Manual No: **577014-031** • Revision: **E**

TLS Magnetostrictive Probes

International Installation Instructions

VEEDER-ROOT

Notice

Veeder-Root makes no warranty of any kind with regard to this publication, including but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

Veeder-Root shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this publication.

The information contained in this publication may be subject to change without notice.

Full GVR EMEA contact information contact information and product documentation is available for viewing and download by distributors from the GVR Extranet: *www.mygvr.com*

Distributors requiring GVR Extranet login details should contact *Eumarketing@gilbarco.com* to obtain an ID and password.

Introduction

Mag Plus Probe Installation Kits

Probe Installation

Appendix A - Surge Protection Risk Assessment

Figures

Tables

Introduction

General

This document describes the procedures necessary to prepare a site for the installation of the Veeder-Root TLS Series Underground Storage Tank Monitoring Systems in locations governed by the ATEX Directive 2014/34/EU, UKEx regulation 2016 No. 1107, or locations that recognize the IECEx scheme.

For installing UL/cUL approved Mag Probes use Manual No. 577013-744.

Veeder–Root maintains a continuous process of product development and therefore product specifications may not be as described in this manual. Please contact the Veeder-Root office nearest you, or visit our website at https://www.veeder.com/us/ for information on new or updated products. Changes affecting products or procedures described in this manual will be reported in subsequent revisions. Veeder–Root has taken every care in the compilation of this manual; however it is the installers' responsibility to take every precaution to safeguard themselves and others.

Every person working with Veeder–Root equipment is expected to take every safety precaution possible and to have read this manual, particularly the sections referring to health and safety.

Deviation from the specifications contained in this manual can result in rework, delays in system installation and additional installation charges. Contractors are advised to contact their nearest Veeder–Root office where local conditions may preclude using the specifications contained in this manual.

Related Manuals

- 577014-055 Grounding and Surge Protection: Recommended Practice
- 577013-578 TLS Monitoring Systems: Contractors' Site Preparation Guide
- 577014-127 Intrinsically Safe Circuit Protectors: Installation References
- 577014-358 Intrinsically Safe Circuit Protectors: Installation References - Type Ga

Product Description

SYSTEMS

All Veeder–Root systems have been designed for ease of operation. System consoles have liquid crystal display screens and one-touch function keys to guide the user through all operating functions. The status of all in-tank probes and leak detection sensors is available immediately on the LCD screen, on the system's printer or, through the system's communication facilities, on the point-of-sale terminal or back office computer.

IN–TANK PROBES

Magnetostrictive probes are ATEX/UKEx Certified as Ⓔx II 1/2 G Ex ia IIA T4 Ga/Gb and II 1 G Ex ia IIA T4 Ga per CERTIFICATE NO. 06 ATEX 0508841X/UL21UKEX 2174X

And, IECEx certified as: Ex ia IIA T4 Ga/Gb per Certificate No. IECEx UL 06.0001X

Mag Probe ingress protection rating is IP 68 at a depth of 3 meters with a duration of 30 days as tested by the notified body (ExNB) UL LLC.

Depending on probe type, canister material may be aluminum or black conductive polymer.

For further information on the performance and specification of in-tank probes, please contact your local Veeder-Root representative.

SURGE PROTECTORS

In a Veeder-Root system, each Intrinsically Safe Device may use an optional surge protector in place of the weatherproof junction box located in Zone 1. Surge protectors consist of a certified in-line device or a simple apparatus conforming to the requirements of Standard No. IEC/EN 60079-14, Electrical installations design, selections and erection.

Surge Protectors are either an ATEX/UKEx Certified Device as Ⓔx II 2 G Ex ia IIA Gb T4 per Certificate No. DEMKO 13 ATEX 13060507X/UL22UKEX2390X or are Simple Apparatus. Surge Protectors can also be an IECEx certified device per Certificate No. IECEx UL 13.0074X.

Health And Safety

SAFETY SYMBOLS

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

 **EXPLOSIVE** Fuels and their vapors are extremely explosive if ignited.	 **NOTICE** Important information and/or recommended practice.
 **WARNING** Pay close attention to the stated procedures and precautions to avoid the noted hazards.	 **RESPIRATORY IRRITANT** Epoxy sealant is irritating to eyes, respiratory system, and skin. Use only in well ventilated areas.
 **GLOVES** Wear gloves to protect hands from irritation or injury.	 **WEAR EYE PROTECTION** Epoxy sealant in contact with eyes can cause serious injury. Always wear eye protection when sealing wire splices.
 **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.	

GENERAL

Ensure that all local council and EU laws and regulations are complied with. Also ensure that all recognised safety codes are followed.

Every person working with Veeder–Root equipment is expected to take every safety precaution possible in the installation of TLS Systems.

Contractors must ensure that supervisory personnel on the installation site are aware of their presence and requirements, especially the provision of safe working areas and isolation from AC electrical power.

Leaking underground tanks can create serious environmental and health hazards. It is the contractor's responsibility to comply with the instructions and warnings found in this manual.

Substitution of specified components may impair intrinsic safety.

⚠ WARNING

An explosion could occur if other wires share ducts with intrinsically safe probe or sensor wiring. Ducting for probes and sensors must not contain any other wiring circuits except where permitted by local wiring codes and regulations.

FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.

EQUIPMENT PROTECTION

TLS monitoring equipment, including the Magnetostrictive Probe, is designed and certified to comply with the Directive 2014/34/EU (ATEX), UKEx regulation 2016 No. 1107 and the IECEx scheme. The installer must consider any local regulations, which may differ or be more stringent, prior to installing any equipment. The suitability/safety of any installation is ultimately determined by the local authority having jurisdiction.

The Magnetostrictive Probe that is part of the TLS Monitoring System is equipment Category 1 intended to be installed in a Zone 0 hazardous location. Extreme care must be taken when determining the suitability of the installation conditions and operation of the TLS Monitoring System. Procedures for installing either in a process connection or riser pipe are detailed beginning on page 14. At least the following items must be considered and will aid in the determination if a probe is to be installed in a process connection or riser pipe:

1. Equipotential grounding of the installation site,
2. Minimizing static hazards associated with the underground storage of flammable liquids, and
3. Protection of the system against lightning strikes and any other source of possible electrical surges caused by electrical railway systems, high voltage direct current facilities and the like.

EQUIPOTENTIAL GROUNDING

Consult any local regulations prior to installing a Magnetostrictive Probe into any tank. Veeder-Root supplies approved process connections for installations where direct connection between the probe body and tank structure is required (see Probe Installation Using Process Connection instructions below).

The intrinsically safe circuit in the TLS Monitoring System is derived from a fuse protected zener diode intrinsic safety barrier. This type of explosion protection requires that the intrinsically safe electric circuit is referenced to the safety ground associated to the mains circuit. If the site has a submersible pump (DIN/EN 15268) connected to the same mains safety ground as the TLS Monitoring System Console and it is installed in a metallic riser of a metallic storage tank, the zener diode barrier must be referenced to the same earth (safety) ground.

MINIMIZATION OF ELECTROSTATIC HAZARDS

Consult any local regulations prior to installing a Magnetostrictive Probe into any tank. Veeder-Root supplies approved process connections for installations where direct connection between the probe body and tank structure is required (see Probe Installation Using Process Connection instructions below).

The magnetostrictive probe housing complies with the 500 volt electrical strength requirements in IEC/EN 60079-11. In addition, the probe housing provides an electrostatic dissipative path to the zener diode barrier earth ground that must be referenced to the common grounding system. The electrostatic resistive path is less than 1 megohm.

All TLS Consoles provide an alarm if either of the two wires to the magnetostrictive probe is disconnected or short circuited due to a malfunction.

If a probe must be serviced or replaced, observe any required relaxation time prior to opening any covers and removing the probe.

LIGHTNING AND SURGE PROTECTION

Consult any local regulations prior to installing a Magnetostrictive Probe into any tank. Local rules or regulations may require surge arrestors when installing equipment that crosses from a less restrictive zone, e.g., Zone1 to Zone 0 independent of the risk assessment. When required Veeder-Root can supply appropriate surge protection devices.

In locations where the intrinsically safe cables or circuits are considered to be at risk of developing hazardous potential differences within Zone 0, an external surge protection device may be needed. Perform the lightning risk analysis to determine if surge protection is required, and if necessary, the surge protector shall be installed in accordance with IEC/EN 60079-25 and IEC/EN 60079-14. Reference Figure 11 and Figure 12 for mounting locations for a surge protector.

When they are deemed necessary, Veeder-Root requires the installation of external surge protection devices that are classified as simple apparatus only. Only gas-discharge type surge protectors that comply with Clause 12 of IEC/EN 60079-25 are acceptable. Additional installation requirements for surge protection devices are defined in Clause 16.3 of standard IEC/EN 60079-14.

A Surge Protection Risk Assessment checklist (SPRA) is available in Appendix A of this manual.

TYPE CERTIFICATES FOR AN INTRINSICALLY SAFE SYSTEM

TLS Monitoring Systems are installed according to the conditions specified in the applicable Certificates. ATEX/ UKEx Certificate Number DEMKO 06 ATEX 137480X, UL21UKEX2358X and IECEx ULD 08.0002X are referred to as the system certificate or parent certificate for all of the equipment in a TLS Monitoring System.

Except for the cables used to connect intrinsically safe apparatus, information contained on the system certificate and each of the device certificates, provide the safety related information (Ex ia) required to install a TLS Monitoring System. Cables used to connect intrinsically safe apparatus must be considered in determining compliance and are limited to the maximum allowable cable parameters listed in this manual. For assistance in calculating the required (Ex ia) safety parameters, contact GVR as described on the inside cover of this manual.

For European Union (EU) installations, additional equipment compliance information is available on the EU Declaration of Conformity including reference to the technical standards applied by the Notified Body (ATEX) or Approved Body (UKEx) in creating the respective Certificates

THESE ARE THE CONDITIONS FOR SAFE USE WHEN INSTALLING A MAG PROBE

1. The devices have been evaluated in conjunction with the intrinsic safety system defined in DEMKO 06 ATEX 137480X/UL21UKEX2358X. The descriptive system documents and manuals included with the aforementioned certificate must be followed during installation and the appropriate Veeder Root accessories must be used. Manual 577014-031 details applicable process connections in accordance with EN 60079-26.
2. The following condition of safe use applies to the Mag Sump Sensor: Before installing or taking 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 device 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 & clothing is required.
3. The enclosure contains aluminum. Care must be taken to avoid ignition hazards due to impact of friction.

WARNING

Important Considerations - Read Prior to Installation - Metallic/Steel Tanks

Process Connection (gland): Must be used in locations where it is mandatory that the Mag Probe be equipotentially bonded to the tank structure.

Riser Pipe: May be used in locations that do not require bonding between the Mag Probe and the tank structure. Reference European Norm IEC/EN 60079-14: Explosive atmospheres - Part 14: Electrical installations design, selection and erection.

Cathodically Protected Tanks: Installation selection is dependent on the considerations listed above for the Process Connection and the Riser Pipe.

Only install TLS Magnetostrictive Probes according to one of the four procedures listed below:

Wired Connections – Mag Probe to ATG Console wiring - see Figures 1 and 18.

