

# Rosemount™ 5600 Series

## Superior Performance 4-Wire Non-Contacting Radar Level Transmitter



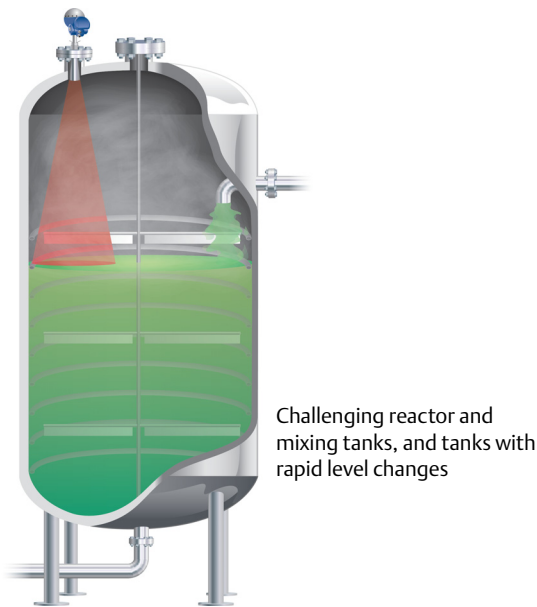
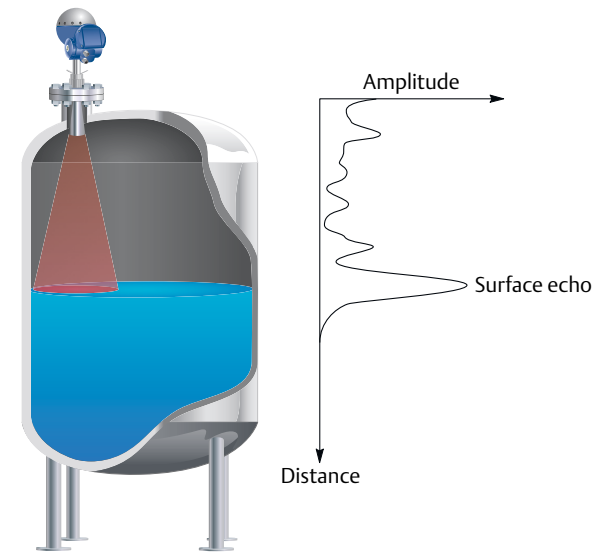
- Best performance and uptime provided by market leading sensitivity
- Unique signal processing allows for challenging process conditions
- Extremely reliable and accurate level transmitter due to its high repeatability
- Easy connection with adjustable power supply, 24-240 Vac/dc, 0-60 Hz
- Easy configuration and setup with intelligent software support
- High application flexibility with an extensive selection of antennas and materials
- Minimized maintenance costs with no contact and no moving parts; no re-calibration required
- Interchangeable transmitter heads and antennas

# Superior performance when applications get tough

## Measurement principle

The level of the product in the tank is measured by radar signals transmitted from the antenna at the tank top. After the radar signal is reflected by the product surface, the echo is picked up by the antenna. As the signal is varying in frequency, the echo has a slightly different frequency compared to the signal transmitted at that moment. The difference in frequency is proportional to the distance to the product surface, and level can be accurately calculated. This method is called Frequency Modulated Continuous Wave (FMCW).

Applications with turbulence, foam, long measuring ranges, disturbing objects, or low dielectric constants can reduce the energy reflecting back and, in worst case, eliminate it completely with the result that no surface can be detected. The reflection intensity can, however, be improved by using a highly sensitive radar, the optimal antenna type, and as large an antenna as possible.



## Radar technology benefits

- Direct level measurement means that virtually no compensation is needed for changing process conditions (such as density, conductivity, temperature, pressure, viscosity, pH, dielectric etc.), which results in high application flexibility.
- Accurate and reliable measurement that requires no re-calibration means improved uptime.
- The non-contacting radar transmitter with no moving parts requires minimized maintenance.
- Good for dirty, coating, crystallizing, and corrosive applications.
- Top-down measurement means simple installation with no empty tank requirements and minimized risk for leakages.

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## Special Rosemount 5600 features

### For the most challenging applications

- Four-wire transmitters with maximum sensitivity and performance
- Suitable for solids, liquids, and slurries with rapid level changes and challenging process conditions
- Manages high pressures and temperature
- Handles long measuring ranges
- Provides application flexibility with a wide selection of materials, process connections, antenna styles, and accessories

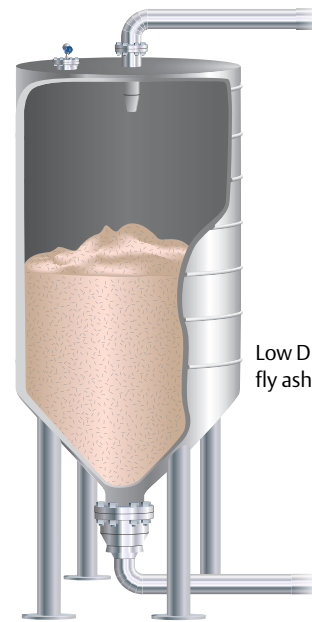
### Best performance and uptime

- The power of four wires provides the highest sensitivity and the ability to detect weak radar echoes in challenging process environments.
- Smart EchoLogic with registration of disturbance echoes provides the ability to handle weak echoes reliably and identifies the true echo from the clutter.
- Ability to handle disturbing factors, longer measuring ranges, and lower dielectrics
- Greater measurement reliability margins result in less downtime, higher safety, and better quality.

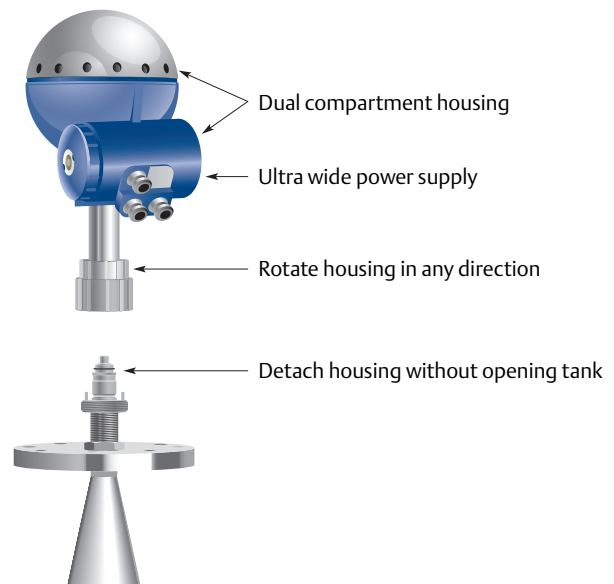
### Robust design reduces costs and increases safety

- The detachable transmitter head allows the tank to remain sealed.
- The dual compartment housing separates cable connections and electronics, which provides safer handling and improved moisture protection.
- Adjustable power supply, 24-240 Vac/dc, 0-60 Hz
- Interchangeable transmitter heads and antennas
- Allows for easy replacement by standard tank connections.

Full range of antenna styles

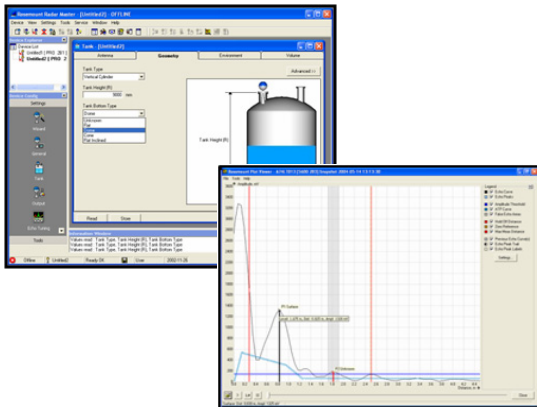


Low DK solids including lime, cement, fly ash, corn, and many more





The Wireless THUM Adapter enables level communication for additional level information and diagnostics



The Rosemount Radar Master enables easy configuration and service with a user-friendly interface including wizards, echo curve with movie feature, offline/online configuration, extensive online help, logging capabilities, and much more.

### Easy installation and plant integration

- Seamless system integration with HART®, Modbus®, or IEC 62591 (*WirelessHART®*) with the Wireless THUM™ Adapter
- Secondary analog 4-20 mA output
- MultiVariable™ output includes the choice of level, distance, volume, and signal strength.
- Pre-configured or easy, user-friendly configuration in Rosemount™ Radar Master with a five-step wizard, auto connect, and online help
- Any DD-compatible configuration tool such as AMS Device Manager, or Field Communicator can be used.

### Minimized maintenance reduces cost

- Non-contacting, no mechanical moving parts that require maintenance
- No re-calibration or compensation needed due to changing process conditions
- The user-friendly software provides easy online troubleshooting with the echo curve tool, registration of disturbance echoes, and logging.
- Predictive maintenance with advanced diagnostics and Plantweb™ alerts
- Adjustments without opening the tank

## Ordering Information



The Rosemount 5601 Radar Level Transmitter is a reliable four-wire radar level transmitter designed for outstanding performance in a wide range of applications and process conditions. Product features include:

- Extensive selection of antennas and materials
- HART 4-20 mA, Modbus, or IEC 62591 (*WirelessHART*) with the Wireless THUM Adapter

### Additional information

Specifications: [page 14](#)

Product Certifications: [page 27](#)

Dimensional Drawings: [page 31](#)

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

See [page 23](#) for more information on material selections.

