

Superior Performance Four-Wire Non-Contacting Radar Level Transmitter

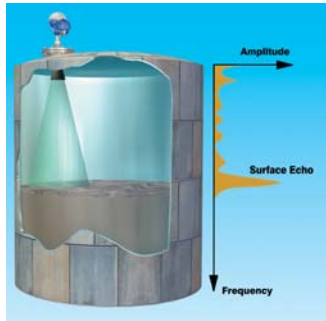
- *Best performance and uptime provided by market leading sensitivity*
- *Unique signal processing allows for challenging process conditions*
- *Extremely reliable and accurate level transmitter due to its high repeatability*
- *Easy connection with adjustable power supply, 24-240 Vac/dc, 0-60 Hz*
- *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*



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Superior Performance, When Applications Get Tough



Challenging reactor and mixing tanks, and tanks with rapid level changes



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



Full range of antenna styles

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, for example, turbulence, foam, long measuring ranges, disturbing objects, and 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 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, reliable measurement that requires no re-calibration, meaning improved uptime
- The non-contacting radar transmitter with no moving parts means 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

SPECIAL 5600 FEATURES

For the most challenging applications

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

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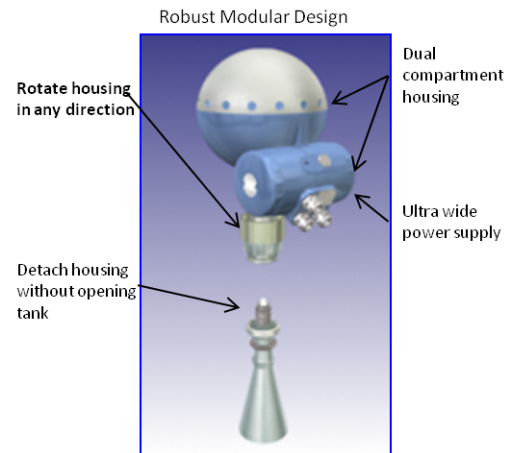
Rosemount 5600 Series

Best Performance and Uptime

- The power of 4 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



The Smart Wireless THUM adapter enables level communication with previously inaccessible and remote tanks

Easy Installation and Plant Integration

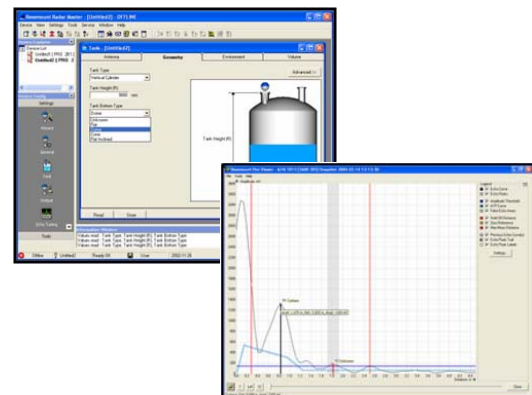
- Seamless system integration with HART®, Modbus®, or IEC 62591 (*WirelessHART®*) with the Smart Wireless THUM™ adapter
- Secondary analog 4-20 mA output
- MultiVariable™ output includes the choice of level, distance, volume, and signal strength
- Pre-configured or easy, user-friendly configuration in Rosemount RadarMaster with a five-step wizard, auto connect, and online help
- Any DD-compatible configuration tool such as AMS, or Field Communicator can be used
- Fully configurable with the remote- or factory-mounted LOI Rosemount 2210 with temperature input option



Rosemount 2210 configurable display with temperature input

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



The Rosemount RadarMaster 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.

Rosemount 5601 Radar Level Transmitter



Rosemount 5601 Radar Level Transmitter is a reliable 4-wire radar level transmitter designed for outstanding performance in a wide range of applications and process conditions. Characteristics include:

- Handles a wide range of process conditions
- Extensive selection of antennas and materials
- HART 4-20 mA, Modbus, or IEC 62591 (*WirelessHART*) with the Smart Wireless THUM adapter

