

Mag Plus Probe

Installation Guide

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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.

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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.
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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 describes Mag Plus probe components and typical installation kits. Instructions are included for assembling floats onto the probe's shaft, attaching spacer rings to the probe's canister, example installations of the probe into both an underground and above ground tank and field wiring connections.

For guidelines on site preparation and atypical installation examples, refer to the appropriate Veeder-Root Site Preparation and Installation manual. For assembly of float kits such as required for Density or Phase separation detection, refer to the float assembly instructions included in those kits.

Make a record of the float size installed on each probe. The installed float size will be required for each probe during system setup.

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

VR Vapor Products Certification: Contractors holding a certification with the following designations are approved to perform installation checkout, startup, programming, system tests, troubleshooting, service techniques and operations training on the designated system.

- ISD – In Station Diagnostics
- PMC – Pressure Management Control
- CCVP - Veeder-Root Vapor Polisher
- Wireless – ISD/PMC Wireless
- A current Veeder-Root Technician Certification is a prerequisite for the VR Vapor Products course.

Warranty Registrations may only be submitted by selected Distributors.

Product Marking Information

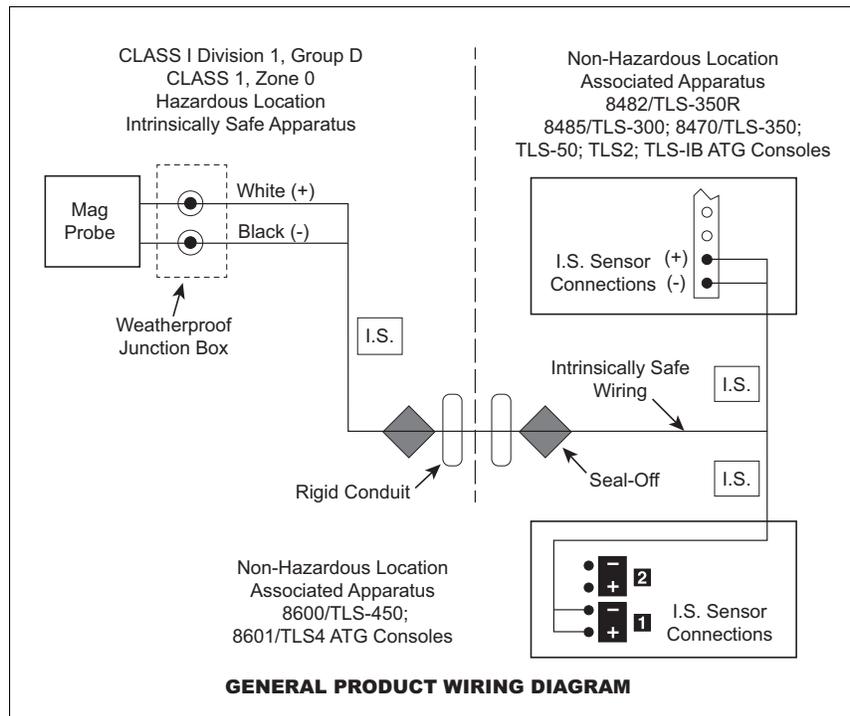
RELATED DOCUMENTS

Documents Required to Install Equipment

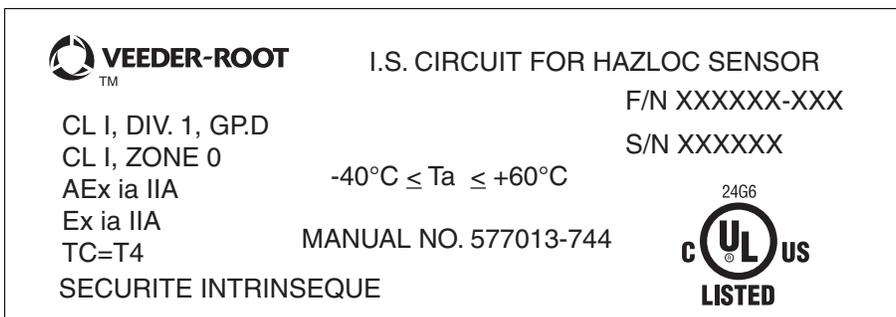
This intrinsically safe apparatus is only for use as part of a Veeder-Root Automatic Tank Gauging System (ATG Console with probes and sensors). To install intrinsically safe apparatus, use the specific control drawing that appears on the nameplate of the applicable associated apparatus (ATG Console):

Equipment	UL/cUL Control Drawing Document No.
Associated Apparatus	
TLS-450/8600	331940-008
TLS-350, TLS-350R	331940-011
TLS-300	331940-013
TLS-50 or TLS2 or TLS-IB	331940-014
TLS4/8601	331940-018
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 under SUPPORT; VR TECHNICAL DOCUMENTS; DRAWINGS.



Product Label Contents



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 Probe 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. Materials used in the construction of this device contain aluminum. Care must be taken to avoid ignition hazards due to impact or friction. 9. 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.

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 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>ELECTRICITY High voltage exists in, and is supplied to, the device. A potential shock hazard exists.</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>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>INJURY Careless or improper handling of materials can result in bodily injury.</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>
 <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>	

Mag Plus Probe Installation Kits

Installation Kits

Available probe installation kits are listed in Table 1 and Table 2..

Table 1. Probe Installation Kit P/N 846100-1XX, 846400-1XX and 846402-1XX

Qty.	Description	Part Number
1	Cable, 5 feet long (standard size)	330272-001
1	2-inch Product Float	331627-001
1	2-inch Water Float	331582-00X
1	Boot	333202-001
2	Canister Insulating Sleeves	332457-001
1	Cable Seal Kit (CSK)	330020-415 or 330020-067