**Table 1. Rosemount 5601 Radar Level Transmitter 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	
5601	Radar Level Transmitter for Process Applications	★
<b>Frequency band</b>		
U	US market only (10 GHz)	★
S	Switzerland market only (10 GHz)	★
A	All other markets (10 GHz)	★
<b>Product certifications</b>		
NA	None	★
E1	CENELEC/ATEX Flameproof	★
E5	FM Explosion-proof	★
E6	CSA Explosion-proof	★
E7	IECEX Flameproof	★
EM	Technical Regulations Customs Union (EAC) Flameproof (consult factory for details)	
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety (consult factory for details)	
<b>Power supply</b>		
P	24-240 Vdc/ac 0-60 Hz	★
<b>Primary output</b>		
5A	4-20 mA with HART communication, Passive Output (HART Revision 5)	★
5B	4-20 mA with HART communication, Passive Output, Intrinsically Safe Circuit (HART Revision 5) <sup>(1)</sup>	★
5C	4-20 mA with HART communication, Active Output (HART Revision 5)	★
5D	4-20 mA with HART communication, Active Output, Intrinsically Safe Circuit (HART Revision 5) <sup>(1)</sup>	★
8A	RS 485 Protocol - Modbus	★

**Table 1. Rosemount 5601 Radar Level Transmitter 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.

<b>Secondary output<sup>(2)(3)</sup></b>		
0	None	★
1	4-20 mA, Passive Output <sup>(4)</sup>	★
2	4-20 mA, Passive Output, Intrinsically Safe Circuit <sup>(1)(4)</sup>	★
3	4-20 mA, Active Output	★
4	4-20 mA, Active Output, Intrinsically Safe Circuit <sup>(1)</sup>	★
<b>Display unit</b>		
N	None	★
<b>Volume calculation</b>		
E	Basic Volume Equations (Standard)	★
V	Strapping Table, up to 100 points	★
<b>Typical model number: 5601 S E1 P 5A 0 N E Antenna Selection<sup>(5)</sup></b>		

1. Intrinsically safe circuit only applicable if product certificate codes E1, E5, E6, or E7 is selected.
2. Secondary output codes are not available in a combination of E6 CSA and Primary Output codes 5A, 5B, 5C, or 5D.
3. Secondary output codes 1, 2, 3, and 4 require an isolator when used in combination 8A.
4. Not available in combination with Primary Output codes 5A, 5B, 5C, or 5D.
5. Select the antenna type and options using [Table 2](#), [Table 3](#), [Table 4](#), [Table 5](#), [Table 6](#), and [Table 7](#).

**Table 2. Cone Antenna 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.

Antenna type	Antenna size	Antenna material	Note	
23S	3-in. (76.1 mm) (DN80) nozzles	SST 316L	Pipe installation only	★
24S	4-in. (101.6 mm) (DN100) nozzles	SST 316L	Free propagation or 4" pipe	★
26S	6-in. (152.3 mm) (DN150) nozzles	SST 316L	Free propagation or 6" pipe	★
28S	8-in. (203.2 mm) (DN200) nozzles	SST 316L	Free propagation only	★
2AS	10-in. (254 mm) (DN250) nozzles	SST 316L	Free propagation only	
23H	3-in. (76.1 mm) (DN80) nozzles	Alloy C22	Longer lead-time, consult factory	
24H	4-in. (101.6 mm) (DN100) nozzles	Alloy C22	Longer lead-time, consult factory	
26H	6-in. (152.3 mm) (DN150) nozzles	Alloy C22	Longer lead-time, consult factory	
28H	8-in. (203.2 mm) (DN200) nozzles	Alloy C22	Longer lead-time, consult factory	
23T	3-in. (76.1 mm) (DN80) nozzles	Titanium Gr 1/2	Longer lead-time, consult factory	
24T	4-in. (101.6 mm) (DN100) nozzles	Titanium Gr 1/2	Longer lead-time, consult factory	
26T	6-in. (152.3 mm) (DN150) nozzles	Titanium Gr 1/2	Longer lead-time, consult factory	
28T	8-in. (203.2 mm) (DN200) nozzles	Titanium Gr 1/2	Longer lead-time, consult factory	
23M	3-in. (76.1 mm) (DN80) nozzles	Alloy 400	Longer lead-time, consult factory	
24M	4-in. (101.6 mm) (DN100) nozzles	Alloy 400	Longer lead-time, consult factory	
26M	6-in. (152.3 mm) (DN150) nozzles	Alloy 400	Longer lead-time, consult factory	
28M	8-in. (203.2 mm) (DN200) nozzles	Alloy 400	Longer lead-time, consult factory	
26Z	Customer specific cone or material		Consult factory	
<b>Tank seal</b>				
P	PTFE			★
Q	Quartz			★
<b>O-ring material</b>			<b>Tank seal</b>	
V	Viton® Fluoroelastomer		P, Q	★
K	Kalrez® 6375 Perfluoroelastomer		P, Q	★
E	Ethylene Propylene (EPDM)		P	★
B	Nitrile Butadiene (NBR)		P	★
<b>Process connection</b>			<b>Note</b>	
NR	Antenna with Plate Design		Customer supplied flange. See <a href="#">Table 10 on page Wireless-13</a> for flange options.	★
XX	Special Process Connection			
	<b>Tri-clamp connection</b>	<b>Flange material</b>	<b>Note</b>	
BT	3-in. (76.1 mm) tri-clamp flange	SST 316L	Longer lead-time, consult factory	

**Table 2. Cone Antenna 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.

CT	4-in. tri-clamp flange	SST 316L	Longer lead-time, consult factory	
DT	6-in. tri-clamp flange	SST 316L	Longer lead-time, consult factory	
ET	8-in. tri-clamp flange	SST 316L	Longer lead-time, consult factory	
<b>Options</b>				
Q8	Material Traceability Certification per EN 10204 3.1			★
<b>Typical model number: Selected code from Table 1 on page Wireless-5 24S P V NR</b>				

**Table 3. Extended Cone Antenna 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.

Antenna type	Antenna size	Antenna material	Note	
73S	3-in. (76.1 mm) (DN80) nozzles	SST 316L	Standard length 20 in. (500 mm)	
74S	4-in. (101.6 mm) (DN100) nozzles	SST 316L	Standard length 20 in. (500 mm)	
76S	6-in. (152.3 mm) (DN150) nozzles	SST 316L	Standard length 20 in. (500 mm)	
7XX	Customer-specific extended cone or material		Consult factory	
<b>Tank seal</b>				
P	PTFE			
Q	Quartz			
<b>O-ring material</b>			<b>Tank seal</b>	
V	Viton Fluoroelastomer		P, Q	
K	Kalrez 6375 Perfluoroelastomer		P, Q	
E	Ethylene Propylene (EPDM)		P	
B	Nitrile Butadiene (NBR)		P	
<b>Process connection</b>			<b>Note</b>	
NR	Antenna with plate design		Customer supplied flange. See Table 10 on page Wireless-13 for flange options.	
XX	Special process connection		Consult factory	
<b>Options</b>				
Q8	Material Traceability Certification per EN 10204 3.1			★
<b>Typical model number: Selected code from Table 1 on page Wireless-5 76S P V NR</b>				



**Table 4. Cone Antenna with Integrated Flushing Connection 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.

Antenna type	Antenna size	Antenna material	Note	
94S	4-in. (101.6 mm) (DN100) nozzles	SST 316L	Consult factory	
96S	6-in. (152.3 mm) (DN150) nozzles	SST 316L	Consult factory	
98S	8-in. (203.2 mm) (DN200) nozzles	SST 316L	Consult factory	
<b>Tank seal</b>				
P	PTFE			
Q	Quartz			
<b>O-ring material</b>			<b>Tank seal</b>	
V	Viton Fluoroelastomer		P, Q	
K	Kalrez 6375 Perfluoroelastomer		P, Q	
E	Ethylene Propylene (EPDM)		P	
B	Nitrile Butadiene (NBR)		P	
<b>Process connection</b>			<b>Note</b>	
XX	Special process connection		Consult factory	
	<b>Stainless steel flange welded to antenna</b>		<b>Note<sup>(1)</sup></b>	
CL	4-in. (101.6 mm) ASME Class 150		Max 101 psig at 392 °F (7 bar at 200 °C)	
DL	6-in. (152.3 mm) ASME Class 150		Max 145 psig at 392 °F (10 bar at 200 °C)	
FL	8-in. (203.2 mm) ASME Class 150		Max 145 psig at 392 °F (10 bar at 200 °C)	
JL	DN100 PN16		Max 72 psig at 392 °F (5 bar at 200 °C)	
KL	DN150 PN16		Max 87 psig at 392 °F (6 bar at 200 °C)	
LL	DN200 PN16		Max 87 psig at 392 °F (6 bar at 200 °C)	
CH	4-in. (101.6 mm) ASME Class 150, SST, higher pressure		Max 145 psig at 752 °F (10 bar at 400 °C)	
DH	6-in. (152.3 mm) ASME Class 150, SST, higher pressure		Max 145 psig at 752 °F (10 bar at 400 °C)	
FH	8-in. (203.2 mm) ASME Class 150, SST, higher pressure		Max 145 psig at 752 °F (10 bar at 400 °C)	
JH	DN100 PN 16, SST< higher pressure		Max 145 psig at 752 °F (10 bar at 400 °C)	
KH	DN150 PN 16, SST< higher pressure		Max 145 psig at 752 °F (10 bar at 400 °C)	
LH	DN200 PN 16, SST< higher pressure		Max 145 psig at 752 °F (10 bar at 400 °C)	
<b>Options</b>				
Q8	Material Traceability Certification per EN 10204 3.1			★
<b>Typical model number: Selected code from Table 1 on page Wireless-5 94S P K KL</b>				

