

# Rosemount™ 3408 Wireless Level Transmitter

Non-Contacting Radar with *WirelessHART*® Protocol



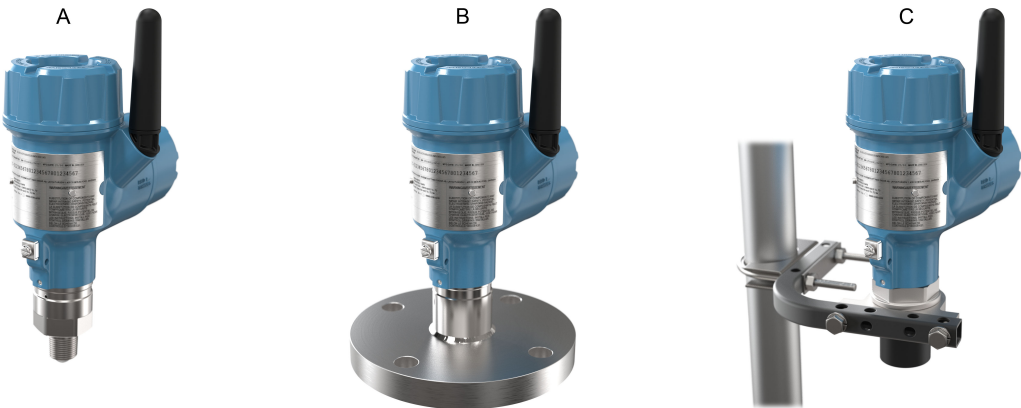
- World's first native Wireless Non-Contacting Radar based on field proven, market FMCW radar technology
- Experience precision, compact design, and reliable performance with 80 GHz non-contact radar level measurement for both solid and liquid applications
- Minimize maintenance and downtime with no wires, long battery life, and advanced diagnostics for continuous, reliable performance
- Fast and simple commissioning with a self-organizing wireless network and an intuitive user interface for seamless integration

# Introduction

## Flexible and fit for purpose

The Rosemount 3408 Wireless Level Transmitter delivers accurate, continuous level measurements for a wide range of liquid and solid media across diverse process applications. Its versatile, fit-for-purpose design supports flexible deployment, simple installation, and adaptability to changing operational needs. Whether used in tanks and vessels with small process fittings, corrosive environments, or open-air installations, the Rosemount 3408 Wireless offers reliable performance with minimal intrusion. Certified for use in hazardous locations, it combines safety, scalability, and precision to support efficient, long-term process optimization.

Figure 1: Antenna Types



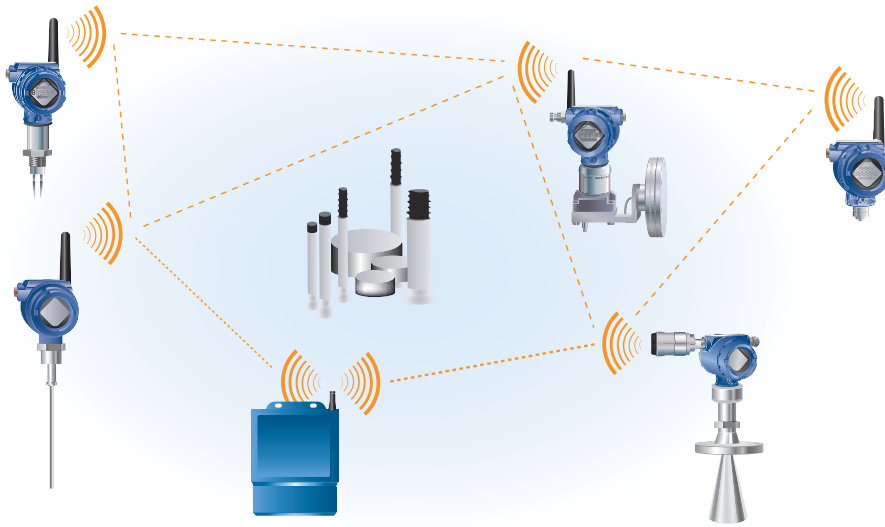
- A. Lens antenna ideal for small process fittings
- B. Process seal antenna with wetted parts in PTFE
- C. Bracket mounted ATAP (Atmospheric Temperature and Atmospheric Pressure) lens antenna

## Emerson Wireless

Emerson Wireless is a self-organizing network solution. Wireless field instruments send data to a Gateway, directly or routed through any of the wireless devices in the network, as illustrated in [Figure 2](#). Multiple communication paths are managed and analyzed in parallel to assure optimal communication and sustained network reliability even if obstructions are introduced.

### Contents

|                                  |    |
|----------------------------------|----|
| Introduction.....                | 2  |
| Ordering information.....        | 5  |
| Performance specifications.....  | 12 |
| Functional specifications.....   | 14 |
| Physical specifications.....     | 20 |
| Installation considerations..... | 21 |
| Product certifications.....      | 25 |
| Dimensional drawings.....        | 26 |

**Figure 2: Emerson Wireless Network**

Gateways interface with existing host systems using industry standard protocols, and native integration into DeltaV™ and Ovation™ is transparent and seamless.

Interference from other radios, Wi-Fi®, and EMC sources is avoided through Time Synchronized Channel Hopping and Direct Sequence Spread Spectrum (DSSS). Also, a layered security implementing industry standard Encryption, Authentication, Verification, Anti-Jamming, and Key Management ensures that data transmissions are secure and received only by the Gateway.

The Rosemount 3408 Wireless is a member of the Emerson Wireless portfolio, whose wireless network experience totals billions of operating hours, hundreds of thousands of field devices, and tens of thousands of networks around the world.

## Non-contacting radar technology

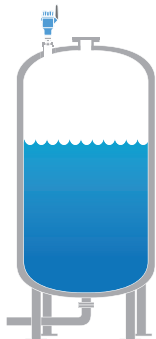
Non-contacting radar technology offers a maintenance-free solution ideal for a wide range of applications. Its top-down installation minimizes leakage risks and delivers consistent performance, unaffected by factors like density, viscosity, temperature, pressure, and pH.

The device uses advanced Frequency Modulated Continuous Wave (FMCW) technology and smart diagnostics to ensure exceptional accuracy and reliability, making it the perfect solution for precise level measurement in tanks of all sizes, even in remote locations.

## Application examples

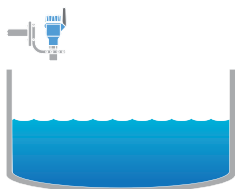
### Storage tanks

Ensure correct filling and storage levels in your tanks.



### Open air applications

Get reliable level measurements of sumps or ponds, regardless of challenging surface and weather conditions.



### Bulk solids

The Rosemount 3408 Wireless can be used for a wide range of solid applications. It provides a reliable measurement that is unaffected by dust or low product reflectivity.



## Access information when you need it with asset tags

Newly shipped devices include a unique QR code asset tag that enables you to access serialized information directly from the device. With this capability, you can:

- Access device drawings, diagrams, technical documentation, and troubleshooting information in your MyEmerson account.
- Improve mean time to repair and maintain efficiency.
- Ensure confidence that you have located the correct device.
- Eliminate the time-consuming process of locating and transcribing nameplates to view asset information.

# Ordering information

## Online product configurator

Many products are configurable online using our product configurator. Select the **Configure** button or visit [Emerson.com/global](https://emerson.com/global) to start. With this tool's built-in logic and continuous validation, you can configure your products more quickly and accurately.

## Specifications and options

Specification and selection of product materials, options, and/or components must be made by the purchaser of the equipment.

### Related information

- [Performance specifications](#)
- [Functional specifications](#)
- [Physical specifications](#)
- [Material selection](#)

## Model codes

Model codes contain the details related to each product. Exact model codes will vary; an example of a typical model code is shown in [Figure 3](#).