Additional Information

Specifications: page 13

Product Certifications: page 23

Dimensional Drawings: page 27

TABLE 1. Rosemount 5601 Radar Level Transmitter Ordering Information

★The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Model	Product Description	
5601	Radar Level Transmitter for Process Applications	
Frequency Band		
Standard		Standard
U	US Market Only (10 GHz)	★
S	Switzerland Market Only (10 GHz)	★
A	All Other Markets (10 GHz)	★
Product Certification		
Standard		Standard
NA	None	★
E1	CENELEC/ATEX Flameproof	★
E5	FM Explosion-proof	★
E6	CSA Explosion-proof	★
E7	IECEx Flameproof	★
Power Supply		
Standard		
P	24-240 Vdc/ac 0-60 Hz	★
Primary Output		
Standard		Standard
5A	4-20 mA with HART communication, Passive Output	★
5B	4-20 mA with HART communication, Passive Output, Intrinsically Safe Circuit ⁽¹⁾	★
5C	4-20 mA with HART communication, Active Output	★
5D	4-20 mA with HART communication, Active Output, Intrinsically Safe Circuit ⁽¹⁾	★
8A	RS 485 Protocol - Modbus	★
Secondary Output⁽²⁾⁽³⁾		
Standard		Standard
0	None	★
1 ⁽⁴⁾	4-20 mA, Passive Output ⁽⁵⁾	★
2 ⁽⁴⁾	4-20 mA, Passive Output, Intrinsically Safe Circuit ⁽¹⁾	★
3	4-20 mA, Active Output ⁽⁵⁾	★
4	4-20 mA, Active Output, Intrinsically Safe Circuit ⁽¹⁾	★

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TABLE 1. Rosemount 5601 Radar Level Transmitter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Display Unit		
Standard		Standard
N	None	★
P	LOI, Factory mounted on transmitter	★
R	LOI, Remote mounted	★
T	LOI, Remote mounted with temp inputs (1-6 spot elements with common returns)	★
Volume Calculation		
Standard		Standard
E	Basic Volume Equations (Standard)	★
V	Strapping Table, up to 100 points	★
Typical Model Number: 5601 S E1 P 5A 0 P E Antenna Selection ⁽⁶⁾		

(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 with 7A, 7B, or 8A.

(4) Not available in combination with Primary Output codes 5A, 5B, 5C, or 5D.

(5) Not allowed in combination with Display Unit codes P, R, or T.

(6) Select the antenna type and options using Table 2, Table 3, Table 4, Table 6, and Table .

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TABLE 2. Cone Antenna Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

Antenna Type	Antenna Size	Antenna Material	Note	
Cone				
Standard				Standard
23S	3 in. (DN80) nozzles	SST 316L	Pipe Installation Only	★
24S	4 in. (DN100) nozzles	SST 316L	Free propagation or 4" pipe	★
26S	6 in. (DN150) nozzles	SST 316L	Free propagation or 6" pipe	★
28S	8 in. (DN200) nozzles	SST 316L	Free propagation only	★
Expanded				
2AS	10 in. (DN250) nozzles	SST 316L	Free propagation only	
23H	3 in. (DN80) nozzles	Alloy C22	Longer Lead-time, Consult Factory	
24H	4 in. (DN100) nozzles	Alloy C22	Longer Lead-time, Consult Factory	
26H	6 in. (DN150) nozzles	Alloy C22	Longer Lead-time, Consult Factory	
28H	8 in. (DN200) nozzles	Alloy C22	Longer Lead-time, Consult Factory	
23T	3 in. (DN80) nozzles	Titanium Gr 1/2	Longer Lead-time, Consult Factory	
24T	4 in. (DN100) nozzles	Titanium Gr 1/2	Longer Lead-time, Consult Factory	
26T	6 in. (DN150) nozzles	Titanium Gr 1/2	Longer Lead-time, Consult Factory	
28T	8 in. (DN200) nozzles	Titanium Gr 1/2	Longer Lead-time, Consult Factory	
23M	3 in. (DN80) nozzles	Alloy 400	Longer Lead-time, Consult Factory	
24M	4 in. (DN100) nozzles	Alloy 400	Longer Lead-time, Consult Factory	
26M	6 in. (DN150) nozzles	Alloy 400	Longer Lead-time, Consult Factory	
28M	8 in. (DN200) nozzles	Alloy 400	Longer Lead-time, Consult Factory	
23Z	3 in. (DN80) nozzles	Tantalum	Longer Lead-time, Consult Factory	
24Z	4 in. (DN100) nozzles	Tantalum	Longer Lead-time, Consult Factory	
26Z	6 in. (DN150) nozzles	Tantalum	Longer Lead-time, Consult Factory	
28Z	8 in. (DN200) nozzles	Tantalum	Longer Lead-time, Consult Factory	
2XX	Customer specific cone or material		Consult Factory	
Tank Seal				
Standard				Standard
P	PTFE			★
Q	Quartz			★
O-ring Material				
Standard				Standard
V	Fluoroelastomer			★
K	Kalrez® 6375			★
E	EPDM			★
B	Nitrile butadiene			★
Process Connection				
Standard				Standard
NR	Antenna with Plate Design NOTE: Customer supplied flange or see Table 10 on page 12 for flange options			★
Expanded				
XX	Special Process Connection		Consult Factory	
	Tri-clamp connection	Flange Material	Note	
BT	3 in. Tri-Clamp Flange	SST 316L	Longer Lead-time, Consult Factory	
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	

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TABLE 2. Cone Antenna Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

Options		
Standard		Standard
Q8	Material Traceability Certification per EN 10204 3.1.B	★
Typical Model Number: Selected code from Table 1 on page 4 24S P V NR		

TABLE 3. Extended Cone Antenna Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

