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# Installation guide 762 VITO Interfaces & VITO, MTT, LT, MRT and MPT probes

June 2014  
Part no. 4416.648  
Rev. 9



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## Preface

This installation guide is intended for technicians involved in the mechanical and electrical installation of the Honeywell Enraf series 76x and 36x temperature and/or water probes and the 762 VITO Interface. There are three 762 VITO Interface versions:

VITO-MTT (16 elements) -> only to be used in combination with 764/765/766 probe;

VITO-LT (9 elements) -> only to be used in combination with 767/768 probe;

VITO-MRT (max. 14 elements) -> only to be used in combination with RTD/MRT/36x MPT probe.

**Note:**

*The 361 VITO MPT probe up to 6 Pt-100 elements can be directly connected to the 990 SmartRadar FlexLine without the need of a 762 VITO-MRT Interface.*

The technician must have basic technical skills and knowledge of safety regulations and explosion proof equipment in hazardous areas.

### EC declaration of conformity

Refer to the EC declaration of conformity, shipped with the instrument.

**Note:**

*The connection to the instrument must be made with shielded cable. The shielding must be grounded in the cable gland on both ends of the cable.*

### Legal aspects

The mechanical and electrical installation shall only be carried out by trained personnel with knowledge of the requirements for installation of explosion proof equipment in hazardous areas.

The information in this installation guide is the copyright property of Enraf B.V., Netherlands. Enraf B.V. disclaims any responsibility for personal injury or damage to equipment caused by:

- Deviation from any of the prescribed procedures;
- Execution of activities that are not prescribed;
- Neglect of the general safety precautions for handling tools, use of electricity and microwave radiation.

The contents, descriptions and specifications are subject to change without notice. Enraf B.V. accepts no responsibility for any errors that may appear in this installation guide.

### Additional information

Please do not hesitate to contact Honeywell Enraf or its representative if you require additional information.

# 1 Safety

## 1.1 Safety aspects of the VITO Interfaces & probes

**Warning**

*Do not use the instrument for anything else than its intended purpose.*

The housing of the 762 VITO Interfaces & 764, 765, 766, 767 or 768 temperature and/or water bottom probe and MRT probe is intrinsically safe, certified by KEMA (Netherlands):

VITO-MTT & VITO-LT : II 1/2 G EEx ia IIB T4, KEMA 01ATEX1212X  
 VITO-MRT : II 1/2 G EEx ia IIB T4, KEMA 04ATEX1225X  
 VITO-CEPS : Zone 0/1 Ex ia IIB T4, IECEx KEM 05.0014X

The VITO MPT probe is a passive component and can be considered as simple apparatus when used in Intrinsically Safe circuits in accordance with the following:

- EN IEC 60079-11, clause 5.7
- NEC (National Electrical Code) Article 504 (Intrinsically Safe Systems) 504.2 (Definitions) Simple Apparatus

The VITO MPT probe is Intrinsically Safe and can be used with the FlexLine radar gauge (direct connection up to 6 Pt-100 elements) or with the VITO-MRT interface.

The environmental conditions for the VITO interfaces & probes are:

Ambient temperature (VITO Interface) : -40 to 60 °C (-40 to 140 °F)  
 Relative humidity (VITO Interface) : 0 –100%  
 Ingress protection (VITO Interface) : IP 65  
 Operating temperature (probes)  
     764 low temp. version : -200 to 70 °C (-328 to 158 °F)  
     764/767 standard version : -55 to 135 °C (-67 to 275 °F)  
     764 high temp. version : -55 to 200 °C (-67 to 392 °F)  
     764 very high temp. version : -55 to 250 °C (-67 to 482 °F)  
     765/766/768/365 probe : 0 to 100 °C (32 to 212 °F)  
     MRT probe : -50 to 200 °C (-58 to 392 °F)  
     361 low temp. version : -200 to 50 °C (-328 to 122 °F)  
     361 standard version : -50 to 120 °C (-58 to 248 °F)  
     361 high temp. version : -50 to 200 °C (-58 to 392 °F)  
     361 very high temp. version : -20 to 250 °C (-4 to 482 °F)  
     365 standard version : -20 to 120 °C (-4 to 248 °F)

**Note:**

*Water measurement performance depends on the phase of water and constitution.*

Operation pressure (probes) : 5 bar / 500 kPa (72 psi) (76x probes)  
 : 6 bar / 600 kPa (87 psi) (36x probes)

**Caution**

*The 762 VITO Interface is an instrument with intrinsically safe output/input circuits.  
 Modification to the instrument may only be carried out by  
 trained personnel which is authorized by Honeywell Enraf.  
 Failure to adhere to this will invalidate the approval certificate.*

**Warning**

*Improper installation of cable glands, conduits or stopping plugs will invalidate the safety approval of the 762 VITO Interface.*

*"For electrical data see certificate".*

## 1.2 Personal safety

The technician must have basic technical skills to be able to safely install the equipment. When a probe is installed in a hazardous area, the technician must work in accordance with the (local) requirements for electrical equipment in hazardous areas.

**Warning**

*In hazardous areas it is compulsory to use personal protection and safety gear such as: hard hat, fire-resistive overall, safety shoes, safety glasses and working gloves.*

*When tank is in operation:*

- Avoid possible generation of static electricity.*
- Use non-sparking tools and explosion-proof testers.*

*Do not install the VITO probe until at least 30 min. after the last movement, to wait for the decay of the static electricity of the product stored in the tank.*

*Make sure the VITO probe is properly bounded before inserting into the tank.*

*Do not rub the surface of the VITO Interface and probe with a cloth to avoid the build-up of electro-static charges. These may cause sparks and explosions in hazardous areas, if a combustible gas mixture is present.*

*Make sure no dangerous quantities of combustible gas mixtures are present in the working area.*

*Never start working before the work permit has been signed by all parties.*

*Pay attention to the kind of product in the tank. If any danger for health, wear a gas mask and take all necessary precautions as mentioned on the work permit and safety assessment.*

## 1.3 Safety conventions

"Warnings", "Cautions" and "Notes" are used throughout this installation guide to bring special matters to the immediate attention of the reader.

A Warning concerns danger to the safety of the technician or user;

A Caution draws the attention to an action which may damage the equipment;

A Note points out a statement deserving more emphasis than the general text, but not requiring a "Warning" or a "Caution".

## 2 Mechanical installation

The mechanical installation is divided into the following sub-chapters:

- Installation of 764/767/361/MRT temperature probe (section 2.2)
- Installation of 765 water probe, 766/768/365 Combi probe (section 2.3)
- Installation of 762 VITO Interface (section 2.5)

### **Caution**

*The VITO Interface and probe may be installed in hazardous areas. Before starting installation, check whether the actual area of installation complies with the area classification on the applicable approval certificate for your type of VITO Interface.*

### **Notes:**

*The entire installation procedure shall be in accordance with national, local and company regulations.*

### 2.1 Recommended tools

Following tools are recommended for installation of the VITO Interface and probe:

- Spanners, size 32 mm (1" 4/16) and 36 mm (1" 7/16)
- Allen keys, size 4 mm (5/32") and 2.5 mm (3/32")
- Pair of wire cutters
- Flat head screw driver, 2 – 3 mm (2/16")
- Wire stripper
- Teflon tape / pipe sealant
- Tie-wraps

### 2.2 Mechanical installation of 764/767/361/MRT temperature probe

The 764/767/361/MRT temperature probe can be installed in two ways:

- in an open or closed vertical thermowell or
- directly in the tank (using anchor weights)

#### 2.2.1 Installation in a vertical thermowell

Minimal, a 2" thermowell must be used. The thermowell flange must be provided with a G ½ (½" BSP) threaded opening **and** an earth screw for connection of the probe.

Preferably the thermowell should be perforated (holes or slots). However, closed thermowells are a must for pressurized applications, and are recommended for applications where aggressive products are stored.

Although it is **not** recommended, closed thermowells can be liquid filled for better heat transfer between the stored product and VITO probe. Normal lube oil can be used, but also glycol.

Care must be taken when the tank contains edible products in order to prevent product contamination in the event of thermowell failure.

**Notes:**

We do **not recommend** using liquid filled thermowells in tanks with heated products. Due to the heating at the lower end, the liquid may circulate in the well which results in a temperature mismatch.

