

# Media-Isolated Mag Plus Probe LPG-ISO Kit

## Installation Guide

# Notice

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

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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.

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## **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**

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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 installation instructions for installing the Veeder-Root Media Isolated Mag Plus probe LPG-ISO kit.

## Related Manuals

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Depending on your installed console, you must reference the appropriate manual below, to connect the probe to the console.

576013-879	TLS-3XX Series Site Prep and Installation Manual
577013-879	TLS-4XX Site Prep and Installation Manual
576013-623	TLS-3XX Series System Setup Manual
577013-757	TLS2 Setup Manual

## Contractor Certification Requirements

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### Contractor Certification Requirements

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

**Installer Certification (Level 1):** 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.

**Technician Certification (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. 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.

## Before You Begin

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Before you begin installation, read the following guidelines:

- This product is to be installed and operated in the highly combustible environment of an LPG storage tank. It is essential that you carefully read and follow the warnings and instructions in this manual to protect yourself and others from serious injury, explosion, or electrical shock.
- For safety reasons, we have taken particular care in the design of this product to limit the power in the wiring to the fuel tanks and to keep that wiring physically separated from any other wiring. It is your responsibility to maintain the effectiveness of these safety features by installing this product in accordance with the instructions and warnings which follow. Your failure to do so could create danger to life and property.
- Failure to install this product in accordance with its instructions and warnings will result in voiding of all warranties connected with this product. This unit does not contain any user controls. Opening or tampering with a magnetostrictive probe will result in voiding the warranty.

## Product Marking Information

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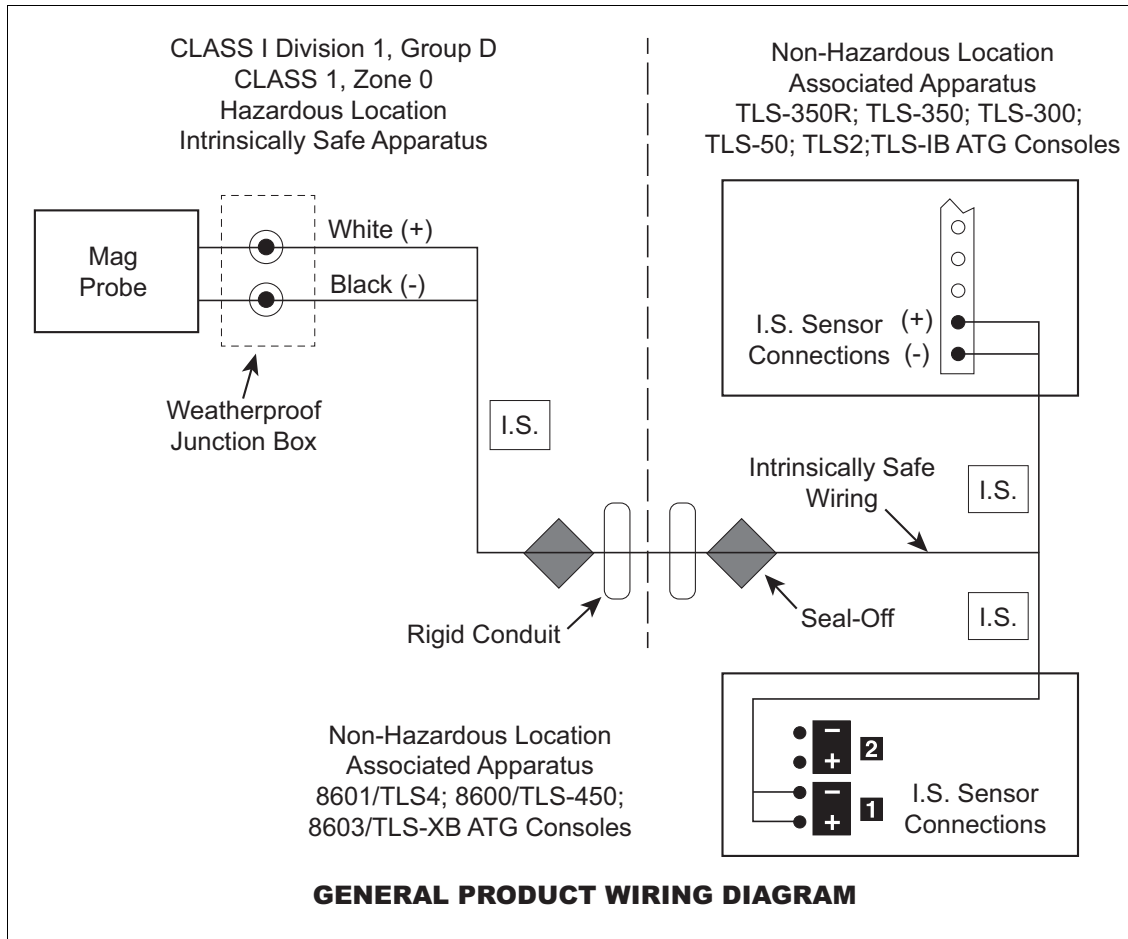
### RELATED DOCUMENTS