1. Pressure and Temperature rating may be lower depending on Tank Seal selection.

**Table 5. Parabolic Antenna 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.

Antenna type	Antenna size	Antenna material	Note	
45S	Ø18 in. (440mm)	SST	Clamped with integrated inclination, low pressure version	★
46S	Ø18 in. (440mm)	SST	Welded with integrated inclination, high pressure version	★
4XX	Customer-specific	Customer-specific	Consult factory	
<b>Tank seal</b>				
P	PTFE			★
<b>O-ring material</b>				
V	Viton Fluoroelastomer			★
<b>Process connection</b>			<b>Note</b>	
NF	None, flange ready		N/A	★
XX	Special process connection		Consult factory	
<b>Options</b>				
Q8	Material Traceability Certification per EN 10204 3.1			★
PB	PTFE protective cover (PTFE bag). Not suitable for hazardous applications. <sup>(1)</sup>			
<b>Typical model number: Selected code from Table 1 on page Wireless-5 45S P V NR</b>				

1. Not suitable for use in Ex environments.

**Table 6. Process Seal Antenna 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.

Antenna type	Antenna size	Antenna material	
34S	4-in. (101.6 mm) (DN100) nozzles	PTFE	
36S	6-in. (152.3 mm) (DN150) nozzles	PTFE	
<b>Tank seal</b>			
P	PTFE		
<b>O-ring material</b>			
N	Not applicable		
<b>Process connection</b>			<b>Note</b>
NF	None, Customer to supply flange per dimensions on <a href="#">Figure 6</a> and <a href="#">Table 16</a> on page <a href="#">Wireless-33</a> .		N/A
XX	Special Process Connection		Consult factory
	<b>Stainless steel flange</b>	<b>Flange material</b>	
CA	4-in. (101.6 mm) ASME Class 150	SST 316L	
DA	6 in. (152.3 mm) ASME Class 150	SST 316L	
JA	DN100 PN16	EN 1.4404	
KA	DN150 PN16	EN 1.4404	
<b>Options</b>			
Q8	Material Traceability Certification per EN 10204 3.1		★
<b>Typical model number: Selected code from <a href="#">Table 1</a> on page <a href="#">Wireless-5</a> 34S P N JA</b>			

**Table 7. Transmitter Options Ordering Information (Multiple Selections Allowed)**

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.

Options		
<b>Material traceability certification</b>		
Q8	Material Traceability Certification per EN 10204 3.1	★
<b>Calibration data certification</b>		
Q4	Calibration Data Certificate	★
<b>Software configuration</b>		
C1	Custom Software Configuration (Configuration Data Sheet required with order, available at <a href="http://www.rosemount.com">www.rosemount.com</a> )	★
<b>Alarm limits</b>		
C4	NAMUR alarm level, high alarm	★
C8	Low alarm (standard Rosemount alarm)	★
<b>Conduit adapters</b>		
G1	½-in. NPT cable gland kit	★
G2	½-in. NPT/ M20 adapters (Set of 3)	★
<b>Conduit electrical connector<sup>(1)</sup></b>		
GE	M12, 4-pin, male connector (eurofast®)	
GM	A size Mini, 4-pin, male connector (minifast®)	
<b>Protective cover</b>		
PB	PTFE protective cover (PTFE Bag) <sup>(2)</sup>	
<b>Special procedures</b>		
U1	TÜV Overfill Protection <sup>(3)</sup>	★
P1	Hydrostatic Testing <sup>(4)</sup>	
QG	GOST Primary Verification Certificate	
<b>Engineered solutions (see page 23)</b>		
Rxxxx	Engineered solutions beyond standard model codes (consult factory for details)	

1. Not available with certain hazardous location certifications. Contact an Emerson Process Management Representative for details.
2. For Parabolic Antenna only. Not suitable for hazardous applications.
3. Requires Secondary Output Code 3 or 4 (Active Output).
4. Not available in combination with Parabolic Antenna option codes.

**Table 8. Typical Model Code Example**

5601 A E1 P 5A 0 N E 24S P V NR
ATEX approval, passive HART primary output. Basic volume calculation. Antenna is a 4-in. (101.6 mm) cone, SST with PTFE seal and Viton Fluoroelastomer O-rings. No options.

## Accessories

**Table 9. Accessories Part Numbers**

Modems		
Part number	Description	Note
03300-7004-0001	HART Modem and cables	Viator by MACTek®
03300-7004-0002	HART USB Modem and cables	Viator by MACTek
05600-5004-0001	K2 RS485 Modbus Modem	For Sensor Bus Port connection (requires PC with 9-pin Serial port)

## Cone antenna flanges

**Table 10. Non-Welded Flange Part Numbers**

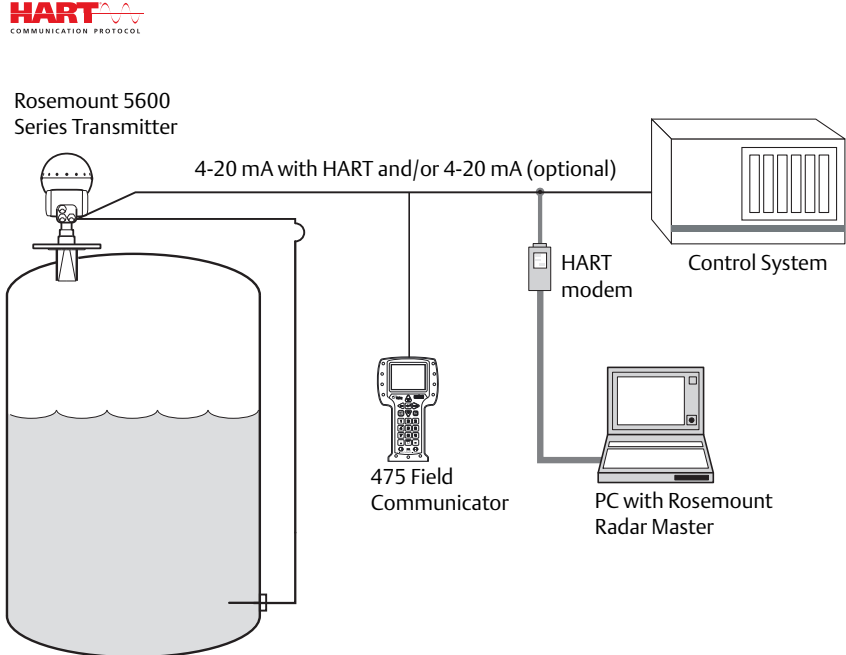

Stainless steel flanges			
Part number	Flange size	Dimension	Material
05600-1811-0211	2-in. (50.8 mm) Class 150	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>
05600-1811-0231	2-in. (50.8 mm) Class 300	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>
05600-1811-0311	3-in. (76.1 mm) Class 150	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>
05600-1811-0331	3-in. (76.1 mm) Class 300	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>
05600-1811-0411	4-in. (101.6 mm) Class 150	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>
05600-1811-0431	4-in. (101.6 mm) Class 300	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>
05600-1811-0611	6-in. (152.3 mm) Class 150	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>
05600-1811-0811	8-in. (203.2 mm) Class 150	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>
05600-1810-0231	DN50 PN40	Acc. To EN 1092-1	EN 1.4404 <sup>(2)</sup>
05600-1810-0311	DN80 PN16	Acc. To EN 1092-1	EN 1.4404 <sup>(2)</sup>
05600-1810-0331	DN80 PN40	Acc. To EN 1092-1	EN 1.4404 <sup>(2)</sup>
05600-1810-0411	DN100 PN16	Acc. To EN 1092-1	EN 1.4404 <sup>(2)</sup>
05600-1810-0431	DN100 PN40	Acc. To EN 1092-1	EN 1.4404 <sup>(2)</sup>
05600-1810-0611	DN150 PN16	Acc. To EN 1092-1	EN 1.4404 <sup>(2)</sup>
05600-1810-0811	DN200 PN16	Acc. To EN 1092-1	EN 1.4404 <sup>(2)</sup>

1. Use gasket type Ia.
2. Gasket type according to EN 1514-1 and bolting according to EN1515-2.

# Specifications

## Functional specifications

General	
Field of Application	<p><b>Liquids, slurries, and solids</b></p> <ul style="list-style-type: none"> <li>■ Process vessels with agitators</li> <li>■ Still-pipe or bridle-pipe mounting</li> <li>■ Small nozzle openings on tanks with short measuring range</li> <li>■ Various types of solid materials</li> </ul>
Measurement Principle	10 GHz Frequency Modulated Continuous Wave (FMCW) radar (see <a href="#">“Measurement principle” on page 2</a> for details).
Microwave Output Power	Max 1.0 mW
Power Consumption	Maximum 10 W, Nominal 5 W
Beam Angle	See <a href="#">Table 14 on page Wireless-22</a> .
Internal Calibration	Internal digital reference for automatic compensation of radar sweep
Signal Processing	Powerful and advanced digital signal processing using Fast Fourier Transform (FFT) and advanced echo handling software.
External Power Supply	<p>Ultra wide 24-240 Vac or dc 0-60 Hz</p> <p>The transmitter head has two separate junction boxes. One is for a Non-Intrinsically Safe (Non-IS) primary signal output and power supply cables. The other is normally used for Intrinsically Safe (IS) HART/analog outputs, or optionally, for a non-IS secondary analog output.</p> <p>Primary Output is HART, either IS or Non-IS. The HART and secondary analog outputs can be either active or passive.</p> <p><b>Note</b> The minimum power required at the transmitter power terminals is 20 V.</p>
Outputs	<p><b>Primary output</b></p> <p>Alternative 1: HART + 4-20 mA current loop (non-IS or IS option)</p> <p>Alternative 2: RS-485 with Modbus communication</p> <p><b>Secondary outputs</b></p> <p>Analog 4-20 mA current loop, active (with power supplied by the Rosemount 5600) or passive (for loop-supplied power) (Optional - see <a href="#">page 6</a>)</p>
Temperature Measurement (optional)	1-3 spot elements, PT100 or Cu90, or 6 spot elements with common return. Input accuracy $\pm 0.9$ °F ( $\pm 0.5$ °C). Average temperature or individual spots as output.