We do **not recommend** using liquid filled thermowells on floating roof tanks. Due to ambient temperature influence at the higher end, the liquid may circulate in the well which results in a temperature mismatch.

While using liquid filled thermowells take care that the liquid can expand when heated, without creating an over pressure in the thermowell.

It is recommended to use a vent opening or an expansion pipe under the flange (refer to figure 1), or any other suitable method to prevent excessive pressures.

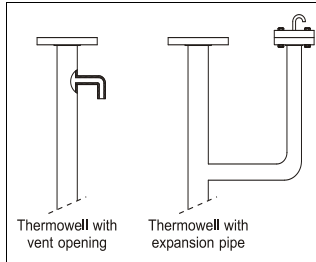


Figure 1 Vent opening and expansion pipe

When the VITO probe is installed in a thermowell, the weight of the probe – combined with the mechanically limited movement of the probe, is sufficient to warrant proper operation.

**Caution**

Water ingress must be prevented in thermowell.  
When freezing, water becomes ice, which can damage 764/767/361/MRT temperature probe.

Refer to figure 2.

- Remove optional lower IP adapter (7), nuts (3 pc.), instrument label(s) and lock washers (2 pc.) from the adjusting pipe (1);
- Screw the flange (2) with G ½ threaded hole on the adjusting pipe.

**Note:**

*Take care not to damage the flying leads when shifting the flange (2) over the flying leads;*

- Position the gasket on the thermowell nozzle;
- Slowly unroll the temperature probe while feeding it into the thermowell;
- As soon as probe's end touches the bottom end of the thermowell, adjust the flange (2) to the correct position on the adjusting pipe (1).

**Note:**

*Use a suitable pipe sealant on the adjusting pipe for sealing the threaded part of the flange;*

- Secure the flange (2) on the thermowell flange;

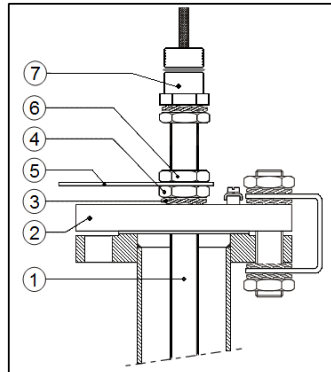


Figure 2 Installation of probe

- Make ground connection across the flanges;
- Lock the VITO probe by means of lock washer (3) and nut (4);
- Place the instrument label(s) (5) and secure them by means of nut (6);
- Go to section: 2.5 Installation 762 VITO Interface.

**2.2.2 Installation directly in the tank, suspended from roof nozzle**

When the VITO probe is installed free space, suspended from the roof, it is recommended to use anchoring weights. These weights can be a single weight of 3 kg or a chain of weights (**total weight max. 9 kg for 361 probe and 23 kg for 76x probes**).

For coated tank bottoms, special provisions are to be taken to prevent damage of the tank coating. One suggestion is to use a single weight and keep the weight and/or probe suspended several centimeters above the tank floor. This height should be sufficient to accommodate vertical tank roof movement due to bulging of the tank caused by hydrostatic pressure exerted by the liquid stored in the tank.

Install the temperature probe from a 2" or larger size roof nozzle. The roof nozzle counter flange must have G 1/2 (1/2" BSP) threaded hole **and** an earth screw for connection of the probe.

**Caution**

*When anchor weights are attached, maximum static load is:  
9 kg (20 lb) for 361 probe  
(when Honeywell Enraf anchor weight – p/n 0815524 – is used, only use 3 weights);  
23 kg (50 lb) for 76x probes.*

Refer to figures 2 and 3.

- Remove optional lower IP adapter (7), nuts (3 pc.), instrument label(s) and lock washers (2 pc.) from the adjusting pipe (1);
- Screw the flange (2) with G 1/2 threaded hole on the adjusting pipe.

**Note:**

*Take care not to damage flying leads when shifting the flange over the flying leads;*

- Position the gasket on the tank nozzle;
- Attach anchor weights to the temperature sensor's lug at lower end;

**Caution: Static Electricity Danger**

*Make sure the probe is properly bonded before inserting the probe into the tank. If needed use an electric cable with alligator clamps to ground the probe to the tank nozzle.*

*Wait at least 30 minutes after the last tank movement.*

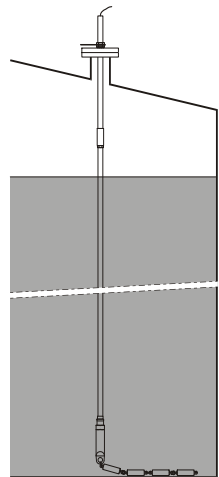


Figure 3 Use of anchor weights



- Slowly feed the temperature probe into the tank; be careful not to damage the corrugated stainless steel tube when lowering the probe into the tank by making sure it does not rub over the tank nozzle;
- As soon as the probe's end touches the tank bottom, adjust the flange (2) to the correct position on the adjusting pipe (1);

**Note:**

*Use a suitable pipe sealant on adjusting pipe for sealing threaded part of the flange;*

- Secure the flange on the roof nozzle and make a ground connection across the flanges;
- Lock the VITO probe by means of the lock washer (3) and nut (4);
- Place the instrument label(s) (5) and secure them by means of nut (6);
- Go to section: 2.5 Installation 762 VITO Interface.

### **2.3 Mechanical installation of 765/766/768/365 VITO water (and temp.) probe**

Install the 765 VITO water probe and the 766/768 VITO and 365 MPT water and temperature probe on 2" or larger roof nozzle. The roof nozzle should be at best position to detect water in the tank.

The roof nozzle counter flange must have a G ½ (½" BSP) threaded hole **and** an earth screw for connection of the probe.

When the VITO probe is installed free space, suspended from the roof, it is recommended to use anchoring weights. These weights can be a single weight of 3 kg or a chain of weights (**total weight max. 9 kg for 365 probe and 23 kg for 76x probes**). Refer to figure 4.

For coated tank bottoms, special provisions are to be taken to prevent damage of the tank coating. One suggestion is to use a single weight and keep the weight and/or probe suspended several centimeters above the tank floor. This height should be sufficient to accommodate vertical tank roof movement due to bulging of the tank caused by hydrostatic pressure exerted by the liquid stored in the tank.

**Caution**

*When anchor weights are attached, maximum static load is:*

*9 kg (20 lb) for 365 probe*

*(when Honeywell Enraf anchor weight – p/n 0815524 – is used, only use 3 weights);*

*23 kg (50 lb) for 76x probes.*

**Note:**

*The 765 VITO water probe, 766/768 VITO and 365 MPT water and temperature probe **cannot** be installed in a closed well.*

When the probe is installed in a well, (i.e. floating roof tank), the well **must** be open at the lower end at the height of sensitive part of the water probe and the well should have equalization holes or slots. Refer to figure 4.

When the VITO probe is installed in a well, the weight of the probe – combined with the mechanically limited movement of the probe, is sufficient to warrant proper operation.

**Note:**

*There should be at least 50 mm (2") free space between the sensitive part of the water probe and the tank shell (or any other large metal part in the tank, i.e. stilling well).*

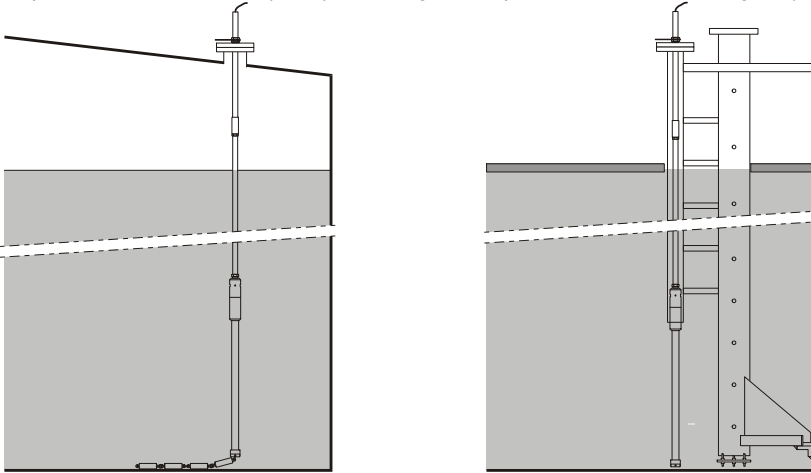


Figure 4 Installation methods for 765 VITO water probe, 766/768 VITO and 365 MPT water & temperature probe

**Installation preparations:**

Before installation can be started it is recommended to verify the installation height and probe length.

