

Rosemount 9000 Series Magnetic Flow Sensors Quick Start Guide



Product documents can be located by selecting the search tool magnifier icon at the top of www.emerson.com and then select the "Serial Number" lookup button in the pop-up menu.

For Additional Product Information:

Please scan the QR code on this document for your local language safety messages. Escaneie o código QR acima para obter as mensagens de segurança no idioma local. Bitte scannen Sie den QR-Code oben nach den Sicherheitshinweisen Ihrer Landessprache.

Veuillez scanner le code QR ci-dessus pour obtenir vos messages de sécurité en langue locale.

Lea el código QR anterior para ver sus mensajes de seguridad en el idioma local.

Eseguire la scansione del codice QR sopra indicato per i messaggi di sicurezza nella lingua locale.

Отсканируйте QR-код выше, чтобы получить сообщения о безопасности на местном языке.

請掃描上面的 QR 代碼以了解您的本地語言安全消息。

上記の QR コードをスキャンして、地域の言語の安全性に関するメッセージを確認してください。

현지 언어 안전 메시지를 보려면 위의 QR 코드를 스캔하세요

1 Safety messages

Handling and lifting

For units with an integral mount transmitter, refer to the safety messages in the appropriate document.

WARNING

Handling and lifting

Failure to follow these installation guidelines could result in serious injury or death:

Installation and servicing instructions are for use by qualified personnel only. Do not perform any servicing other than that contained in the operating instructions, unless qualified.

Potential electrostatic charging hazard: Rosemount Magnetic flow meters ordered with either standard or non-standard paint options or non-metallic labels may be subject to electrostatic discharge. To avoid electrostatic charge build-up, do not rub the flow meter with a dry cloth or clean with solvents.

Verify that the operating environment of the sensor and transmitter is consistent with the appropriate Agency Approval.

If installed in an explosive atmosphere, verify that the device certification and installation techniques are suitable for that particular environment.

WARNING

Ground the meter components

Failure to comply with requirements for intrinsic safety in a hazardous area could result in an explosion causing death or serious injury.

Comply with the intrinsic safety requirements.

Removing the metal clamping ring while the unit is powered on violates safety and intrinsic safety protection methods and could result in serious injury or death

The metal clamping ring provides a safety earth ground connection.

CAUTION

Lifting lugs

If provided, use the lifting lugs on each flange to handle the flow meter when it is transported and lowered into place at the installation site. If lifting lugs are not provided, the flow meter must be supported with a lifting sling on each side of the housing.

Standard pressure 3-inch through 24-inch flanged magnetic flow meters come with lifting lugs.

High pressure (above 600#) 1.5-inch through 24-inch flanged magnetic flow meters come with lifting lugs.

CAUTION

Handling and lifting

To reduce the risk of personal injury or damage to equipment, follow all lifting and handling instructions:

Handle all parts carefully to prevent damage. Whenever possible, transport the system to the installation site in the original shipping container.

All sensors are shipped with end covers that protect flange sealing surfaces from mechanical damage. Remove the end covers just before installation.

PTFE-lined sensors require the end covers to prevent normal unrestrained distortion of the liner material. Remove the end covers just before installation.

Keep the shipping plugs in the conduit ports until they are ready to be connected and sealed. Appropriate care must be taken to prevent water ingress by replacing the shipping plugs with a permanent plug/conduit seal.

The sensor should be supported by the pipeline. Pipe supports are recommended on both the inlet and outlet sides of the sensor pipeline. There should be no additional support attached to the sensor.

Use proper Personal Protection Equipment (PPE) including safety glasses and safety shoes.

Do not lift the meter by holding the electronics housing or junction box.

The sensor liner is vulnerable to handling damage. Never place anything through the sensor for the purpose of lifting or gaining leverage. Liner damage can render the sensor useless.

Do not drop the device from any height.

NOTICE

Rotate the remote junction box on the sensor

Do not rotate the remote junction box if the remote wiring has been connected to the terminal block. Rotation with wiring connected can damage the wiring and cause measurement error or flow meter failure.

NOTICE

Once installed, the remote junction box cannot be removed completely.

NOTICE

Flanged sensors

For sensors with lining protectors or PEX lining material, follow suggested torque values for the bolts or gaskets being used, whichever has the lower limit.