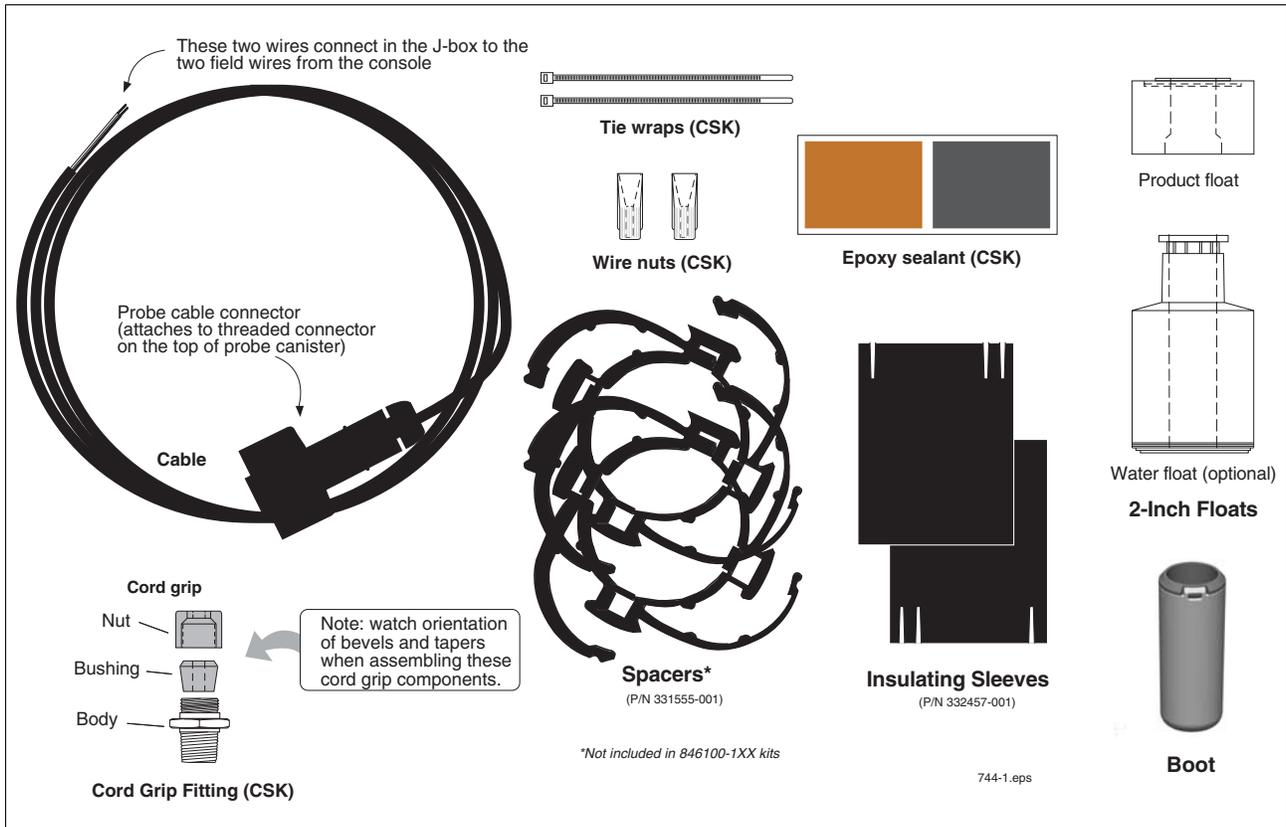


Figure 1. Probe Installation Kit 846100-1XX, 846400-1XX and 846402-1XX Contents

Table 2. Probe Installation Kit P/N 846400-3XX, -0XX and 846402-3XX, -0XX, 330020-720, -721, -722

Qty.	Description	Part Number
1	Cable, 5 feet long (standard size)	330272-001
1	3-inch* Product Float	331759-001
1	3-inch* Water Float	331583-00X
1	4-inch* Product Float	331719-001
1	4-inch* Water Float	331718-00X
1	Boot	333202-001
2	Canister Spacer Ring	331555-001
1	Cable Seal Kit (CSK)	330020-067

*Note: Depending on your order, this kit is shipped with either 3- or 4-inch floats.

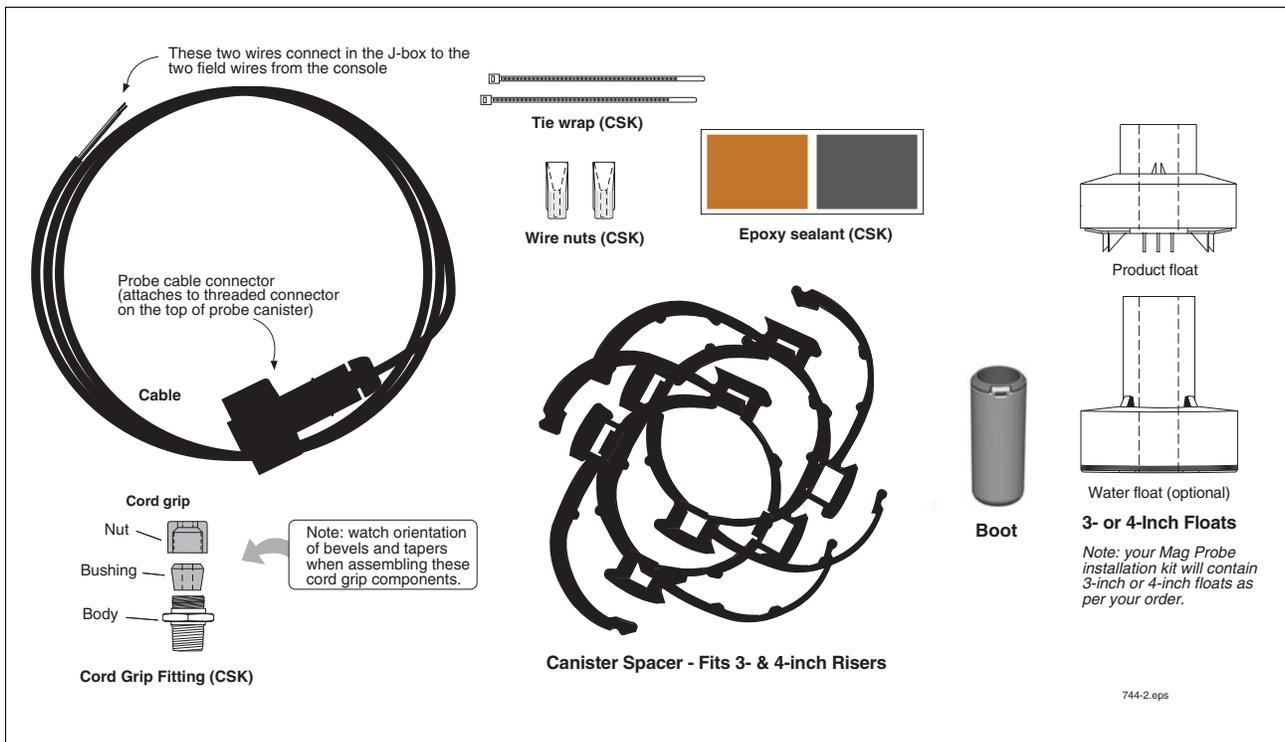


Figure 2. Probe Installation Kit 846400-3XX, -0XX and 846402-3XX, -0XX Contents

Riser Cap Kit for Mag Probe Installations

The cap on the riser containing the Mag Probe must be modified to allow the probe's cable to exit the riser. This modification requires making a 1/2"-14 NPT tapped hole in the cap for a cord grip. Two types of drilled and tapped Riser Cap kits are available for purchase, or you may be able to modify the existing riser cap.