1. Process Connection (gland) – Zone 1 installation, Surge Protector not required
2. Riser Pipe – Zone 0 installation, Surge Protection Risk Assessment (SPRA) required

Wireless Communication – Mag Probe with RF hardware - see Figures 2, 24 and 25

3. Process Connection (gland) – Zone 1 installation, Surge Protector required
4. Riser Pipe – Zone 0 installation, Surge Protector required

Before You Begin

1. Consult any local regulations prior to proceeding to determine the best installation method. The instructions below detail how to safely install probes with process connections or in a riser pipe and will also help in determining when surge protection is required or may be necessary.
2. Depending on the considerations above, perform a Surge Protection Risk Assessment (SPRA) of equipment in the site. A (SPRA) checklist is available in Appendix A of this manual.
3. Verify the equipment needed to complete the installation as described in this manual, and, if necessary, any equipment required following completion of the site Surge Protection Risk Assessment (SPRA).

Procedures for Installing Mag Probes

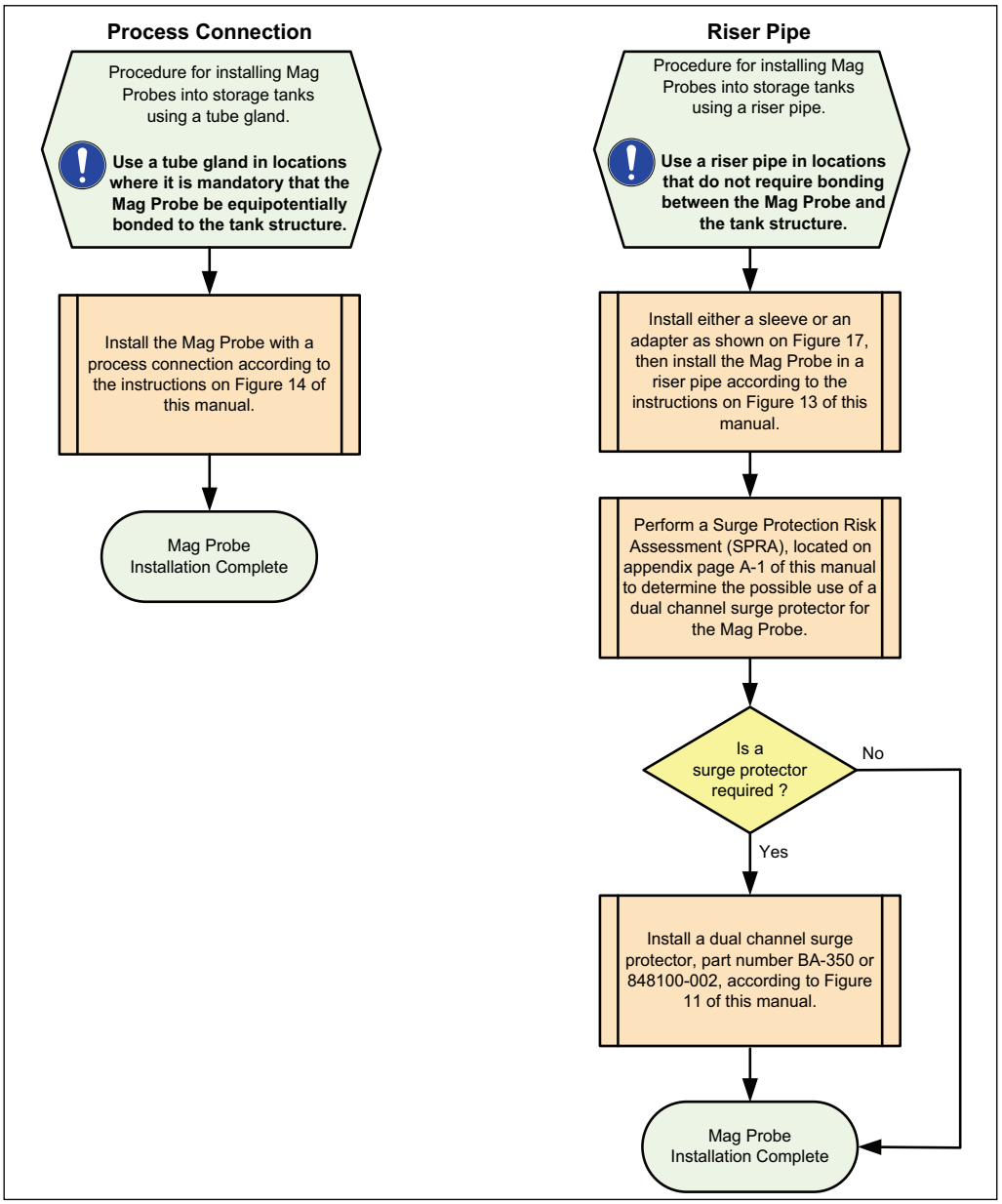


Figure 1. Procedures For Installing Mag Probes Using Wired Connections

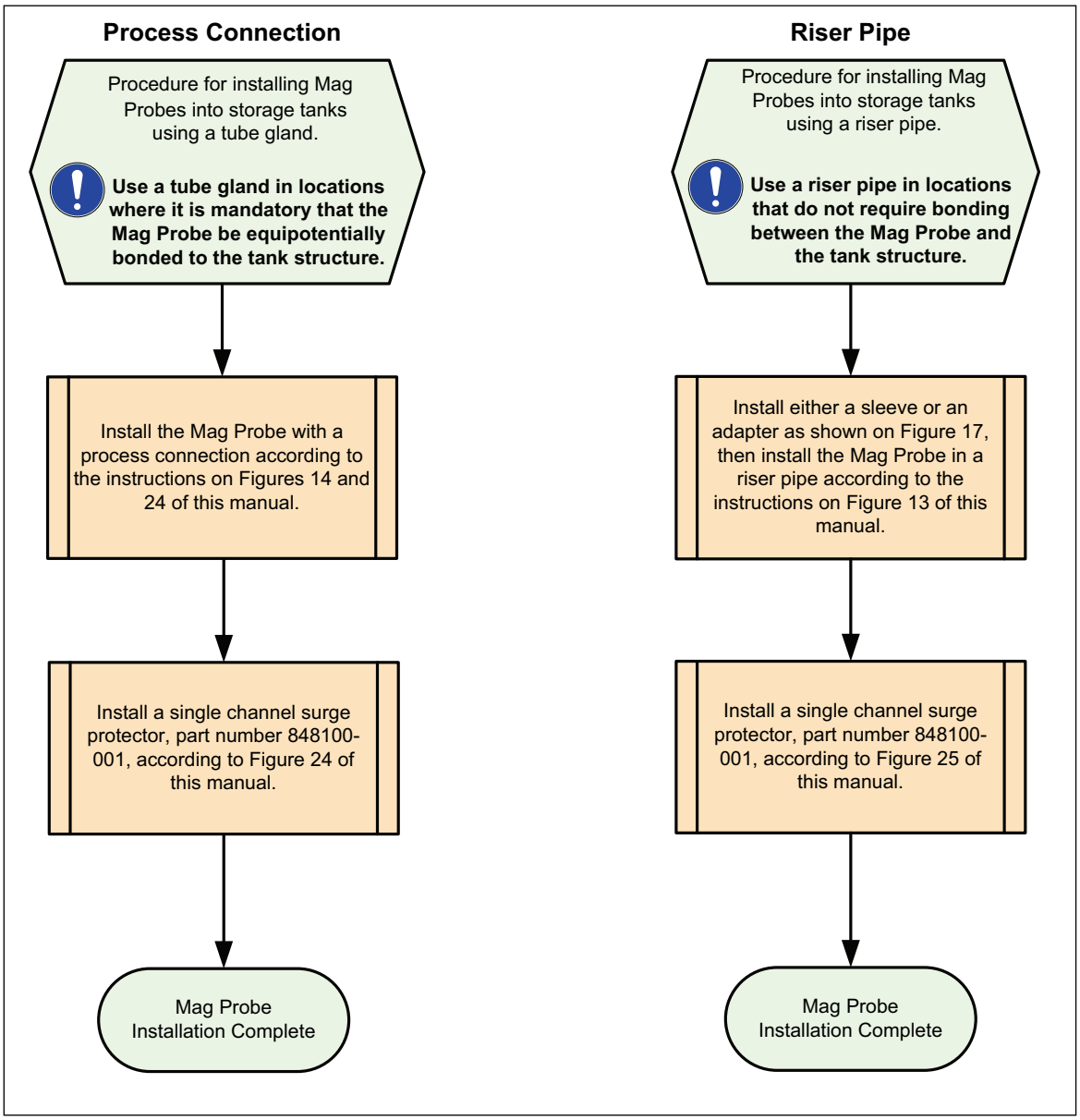


Figure 2. Procedures For Installing Mag Probes Using Wireless Connections

Mag Plus Probe Installation Kits

The Mag Plus Probe Installation kit.