NOTICE

Gaskets

It is the responsibility of the customer to provide an appropriate gasket for their installation.

The gasket material must be compatible with the process fluid and process conditions. See note below for more information regarding suitable gasket materials.

If no ground rings or lining protectors are being used, a gasket is required at each process connection.

If using grounding ring(s), a gasket is required on each side of each grounding ring.

If using lining protectors, a gasket is required between each lining protector and each process connection.

Metallic or spiral wound gaskets should not be used in contact with the liner face. **They will damage the liner face.** If metallic or spiral wound gaskets are required for the application, then lining protectors must be used.

Examples of gasket materials that will not damage the liner face are rubber, fiber, or PTFE.

Flat ring gasket types are suitable for raised-face (RF) flanges. Full-face gasket types are suitable for raised-face (RF) flanges and flat-face (FF) flanges.

2 Product certifications

Please use the QR code link, or enter your product's serial number into the search tool at [MyEmerson](#), to access Rosemount 9205 Magnetic Flow Sensor that can be found by searching for the Rosemount 9205 product page.

Scroll down to **Documents & Drawings** and click **Certificates & Approvals**.

3 Planning

3.1 About this document

This document provides basic installation guidelines for the Rosemount 9000 Series Magnetic Flow Meter Sensor, including the Rosemount 9205 Sensor.

- For transmitter installation instructions, refer to the appropriate document:

Product model number	Document number ⁽¹⁾
9732ATxxxxxxxxxx	00825-0xx0-9732

(1) "xx" in the second segment of the document number indicates the language. See Table 3-1.

- For additional installation information, configuration, maintenance, and troubleshooting, refer to the appropriate product reference manual.

Table 3-1: Document language codes

Code	Language
10	English
20	Italian
30	French

Code	Language
40	Japanese
50	German
60	Chinese (Simplified)
70	Russian
90	Spanish
22	Portuguese (Brazilian)

All user documentation can be found at www.emerson.com. For more contact information, see [Emerson Flow customer service](#).

3.2 Return policy

Emerson procedures must be followed when returning equipment. These procedures ensure legal compliance with government transportation agencies and help provide a safe working environment for Emerson employees. Failure to follow Emerson procedures will result in your equipment being refused delivery. Contact Emerson Flow customer service for return procedures.

4 Location and position

4.1 Environmental considerations

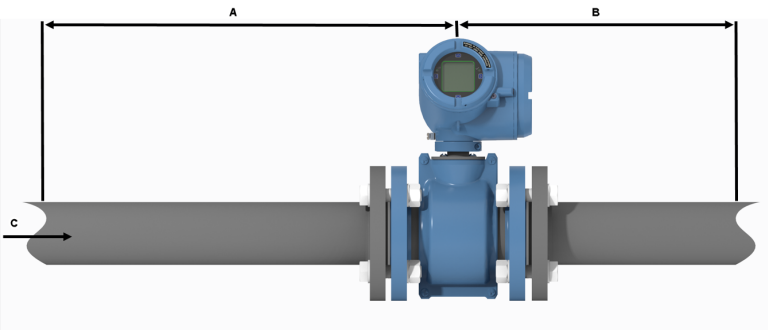
To ensure maximum sensor life, avoid extreme temperatures and excessive vibration. Typical problem areas include the following:

- High-vibration lines
- Tropical/desert installations in direct sunlight
- Outdoor installations in arctic climates

4.2 Upstream and downstream piping

To ensure specified accuracy over widely varying process conditions, it is recommended to install the sensor with a minimum of five straight pipe diameters upstream and two pipe diameters downstream from the electrode plane.

