

Rosemount 3308 Series

Wireless Guided Wave Radar, 3308A

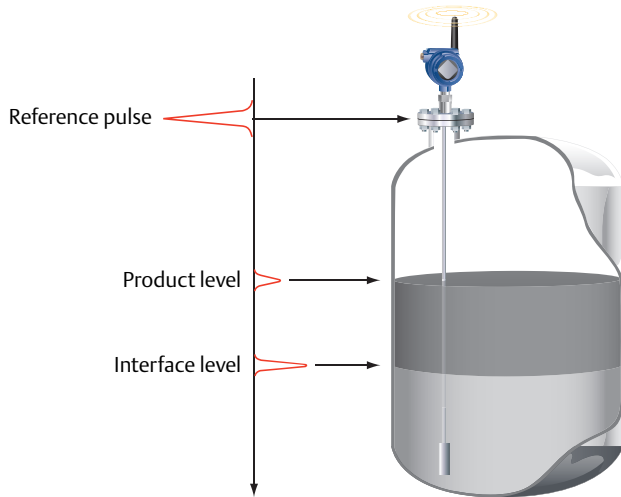
Product Data Sheet



WirelessHART

- World's first true wireless Guided Wave Radar based on field proven, market leading technologies
- Accurate, direct level and interface measurements virtually unaffected by process conditions
- Fast and simple commissioning with self-organizing wireless network, intuitive user interface and cut-to-fit probes
- Minimized maintenance with no wires, no moving parts, no re-calibration
- Reduced number of field trips with long battery life and advanced diagnostics for better process insight

Introduction

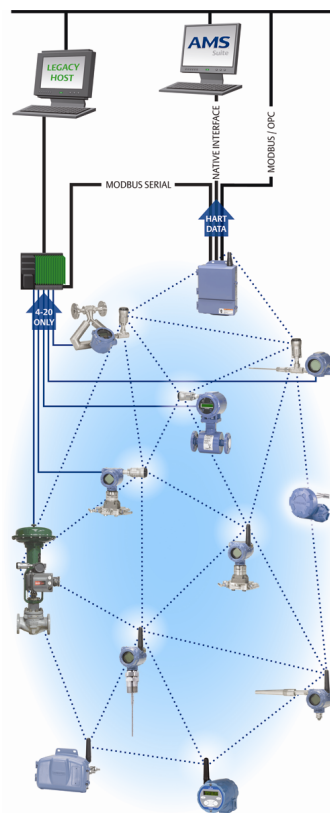


Guided Wave Radar

The Rosemount 3308 Series is the first true wireless level transmitter that is based on the Time Domain Reflectometry (TDR) principle. Low power nano-second-pulses are guided along a probe submerged in the process media. When a pulse reaches the surface of the material it is measuring, part of the energy is reflected back to the transmitter, and the time difference between the generated and reflected pulse is converted into a distance from which the total level or interface level is calculated (see left).

The reflectivity of the product is a key parameter for measurement performance. A high dielectric constant of the media gives better reflection and a longer measuring range.

Thanks to innovative technologies, inherited from market leading Rosemount guided wave radars 3300 and 5300 Series, Rosemount 3308 Series enables reliable measurements combined with long battery life.



Emerson Smart Wireless

Emerson Smart 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. Multiple communication paths are managed and analyzed in parallel to assure optimal communication and sustained network reliability even if obstructions are introduced.

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, WiFi, 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 3308 Series joins the Emerson Wireless portfolio, whose wireless network experience totals billions of operating hours, hundreds of thousands field devices, and tens of thousands of networks around the world.

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Application Examples

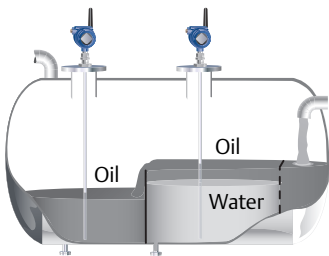
The Rosemount 3308 Series transmitter is suited for aggregate (total) level measurements on a wide range of liquids, semi-liquids, and liquid/liquid interfaces.

Moreover, the reliable and accurate guided wave radar technology offers a versatile solution that is virtually unaffected by process conditions such as temperature, pressure, vapor gas mixtures, density, turbulence, bubbling/boiling, varying dielectric media, pH, and viscosity.



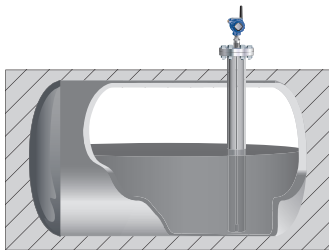
Production, storage, and buffer tanks

The Rosemount 3308 Series transmitter is ideal for production and shorter storage or buffer tanks that contain oil, gas condensate, water, or chemicals.



Low pressure separators

The Rosemount 3308 Series transmitter can measure both level and interface level in for example separator applications.



Waste tanks and sump pits

The Rosemount 3308 Series transmitter is also a good choice for waste tanks and underground tanks, such as sump pits.



Chamber applications

The Rosemount 3308 Series transmitter is a good choice for both chamber and pipe installations.

Ordering Information



Rosemount 3308 Series Guided Wave Radar Level transmitters are versatile and easy-to-use with field proven, market leading technologies. Characteristics include:

- Intrinsically Safe
- Long battery life
- IEC 62591 (WirelessHART™) Communication
- Compatible with AMS Device Manager and AMS Wireless Configurator packages for easy commissioning and troubleshooting

Additional Information

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Table 1. Rosemount 3308 Series Level and/or Interface Measurements in Liquids Ordering Information

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

Model	Product Description
★ 3308A	Guided Wave Radar Level Transmitter

Profile	
★ S	Standard

Signal Output (see page 10 for details)	
★ X	Wireless

Measurement Type (see page 13)	
★ 2	Level and Interface Transmitter
1	Level or Interface Transmitter (Interface available for fully submerged probe)

Housing	
★ D1	Wireless Dual Compartment Housing, Aluminum (with plugged ½-14 NPT conduits)
★ E1	Wireless Dual Compartment Housing, Stainless steel (with plugged ½-14 NPT conduits)

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Product Certifications (see page 21-23)	
★ I1	ATEX Intrinsic Safety
★ I5	FM Intrinsically Safe
★ I6	Canadian Intrinsically Safe
★ I7	IECEX Intrinsic Safety
KD	ATEX and Canadian Intrinsic Safety
KE	FM and Canadian Intrinsically Safe
KF	ATEX and FM Intrinsic Safety
NA	No Hazardous Locations Certifications

Operating Temperature and Pressure (see page 12)	
★ S	- 15 psig (-1 bar) to 580 psig (40 bar) @ 302 °F (150 °C)

Material of Construction; Process Connection/ Probe	
★ 1	316L SST (EN 1.4404)

Sealing O-ring Material (see Table 3 on page 13)	
★ V	Viton® Fluoroelastomer
★ E	Ethylene Propylene
★ K	Kalrez 6375 perfluoroelastomer
★ B	Buna-N

Process Connection Size	
★ 5	1½ in. (threaded connections only)
★ 2	2 in. / DN50 / 50A (threaded connections and flanged connections)
★ 3	3 in. / DN80 / 80A (flanged connections only)
★ 4	4in. / DN100 / 100A (flanged connections only)
★ P	Proprietary Flanges
1	1 in. (threaded connections only)
6	6 in. / DN150 / 150A (flanged connections only)
8	8 in. / DN200 / 200A (flanged connections only)

Table 1. Rosemount 3308 Series Level and/or Interface Measurements in Liquids Ordering Information

