

Rosemount™ 5408 and 5408:SIS Level Transmitters

Parabolic Antenna



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1 About this guide

This Quick Start Guide provides basic guidelines for the Rosemount 5408 and 5408:SIS Level Transmitters. Refer to the Rosemount 5408 and 5408:SIS with HART® [Reference Manual](#) and Rosemount 5408 with FOUNDATION™ Fieldbus [Reference Manual](#) for more instructions. The manuals and this guide are also available electronically on [Emerson.com/Rosemount](https://www.emerson.com/Rosemount).

1.1 Safety messages

⚠ WARNING

Failure to follow safe installation and servicing guidelines could result in death or serious injury.

Ensure the transmitter is installed by qualified personnel and in accordance with applicable code of practice.

Use the equipment only as specified in this manual. Failure to do so may impair the protection provided by the equipment.

For installations in hazardous locations, the transmitter must be installed according to the Rosemount 5408 [Product Certifications](#) document and System Control Drawing.

Repair, e.g. substitution of components, etc. may jeopardize safety and is under no circumstances allowed.

⚠ WARNING

Explosions could result in death or serious injury.

Verify that the operating atmosphere of the transmitter is consistent with the appropriate hazardous locations certifications.

Before connecting a handheld communicator in an explosive atmosphere, ensure that the instruments are installed in accordance with intrinsically safe or non-incendive field wiring practices.

In Explosion-proof/Flameproof and Non-Incendive/Type n installations, do not remove the transmitter covers when power is applied to the transmitter.

Both transmitter covers must be fully engaged to meet Explosion-proof/Flameproof requirements.

⚠ WARNING**Electrical shock could cause death or serious injury.**

In Explosion-proof/Flameproof and Non-Incendive/Type n installations, avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.

Ensure the mains power to the transmitter is off and the lines to any other external power source are disconnected or not powered while wiring the transmitter.

⚠ WARNING**Process leaks could result in death or serious injury.**

Ensure the transmitter is handled carefully. If the process seal is damaged, gas might escape from the tank.

⚠ WARNING**Physical access**

Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users' equipment. This could be intentional or unintentional and needs to be protected against.

Physical security is an important part of any security program and fundamental in protecting your system. Restrict physical access by unauthorized personnel to protect end users' assets. This is true for all systems used within the facility.

⚠ CAUTION**Hot surfaces**

The flange and process seal may be hot at high process temperatures. Allow to cool before servicing.



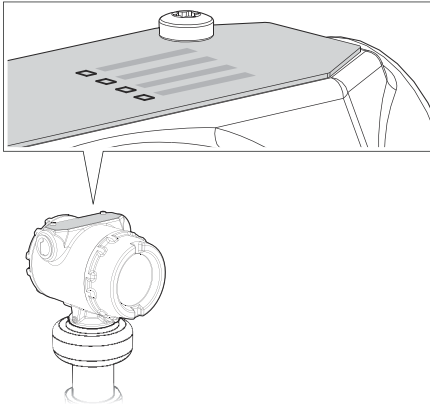
2 Confirm approval type

For hazardous locations transmitters labeled with multiple approval types:

Procedure

Permanently mark the checkbox of the selected approval type.

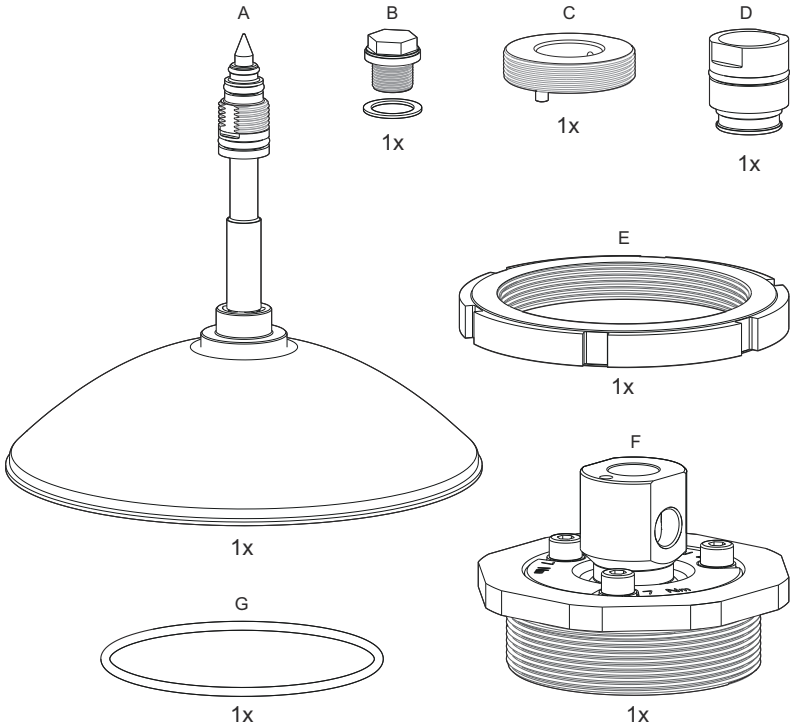
Figure 2-1: Label with Multiple Approval Types



3 Components of the parabolic antenna

3.1 Components of the threaded version

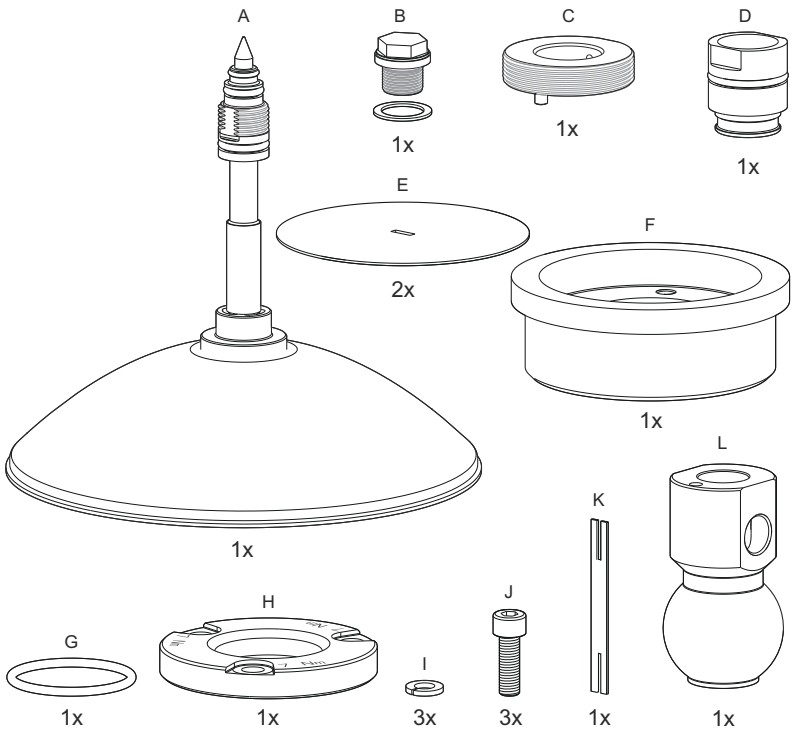
Figure 3-1: Components



- A. Antenna
- B. Purge plug kit
- C. Threaded sleeve
- D. M20 adapter
- E. Lock nut BSPP (G) 3½-in.
- F. Antenna adapter with ball joint
- G. O-ring