Measure the distance (refer to figure 5):  
roof nozzle (well nozzle) – tank bottom.

**Note:**

*If the commissioning takes place directly after installation, also measure the product level and the amount of water in the tank at the place of the probe.*

*These measurements will be used with the commissioning.*

- Unroll the probe at a suitable place;
- Make sure the probe is completely stretched;
- Measure along the probe, starting from the bottom side and mark the measured nozzle height at the threaded top side (adjusting pipe).

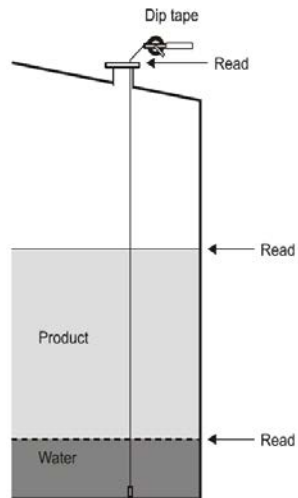


Figure 5 Checking overall length (and water level)

**Installation:**

Refer to figures 2 and 4.

- Remove optional lower IP adapter (7), nuts (3 pc.), instrument label(s) (5) and lock washers (2 pc.) from the adjusting pipe (1);
- Screw the flange (2) with G ½ threaded hole on the adjusting pipe till the marked position.

**Note:**

*Take care not to damage the flying leads when shifting the flange over the flying leads;*

*Use a suitable pipe sealant on the adjusting pipe for sealing threaded part of the flange;*

- Hook-up anchor weight(s) (if applicable). Maximum weight: 9 kg (20 lb) for 365 probe and 23 kg (50 lb) for 76x probes;
- Position the gasket on the tank nozzle;

**Caution: Static Electricity Danger**

*Make sure the probe is properly bonded before inserting the probe into the tank. If needed use an electric cable with alligator clamps to ground the probe to the tank nozzle before installation.*

*Wait at least 30 minutes after the last tank movement.*

- Slowly feed the temperature probe into the tank; be careful not to damage the corrugated stainless steel tube when lowering the probe into the tank by making sure it does not rub over the tank nozzle;
- Secure flange (2) on the roof/well nozzle and make ground connection across the flanges;
- Lock the VITO probe by means of lock washer (3) and lock nut (4);
- Place the instrument label (5) and secure it by nut (6);
- Go to section: 2.5 Installation 762 VITO Interface.

## 2.4 Removing VITO temperature probe on cryogenic tank

**Warning**

*Open the vent screw when removing the VITO temperature probe from a cryogenic tank.*

*This must be done to prevent the hose of the VITO temperature probe to shrink in an uncontrolled matter, which can harm persons.*

In cryogenic applications, a vacuum can be created in the stainless steel hose of the VITO temperature probe.

When removing the VITO temperature probe and there is such a vacuum inside the hose, there can become a dangerous situation for those persons, removing the probe.

To prevent this, the VITO probes for cryogenic temperature measurement have an additional coupling with a vent screw.

The vent screw is located below the coupling with the adjusting pipe.

Just lift the VITO temperature probe till the vent screw can be reached and remove the vent screw before completely retracting the VITO temperature probe. Refer to figure 6.

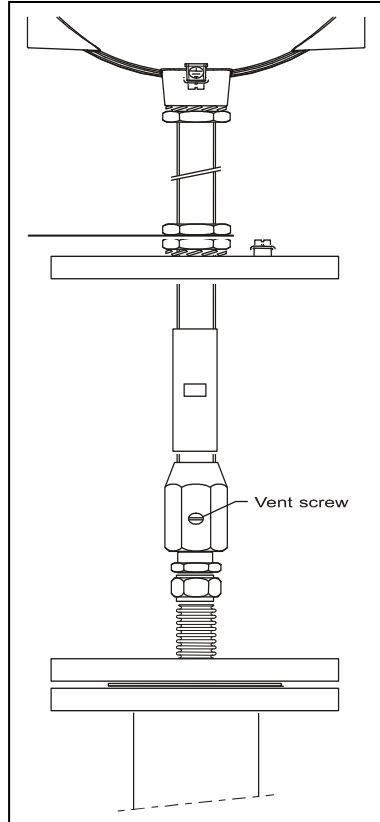


Figure 6 Vent screw

## 2.5 Installation 762 VITO Interface

The VITO interface is typically installed directly on top of the VITO probe / MRT (refer to section 2.5.1)

For installations where the VITO interface cannot be installed directly on the VITO probe / MRT (e.g. when the adjustment pipe is installed close to a stilling well or other mechanical obstruction), it is possible to install the VITO Interface in close proximity of the VITO probe (refer to section 2.5.2).

For VITO MPT probes with six (6) or less Pt100 sensors, there is no need for the VITO Interface when used in combination with the 990 series SmartRadar FlexLine (refer to section 2.5.3).

### 2.5.1 Installation 762 VITO Interface directly on VITO probe / MRT

#### 2.5.1.1 Standard version (without optional IP adapter)

Refer to figure 7a.

- Turn the remaining nut (1) for appr. 25 mm (1") on the adjusting pipe and place the remaining lock washer (2) on top of the nut;
- Unpack the VITO Interface (preferable on the tank);
- Apply Teflon® tape or a suitable pipe sealant on the first 20 mm (3/4") of the adjusting pipe;
- Remove the cover from the VITO Interface enclosure;
- Feed the flying leads through the lower opening of the VITO Interface enclosure.

**Note:**

*With 762 CEPS Interface and 365 Combi probe, it may be required to remove the front (temperature) module to feed the flying leads into the 762 CEPS enclosure (refer to section 3.2.3 and figure 10);*

**Caution**

*Make sure the probe wiring is not damaged when mounting the VITO enclosure on the threaded pipe.*

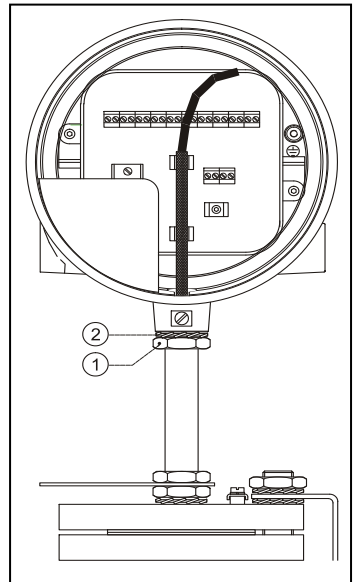


Figure 7a Installation VITO Interface (standard version)

- Turn the VITO Interface onto the VITO probe's adjusting pipe. The VITO Interface will fit for appr. 12 to 15 mm ( $\frac{1}{2}$ " to  $\frac{5}{8}$ " ) onto the adjusting pipe;
- Prevent the VITO Interface from turning by fastening lock nut (1) with lock washer (2);

- When the electrical installation is carried out at a later stage, the cover of the VITO Interface enclosure can be closed after verifying there is no wire or cable in the gap between the shield and the enclosure. Make sure the cover threading is clean – if needed clean the threading with an old tooth brush and apply anti-seize;

**Caution**  
*Do not damage the thread of the cover.*  
*Before closing, inspect, clean and lightly grease with anti seize.*  
*When closing, turn cover counter-clockwise till thread 'clicks' in place, then turn clockwise until cover is fully closed.*

**Notes:**

*Make sure the cable gland is water tight – use Teflon® tape or a suitable pipe sealant if needed.*

*Use of a self-fusing silicone tape (such as rescue Tape®) or a suitable pipe sealant is recommended to protect the cable gland from the environment.*

**2.5.1.2 Version with optional IP adapter**

Refer to figure 7b.