4-20 mA HART and secondary outputs (optional) (output option code 5A - 5D) - (see "Primary output " in Table 1 on page 5)	
Output	<p>HART Revision 5, analog 4-20 mA current loop, and Secondary 4-20 mA Output (Optional, active or passive)</p>  <p><b>HART</b> COMMUNICATION PROTOCOL</p> <p>Rosemount 5600 Series Transmitter</p> <p>4-20 mA with HART and/or 4-20 mA (optional)</p> <p>Control System</p> <p>HART modem</p> <p>475 Field Communicator</p> <p>PC with Rosemount Radar Master</p>
Wireless THUM Adapter	<p>The optional Wireless THUM Adapter can be mounted directly on the transmitter or by using a remote mounting kit. IEC 62591 (<i>WirelessHART</i>) enables access to multi-variable data and diagnostics, and adds wireless to almost any measurement point. See the <a href="#">Rosemount Wireless THUM Adapter Product Data Sheet</a> (document number 00813-0100-4075) and <a href="#">Wireless THUM Adapter for Rosemount Process Level Transmitter Applications</a> (document number 00840-0100-4026).</p> 
Galvanic Isolation	>1500 V RMS or DC
IS Electrical Parameters	See "Product certifications" on page 27.
Signal on Alarm (configurable)	Standard: Low=3.8 mA, High=22 mA or freeze, NAMUR NE43: High=22.50 mA, Rosemount: Low=3.75 mA
Output Impedance	>10 MΩ
Analog Output Characteristics (Passive or Active Out Options)	7-30 V
Load Limitations	<700 Ω (passive output with 24 V external supply) <300 Ω (active output)
Configuration	
Diagnostics	Failures: level, temperature, and volume measurement failure Warnings: empty tank, full tank, database, hardware, software, and configuration warnings Errors: database, hardware, software, and configuration warnings

Configuration Tools	<p>Emerson® Field Communicator (e.g. 375/475 Field Communicator), Rosemount Radar Master (RRM) software package (included with delivery of transmitter), Emerson AMS Device Manager or DeltaV® or any other Device Description (DD) compatible host systems. Certificates are available from all major host system vendors.</p> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>■ To communicate using RRM or AMS Device Manager, a HART modem is required. The HART modem is available as an RS232 or USB version (see <a href="#">“Accessories” on page 13</a>).</li> <li>■ The transmitter can be pre-configured by selecting option code C1 (see <a href="#">“Software configuration” on page 12</a>) and sending a complete Configuration Data Sheet (CDS). The CDS is available from <a href="http://www.rosemount.com">www.rosemount.com</a>.</li> </ul>
Output Units	<p>Level and Distance: ft, inch, m, cm, or mm  Volume: ft<sup>3</sup>, inch<sup>3</sup>, US gals, Imp gals, barrels, yd<sup>3</sup>, m<sup>3</sup>, or liters  Level Rate: ft/s, m/s  Temperature: °F, °C</p>
Output Variables	<p>Level, Distance, Volume, Level Rate, Signal Strength, Used defined, Temperature (1-6), and Average Temperature</p>
Damping	<p>0-60 s (2 s, default value)</p>



Temperature and pressure limits	
Ambient Temperature	-40 to 70 °C (-40 to 158 °F)
Process Temperature and Pressure	<p>The final rating depends on antenna, tank seal, and O-ring selection. See <a href="#">Table 11 on page Wireless-18</a> for further details.</p> <p><b>Rosemount 5600 with cone antenna and extended cone antenna<sup>(1)</sup></b></p> <p>Pressure psig (bar)</p> <p>Process Temperature °F (°C)</p> <ul style="list-style-type: none"> <li>- - - Cone, Quartz tank seal</li> <li>— Cone, PTFE tank seal</li> <li>① 145 psig at 212 °F / 10 bar at 100 °C</li> <li>② 73 psig at 392 °F / 5 bar at 200 °C</li> <li>③ -15 psig at 392 °F / -1.0 bar at 200 °C</li> <li>④ 798 psig at 752 °F / 55 bar at 400 °C</li> </ul>
	<p><b>Rosemount 5600 with cone antenna - integrated flushing connection<sup>(1)</sup></b></p> <p>Maximum 145 psig at 392 °F (10 bar at 200 °C) or up to 145 psig at 752 °F (10 bar at 400 °C). See <a href="#">Table 4 on page Wireless-9</a> for more information.</p>
	<p><b>Rosemount 5600 with parabolic antenna</b></p> <p>Pressure psig (bar)</p> <p>Process Temperature °F (°C)</p> <ul style="list-style-type: none"> <li>- - - 45S, Clamped version, low pressure</li> <li>— 46S, Welded version, high pressure</li> <li>① 145 psig at 392 °F / 10 bar at 200 °C</li> <li>② 2.9 psig at 392 °F / 0.2 bar at 200 °C</li> <li>③ -2.9 psig at 392 °F / -0.2 bar at 200 °C</li> </ul>

<p>Process Temperature and Pressure (continued)</p>	<p><b>Rosemount 5600 with process seal antenna</b></p> <p>Pressure psig (bar)</p> <p>Process Temperature °F (°C)</p> <p>--- 6" PTFE ..... 4" PTFE</p> <p>① 0 psig at 302 °F / 0 bar at 150 °C ② -15 psig at 40 °F / -1.0 bar at -40 °C ③ 29 psig at -40 °F / 2 bar at -40 °C ④ 73 psig at -40 °F / 5 bar at -40 °C</p>
<p>ASME / ANSI Flange Rating</p>	<p>According to ASME B16.5</p>
<p>EN Flange Rating</p>	<p>According to EN 1092-1</p>
<p>Temperature Rating Considerations</p>	<p>O-rings</p> <p>Flange Temperature measured here</p> <p>Process Temperature measured here</p> <p><b>Note</b> Flange temperature depends on mounting conditions, such as nozzle position, distance to maximum product level, nozzle height, presence of insulation, etc.</p>

1. Pressure rating may be lower depending on flange selection. Minimum / maximum flange temperature rating depends on O-ring selection. For further information, see [Table 11 on page Wireless-18](#).

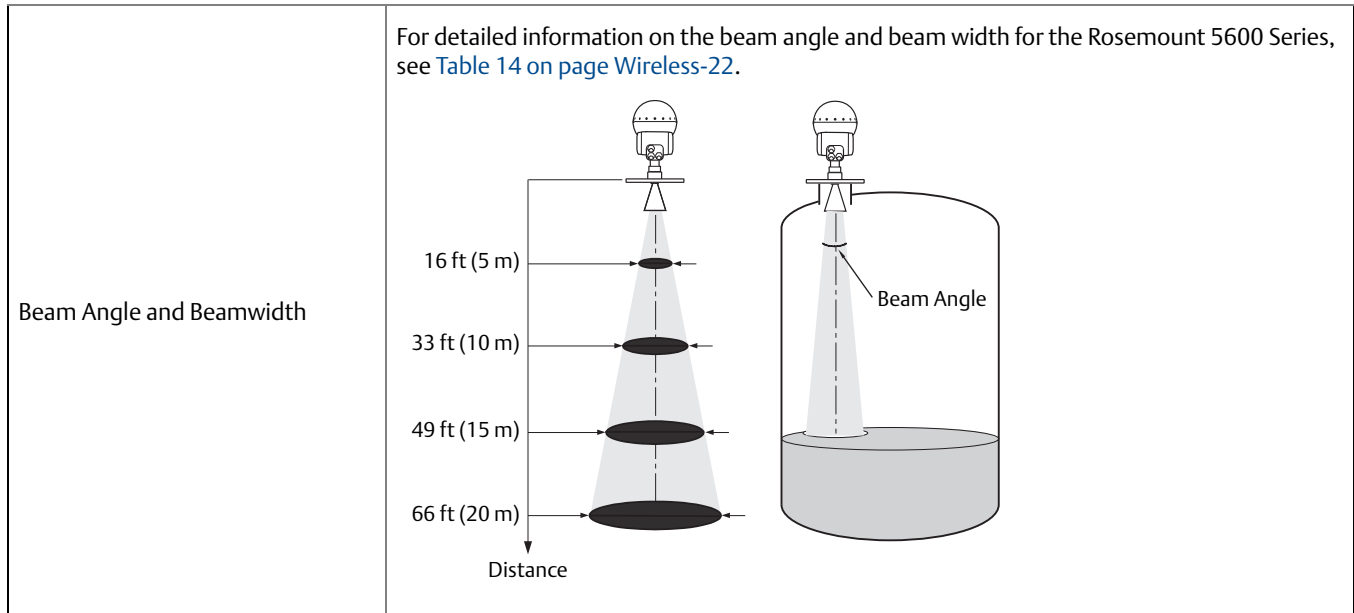
**Table 11. Flange Temperature Range Depending on O-ring Selection**

O-ring material	Minimum temperature °F (°C) in air	Maximum temperature F (°C) in air
Viton Fluoroelastomer	5 (-15)	392 (200) <sup>(1)</sup>
Kalrez 6375 Perfluoroelastomer	-4 (-20)	392 (200) <sup>(1)</sup>
Ethylene Propylene (EPDM)	-40 (-40)	266 (130)
Nitrile butadiene (NBR)	-31 (-35)	230 (110)

1. For Quartz seal maximum process temperature is 752 °F (400 °C), provided that the O-rings do not exceed the temperature listed in [Table 11](#) above. O-rings are not pressure retaining in this configuration.