Figure 4-1: Upstream and Downstream Straight Pipe Diameters



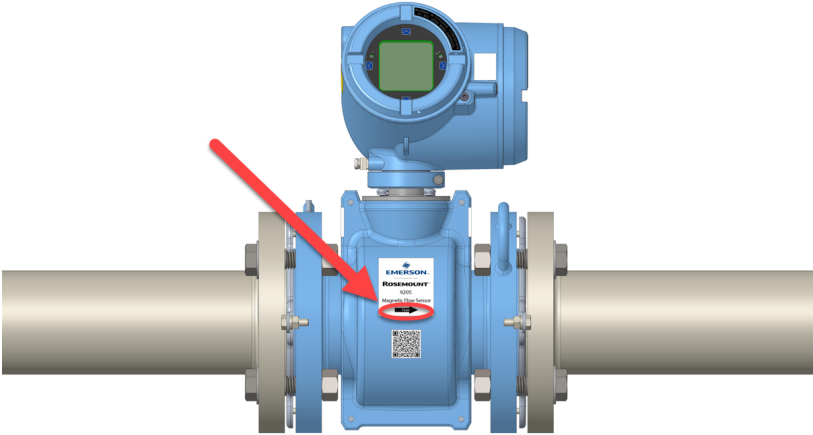
- A. Five pipe diameters (upstream)
- B. Two pipe diameters (downstream)
- C. Flow direction

Installations with reduced upstream and downstream straight runs are possible. In reduced straight run installations, the meter may not meet accuracy specifications. Reported flow rates will still be highly repeatable.

4.3 Flow direction

The sensor should be mounted so that the arrow points in the direction of flow.

Figure 4-2: Flow Direction Arrow

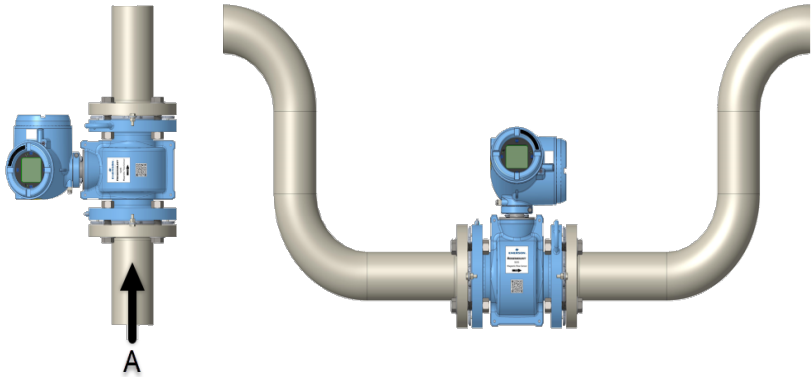


4.4 Sensor piping location and orientation

The sensor should be installed in a location that ensures it remains full during operation. Depending on where it is installed, orientation must also be considered.

- Vertical installation with upward process fluid flow keeps the cross-sectional area full, regardless of flow rate.
- Horizontal installation should be restricted to low piping sections that are normally full.

Figure 4-3: Sensor Orientation

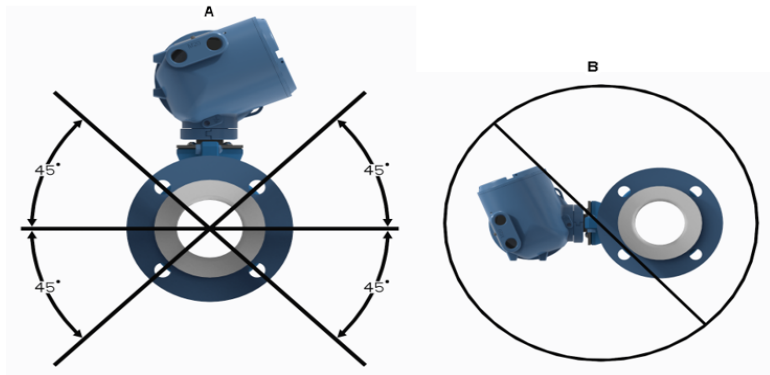


A. Flow direction

4.5 Electrode orientation

The electrodes in the sensor are properly oriented when the two measurement electrodes are in the 3 and 9 o'clock positions or within 45 degrees from the horizontal, as shown on the left side of [Figure 4-4](#). Avoid any mounting orientation that positions the top of the sensor at 90 degrees from the vertical position as shown on the right of the [Figure 4-4](#).

Figure 4-4: Electrode Orientation



- A. Correct orientation
- B. Incorrect orientation

The sensor may require a specific orientation to comply with Hazardous Area T-code rating. Refer to the appropriate hazardous area approvals document for any potential restrictions. In high temperature installations, consider transmitter or remote junction box orientation to ensure maximum meter life. Refer to installation temperature limits in the *Rosemount 9000 Series Product Data Sheet*.