3.2 Components of the welded version

Figure 3-2: Components



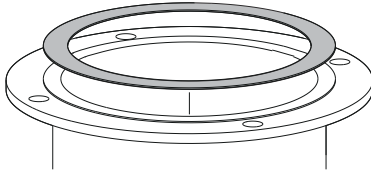
- A. Antenna
- B. Purge plug kit
- C. Threaded sleeve
- D. M20 adapter
- E. Weld protection plate
- F. Flange ball
- G. O-ring
- H. Clamp flange
- I. Washer
- J. M8 screw
- K. Weld protection bar
- L. Ball joint

4 Mount the transmitter

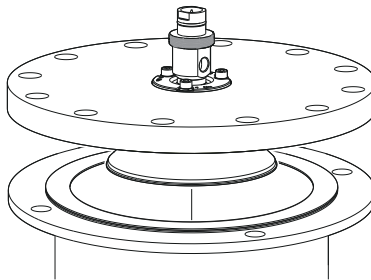
4.1 Mount the flanged version

Procedure

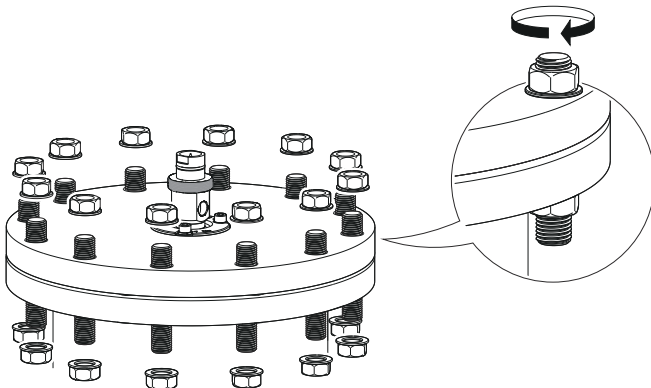
1. Place a suitable gasket on the tank flange.



2. Lower the flange and antenna assembly into the nozzle.



3. Tighten the bolts and nuts with sufficient torque for the flange and gasket choice.



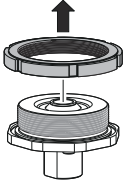
Postrequisites

1. Adjust the inclination of the antenna.
2. Connect the air purging system.

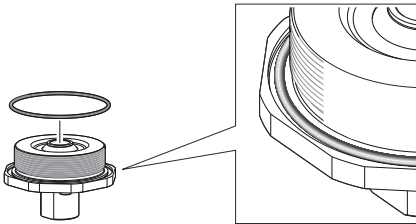
4.2 Mount the threaded version

Procedure

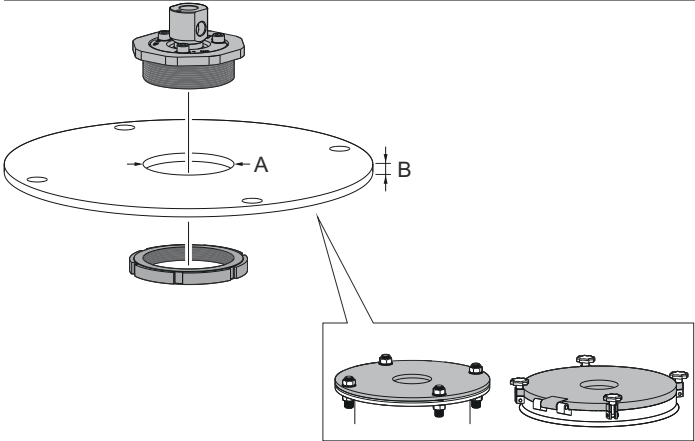
1. Remove the lock nut.



2. Mount the O-ring.



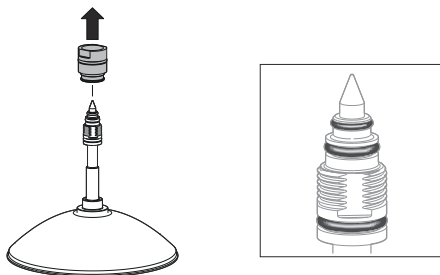
3. Mount the antenna adapter on flange/manhole cover. Ensure the antenna adapter fits tightly to the flange/manhole cover.



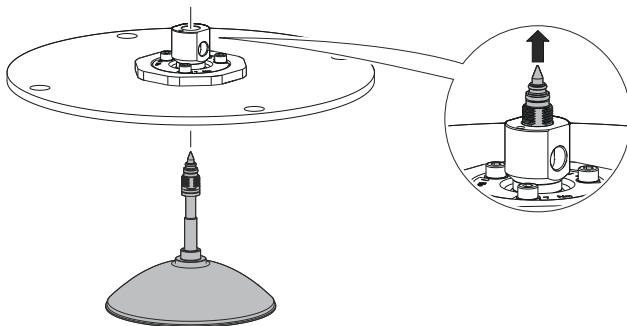
A. $\varnothing 3.98 \pm 0.02$ in. ($\varnothing 101 \pm 0.6$ mm) or G 3½-in.

B. Max. 0.59 in. (15 mm)

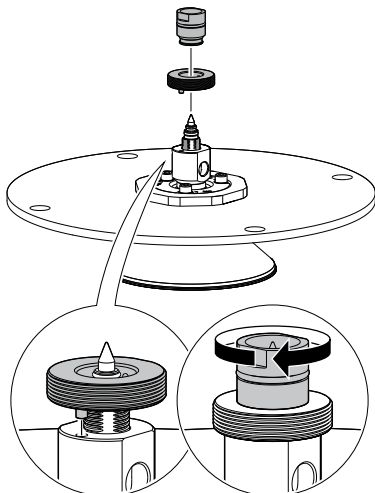
- 4. Remove the M20 adapter and visually inspect the O-rings for damage and dirt.




- 5. Carefully insert the antenna.

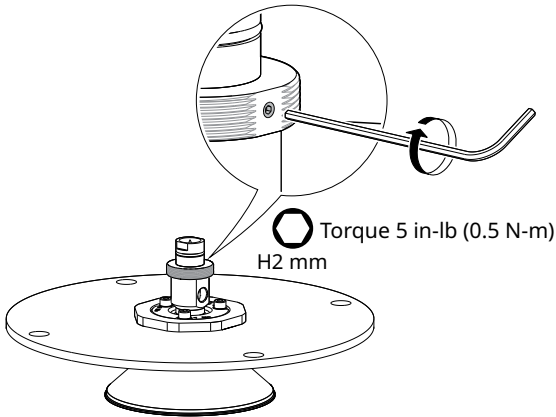


- 6. Secure the antenna.

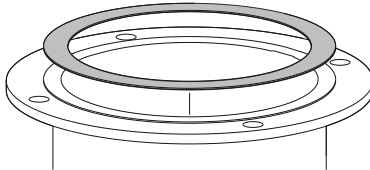


 Torque 180 in-lb (20 N-m)
27 mm

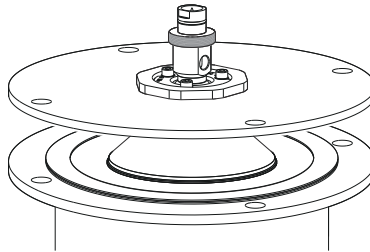
7. Tighten the set screw.



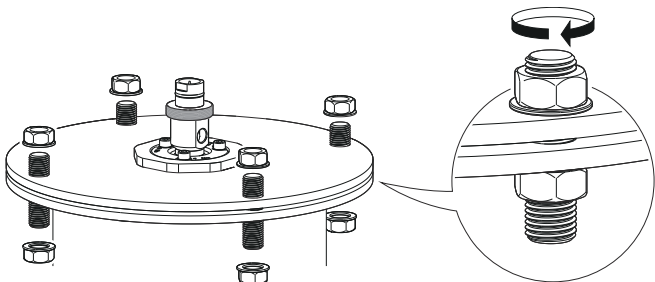
8. Place a suitable gasket on the tank flange.



