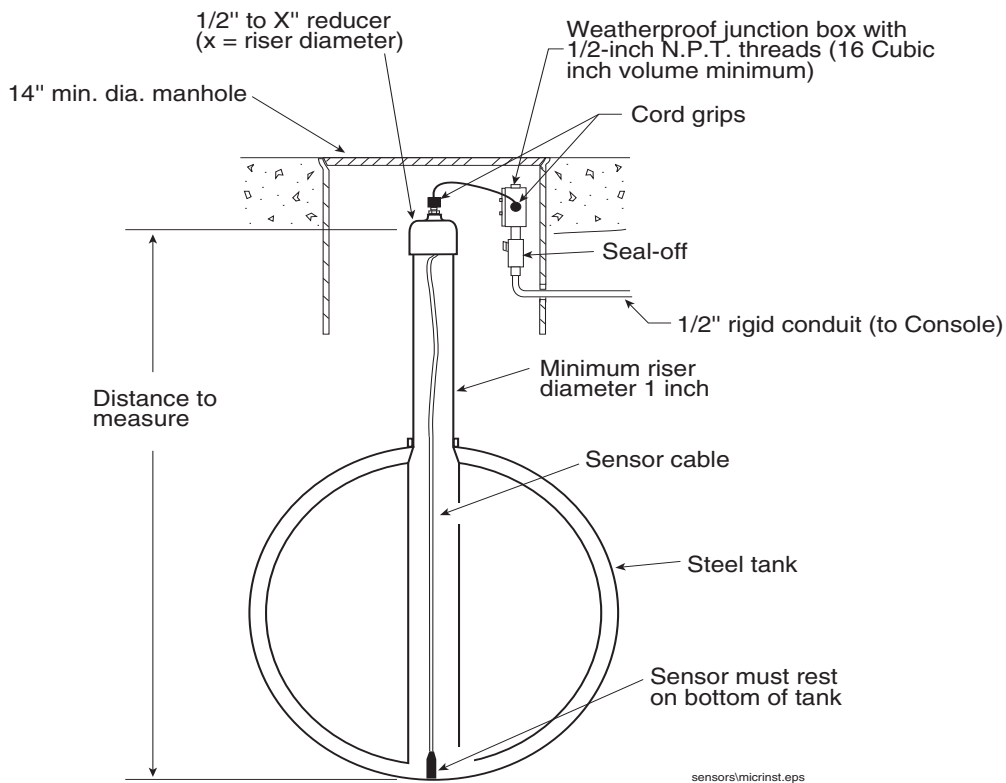


Figure 4. Sensor Dimensions and Installation - Steel Tanks

4. Lower the sensor assembly into the riser pipe until the sensor is just resting on the bottom of the tank.
5. Run the sensor leader cable through the reducer up to the mark previously made on the cable.
6. Secure the reducer to the riser pipe.
7. Keeping the cable taut, secure the sensor assembly in place by attaching the cord grip.
8. Tighten the cable bushing nuts on the riser cap and junction box to ensure a watertight seal at the cable entry.
9. Using wire nuts, connect the two-wire sensor cable to the console field wires in the sensor junction box. Be sure to observe color codes for proper polarity (as shown in Figure 3 on page 6).
10. Seal wire nuts with epoxy sealant using one bag for two wire nut connections as discussed in Step 5 of the containment riser installation above.