#### ***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):

<b>Equipment</b>	<b>UL/cUL Control Drawing Document No.</b>
<b>Associated Apparatus</b>	
TLS-450/8600	331940-008
TLS-350, TLS-350R	331940-011
TLS-300	331940-013
TLS-50 or TLS2 or TLS-IB	331940-014
TLS4/8601	331940-018
TLS-XB/8603	331940-019
Intrinsically Safe Apparatus for Wireless Applications	
Tank Gauge Accessories	331940-012

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](http://veeder.com) under SUPPORT; VR TECHNICAL DOCUMENTS; DRAWINGS.




**Product Label Contents**

 <b>VEEDER-ROOT</b> 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 XXXXXX-XXX S/N XXXXXX $-40^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$ MANUAL NO. 577013-770	
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## Safety Warnings







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

<b>⚠ WARNING</b>	
	<p>This product is to be installed in systems operating near locations where highly combustible fuels or 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. Comply with all federal, state, and local codes, and other applicable safety codes. All wiring must comply with UL/CUL standards and other local electrical and pressure vessel codes.</li> <li>4. All work on LPG systems must comply with NFPA 58, Liquefied Petroleum Gas Code and other applicable code requirements.</li> <li>5. LPG tanks must be depressurized (drained) and free of liquid and combustible vapors before work begins.</li> <li>6. To protect yourself and others from being struck by vehicles, block off your work area during installation or service.</li> <li>7. Do not alter or modify any component or substitute components in this kit.</li> <li>8. <b>Warning!</b> Substitution of components may impair intrinsic safety.</li> <li>9. Field wiring to the Probe must not share a conduit with any non-intrinsically safe device's wiring.</li> <li>10. <b>Warning!</b> To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.</li> <li>11. 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>12. 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>

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

## Safety Symbols

The following safety symbols may be 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>TURN ELECTRICAL POWER OFF</b> Live power to a device creates a potential shock hazard. Turn Off, tag and lock out electrical power to the device and associated accessories when servicing the unit.</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>
 <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 damage to equipment, property, environment or personal injury.</p>

## LPG-ISO kits

This equipment is intended to be installed in a tank that has a threaded 1-1/2" NPT opening (333083-XXX kit), or a 2" NPT opening (333082-XXX kit) to accept the probe and connectors. The threaded openings must meet local codes for pressure vessels.

The parts listed in Table 1 and shown in Figure 1 below are included in the installation kits are required to install a Veeder-Root Form No. 8463XX Series Mag Probe into a liquefied petroleum gas (LPG) tank.