9. Lower the antenna assembly into the tank.



10. Tighten the bolts and nuts with sufficient torque for the flange and gasket choice.



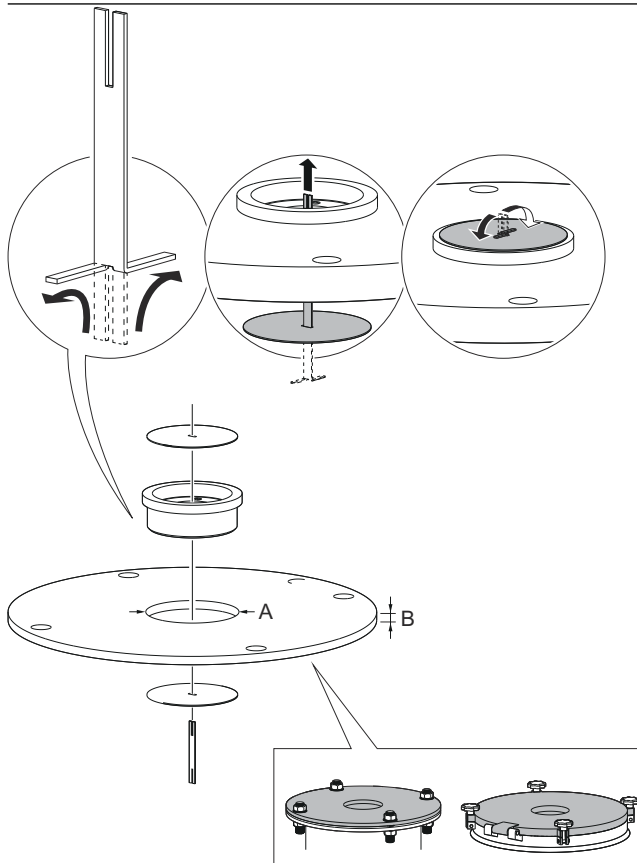
Postrequisites

1. Adjust the inclination of the antenna.
2. Connect the air purging system.

4.3 Mount the welded version

Procedure

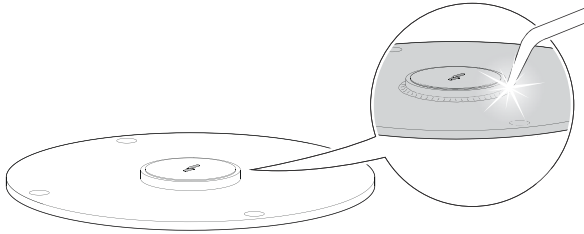
1. Mount the protection plates to flange/manhole cover. These plates protect the internal surfaces of the flange ball from dust and sparks during welding.



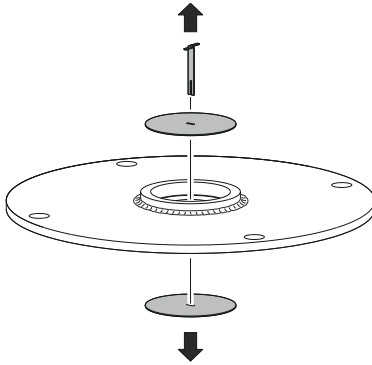
A. $\varnothing 3.94 \pm 0.02$ in. ($\varnothing 100 \pm 0.5$ mm)

B. Max. 1.18 in. (30 mm)

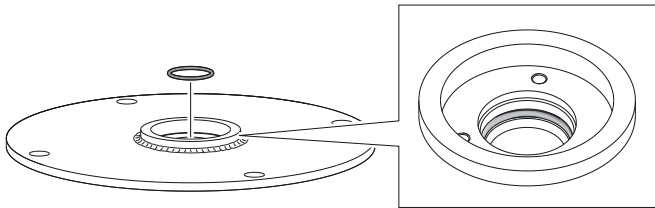
2. Weld the flange ball.



3. Remove the protection plates and visually inspect the internal surfaces of the flange ball for damage and dirt.

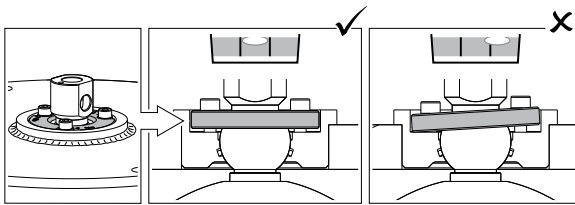
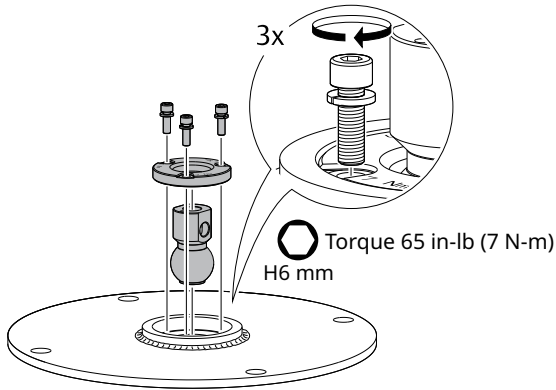


4. Mount the O-ring.

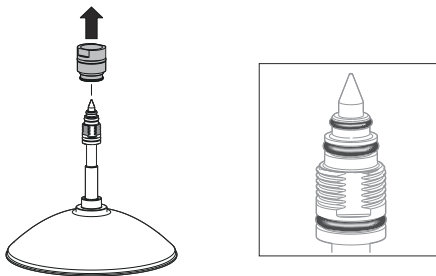


5. Mount the ball joint.

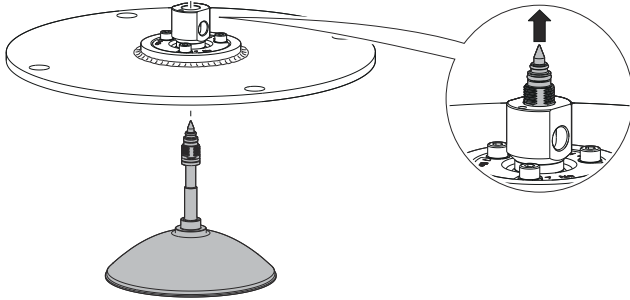
- a) Insert the ball joint and place the clamp flange with the "7 Nm" marking side up.
- b) Gradually tighten the M8 screws.



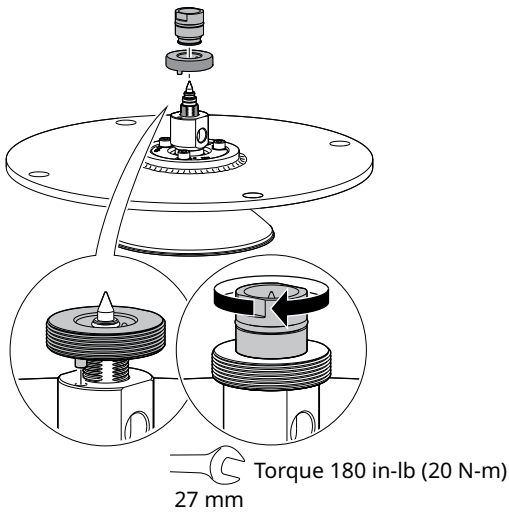
6. Remove the M20 adapter and visually inspect the O-rings for damage and dirt.