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

Process Connection Rating (see page 16 for dimensions)	
★ NN	For use with threaded connections
ANSI rating	
★ AA	ASME B16.5 Class 150 Flange
★ AB	ASME B16.5 Class 300 Flange
EN rating	
★ DA	EN1092-1 PN16 Flange
★ DB	EN1092-1 PN40 Flange
JIS ratings	
★ JA	JIS 10K Flange
★ JB	JIS 20K Flange
Proprietary	
★ PF	Proprietary Flange

Process Connection Type (Threads/Flanges/Flange Faces)	
Thread	
★ N	NPT thread
★ G	BSPP (G) thread
Flange Faces	
★ F	Flat Face (FF) Flange
★ R	Raised Face (RF) Flange
Proprietary Flanges (see page 27 for dimensions)	
★ M	Masoneilan-Proprietary, 316 SST Torque Tube Flange, 316L
★ P	Fisher-Proprietary, 316 SST, (for 249B and 259B cages) Torque Tube Flange, 316L
★ Q	Fisher-Proprietary, 316 SST, (for 249C cages) Torque Tube Flange, 316L

Probe Type	Probe Lengths
★ 5A	Flexible Single Lead (d=0.16"/4mm), for installation in metallic tanks. Refer to "Options" on page 7 to specify weight or chuck. Min.: 3 ft. 4 in. (1m) Max.: 32 ft. 10 in. (10 m)

Probe Length Units (see page 17 for total probe length)	
★ E	English (feet, inches)
★ M	Metric (meters, centimeters)

Table 1. Rosemount 3308 Series Level and/or Interface Measurements in Liquids Ordering Information

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

Probe Length (feet / meters)	
★ XXX	0-32 feet or 0-10 meters

Probe Length (inches / centimeters)	
★ XX	0-11 inches or 0-99 Centimeters

Update Rate, Operating Frequency and Protocol	
★ WA3	User Configurable Update Rate, 2.4 GHz DSSS (Direct Sequence Spread Spectrum), IEC 62591 (<i>WirelessHART</i>)

Omnidirectional Wireless Antenna and SmartPower Solutions (see page 10 for functional specification)	
★ WK1	External Antenna, Adapter for Black Power Module (I.S. Power Module Sold Separately)
★ WN1 ⁽¹⁾	High Gain, Remote Antenna (see page 26 for dimensions), Adapter for Black Power Module (I.S. Power Module Sold Separately)

Options	
Display	
★ M5	Device Display (see page 10)
Factory Configuration	
★ C1	Factory Configuration (Configuration Data Sheet required with order, available at www.rosemount.com)
Certifications	
★ P1	Hydrostatic Testing
★ Q4	Calibration Data Certificate
★ Q8	Material Traceability Certification per EN 10204 3.1
Q66	Welding Procedure Qualification Record Documentation
Installation Options	
★ LS	Long Stud for Flexible Single Lead Probes, 25 cm (10 in.) (for use in tall nozzles)
BR	Mounting Bracket for 1.5 in. NPT Process Connection (see page 25)
Weight and Anchoring options for Flexible Single Probes (see page 16 for dimensions)	
★ W1	Small Weight (for narrow tank openings less than 2 in. (50 mm))
★ W3	Heavy weight (for most applications)
★ W4	Chuck (to tie probe end to tank bottom)
W2	Short weight (when measuring close to the probe end)
Weight Assembly Options for Flexible Single Probes	
★ WU	Weight or chuck not mounted on the probe
PlantWeb Diagnostic Functionality	
★ DA1	HART Diagnostics (see page 11)

Table 1. Rosemount 3308 Series Level and/or Interface Measurements in Liquids Ordering Information

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

Centering Disc (see page 19-20 for dimensions and size recommendation)	
★ S2	2 in. Centering disc ⁽²⁾
★ S3	3 in. Centering disc ⁽²⁾
★ S4	4 in. Centering disc ⁽²⁾
★ P2	2 in. Centering disc PTFE
★ P3	3 in. Centering disc PTFE
★ P4	4 in. Centering disc PTFE
S6	6 in. Centering disc ⁽²⁾
S8	8 in. Centering disc ⁽²⁾
P6	6 in. Centering disc PTFE
P8	8 in. Centering disc PTFE
Assemble / Consolidate to Chamber (see page 18)	
★ XC	Consolidate to Chamber

(1) Not CE approved.

(2) Centering disc in same material as probe material of construction.

Table 2. Accessories Ordering Information

Process Connection - Size/Type (consult the factory for other process connections)		
Centering discs^{(1) (2)} (see page 19-20 for dimensions and size recommendation)		Outer Diameter
★ 03300-1655-1001	Kit, 2-in. Centering disc, SST, Single Flex Lead	1.8 in. (45 mm)
★ 03300-1655-1002	Kit, 3-in. Centering disc, SST, Single Flex Lead	2.7 in. (68 mm)
★ 03300-1655-1003	Kit, 4-in. Centering disc, SST, Single Flex Lead	3.6 in. (92 mm)
★ 03300-1655-1006	Kit, 2-in. Centering disc, PTFE, Single Flex Lead	1.8 in. (45 mm)
★ 03300-1655-1007	Kit, 3-in. Centering disc, PTFE, Single Flex Lead	2.7 in. (68 mm)
★ 03300-1655-1008	Kit, 4-in. Centering disc, PTFE, Single Flex Lead	3.6 in. (92 mm)
03300-1655-1004	Kit, 6-in. Centering disc, SST, Single Flex Lead	5.55 in. (141 mm)
03300-1655-1005	Kit, 8-in. Centering disc, SST, Single Flex Lead	7.40 in. (188 mm)
03300-1655-1009	Kit, 6-in. Centering disc, PTFE, Single Flex Lead	5.55 in. (141 mm)
03300-1655-1010	Kit, 8-in. Centering disc, PTFE, Single Flex Lead	7.40 in. (188 mm)
Vented Flanges⁽³⁾		
03300-1812-0092	Fisher 249B/259B ⁽⁴⁾	
03300-1812-0093	Fisher 249C	
03300-1812-0091	Masoneilan	
Flushing Connection Rings		
DP0002-2111-S6	2 in. ANSI, ¼ in. NPT connection	
DP0002-3111-S6	3 in. ANSI, ¼ in. NPT connection	
DP0002-4111-S6	4 in. ANSI, ¼ in. NPT connection	
DP0002-5111-S6	DN50 ¼ in. NPT. connection	
DP0002-8111-S6	DN80 ¼ in. NPT. connection	
Other		
★ 03300-7004-0001	Viator HART Modem and cables (RS232 connection)	
★ 03300-7004-0002	Viator HART Modem and cables (USB connection)	

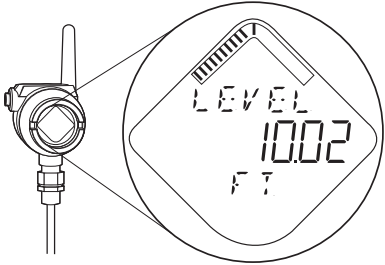
(1) If a centering disc is required for a flanged probe, the centering disc can be ordered with options Sx or Px on page 8 in the model code. If a centering disc is required for a threaded connection or as a spare part, it should be ordered using the item numbers listed below.

(2) To order a centering disc in a different material, consult the factory.

(3) 1½ in. NPT threaded connection is required.

(4) For pressure and temperature rating, see "Fisher & Masoneilan Flange Rating" on page 12.