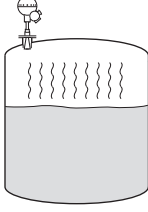
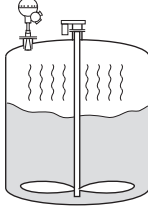
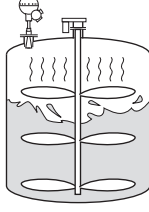
## Performance specifications

General	
Reference Conditions	Metal plate with no disturbing objects Temperature: 68 °F (20 °C) Pressure: 14 - 15 psi (960 - 1060 mbar) Humidity: 25 - 75% RH Reference Measuring Range: 1.64 - 98 ft. (0.5 - 30 m)
Instrument Accuracy (under reference conditions)	±0.2 in. (±5 mm)
Repeatability	±0.04 in. (±1 mm)
Resolution	0.04 in. (1 mm)
Ambient Temperature Effect	±500 ppm of measured distance within the ambient temperature range
Update Interval	100 ms
Linearity	±0.01%
Analog Out Temperature Drift	±28 ppm/°F (±50 ppm/°C)
Analog Out Accuracy	±300 µA at 4 mA ±600 µA at 20 mA
Analog Out Resolution	0.5 µA (0.003%)
Measuring range	
Measuring Range and Minimum Dielectric Constant	<p>0-164 ft. (0-50 m) Standard 0-324 ft. (0-99 m) Optional, requires special configuration</p> <p>The measuring range depends on:</p> <ul style="list-style-type: none"> <li>■ antenna type</li> <li>■ the dielectric constant of the liquid (<math>\epsilon_r</math>) (min. <math>\epsilon_r=1.4</math>)</li> <li>■ process conditions</li> </ul> <p>See <a href="#">Table 12 on page Wireless-21</a> and <a href="#">Table 13 on page Wireless-22</a> for measuring range and minimum dielectric constant values. For more information, ask your local Emerson Process Management representative.</p> <p>For liquids with <math>\epsilon_r</math> that are smaller than 1.8 such as liquefied gases, an 8-in. (203.2 mm) or bigger diameter antenna is recommended if measurement is done with free propagation. In this case, the measuring range in calm surface tanks is 50 ft (15 m).</p> <p>The Rosemount 5600 transmitter installed in a pipe can measure products with a dielectric <math>\geq 1.4</math>.</p>



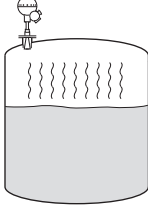
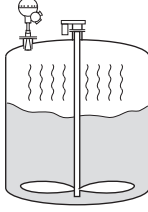
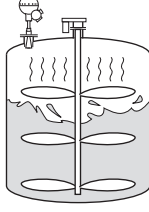
Environment	
Vibration Resistance	IEC 721-3-4 class 4M4
Electromagnetic Compatibility	Emission and Immunity: EMC directive 204/108/EC. EN 61326-1:2006. Immunity 50081-2. Emission 50081-1.
EU Directive Compliance	Complies with 93/98/EEC
Transient / Built-in Lightning Protection	EN61326, EN61000-4-5, IEC801-5, level 2 kV
Humidity	IEC 60068-2-3
Radio Approvals	FCC: Part 15C (K8CPRO & K8CPROX: Note: This device must be professionally installed and is only authorized for use on sealed metal links)  R&TTE: ETSI EN 302 372 (Note: This device must be installed at a permanent fixed position at a closed (not open) metallic tank or reinforced concrete tank, or similar enclosure structure made of comparable attenuating material)  IC: RSS210-5 (2827A- 5600PRO)
Climatic Class/Corrosion Class	IEC 68-2-1, IEC 60068-2-52 test KB severity 2
UV Protection	ISO 4892-2
Power Supply Fluctuation	IEC 92 Part 504 sec. 3.5

**Table 12. Rosemount 5600, Recommended Measuring Range for Optimum Performance, ft (m)**

									
	<b>Dielectric constant<sup>(1)</sup></b>								
	<b>A</b>	<b>B</b>	<b>C</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>A</b>	<b>B</b>	<b>C</b>
3-in. (76.1 mm) cone	41 (12.5)	57 (17.5)	69 (21)	20 (6)	30 (9)	34 (10.5)	8 (2.5)	8 (2.5)	11 (3.5)
4-in. (101.6 mm) process seal	36 (11)	38 (11.5)	49 (15)	23 (7)	30 (9)	33 (10)	3 (1) <sup>(2)</sup>	7 (2) <sup>(2)</sup>	11 (3.5) <sup>(2)</sup>
6-in. (152.3 mm) process seal	49 (15)	56 (17)	57 (17.5)	30 (9)	36 (11)	39 (12)	5 (1.5) <sup>(2)</sup>	10 (3) <sup>(2)</sup>	20 (6) <sup>(2)</sup>
4-in. (101.6 mm) cone	66 (20)	72 (22)	82 (25)	43 (13)	49 (15)	56 (17)	7 (2) <sup>(2)</sup>	16 (5) <sup>(2)</sup>	25 (7.5) <sup>(2)</sup>
6-in. (152.3 mm) cone	82 (25)	95 (29)	107 (32.5)	49 (15)	62 (19)	69 (21)	15 (4.5) <sup>(2)</sup>	21 (6.5) <sup>(2)</sup>	33 (10) <sup>(2)</sup>
8-in. (203.2 mm) cone	99 (30)	131 (40)	131 (40)	72 (22)	82 (25)	95 (29)	21 (6.5)	36 (11)	44 (14)
Parabolic	115 (35)	164 (50)	164 (50)	80 (24.5)	97 (29.5)	113 (34.5)	33 (10)	56 (17)	66 (20)
3-6-in. cone in still-pipe	N/A	N/A	N/A	N/A	N/A	N/A	99 (30)	99 (30)	99 (30)

1. A. Oil, gasoline and other hydrocarbons, petrochemicals (dielectric constant,  $\epsilon_r=1.9-4.0$ ), in pipes ( $\epsilon_r>1.4$ )  
 B. Alcohols, concentrated acids, organic solvents, oil/water mixtures, and acetone ( $\epsilon_r=4.0-10$ )  
 C. Conductive liquids, e.g. water based solutions, dilute acids, and alkalis ( $\epsilon_r > 10$ )
2. Not recommended.

**Table 13. Rosemount 5600, Maximum Recommended Measuring Range, ft (m)**

									
	<b>Dielectric constant<sup>(1)</sup></b>								
	<b>A</b>	<b>B</b>	<b>C</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>A</b>	<b>B</b>	<b>C</b>
3-in. (76.1 mm) cone	52 (16)	72 (22)	92 (28)	30 (9)	39 (12)	52 (16)	16 (5)	20 (6)	21 (6.5)
4-in. (101.6 mm) process seal	49 (15)	51 (15.5)	59 (18)	31 (9.5)	34 (10.5)	41 (12.5)	8 (2.5) <sup>(2)</sup>	11 (3.5) <sup>(2)</sup>	20 (6) <sup>(2)</sup>
6-in. (152.3 mm) process seal	59 (18)	67 (20.5)	80 (24.5)	36 (11)	41 (12.5)	54 (16.5)	10 (3) <sup>(2)</sup>	20 (6) <sup>(2)</sup>	23 (7) <sup>(2)</sup>
4-in. (101.6 mm) cone	82 (25)	89 (27)	98 (30)	52 (16)	59 (18)	71 (21.5)	10 (3)	21 (6.5)	33 (10)
6-in. (152.3 mm) cone	98 (30)	112 (34)	131 (40)	66 (20)	80 (24.5)	92 (28)	21 (6.5)	33 (10)	43 (13)
8-in. (203.2 mm) cone	115 (35)	148 (45)	164 (50)	85 (26)	95 (29)	107 (32.5)	26 (8)	46 (14)	52 (16)
Parabolic	131 (40)	164 (50)	164 (50)	98 (30)	115 (35)	131 (40)	46 (14)	82 (25)	98 (30)
3-6-in. cone in still-pipe	N/A	N/A	N/A	N/A	N/A	N/A	164 (50)	164 (50)	164 (50)

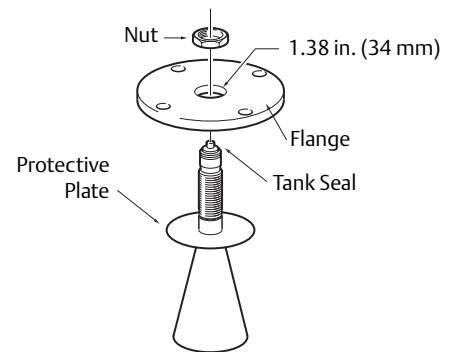
- A. Oil, gasoline and other hydrocarbons, petrochemicals (dielectric constant,  $\epsilon_r=1.9-4.0$ ), in pipes ( $\epsilon_r>1.4$ )
  - B. Alcohols, concentrated acids, organic solvents, oil/water mixtures, and acetone ( $\epsilon_r=4.0-10$ )
  - C. Conductive liquids, e.g. water based solutions, dilute acids, and alkalis ( $\epsilon_r > 10$ )
2. Not recommended.