- Clean the threads on the temperature probe and lower IP adapter (3a) removing any old grease, anti-seize, dirt, etc.
- Apply a light, smooth layer of the Agip TOP 2000 grease over the temperature probe threads;
- Turn the remaining nut (1) for appr. 25 mm (1") on the adjusting pipe and place the remaining lock washer (2) on top of the nut;
- Bolt the lower IP adapter (3a) to the temperature probe. Tighten the adapter to the probe to achieve positive sealing between the two parts! Tightening the adapter to the probe will compress squared ring located inside of the adapter.

**Note:**

*Make sure not to over tighten the connection and/or damage the ring! Looking through the opening on the adapter top side you will be able to see when the sealing ring gets oval shape while the probe has pushed it from the bottom side;*

- Secure the lower IP adapter (3a) by fastening lock nut (1) with lock washer (2);

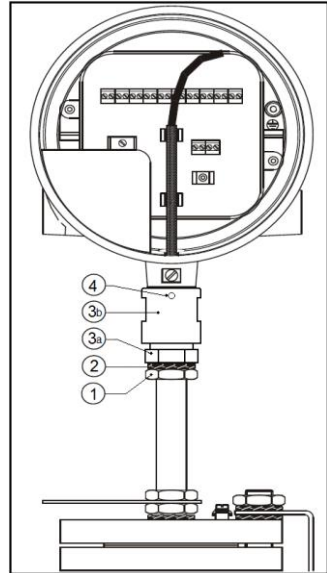


Figure 7b Installation VITO Interface (with optional IP adapter)

- Unpack the VITO Interface (preferable on the tank);
- Remove the cover from the VITO Interface enclosure;
- Clean the inside thread of the upper IP adapter (3b) which is already attached to the VITO housing;
- Apply a light, smooth layer of Agip TOP 2000 grease over the inside threads of the upper IP adapter (3b) on the VITO Interface housing and over the outside threads of the lower IP adapter (3a) on the probe;
- Feed the flying leads through the upper IP adapter (3b) on the VITO Interface enclosure.

**Note:**

*With 762 CEPS Interface and 365 Combi probe, it may be required to remove the front (temperature) module to feed the flying leads into the 762 CEPS enclosure (refer to section 3.2.3 and figure 10);*

**Caution**

*Make sure the probe wiring is not damaged when mounting the VITO enclosure on the threaded pipe.*

- Turn the VITO Interface onto the VITO probe's lower IP adapter (3a);
- Prevent the VITO Interface from turning by tighten the two set screws (4) on the upper IP adapter;
- When the electrical installation is carried out at a later stage, the cover of the VITO Interface enclosure can be closed after verifying there is no wire or cable in the gap between the shield and the enclosure. Make sure the cover threading is clean – if needed clean the threading with an old tooth brush and apply Agip TOP 2000 grease.

**Caution**

*Do not damage the thread of the cover.*

*Before closing, inspect, clean and lightly grease with Agip TOP 2000 grease.*

*When closing, turn cover counter-clockwise till thread 'clicks' in place, then turn clockwise until cover is fully closed.*

**Notes:**

*Make sure the cable gland is water tight – use Teflon<sup>®</sup> tape or a suitable pipe sealant if needed.*

*Use of a self-fusing silicone tape (such as rescue Tape<sup>®</sup>) or a suitable pipe sealant is recommended to protect the cable gland from the environment.*

### **2.5.2 Installation of VITO Interface in close proximity of VITO probe / MRT**

In some cases there is not sufficient space to install the VITO interface on top of the VITO probe / MRT.

In these cases a (preferable flexible) metal conduit is advised, although also a set of matching coupling and unions can be considered.

Please contact the factory for detailed advice.

### **2.5.3 Installation of VITO MPT probe in combination with SmartRadar FlexLine**

The 361 VITO MPT temperature probes with six (6) or less elements can be directly connected to a 990 SmartRadar FlexLine. In this case the FlexLine radar must be equipped with a FII-RTD board and the 762 VITO Interface and SmartRadar FlexLine FII-VT board are not required.

For this type of installation the maximum distance between the FlexLine radar and the VITO MPT probe is 600 cm (236 inch). The VITO MPT probe should be ordered with the correct extended flying leads, i.e. 250 cm (98 inch) or 600 cm (236 inch).

**Note:**

*Although it is not advised, the wires can be extended beyond the above specified 600 cm. In this case an extra junction box (JB) is required, and preferably the same wire should be used. Please contact the factory for detailed advice.*

For protection and shielding of the temperature sensor wiring between VITO MPT probe and SmartRadar FlexLine, it is strongly advised to use preferably flexible, metal conduit. The conduit should be properly bonded to the temperature sensor on one side and the SmartRadar FlexLine on the other side.

Both connections should be properly sealed and protected against water ingress, with for example PTFE<sup>®</sup> tape and self vulcanizing electrical tape on the outside.

For the connection of the VITO MPT probe wiring to the 990 SmartRadar FlexLine, refer to the installation guide SmartRadar FlexLine.



### 3 Electrical installation

The entire electrical installation shall be in accordance with the International Standard IEC EC 60079-14 (Selection and Installation).

**Warning**

*Make sure that all power to the associated instrument is switched off before opening the cover of the 762 VITO Interface.*

*Failure to do so may cause danger to persons or damage the equipment.  
The cover must be closed before switching on power.*

**Caution**

*Make sure that no dangerous quantities of combustible products are present in the working area.*

#### 3.1 Bonding of the VITO Interface

Proper bonding of the VITO Interface to the tank is required. Use the external ground terminal on the VITO Interface enclosure (refer to figure 8).

**Caution**

*Safety depends on proper bonding.  
Check the resistance of the ground connection directly after installation.  
The measured ground resistance shall be below the maximum prescribed by local bonding requirements.*

**Warning**

*When measuring the resistance, use a suitable explosion-proof tester.*

**Note:**

*Bonding shall be performed according to local (explosion-proof) regulations.*

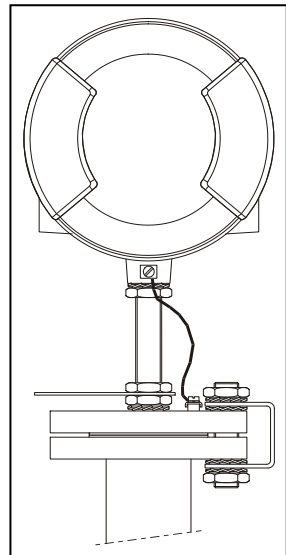


Figure 8 Bonding of the VITO Interface

### 3.2 VITO Interface wiring to tank level gauge

The VITO-MTT/LT/MRT Interface connection to associated Honeywell Enraf instrument is by a single twisted pair cable. The single pair provides both intrinsically safe supply to the interface as well as data communication between the interface and the associated gauge. The VITO-CEPS Interface (used with the 365 MPT temperature and water probe) requires a double twisted pair cable.

The cable to the gauge is fed through the side threaded opening of the VITO Interface.

**Note:**

*Local and company requirements must be followed for routing of intrinsically safe wiring.*

Power rating:

- VITO-MTT & VITO-LT Interface : 15 Vdc nominal; 5.5 mA
- VITO-MRT Interface : 15 Vdc nominal; 7.0 mA

Refer to the level gauge manual for details on the wiring in the level gauge.

#### 3.2.1 Cable requirements

Keep cable length between 762 VITO Interface and associated instrument as short as possible.

The connection to the instrument must be made with shielded cable.

Cable requirements are:

- Single twisted pair and shielded (with 361 VITO MPT probe, 76x VITO probes and MRT)
- Double twisted pair and shielded (with 365 VITO MPT / water probe)
- $R_{\max}$  : 25  $\Omega$  / line
- $C_{\max}$  : 1  $\mu$ F
- $L_{\max}$  : 15 mH

**Caution**

*Wiring to 762 VITO Interface shall be protected against EMC influences.*

**Note:**

*It is required to use metallic cable glands to provide good contact between cable shield and VITO Interface enclosure.*

The shield of the cable shall be connected **inside** the cable gland.

**Note:**

*Shielding must be connected externally to the VITO Interface enclosure and Associated instrument, or in the cable glands; thus never inside the VITO Interface enclosure.*

The shielding must be connected to ground at **both ends** of the cable.

### 3.2.2 Supply / data communication connection for 361 VITO MPT probe, 76x VITO probes and MRT

Refer to figure 9.