Functional Specification

General	
Field of Application	Liquids and semi-liquids level or liquid/liquid interfaces <ul style="list-style-type: none"> ■ 3308Axx1... for level or submerged probe interface measurement ■ 3308Axx2... for level and interface measurement
Measurement Principle	Time Domain Reflectometry (TDR). (See "Introduction" on page 2 for a description of how it works)
Microwave Output Power	Nominal 10 μ W, Max <20 mW
Humidity Limits	0 to 100% relative humidity
Wireless	
Output	IEC 62591 (WirelessHART) 2.4 GHz DSSS
Frequency Range	2400 - 2483.5 MHz
Radio Frequency Output from Antenna	External (WK option) antenna: Maximum 10 mW (+10dBm) EIRP High Gain, Remote (WN option) antenna: Maximum of 40mW (16dBm) EIRP
Modulation Type	QPSK / IEEE 802.15.4 DSSS IEC 62591 (WirelessHART)
Number of Channels	15
Channel Spacing	5 MHz
Emission Designation	G1D
Transmit Rate	User selectable, 4 seconds to 60 minutes
Display and Configuration	
Device Display	 <p>The optional device display can show sensor variables and diagnostic information. Display updates at each wireless update.</p>
Output Units	<ul style="list-style-type: none"> ■ For Level, Interface, and Distance: ft, inch, m, cm, or mm ■ For Volume: ft³, inch³, US gals, Imp gals, barrels, yd³, m³, or liters ■ For temperature: °F, °C

Output Variables		Display	PV, SV, TV, QV
	Level	X	X
	Distance	X	X
	Surface Signal Strength		X ⁽²⁾
	Total Volume	X	X
	Interface Level ⁽¹⁾	X	X
	Interface Distance ⁽¹⁾	X	X
	Interface Signal Strength ⁽¹⁾		X ⁽²⁾
	Upper Product Thickness ⁽³⁾	X	X
	Electronics Temperature	X	X ⁽²⁾
	Signal Quality	X	X ⁽²⁾
	Supply Voltage	X	X ⁽²⁾
	% of Range	X	X ⁽²⁾
<p>(1) For 3308Axx1, Interface measurement is only available for fully submerged probe. (2) Not available as primary variable. (3) Only available with 3308Axx2.</p>			
HART Diagnostics	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 probe coating or sudden loss of signal strength. Signal Quality is available as Output Variable and it comes with user configurable alerts through AMS or Field Communicator.		

Temperature Limits			
Ambient and Storage Temperature Limits	Verify that the operating atmosphere of the transmitter is consistent with the appropriate hazardous locations certifications		
		Operating Limit	Storage Limit
	With Device Display	-4 to 175 °F (-20 to 80° C)	-40 to 185 °F (-40 to 85° C)
Without Device Display	-40 to 185 °F (-40 to 85° C)	-40 to 185 °F (-40 to 85° C)	

Process Temperature and Pressure Rating	
Process Temperature	<p>Max. Rating, Standard Tank Connections</p> <p>Pressure psig (bar)</p> <p>Final rating depends on flange and O-ring selection. Table 3 on page 13 gives the temperature ranges for standard tank seals with different O-ring materials.</p> <hr/> <p>Note The maximum process temperature is at the lower part of the flange.</p>
ASME / ANSI Flange Rating	316L SST Flanges according to ASME B16.5 Table 2-2.3. Max. 302 °F/580 psig (150 °C/40 bar)
EN Flange Rating	1.4404 according to EN 1092-1 material group 13E0. Max. 302 °F/580 psig (150 °C/40 bar)
Fisher & Masoneilan Flange Rating	316L SST Flanges according to ASME B16.5 Table 2-2.3. Max. 302 °F/580 psig (150 °C/40 bar)
JIS Flange Rating	316L SST Flanges according to JIS B2220 material group 2.3. Max. 302 °F/580 psig (150 °C/40 bar)
Flange Connection Rating	See Table 4 on page 13 for the conditions used for flange strength calculations

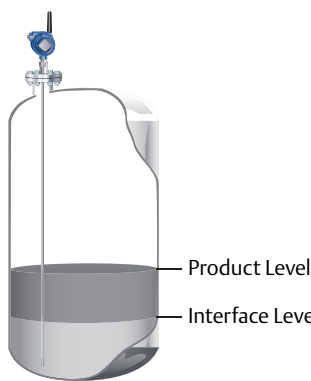
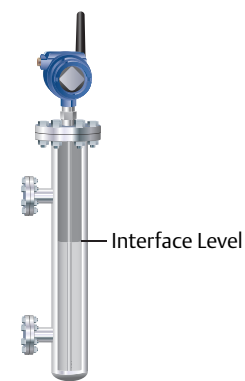
Interface Measurements	
Considerations	<p>The Rosemount 3308 Series is well suited for interface measurements, including applications where the probe is fully submerged in the liquid:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Interface Measurement</p> </div> <div style="text-align: center;">  <p>Interface Measurement with fully submerged probe</p> </div> </div> <p>If interface is to be measured, follow these criteria:</p> <ul style="list-style-type: none"> ■ The dielectric constant of the upper product must be known and should not vary. The AMS Wireless Configurator and Field Communicator have a built-in dielectric constant calculator to assist the user in determining the dielectric constant of the upper product. ■ The dielectric constant of the upper product must have a lower dielectric constant than the lower product to have a distinct reflection. ■ The difference between the dielectric constants for the two products must be larger than 10. ■ Maximum dielectric constant for the upper product is 5. ■ Minimum detectable upper product thickness is 4 in. (10 cm). <p>For guidelines on emulsion situations, consult your local Emerson Process Management representative.</p>

Table 3. Temperature ranges for standard tank seals with different O-ring materials

Tank seal with different O-ring material	Min. Temperature °F (°C) in air	Max. Temperature °F (°C) in air
Viton® Fluoroelastomer	5 (-15)	302 (150)
Ethylene Propylene (EPDM)	-40 (-40)	266 (130)
Kalrez® 6375 perfluoroelastomer	14 (-10)	302 (150)
Buna-N	-31 (-35)	230 (110)

Note

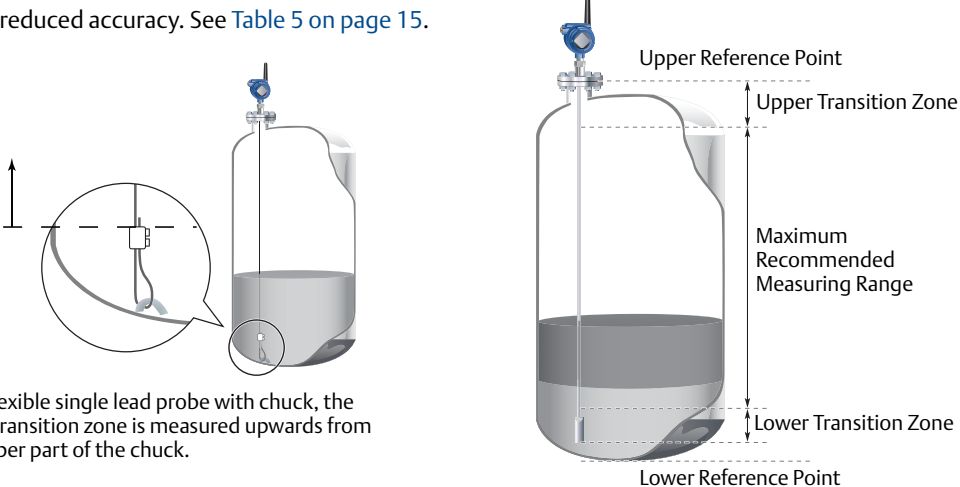
Always check the chemical compatibility of the o-ring material with your application.