CAP AND CORD GRIP KIT

This Riser Cap kit (Table 3) contains a non-metallic cap which screws onto the 4" NPT riser (Figure 3). The cap comes drilled and tapped with a cord grip.

Table 3.- Cap and cord grip kit - Part No. 330020-282

Quantity	Description	Part Number
1	Cap Riser	331106-001
1	Gasket	331140-001
1	Bushing - Cord Grip	330787-001
1	Nut - Cord Grip	330594-001

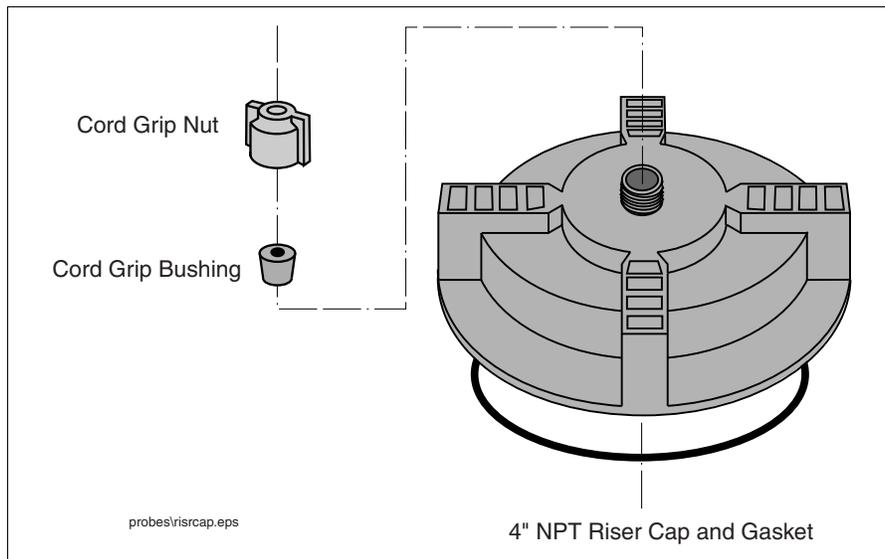


Figure 3. Cap and Cord Grip Kit

METAL CAP AND RING KIT

This riser cap kit contains an adapter ring which screws onto the 4"NPT riser and a quick-release metal cap which clamps onto the ring (Table 4). The cap comes drilled and tapped with a cord grip (Figure 4).

Table 4.- Metal cap and ring kit - Part No. 312020-952

Quantity	Description	Part Number
1	Adapter ring and gasket	514100-332
1	Cap and gasket	327869-003
1	Group Cord Grip	331028-001

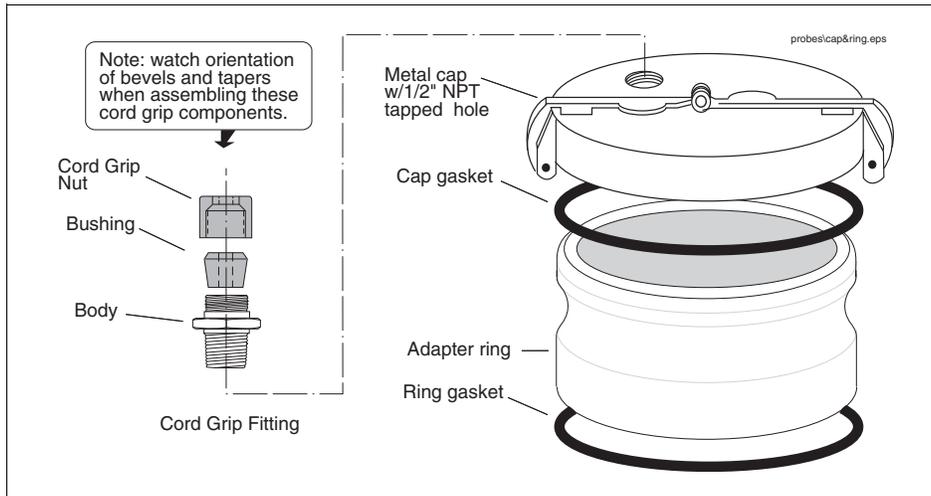


Figure 4. Metal Cap and Ring Kit

Modifying an Existing Metal Cap

In order to ensure that the riser cap seals properly to the probe cable and riser, we recommend that you purchase one of the kits available for this purpose. Riser Caps from other manufacturers may require modification. If you use your own metal riser cap, you must drill and tap it for a cord grip fitting (P/N 331028-001) as follows.

1. Remove the cap to a non-hazardous location.
2. Drill and tap the cap for a 1/2"-14 NPT cord grip thread [Figure 5].

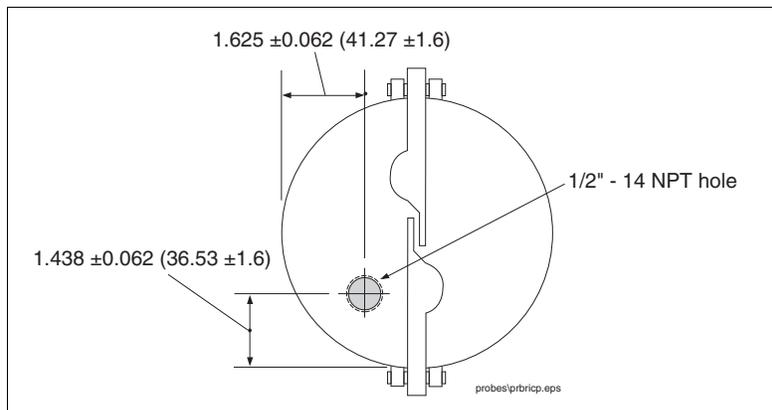


Figure 5. Modifying an Existing Metal Riser Cap

AST Installation Kit

This kit is recommended when installing Mag Probes into an above ground storage tank (AST). This kit contains a length of flexible conduit, connectors, etc., for easier probe access. The kit contents are listed in Table 5 and shown in Figure 6.