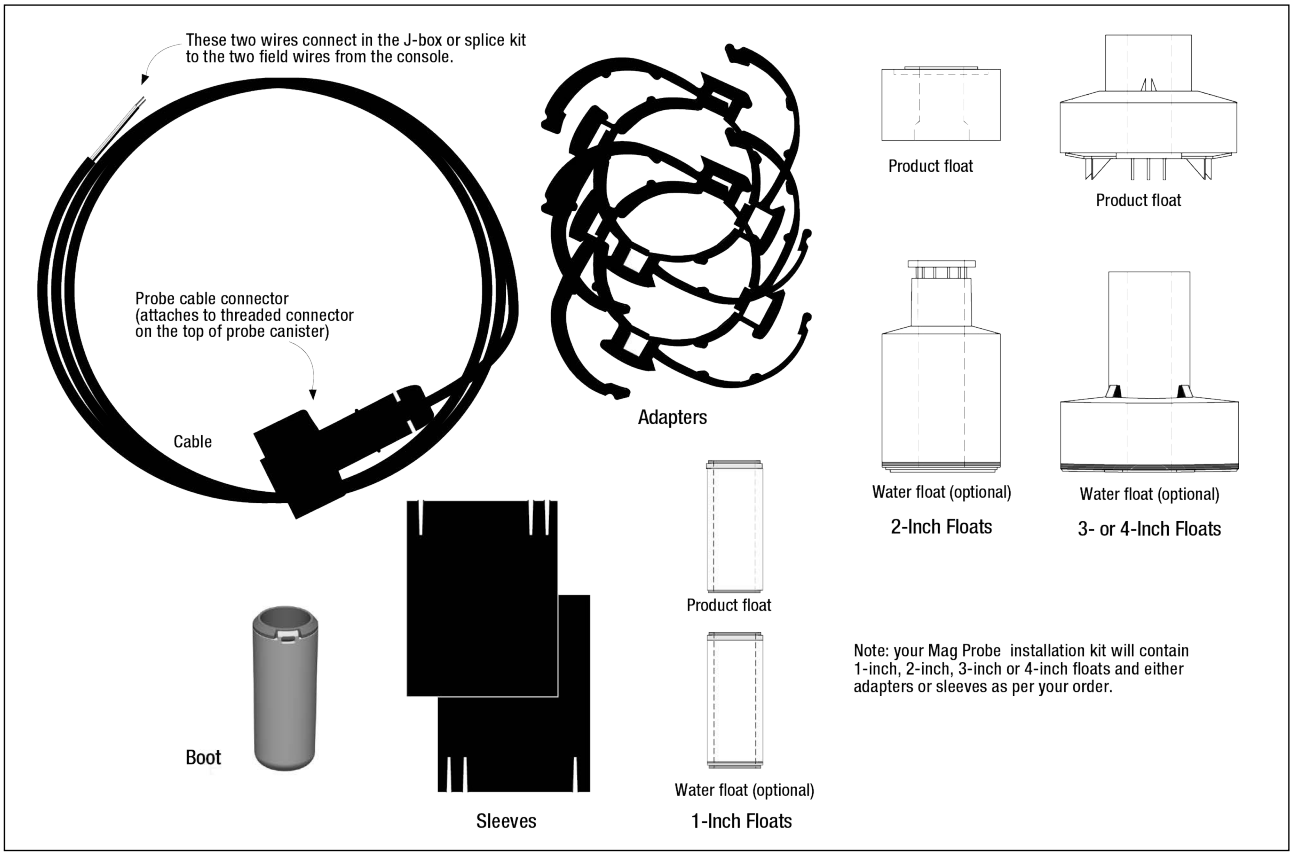


Figure 3. Mag Plus Probe Installation Kit 846402

Cable Seal Kit

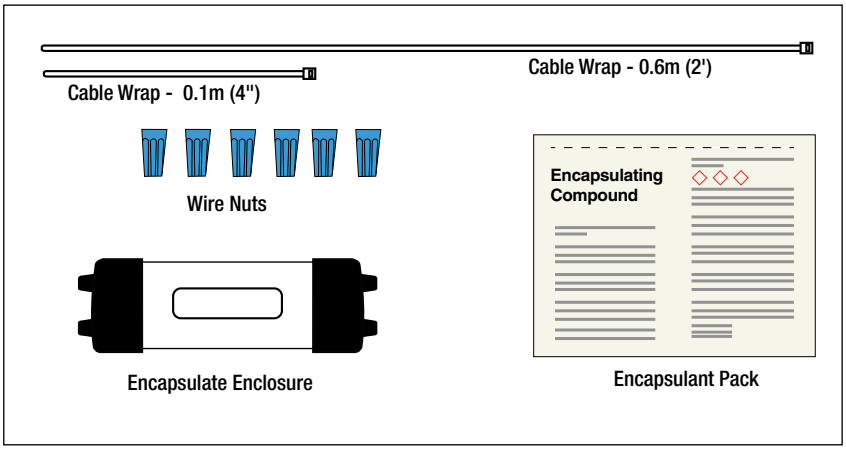


Figure 4. Cable Seal Kit

Surge Protector Kits

When required, a surge arrestor must conform to Clause 12 of IEC/EN 60079-25 and must be installed in accordance with the requirements for surge protection devices defined in Clause 16.3 of standard IEC/EN 60079-14 as follows:

1. Surge protection is required between each conductor of the cable including the screen and the structure where the conductor is not already bonded to the structure.
2. The surge protection device shall be capable of diverting a minimum peak discharge current of 10 kA (8/20 us impulse according to IEC 60060-1 for 10 operations).
3. The connection between the protection device and the local structure shall have a minimum cross-sectional area equivalent to 4mm^2 copper.
4. The cable between the intrinsically safe apparatus in Zone 0 and the surge protection device shall be installed in such a way that it is protected from lightning.
5. Any surge protection device introduced into an intrinsically safe circuit shall be suitably explosion protected for its intended location.
6. The use of surge protection devices which interconnect the circuit and the structure via nonlinear devices such as gas discharge tubes and semiconductors is not considered to adversely affect the intrinsic safety of a circuit, provided that in normal operation the current through the device is less than 10 uA.

For example, the two surge arrestor types shown in Figure 5 and Figure 6, supplied by Gilbarco Veeder-Root, are examples that comply with the above requirements per the manufacturers declaration of conformity.

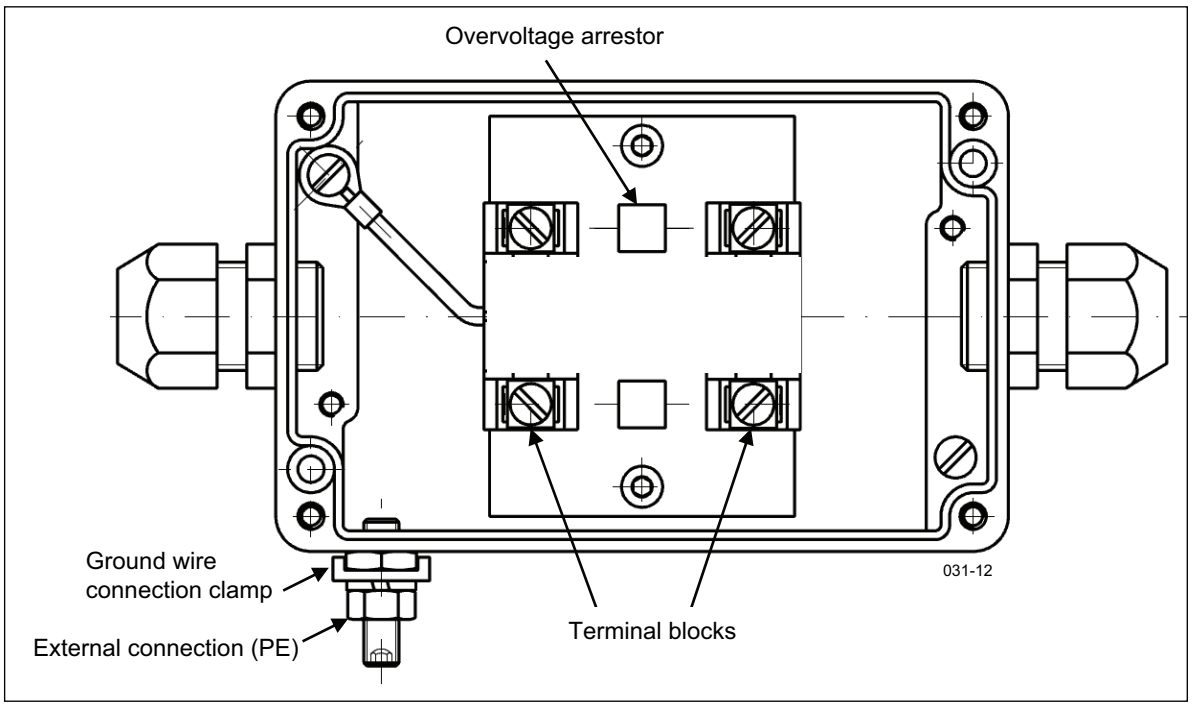


Figure 5. Surge Protector Kit For Wired Installations - Dual Channel Surge Protector BA-350 Or Equivalent

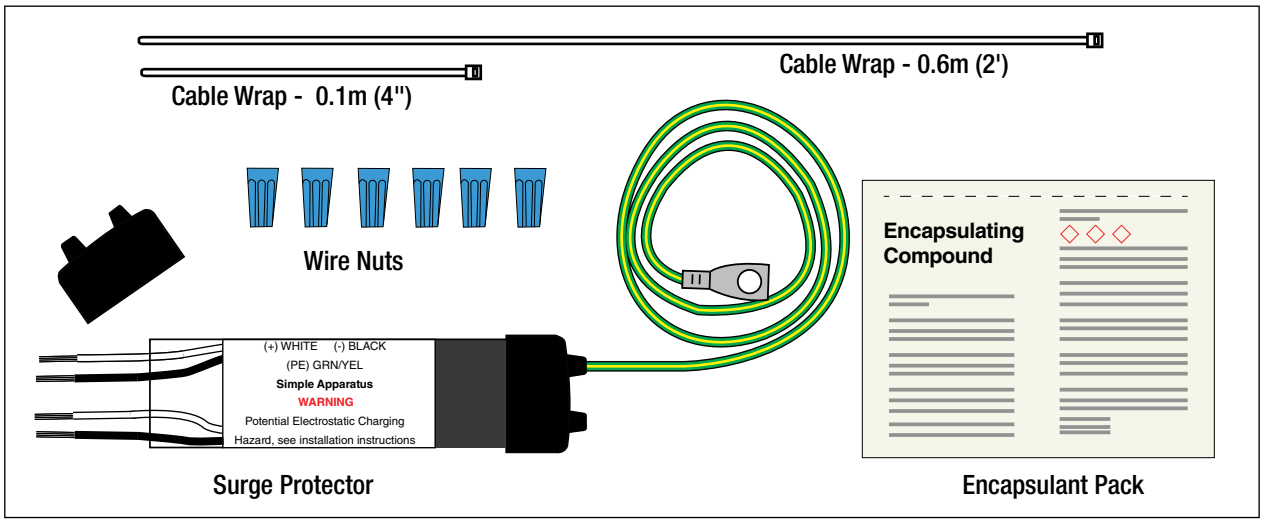


Figure 6. Surge Protector Kit - Single Channel P/N 848100-001 (Wireless) or Dual Channel P/N 848100-002 (Wired)

Process Connections

A suitable process connection, IP67 minimum, is required for sealing a tank riser pipe or for forming an appropriate boundary wall. The two riser caps/glands and process connection gland detailed below can be supplied by Gilbarco Veeder-Root and are included on the manufactures type approval certificates DEMKO 06 ATEX 0508841X/UL21UKEX2174X and IECEx UL 06.0001X and provide IP67 zone isolation and have been additionally subjected to a 10 bar pressure test.

51MM CAP AND GLAND

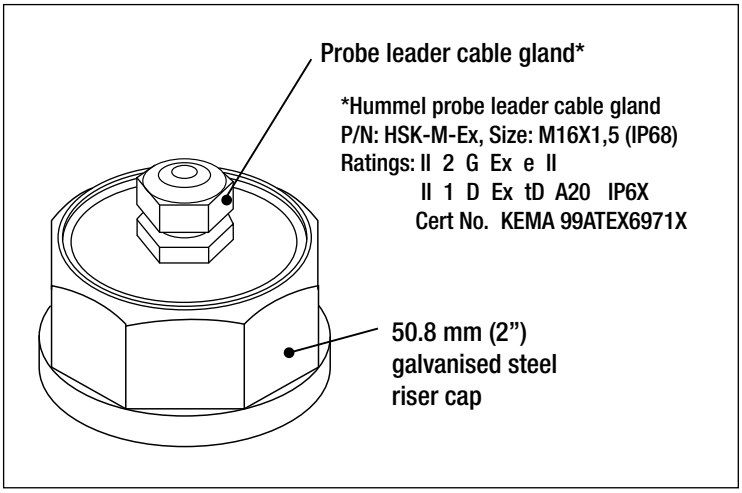


Figure 7. 51mm Threaded Riser Cap Assembly P/N 705-100-2203

76MM CAP AND GLAND

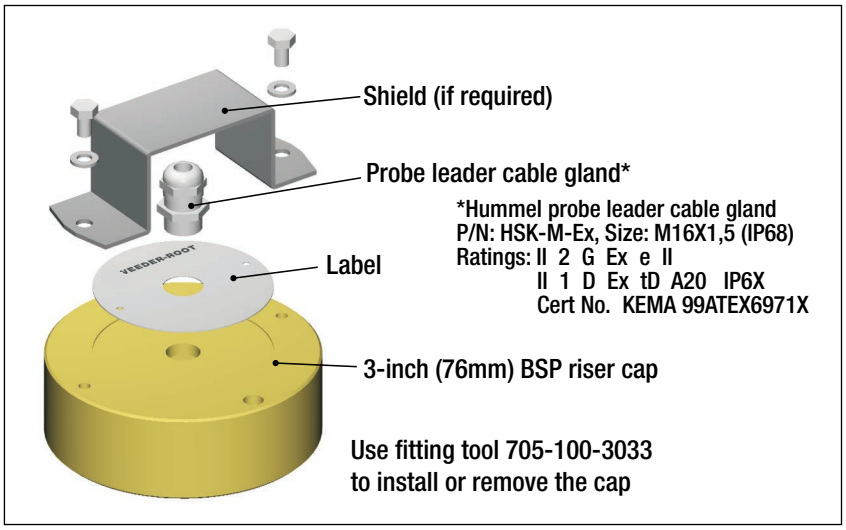


Figure 8. 76mm Riser Cap Assembly

MAG PROBE PROCESS CONNECTION (GLAND)

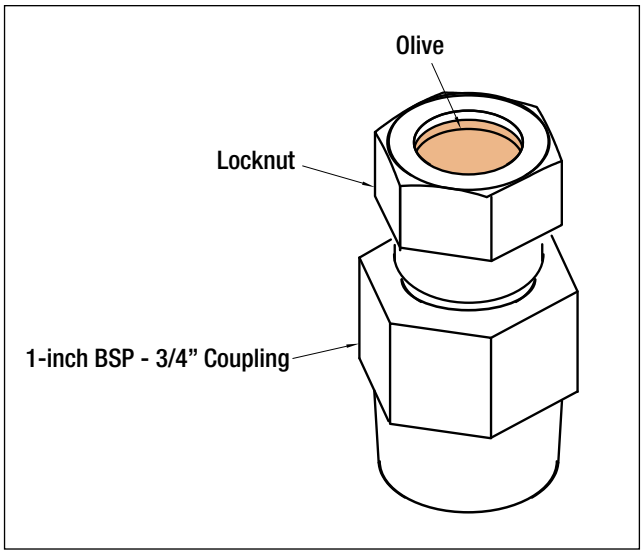


Figure 9. Mag Probe Process Connection (Gland) P/N 501-000-1206

Probe Installation

Access Chamber Installation

GENERAL

The installation of the tank access chamber is the responsibility of the customer or their local site contractor and not that of Gilbarco Veeder-Root. However, there are certain requirements which need to be met to allow the correct installation of Veeder-Root in–tank monitoring probes. Typical wired installations are shown in Figure 10 and Figure 11.