**Table 14. Rosemount 5600 Beam Diameter and Angle**

<b>Antenna type &amp; beam angle</b>	<b>Distance, ft (m)</b>			
	<b>16 (5)</b>	<b>33 (10)</b>	<b>49 (15)</b>	<b>66 (20)</b>
	<b>Beam diameter, ft (m)</b>			
Cone 3 in. (76.1 mm) 25°	7.2 (2.2)	14 (4.4)	22 (6.7)	29 (8.9)
Cone 4 in. (101.6 mm)/process seal 4 in. 21°	6.2 (1.9)	12 (3.7)	18 (5.6)	24 (7.4)
Cone 6 in. (152.3 mm)/process seal 6 in. 18°	5.2 (1.6)	10 (3.1)	15 (4.7)	21 (6.3)
Cone 8 in. (203.2 mm) 15°	4.3 (1.3)	8.5 (2.6)	13 (3.9)	17 (5.3)
Parabolic 10°	3.0 (0.9)	5.6 (1.7)	8.5 (2.6)	11 (3.5)

## Physical specifications

Material selection	
Material Selection	Emerson provides a variety of Rosemount product with various product options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The Rosemount 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 Process Management 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.
Housing and enclosure	
Type	Two separate junction boxes that separate electronics from cabling. The transmitter housing can be rotated in any direction, and has interchangeable electronics without opening the tank.
Electrical Connections	3 X ½-in. NPT; for cable glands or conduit entries Optional: ½-in. NPT Cable Gland Kit, ½-in. NPT/M20 Adapters (Set of 3) The recommended output cabling is a 4-wire, twisted and shielded instrument cable, min. 0.5 mm <sup>2</sup> (AWG 20).
Housing Material	Permanent moulded cast aluminum, chromed and powder painted
Ingress Protection	IP66, IP 67, and NEMA 4
Factory Sealed	See CSA Approvals information on <a href="#">page 28</a> .
Weight	Transmitter Head (TH): 19.8 lb (9.0 kg)
Engineered solutions	
Rxxxx	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 R-labeled numeric option code that should be added at the end of the standard model string. See example model string below.  Example Model String: 5601-A-E1-P-5A-0-N-E-24S-P-V-NR- <b>R1234</b>
Tank connection and antennas	
Tank Connection	<p>The tank connection consists of a tank seal and a flange.</p> <p>Cone antennas, except for the Cone antennas with Integrated Flushing Connection, are designed with a protective plate. The plate and antenna (SST or optional material) together with the tank seal (PTFE or Quartz) and o-rings are the wetted parts exposed to the tank atmosphere. This allows the use of an existing flange, or a lower cost flange alternative.</p> <p>Loose flanges are also available (see <a href="#">Table 10 on page Wireless-13</a>).</p>



Flange Dimensions	Follow ASME, EN standard Material: Stainless steel 316L and Stainless Steel EN 1.4404
Antennas	<p>Cone, Parabolic, and Process Seal antennas. Extended Cone Antennas are available in SST 316L. Cone Antennas are available with flushing connections (½-in. (12.7 mm) NPT).</p> <p><b>Cone antenna</b></p> <ul style="list-style-type: none"> <li>■ Suitable for free-propagation and pipe-mounted installation</li> <li>■ Cone extensions are available (see <a href="#">Table 3 on page Wireless-8</a>)</li> <li>■ Optional Cone antennas with cleaning/flushing connection are available (see <a href="#">Table 4 on page Wireless-9</a>)</li> </ul> <p><b>Parabolic antenna</b></p> <ul style="list-style-type: none"> <li>■ Suitable for solid materials (for example, cement)</li> <li>■ Withstand heavy contamination</li> <li>■ Can be equipped with a PTFE protective cover to reduce the effects of dusty environments</li> </ul> <p><b>Process seal antenna</b></p> <ul style="list-style-type: none"> <li>■ The dish of the Process Seal is made of PTFE</li> <li>■ Only exposes material suitable for hygienic or corrosive applications (see <a href="#">Figure 5 on page 33</a> and <a href="#">Table 6 on page Wireless-11</a>)</li> </ul>
Antenna Dimensions	<p>Cone Antenna: See <a href="#">Figure 1 on page 31</a>            Extended Cone Antenna: See <a href="#">Figure 2 on page 31</a>            Cone Antenna with Integrated Flushing Connection: See <a href="#">Figure 3 on page 32</a>            Parabolic Antenna: See <a href="#">Figure 4 on page 32</a>            Process Seal Antenna: See <a href="#">Figure 5 on page 33</a> and <a href="#">Table 16 on page Wireless-33</a></p>
Antenna Weight	<p>3-in. Cone Antenna: 2.20 lb. (1.0 kg)            4-in. Cone Antenna: 3.31 lb. (1.5 kg)            6-in. Cone Antenna: 4.41 lb. (2.0 kg)            8-in. Cone Antenna: 6.61 lb. (3.0 kg)            Parabolic Antenna: 17.6 lb. (8.0 kg)            4-in. Process Seal Antenna: 4.41 lb. (2.0 kg)            6-in. Process Seal Antenna: 5.51 lb. (2.5 kg)</p>
Material Exposed to Tank Atmosphere	<p><b>Cone antenna (PTFE sealing)</b></p> <ul style="list-style-type: none"> <li>■ Antenna: 316L SST (EN1.4404) or Alloy C-22 or Alloy 400</li> <li>■ Sealing: PTFE fluoropolymer</li> <li>■ O-rings: Viton fluoroelastomer or Kalrez 6375 perfluoroelastomer or Ethylene propylene or Nitrile butadiene</li> </ul> <p><b>Cone antenna (Quartz sealing)</b></p> <ul style="list-style-type: none"> <li>■ Antenna: 316L SST (EN1.4404) or Alloy C-22 or Alloy 400</li> <li>■ Sealing: Quartz or Graphite</li> <li>■ O-rings: Viton fluoroelastomer or Kalrez 6375 perfluoroelastomer</li> </ul> <p><b>Parabolic antenna</b></p> <ul style="list-style-type: none"> <li>■ Antenna: 316L SST</li> <li>■ Sealing: FEP/PTFE fluoropolymer</li> </ul> <p><b>Process seal antenna</b></p> <ul style="list-style-type: none"> <li>■ Antenna: PTFE fluoropolymer</li> </ul>



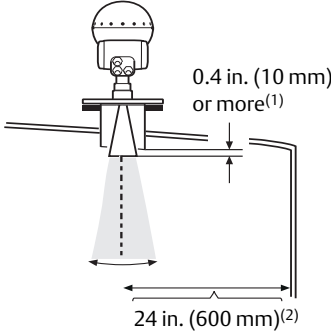
Installation and mounting considerations	
<p>Mechanical Mounting Considerations</p>	<p>The Rosemount 5600 radar transmitter is easily carried to the tank top and mounted on a suitable nozzle or pipe.</p> <p>The radar transmitter should be installed as follows:</p> <ul style="list-style-type: none"> <li>■ Antenna oriented perpendicular to a horizontal surface.</li> <li>■ The transmitter should be mounted with as few fittings as possible within the beam angle.</li> <li>■ Filling inlets creating turbulence should preferably be kept at a distance.</li> <li>■ Choose as large antenna diameter as possible. A larger diameter concentrates the radar beam and ensures maximum antenna gain. Increased antenna gain offers greater reflection of weak surface echoes.</li> </ul> <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 20px;"> <p>(1) For best measurement performance the nozzle height should be shorter than the antenna or consider an extended cone (see <a href="#">Figure 2 on page 31</a>) for your current transmitter.</p> <p>(2) Recommended minimum distance for all antennas. (Shorter distance may apply, consult factory).</p> </div> </div>
<p>Pipe/Chamber Installations</p>	<p>If used correctly, pipe or chamber measurement can be advantageous in many applications:</p> <ul style="list-style-type: none"> <li>■ Use cone antennas (3 in. (76.1 mm) to 6 in. (152.3 mm))</li> <li>■ The gap between the cone antenna and the still-pipe is limited to 0.4 in. (10 mm)</li> </ul>

Table 15. Antenna Material and O-ring Selection

	Cone antenna	Extended cone antenna	Cone with integrated flushing connection	Parabolic antenna	Process seal antenna
<b>Material</b>					
Stainless Steel 316L	•	•	•	•	-
Alloy C22	•	-	-	-	-
Titanium Gr1/Gr2	•	-	-	-	-
Tantalum	•	-	-	-	-
Alloy 400	•	-	-	-	-
PTFE	-	-	-	-	•
<b>Tank Seal</b>					
PTFE	•	•	•	•	-
Quartz	•	•	•	-	-
<b>O-Rings</b>					
Viton Fluoroelastomer	•	•	•	•	-
Kalrez 6375 Perfluoroelastomer	•	•	•	-	-
Ethylene Propylene (EPDM)	•	•	•	-	-
Nitrile butadiene (NBR)	•	•	•	-	-

- Applicable
- Not applicable

# Product certifications

Rev 1.8

## European directive information

A copy of the EC Declaration of Conformity can be found at the end of the quick start guide. The most recent revision of the EC Declaration of Conformity can be found at [EmersonProcess.com/Rosemount](http://EmersonProcess.com/Rosemount).

## Ordinary location certification

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

## Telecommunication compliance

### FCC

This device complies with Part 15C and Part 90 of the FCC Rules.

Certificate: K8CPRO complies with Part 15C  
K8CPROX complies with Part 90

### IC

This device complies with RSS210 issue 6.

Certificate: 2827A-5600PRO

### R&TTE

This device complies with ETSI EN 302 372. EU directive 99/5/EC.