Table 5. Mag Probe AST installation kit - Part No. 312020-984

Quantity	Description	Part Number
5 feet	3/8" Flexible conduit	576008-294
1	3/8" Adaptor nut	329972-002
2	3/8" Straight liquidtight connectors and related parts	576008-295
1	Cord Grip Group	331028-001

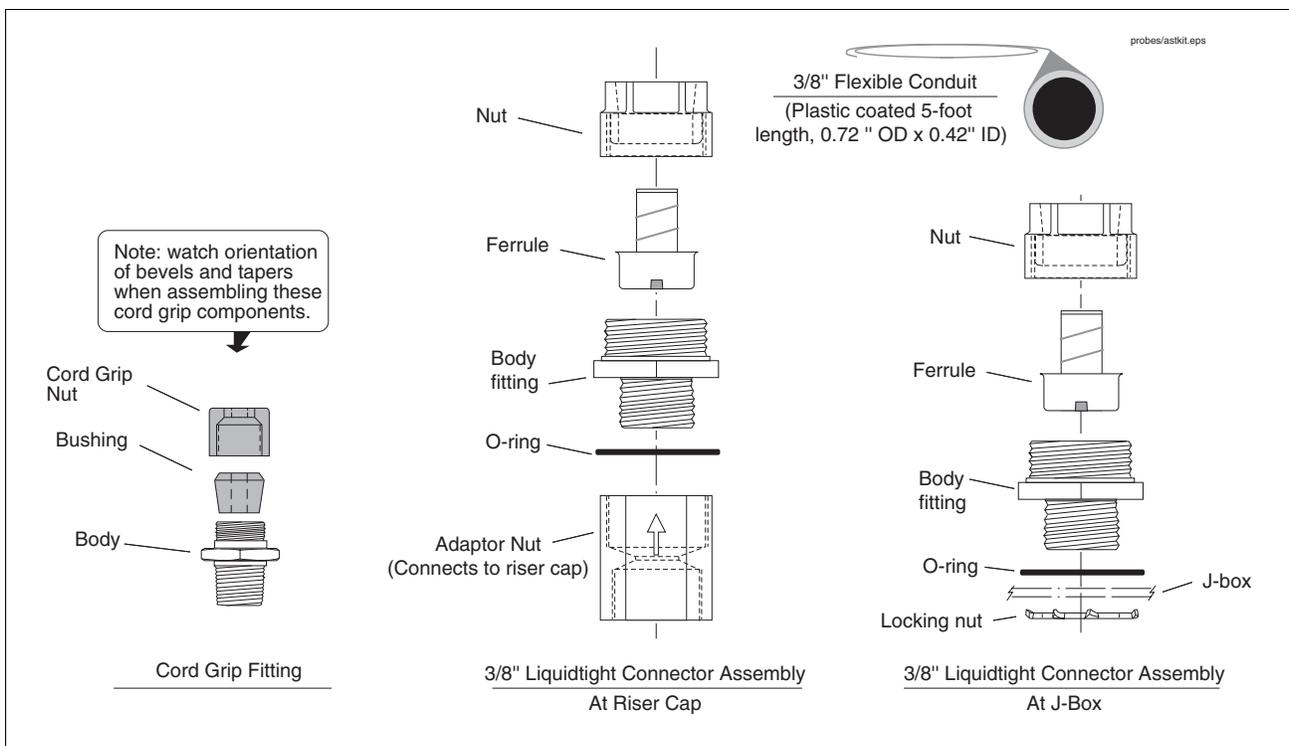


Figure 6. Mag Probe AST Installation Kit

Assembling Probe Components

Attaching Probe Canister Insulator Sleeves (2-Inch Risers)

1. Open the Probe shipping carton so that you have access to the probe. Also open the installation kit.
2. Install the two canister sleeves onto the probe canister as shown in Figure 7.

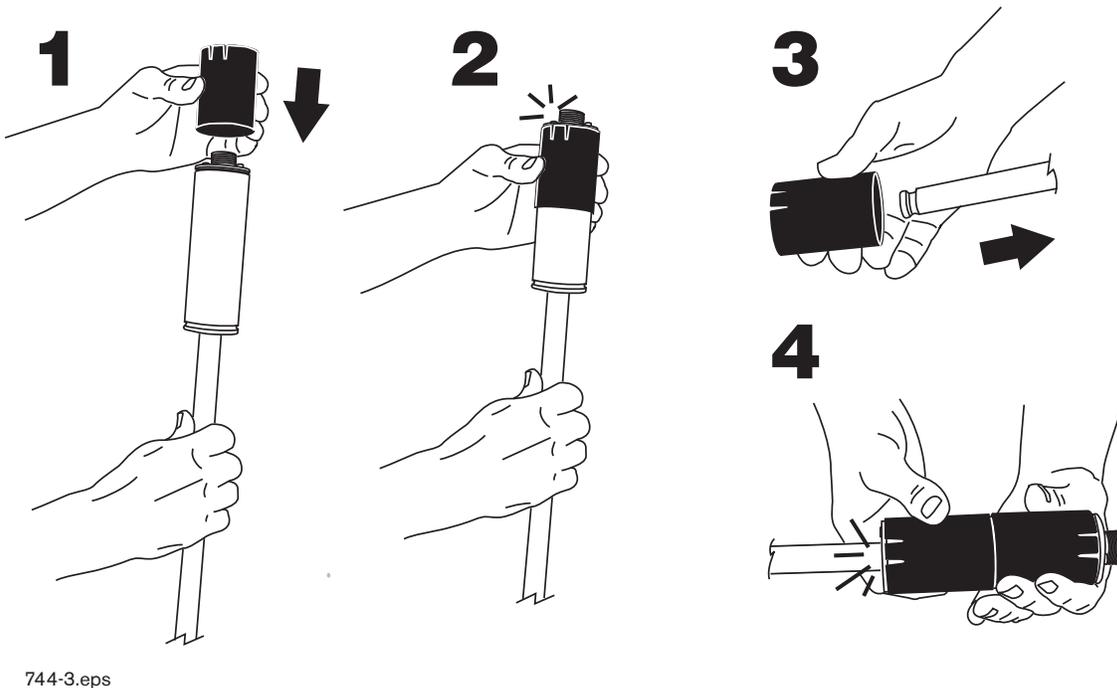


Figure 7. Installing Probe Canister Insulator Sleeves

Attaching Probe Canister Spacer Rings (3- & 4-Inch Risers)

1. Open the Probe shipping carton so that you have access to the probe. Open the installation kit.
2. Set the spacer vanes for a 3- or 4-inch riser (see Figure 8) as required. Install the two spacer rings onto the probe canister as shown in the figure below. Note: you must slide the bottom spacer over the probe and onto the lower end of the canister.