Antenna Type	Antenna Size	Antenna Material	Note	
Expanded				
73S	3 in. (DN80) nozzles	SST 316L	Standard length 20 inch (500 mm)	
74S	4 in. (DN100) nozzles	SST 316L	Standard length 20 inch (500 mm)	
76S	6 in. (DN150) nozzles	SST 316L	Standard length 20 inch (500 mm)	
7XX	Customer specific extended cone or material		Consult Factory	
Tank Seal				
Expanded				
P	PTFE			
Q	Quartz			
O-ring Material				
Expanded				
V	Fluoroelastomer			
K	Kalrez 6375			
E	EPDM			
B	Nitrile butadiene			
Process Connections				
Expanded				
NR	Antenna with Plate Design <i>NOTE: Customer supplied flange or see Table 10 on page 12 for flange options</i>			
XX	Special Process Connection		Consult Factory	
Options				
Standard				Standard
Q8	Material Traceability Certification per EN 10204 3.1.B			★
Typical Model Number: Selected code from Table 1 on page 4 76S P V NR				

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TABLE 4. Cone Antenna with Integrated Flushing Connection Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

Antenna Type	Antenna Size	Antenna Material	Note	
Cone with Integrated Flushing Connection				
Expanded				
94S	4 in. (DN100) nozzles	SST 316L	Consult Factory	
96S	6 in. (DN150) nozzles	SST 316L	Consult Factory	
98S	8 in. (DN200) nozzles	SST 316L	Consult Factory	
Tank Seal				
Expanded				
P	PTFE			
Q	Quartz			
O-ring Material				
Expanded				
V	Fluoroelastomer			
K	Kalrez 6375			
E	EPDM			
B	Nitrile butadiene			
Process Connection				
Expanded				
XX	Special Process Connection		Consult Factory	
	Stainless Steel Flange Welded to Antenna		Note⁽¹⁾	
CL	4 in. ANSI Class 150		Max 101 psig at 392 °F (7 bar at 200 °C)	
DL	6 in. ANSI Class 150		Max 145 psig at 392 °F (10 bar at 200 °C)	
FL	8 in. ANSI 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. ANSI Class 150, SST, Higher Pressure		Max 145 psig at 752 °F (10 bar at 400 °C)	
DH	6 in. ANSI Class 150, SST, Higher Pressure		Max 145 psig at 752 °F (10 bar at 400 °C)	
FH	8 in. ANSI 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)	
Options				
Standard				Standard
Q8	Material Traceability Certification per EN 10204 3.1.B			★
Typical Model Number: Selected code from Table 1 on page 4 94S P K KL				

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

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TABLE 5. Parabolic Antenna Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

Antenna Type	Antenna Size	Antenna Material	Note	
Parabolic				
Standard				Standard
45S	ø18 in. (440mm)	SST	Clamped with Integrated Inclination, Low pressure version	★
46S	ø18 in. (440mm)	SST	Welded with Integrated Inclination, High pressure version	★
Expanded				
4XX	Customer Specific	Customer Specific	Consult Factory	
Tank Seal				
Standard				Standard
P	PTFE			★
O-ring Material				
Standard				Standard
V	Fluoroelastomer			★
Process Connections				
Standard				Standard
NF	None, Flange Ready			★
Expanded				
XX	Special Process Connection		Consult Factory	
Options				
Standard				Standard
Q8	Material Traceability Certification per EN 10204 3.1.B			★
Expanded				
PB	PTFE Protective Cover (PTFE Bag) Not suitable for hazardous applications ⁽¹⁾ .			
Typical Model Number: Selected code from Table 1 on page 4 45S P V NR				

(1) Not suitable for use in Ex environments.

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TABLE 6. Process Seal Antenna Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

Antenna Type	Antenna Size	Antenna Material	Note	
Process Seal				
Expanded				
34S	4 in. (DN100) nozzles	PTFE		
36S	6 in. (DN150) nozzles	PTFE		
Tank Seal				
Expanded				
P	PTFE			
O-ring Material				
N	Not Applicable			
Process Connection				
Expanded				
NF	None, Customer to supply flange per dimensions on FIGURE 6.			
XX	Special Process Connection		Consult Factory	
	Stainless Steel Flange	Flange Material		
CA	4 in. ANSI Class 150	SST 316L		
DA	6 in. ANSI Class 150	SST 316L		
JA	DN100 PN16	SST 316L		
KA	DN150 PN16	SST 316L		
Options				
Standard				Standard
Q8	Material Traceability Certification per EN 10204 3.1.B			★
Typical Model Number: Selected code from Table 1 on page 4 34S P N JA				

TABLE 7. Transmitter Options Ordering Information (multiple selections allowed)