- Remove the cover from the VITO Interface enclosure (if not already removed);
- Remove the black plastic shield from the VITO Interface converter block;
- Insert the gauge wire into the cable gland on the left hand side of the VITO Interface enclosure;
- Connect the twisted pair of gauge wire to the terminals on the lower left hand side of the converter block:
  - pin 1: -
  - pin 2: +;
- Re-install the black plastic shield.

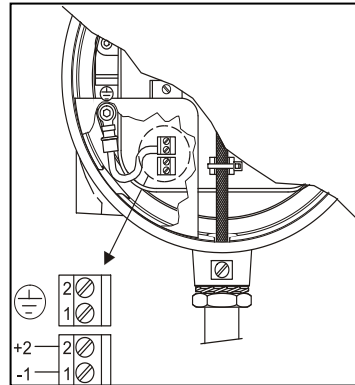


Figure 9 Connection of twisted pair  
For gauge wiring

### 3.2.3 Supply / data communication connection for 365 VITO MPT probe

When a 365 MPT temperature and water probe is used, the VITO Interface contains **two** modules. One for the spot temperature elements (at the front) and one for the capacitive water probe (at the rear).

Both modules need to be connected with a separate supply / data communication cable. Refer to figure 10.

- Remove the cover from the VITO Interface enclosure (if not already removed);
- Remove the black plastic shield from the VITO Interface converter block (1);
- Disconnect yellow/green ground wire (3);
- Remove front (temperature) module by loosening the two hex screws marked (2) and store at a safe place;
- Insert the gauge wire into the cable gland on the left hand side of the VITO Interface enclosure;
- Connect one twisted pair of the gauge wire to the terminals on the lower left hand side of the rear (water) converter block:
  - pin 1: -
  - pin 2: +;
- Re-install the black plastic shield on the rear converter block;
- Remove dummy capacitor (refer to figure 11);
- Connect the Coax cable and ground wire from the water probe (refer to figure 12: Water probe connections);
- Re-install the front (temperature) module, including yellow/green ground wire;

- Connect the other twisted pair of gauge wire the terminals on the lower left hand side of the front (temperature) converter block:  
pin 1: -  
pin 2: +;
- Re-install the black plastic shield on the front converter block.

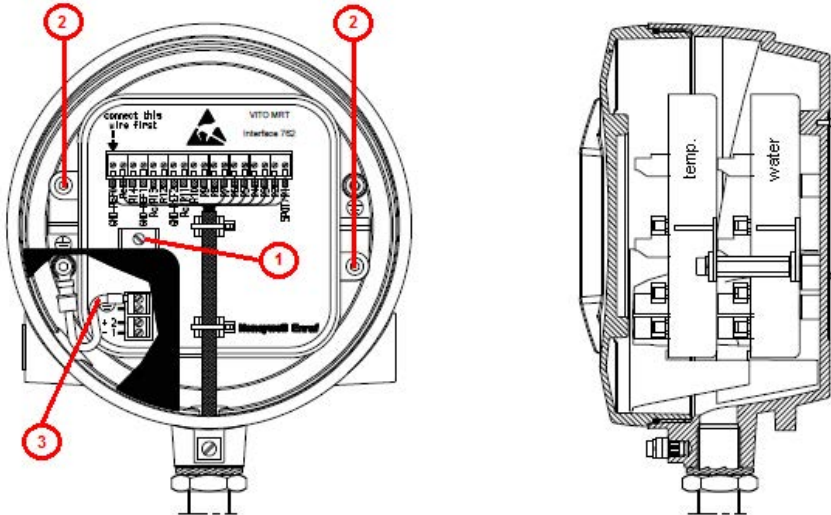


Figure 10 CEPS Interface for 365 MPT temperature and water probe

**Note:**

The 365 MPT temperature and water probe with the associated CEPS Interface **can only** be used (connected) with an 990 SmartRadar FlexLine which contains two FII-VT boards.

### 3.3 Sensor connections

The electronic circuits of the 762 VITO Interfaces are protected against electrical static discharge during transport and storage by metal jumpers placed on the temperature probe connectors. A dummy resistor of 10Ω is placed between the red and brown wires (VITO-MTT & VITO-LT) to detect the absence of a temperature probe.

There is also placed a dummy capacitor on the water probe connectors to detect the absence of a water probe. Refer to figure 11.

Depending on the type of probe, the jumpers and dummy resistor and/or the dummy capacitor must be removed. Refer to table below.

Type of probe	Jumpers and dummy resistor on temperature probe connectors	Dummy capacitor on water probe connectors
764/767 VITO temperature probe	remove	<b>do not</b> remove
765 VITO water probe	<b>do not</b> remove	remove
766/768 VITO temperature & water probe	remove	remove
RTD/MRT/361 MPT probe	remove	n.a.
365 MPT temperature & water probe	front module (temp.): remove	front module (temp.): n.a.
	rear module (water): <b>do not</b> remove	rear module (water): remove

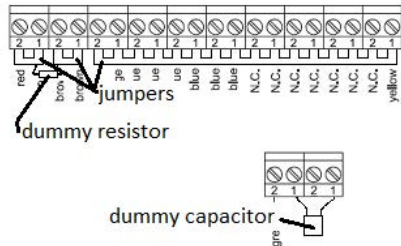


Figure 11 Location of jumpers and dummy resistor/capacitor

- Cut the temperature and water probe wiring to approximate length

**Note:**

*It is recommended to loop the wires one time and strip each wire approximate 10 – 12 mm (3/16 – 1/2”). Use the proper tools for removal of the insulation and make sure the copper core is no carved.*

- Connect:
  - VITO probe wiring as indicated in figure 12 or figure 13;
  - MRT as indicated in figure 14;
  - 2 or 3 separate RTD's as indicated in figure 15;
  - 361 MPT probe as indicated in figure 16;
  - 365 MPT probe as indicated in figure 12 (water probe connection at rear module) and figure 16 (multiple spot connection at front module).

**Note (VITO-MTT & VITO-LT):**

*There is only an orange wire with VITO probes which have a thermocouple spot at the probe's bottom (below the Pt100 reference resistor). That orange wire **must** be connected to the "orange/blue" connector of the interface unit.*

*When there is no orange wire from the temperature probe, then connect one of the blue wires to the "orange/blue" connector of the interface unit.*

- Double check the wiring and use tie-wrap as stress relief (refer to figures 12, 13, 14 and 16).
- Verify there is no wire or cable in the gap between the shield and the enclosure;

**Caution**

*Do not damage the thread of the cover.*

*Before closing, inspect, clean, and lightly grease with anti seize*

*When closing, turn the cover counter-clockwise till the thread 'clicks' in place, then turn clockwise until cover is fully closed.*

- Make sure the cover threading is clean – if needed clean the threading with an old tooth brush and apply anti-seize;
- Re-install the VITO interface cover.

**Next step is the connection of the wiring to the associated gauge and configuration of the temperature option.**

**Please refer to the related manuals for detailed instructions.**

**Caution**  
 For grounding reasons, first connect the brown wires towards the level gauge (VITO interface is powered by the level gauge).