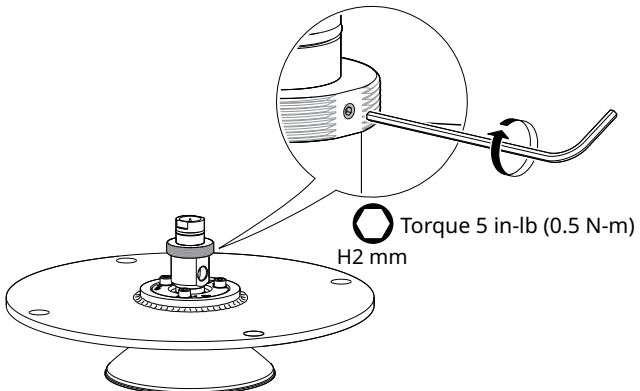
7. Carefully insert the antenna.



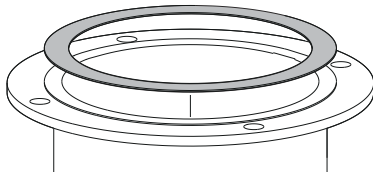
8. Secure the antenna.



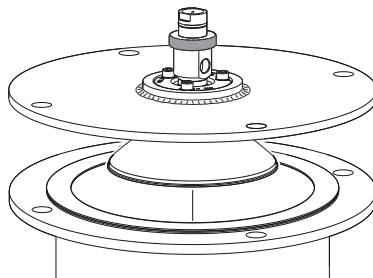
9. Tighten the set screw.



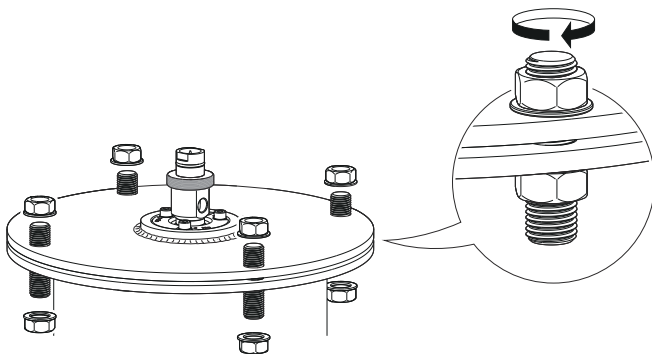
10. Place a suitable gasket on the tank flange.



11. Lower the antenna assembly into the tank.



12. Tighten the bolts and nuts with sufficient torque for the flange and gasket choice.



Postrequisites

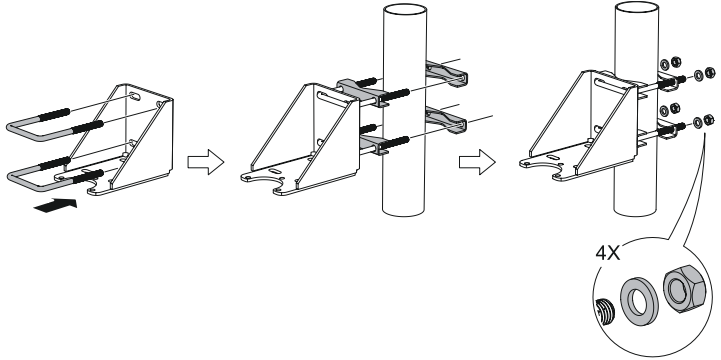
1. Adjust the inclination of the antenna.
2. Connect the air purging system.

4.4 Mount the bracket

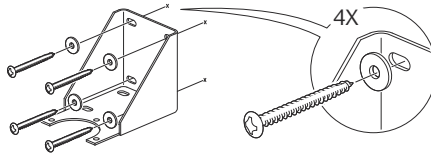
Procedure

1. Mount the bracket to the pipe/wall.

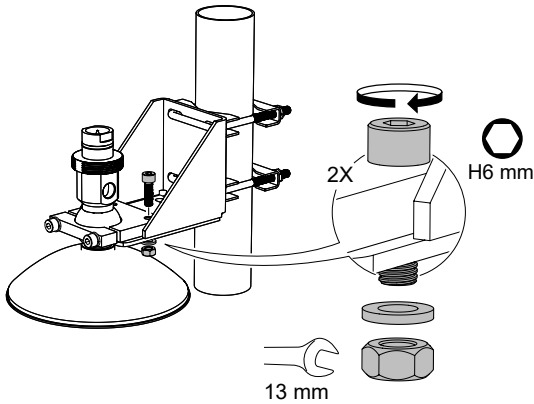
On pipe:



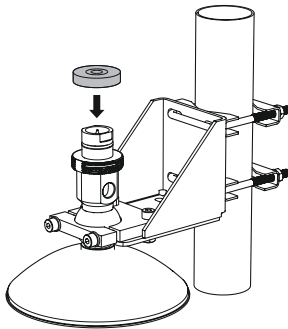
On wall:



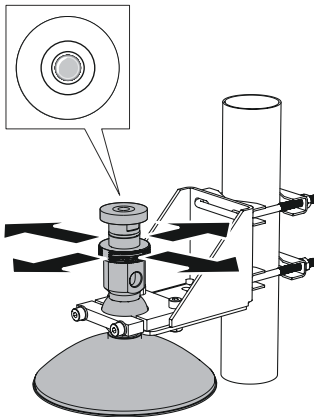
2. Mount the antenna assembly to the bracket.



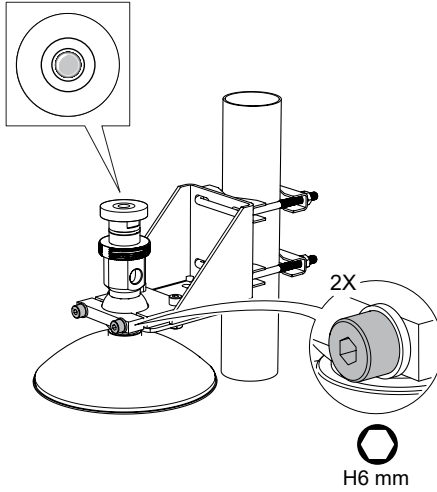
3. Place the supplied circular level on top of the antenna assembly.



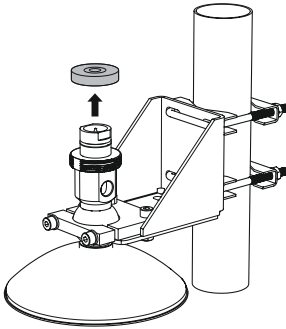
4. Adjust the inclination of the antenna.



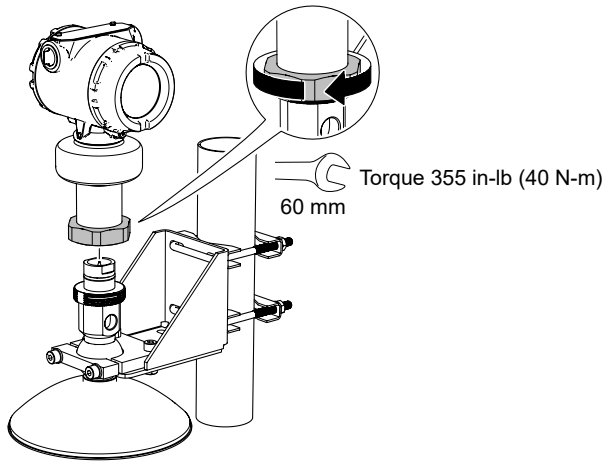
5. Gradually tighten the two M8 screws.