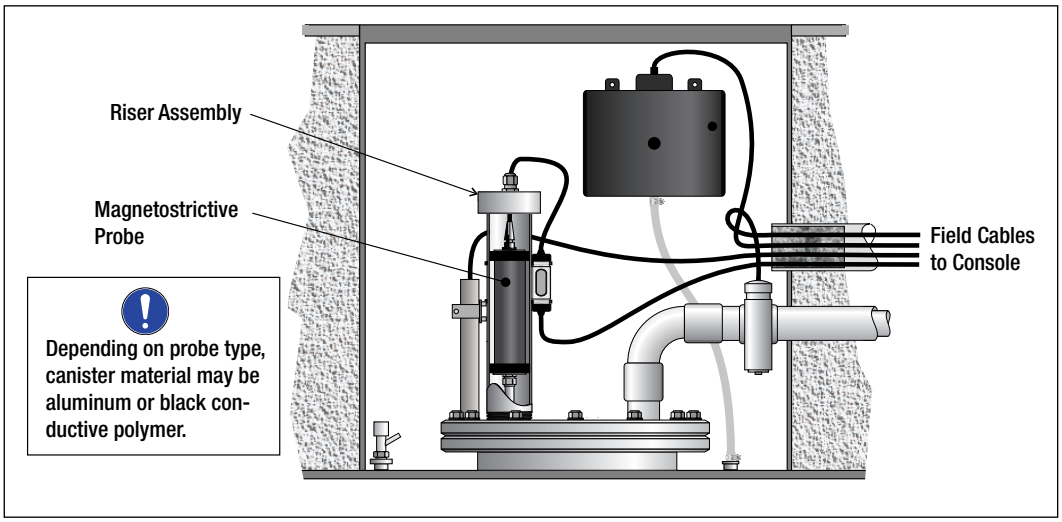


Figure 10. Typical Tank Lid Access Chamber Installation w/o Surge Protector

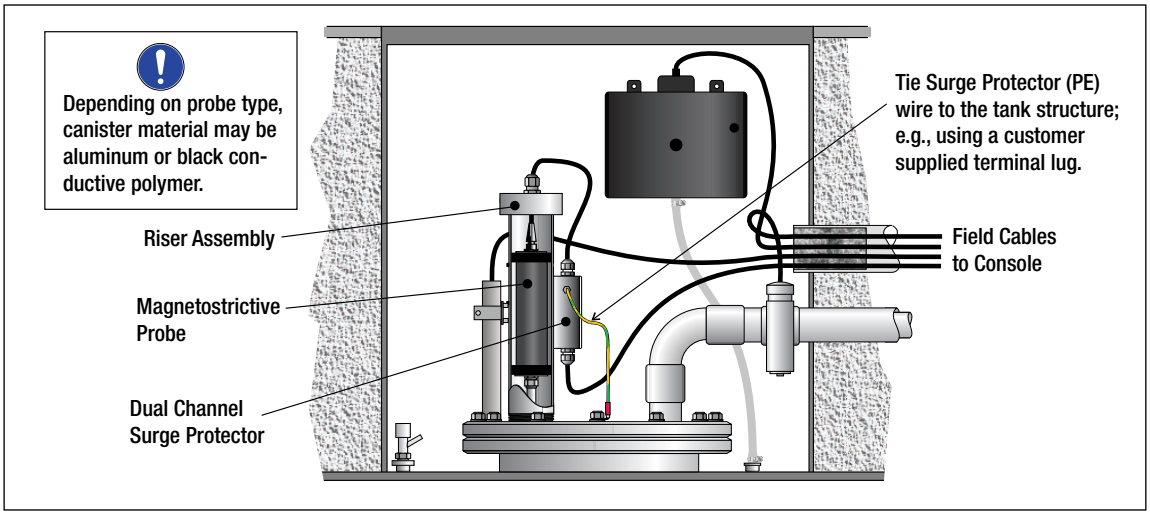


Figure 11. Typical Tank Lid Access Chamber Installation w/ Surge Protector

To allow adequate space for probe installation and servicing, it is recommended that the access chamber is a minimum 750mm deep and 600mm wide at the base. See Figure 12.

PROVISION FOR PROBE RISERS

A dedicated probe tapping of either 2-inch BSP (preferred), 3-inch BSP, or 4-inch BSP must be provided. For maximum height–to–volume accuracy, the probe socket must be as close as possible to the longitudinal axis of the tank.

The probe entry must not be obstructed by other pipe work. A free area above the probe socket of at least 100mm radius from its center must be provided. See Figure 12.

The probe riser probe riser shall comply with IEC/EN 60079-26 and form a suitable process connection across the boundary between zone 0 and zone 1 subject to the approval of the local authority.

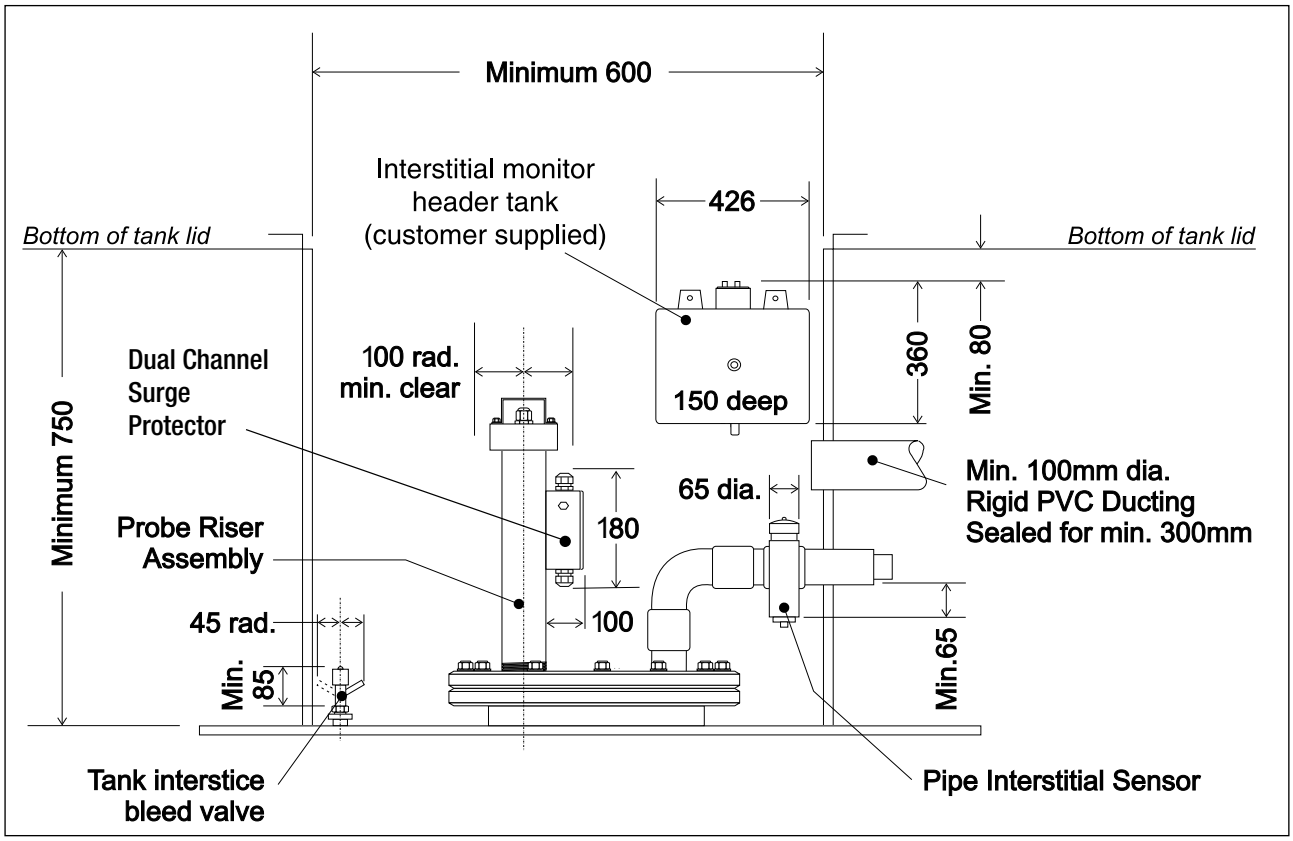


Figure 12. Tank Lid Access Chamber – Critical Dimensions (in mm)

Where mechanical overfill prevention devices are installed, contractors must ensure that no part of these devices will be obstructed when the probe and riser assembly are installed. Failure to comply with this warning may result in the overfill prevention device not operating correctly.

Probe and Riser Installation Criteria

Mag probe installations require a 2-inch or 3-inch (51 or 76mm) riser, regardless of tank entry size. Entry sizes of 1 inch, or entries larger than 3 inches must be with the suitable fittings.

The canister of the probe must be completely contained within the riser. In all cases, the probe must rest on the bottom of the tank (see Figure 13). Risers, when fitted, should be a minimum of 100mm above the probe canister.