## Installing equipment in North America

The US National Electrical Code® (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

## USA

### E5 Explosion-proof (XP), Dust-Ignitionproof (DIP)

Certificate: FM 18US0053X

Standards: Class 3600 - 2011; Class 3610 - 2010; Class 3615 - 2006; Class 3810 - 2005; ANSI/NEMA 250 - 1991

Markings: Explosion-proof for use in Class I, Division 1, Groups A, B, C and D, T6; Dust-Ignition-proof for use in Class II, III, Division 1, Groups E, F and G, T5; Ta= +70 °C; Type 4X

Explosion-proof for use in Class I, Division 1, Groups A, B, C and D with Intrinsically Safe Connections to Class I, Division 1, Groups A, B, C and D, T6; Dust-Ignition-proof for use in Class II, III, Division 1, Groups E, F and G, T5, Ta=+70 °C; Type 4X; in accordance with Entity requirements and system control drawing 9150074-994

### *Specific Conditions for Safe Use (X):*

1. Warning - Potential Electrostatic Charging Hazard - The enclosure is constructed from non-metallic material. To prevent the risk of electrostatic sparking the plastic surface should only be cleaned with a damp cloth.
2. Warning - The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.

## Canada

### E6 Explosion-proof (XP)

Certificate: 1346169

Standards: CSA C22.2 No 0-10 2010(R2015), CAN/CSA C22.2 No 60079-0:2015, CAN/CSA C22.2 No 60079-1:2016, CAN/CSA C22.2 No 60079-7:2016 and CAN/CSA C22.2 No 60079-11:2014, CSA C22.2 No.142-M1987

Markings: Ex db eb IIC T6 Gb, rated 24-240 Vac, 10W up to two inputs 7 - 30V, 4 - 20mA; up to two outputs 4 - 20mA, 300 Ohm max. or Digital outputs TRL2bus, Profibus DP or Foundation Fieldbus; ambient temperature range [- 40C, + 70C]; for installation refer to drawing # 9150074-937

Ex db eb [ib/ia] IIC T6 Gb, rated 24 - 240Vac, 10W; Digital outputs TRL2bus, Profibus DP or Foundation Fieldbus; ambient temperature range [- 40C, + 70C]; for installation refer to drawing # 9150074-939.

WARNING: Substitution of components may impair intrinsic safety.

WARNING: POTENTIAL ELECTROSTATIC CHARGING HAZARD.

This equipment has flame paths, which differ from those in CAN/CSA C22.2 No 60079-1 and are not intended for repair.

	Uo	Io	Po	Co	Lo
<b>Intrinsically Safe Display Output Entity parameters</b>	7.84 V	385.6 mA	0.678 W	8.8 ÷ F	0.17 mH
<b>Up to two Intrinsically Safe Outputs Entity parameters</b>	23.1 V	125.7 mA	0.726 W	0,14 ÷ F	2.2 mH


	Ui	Ii	Pi	Ci	Li
<b>Up to two Intrinsically Safe Display Input Entity parameters</b>	30 V	200 mA	1,3 W	0 nF	0 mH
	30 V	300 mA	1,3 W	0 nF	0 mH

## Europe

### E1 ATEX Flameproof

Certificate: Sira 03ATEX1294X

Standards: EN 60079-0:2012/A11:2013, EN 60079-1:2014, EN 60079-7:2015, EN 60079-11:2012, EN 60079-26:2015 & EN 60079-31:2014

Markings:  Non-IS Outputs (Primary, Secondary) II ½ GD Ex db eb IIC T6 Ga/Gb (-40°C to +70°C) Ex tb IIIC T 85°C Db IP65 IS Outputs (Primary, Secondary and Display) alt. with Non-IS Primary

Outputs

II (2) (1) ½ GD

Ex db eb [ib] [ia] IIC T6 Ga/Gb (-40 °C to +70 °C)

Ex tb IIIC T85 °C Db IP65

IS Outputs (Display) alt. with Non-IS Primary Outputs

II (1) 1/2 GD

Ex db ib [ia] IIC T6 Ga/Gb (-40 °C to +70 °C)

Ex tb IIIC T85 °C Db IP65

#### Specific Conditions for Safe Use (X):

- As light alloys may be used as the enclosure (or other parts) they may be at the accessible surface of this equipment, in the event of rare incidents, ignitions sources due to impact and friction sparks could occur. This shall be considered when the equipment is being installed in locations that specifically require Group II, Category 1G equipment.
- Under certain extreme circumstances, the non-metallic parts of the equipment may be capable of generating an ignition-capable level or electrostatic charge. Therefore, when used for applications that specifically require Group II, Category 1 equipment, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. Additionally, the equipment non-metallic parts shall only be cleaned with a damp cloth.
- This equipment has flame paths, which differ from those in EN/IEC 60079-1 and are not intended for repair.

	Uo	Io	Po	Co	Lo
<b>Output Entity parameters</b>	7.84 V	385.6 mA	0.678 W	9.3 ÷ F	239 µH

## International

### E7 IECEx Flameproof

Certificate: IECEx SIR 05.0024X

Standards: IEC 60079-0:2011, IEC 60079-1:2014, IEC 60079-7:2015, IEC 60079-11:2011, IEC 60079-26:2014 & IEC 60079-31:2013

Markings: Non-IS Outputs (Primary, Secondary)

Ex db eb IIC T6 Ga/Gb (-40 °C to +70 °C)

Ex tb IIIC T85 °C Db IP65

IS Outputs (Primary, Secondary and Display) alt. with Non-IS Primary

Outputs

Ex db eb [ib] [ia] IIC T6 Ga/Gb (-40 °C to +70 °C)

Ex tb IIIC T85 °C Db IP65

IS Outputs (Display) alt. with Non-IS Primary Outputs

Ex db eb [ia] IIC T6 Ga/Gb (-40 °C to +70 °C)

Ex tb IIIC T85 °C Db IP65

#### Specific Conditions for Safe Use (X):

- As light alloys may be used as the enclosure (or other parts) they may be at the accessible surface of this equipment, in the event of rare incidents, ignitions sources due to impact and friction sparks could occur. This shall be considered when the equipment is being installed in locations that specifically require Group II, Category 1G equipment.
- Under certain extreme circumstances, the non-metallic parts of the equipment may be capable of generating an ignition-capable level or electrostatic charge. Therefore, when used for applications that specifically require Group II, Category 1 equipment, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. Additionally, the equipment non-metallic parts shall only be cleaned with a damp cloth.
- This equipment has flame paths, which differ from those in EN/IEC 60079-1 and are not intended for repair.

	Ui	Ii	Pi	Ci	Li
Passive Analog Circuit Entity Parameters	30 V	200 mA	0 W	0 ÷ F	0 µH

	Uo	Io	Po	Co	Lo
Active Analog Circuit Entity Parameter	23.1V	125.7 mA	0.726 W	0.14 ÷ F	2.2 µH

	Uo	Io	Po	Co	Lo
Output Entity parameters	7.84 V	385.6 mA	0.678 W	9.3 ÷ F	239 µH

## Brazil

### E2 INMETRO Flameproof

Certificate: IEx 15.0021X

Standards: ABNT NBR IEC 60079-0:2013; ABNT IEC 60079-1:2009; ABNT IEC 60079-7:2008; ABNT IEC 60079-11:2013; ABNT IEC 60079-26:2008; ABNT NBR IEC 60079-31:2011

Markings: Ex de IIC T6 Ga/Gb (-40°C ≤ Tamb ≤ +70°C)

Ex de [ia Ga] IIC T6 Ga/Gb (-40°C ≤ Tamb ≤ +70°C)

Ex de [ib Gb] [ia Ga] IIC T6 Ga/Gb (-40°C ≤ Tamb ≤ +70°C)

Ex tb IIIC T85°C Db IP65

#### Specific Conditions for Safe Use (X):

- See certificate for specific conditions.

	Ui	Ii	Pi	Ci	Li
Entity parameters HART	30 V <sub>CC</sub>	130 mA	1.0 W	7.26 nF	Negligible
Entity parameters Fieldbus	30 V <sub>CC</sub>	130 mA	1.5 W	4.95 nF	Negligible

## China

### XX China Flameproof

Certificate: GYJ13.1446X

Standards: GB3836.1-2010, GB 3836.2-2010, GB 3836.3-2010, GB 3836.4-2010, GB 3836.20-2010, GB 12476.1-2000

Markings: Ex de IIC T6 Ga/Gb, Ex de [ib] [ia] IIC T6 Ga/Gb, Ex de [ia] IIC T6 Ga/Gb, DIP A21 TA 85 °C IP65

#### Specific Conditions for Safe Use (X):

- See certificate for special conditions.

## EAC

**EM** Technical Regulations Customs Union (EAC) Flameproof

Certificate: RU C-SE. GB05B.01030

Markings: Ga/Gb Ex d e IIC T6 X

Ga/Gb Ex d e [ib Gb] [ia Ga] IIC T6 X

Ga/Gb Ex D e [ia Ga] IIC T6 X

### **Specific Conditions for Safe Use (X):**

1. See certificate for special conditions.

See certificate for entity parameters.