6. Remove the circular level.



7. Mount the transmitter head.



Postrequisites

1. Connect the air purging system.

5 Adjust the inclination of the antenna

Prerequisites

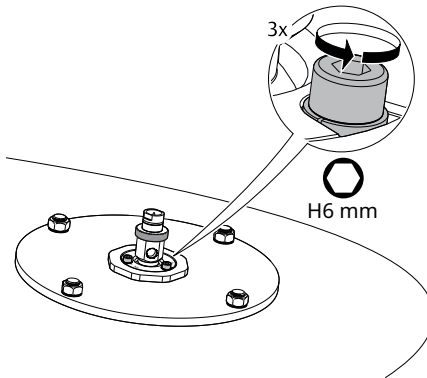
⚠ WARNING

Contents may be under pressure.

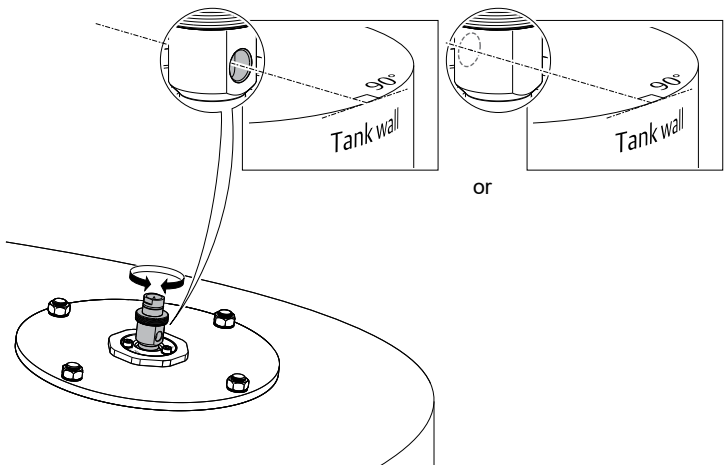
Do not loosen the M8 screws while in operation. Attempting to do so may release pressurized gases, resulting in serious injury or death.

Procedure

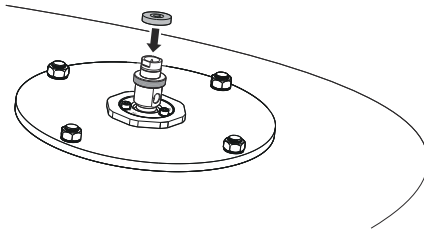
1. Loosen the M8 screws until the antenna can rotate smoothly.



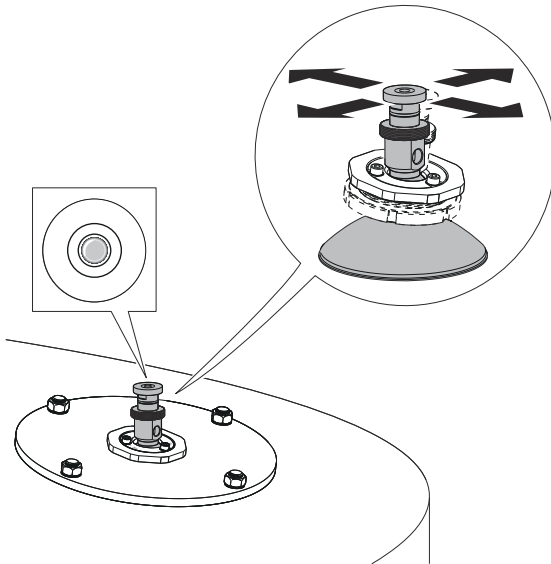
2. Rotate the antenna so the air purge connection is directed toward the tank wall.



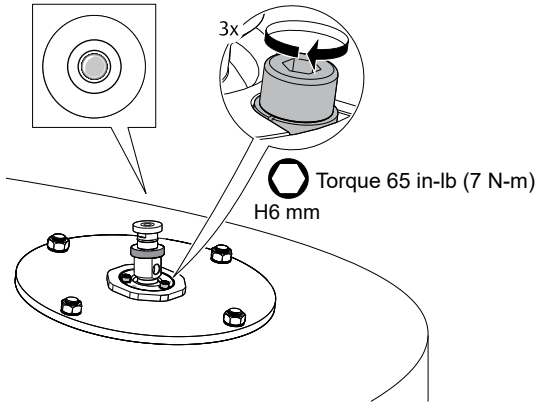
- 3. Place the supplied circular level on top of the antenna assembly.



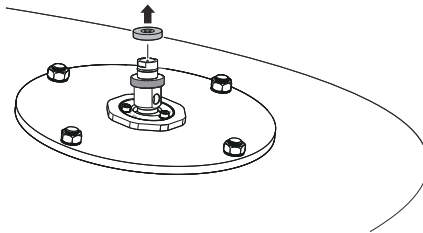
- 4. Adjust the inclination of the antenna.



5. Gradually tighten the M8 screws.

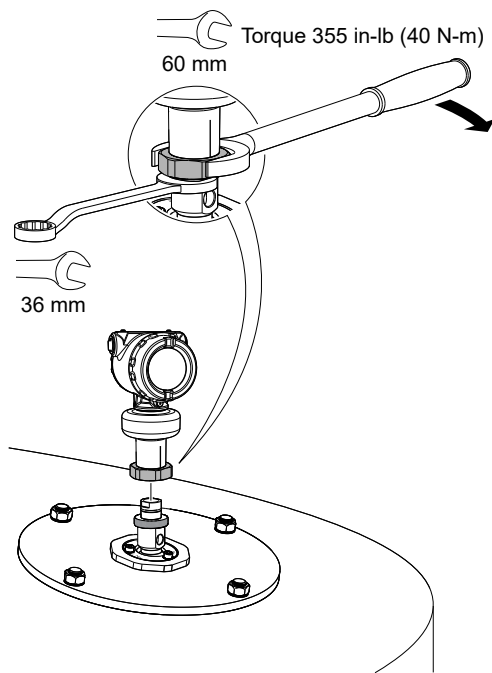
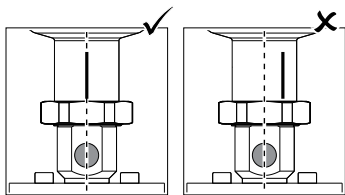


6. Remove the circular level.



7. Mount the transmitter head.

Align the marking on the sensor module with the air purge connection.

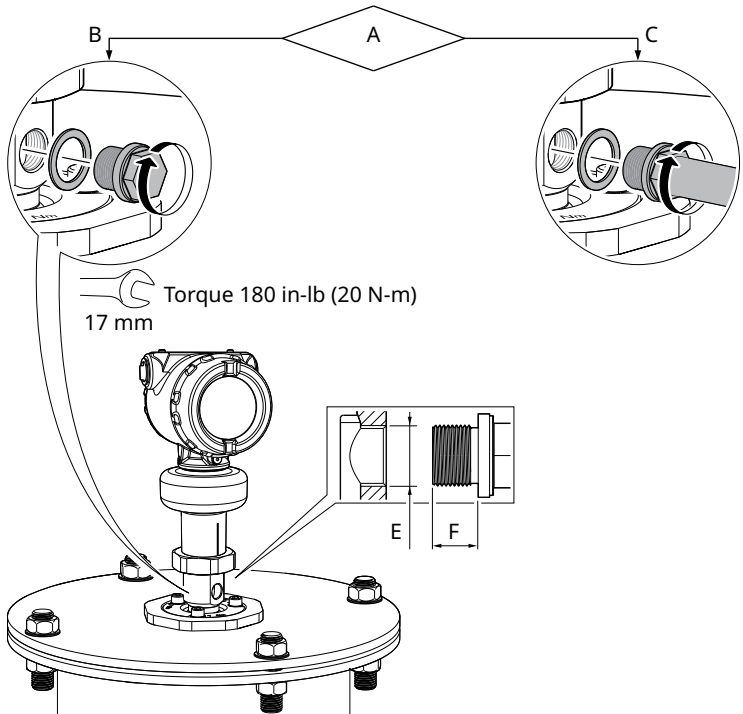


6 Connect the air purging

Procedure

- If air purging is not used, plug and seal the entry with the purge plug kit.