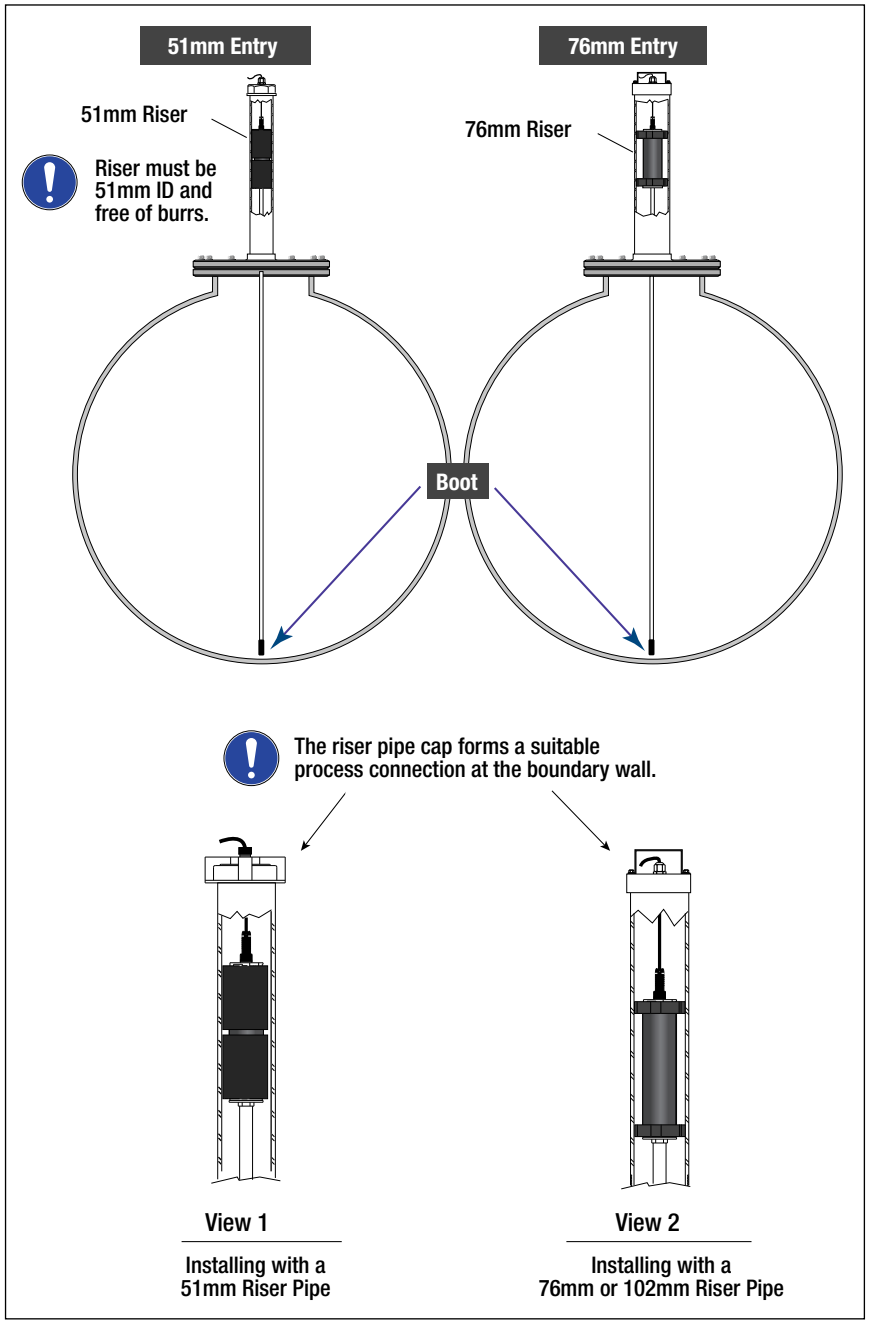


Figure 13. Typical Probe Installations In Riser Pipe

PROBE INSTALLATION USING PROCESS CONNECTION

Certain installations may require a modified probe mounting arrangement consisting of a process connection (gland) mounted directly to the tank lid as shown in Figure 14. Either a dedicated tapping or a suitable flange, tapped G2 inch 11 tpi to DIN 2999 (BS2779) must be provided.

1. Prior to installing or servicing the Magnetostrictive Probe, remove the AC input power going to the TLS Console and verify that the console power is off. During servicing, disconnect the probe cable and remove the probe from the tank.
2. Reference Figure 14 to identify the hardware required to complete this installation.
3. Install the flange onto the tank lid then install the gland adapter. For 3-inch and 4-inch float sizes, install the tube gland and the associated reducer onto the gland adapter prior to performing Step 4.
4. Prior to inserting the Mag Probe, install the tube gland on the probe shaft near the probe canister. Care must be taken to ensure that the probe shaft is not harmed in any way.
5. Add the fuel float and the water float then install the plastic boot on the very bottom of the probe.
6. Insert the probe assembly into the tank and tighten the tube gland to the gland adapter.
7. Slide the Mag probe downward until the boot makes contact with the tank bottom. Lift the probe at least 10 mm (0.4 inch) from the bottom of the tank to account for thermal expansion of the probe. Tighten the tube gland once the probe is at the appropriate height.
8. Connect the probe leader cable to the field wiring using the encapsulated splice kit shown in Figure 4.
9. Restore power to the TLS Console and verify that the system is operating properly.

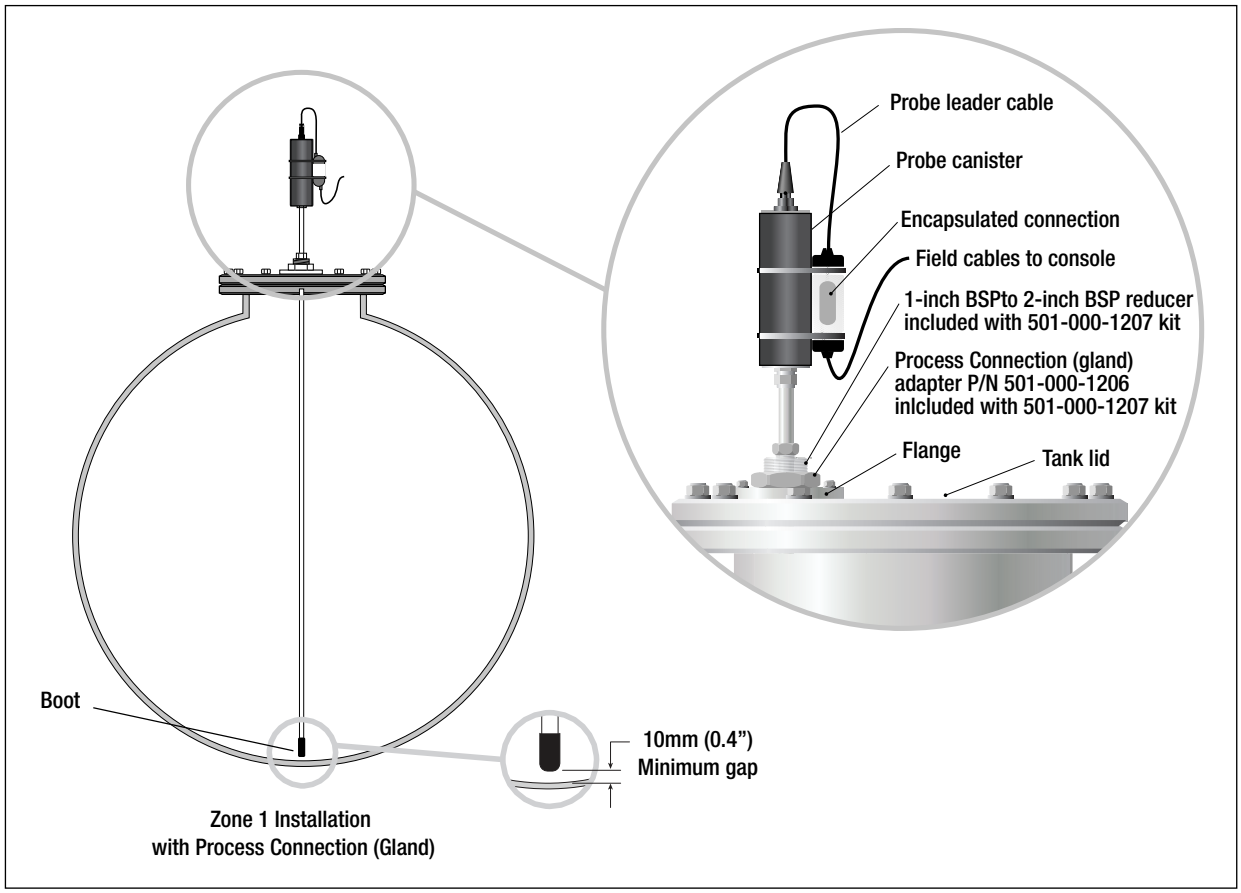


Figure 14. Installation Of A Mag Probe With A Process Connection (Gland)

DETERMINING THE CORRECT PROBE LENGTH

Refer to Figure 15 and carry out the following procedure.

1. Enter dimensions A, B, C, and E in Table 1.
2. Add dimensions B + C and enter this in column “F”.
3. Select a standard probe length that is equal to or greater than the dimension in column “F”. Enter the standard probe Length in column “G”.

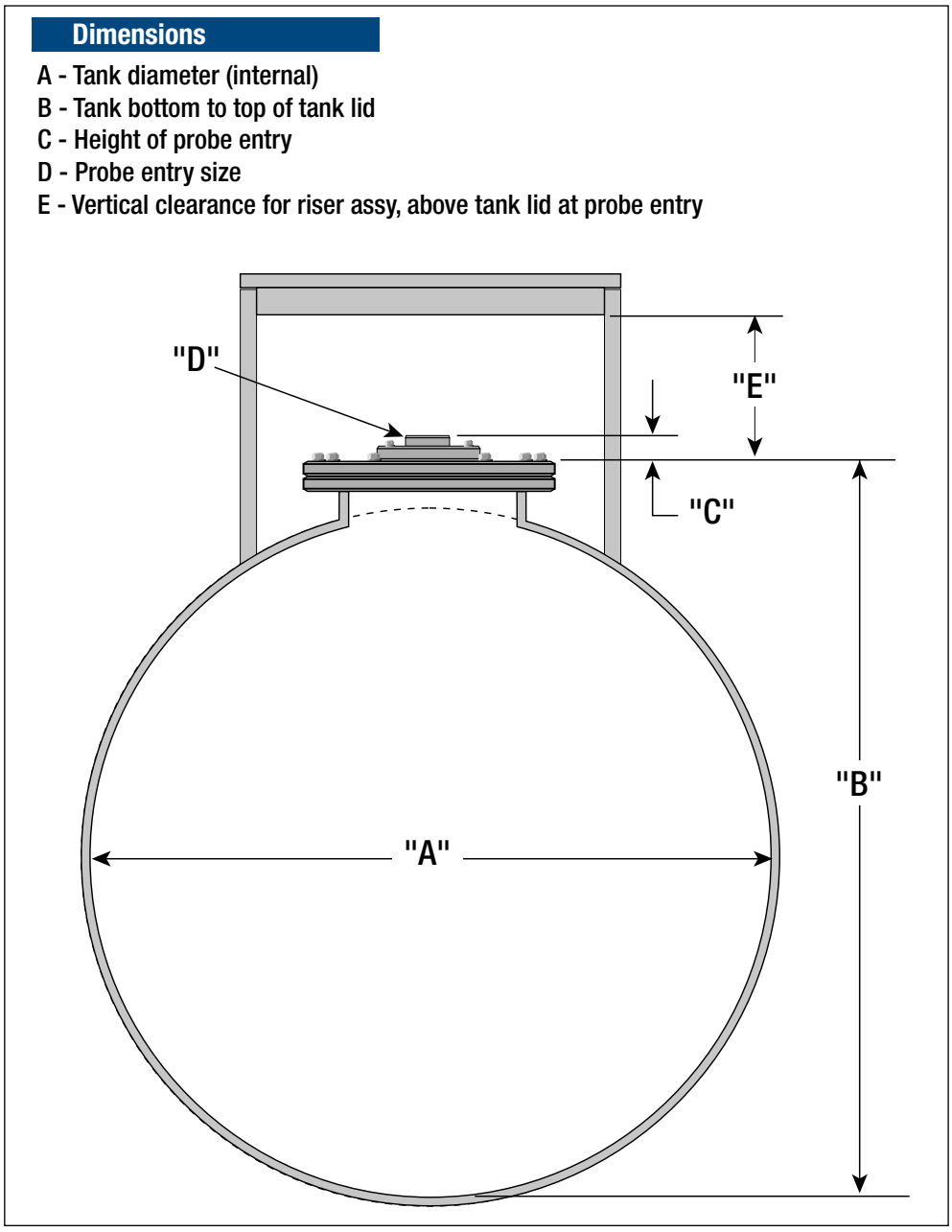


Figure 15. Dimensions Needed To Calculate Custom Probes And Risers

DETERMINING THE MINIMUM ACCESS CHAMBER DEPTH

The minimum access chamber depth, is calculated as follows:

1. To the chosen standard probe Length (“G”), add 290mm, this is the overall probe length; enter this in column “H”.
2. From the overall probe Length subtract dimension “B + C” (bottom of tank to top of probe flange); the result is the minimum access chamber depth. Enter in column “I”.
3. Calculate the actual access chamber depth, dimension “E” minus dimension “C” and enter in column “J”
4. Calculate the probe clearance (“J” – “I”) and enter in column “K”.