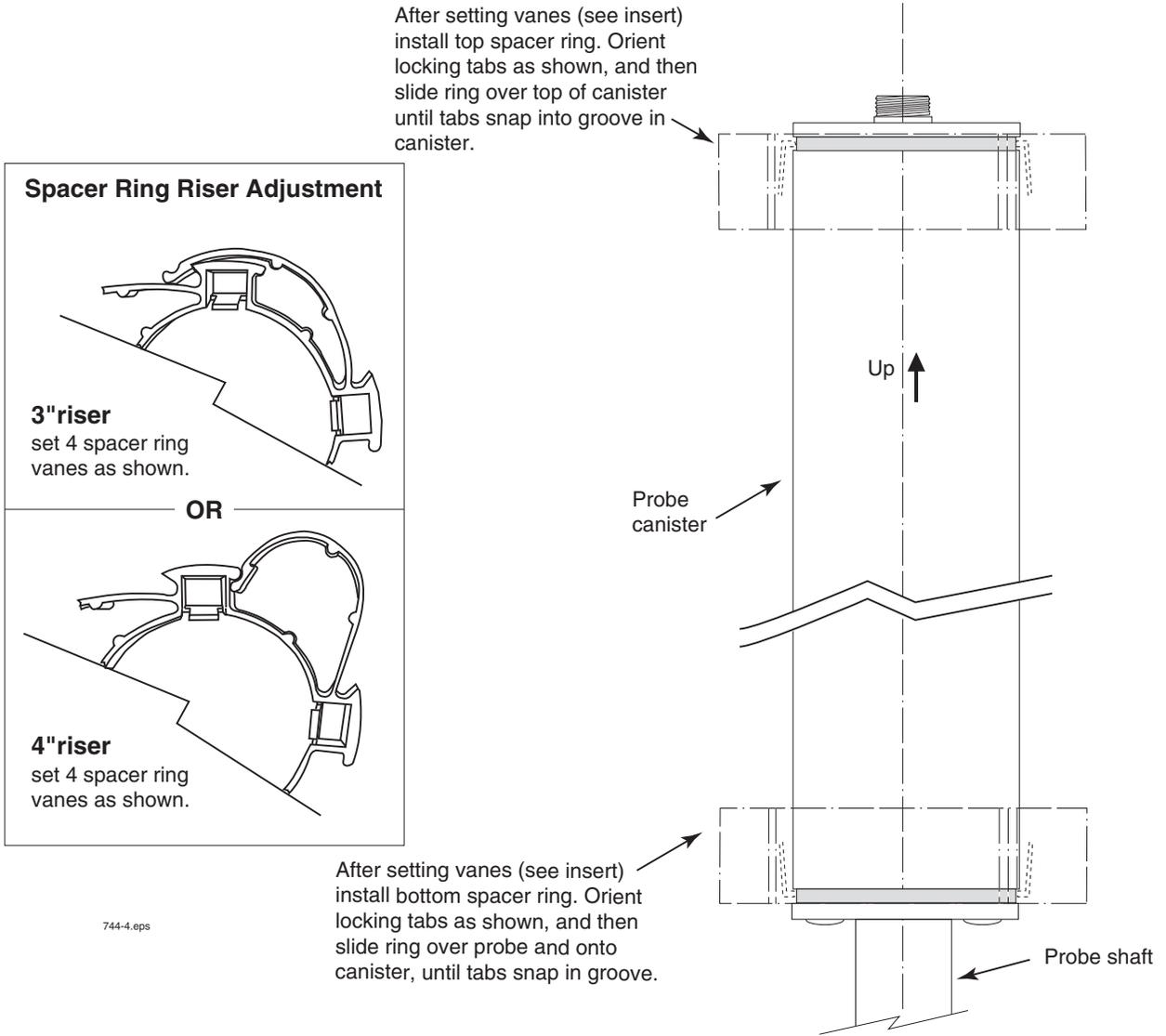


Figure 8. Installing Probe Canister Spacer Rings

Assembling Floats onto Probe Shaft

The Product floats, Water Floats (if ordered), and Boots from Probe Installation Kits are assembled on the probe shafts in the exact sequence and orientation shown in Figure 9.

IMPORTANT! Failure to push the boot as far as possible onto the probe shaft could cause the boot and float(s) to fall into the tank. The boot must be pushed on until it “locks” on the probe shaft. Also, water floats must be installed, if ordered, for the probe to operate correctly.

Handle the probe carefully. Striking or dropping the probe will result in loss of calibration and could cause permanent damage.