Figure 6-1: Air Purging



- A. Air purging?
- B. No
- C. Yes
- D. Use thread sealant or gasket according to your site procedures.
- E. $G\frac{3}{8}$ -in.
- F. 0.3-0.4 in. (8-10 mm) (gasket excluded)

6.1 Incoming air supply specification

- Maximum pressure: 190 psi (13 bar)
- Recommended pressure: 100 to 115 psi (7 to 8 bar)
- Inlet/outlet connection: BSPP (G) $\frac{3}{8}$ -in.
- Air consumption: 252 gal/min at 65 psi (955 l/min at 4.5 bar)

7 Adjust display orientation (optional)

To improve field access to wiring or to better view the optional LCD display:

Prerequisites

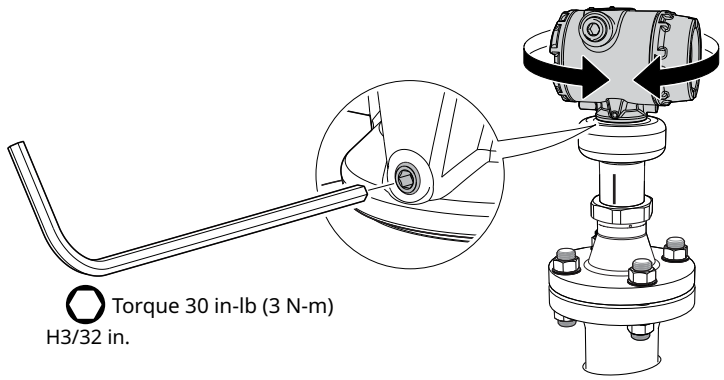
Note

In high vibration applications, the transmitter housing must be fully engaged into the sensor module to meet the vibration test specifications. This is achieved by rotating the transmitter housing clockwise to thread limit.

Procedure

1. Loosen the set screw until the transmitter housing can rotate smoothly.
 2. First, rotate the housing clockwise to the desired location. If the desired location cannot be achieved due to thread limit, rotate the housing counterclockwise to the desired location (up to 360° from thread limit).
 3. Re-tighten the set screw.
-

Figure 7-1: Rotate the Transmitter Housing



8 Prepare the electrical connections

8.1 Cable selection

Table 8-1: Recommended Cable Size

Protocol	Wire diameter
4–20 mA/HART®	24-14 AWG
FOUNDATION™ Fieldbus	18 AWG, Fieldbus type A cable

Twisted pairs and shielded wiring are recommended for environments with high EMI (electromagnetic interference).

Use wire rated at least 5 °C above maximum ambient temperature.

Two wires can be safely connected to each terminal screw.

8.2 Cable gland/conduit

For explosion-proof/flameproof installations, only use cable glands or conduit entry devices certified explosion-proof or flameproof.

8.3 Power consumption

Max. 1 W, current max. 23 mA

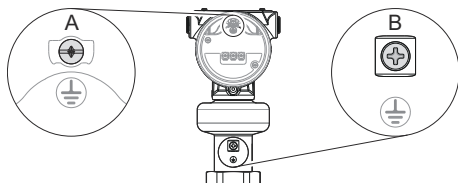
8.4 Grounding

Make sure grounding is done according to national and local electrical codes. Failure to do so may impair the protection provided by the equipment.

Transmitter housing

The most effective grounding method is direct connection to earth ground with minimal impedance. There are two grounding screw connections provided (see [Figure 8-1](#)).

Figure 8-1: Ground Screws



A. Internal ground screw

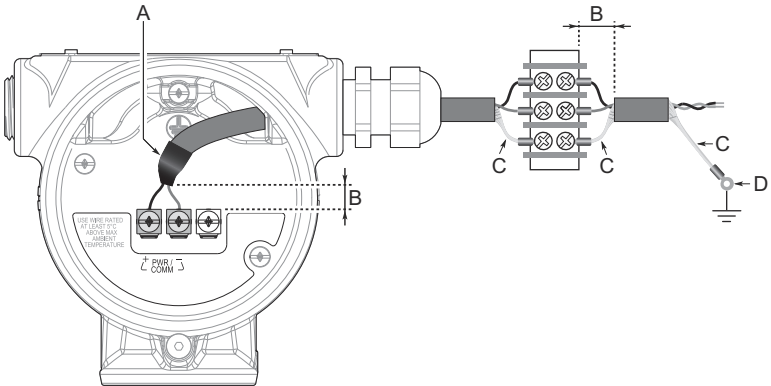
B. External ground screw

Cable shield grounding

Make sure the instrument cable shield is:

- Trimmed close and insulated from touching the transmitter housing.
- Continuously connected throughout the segment.
- Connected to a good earth ground at the power supply end.

Figure 8-2: Cable Shield



- Insulate shield and drain wire*
- Minimize distance*
- Trim shield and insulate exposed drain wire*
- Connect drain wire to the power supply ground*

Note

Do not ground the shield and its drain wire at the transmitter. If the cable shield touches the transmitter housing, it can create ground loops and interfere with communications.

8.5 4-20 mA HART®

8.5.1 Power supply

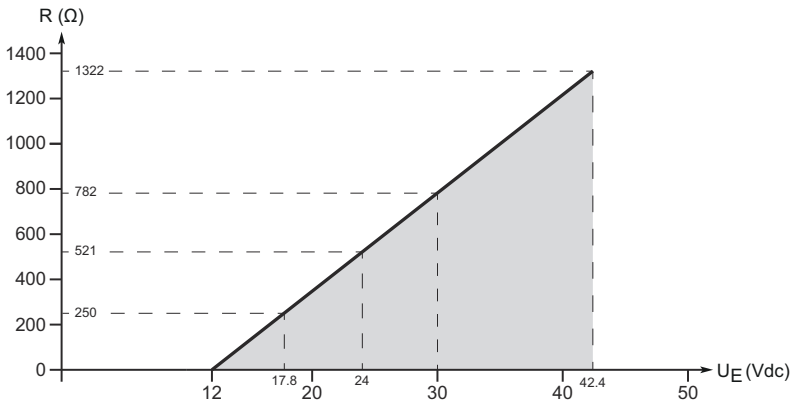
The transmitter operates on 12-42.4 Vdc transmitter terminal voltage (12-30 Vdc in Intrinsically Safe installations).

8.5.2 Load limitations

For HART® communication, a minimum loop resistance of 250 Ω is required. Maximum loop resistance (R) is determined by the voltage level of the external power supply (U_E):

$$R = 43.5 \times (U_E - 12)$$

Figure 8-3: Load Limits



8.6 FOUNDATION™ Fieldbus

8.6.1 Power supply

The transmitter operates on 9-32 Vdc (9-30 Vdc in Intrinsically Safe installations and 9-17.5 Vdc for FISCO) at the transmitter terminals.