- 333083-XXX ISO Installation Probe Kit, with a 1.5" (38.1 mm) LPG Float, rated for a working pressure of 375 psi as specified in NFPA 58 with a working temperature range between -40°C to +60°C.
- 333082-XXX ISO Installation Probe Kit, with a 2" (50.8 mm) LPG Float, rated for a working pressure of 375 psi as specified in NFPA 58 with a working temperature range between -40°C to +60°C.
- The 3-inch LPG Float kit (P/N 333379-001) contains only a 3" float and a 2" OD, SST retaining washer. You must also order the V-R 333082-XXX kit and have a customer supplied 3" NPT to 1" NPT, SST reduction bushing to complete the installation.

**Table 1. LPG ISO Installation Kits**

Qty.	Part Description	1-1/2" NPT Kit P/N 333083-XXX	2" NPT Kit P/N 333082-XXX	3" LPG Float Kit P/N 333379-001
1	Tube group	331800-XXX	331800-XXX	-----
1	Float	331797-001	331797-002	333347-001
1	Male connector 7/8" to 1" NPT	576008-643	576008-643	-----
1	Reduction bushing 1-1/2" NPT to 1" NPT, SST	576008-644	-----	-----



Table 1. LPG ISO Installation Kits

Qty.	Part Description	1-1/2" NPT Kit P/N 333083-XXX	2" NPT Kit P/N 333082-XXX	3" LPG Float Kit P/N 333379-001
1	Reduction bushing 2" NPT to 1" NPT, SST	-----	576008-645	-----
1	2" OD x 0.13 thick washer, SST	-----	-----	576008-706
1	Float retaining ring	511805-378	511805-378	511805-378
1	Cable	330272-XXX	330272-XXX	-----
1	Cable Seal Kit (cord grip fitting, sealant pack, wire nuts, and tie wraps)	330020-067	330020-067	-----
1	Rain shield	331880-001	331880-001	-----
1	Warning tag	331879-001	331879-001	-----

Where XXX is used to indicate various tube lengths between 2 feet (610 mm) and 12 feet (3658 mm).