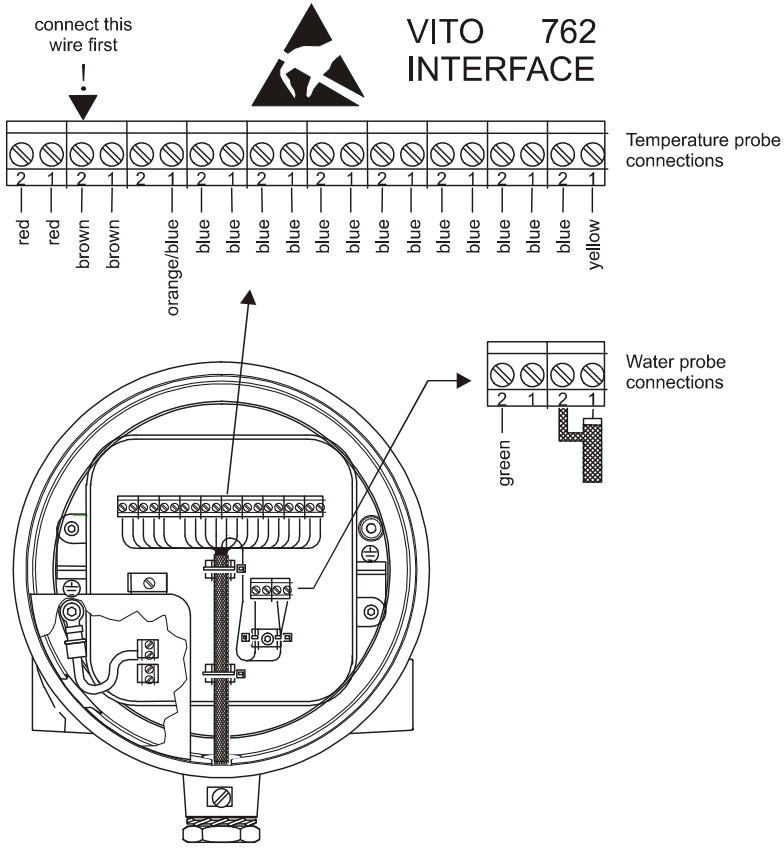


Figure 12 Sensor connections (764/765/766 probe) to 762 VITO-MTT

**Caution**  
 For grounding reasons, first connect the brown wires towards the level gauge (VITO interface is powered by the level gauge).

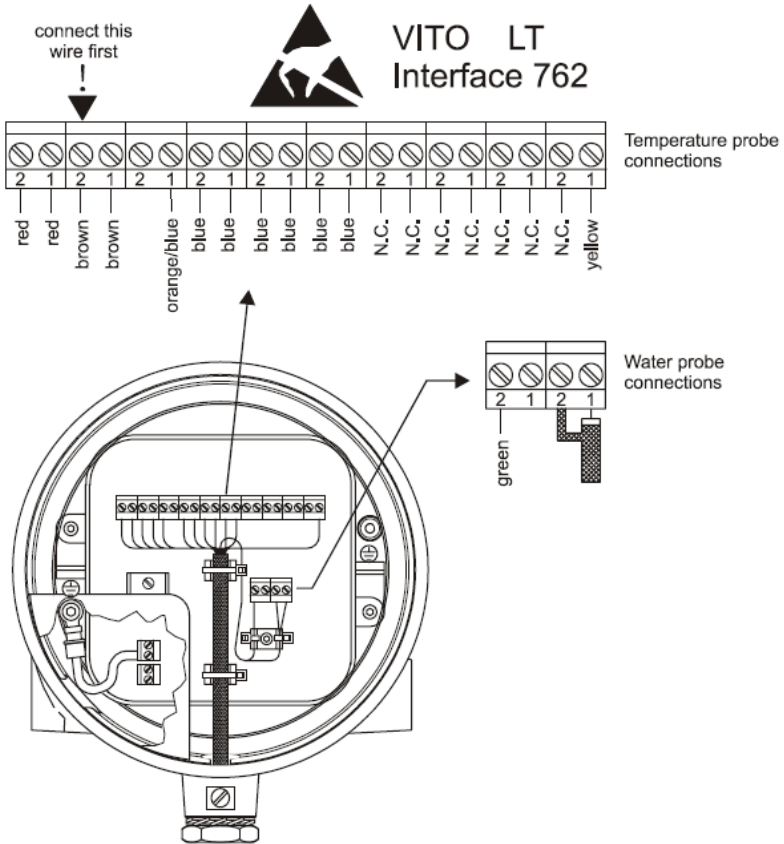


Figure 13 Sensor connections (767/768 probe) to 762 VITO-LT



**Caution**  
 For grounding reasons, first connect the black wires towards the level gauge (VITO interface is powered by the level gauge).

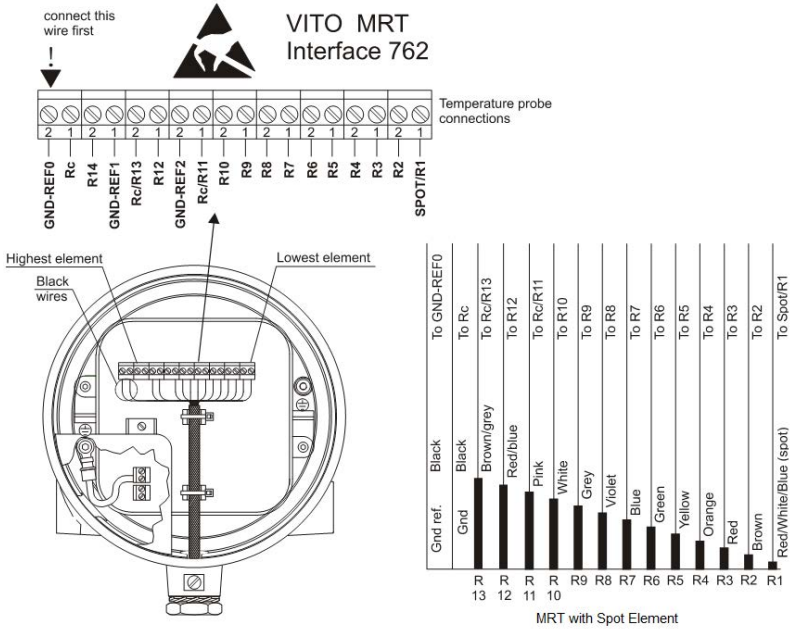


Figure 14 MRT probe connected to 762 VITO-MRT

**Note:**  
 Non used MRT-elements connections should be left open.

**Caution**  
 With RTD's, first connect one of the common wires of each RTD to GND-REF0 / GND-REF1 / GND-REF2.

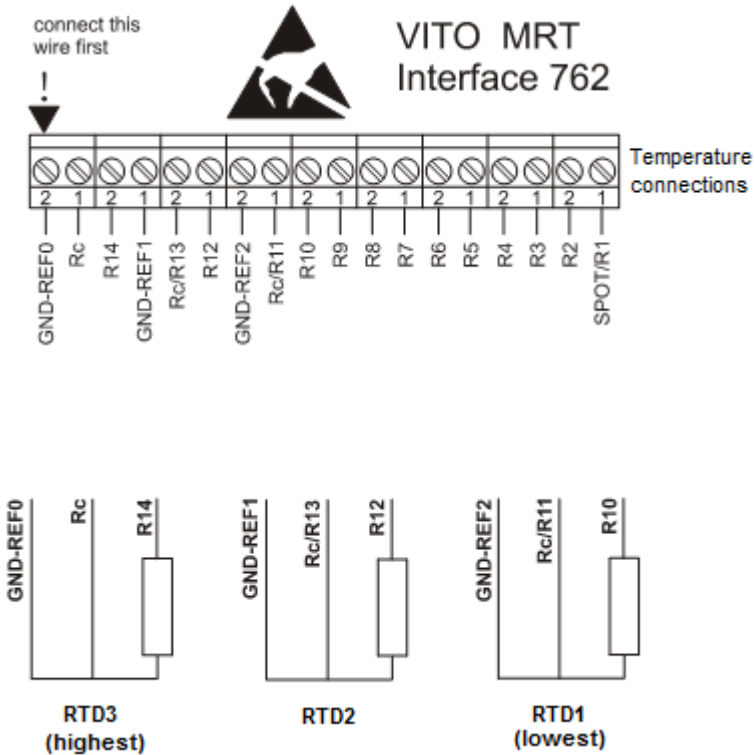


Figure 15 Three separated RTD's connected to 762 VITO-MRT

**Note:**

Non used RTD's elements connections should be left open.

**Caution**  
 For grounding reasons, first connect the black wires towards the level gauge (VITO interface is powered by the level gauge).