Column “K” must be zero or a positive number. If the result is a negative number there is insufficient clearance for the probe and riser assembly. In this case please contact Veeder-Root Technical Support or your local Representative for details on custom length Mag Probes and special skirted risers, having available the dimensions A - E shown in Figure 15.

Table 1. Calculation sheet for determining the correct probe length

TANK No.	A	B	C	E	F Bottom of Tank to Top of Probe Entry “B”+“C”	G Standard Probe Length	H Overall Probe Length “G”+290mm	I Minimum Access Chamber Depth “H”-”F”	J Actual Access Chamber Depth “E”-”C”	K Probe Clearance “J”-”I”
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										

Probe Riser Pipe Installation

A riser assembly consisting of a riser (either 2- or 3-inch [50.8 or 76mm] nominal bore galvanised steel pipe threaded 2- or 3-inch BSPT at each end) and a 2- or 3-inch riser cap, designed specifically for the efficient installation of Veeder-Root magnetostrictive probes, should be used for Mag Probe installation (see Figure 16). Riser caps are normally fitted at the time of probe installation by Veeder-Root authorised engineers. An optional cable shield is available for 3-inch (76mm) riser caps, if required.

Non–standard or locally supplied risers may be made from 2- or 3-inch nominal bore galvanised steel pipe threaded 2- or 3-inch at each end (see Table 2 for allowable riser dimensions).

Remove the plug from the tank socket. Install a 2-inch (50mm nominal bore) or 3-inch (80mm nominal bore) riser using an appropriate thread-sealing compound. Reducers are available for 4-inch (102mm nominal bore) sockets. If the probes are not to be installed immediately, cap the riser.

Where locally supplied, 2-inch risers should be seamless, have a 2-inch ID, and be free of burrs.

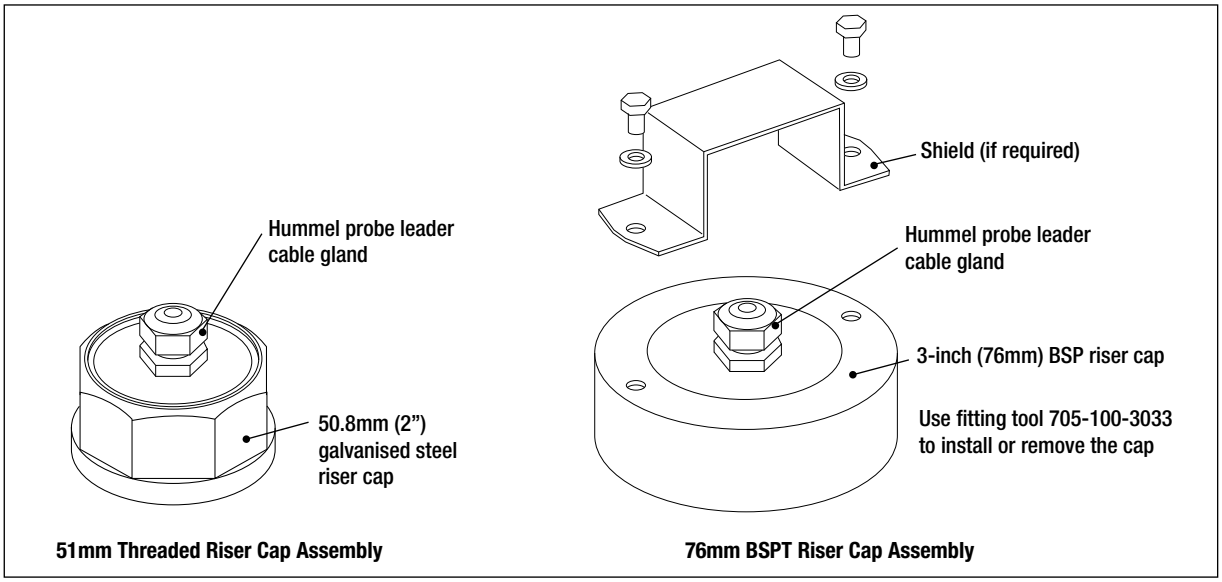


Figure 16. Veeder-Root Riser Cap Assemblies

Table 2. Dimensions for Steel Riser Pipes[1] and Mag Probe Floats

DN[2] Nom Pipe (mm)	NPS[3] Nom Pipe (inch)	ID Nom Pipe (mm)	ID Nom Pipe (inch)	OD Max Float (mm)	OD Max Float (inch)	OD Min Float (mm)	ID Max[4] Pipe (mm)
25	1	26.65	1.049	29.34	1.155	29.08	N/A
50	2	52.51	2.067	47.63	1.875	46.86	55
80	3	77.93	3.068	76.58	3.015	75.82	85
100	4	102.26	4.026	95.63	3.765	94.87	110

[1]Pipe type is iron or schedule 40 steel,
[2]DN = Diameter Nominal,
[3]NPS = Nominal pipe size,
[4]Maximum allowable inside diameter for Mag Probe installation.

PROBE SPACER ASSEMBLY

See Figure 17 for example probe sleeve/adapter assembly instructions.