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

Options		
Material Traceability Certification		
Standard		Standard
Q8	Material Traceability Certification per EN 10204 3.1B	★
Calibration Data Certification		
Standard		Standard
Q4	Calibration Data Certificate	★
Software Configuration		
Standard		Standard
C1	Custom Software Configuration (CDS required with order)	★
Alarm Limits		
Standard		Standard
C4	NAMUR Alarm Level, High Alarm	★
C8	Low Alarm (Standard Rosemount Alarm)	★
Conduit Adapters		
Standard		Standard
G1	¹ / ₂ inch NPT Cable Gland Kit	★
G2	¹ / ₂ inch NPT/ M20 Adapters (Set of 3)	★
Conduit Electrical Connector⁽¹⁾		
Expanded		
GE	M12, 4-pin, Male Connector (eurofast [®])	
GM	A size Mini, 4-pin, Male Connector (minifast [®])	
Protective Cover		
Expanded		
PB ⁽²⁾	PTFE Protective Cover (PTFE Bag)	
Special Procedures		
Standard		Standard
U1 ⁽³⁾	TÜV Overfill Protection	★
Expanded		
P1 ⁽⁴⁾	Hydrostatic Testing	
QG	GOST Primary Verification Certificate	

(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 P E 24S P V NR
ATEX approval, passive HART primary output and display mounted on transmitter. Basic Volume calculation. Antenna is a 4 inch Cone, SST with PTFE Seal and Fluoroelastomer O-rings. No options.

Accessories

TABLE 9. Accessories Part Numbers

Part Number	Description	Note
Modems		
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	Dimensions	Material
05600-1811-0211	ANSI 2 inch Class 150	Acc. To ANSI B16.5	SST 316L ⁽¹⁾
05600-1811-0231	ANSI 2 inch Class 300	Acc. To ANSI B16.5	SST 316L ⁽¹⁾
05600-1811-0311	ANSI 3 inch Class 150	Acc. To ANSI B16.5	SST 316L
05600-1811-0331	ANSI 3 inch Class 300	Acc. To ANSI B16.5	SST 316L
05600-1811-0411	ANSI 4 inch Class 150	Acc. To ANSI B16.5	SST 316L
05600-1811-0431	ANSI 4 inch Class 300	Acc. To ANSI B16.5	SST 316L
05600-1811-0611	ANSI 6 inch Class 150	Acc. To ANSI B16.5	SST 316L
05600-1811-0811	ANSI 8 inch Class 150	Acc. To ANSI B16.5	SST 316L
05600-1810-0231	DN50 PN40	Acc. To EN 1092-1	EN 1.4404 ⁽²⁾
05600-1810-0311	DN80 PN16	Acc. To EN 1092-1	EN 1.4404 ⁽²⁾
05600-1810-0331	DN80 PN40	Acc. To EN 1092-1	EN 1.4404 ⁽²⁾
05600-1810-0411	DN100 PN16	Acc. To EN 1092-1	EN 1.4404 ⁽²⁾
05600-1810-0431	DN100 PN40	Acc. To EN 1092-1	EN 1.4404 ⁽²⁾
05600-1810-0611	DN150 PN16	Acc. To EN 1092-1	EN 1.4404 ⁽²⁾
05600-1810-0811	DN200 PN16	Acc. To EN 1092-1	EN 1.4404 ⁽²⁾

(1) Use gasket type Ia.

(2) Gasket type according to EN 1514-1 and bolting according to EN1515-2.