Figure 3: Model Code Example

|                                  |            |
|----------------------------------|------------|
| 3408 A 1 S X D 4 I5 1 N A ZZ SBA | WA3 WK1 M5 |
| 1                                | 2          |

1. Required model components (choices available on most)
2. Additional options (variety of features and functions that may be added to products)

## Optimizing lead time

The starred offerings (★) represent the most common options and should be selected for the fastest delivery. The non-starred offerings are subject to additional delivery lead time.

## Rosemount 3408 Wireless Level Transmitter ordering information



The Rosemount 3408 Wireless is a non-contacting radar transmitter for level measurements. It uses a unique energy efficient radar technology based on the FMCW principle to ensure reliable performance even in challenging conditions.

[CONFIGURE >](#)
[VIEW PRODUCT >](#)

### Required model components

#### Model

| Code | Description             |   |
|------|-------------------------|---|
| 3408 | Radar Level Transmitter | ★ |

#### Profile

| Code | Description                                |   |
|------|--------------------------------------------|---|
| A    | Standard monitoring & control applications | ★ |

#### Measurement type

| Code | Description                       |   |
|------|-----------------------------------|---|
| 1    | Liquid level measurement          | ★ |
| 3    | Solids level measurement          | ★ |
| 4    | Liquid & solids level measurement | ★ |

#### Performance class

| Code | Description |   |
|------|-------------|---|
| S    | Standard    | ★ |

#### Signal output

| Code | Description             |   |
|------|-------------------------|---|
| X    | WirelessHART® IEC 62591 | ★ |

#### Housing material

| Code | Description | Note             |   |
|------|-------------|------------------|---|
| D    | Aluminum    | Dual compartment | ★ |

#### Conduit/cable threads

| Code | Description |   |
|------|-------------|---|
| 4    | ½-14 NPT    | ★ |

**Hazardous locations certifications**

| Code | Description                                 |   |
|------|---------------------------------------------|---|
| NA   | None                                        | ★ |
| I1   | ATEX Intrinsic Safety                       | ★ |
| I5   | USA Intrinsic Safety and Non-Incendive      | ★ |
| I6   | Canadian Intrinsic Safety and Non-Incendive | ★ |
| I7   | IECEx Intrinsic Safety                      | ★ |

**Related information**

[Product certifications](#)

**Materials of construction**

| Code | Description                   | Available antenna types |   |
|------|-------------------------------|-------------------------|---|
| 1    | 316/316L/EN 1.4404, PTFE lens | Lens                    | ★ |
| 7    | All PTFE wetted parts         | Process seal            | ★ |
| A    | Aluminum, PTFE lens           | ATAP lens               | ★ |

**Process connection type**

| Code | Description        | Available antenna types |   |
|------|--------------------|-------------------------|---|
| F    | Flat Face flange   | Process seal            | ★ |
| R    | Raised Face flange | Process seal            | ★ |
| N    | NPT thread         | Lens                    | ★ |
| G    | BSPP (G) thread    | Lens, ATAP lens         | ★ |

**Related information**

[Availability of process connections](#)

**Process connection size**

| Code | Description      | Available process connections |   |
|------|------------------|-------------------------------|---|
| C    | ¾-in.            | Thread                        | ★ |
| 1    | 1-in.            | Thread                        | ★ |
| A    | 1½-in.           | Thread                        | ★ |
| 2    | 2-in./DN50/50A   | Flange                        | ★ |
| 3    | 3-in./DN80/80A   | Flange                        | ★ |
| 4    | 4-in./DN100/100A | Flange                        | ★ |
| 6    | 6-in./DN150/150A | Flange                        | ★ |

**Related information**

[Availability of process connections](#)

**Process connection rating**

| Code | Description                                          |   |
|------|------------------------------------------------------|---|
| ZZ   | None (for use with threaded process connection type) | ★ |
| AA   | ASME B16.5 Class 150 flange                          | ★ |
| AB   | ASME B16.5 Class 300 flange                          | ★ |
| DA   | EN1092-1 PN16 flange                                 | ★ |
| DB   | EN1092-1 PN40 flange                                 | ★ |
| JA   | JIS 10K flange                                       | ★ |
| JB   | JIS 20K flange                                       | ★ |

**Related information**

[Availability of process connections](#)

**Antenna type**

| Code | Description                                                          | Operating pressure             | Operating temperature                      |   |
|------|----------------------------------------------------------------------|--------------------------------|--------------------------------------------|---|
| SAA  | Process seal antenna                                                 | -15 to 363 psig (-1 to 25 bar) | -76 to 392 °F (-60 to 200 °C)              | ★ |
| SBA  | Lens antenna                                                         | -15 to 363 psig (-1 to 25 bar) | -76 to 392 °F (-60 to 200 °C)              | ★ |
| SCA  | ATAP (Atmospheric Temperature and Atmospheric Pressure) lens antenna | -15 to 7 psig (-1 to 0.5 bar)  | -4 to 176 °F (-20 to 80 °C) <sup>(1)</sup> | ★ |

<sup>(1)</sup> The temperature range is -40 to 176 °F (-40 to 80 °C) for open air applications.

**Related information**

[Antenna versions](#)

**Additional options****Update rate, operating frequency and protocol**

| Code | Description                                                            |   |
|------|------------------------------------------------------------------------|---|
| WA3  | User configurable update rate, 2.4 GHz DSSS, IEC 62591 (WirelessHART®) | ★ |

**Omnidirectional wireless antenna and SmartPower™ solutions**

I.S. Power Module sold separately.

| Code               | Description                                                         |   |
|--------------------|---------------------------------------------------------------------|---|
| WK1 <sup>(1)</sup> | External antenna, adapter for Black Power Module                    | ★ |
| WM1 <sup>(1)</sup> | Extended range, external antenna, adapter for Black Power Module    | ★ |
| WN1 <sup>(1)</sup> | High gain, remote antenna, adapter for Black Power Module           | ★ |
| WK2 <sup>(2)</sup> | External antenna, extra long life Blue Power Module                 | ★ |
| WM2 <sup>(2)</sup> | Extended range, external antenna, extra long life Blue Power Module | ★ |
| WN2 <sup>(2)</sup> | High gain, remote antenna, extra long life Blue Power Module        | ★ |

<sup>(1)</sup> Black Power Module must be shipped separately; order Model 701PBKFF.

<sup>(2)</sup> Blue Power Module must be shipped separately; order Model MHM-89004.

**Related information**

[Emerson Wireless Black SmartPower Solutions Product Data Sheet](#)

[Emerson Wireless Blue SmartPower Solutions Product Data Sheet](#)

**Installation options**

The mounting bracket is available for the ATAP lens antenna.

| Code | Description      |   |
|------|------------------|---|
| BR   | Mounting bracket | ★ |

**Display**

| Code | Description |   |
|------|-------------|---|
| M5   | LCD display | ★ |

**Related information**

[LCD display](#)

**Plantweb™ diagnostic functionality**

| Code | Description       |   |
|------|-------------------|---|
| DA1  | HART® Diagnostics | ★ |

**Related information**

[Smart Diagnostics Suite](#)

**Factory configuration**

| Code | Description                                                        |   |
|------|--------------------------------------------------------------------|---|
| C2   | Factory configuration per <a href="#">Configuration Data Sheet</a> | ★ |

**Welding standard for flanges**

| Code | Description          |   |
|------|----------------------|---|
| AW   | According to ASME IX | ★ |
| EW   | According to EN-ISO  | ★ |

**Country certification**

CRN is not available with EN1092-1 or JIS B2220 flanges.

| Code | Description                 |   |
|------|-----------------------------|---|
| J1   | Canadian Registration (CRN) | ★ |

**Special quality assurance**

| Code | Description                  |   |
|------|------------------------------|---|
| Q4   | Calibration data certificate | ★ |

**Hydrostatic testing**

Hydrostatic testing is only available for flanged process connections.

| Code | Description                                |   |
|------|--------------------------------------------|---|
| Q5   | Hydrostatic testing, including certificate | ★ |