## Republic of Korea

**XX** Flameproof

Certificate: 2011-2456-9

Markings: Ex de IIC T6 tD A20 IP65 T85 °C

Ex de [iB] [iA] IIC T6 IP65 T85 °C

Ex de [iA] IIC T6 tD A20 IP65 T85 °C

### **Specific Conditions for Safe Use (X):**

1. See certificate for special conditions.

## India

**XX** Flameproof

Certificate: P119223/1

Markings: Ex de IIC T6 Ga/Gb

Ex de [ib] ib IIC T4/T6 Ga/Gb

### **Specific Conditions for Safe Use (X):**

1. See certificate for Specific Conditions.

## Ukraine

Flameproof, Intrinsically Safe

Certificate: UA.TR.047.C.0352-13

Markings: 0 Ex ia IIC T4X

1 Ex d ia IIC T4 X

### **Specific Conditions for Safe Use (X):**

1. See certificate for special conditions.

## Additional Certifications

### TÜV Overfill Prevention

Certificate: Z 65.16-417

Application: TÜV tested and approved by DIBt for overfill prevention according to the German WHG regulations.

### Republic of Korea EMC

Certificate: KCC-REM-ERN-RMDLVMS5600PRO

## Pattern Approval

GOST Belarus

Certificate: RB-03 07 2765 10

GOST Kazakhstan

Certificate: KZ.02.02.03473-2013

GOST Russia

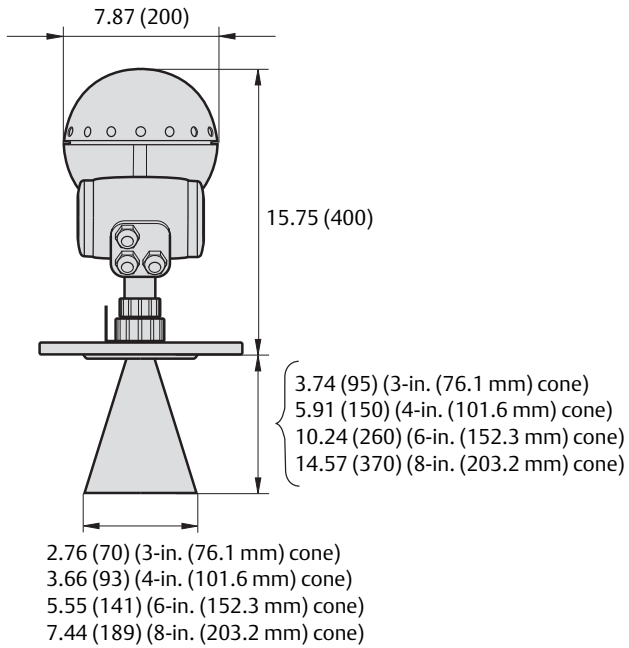
Certificate: SE.C.29.004.A

China Pattern Approval

Certificate: CPA2012-L133

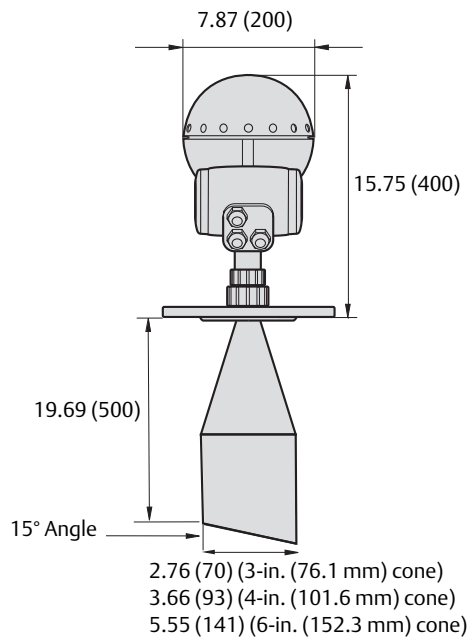
# Dimensional Drawings

**Figure 1. Cone Antenna**



Dimensions are in inches (millimeters).

**Figure 2. Extended Cone Antenna**

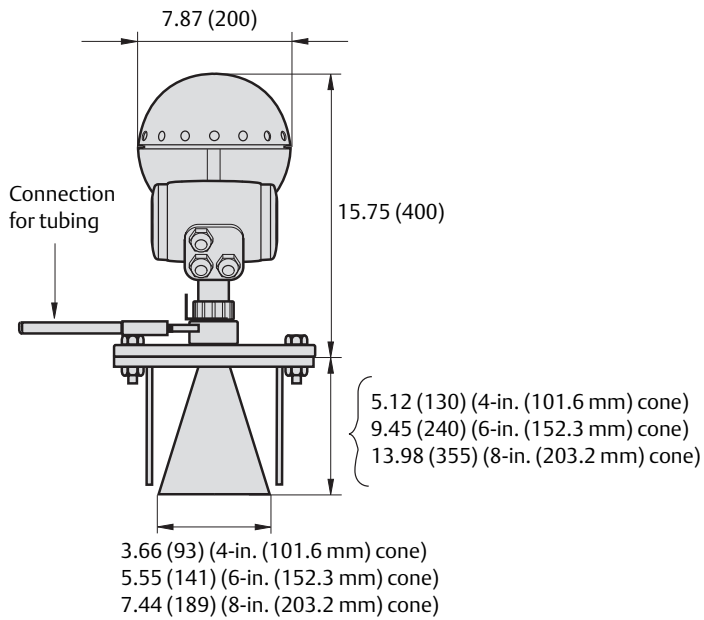


**Note**

Other extended cone lengths are also available upon request; consult factory.

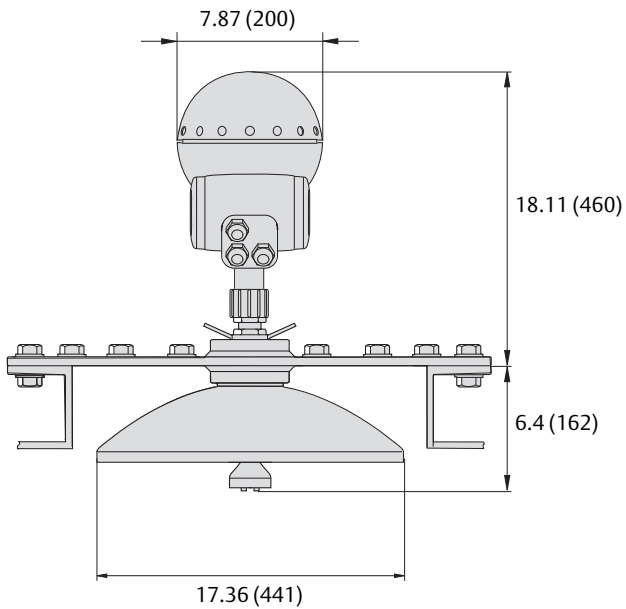
Dimensions are in inches (millimeters).

**Figure 3. Cone Antenna with Integrated Flushing Connection**



Dimensions are in inches (millimeters).

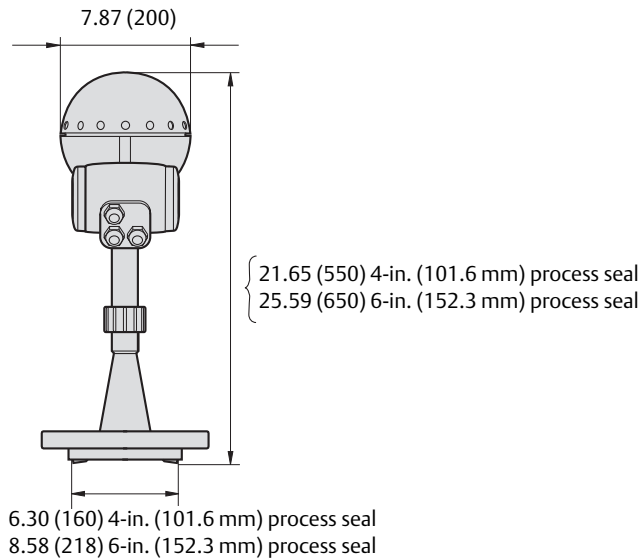
**Figure 4. Parabolic Antenna**



Dimensions are in inches (millimeters).

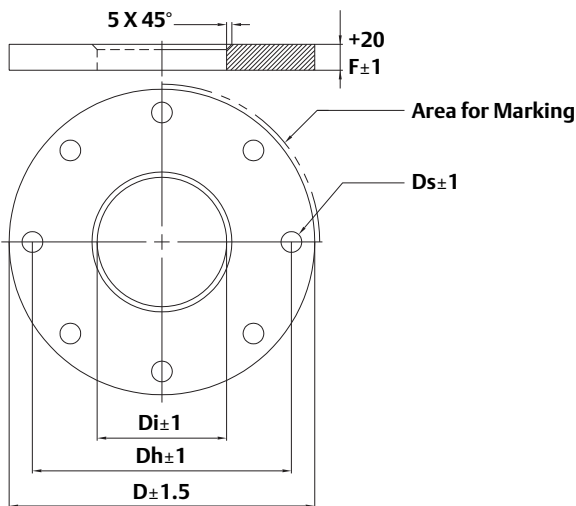


**Figure 5. Process Seal Antenna**



Dimensions are in inches (millimeters).

**Figure 6. Process Seal Flange**





**Table 16. Dimensions for Stainless Steel Flange are in Inches (millimeters)**

Flange	Di	D	Dh	Ds	F
ASME 4-in. (101.6 mm) Class 150	3.78 (96)	9.02 (229)	7.52 (191)	0.87 (22)	0.94 (23.8)
ASME 6-in. (152.3 mm) Class 150	4.94 (125.5)	10.98 (279)	9.49 (241)	0.87 (22)	1.0 (25.4)
DN100 PN16	3.78 (96)	8.66 (220)	7.09 (180)	0.71 (18)	0.79 (20.0)
DN150 PN16	4.94 (125.5)	11.22 (285)	9.45 (240)	0.87 (22)	0.87 (22.0)




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