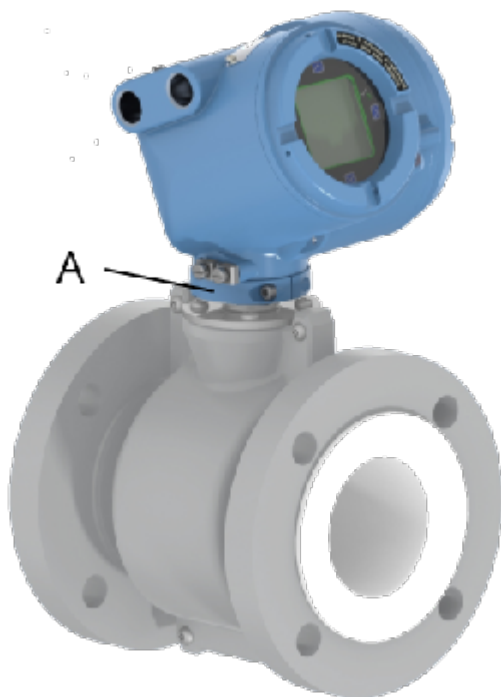
4.6 Transmitter or remote junction box rotation (optional)

For easier access to the user interface or the wiring terminals, the transmitter can be rotated on the sensor.

4.6.1 Rotate the transmitter on the sensor

For easier access to the user interface or the wiring terminals, the transmitter can be rotated on the sensor.

Figure 4-5: Rotating 9732 Transmitter



A. Clamping ring

Prerequisites

Refer to the [Safety messages](#) section for product-specific safety messages.

Procedure

1. Disconnect power before rotating the transmitter.
2. Loosen the metal clamping ring from the base of the feed through using a 4 mm hex wrench.
3. Rotate the transmitter to the desired position. Do not rotate more than 270 °.
4. Tighten the clamping ring on the mounting interface. Tighten the screw to 30 in-lb (3.4 N m) to 32 in-lb (3.62 N m).
5. Reconnect power to the transmitter.

4.6.2 Rotate the remote junction box on the sensor

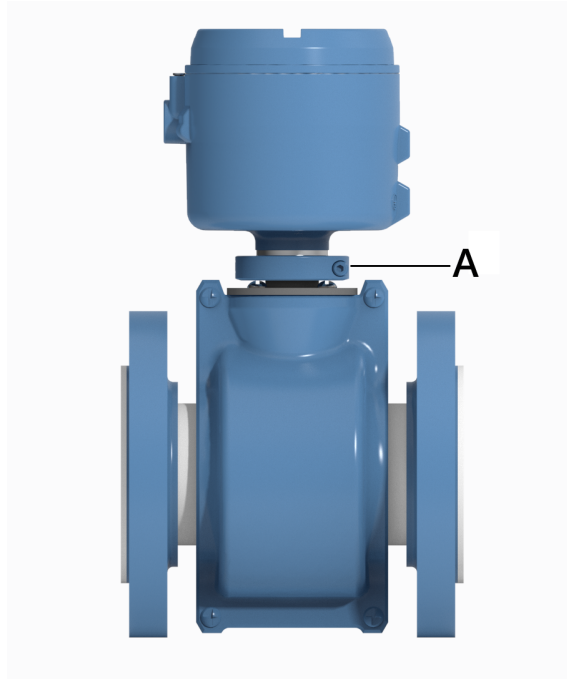
Procedure

1. Loosen or remove the metal clamping ring from the base of the mounting interface. Refer to [Figure 4-6](#).

NOTICE

Once installed, the remote junction box cannot be removed completely.

Figure 4-6: Rotating the Remote Junction Box on the Sensor



A. Clamping ring

-
2. Rotate the remote junction box to the desired position. Refer to the Rotate the remote junction box on the sensor message in [Safety messages](#).
 3. Replace the clamping ring on the mounting interface. Tighten the screw to 28 in-lb (3.16 N m) to 32 in-lb (3.62 N m).

5 Sensor installation

5.1 Lifting lugs

If lifting lugs are not provided, the flow meter must be supported with a lifting sling on each side of the housing (refer to the lifting lugs caution message in [Safety messages](#)).