**Material traceability certification**

Certificate includes all pressure retaining and wetted parts. This certificate is not available with ATAP lens antenna.

| Code | Description                                                                 |   |
|------|-----------------------------------------------------------------------------|---|
| Q8   | Material traceability certification per EN 10204 3.1 (2.1 for non-metallic) | ★ |

**Materials certification**

The materials certification is not available with ATAP lens antenna.

| Code | Description                                                                      |   |
|------|----------------------------------------------------------------------------------|---|
| Q15  | NACE® material recommendation per NACE MR0175/ISO 15156                          | ★ |
| Q25  | NACE material recommendation per NACE MR0103/ISO 17945                           | ★ |
| Q35  | NACE material recommendation per NACE MR0175/ISO 15156 and NACE MR0103/ISO 17945 | ★ |

**Welding procedure qualification record documentation**

| Code | Description                                   |   |
|------|-----------------------------------------------|---|
| Q66  | Welding Procedure Qualification Record (WPQR) | ★ |
| Q67  | Welder Performance Qualification (WPQ)        | ★ |
| Q68  | Welding Procedure Specification (WPS)         | ★ |
| Q79  | WPQR/WPQ/WPS                                  | ★ |

**Dye penetration test certificate**

Only available with flanged process connections.

| Code | Description                                |   |
|------|--------------------------------------------|---|
| Q73  | Certificate of liquid penetrant inspection | ★ |

**Positive material identification certificate**

| Code | Description                                                 |   |
|------|-------------------------------------------------------------|---|
| Q76  | Positive material identification certificate of conformance | ★ |

**Extended product warranty**

| Code | Description             |   |
|------|-------------------------|---|
| WR3  | 3-year limited warranty | ★ |
| WR5  | 5-year limited warranty | ★ |

## Specials

| Code  | Description                                                                           |  |
|-------|---------------------------------------------------------------------------------------|--|
| PXXXX | Custom engineered solutions beyond standard model codes. Consult factory for details. |  |

## Related information

[Engineered solutions](#)

## Availability of process connections

**Table 1: Type vs. Size and Rating**

F = Flat Face; G = BSPP (G) thread; N = NPT thread; R = Raised Face

| Antenna type         | Process connection size | Process connection rating |                             |                       |           |     |
|----------------------|-------------------------|---------------------------|-----------------------------|-----------------------|-----------|-----|
|                      |                         | Thread                    | ASME B16.5<br>Class 150/300 | EN1092-1<br>PN16/PN40 | JIS B2220 |     |
|                      |                         |                           |                             |                       | 10K       | 20K |
| Lens antenna         | ¾-in.                   | G, N                      | N/A                         | N/A                   | N/A       | N/A |
|                      | 1-in.                   | G, N                      | N/A                         | N/A                   | N/A       | N/A |
|                      | 1½-in.                  | G, N                      | N/A                         | N/A                   | N/A       | N/A |
| ATAP lens antenna    | 1½-in.                  | G                         | N/A                         | N/A                   | N/A       | N/A |
| Process seal antenna | 2-in./DN50/50A          | N/A                       | R                           | F                     | R         | R   |
|                      | 3-in./DN80/80A          | N/A                       | R                           | F                     | R         | R   |
|                      | 4-in./DN100/100A        | N/A                       | R                           | F                     | R         | R   |
|                      | 6-in./DN150/150A        | N/A                       | R                           | F                     | R         | N/A |

## Accessories

### Flushing connection rings

Only available for process seal antennas.

Not available with Canadian Registration Number (CRN).

| Item number    | Description                                      |  |
|----------------|--------------------------------------------------|--|
| DP0002-2111-S6 | 2-in. ANSI, one ¼-in. NPT connection, 316L       |  |
| DP0002-3111-S6 | 3-in. ANSI, one ¼-in. NPT connection, 316L       |  |
| DP0002-4111-S6 | 4-in. ANSI/DN100, one ¼-in. NPT connection, 316L |  |
| DP0002-A111-S6 | 6-in. ANSI, one ¼-in. NPT connection, 316L       |  |
| DP0002-5111-S6 | DN50, one ¼-in. NPT connection, 316L             |  |
| DP0002-8111-S6 | DN80, one ¼-in. NPT connection, 316L             |  |

# Performance specifications

## General

### Reference conditions

- Measurement target: Stationary metal plate, no disturbing objects
- Antenna: Process seal
- Temperature: 59 to 77 °F (15 to 25 °C)
- Ambient pressure: 14 to 15 psi (960 to 1060 mbar)
- Relative humidity: 25-75%
- Frequency range: 77 to 81 GHz

### Instrument accuracy (under reference conditions)

±0.12 in. (±3 mm)<sup>(1)</sup>

### Repeatability

±0.04 in. (±1 mm)

### Ambient temperature effect

±0.04 in. (±1 mm)/10 K

## Measuring range

Table 2: Maximum Measuring Range, ft. (m)

| Antenna type                               | Maximum measuring range |
|--------------------------------------------|-------------------------|
| Process seal antenna                       | 98 (30)                 |
| Lens antenna (¾-in. thread) <sup>(1)</sup> | 49 (15)                 |
| Lens antenna (1- and 1½-in. threads)       | 82 (25)                 |
| ATAP lens antenna                          | 98 (30)                 |

(1) The ¾-in. lens antenna is suitable only for calm water-based media.

Note that a combination of adverse process conditions, such as turbulence, foam, and condensation, together with products with poor reflection may affect the measuring range.

### Measuring range for solids

The figures given in [Table 3](#) should be considered as guidelines; the total measuring range may differ depending on other contributing application conditions such as product filling, how the product piles up, silo diameter vs. angle of repose, internal obstacles within the silo, dust, condensation, antenna build up, etc.

(1) Refers to inaccuracy according to IEC 60770-1 when excluding installation dependent offset. See the IEC 60770-1 standard for a definition of radar specific performance parameters and if applicable corresponding test procedures.

**Table 3: Recommended Measuring Range for Solids, ft. (m)**

| Antenna                              | Light powder <sup>(1)</sup> | Light granulates and pellets <sup>(2)</sup> | Heavy powder <sup>(3)</sup> | Grains <sup>(4)</sup> | Larger particles <sup>(5)</sup> |
|--------------------------------------|-----------------------------|---------------------------------------------|-----------------------------|-----------------------|---------------------------------|
| Lens antenna (¾-in. thread)          | N/A                         | N/A                                         | N/A                         | N/A                   | N/A                             |
| Lens antenna (1- and 1½-in. threads) | N/A                         | 33 (10)                                     | 49 (15)                     | 49 (15)               | 66 (20)                         |
| Process seal and ATAP lens antennas  | N/A                         | 49 (15)                                     | 66 (20)                     | 66 (20)               | 98 (30)                         |

(1) Light powder, etc. (Dielectric constant: 1.2)

(2) Plastic pellets, etc. (Dielectric constant: 1.35)

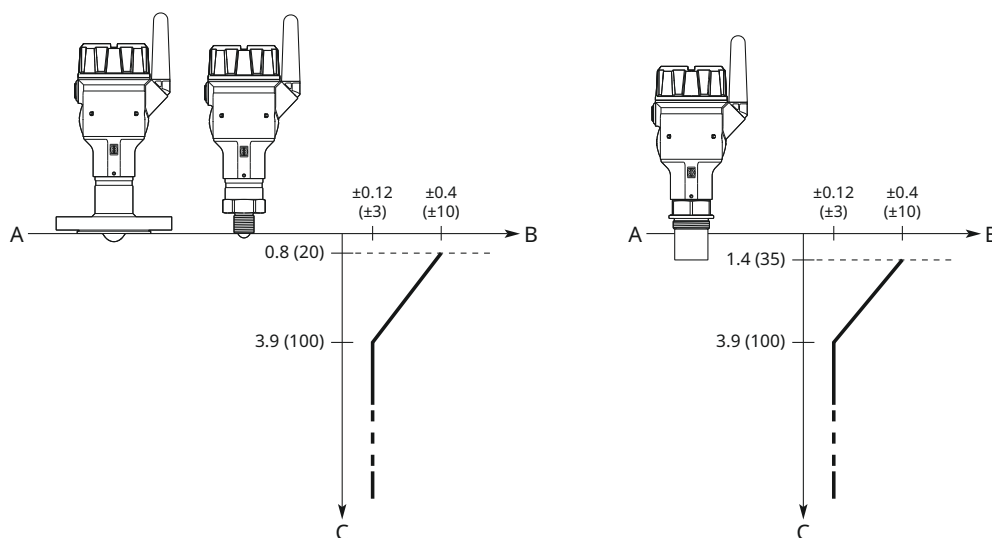
(3) Lime powder, cement, sand, etc. (Dielectric constant: 1.5)