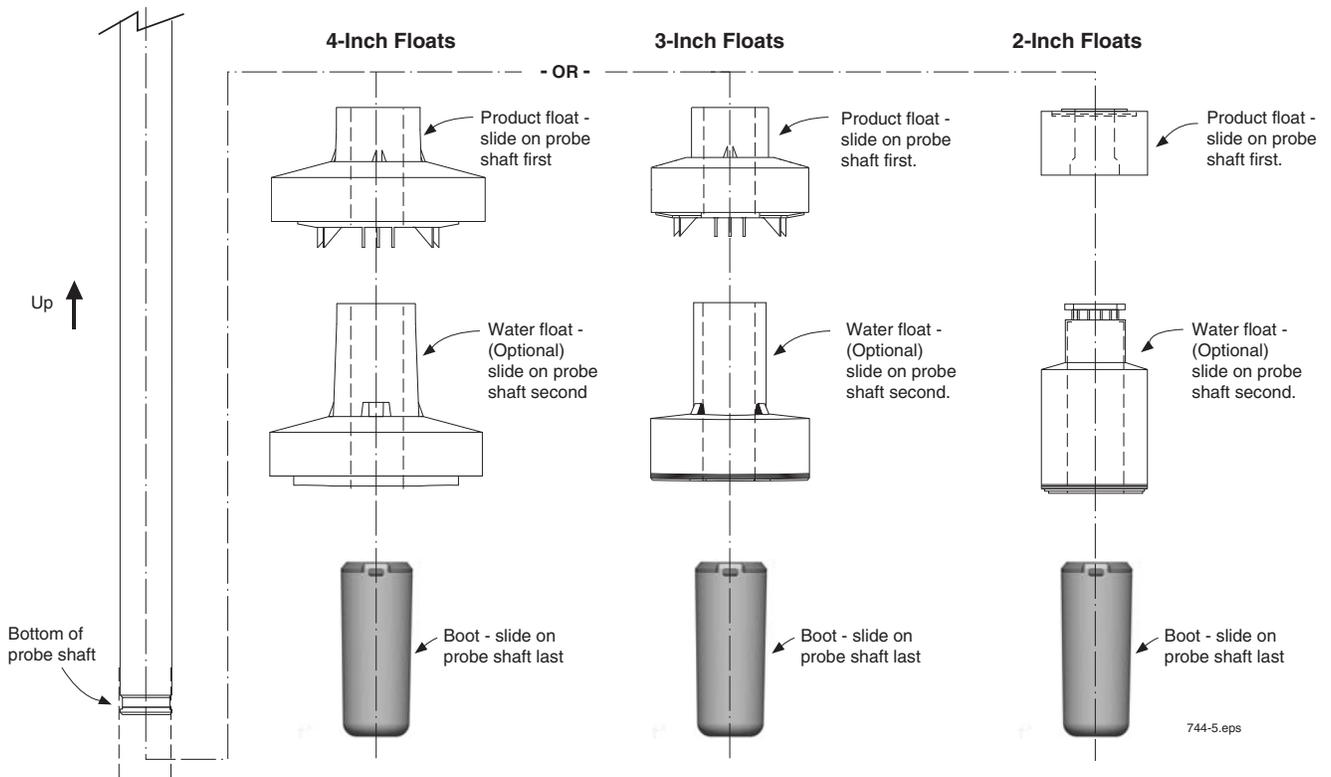


Figure 9. Probe float installation

Mag Probe Installation

UST/AST Tank - Dedicated Riser



1. Turn OFF power to the console.
2. Remove any sludge from the bottom of the tank.
3. Check that floats, boot, and cable are assembled correctly on probe.
4. Gently slide the float(s) to the bottom of the probe shaft before raising the probe. Carefully lower the probe into the riser pipe until the boot rests on the bottom of the tank [See Figure 10 for example UST installation or Figure 11 for example AST installation].



WARNING! Handle probes carefully. Striking or dropping the probe will result in loss of calibration and damage to the probe.

5. Attach the connector end of the probe cable to the threaded connector on top of the probe canister and tighten down the integral nut.

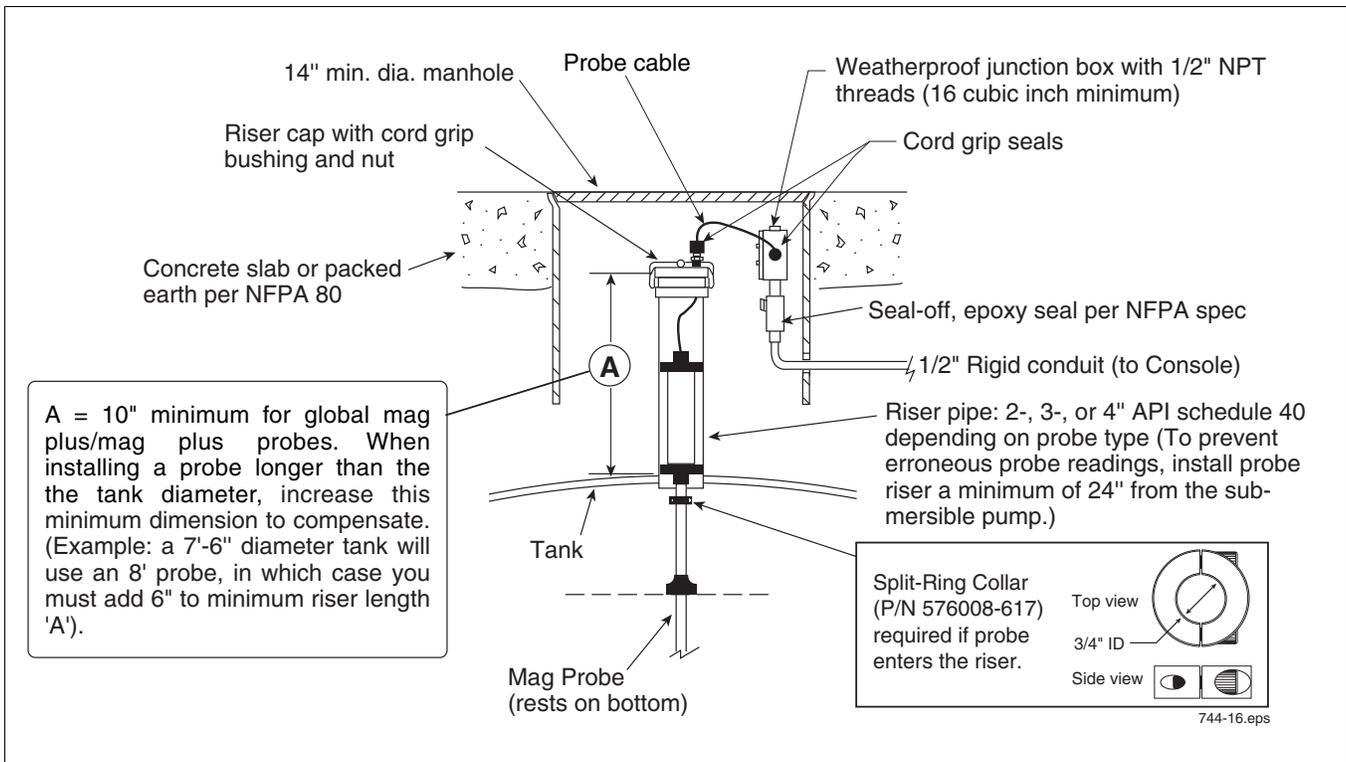


Figure 10. UST Probe Installation - Dedicated Riser

UST RISER CAP ATTACHMENT

1. If you are using the one piece cap (see Figure 3 on page 7), push the end of the probe cable through the cord grip bushing and nut on the cap, leaving a minimal amount of slack between the probe and cap. Screw the cap onto the riser by hand until the gasket first contacts the pipe. Then lightly tap the cap with a hammer to tighten it an additional 3/4 turn. Go to Step 3.