Table 4. Conditions used for flange strength calculations

	Bolting material	Gasket	Flange material	Hub material
ASME / ANSI	SST SA193 B8M Class 2	Soft (1a) with min. thickness 1.6 mm	SST A182 Gr. F316L and EN 10222-5-1.4404	SST SA479M 316L and EN 10272-1.4404
EN, JIS	EN 1515-1/-2 group 13E0, A4-70	Soft (EN 1514-1) with min. thickness 1.6 mm		

Performance Specification

General	
Reference Conditions ⁽¹⁾	Single flexible probe mounted in a 4" nozzle. Normal indoor temperature (68° - 79 °F, 20° - 26 °C) water
Reference Accuracy	±0.25 in. (6 mm)
Repeatability	±0.08 in. (2 mm)
Ambient Temperature Effect	Less than 0.01% of measured distance per °C
Power Module Battery Life	9 years at one minute update rate ⁽²⁾

Measuring Range	
Transition Zones	<p>These zones are areas where measurements are non-linear or have reduced accuracy. See Table 5 on page 15.</p>  <p>For a flexible single lead probe with chuck, the lower transition zone is measured upwards from the upper part of the chuck.</p> <p>Note The measurement accuracy is reduced in the Transition Zones. It may even be impossible to make any measurements at all in those regions. Therefore, the alarm limit points should be configured outside the Transition Zones.</p>

Environment	
Vibration Resistance	No effect when tested per the requirements of IEC60770-1 (1999): High Vibration Level - field or pipeline (10-60 Hz 0.21 mm displacement peak amplitude / 60-2000 Hz 3g).
Electromagnetic Compatibility	<ul style="list-style-type: none"> Meets CE 61326:2012 and NE21:2012 if installed in metallic vessels or still pipes. When single probes are installed in non-metallic vessels or open applications, influence of strong electromagnetic fields might affect measurements.

(1) Please refer to the IEC 60770-1 (IEC 1292-2) standard for a definition of radar specific performance parameters and if applicable corresponding test procedure.

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

Table 5. Transition Zones

Transition Zone	Dielectric Constant	Flexible Single Lead
Upper Transition Zone ⁽¹⁾	80	6 in. (15 cm)
	2	6in. (15 cm)
Lower Transition Zone ⁽²⁾	80	4 in. (10 cm) ⁽³⁾
	2	4 in. (10 cm) ⁽³⁾

- (1) The distance from the upper reference point where measurements have reduced accuracy.
- (2) The distance from the probe end where measurements have reduced accuracy.
- (3) If a weight is mounted on the probe, the length of the weight shall be added to the specified distance.

Table 6. Measuring Range and Minimum Dielectric Constant

Flexible Single Lead
Maximum Measuring Range
32.8 ft. (10 m)
Minimum Dielectric Constant
2.0 up to 32.8 ft (10 m) ^{(1) (2)}

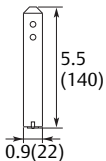
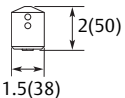
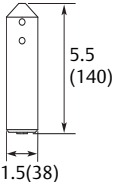
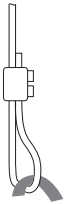
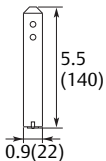
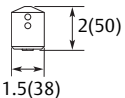
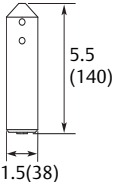
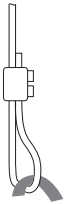
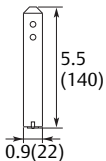
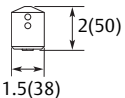
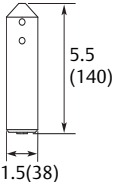
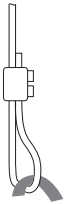
- (1) Minimum Dielectric Constant may be lower than 2.0 if one or more of the following conditions apply:
 - Probe is installed in stilling well or chamber.
 - Maximum measuring range is not utilized.
 - Noise Threshold is manually adjusted to a lower level.
- (2) For temperatures above 140 °F (60 °C) manual adjustment of noise threshold may be required for products with low dielectric constant at or close to maximum measuring range.

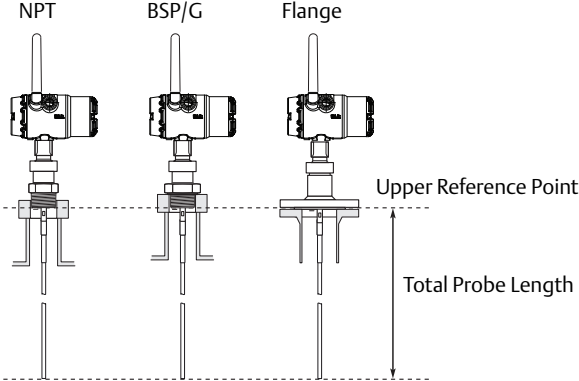
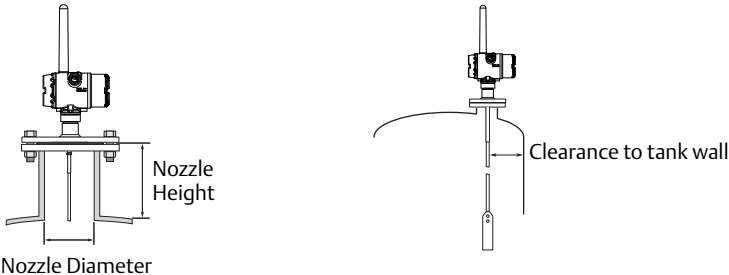
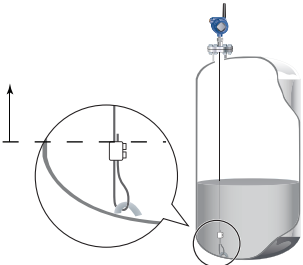
Table 7. Maximum recommended Viscosity and Coating / Build-up

Single Lead
Maximum Viscosity
8000 cP ⁽¹⁾
Coating / Build-up
Coating allowed

- (1) Consult your local Emerson Process Management representative in the case of agitation/turbulence and high viscous products.

Physical Specification

Tank Connection and Probe																					
Tank Connection	The tank connection consists of a tank seal, a flange, or NPT or BSP/G threads. See “Dimensional Drawings” on page 24.																				
Flange Dimensions	Follows ASME B 16.5, JIS B2220, and EN 1092-1 standards for blind flanges. For Proprietary Fisher® and Maseoilan® flanges, see “Proprietary flanges” on page 27.																				
Probe Versions	Flexible Single. There are in total four weight and anchoring options for flexible probes.																				
	<table border="1"> <thead> <tr> <th>Weight and Anchoring Option</th> <th>Weight lb (kg)</th> <th>Dimension in. (mm)</th> <th>Application</th> </tr> </thead> <tbody> <tr> <td>W1 (Small weight)</td> <td>0.88 (0.40)</td> <td>  </td> <td>A small weight is recommended for narrow tank openings less than 1.5 inches (38 mm).</td> </tr> <tr> <td>W2 (Short weight)</td> <td>0.88 (0.40)</td> <td>  </td> <td>A short weight is available for the single flexible stainless steel probe. It is recommended for maximized measuring ranges with measurements close to the probe end.</td> </tr> <tr> <td>W3 (Heavy weight)</td> <td>2.43 (1.10)</td> <td>  </td> <td>A heavy weight is the recommended choice for most applications.</td> </tr> <tr> <td>W4 (Chuck)</td> <td>-</td> <td>  </td> <td>To tie probe end to tank bottom.</td> </tr> </tbody> </table>	Weight and Anchoring Option	Weight lb (kg)	Dimension in. (mm)	Application	W1 (Small weight)	0.88 (0.40)		A small weight is recommended for narrow tank openings less than 1.5 inches (38 mm).	W2 (Short weight)	0.88 (0.40)		A short weight is available for the single flexible stainless steel probe. It is recommended for maximized measuring ranges with measurements close to the probe end.	W3 (Heavy weight)	2.43 (1.10)		A heavy weight is the recommended choice for most applications.	W4 (Chuck)	-		To tie probe end to tank bottom.
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W3 (Heavy weight)	2.43 (1.10)		A heavy weight is the recommended choice for most applications.																		
W4 (Chuck)	-		To tie probe end to tank bottom.																		
Material Exposed To Tank Atmosphere	Material model code 1: 316L stainless steel (EN 1.4404), 316, PTFE, PFA, and O-ring materials																				