(4) Kernels, brans, etc. (Dielectric constant: 1.5)

(5) Wood chips/pellets, etc. (Dielectric constant: 1.7)

## Accuracy over measuring range

Figure 4 illustrates the accuracy over measuring range at reference conditions. Actual measurement performance in the near zone and close to a strong bottom echo will depend on the product's characteristics and application conditions.

**Figure 4: Accuracy Over Measuring Range**

A. Device Reference Point

B. Accuracy in inches (millimeters)

C. Distance in inches (millimeters)

## Environment

### Vibration resistance

2 g at 10-1000 Hz according to IEC 62828-1:2017, level "field with general application"

#### Note

The bracket option does not meet the vibration requirements.

## Electromagnetic compatibility (EMC)

- EMC Directive (2014/30/EU): EN 61326-1
- EN 61326-2-3

## Pressure Equipment Directive (PED)

Complies with 2014/68/EU article 4.3

## Radio approvals

- Radio Equipment Directive (2014/53/EU)
- Part 15 of the FCC Rules
- Industry Canada RSS 211
- Other country approvals

### Related information

[Product certifications](#)

## Power module

### Power module battery life

4 years at one minute update rate in normal power mode<sup>(2)</sup>

### Power module life estimator

To better estimate power module life for a wireless transmitter in your network, visit the on-line [Power Module Life Estimator](#).

# Functional specifications

## General

### Field of application

Continuous level measurements on a broad range of liquids, slurries, and solids.

### Application limitations

Not suitable for applications with heavy turbulence or foam.

### Measurement principle

Frequency Modulated Continuous Wave (FMCW)

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(2) Reference conditions are 70 °F (21 °C), and routing data for three additional network devices.

## Frequency range

77 to 81 GHz

## Microwave output power

+5 dBm (3.2 mW)

## Humidity

0 - 100% relative humidity, non-condensing

## Turn-on time

< 15 s<sup>(3)</sup>

## Wireless

### Output

IEC 62591 (*WirelessHART*®) 2.4 GHz

### Wireless update rate

User selectable, 4 seconds to 60 minutes (1 minute as default)

## Frequency range

2400 - 2483.5 MHz

## Radio frequency output from antenna

| Antenna type                     | Radio frequency output |
|----------------------------------|------------------------|
| External antenna                 | < 10 mW (+10dBm) EIRP  |
| Extended range, external antenna | < 18 mW (12.5dBm) EIRP |
| Remote antenna                   | < 40mW (16dBm) EIRP    |

## Modulation type

QPSK/IEEE 802.15.4 IEC 62591 (*WirelessHART*)

## Number of channels

15

## Channel spacing

5 MHz

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(3) Time from when power is applied to the transmitter until performance is within specifications.

## Emission designation

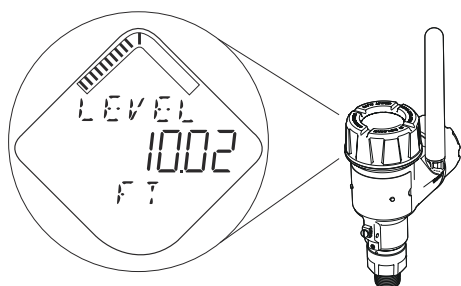
G1D

## Display and configuration

### LCD display

- Toggles between selected output variables
- Shows diagnostic information (alerts)
- Display updates at each wireless update

**Figure 5: LCD Display**



### Configuration tools

- Field Device Integration (FDI) compliant systems
- Device Descriptor (DD) compliant systems

#### Related information

[Emerson.com/MySoftware](https://www.emerson.com/MySoftware)

[Emerson.com/AMSDeviceConfigurator](https://www.emerson.com/AMSDeviceConfigurator)

### Output units

- Level and distance: ft., in., m, cm, mm
- Level rate: ft/s, in./min, in./s, m/h, m/s
- Volume: ft<sup>3</sup>, in.<sup>3</sup>, yd<sup>3</sup>, US gal, imperial gal, barrel (bbl), m<sup>3</sup>, l
- Temperature: °F, °C
- Signal strength: mV

## Output variables

| Variable                      | LCD display | PV  | SV, TV, QV |
|-------------------------------|-------------|-----|------------|
| Level                         | ✓           | ✓   | ✓          |
| Distance (ullage)             | ✓           | N/A | ✓          |
| Level rate                    | ✓           | N/A | ✓          |
| Signal strength               | ✓           | N/A | ✓          |
| Volume                        | ✓           | N/A | ✓          |
| Electronics temperature       | ✓           | N/A | ✓          |
| Signal quality <sup>(1)</sup> | ✓           | N/A | ✓          |
| Supply voltage                | ✓           | N/A | ✓          |
| Level percent of range        | ✓           | N/A | ✓          |
| Heartbeat                     | N/A         | N/A | ✓          |

(1) Only for transmitters ordered with Smart Diagnostics Suite.

## Diagnostics

### Alerts

The transmitter is compliant with NAMUR NE 107 Field Diagnostics for standardized device diagnostic information.

### Tools and logging

The configuration software simplifies troubleshooting with intuitive tools such as the echo curve and level trend timeline. The timeline displays the last three days of level readings, echo curve profiles, and the 50 most recent alerts.

## Smart Diagnostics Suite

### Signal Quality Metrics

Diagnostics package that monitors the relations between surface, noise, and threshold. The function can be used to detect abnormal conditions in the process such as antenna contamination or sudden loss of signal strength. Signal Quality is available as output variable and it comes with user configurable alerts.

## Process pressure

Final rating may be lower depending on flange selection.

### Process seal antenna

-15 to 363 psig (-1 to 25 bar)

### Lens antenna

-15 to 363 psig (-1 to 25 bar)

### ATAP lens antenna

-15 to 7 psig (-1 to 0.5 bar)

## Temperature limits

### Process temperature

#### Process seal antenna

-76 to 392 °F (-60 to 200 °C)

#### Lens antenna

-76 to 392 °F (-60 to 200 °C)

#### ATAP lens antenna

-4 to 176 °F (-20 to 80 °C)

#### Note

The temperature range is -40 to 176 °F (-40 to 80 °C) for open air applications.

### Ambient temperature

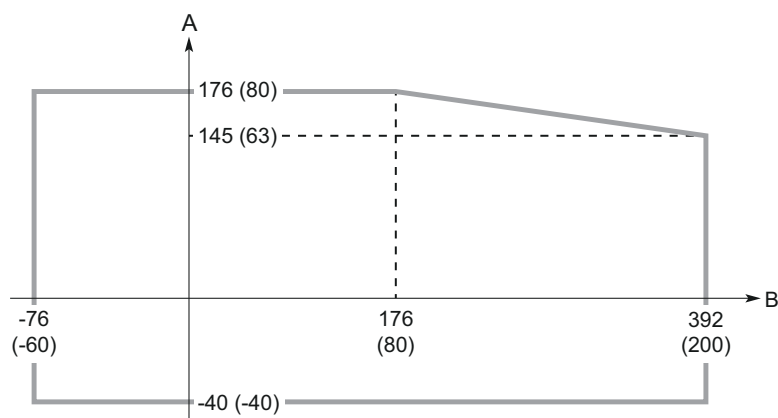
-40 to 176 °F (-40 to 80 °C)

#### Note

LCD display may not be readable and LCD display updates will be slower at temperatures below -4 °F (-20 °C).