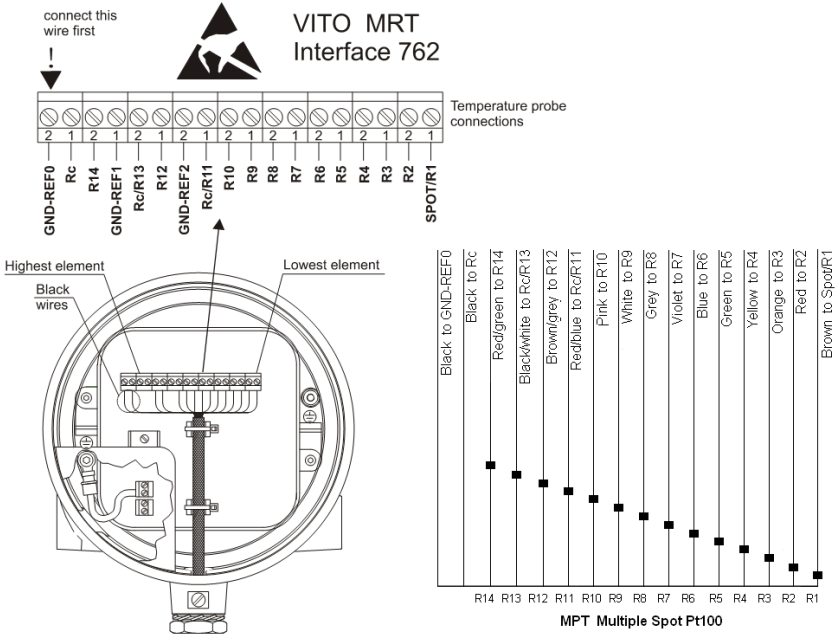
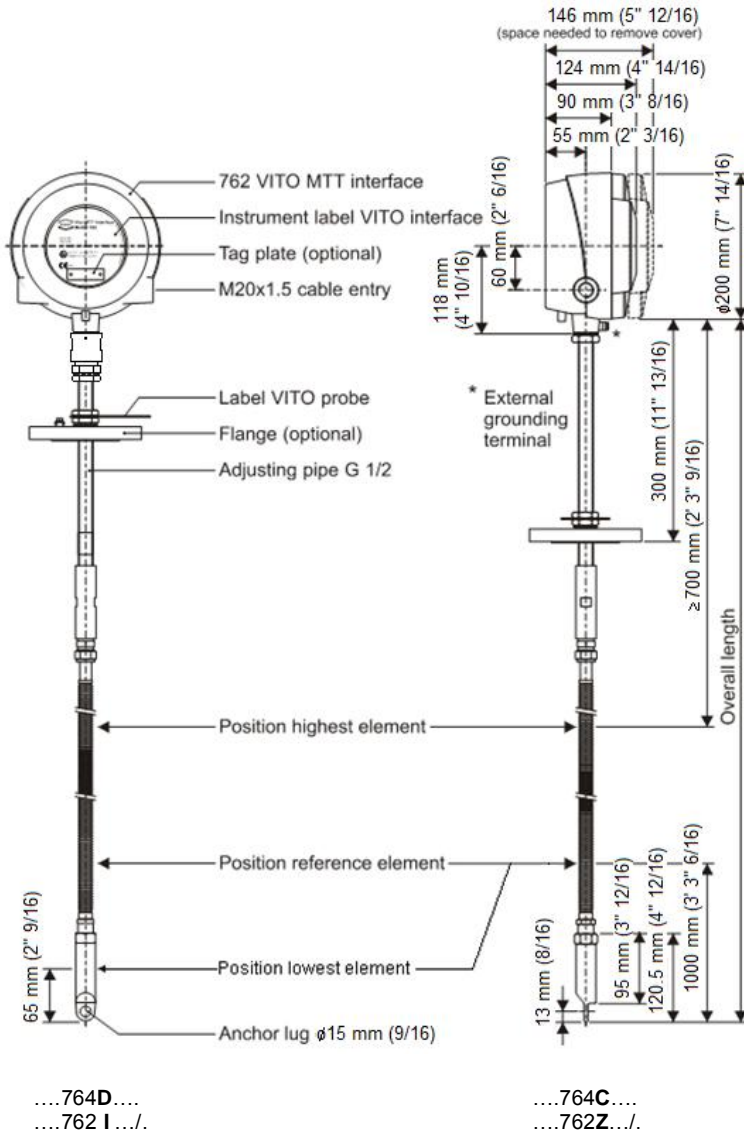


Figure 16 MPT Multiple Spot (Pt100) connected to 762 VITO-MRT

**Note:**  
 Non used MPT elements connections should be left open.

Appendix A Dimensional drawing VITO 764 Temperature probe

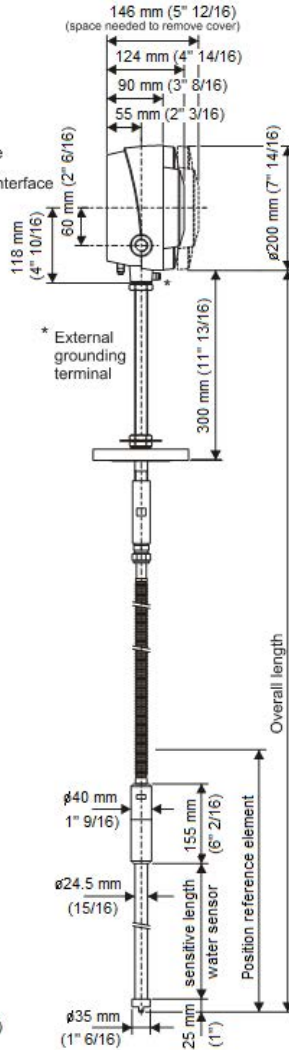


Appendix B Dimensional drawing VITO 765 Water probe

Model	sensitive length water sensor
A..765	485 mm (1' 7" 2/16)
B..765	985 mm (3' 2" 12/16)
C..765	1985 mm (6' 6" 2/16)

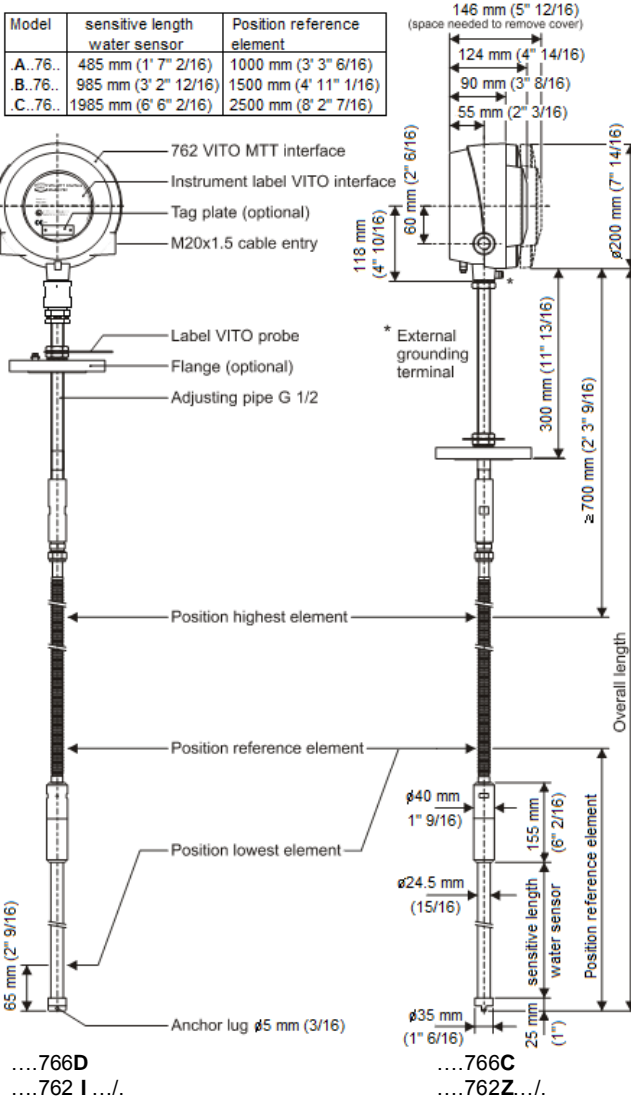


....762 I .../.