<p>Total Probe Length</p>	<p>This is defined from the Upper Reference Point to the end of the probe (weight included, if applicable).</p>  <p>Select the probe length according to the required measuring range (the probe must be hung and fully extended through the entire distance where level readings are desired).</p>
<p>Cut-to-fit probes</p>	<p>Probes can be cut in field.</p>
<p>Minimum and Maximum Probe Length</p>	<p>Flexible Single Lead: 3.3 ft (1 m) to 32.8 ft (10m)</p>
<p>Probe Angle</p>	<p>0 to 90 degrees from vertical axis</p>
<p>Tensile Strength</p>	<p>Flexible Single Lead probe: 2698 lb (12 kN)</p>
<p>Collapse Load</p>	<p>Flexible Single Lead probe: 3597 lb (16 kN)</p>
<p>Maximum Recommended Nozzle Height</p>	<p>4 in. (10 cm) + nozzle diameter</p>
<p>Minimum Clearance (See Table 8 on page 19)</p>	
<p>Other Mechanical Considerations</p>	<p>To get best possible performance, the following must be considered before installing the transmitter:</p> <ul style="list-style-type: none"> ■ Inlets should be kept at a distance in order to avoid product filling on the probe. ■ Avoid physical contact between probes and agitators, as well as applications with strong fluid movement unless the probe is anchored. ■ Probe tie-down is recommended if the probe can move to within 1 ft. (30 cm) of any object during operations. ■ In order to stabilize the probe for side forces, it is possible to fix or guide the probe to the tank bottom ■ Single lead probes are not suited for non-metallic tanks or open atmosphere applications, due to high susceptibility to strong electromagnetic fields. <p>See the Reference Manual (Document No. 00809-0100-4308) for more mechanical installation information.</p>  <p>For a flexible single lead probe with chuck, the lower transition zone is measured upwards from the upper part of the chuck.</p>

Weight	Flange: Depends on flange size Flexible Single Lead probe: 0.05 lb/ft. (0.07 kg/m) End weight: W1: 0.88 lb (0.40 kg) W2: 0.88 lb (0.40 kg) W3: 2.43 lb (1.10 kg)
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Chamber / Pipe Installations

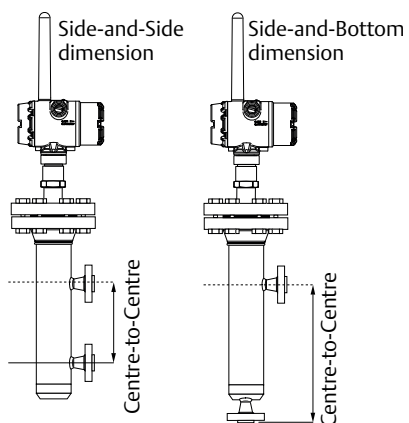
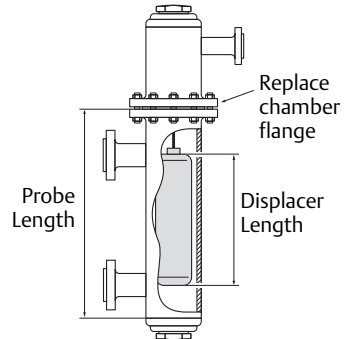
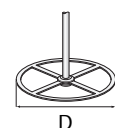
General Chamber Considerations	The recommended minimum chamber diameter is 4 in. (100 mm) for Single Flexible probe. The probe should be centered to prevent it touching the sides of the well.
Rosemount 9901 Chamber	<p>Rosemount 9901 allows external mounting of process level instrumentation. It supports a variety of process connections, and optional drain and vent connections. The Rosemount 9901 chamber is designed to the ASME B31.3 standard, and is Pressure Equipment Directive (PED) compliant. Use option code XC to order together with the 3308 Series transmitters.</p> <p>The probe length to use for a Rosemount 9901 chamber can be calculated with this formula:</p> <p>Side-and-Side dimension: Probe length=Centre-to-Centre dimension + 19 in. (48 cm)</p> <p>Side-and-Bottom dimension: Probe length=Centre-to-Centre dimension + 4 in. (10 cm)</p> <p>Use a centering disc the same diameter as the chamber if the probe length >3.3 ft. (1 m). See “Centering Discs” on page 18 for which disc to use.</p> <p>For additional information, see the Rosemount 9901 Chamber for Process Level Instrumentation Product Data Sheet (Document Number 00813-0100-4601).</p> 
Existing Chamber	<p>A Rosemount 3308 Series transmitter is the perfect replacement in an existing displacer chamber. Proprietary flanges are offered, enabling use of existing chambers to make installation easy.</p> <p>Considerations when changing to 3308 Series:</p> <ul style="list-style-type: none"> ■ The 3308 Series flange choice and probe length must be correctly matched to the chamber. Both standard ANSI and EN (DIN), as well as proprietary chamber flanges, are available. See “Proprietary flanges” on page 27 to identify the proprietary flanges. ■ See “Centering Discs” on page 18 for which disc to use. See Table 9 on page 19 for guidelines on the required probe length. <p>For additional information, see the Replacing Displacers with Guided Wave Radar Technical Note (Document Number 00840-2200-4811).</p> 
Centering Discs	<p>To prevent the probe from contacting the chamber or pipe wall, centering discs are available for rigid single, flexible single, and flexible twin lead probes. The disc is attached to the end of the probe. Discs are made of stainless steel, or PTFE. See Table 10 on page 19 for Dimension D. Table 11 on page 20 shows which centering disc diameter to choose for a particular pipe.</p> 

Table 8. Minimum Clearance

	Flexible Single Lead
Recommended nozzle diameter	4 in. (10 cm) or more
Min. nozzle diameter ⁽¹⁾	1.5 in. (4 cm)
Min. clearance to tank wall or obstruction	4 in. (10 cm) if smooth metallic wall. 16 in. (40 cm) if disturbing objects, rugged metallic or concrete/plastic wall.
Min. pipe / bypass diameter	Consult your local Emerson Process Management representative.

(1) Requires special configuration and setting of Upper Null Zone.

Table 9. Required probe length in chambers

Chamber Manufacturer	Probe Length⁽¹⁾
Major torque-tube manufacture (249B, 249C, 249K, 249N, 259B)	Displacer + 9 in. (229 mm)
Masoneilan (Torque tube operated), proprietary flange	Displacer + 8 in. (203 mm)
Other - torque tube ⁽²⁾	Displacer + 8 in. (203 mm)
Magnetrol (spring operated) ⁽³⁾	Displacer + between 7.8 in. (195 mm) to 15 in. (383 mm)
Others - spring operated ⁽²⁾	Displacer + 19.7 in. (500 mm)

(1) If flushing ring is used, add the ring height to the probe length.

(2) For other manufacturers, there are small variations. This is an approximate value, actual length should be verified.

(3) Lengths vary depending on model, SG and rating, and should be verified.

Table 10. Centering Discs Dimensions

Disc Size	Actual Disc Diameter
2 in.	1.8 in. (45 mm)
3 in.	2.7 in. (68 mm)
4 in.	3.6 in. (92 mm)
6 in.	5.55 in. (141 mm)
8 in.	7.40 in. (188 mm)

Table 11. Centering disc size recommendation for different pipe schedules

		Pipe Schedule			
		5s, 5 & 10s, 10	40s, 40 & 80s, 80	120	160
Pipe Size	2 in.	2 in.	2 in.	NA ⁽¹⁾	NA ⁽²⁾
	3 in.	3 in.	3 in.	NA ⁽¹⁾	2 in.
	4 in.	4 in.	4 in.	4 in.	3 in.
	5 in.	4 in.	4 in.	4 in.	4 in.
	6 in.	6 in.	6 in.	4 in.	4 in.
	7 in.	NA ⁽¹⁾	6 in.	NA ⁽¹⁾	NA ⁽¹⁾
	8 in.	8 in.	8 in.	6 in.	6 in.