The ambient temperature limits may be further restricted by the process temperature as described by [Figure 6](#).

**Figure 6: Ambient Temperature vs. Process Temperature**



A. Ambient temperature °F (°C)

B. Process temperature °F (°C)

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

#### Related information

[Product certifications](#)

### Storage temperature

-40 to 176 °F (-40 to 80 °C)

## Flange rating

### ASME

316 SST according to ASME B16.5 Table 2-2.2

### EN

1.4404 according to EN 1092-1 material group 13E0

### JIS

316 SST according to JIS B2220 material group No. 2.2

## Conditions used for flange strength calculations

**Table 4: Stainless Steel Flanges**

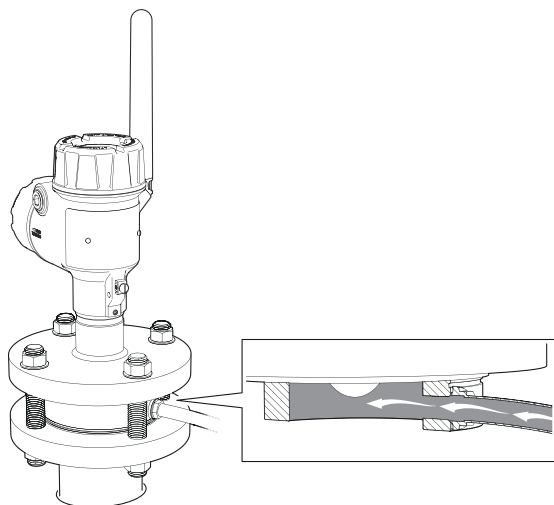
| Item             | ASME                                                | EN, JIS        |
|------------------|-----------------------------------------------------|----------------|
| Bolting material | SA193 B8M CL.2                                      | ISO 3506 A4-70 |
| Flange material  | Stainless steel A182 Gr. F316 and EN 10222-5-1.4404 |                |
| Hub material     | Stainless steel SA479 316 and EN 10272-1.4404       |                |

## Air purging

An air purge connection can prevent clogging of the antenna in extreme applications with dirt or heavy coating. To determine if air purging is needed, inspect the tank internal conditions at the location intended for the transmitter. If there is normally a thick layer of product build-up there, air purging is most likely needed. Typical purging media to use is air.

Flushing connection rings are available as accessory for use with process seal antennas.

**Figure 7: Air Purging for Process Seal Antenna**



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) 3/8-in.
- Air consumption: 252 gal/min at 65 psi (955 l/min at 4.5 bar)

Physical specifications

Material selection

Emerson provides a variety of Rosemount products with various product options and configurations, including materials of construction that can be expected to perform well in a wide range of applications.

The product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product, materials, options, and components for the particular application. Emerson is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product, options, configuration, or materials of construction selected.

Engineered solutions

When standard model codes are not sufficient to fulfill requirements, please consult the factory to explore possible Engineered Solutions. This is typically, but not exclusively, related to the choice of wetted materials or the design of a process connection. These Engineered Solutions are part of the expanded offerings and may be subject to additional delivery lead time. For ordering, factory will supply a special P-labeled numeric option code that should be added at the end of the standard model string.

Housing and enclosure

Housing material

Polyurethane-covered aluminum

Transmitter weight

| Type                                                      | Weight <sup>(1)</sup> |
|-----------------------------------------------------------|-----------------------|
| Aluminum housing with LCD display and 1½-in. lens antenna | 6.4 lb (2.9 kg)       |
| Aluminum housing with LCD display and ATAP lens antenna   | 5.1 lb (2.3 kg)       |

(1) Power module not included.

## Ingress protection

- IP 66/67/68<sup>(4)</sup>
- NEMA<sup>®</sup> 4X

## Antenna versions

### Process seal antenna

All PTFE wetted parts ideal for use in applications with corrosive media, dust, and heavy condensation

### Lens antenna

Suitable for use on vessels with small process fittings

### ATAP lens antenna

Designed for open air installations and non-pressurized tanks

## Material exposed to tank atmosphere

### Process seal antenna

- PTFE sealing: PTFE fluoropolymer

### Lens antenna

- PTFE sealing: PTFE fluoropolymer
- Threaded process connection: Stainless steel 316/316L (EN 1.4404)

### ATAP lens antenna

- PTFE sealing: PTFE fluoropolymer
- Threaded process connection: Anodized aluminum 6082-T6 or 6061-T6
- O-ring: FKM
- Antenna extension for open air: PTFE fluoropolymer with carbon filler

## Installation considerations

Before installing the device, follow recommendations for mounting position, sufficient free space, nozzle requirements, etc.

## Mounting position

When finding an appropriate location on the tank for the device, the conditions of the tank must be carefully considered.

Consider the following guidelines when mounting the device:

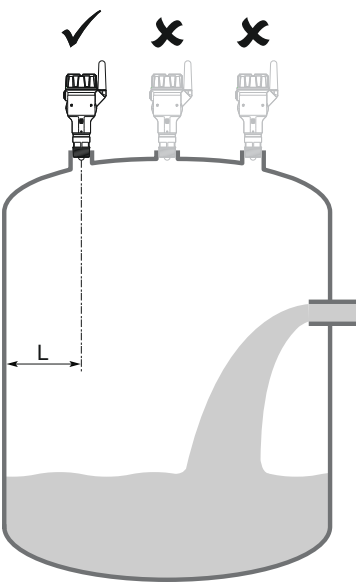
- Install the device in a location with a clear and unobstructed view of the product surface, free from internal structures, inlet streams, or other objects in the radar beam.

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(4) The transmitter meets IP 68 at 9.8 ft. (3 m) for 45 minutes.

- Do not install the device in the center of the tank.
- Do not mount the device on a manway cover.
- Do not position the device directly over a side manway door.
- Multiple Rosemount 3408 Wireless devices can be used in the same tank without interfering with each other.

Figure 8: Recommended Mounting Position



Free space requirements

If the device is mounted close to a wall or other tank obstruction such as heating coils and ladders, noise might appear in the measurement signal. See [Table 5](#) for recommended clearance.

Figure 9: Free Space Requirements

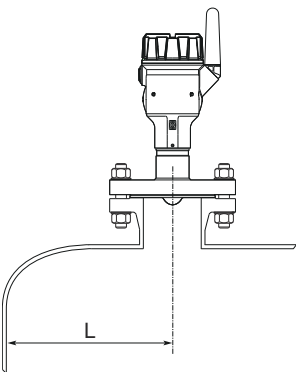


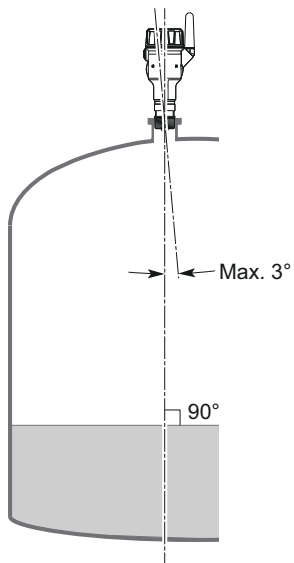
Table 5: Distance to Tank Wall (L)

| Application | Minimum        | Recommended      |
|-------------|----------------|------------------|
| Liquids     | 8 in. (200 mm) | ½ of tank radius |
| Solids      | 8 in. (200 mm) | ⅔ of tank radius |

## Inclination

The device should be mounted vertically to ensure a good echo from the product surface. See [Figure 10](#) for recommended maximum inclination.