Functional Specification

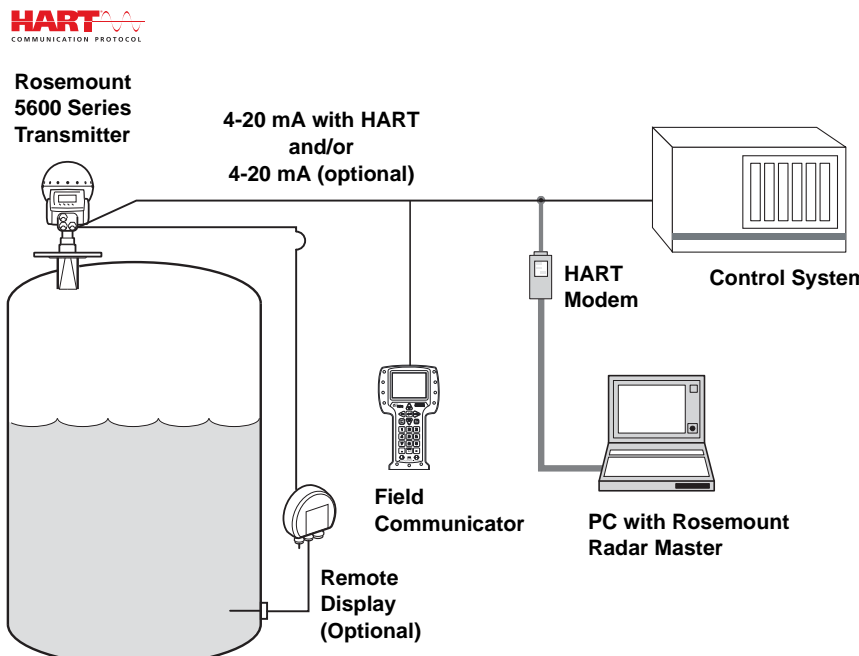

General	
Field of Application	<p>Liquids, slurries, and solids:</p> <ul style="list-style-type: none"> • Process vessels with agitators • Still-pipe or bridle-pipe mounting • Small nozzle openings on tanks with short measuring range • Various types of solid materials
Measurement Principle	10 GHz Frequency Modulated Continuous Wave (FMCW) radar (see Measurement Principle on page 2 for details).
Microwave Output Power	Max 1.0 mW
Power Consumption	Maximum 10 W, Nominal 5 W
Beam Angle	See Table 13 on page 19.
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. Primary Output is HART, either IS or Non-IS. The HART and secondary analog outputs can be either active or passive.</p> <p>Note: The minimum power required at the transmitter power terminals is 20 V.</p>
Outputs	<p>Primary Output: Alternative 1: HART + 4-20 mA current loop (non-IS or IS option) Alternative 2: RS-485 with Modbus communication</p> <p>Secondary Outputs: Analog 4-20 mA current loop, active (with power supplied by the Rosemount 5600) or passive (for loop-supplied power) (Optional - see page 4)</p>
Temperature Measurement (optional)	1-3 spot elements, PT100 or Cu90, or 6 spot elements with common return. Input accuracy $\pm 0.9^{\circ}\text{F}$ ($\pm 0.5^{\circ}\text{C}$). Average temperature or individual spots as output.

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4-20 mA HART and Secondary Outputs (Optional) (Output Option Code 5A - 5D) - (See Ordering Information in Table 1 on page 4)	
Output	<p>HART analog 4-20 mA current loop, and Secondary 4-20 mA Output (Optional, active or passive)</p>  <p>HART COMMUNICATION PROTOCOL</p> <p>Rosemount 5600 Series Transmitter</p> <p>4-20 mA with HART and/or 4-20 mA (optional)</p> <p>Field Communicator</p> <p>Remote Display (Optional)</p> <p>HART Modem</p> <p>Control System</p> <p>PC with Rosemount Radar Master</p>
Smart Wireless THUM Adapter	 <p>The optional Smart 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 Rosemount Smart Wireless THUM adapter Product Data Sheet (Document No. 00813-0100-4075) and Smart Wireless THUM Adapter for Rosemount Process Level Transmitter Applications (Document No. 00840-0100-4026).</p>
Galvanic Isolation	> 1500 V RMS or DC
IS Electrical Parameters	See Product Certifications on page 23.
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)

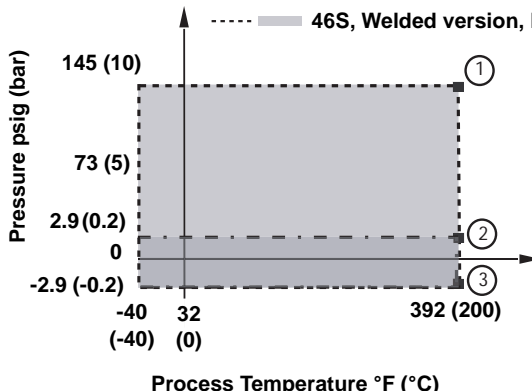
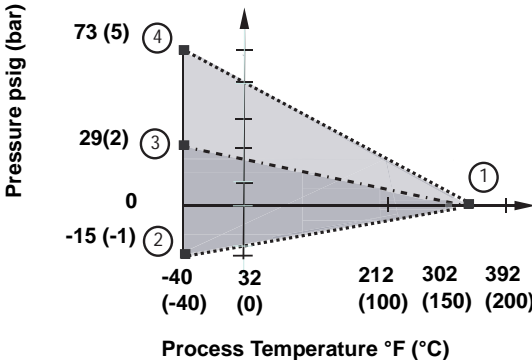
Display and Configuration	
Display	Factory Mounted (Option code P) The Rosemount 2210 offers basic configuration using the 4 soft keys on the display. Data presentation on the LCD can be customized and allows many viewing alternatives by: <ul style="list-style-type: none"> • 6-digit graphical LCD display, 128 x 64 pixels • 7 text lines with 16 characters/line
	Remote Mounted (Option Code R and T for temperature inputs) The Rosemount 2210 is available as remote mounted and has optional temperature inputs (1-3 spot elements PT100 or CU90)
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	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.
	Notes: <ul style="list-style-type: none"> • 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 Accessories on page 12). • The transmitter can be pre-configured by selecting option code C1 (see page 11) and sending a complete Configuration Data Sheet (CDS). The CDS is available from www.rosemount.com.
Output Units	Level and Distance: ft, inch, m, cm, or mm Volume: ft ³ , inch ³ , US gals, Imp gals, barrels, yd ³ , m ³ , or liters Level Rate: ft/s, m/s Temperature: °F, °C
Output Variables	Level, Distance, Volume, Level Rate, Signal Strength, Used defined, Temperature (1-6), and Average Temperature
Damping	0-60 s (2 s, default value)
Temperature and Pressure Limits	
Ambient Temperature	-40 to 70 °C (-40 to 158 °F) LCD Readable between: -20 to 70 °C (-4 to 158 °F)
Process Temperature and Pressure	The final rating depends on antenna, tank seal, and O-ring selection. See Table 15 on page 28 for further details.
	<p>Rosemount 5600 with Cone Antenna and Extended Cone Antenna ⁽¹⁾</p> <p> Cone, Quartz tank seal Cone, PTFE tank seal </p> <p>Pressure psig (bar)</p> <p>Process Temperature °F (°C)</p> <p> ① 145 psig at 212 °F 10 bar at 100 °C ② 73 psig at 392 °F 5 bar at 200 °C ③ -15 psig at 392 °F -1.0 bar at 200 °C ④ 798 psig at 752 °F 55 bar at 400 °C </p> <p>Rosemount 5600 with Cone Antenna - Integrated Flushing Connection ⁽¹⁾</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 Table 4 on page 8 for more information.</p>