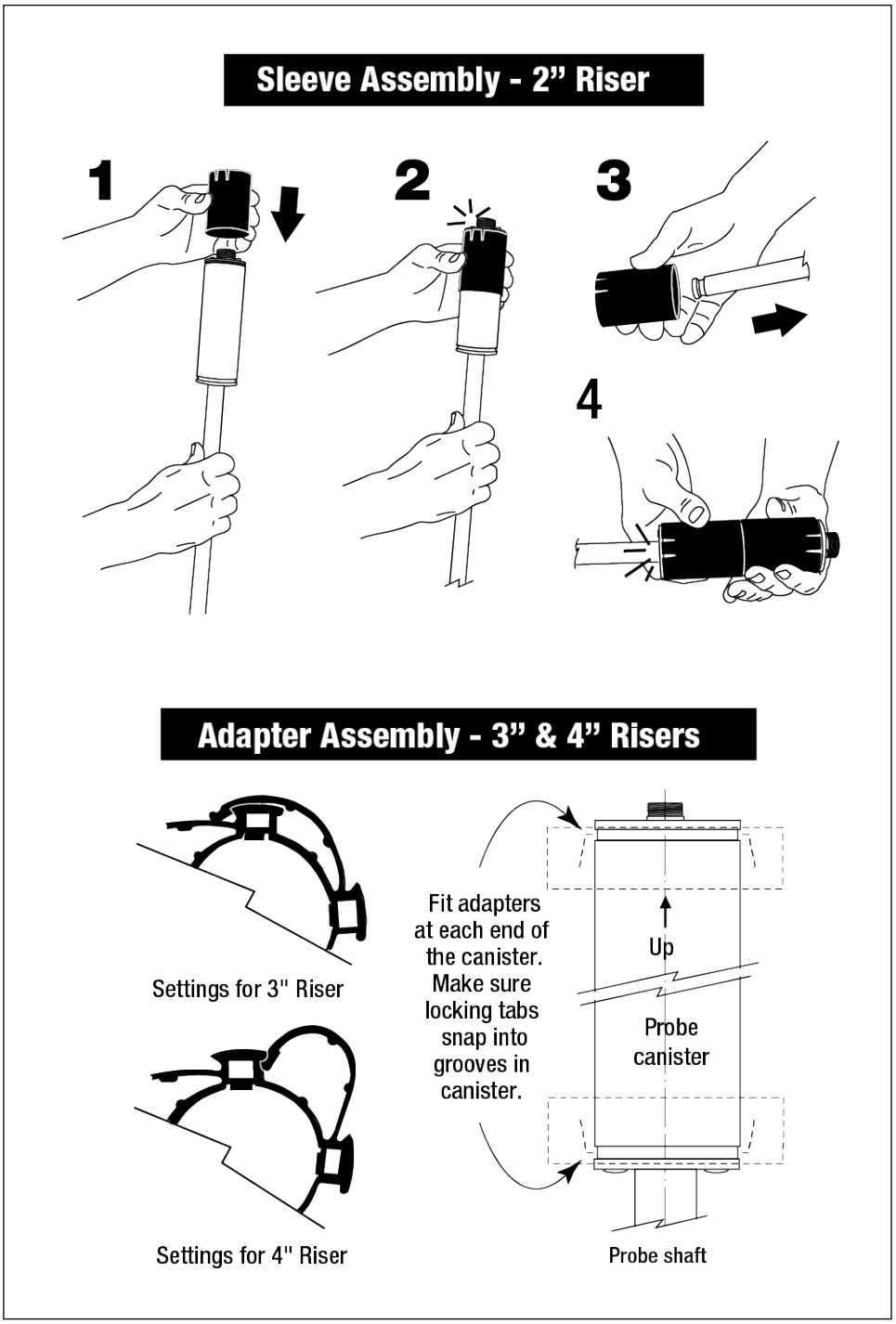


Figure 17. Example Probe Canister Sleeve/Adapter Assembly

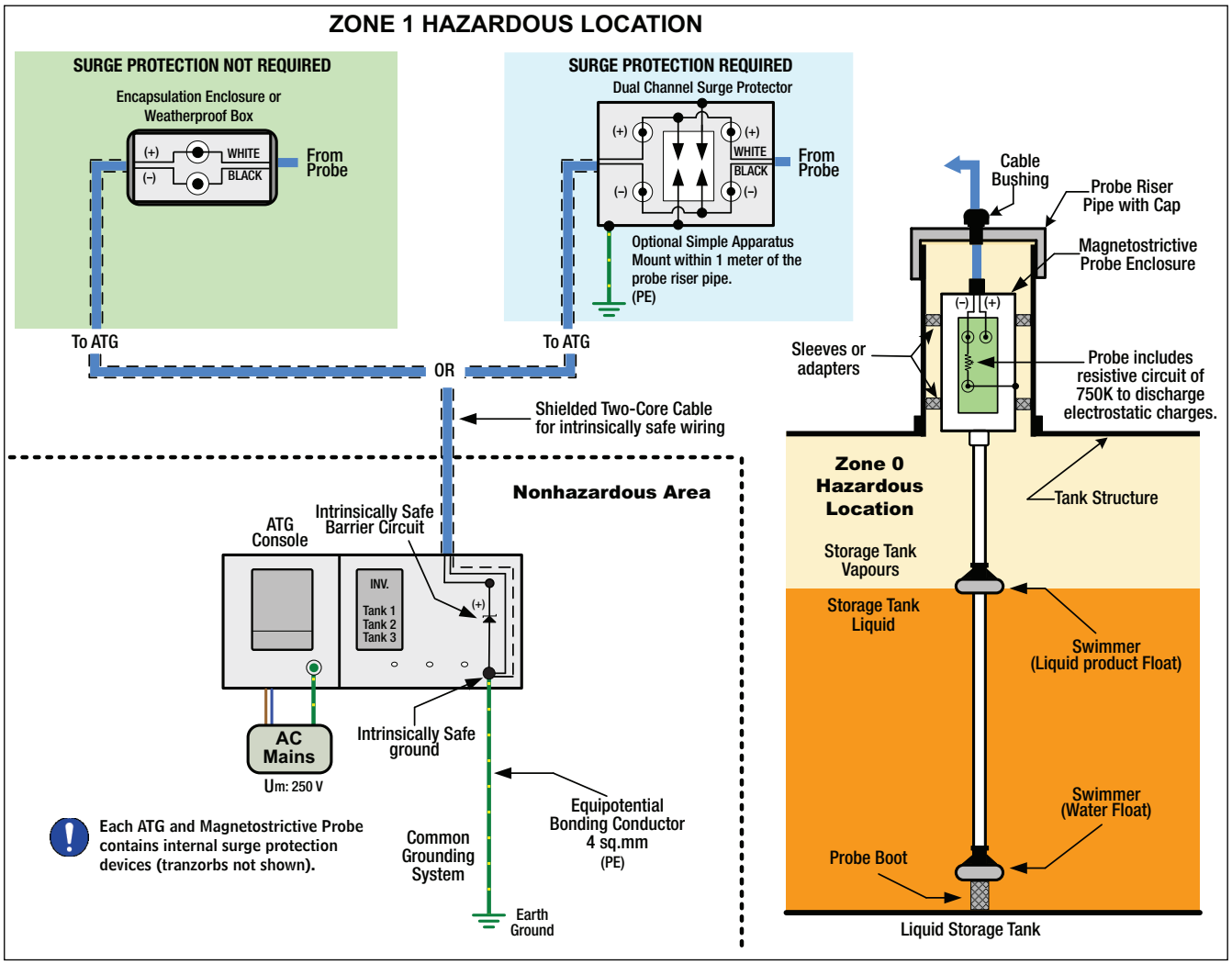


Figure 18. Connection Diagram for a Mag Probe in a Riser Pipe with and without Optional Surge Protection

Field Wiring

PROBE TO TLS CONSOLE

Pull appropriate cable from the each probe location to the TLS console.

An explosion could occur if other, non–intrinsically safe wires share TLS intrinsically safe wire conduits or wiring troughs. Conduits and wiring troughs from probes and sensors to the console must not contain any other wires.

At least 2 metres of free cable must be left for connection at both the TLS console and the probe locations.

Ensure that **all** cables are correctly identified. All probe field wiring **must** be legibly and permanently labelled with the tank number.

Failure to correctly mark probe field wiring may lead to re-work, delays in system installation and additional charges.

MAXIMUM CABLE LENGTHS

A maximum of 305 metres of cable length per probe must be observed.

SPLICING PROBE FIELD WIRING

1. Insert the probe cable through the top of each riser cap and through the Hummel cable leader bushing.
2. Cut the soft vinyl epoxy enclosure end cap entrance holes to accommodate each cable diameter. Keep the hole sizes to a minimum. Insert about 127mm of each cable through the openings [Figure 19]. Remove 76mm of the outer jacket from each cable. Trim the insulation from the conductors.

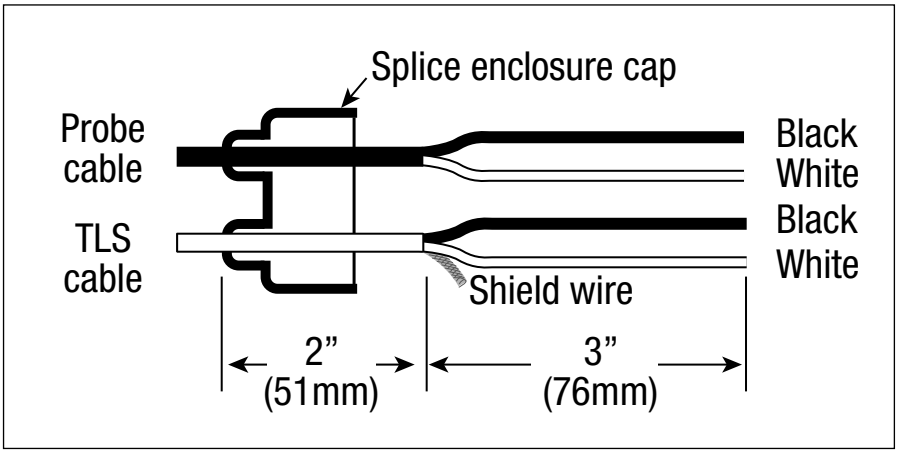


Figure 19. Splice Length Dimensions

3. Make the connections using wire nuts [Figure 20]. Cut off the bare shield wire at the cable jacket.

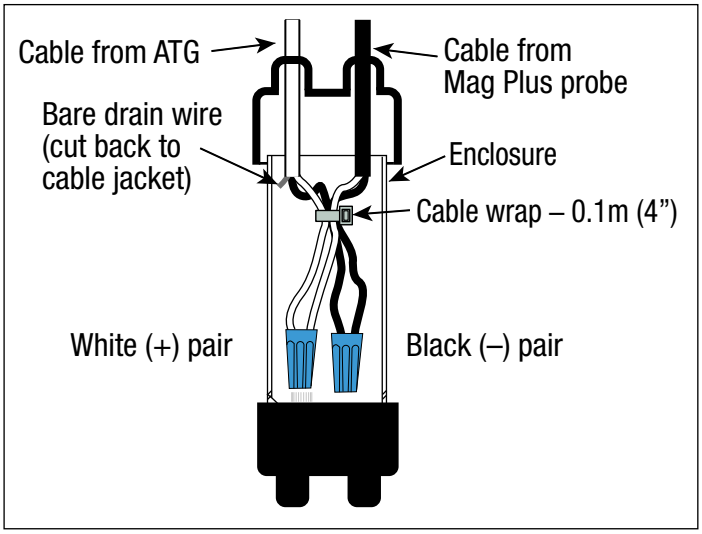


Figure 20. Splice Connections

4. Use the 0.1m [4"] cable wrap to hold the cables together (see Figure 20).

Older kits may contain a split bolt and nut instead of this cable wrap to hold the cables together.

5. Center the splice in the clear plastic sleeve. Assemble the splice enclosure, making sure the sleeve is fully inserted into each of the vinyl end caps. Rotate the sleeve cover until both openings line up. Place the splice on a level surface.

WARNING

Sealing compound contains isocyanate. Vapor and liquid may cause sensitization. May be irritating to the eyes.

Avoid skin and eye contact. Avoid repeated and prolonged breathing of vapor. Use only in well ventilated areas or wear respiratory protection. Wear chemically resistant gloves.

Inhalation – provide fresh air. In case of eye contact flush eyes with plenty of water for 10 minutes and get medical attention. If ingested do not induce vomiting. Get medical attention. Wash with soap and water in case of skin contact.

Store the sealing compound at 16°C (60°F) or warmer until ready to mix. Failure to do so can result in an improper seal once the mixed compound has hardened.

Read the information on the sealing compound package prior to mixing and follow all warnings and instructions provided.

6. Remove bag of "Sealing compound" from foil package. Grasp the ends, one in each hand, then pull sharply to remove plastic clip [Figure 21].

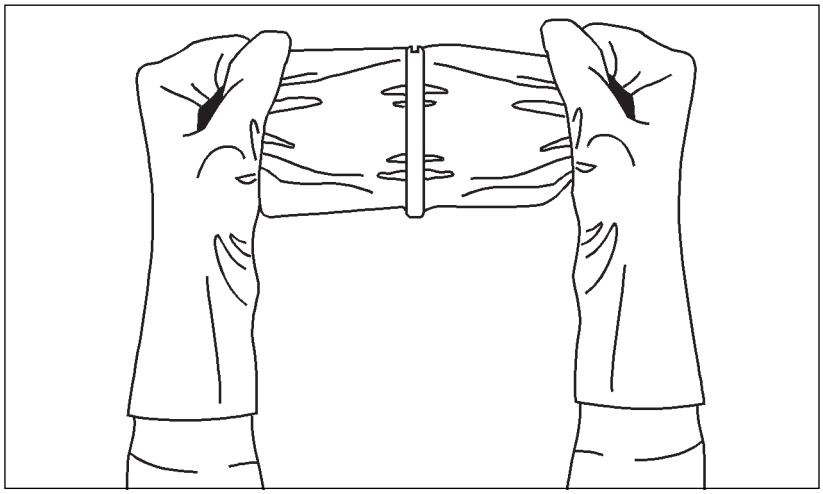


Figure 21. Removing Sealing Compound Clip

7. Thoroughly mix compound together. Invert bag several times while squeezing compound from one end to the other for a minimum of one minute.
8. Once the mixture feels warm, immediately cut one corner and slowly fill the plastic sleeve. Stop just short of filling the entire sleeve. **Do not overfill**. [Figure 22]

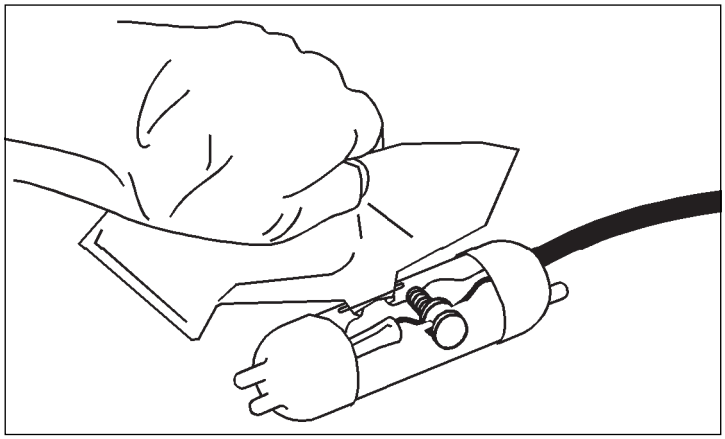


Figure 22. Pouring Sealing Compound Into Sleeve

9. With a twisting motion, rotate the outer clear plastic barrel to close the pouring slot.
10. Wait at least five minutes, then use the large cable tie to mount the splice to the riser pipe or probe canister as applicable (see Figure 23).

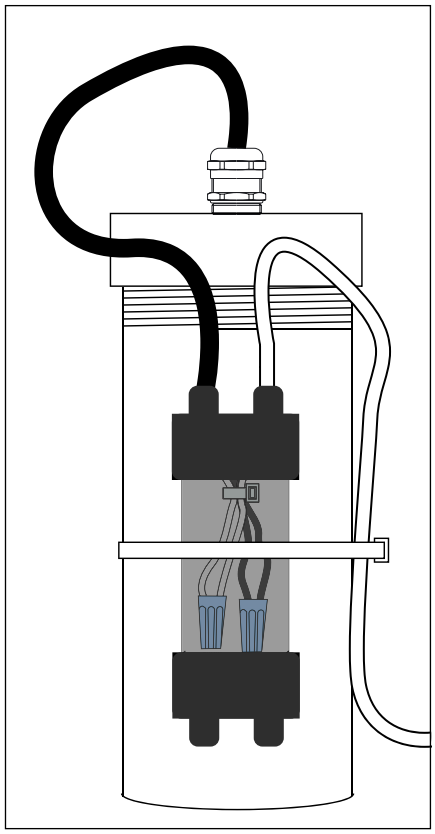


Figure 23. Securing Splice Enclosure With Cable Tie

Surge Protector

INSTALLATION (IF REQUIRED)

When surge protection is required, mount the surge protector as close as possible to the entry point for the probe leader cable.