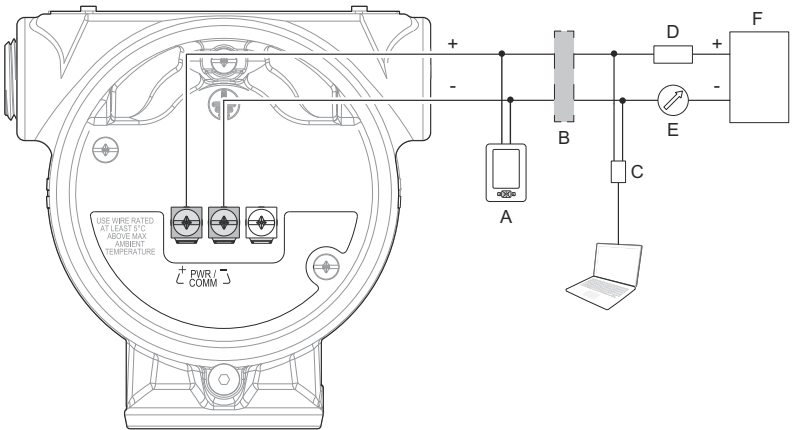
8.6.2 Signal termination

A terminator should be installed at the beginning and end of every Fieldbus segment.

For transmitter with built-in terminator, connect a jumper wire between the "TERMINATE ON" terminals to activate the terminator.

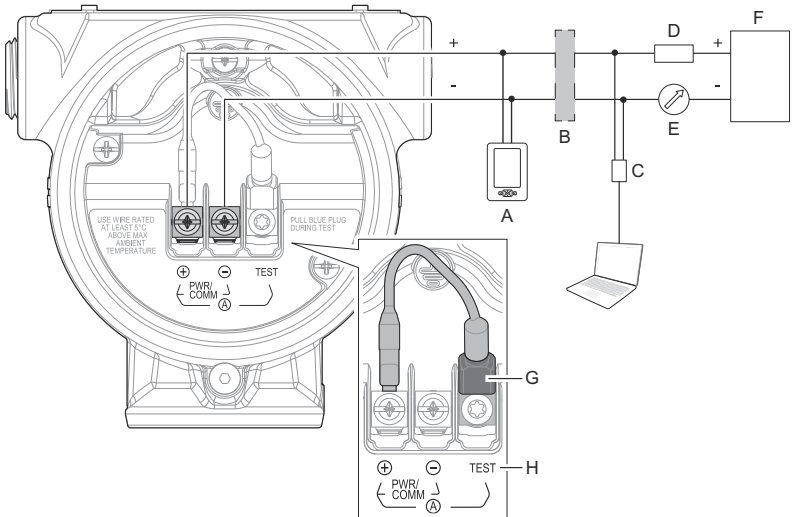
8.7 Wiring diagram

Figure 8-4: 4-20 mA/HART® Communication



- A. Handheld communicator
- B. Approved IS barrier (for Intrinsically Safe installations only)
- C. HART modem
- D. Load resistance ($\geq 250 \Omega$)
- E. Current meter
- F. Power supply

Figure 8-5: 4-20 mA/HART Communication - Terminal Block with TEST Terminal

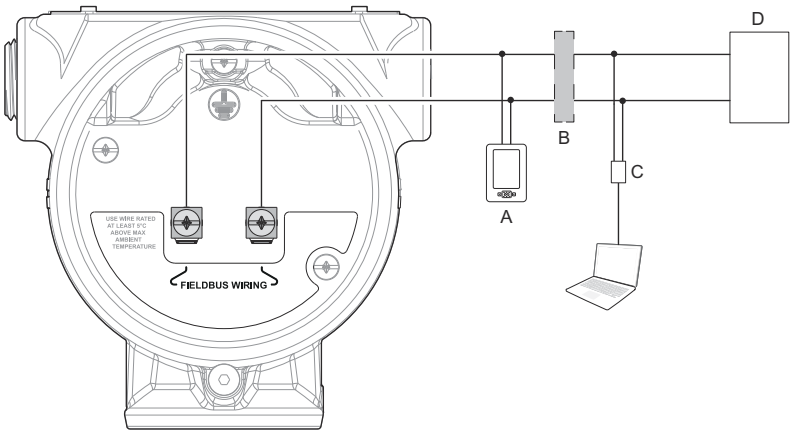


- A. Handheld communicator
- B. Approved IS barrier (for Intrinsically Safe installations only)
- C. HART modem
- D. Load resistance ($\geq 250 \Omega$)
- E. Current meter
- F. Power supply
- G. Blue plug
- H. TEST terminal

Note

Disconnect the blue plug only during the loop current measurement procedure.

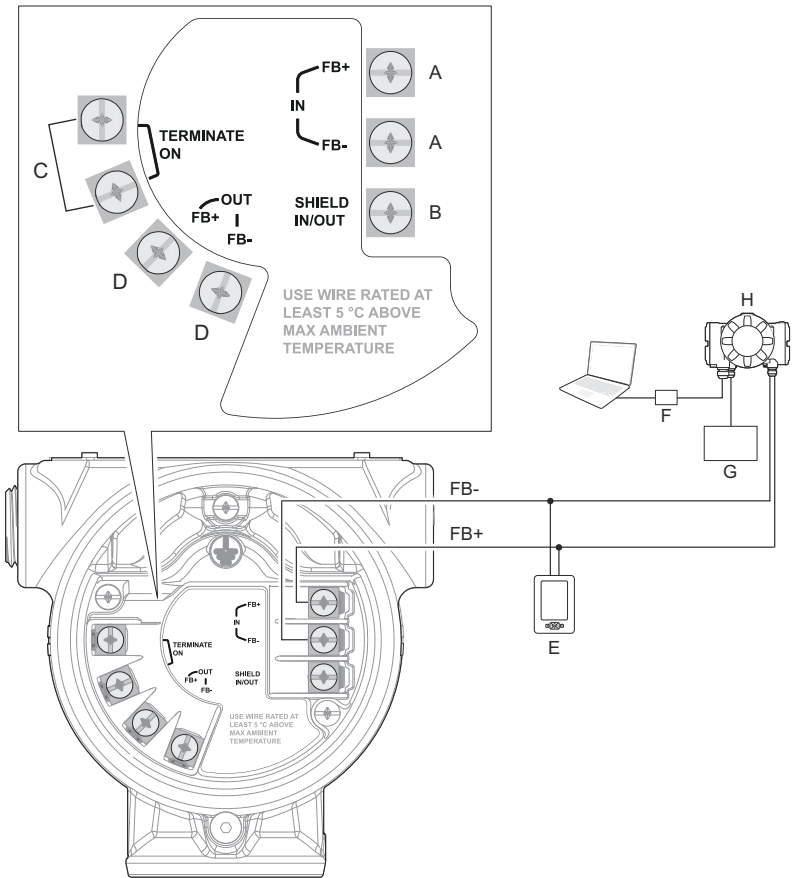
Figure 8-6: FOUNDATION™ Fieldbus



- A. Handheld communicator
- B. Approved IS barrier (for Intrinsically Safe installations only)
- C. FOUNDATION Fieldbus modem
- D. Power supply

The terminals are not polarity sensitive.

Figure 8-7: FOUNDATION Fieldbus - Terminal Block with Built-in Terminator and Connections for Daisy-chaining

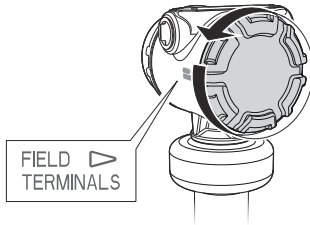


- A. Tankbus
- B. Cable shield (insulate from touching the transmitter housing)
- C. Built-in terminator (connect jumper if last device on the fieldbus segment)
- D. Daisy-chain connection to other devices
- E. Handheld communicator
- F. Fieldbus modem
- G. Power supply
- H. Rosemount™ 2410 Tank Hub

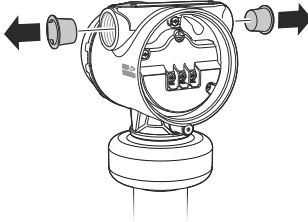
9 Connect wiring and power up

Procedure

1. ⚠️ Verify the power supply is disconnected.
2. Remove the cover.