Figure 5-1: Example lifting without and with lifting lugs

A



B



A. Without lifting lugs

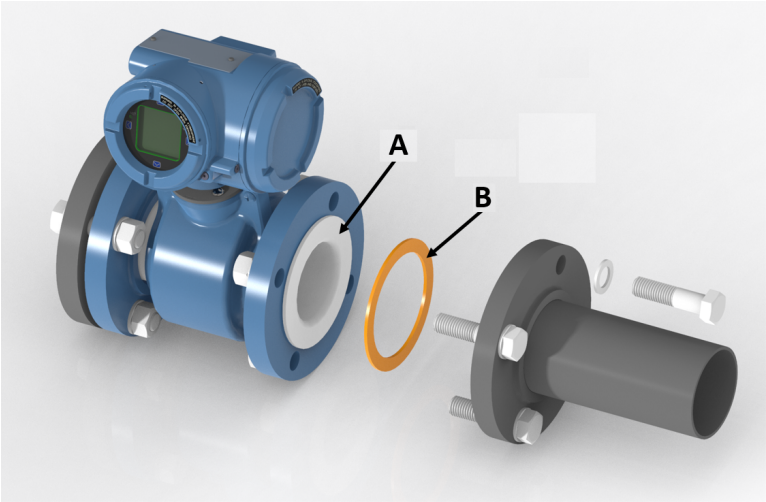
B. With lifting lugs

5.2 Flanged sensors

5.2.1 Gaskets

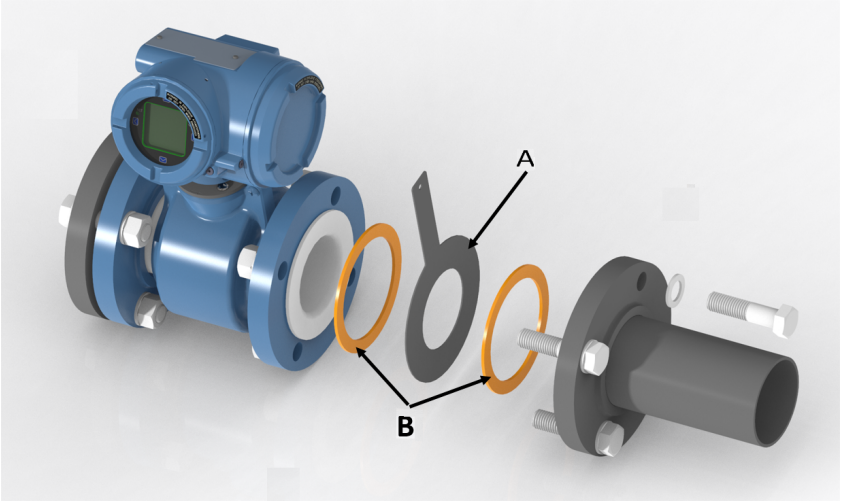
For important guidelines about gaskets, (refer to the notice message in [Safety messages](#)).

Figure 5-2: Flanged Gasket Placement with no Grounding Ring(s) or Lining Protector(s)



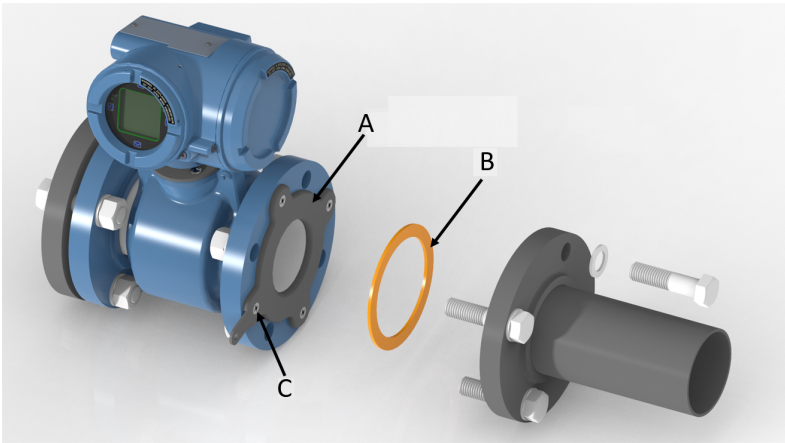
- A. Liner face
- B. Customer supplied gasket (x2)

Figure 5-3: Flanged Gasket Placement with Grounding Ring(s)