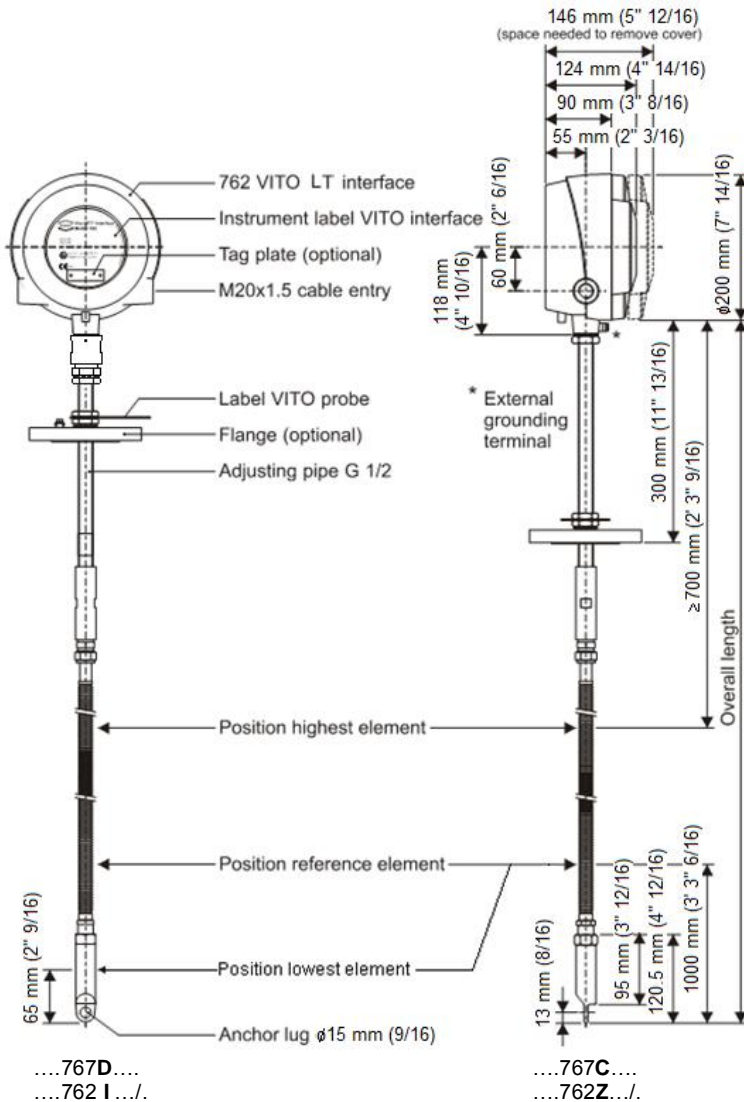


....762Z.../.

Appendix C Dimensional drawing VITO 766 Combi probe

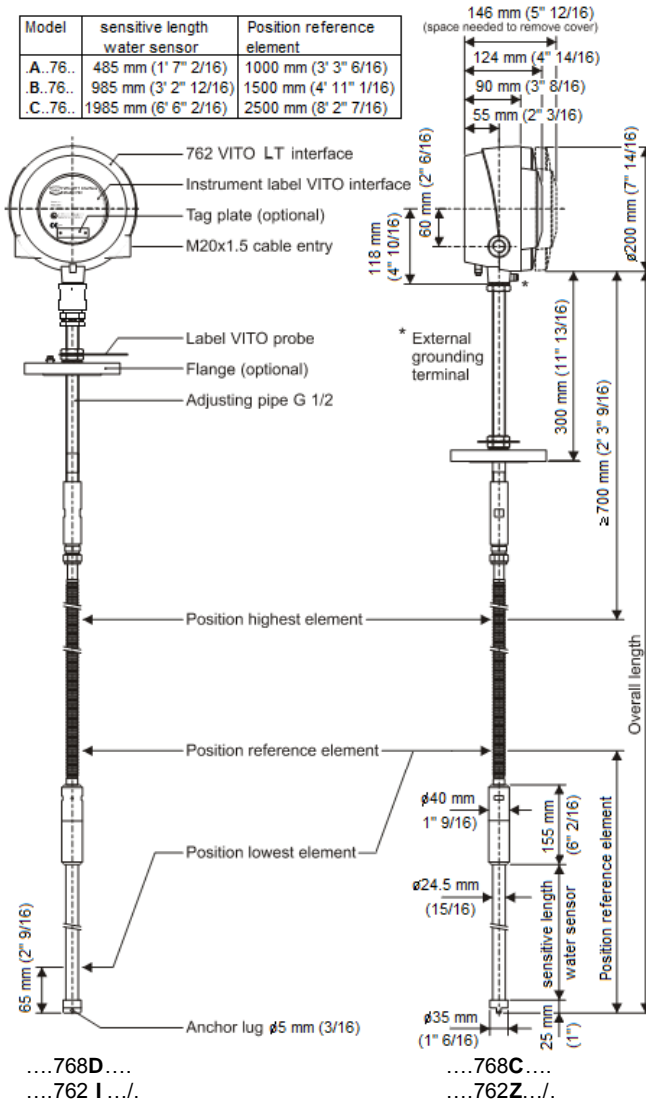


## Appendix D Dimensional drawing VITO 767 Temperature probe



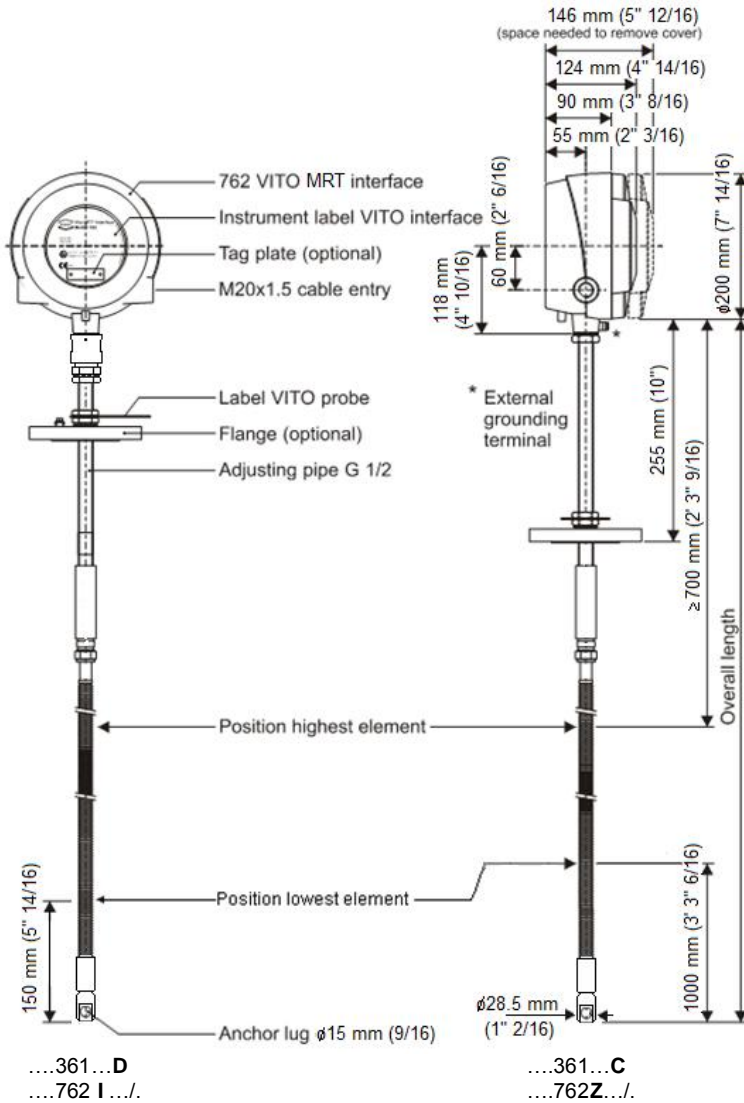
## Appendix E Dimensional drawing VITO 768 Combi probe

Model	sensitive length water sensor	Position reference element
A..76..	485 mm (1' 7" 2/16)	1000 mm (3' 3" 6/16)
B..76..	985 mm (3' 2" 12/16)	1500 mm (4' 11" 1/16)
C..76..	1985 mm (6' 6" 2/16)	2500 mm (8' 2" 7/16)





Appendix F Dimensional drawing 361 MPT temperature probe





## **Appendix H    Related documents**

Installation guide 854 Advanced Technology Gauge  
Installation guide 854 XTG Level Gauge

Installation guide 877 FDI Field Display & Interface

Installation guide 973 SmartRadar LT  
Installation guide 971 SmartRadar LTi  
Installation guide 970 SmartRadar ATi

Installation guide SmartRadar FlexLine

Instruction manual VITO  
Service Manual SmartRadar FlexLine

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