**Figure 10: Inclination**



## Non-metallic tanks

Nearby objects outside the tank may cause disturbing radar echoes. Wherever possible, the device should be positioned so that objects close to the tank are kept outside the radar beam.

## Beam angle and beam width

The device should be mounted with no internal structures within the radar beam.

**Figure 11: Beam Angle and Beam Width**

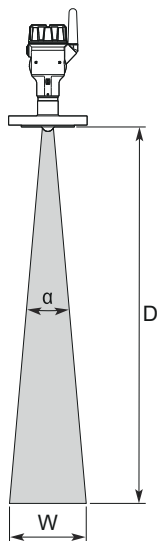


**Table 6: Beam Angle**

| Antenna type                         | Beam angle ( $\alpha$ ) |
|--------------------------------------|-------------------------|
| Process seal antenna                 | 8°                      |
| Lens antenna (3/4-in. thread)        | 12°                     |
| Lens antenna (1- and 1½-in. threads) | 9°                      |
| ATAP lens antenna                    | 8°                      |

### Beam width

See [Table 7](#) for beam width at different distances.

**Table 7: Beam Width, ft. (m)**

| Distance (D) | Beam width (W)     |                    |                     |
|--------------|--------------------|--------------------|---------------------|
|              | $\alpha = 8^\circ$ | $\alpha = 9^\circ$ | $\alpha = 12^\circ$ |
| 16 (5)       | 2.2 (0.7)          | 2.5 (0.8)          | 3.4 (1.1)           |
| 33 (10)      | 4.6 (1.4)          | 5.2 (1.6)          | 6.9 (2.1)           |
| 49 (15)      | 6.9 (2.1)          | 7.7 (2.4)          | 10.3 (3.2)          |
| 66 (20)      | 9.2 (2.8)          | 10.4 (3.1)         | 13.9 (4.2)          |
| 82 (25)      | 11.5 (3.5)         | 12.9 (3.9)         | 17.2 (5.3)          |
| 98 (30)      | 13.7 (4.2)         | 15.4 (4.7)         | 20.6 (6.3)          |

Nozzle requirements

See [Table 8](#) for recommended nozzle dimensions. The inside of the nozzle must be smooth (i.e. avoid bad welding, rust, or deposit).

Figure 12: Mounting in Nozzles

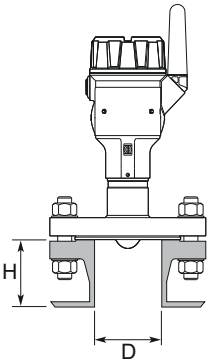


Table 8: Nozzle Requirements

| Nozzle diameter (D) | Recommended maximum nozzle height (H) <sup>(1)</sup> |                      |
|---------------------|------------------------------------------------------|----------------------|
|                     | Lens antenna and ATAP lens antenna                   | Process seal antenna |
| 1 in. (25 mm)       | 3.9 in. (100 mm)                                     | N/A                  |
| 1.5 in. (40 mm)     | 5.9 in. (150 mm)                                     | 5.9 in. (150 mm)     |
| 2 in. (50 mm)       | 7.9 in. (200 mm)                                     | 19.7 in. (500 mm)    |
| 3 in. (80 mm)       | 11.8 in. (300 mm)                                    | 39.4 in. (1000 mm)   |
| 4 in. (100 mm)      | 15.8 in. (400 mm)                                    | 39.4 in. (1000 mm)   |
| 6 in. (150 mm)      | 23.6 in. (600 mm)                                    | 51.2 in. (1300 mm)   |

(1) Nozzles taller than 19.7 in. (500 mm) may require additional configuration adjustments.

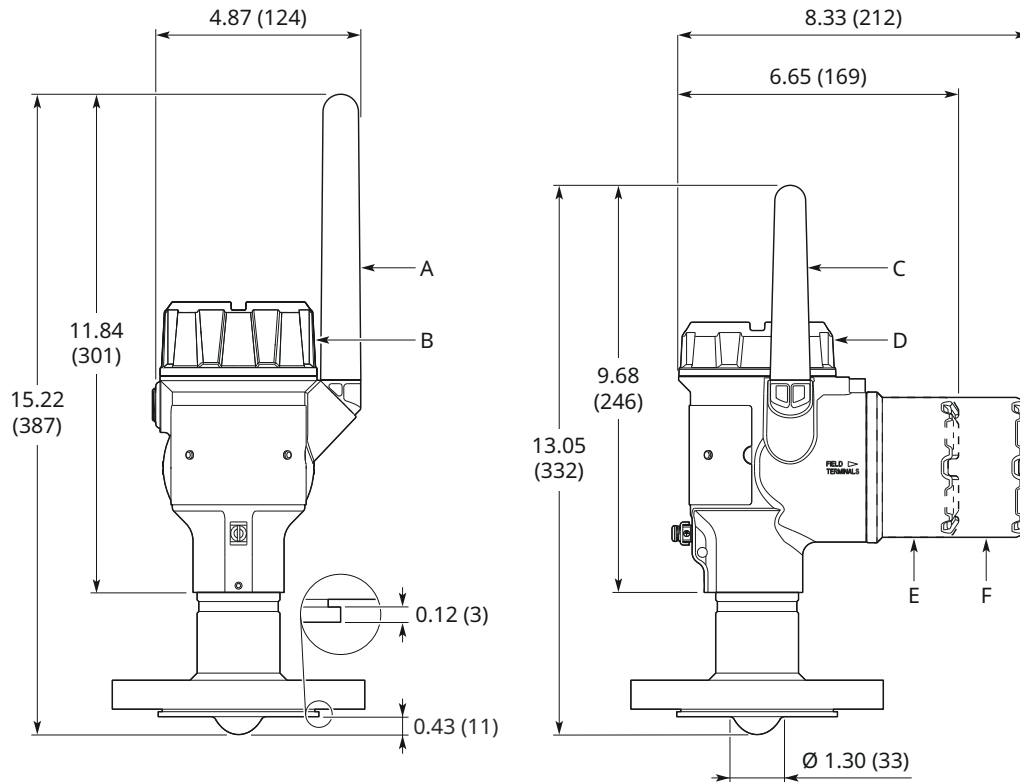
In some applications, especially in solids, it may be necessary to increase the Upper Null Zone to block out disturbance echoes from the tank nozzle. Amplitude threshold adjustments may also be needed.

Product certifications

See the Rosemount 3408 Wireless [Product Certifications](#) document for detailed information on the existing approvals and certifications.