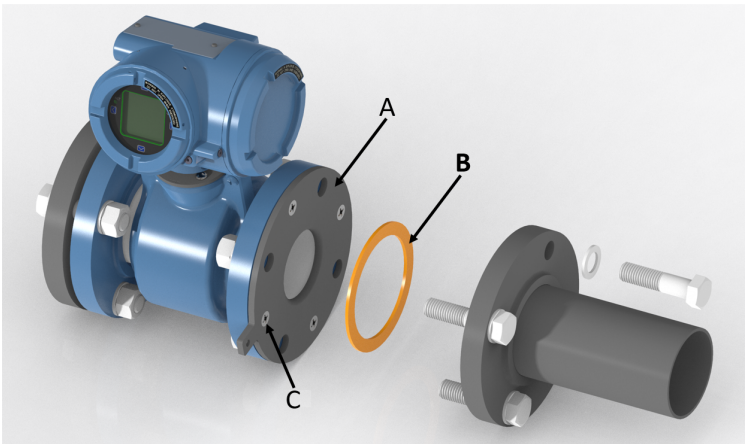
- A. Ground ring
- B. Customer supplied gaskets (x2 per ground ring)

Figure 5-4: Flanged Gasket Placement with Stamped Lining Protector(s)



- A. Stamped lining protector
- B. Customer supplied gasket (x1 per lining protector)
- C. Lining protector fastening screws — DO NOT REMOVE either component.

Figure 5-5: Flanged Gasket Placement with Machined Lining Protector(s)



- A. Machined lining protector
 - B. Customer supplied gasket (x1 per lining protector)
 - C. Lining protector fastening screws — DO NOT REMOVE either component.
-

5.2.2 Bolts

Note

Do not bolt one side at a time. Tighten both sides simultaneously. Example:

1. Snug upstream
2. Snug downstream
3. Tighten upstream (20%)
4. Tighten downstream (20%)

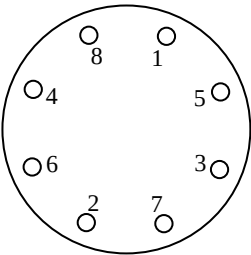
Do not snug and tighten the upstream side and then snug and tighten the downstream side. Failure to alternate between the upstream and downstream flanges when tightening bolts may result in liner damage.

Suggested torque values by sensor line size and liner type are listed in for ASME B16.5 flanges and or for EN flanges. Consult the factory if the flange rating of the sensor is not listed. Tighten flange bolts on the upstream side of the sensor in the incremental sequence shown in to 20% of the suggested torque values. Repeat the process on the downstream side of the sensor. For sensors with greater or fewer flange bolts, tighten the bolts in a similar crosswise sequence. Repeat this entire tightening sequence at 40%, 60%, 80%, and 100% of the suggested torque values.

If leakage occurs at the suggested torque values, the bolts can be tightened in additional 10% increments until the joint stops leaking, or until the measured torque value reaches the maximum torque value of the bolts. Practical consideration for the integrity of the liner often leads to distinct torque values to stop leakage due to the unique combinations of flanges, bolts, gaskets, and sensor liner material.

Check for leaks at the flanges after tightening the bolts. Failure to use the correct tightening methods can result in severe damage. While under pressure, sensor materials may deform over time and require a second tightening 24 hours after the initial installation.

Figure 5-6: Flange bolt torquing sequence



Prior to installation, identify the lining material of the flow sensor to ensure the suggested torque values are applied.

For detailed information about Lining material and suggested flange bolt torque values for Rosemount 9205 sensors, refer to the *Rosemount™ 9732 Magnetic Flow Meter Transmitter Quick Start Guide*.

6 Process reference connection

The figures shown in this section illustrate best practice installations for process reference connections only. For installations in conductive, unlined pipe it may be acceptable to use one ground ring or one lining protector to establish a process reference connection. Earth safety ground is also required as part of this installation, but is not shown in the figures. Follow national, local, and plant electrical codes for safety ground.

Use [Table 6-1](#) to determine which process reference option to follow for proper installation.

Table 6-1: Process Reference Options

Type of pipe	Grounding straps	Grounding rings	Reference electrode	Lining protectors
Conductive unlined pipe	See Figure 6-1	See Figure 6-2	See Figure 6-1	See Figure 6-2
Conductive lined pipe	Insufficient grounding	See Figure 6-2	See Figure 6-3 .	See Figure 6-2
Non-conductive pipe	Insufficient grounding	See Figure 6-2	See Figure 6-3 .	See Figure 6-2

Note

For line sizes 10-inch and larger, the ground strap may come attached to the sensor body near the flange. See [Figure 6-4](#).