(1) Schedule is not available for pipe size.

(2) No centering disc is available.

Product Certifications

European Union Directive Information

The EC Declaration of Conformity for all applicable European directives for this product can be found on www.rosemount.com. A hard copy may be obtained by contacting your local sales representative.

Approved Manufacturing Locations

Rosemount Inc. - Chanhassen, Minnesota, USA
 Rosemount Tank Radar AB -Gothenburg, Sweden
 Emerson Process Management Asia Pacific Private Limited - Singapore

ATEX Directives (94/9/EC)

Emerson Process Management complies with the ATEX Directive

Electro Magnetic Compatibility (EMC) (2004/108/EEC)

EN 61326-1; 2006
 EN 61326-2-3; 2006

Radio and Telecommunications Terminal Equipment Directive (R&TTE) (1999/5/EC)

Emerson Process Management complies with the R & TTE Directive

Telecommunication Compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the RF spectrum. Nearly every country requires this type of product certification. Emerson is working with governmental agencies around the world to supply fully compliant products and remove the risk of violating country directives or laws governing wireless device usage.

FCC and IC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation distance of 20 cm from all persons.

CAUTION

Changes or modifications to the equipment not expressly approved by Rosemount Inc. could void the user's authority to operate the equipment.

Ordinary Location Certification for FM Approvals

As standard, the transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM Approvals, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

Pressure Equipment Directive (PED)

Complies with 97/23/EC article 3.3

Hazardous Locations Certificates

North American certifications

FM US Approvals

I5 Intrinsically Safe

Certificate No: 3046655

Applicable Standards: FM Class 3600 – 2011, FM Class 3610 – 2010, FM Class 3810 – 2005, NEMA 250 – 2003, ANSI/ISA 60079-0:2009, ANSI/ISA 60079-11:2011, ANSI/ISA 60079-26:2011, ANSI/ISA 60529:2004.

Markings: IS CL I, DIV 1, GP A, B, C, D:

IS CL I Zone 0, AEx ia IIC;

T4 Ta = -55 to +70 °C

WHEN INSTALLED PER ROSEMOUNT DRW 03308-1010

SPECIAL CONDITIONS OF CERTIFICATION:

1. The Model 3308 transmitter housing contains aluminum, protect the enclosure to avoid a potential risk of ignition due to impact or friction.
2. The surface resistivity of the polymeric antenna is greater than 1GW. To avoid electrostatic charge buildup, it must not be rubbed or cleaned with solvents or a dry cloth.
3. For use with the Emerson Process Management 701PBKKF SmartPower Option only.
4. Only the Emerson Process Management 375 or 475 Field Communicator is approved for use with this transmitter.
5. The maximum permitted operating temperature of the Rosemount 3308A transmitter is 70 °C. To avoid the effects of process temperature and other thermal effects care shall be taken to ensure that the "Electronics Temperature" does not exceed 70 °C.

FM Canadian Approvals**I6** Intrinsically Safe

Certificate No: 3046655

Applicable Standards: CSA Std. C22.2 No. 1010.1:04, CSA Std. 22.2 No 94-M91, CSA Std. C22.2 No. 157 – 92, CAN/CSA-C22.2 No. 60079-0:11, CAN/CSA-C22.2 No. 60079-11:11

Markings: INTRINSICALLY SAFE Ex ia CLASS I, GP A, B, C, D; CLASS I, Zone 0, Ex ia IIC Ga; TEMP CODE T4 (-55 °C ≤ Ta ≤ +70 °C) WHEN INSTALLED PER ROSEMOUNT DRW 03308-1010.

SPECIAL CONDITIONS OF CERTIFICATION:

1. The Model 3308 transmitter housing contains aluminum, protect the enclosure to avoid a potential risk of ignition due to impact or friction.
2. The surface resistivity of the polymeric antenna is greater than 1GW. To avoid electrostatic charge buildup, it must not be rubbed or cleaned with solvents or a dry cloth.
3. For use with the Emerson Process Management 701PBKKF SmartPower Option only.
4. Only the Emerson Process Management 375 or 475 Field Communicator is approved for use with this transmitter.
5. The maximum permitted operating temperature of the Rosemount 3308A transmitter is 70 °C. To avoid the effects of process temperature and other thermal effects care shall be taken to ensure that the “Electronics Temperature” does not exceed 70 °C.

European Certificates**I1** ATEX Intrinsic Safe

Certificate No: FM 12ATEX0072X

Applicable Standards: EN 60079-0:2012, EN 60079-11:2012, EN 60079-26:2007

Markings: Category II 1 G, Ex ia IIC T4 Ga (-55 °C ≤ Ta ≤ +70 °C);

 1180

SPECIAL CONDITIONS OF CERTIFICATION:

1. The Model 3308 transmitter housing contains aluminum, protect the enclosure to avoid a potential risk of ignition due to impact or friction.
2. The surface resistivity of the polymeric antenna is greater than 1GW. To avoid electrostatic charge buildup, it must not be rubbed or cleaned with solvents or a dry cloth.
3. For use with the Emerson Process Management 701PBKKF SmartPower Option only.
4. Only the Emerson Process Management 375 or 475 Field Communicator is approved for use with this transmitter.
5. The maximum permitted operating temperature of the Rosemount 3308A transmitter is 70 °C. To avoid the effects of process temperature and other thermal effects care shall be taken to ensure that the “Electronics Temperature” does not exceed 70 °C.

IECEx Certificates**I7** IECEx Intrinsic Safety

Certificate No: IECEx FMG 12.0029X

Applicable Standards: IEC 60079-0:2011, IEC 60079-11:2011, IEC 60079-26:2006

Markings: Ex ia IIC T4 Ga (-55 °C < Ta < +70 °C)

SPECIAL CONDITIONS OF CERTIFICATION:

1. The Model 3308 transmitter housing contains aluminum, protect the enclosure to avoid a potential risk of ignition due to impact or friction.
2. The surface resistivity of the polymeric antenna is greater than 1GW. To avoid electrostatic charge buildup, it must not be rubbed or cleaned with solvents or a dry cloth.
3. For use with the Emerson Process Management 701PBKKF SmartPower Option only.
4. Only the Emerson Process Management 375 or 475 Field Communicator is approved for use with this transmitter.
5. The maximum permitted operating temperature of the Rosemount 3308A transmitter is 70 °C. To avoid the effects of process temperature and other thermal effects care shall be taken to ensure that the “Electronics Temperature” does not exceed 70 °C.