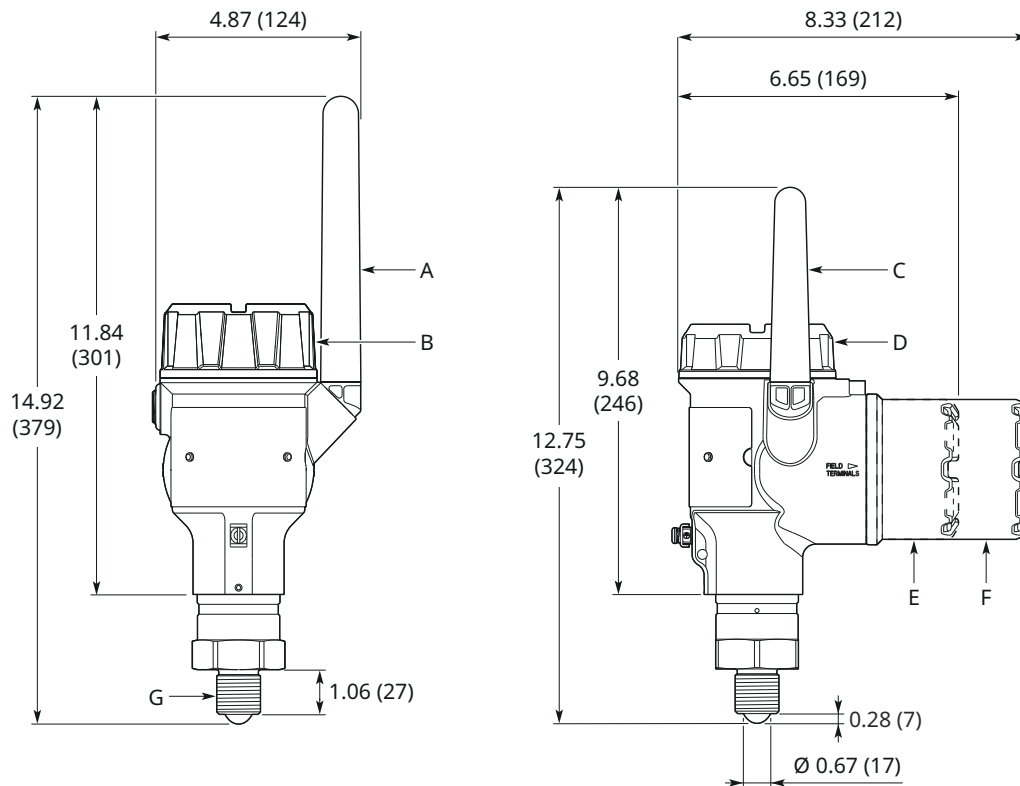
## Dimensional drawings

**Figure 13: Process Seal Antenna**



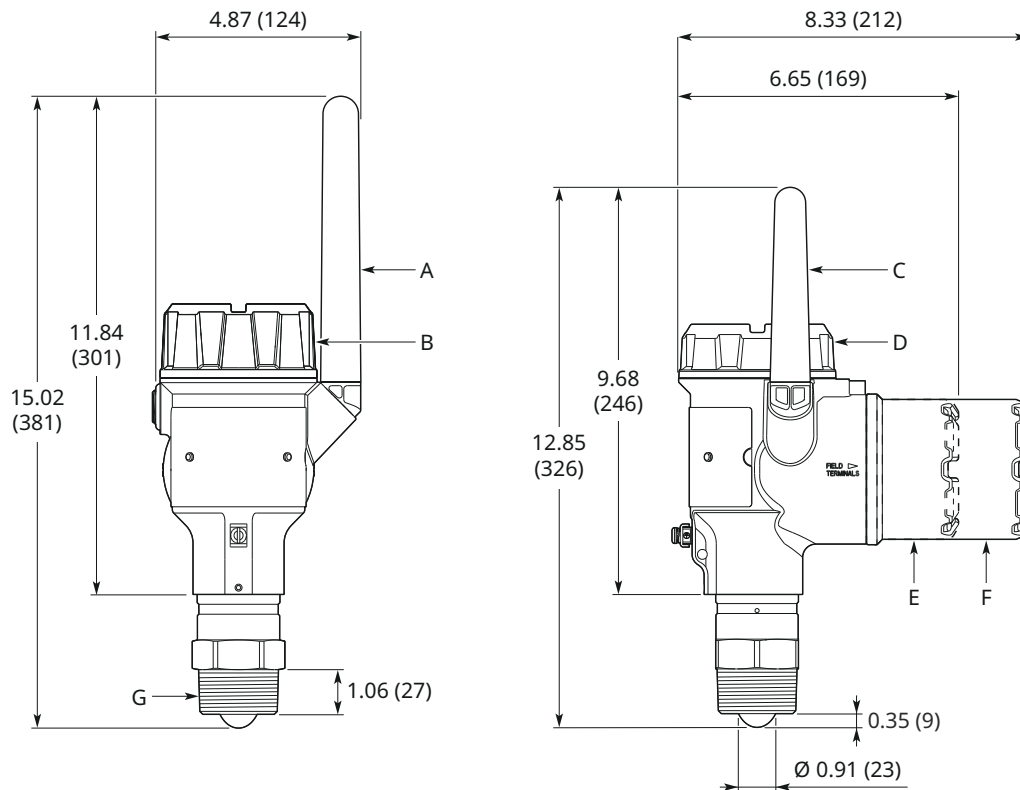
- A. Extended range external antenna
- B. LCD display option
- C. External antenna
- D. No LCD display
- E. Cover for black power module
- F. Cover for blue power module

Dimensions are in inches (millimeters).

**Figure 14: Lens Antenna with ¾-in. Threaded Process Connection**

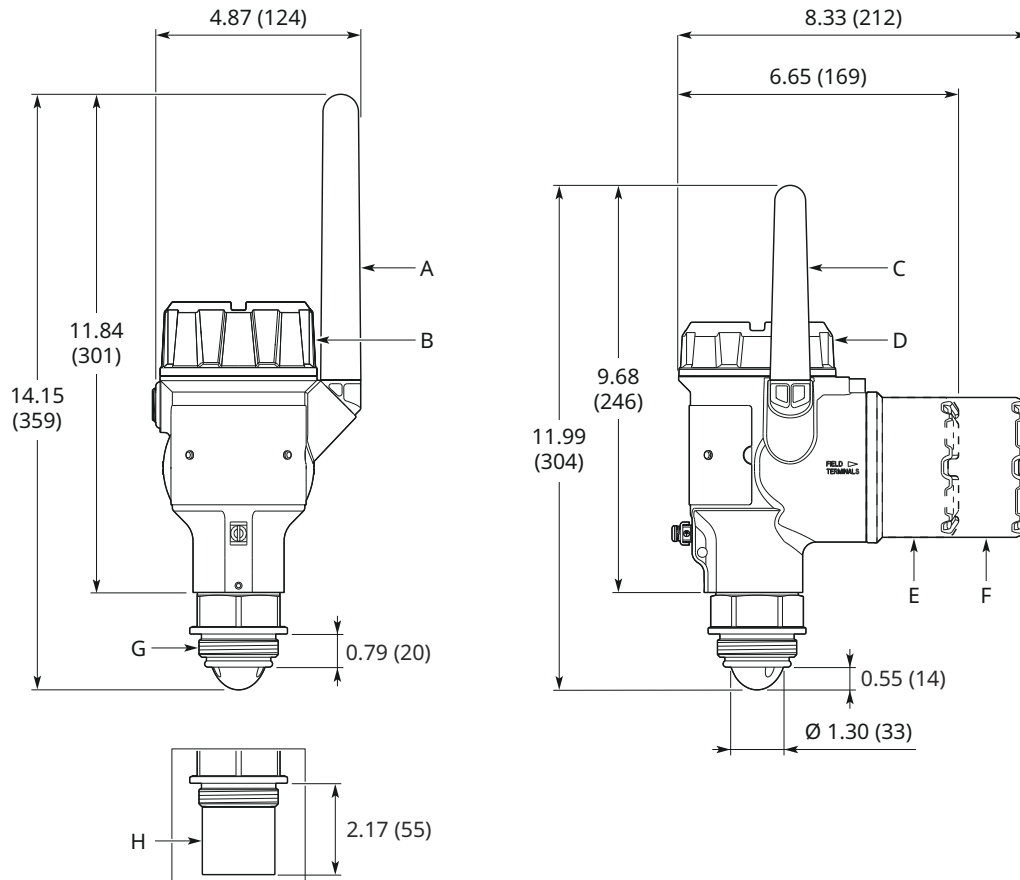
- A. Extended range external antenna
- B. LCD display option
- C. External antenna
- D. No LCD display
- E. Cover for black power module
- F. Cover for blue power module
- G. NPT or BSPP (G)

Dimensions are in inches (millimeters).