Figure 6-1: Grounding straps in conductive unlined pipe

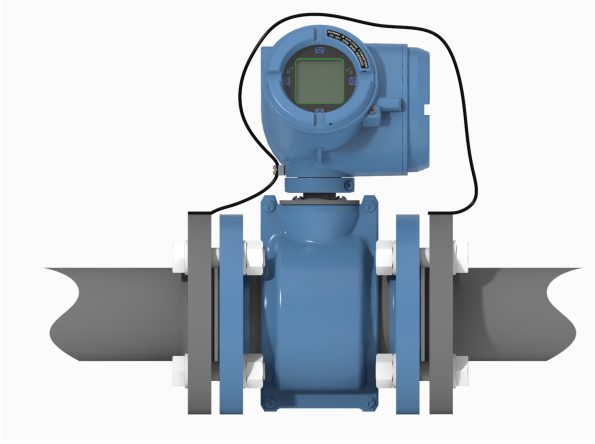
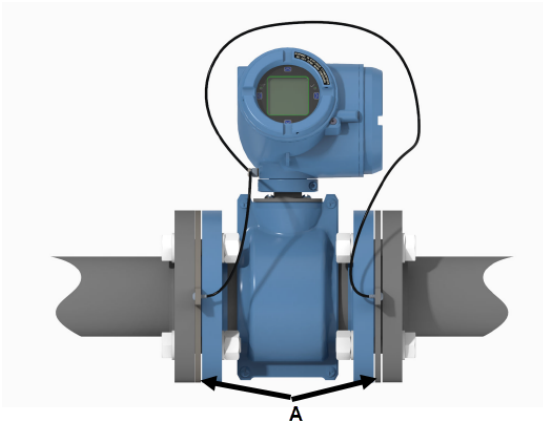


Figure 6-2: Grounding with grounding rings or lining protectors



A. Grounding rings or lining protectors

Figure 6-3: Grounding with reference electrode in conductive unlined pipe

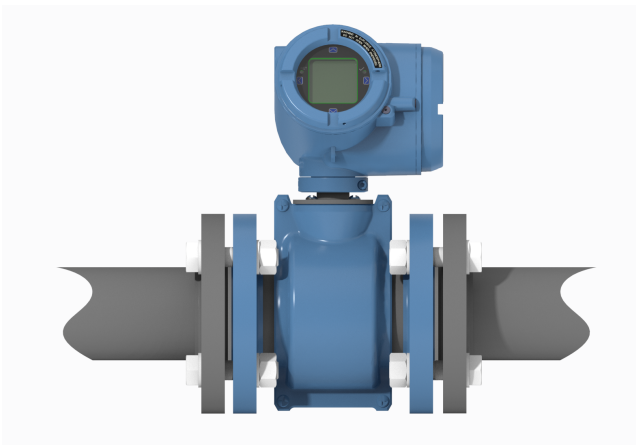
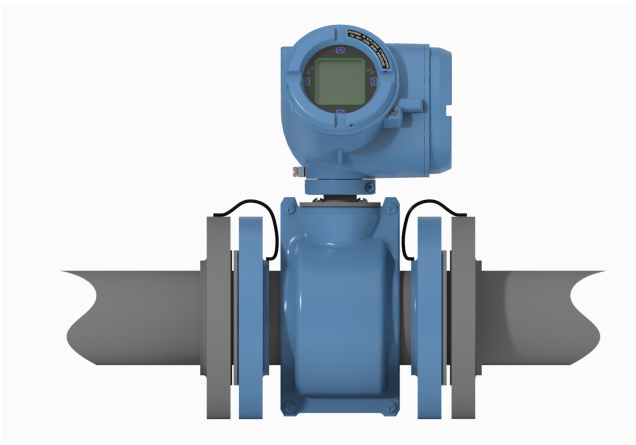


Figure 6-4: Grounding for line sizes 10-in. and larger



7 Wiring sensor to transmitter

For the 9205 Magnetic Flowmeter Sensor wiring diagrams, refer to the *Rosemount™ 9732 Magnetic Flow Meter Transmitter Quick Start Guide*.



Quick Start Guide

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