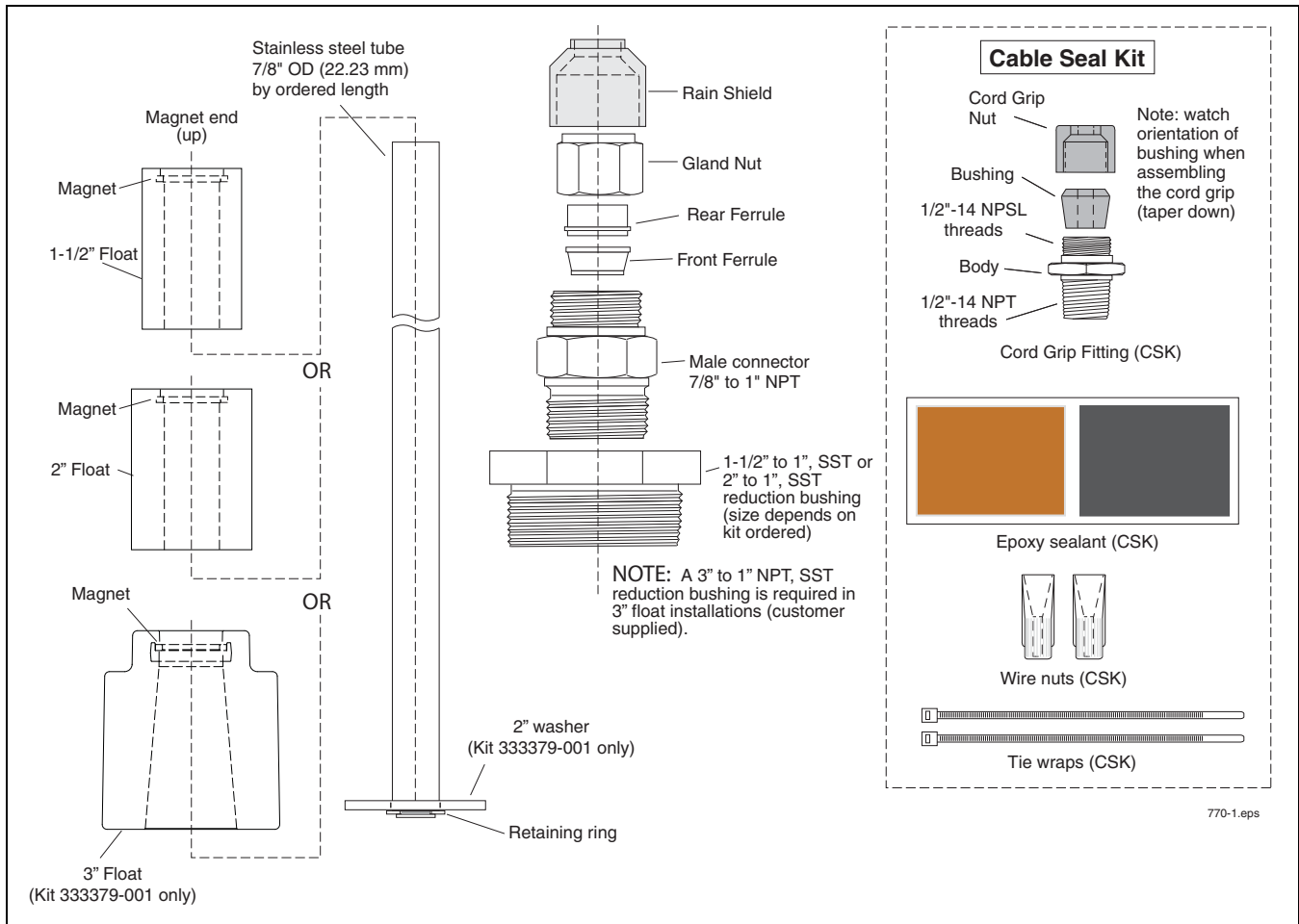


Figure 1. Mag Plus Probe LPG-ISO Kit Components and assembly sequence

## Installing the Mag Probe

NOTE: To ensure that the probe/tube kit can be installed, the probe length should be at least 6 inches (152.4 mm) longer than the tank's inside diameter.

### Before you begin

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1. Make sure that the tank is depressurized (drained) and free of liquid and combustible vapors.
2. Remove any sludge from the bottom of the tank. Sludge can interfere with the proper operation of the float.

### Assembling the float on the tube

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#### FOR 1-1/2" AND 2" NPT KITS

Slide the stainless steel tube out of the shipping box. Carefully slide the float, non-magnet end first, onto the tube and down against the retaining ring at the bottom of the tube.

#### FOR 3" NPT FLOAT KITS

Slide the supplied washer (2" OD x 0.13" thick) onto the tube and down against the retaining ring. Carefully slide the float, non-magnet end first, on the tube and down against the washer.

The float must be installed magnet-end up to measure fuel correctly (see Figure 1).

### Installing the Stainless Steel Tube into the Tank

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1. With the float against the retaining ring (1-1/2" and 2" float kits) or washer (3" float kits), carefully lift the open end of the tube up and lower the assembly, float end first, into the tank until the tube rests on the bottom of the tank (Figure 2). Carefully slide the stainless steel reducing bushing, large end first, down over the tube until it rests against the tank opening. Apply UL classified sealant suitable for use with LPG to the outside bushing threads that will be screwed into the tank fitting. Screw the bushing into the tank fitting. Tighten the bushing as required to ensure a proper seal.