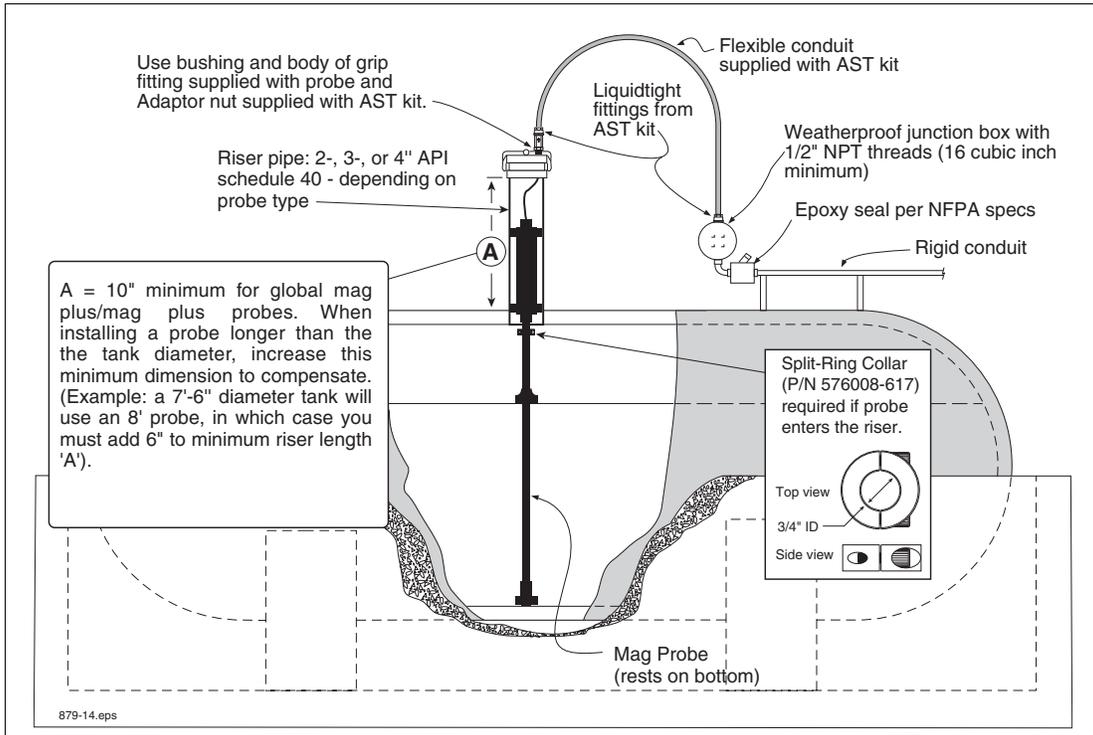


Figure 11. AST Probe Installation - Dedicated Riser

2. If you are installing the metal cap and adapter ring (see Figure 4 on page 8), screw the ring onto the 4" riser until the gasket contacts the pipe, then use a pipe wrench to tighten it an additional 3/4 turn. Push the cable through the metal cap and cord grip, then clamp the cap onto the ring.

At sites that require installation of a riser adaptor (Phil-Tite M/F 4X4 or equivalent) at the top of the riser, do so following the manufacturer's instructions. Next screw the adapter ring from the Veeder-Root kit (P/N 312020-952) onto the riser adaptor by hand until the gasket contacts the sealing surface. Then use a torque wrench attached to an appropriate strap wrench (K-D Specialty tools nylon strap oil filter wrench, or equivalent) and tighten the ring to 35 - 45 ft-lbs. Loosen the cord grip nut and push the cable through the metal cap and cord grip, then clamp the cap onto the ring (see Figure 12).

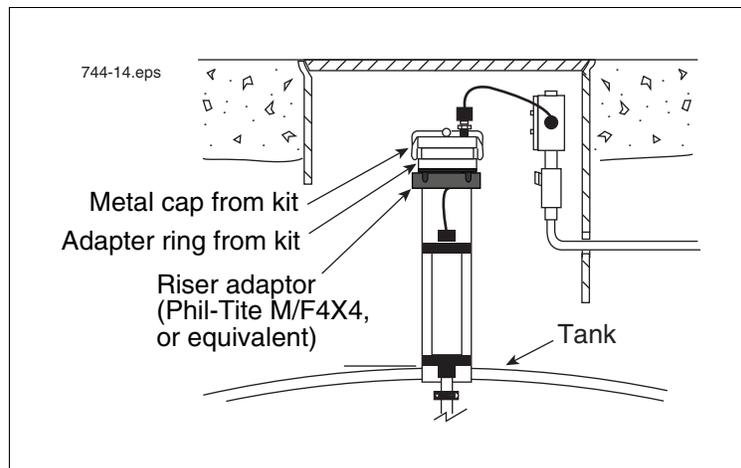


Figure 12. Installing a riser adaptor beneath the metal cap and adapter ring

3. Make sure there is a minimal amount of slack between the probe and cap, then tighten the cord grip nut until the cable is held firmly. Push the end of the cable through the field J-box cord grip, then tighten that cord grip nut as well. Splice and seal the wires in the J-box.

AST RISER CAP ATTACHMENT

1. If you are using the one piece cap (see Figure 3), push the end of the probe cable through the cap and cord grip bushing, leaving a minimal amount of slack between the probe and cap. Discard the cord grip nut and attach the Adaptor Nut from the AST kit to the cap (see Figure 6). Tighten the Adaptor Nut until the cable is held firmly. Go to Step 3.
2. If you are installing the metal cap and ring (see Figure 4), screw the ring onto the 4" riser until the gasket contacts the pipe, then use a pipe wrench to tighten it an additional 3/4 turn. Using UL-classified pipe sealant (suitable for the fuels involved), screw the cord grip fitting into the tapped hole and tighten. Place the cord grip bushing in the fitting. Discard the cord grip nut and loosely screw the Adaptor Nut from the AST kit onto the cord grip fitting (see Figure 6). Push the cable through the metal cap, bushing, and Adaptor nut, then clamp the cap onto the ring. Make sure there is a minimal amount of slack between the probe and cap, then tighten the Adaptor Nut until the cable is held firmly.
3. Next assemble the liquid tight connectors on both ends of the flexible conduit as shown in Figure 6. Push the cable through the flexible conduit assembly and into the J-box. Connect the flexible conduit assembly to the Adaptor Nut on one end and the J-box on the other.
4. Tighten the fittings until snug. Splice and seal the wires in the J-box.