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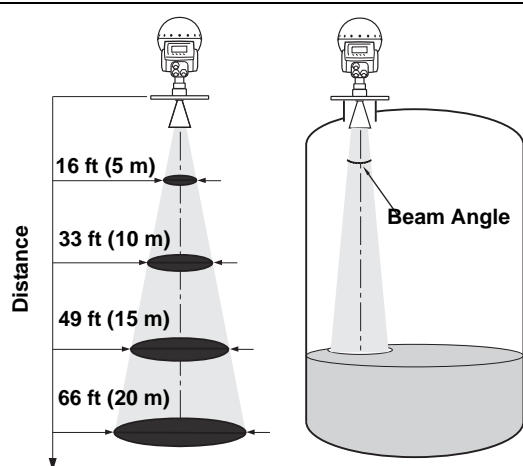
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	<p>Rosemount 5600 with Parabolic Antenna</p> <p>--- 45S, Clamped version, low pressure 46S, Welded version, high pressure</p>  <p>① 145 psig at 392 °F / 10 bar at 200 °C ② 2.9 psig at 392 °F / 0.2 bar at 200 °C ③ -2.9 psig at 392 °F / -0.2 bar at 200 °C</p>
	<p>Rosemount 5600 with Process Seal Antenna</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>ANSI Flange Rating</p>	<p>According to ANSI B16.5</p>
<p>EN Flange Rating</p>	<p>According to EN 1092-1</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 16 and Table 17 on page 28.

Performance Specification

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"> • antenna type, • the dielectric constant of the liquid (ϵ_r) (min. $\epsilon_r=1.4$) • process conditions <p>See Table 11 and Table 12 on page 19 for measuring range and minimum dielectric constant values. For more information, ask your local Emerson Process Management representative.</p> <p>For liquids with ϵ_r that are smaller than 1.8 such as liquefied gases, an 8-inch 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). The 5600 transmitter installed in a pipe can measure products with a dielectric ≥ 1.4.</p>
Beam Angle and Beamwidth	<p>For detailed information on the beam angle and beam width for the Rosemount 5600 Series, see Table 13 on page 19.</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

Rosemount 5600 Series

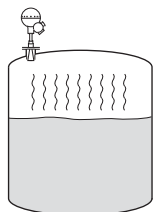
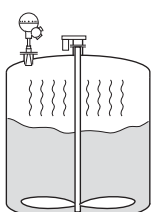
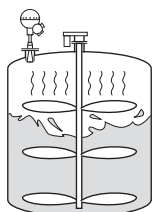
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Humidity	IEC 60068-2-3
Radio Approvals	<p>FCC: Part 15C (K8CPRO & K8CPROX: Note: This device must be professionally installed and is only authorized for use on sealed metal links)</p> <p>R&TTE: ETSI EN 302 372 (Note: This device must be installed at a permanent fixed position at a closed (not open) metallic tank or reinforced concrete tank, or similar enclosure structure made of comparable attenuating material)</p> <p>IC: RSS210-5 (2827A- 5600PRO)</p>
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 11. Rosemount 5600 Recommended Measuring Range for Optimum Performance, ft (m)