#### SEALING THE STAINLESS STEEL TUBE IN THE TANK OPENING

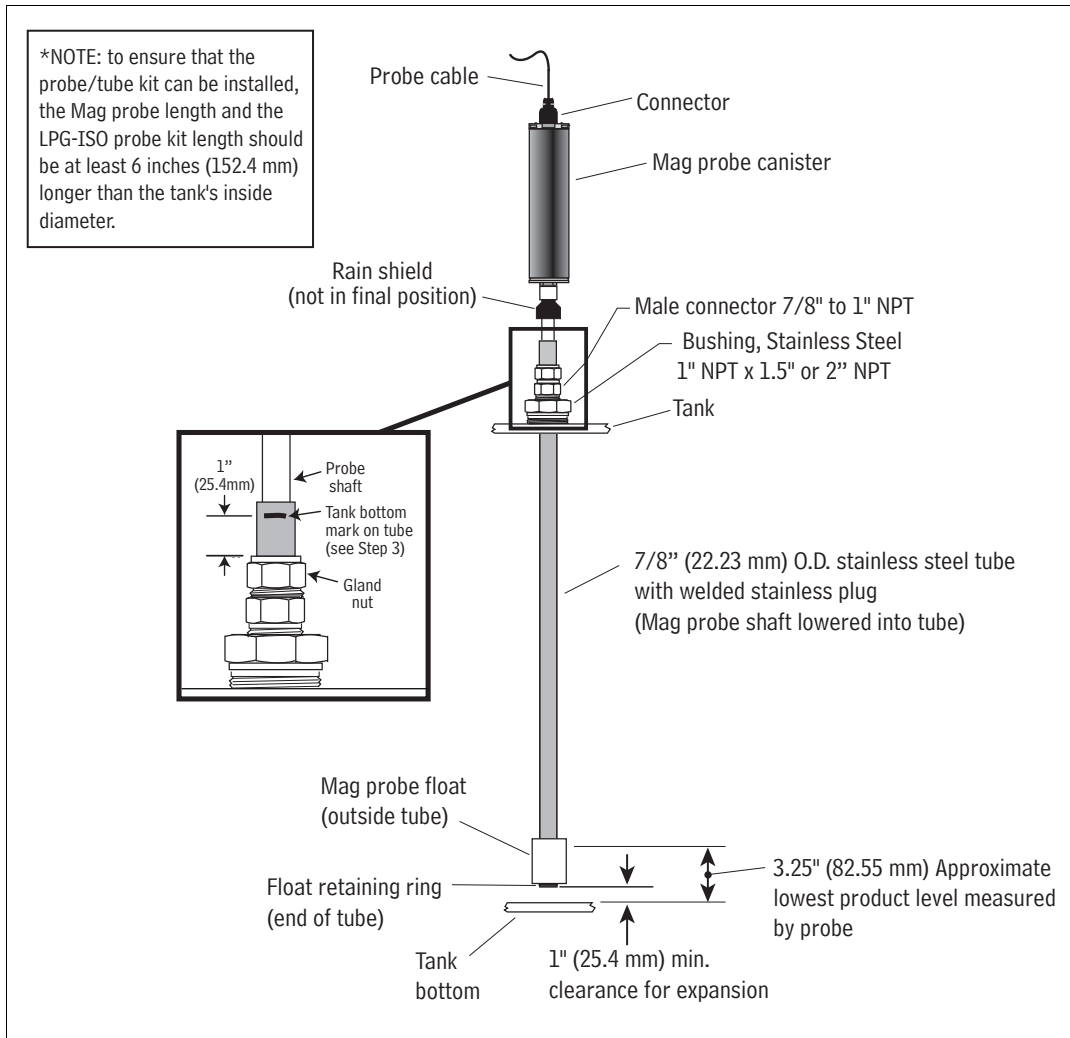
2. Loosen the gland nut on the male connector. Carefully slide the male connector, 1 inch (25.4 mm) end first, down onto the tube until it rests against the bushing. Apply UL classified sealant suitable for use with LPG to the threads of the connector's NPT threads. Screw the connector into the bushing. Tighten the connector as required to ensure a proper seal.