**Figure 15: Lens Antenna with 1- or 1½-in. Threaded Process Connection**

- A. Extended range external antenna
- B. LCD display option
- C. External antenna
- D. No LCD display
- E. Cover for black power module
- F. Cover for blue power module
- G. NPT or BSPP (G)

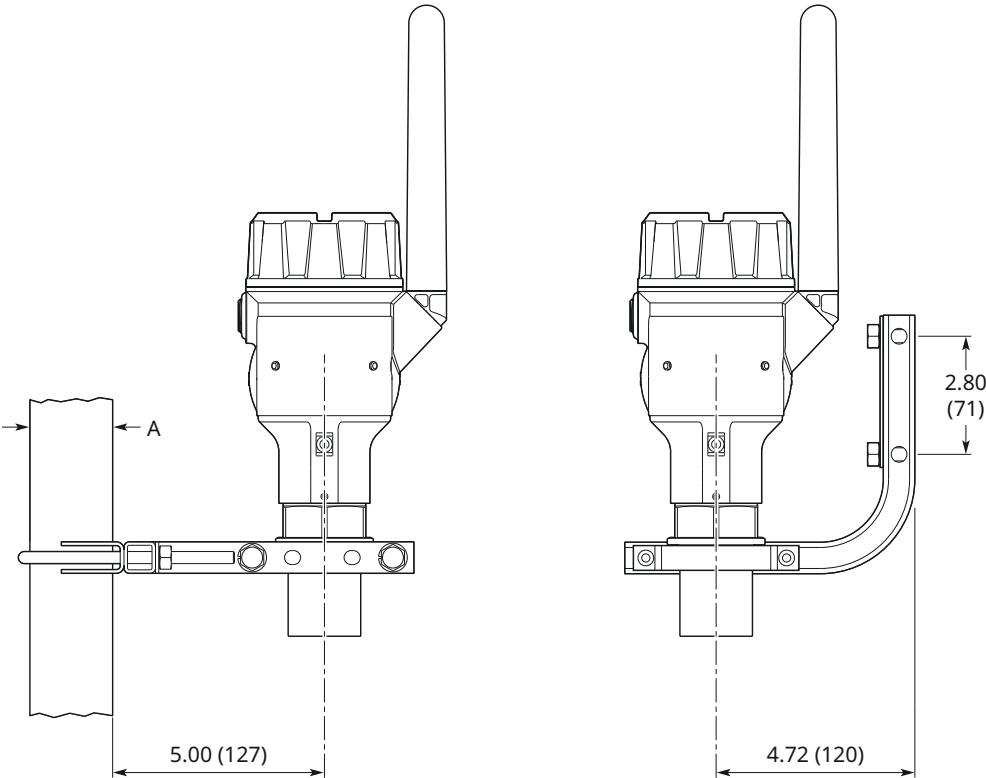
Dimensions are in inches (millimeters).

**Figure 16: ATAP Lens Antenna**

- A. Extended range external antenna
- B. LCD display option
- C. External antenna
- D. No LCD display
- E. Cover for black power module
- F. Cover for blue power module
- G. BSPP (G) 1½-in.
- H. Antenna extension for open air installations

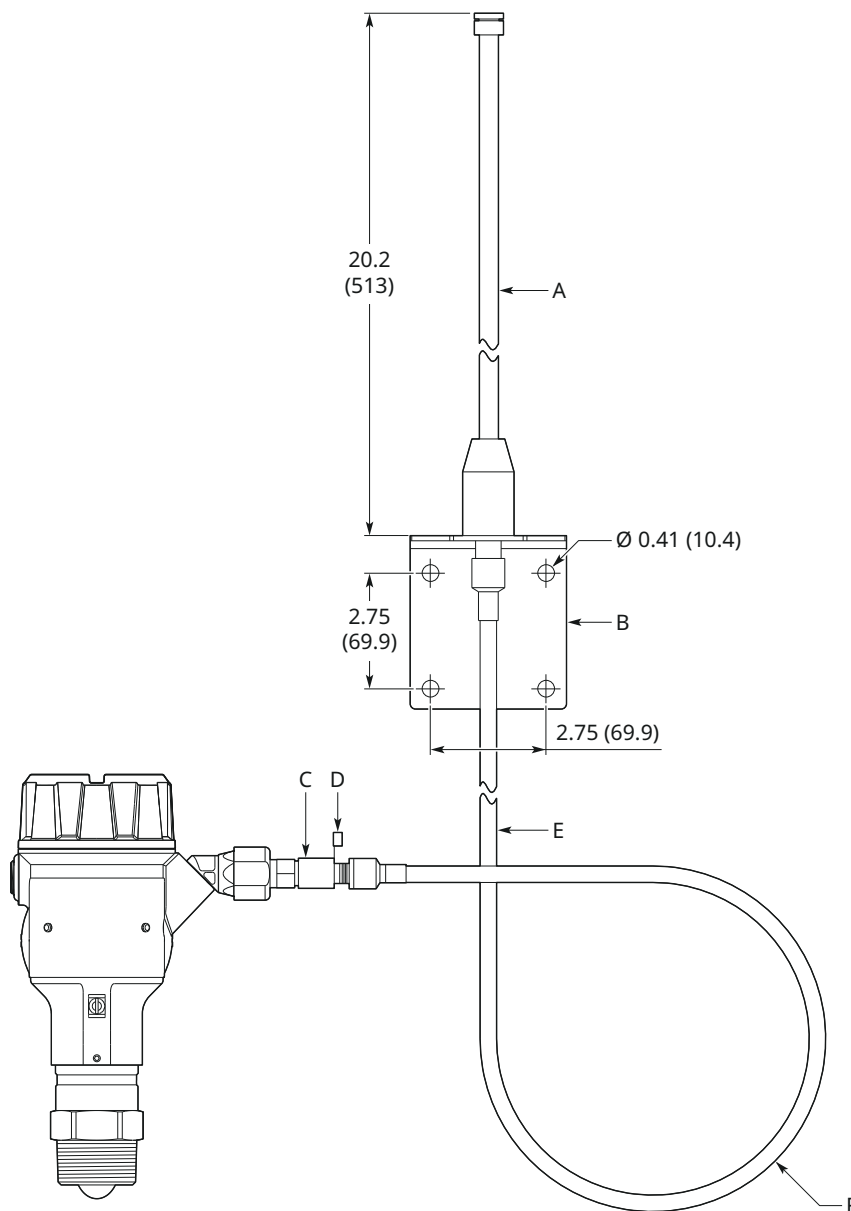
Dimensions are in inches (millimeters).

Figure 17: ATAP Lens Antenna with Mounting Bracket



A. Pipe diameter, max 2.5 (63.5)

Dimensions are in inches (millimeters).

**Figure 18: High Gain, Remote Antenna**

- A. Antenna
- B. Mounting bracket
- C. RF lightning arrestor
- D. Ground connection point
- E. 25 ft. (7.6 m) cable
- F. Minimum drip loop: Ø12 (300)

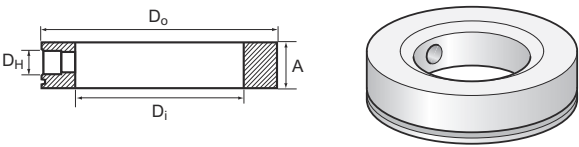
Dimensions are in inches (millimeters).

#### Related information

[Type 1 Drawing](#)

Flushing connection rings

Figure 19: Flushing Connection Rings



A. Height: 0.97 in. (24.6 mm)

Table 9: Dimensions of Flushing Connection Rings

| Flushing connection rings | $D_i$       | $D_o$        | $D_H$     |
|---------------------------|-------------|--------------|-----------|
| 2-in. ANSI                | 2.12 (53.8) | 3.62 (91.9)  | ¼-in. NPT |
| 3-in. ANSI                | 3.60 (91.4) | 5.00 (127.0) | ¼-in. NPT |
| 4-in. ANSI/DN100          | 3.60 (91.4) | 6.20 (157.5) | ¼-in. NPT |
| 6-in. ANSI                | 3.60 (91.4) | 8.50 (215.9) | ¼-in. NPT |
| DN50                      | 2.40 (61.0) | 4.00 (102.0) | ¼-in. NPT |
| DN80                      | 3.60 (91.4) | 5.43 (138.0) | ¼-in. NPT |







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