For wired installations the dual channel surge protector is not polarity sensitive so either cable port may be used for the probe leader cable. Use the cable port on the opposite side for the wiring coming from the ATG Console. Inside the surge protector, one side of each spark gap device is wired to the metal enclosure as shown in Figure 18. Use a bonding strap, with a minimum cross-sectional area equivalent to 4mm^2, to wire the enclosure to the tank structure using the external potential equalization (PE) terminal.

For wireless installations using a polarity sensitive single channel surge protector, connect the wires from each cable as shown in Figure 24 and Figure 25.

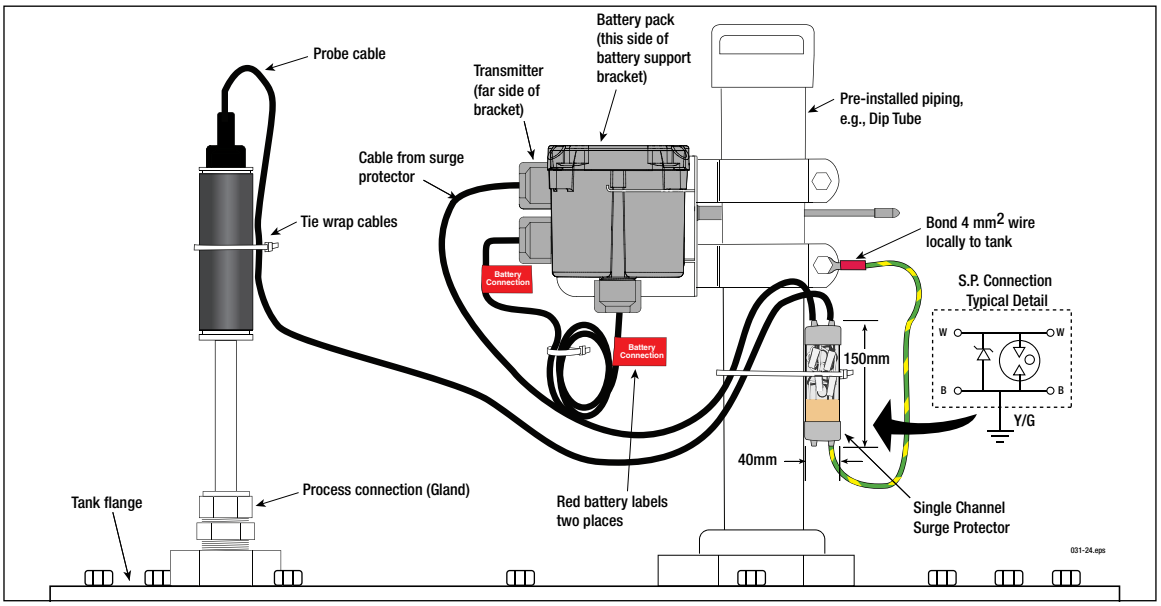


Figure 24. Example Wireless Installation with Process Connection and Single Channel Surge Protector

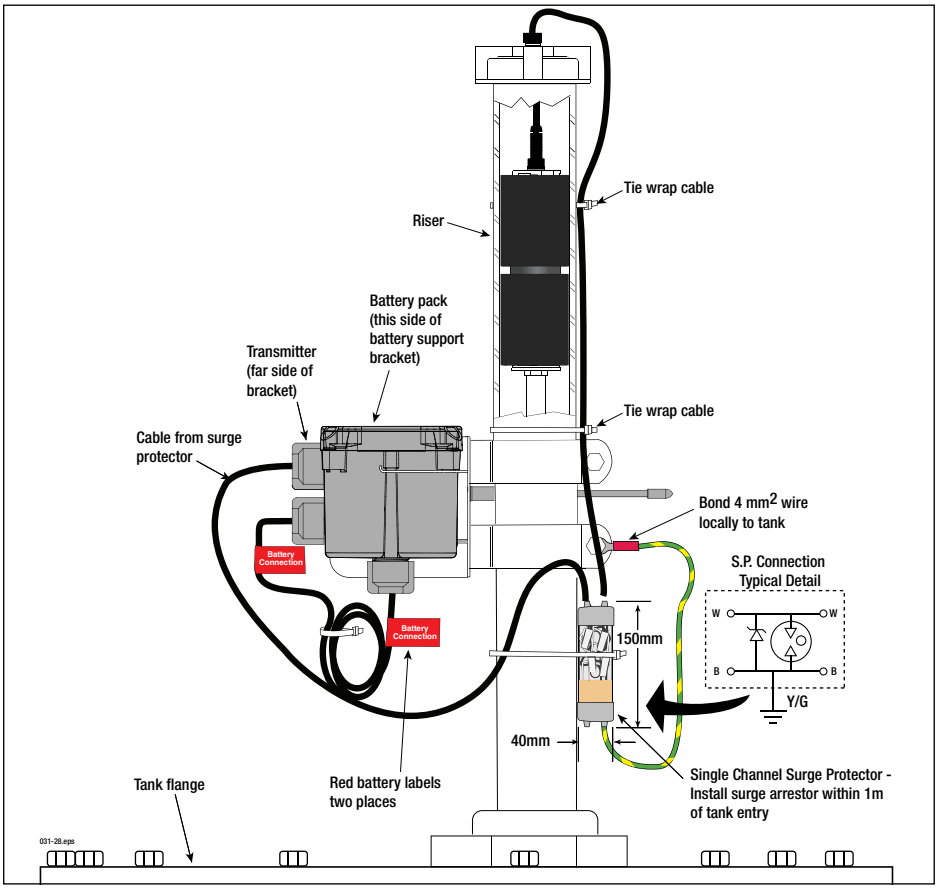


Figure 25. Example Wireless Installation with Riser Pipe and Single Channel Surge Protector

Appendix A - Surge Protection Risk Assessment

Where a tank gauge probe with a wired connection is installed in a 'riser' and the entire probe is within the vapour space of the tank, a risk assessment is required to assess whether additional surge protection is required in close proximity to the probe.

First, complete the Lightning Risk Assessment by identifying whether the site is suitably described by one of the 6 categories listed. Where required, a lightning ground flash density number can be estimated from a lightning map (see example on the following page). Tick the box next to the description that best describes the site. If none of the descriptions apply, then do not tick any box. In this instance, additional surge protection is required in close proximity to the probe.

Second, step through the overall Surge Risk Assessment. For each statement, tick either True or False. Additional surge protection is required if any of the statements are False.

LIGHTNING RISK ASSESSMENT - is the site described by one of the following categories? If yes, tick the relevant box	
The site is in a town, village, or built up area	
The site is a large motorway site with no probe cable extending more than 5m beyond the area covered by the canopy	
The site is a large motorway site with no probe cable extending more than 10m beyond the area covered by the canopy and the lightning ground flash density is less than 3.38	
The site is a large motorway site with no probe cable extending more than 15m beyond the area covered by the canopy and the lightning ground flash density is less than 2.25	
The site is a large motorway site with no probe cable extending more than 20m beyond the area covered by the canopy and the lightning ground flash density is less than 1.88	
The site is in open country with no probe cable extending beyond the area covered by the canopy and the lightning ground flash density is less than 1.13	

SURGE RISK ASSESSMENT	**True**	**False**
A lightning risk assessment has been performed as above and the site falls into one of the categories identified		
The installation of the tanks and/or probe is more than 100m away from an electric railway, underground railway, or tram line		
The installation of the tanks and/or probe is more than 100m away from other high voltage sources such as power turbines		
The site does not have high voltage power cables supported by pylons passing overhead		
The installation does not use above ground tanks		
The site is not used for high blend ethanol fuels		
The probe cable is buried under the forecourt		
The site does NOT use cathodic protection for the tanks		

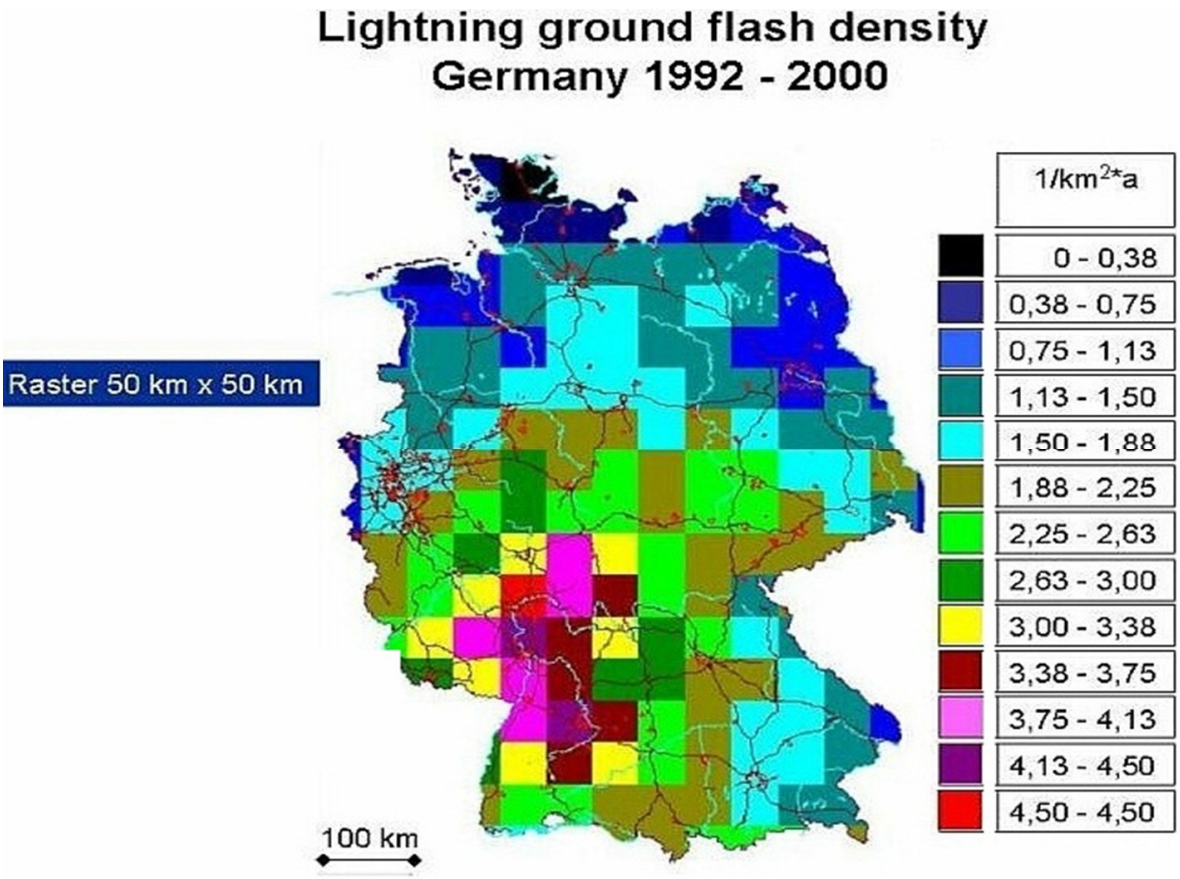
Delete as appropriate

Additional surge protection is not required at this site since all entries in the SURGE RISK ASSESSMENT table above are marked as TRUE.

Additional surge protection is required at this site since one or more entries in the SURGE RISK ASSESSMENT table above are marked as FALSE

Site name Date Signatory

Example Isokeraunic Map from IEC Lightning Risk Assessment Tool: Germany



VEEDER-ROOT™

For technical support, sales or other assistance, please visit:
veeder.com