Taiwan Certifications

注意！

依據 低功率電波輻射性電機管理辦法

第十二條

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。

低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Dimensional Drawings

Figure 1. Flexible Single Lead

Dimensions are in inches (millimeters)

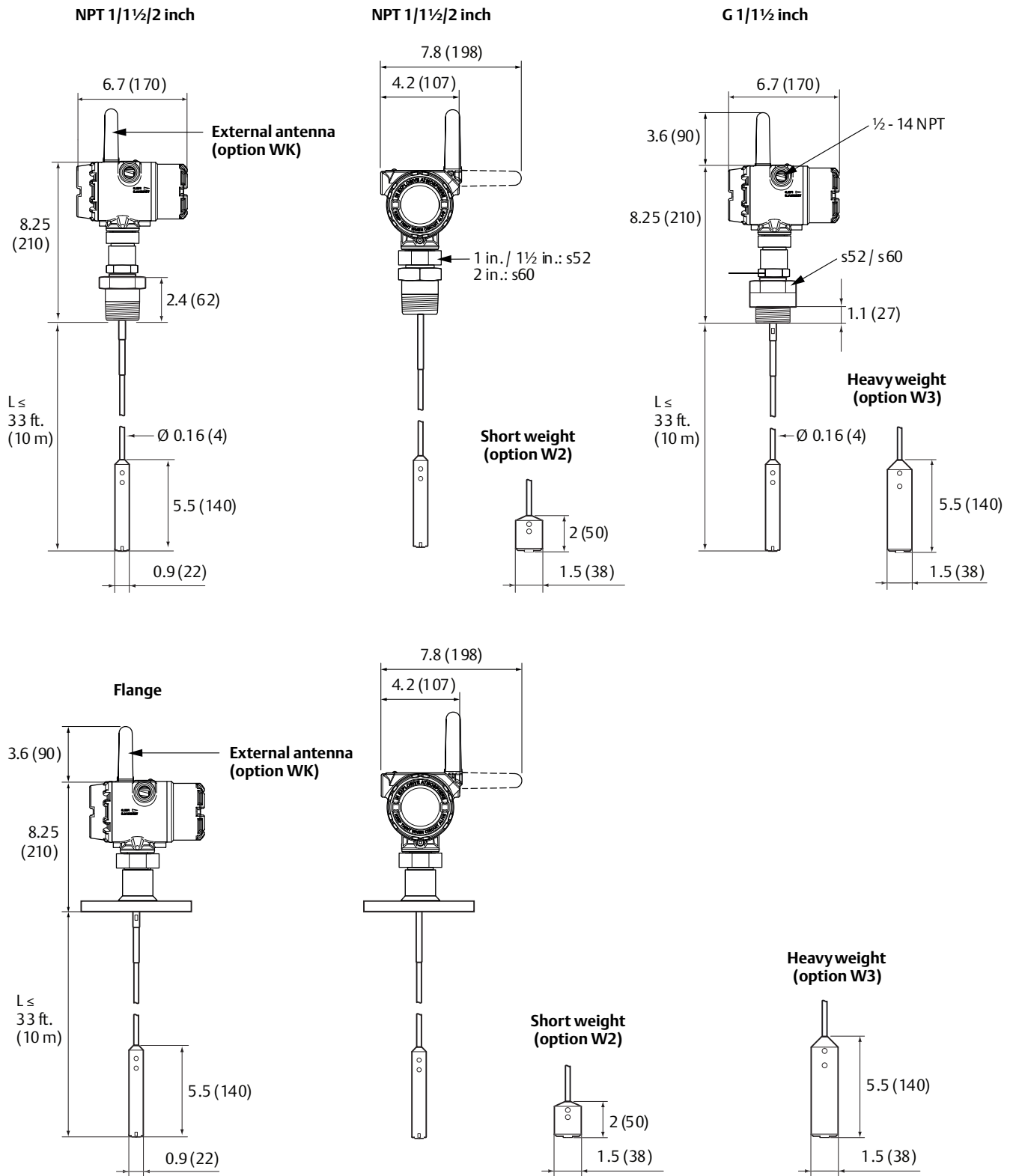


Figure 2. Mounting Bracket (option code BR)

Dimensions are in inches (millimeter)