Rosemount 5600 Series									
	Dielectric Constant ⁽¹⁾								
	A	B	C	A	B	C	A	B	C
3-in. 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. Process Seal	36 (11)	38 (11.5)	49 (15)	23 (7)	30 (9)	33 (10)	3 (1) ⁽²⁾	7 (2) ⁽²⁾	11 (3.5) ⁽²⁾
6-in. Process Seal	49 (15)	56 (17)	57 (17.5)	30 (9)	36 (11)	39 (12)	5 (1.5) ⁽²⁾	10 (3) ⁽²⁾	20 (6) ⁽²⁾
4-in. Cone	66 (20)	72 (22)	82 (25)	43 (13)	49 (15)	56 (17)	7 (2) ⁽²⁾	16 (5) ⁽²⁾	25 (7.5) ⁽²⁾
6-in. Cone	82 (25)	95 (29)	107 (32.5)	49 (15)	62 (19)	69 (21)	15 (4.5) ⁽²⁾	21 (6.5) ⁽²⁾	33 (10) ⁽²⁾
8-in. Cone	99 (30)	131 (40)	131 (40)	72 (22)	82 (25)	95 (29)	21 (6.5)	36 (11)	46 (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	-	-	-	-	-	-	99 (30)	99 (30)	99 (30)

(1) A. Oil, gasoline and other hydrocarbons, petrochemicals (dielectric constant, $\epsilon_r=1.9-4.0$), in pipes ($\epsilon_r \geq 1.4$)

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.

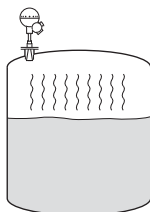
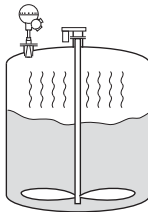
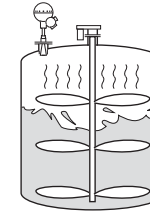
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TABLE 12. Rosemount 5600, Maximum Recommended Measuring Range, ft (m)

Rosemount 5600 Series									
	Dielectric Constant ⁽¹⁾								
	A	B	C	A	B	C	A	B	C
3-in. Cone	52 (16)	72 (22)	92 (28)	30 (9)	39 (12)	52 (16)	16 (5)	20 (6)	21 (6.5)
4-in. Process Seal	49 (15)	51 (15.5)	59 (18)	31 (9.5)	34 (10.5)	41 (12.5)	8 (2.5) ⁽²⁾	11 (3.5) ⁽²⁾	20 (6) ⁽²⁾
6-in. Process Seal	59 (18)	67 (20.5)	80 (24.5)	36 (11)	41 (12.5)	54 (16.5)	10 (3) ⁽²⁾	20 (6) ⁽²⁾	23 (7) ⁽²⁾
4-in. Cone	82 (25)	89 (27)	98 (30)	52 (16)	59 (18)	71 (21.5)	10 (3)	21 (6.5)	33 (10)
6-in. Cone	98 (30)	112 (34)	131 (40)	66 (20)	80 (24.5)	92 (28)	21 (6.5)	33 (10)	43 (13)
8-in. 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	-	-	-	-	-	-	164 (50)	164 (50)	164 (50)

(1) A. Oil, gasoline and other hydrocarbons, petrochemicals (dielectric constant, $\epsilon_r=1.9-4.0$), in pipes ($\epsilon_r \geq 1.4$)

B. Alcohols, concentrated acids, organic solvents, oil/water mixtures, and acetone ($\epsilon_r=4.0-10$)

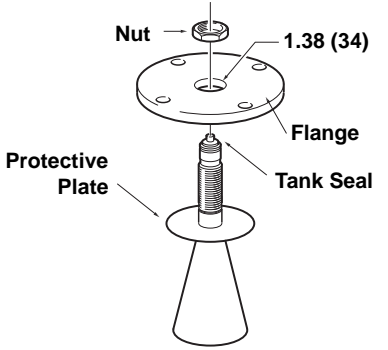
C. Conductive liquids, e.g. water based solutions, dilute acids, and alkalis ($\epsilon_r > 10$)

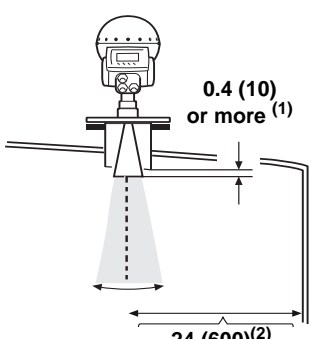
(2) Not recommended.