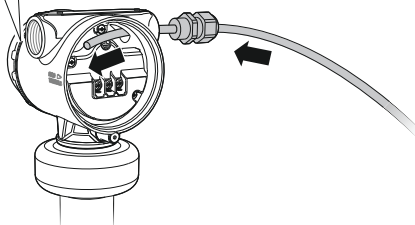
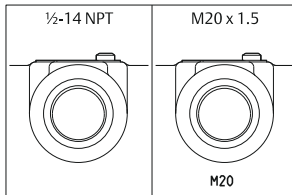


3. Remove the plastic plugs.



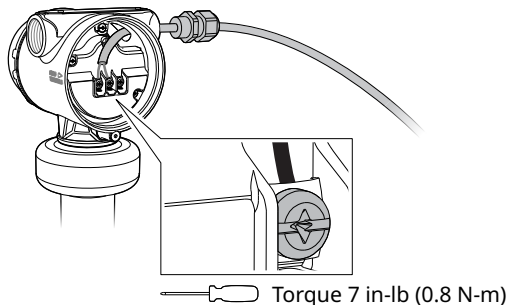
4. Pull the cable through the cable gland/conduit.⁽¹⁾

Identification of thread size and type:

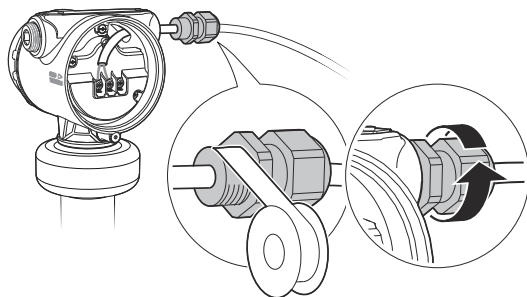


⁽¹⁾ Unless marked, the conduit/cable entries in the transmitter housing use a ½-14 NPT thread form.

- 5. Connect the cable wires.

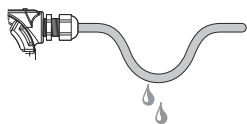


- 6. Ensure proper grounding.
- 7. Tighten the cable gland.
- Apply PTFE tape or other sealant to the threads.

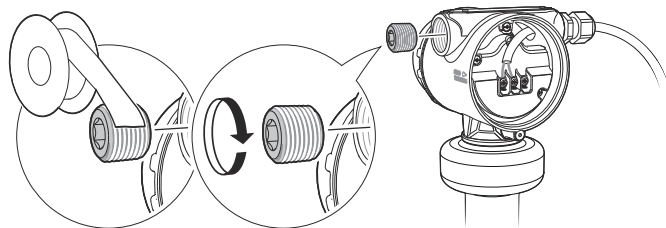


Note

Make sure to arrange the wiring with a drip loop.

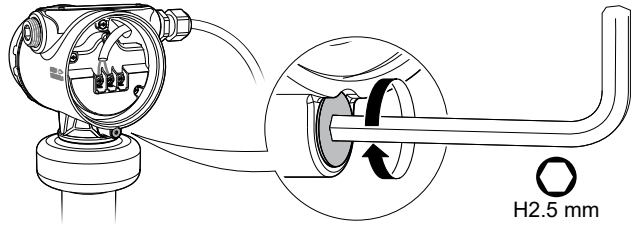


- 8. Seal any unused port with the enclosed metal plug.
- Apply PTFE tape or other sealant to the threads.

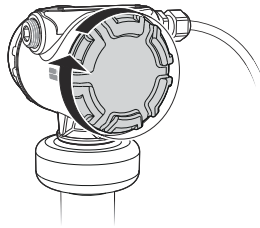


9. Attach and tighten the cover.

- a) Verify the cover jam screw is completely threaded into the housing.

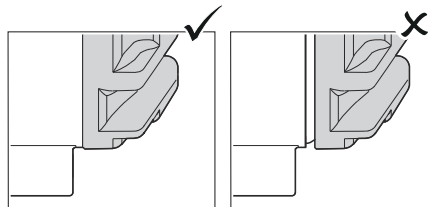


- b) Attach and tighten the cover.



Note

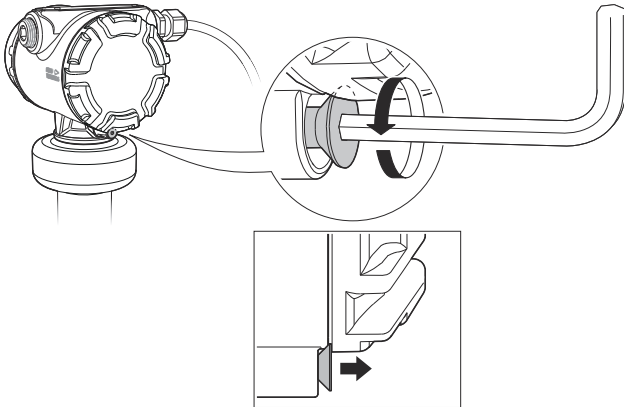
Make sure the cover is fully engaged. There should be no gap between the cover and the housing.



- c) Turn the jam screw counterclockwise until it contacts the cover.

Note

Required for explosion-proof/flameproof installations only.



- d) Turn the jam screw an additional $\frac{1}{2}$ turn counterclockwise to secure the cover.

10. Connect the power supply.

Note

It may take up to 15 seconds before the LCD display lights up.

10 Configuration

10.1 Configuration tools

- Field Device Integration (FDI) compliant systems
- Device Descriptor (DD) compliant systems
- Device Type Manager (DTM™) compliant systems

10.2 Rosemount Radar Master Plus

Rosemount Radar Master Plus is the recommended tool for configuration. It is a User Interface Plug-in (UIP) that includes basic configuration options, as well as advanced configuration and service functions. An FDI or DTM compliant host is needed to run Rosemount Radar Master Plus.

Related information

[Emerson.com/RosemountRadarMasterPlus](https://emerson.com/RosemountRadarMasterPlus)

10.2.1 Download AMS Device Configurator

AMS Device Configurator is a software for configuration of Emerson field devices using FDI technology.

Procedure

Download the software at [Emerson.com/AMSDeviceConfigurator](https://emerson.com/AMSDeviceConfigurator).

10.3 Confirm correct device driver

Procedure

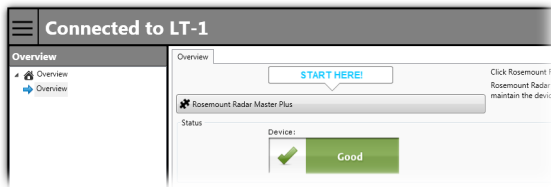
1. Verify that the correct FDI/DD/DTM Package is loaded on your systems to ensure proper communication.
2. Download the latest FDI/DD/DTM Package at [Emerson.com/MySoftware](https://emerson.com/MySoftware) or [FieldCommGroup.org](https://fieldcommgroup.org).

10.4 Configure transmitter using guided setup

The options available in the Guided Setup wizard include all items required for basic operation.

Procedure

1. If using an FDI or DTM compliant software, then select **Overview** → **Rosemount Radar Master Plus**.



2. Select **Configure** → **Guided Setup** and follow the on-screen instructions.



Quick Start Guide
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For more information: [Emerson.com/global](https://emerson.com/global)

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