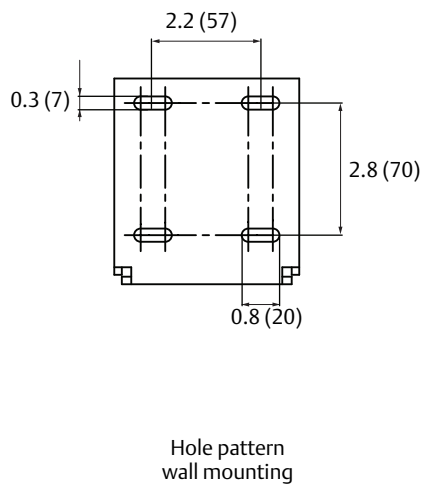
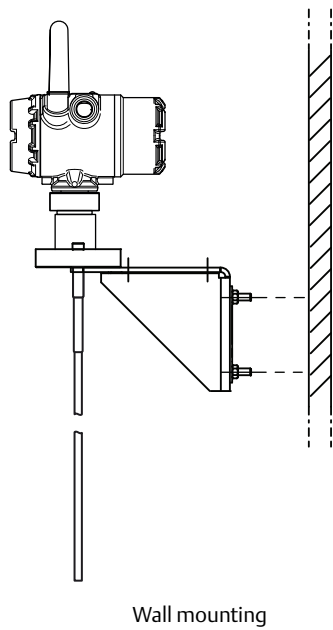
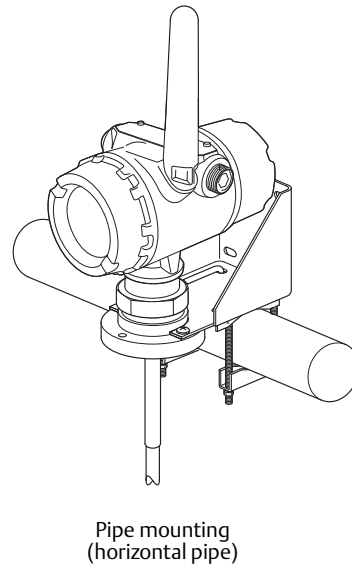
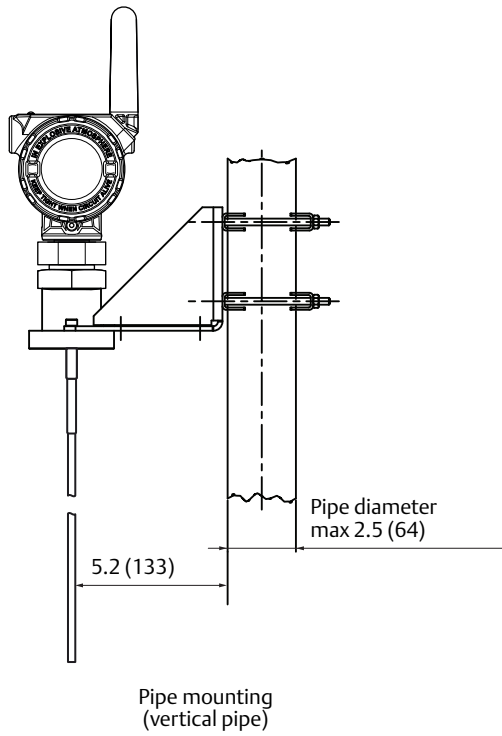
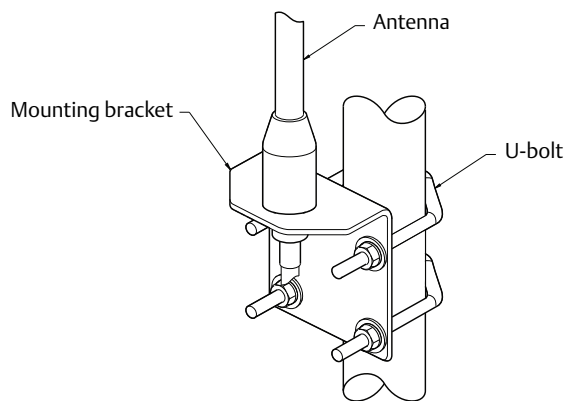
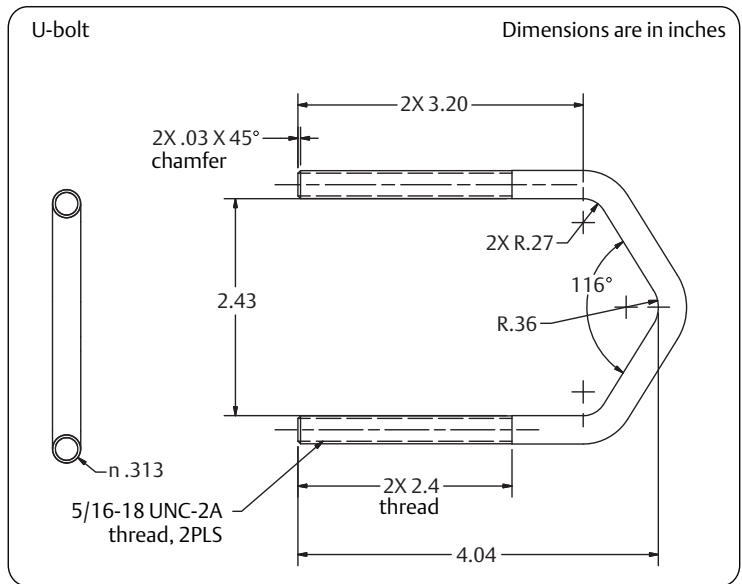
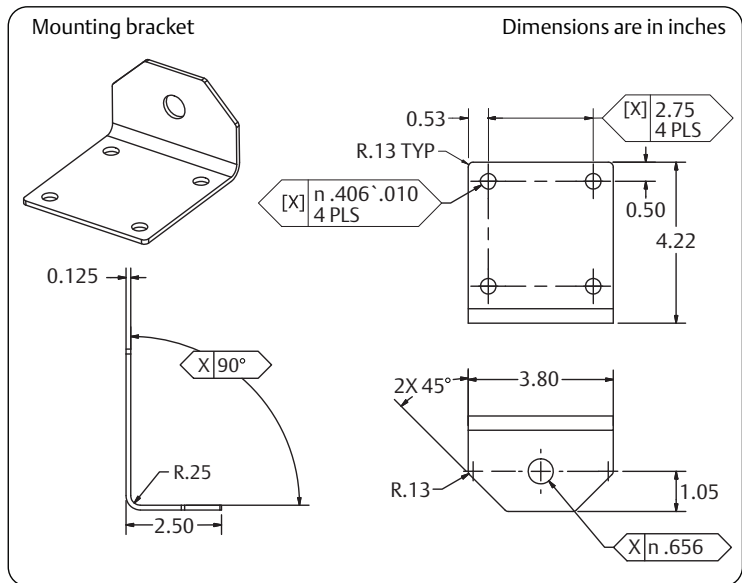
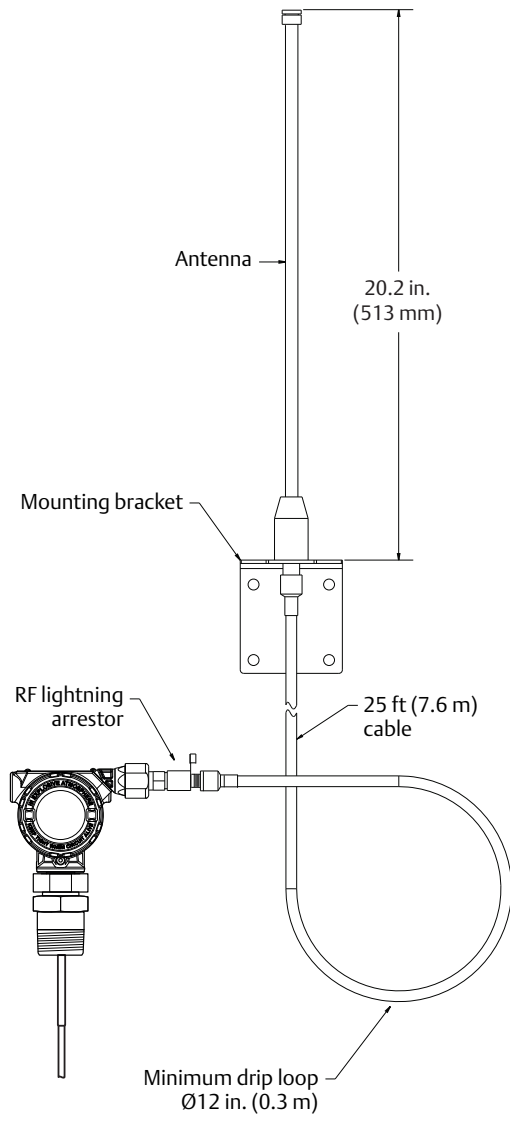
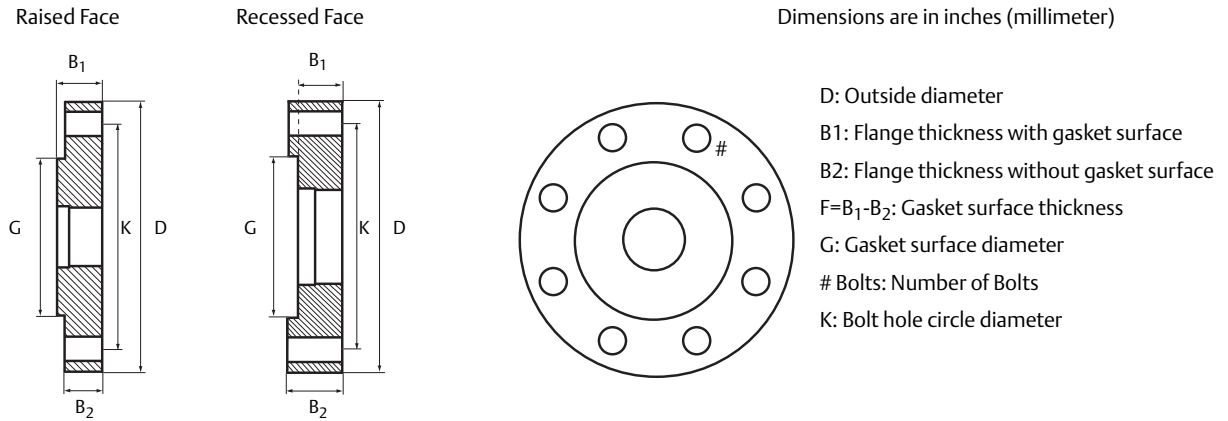


Figure 3. High Gain, Remote Antenna (option code WN)



Proprietary flanges

Figure 4. Proprietary flanges



Note

Dimensions may be used to aid in the identification of installed flanges. It is not intended for manufacturing use.

Table 12. Dimensions of proprietary flanges

Special Flanges ⁽¹⁾	D	B ₁	B ₂	F	G	# Bolts	K
Fisher 249B/259B ⁽²⁾	9.00 (228.6)	1.50 (38.2)	1.25 (31.8)	0.25 (6.4)	5.23 (132.8)	8	7.25 (184.2)
Fisher 249C ⁽³⁾	5.69 (144.5)	0.94 (23.8)	1.13 (28.6)	-0.19 (-4.8)	3.37 (85.7)	8	4.75 (120.65)
Masoneilan ⁽²⁾	7.51 (191.0)	1.54 (39.0)	1.30 (33.0)	0.24 (6.0)	4.02 (102.0)	8	5.87 (149.0)

(1) These flanges are also available in a vented version.

(2) Flange with raised face.

(3) Flange with recessed face.

**Complementary point level monitoring**

An ideal complement to the 3308, the Rosemount 2160 wireless vibrating fork liquid level switch provides reliable high/low level alarms and overflow protection, wirelessly communicating output and advanced instrument health.

With an update rate of up to one second, the 2160 may be used in both monitoring and control applications.

See the Rosemount 2160 Product Data Sheet (Document No. 00813-0100-4160) for more information.

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