3. Push the tube down until it rests on the tank's bottom. Using a felt marker, make a mark on the tube at the top of the gland nut. Raise the tube until the mark is 1 inch (25.4 mm) above the nut, then hand tighten the gland nut until the tube is held in place (this distance is necessary for expansion and contraction of the tank). Tighten the gland nut one and one-quarter full turns beyond hand tight to crimp the ferrules to the tube and create the proper seal. Note that with the bottom clearance set at 1 inch (25.4 mm), the lowest level the probe can measure in the tank is approximately 3.25 inches (82.55 mm) (see Figure 2).

**INSTALLING THE PROBE IN THE STAINLESS STEEL TUBE**

4. Slide the rubber rain shield onto the probe shaft (narrow end up) and push it all the way up to the probe canister. Gently slide the probe down into the tube until it rests on the bottom of the tube. Slide the rain shield down the shaft until it rests against the top end of the tube. The lower (wide) end of the shield may be a little over the top of the gland nut. Note: the rain shield is intended to keep water out from between the probe's shaft and the inside of the tube so you don't want to force the shield down below the top end of the tube (see Figure 3).
5. Attach the warning tag as shown in Figure 3. Attach the probe cable connector to the mating plug on the top of the probe canister. Hand tighten the connector securely.
6. If required by local regulations, install a protective housing. A typical housing consists of a reducer, 4-inch (101.6 mm) diameter pipe, and union. The final assembly must comply with local codes.
7. Perform a leak test in accordance with applicable safety codes on the tank to ensure that there are no leaks in the system.
8. The contents of the Cable Seal kit are used to field connect the probe-to-console wiring. Reference the appropriate Site Prep manual for instructions on this procedure.



**Figure 2. Media Isolated Mag Plus Probe installation example**

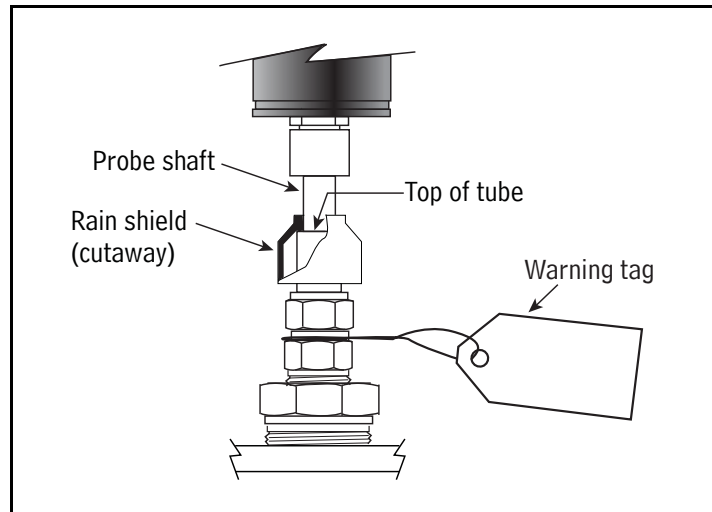


Figure 3. Rain shield installed position

## Entering Custom Float Size

At the console, select Custom for float size/type. For the LPG probe you need to enter a Fuel Offset value of +0001.120<sup>1</sup> (28.45 mm) and an Invalid Fuel value of +0003.250 (82.55 mm). (Water Offset and Water Minimum values are ignored for this probe so no changes are necessary). The probe is now installed and setup.

**NOTE** (EU Applications Only) - If using the 35 mm float, part number 333222-001, you will need to enter a Fuel Offset value of +0000.600 in (15.24 mm) and an Invalid Fuel value of +0005.910 in (150.11 mm).

**NOTE** (For 3" Float Installations Only) - When using the 3" float, part number 333347-001, enter a fuel offset value of +0002.125 inches (53.98mm) and an invalid fuel value of +0004.750 inches (120.65mm).

1. On Version 21 and earlier software this offset can be entered in setup by selecting a "Tilt" value of +1.06 (26.93 mm) and a 2-inch (50 mm) float entry.



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