Mag Probe Field Wiring Connections

Figure 13 shows the field wiring diagram of the probe to console cable. Observe polarity.

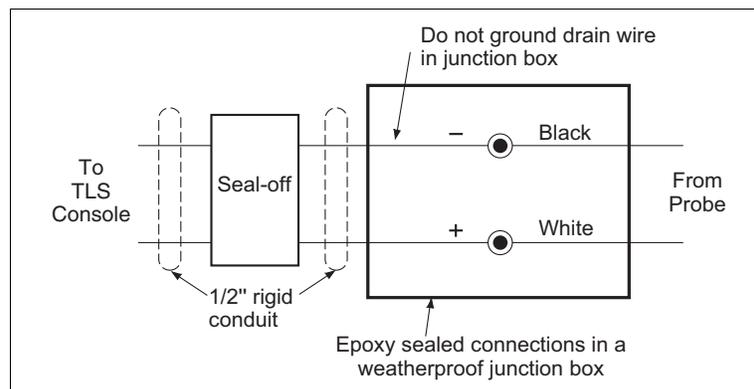


Figure 13. Field Wiring Probe to Console Cable

SEALING FIELD CONNECTION

Wiring Run Through Rigid Conduit

1. Route the wire from the probe canister into the weatherproof junction box. If necessary, pull the two-wire cable from the console into the junction box.
2. Using wire nuts, connect the two wires from the probe to the two wires from the console. To observe polarity, record wire colors or tag wires when making these connections at the console.

3. Seal wire nuts with epoxy sealant following the instructions in Figure 14.

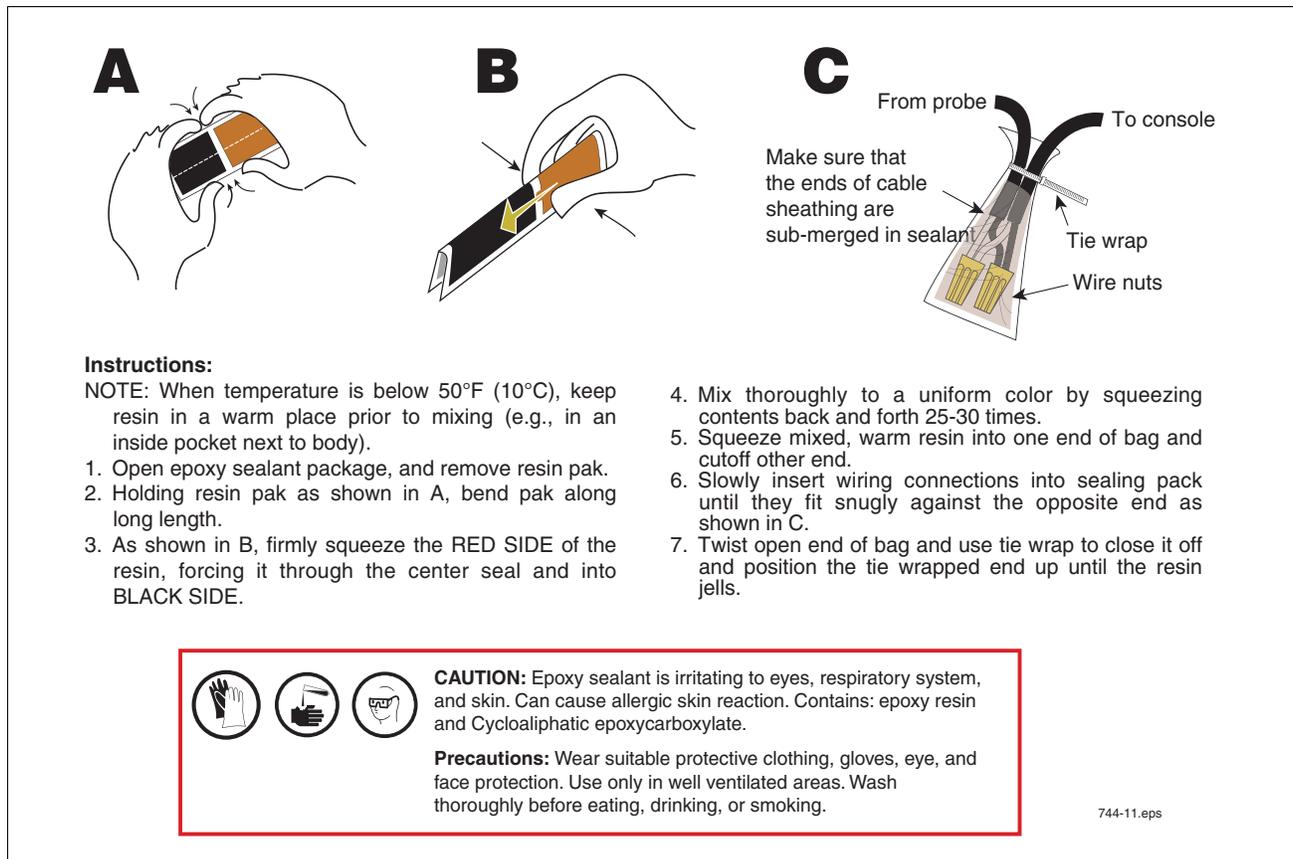


Figure 14. Epoxy Sealing Probe and Sensor Field Connections

4. Do NOT terminate shield or drain wire in the field junction box, ground shield and drain wires at console only.
5. Place the bag with the resin sealed wiring connections in the junction box. Replace and tighten the junction box cover.

DIRECT BURIAL CABLE

When using direct burial cable for probe-to-console wiring runs, the sealing materials and procedure are completely different. Refer to the Direct Burial Cable Installation Manual 576013-858.