TABLE 13. Rosemount 5600 Beam Diameter and Angle

Antenna Type & Beam Angle	Distance, ft (m)			
	16 (5)	33 (10)	49 (15)	66 (20)
	Beam Diameter, ft (m)			
Cone 3 in 25°	7.2 (2.2)	14 (4.4)	22 (6.7)	29 (8.9)
Cone 4 in/ Process Seal 4 inch 21°	6.2 (1.9)	12 (3.7)	18 (5.6)	24 (7.4)
Cone 6 in/ Process Seal 6 inch 18°	5.2 (1.6)	10 (3.1)	15 (4.7)	21 (6.3)
Cone 8 inch 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 Specification

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	<p>3 X 1/2 inch NPT; for cable glands or conduit entries Optional: 1/2 inch NPT Cable Gland Kit, 1/2 inch NPT / M20 Adapters (Set of 3) Optional remote display (option code R and T): 2 x M20 Entries, 1 x M25 Entry; max. cable length display - radar transmitter: 330 ft (100 m)</p> <p>The recommended output cabling is a 4-wire, twisted and shielded instrument cable, min. 0.5 mm² (AWG 20).</p>
Housing Material	Permanent moulded cast aluminium, chromed and powder painted
Ingress Protection	IP66, IP 67, and NEMA 4
Ingress Protection - Remote Display	IP 67, mounted in separate enclosure with weather/dirt protection cover
Factory Sealed	See CSA Approvals information on page 25.
Weight	Transmitter Head (TH): 19.8 lb (9.0 kg)
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 and o-rings (PTFE or Quartz) 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 Table 10 on page 12).</p>  <p style="text-align: right;">Dimensions are inches (millimeters)</p>
Flange Dimensions	<p>Follow ANSI, DIN standard Material: Stainless steel 316L and Stainless Steel EN 1.4404</p>
Antennas	<p>Cone, Parabolic, and Process Seal antennas. Extended Cone Antennas are available in SST 316L. Cone Antennas are available with flushing connections (1/2-in. NPT).</p> <p>Cone Antenna</p> <ul style="list-style-type: none"> • Suitable for free-propagation and pipe-mounted installation • Cone extensions are available (see Table 3 on page 7) • Optional Cone antennas with cleaning/flushing connection are available (see Table 4 on page 8) <p>Parabolic Antenna</p> <ul style="list-style-type: none"> • Suitable for solid materials (for example, cement) • Withstand heavy contamination • Can be equipped with a PTFE protective cover to reduce the effects of dusty environments <p>Process Seal Antenna</p> <ul style="list-style-type: none"> • The dish of the Process Seal is made of PTFE • Only exposes material suitable for hygienic or corrosive applications (see Figure 6 on page 28 and Table 6 on page 10)

Antenna Dimensions	<p>Cone Antenna: See Figure 1 on page 27</p> <p>Extended Cone Antenna: See Figure 2 on page 27</p> <p>Cone Antenna with Integrated Flushing Connection: See Figure 3 on page 27</p> <p>Parabolic Antenna: See Figure 4 on page 27</p> <p>Process Seal Antenna: See Figure 6 on page 28 and Table 16 on page 29</p>
Antenna Weight	<p>3-in. Cone Antenna: 2.20 lb. (1.0 kg)</p> <p>4-in. Cone Antenna: 3.31 lb. (1.5 kg)</p> <p>6-in. Cone Antenna: 4.41 lb. (2.0 kg)</p> <p>8-in. Cone Antenna: 6.61 lb. (3.0 kg)</p> <p>Parabolic Antenna: 17.6 lb. (8.0 kg)</p> <p>4-in. Process Seal Antenna: 4.41 lb. (2.0 kg)</p> <p>6-in. Process Seal Antenna: 5.51 lb. (2.5 kg)</p>
Material Exposed to Tank Atmosphere	<p>Cone Antenna (PTFE sealing)</p> <ul style="list-style-type: none"> • Antenna: 316L SST (EN1.4404) or Alloy C-22 or Tantalum or Alloy 400 • Sealing: PTFE fluoropolymer • O-rings: fluoroelastomer or Kalrez perfluoroelastomer <p>Cone Antenna (Quartz sealing)</p> <ul style="list-style-type: none"> • Antenna: 316L SST (EN1.4404) or Alloy C-22 or Tantalum or Alloy 400 • Sealing: Quartz • O-rings: fluoroelastomer or Kalrez perfluoroelastomer <p>Parabolic Antenna</p> <ul style="list-style-type: none"> • 316L SST • FEP/PTFE fluoropolymer <p>Process Seal Antenna</p> <ul style="list-style-type: none"> • PTFE fluoropolymer or Al₂O₃ (Aluminium oxide)
Installation and Mounting Considerations	
Mechanical Mounting Considerations	<p>The 5600 radar transmitter is easily carried to the tank top and mounted on a suitable nozzle or pipe. The radar transmitter should be installed as follows:</p> <ul style="list-style-type: none"> • Antenna oriented perpendicular to a horizontal surface. • The transmitter should be mounted with as few fittings as possible within the beam angle. • Filling inlets creating turbulence should preferably be kept at a distance. • 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. <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>Dimensions are inches (millimeters).</p> <p>(1) For best measurement performance the nozzle height should be shorter than the antenna or consider an extended cone (FIGURE 3.) for your current transmitter.</p> <p>(2) Recommended minimum distance for all antennas. (Shorter distance may apply, consult factory).</p> </div> </div>
Pipe/Chamber Installations	<p>If used correctly, pipe or chamber measurement can be advantageous in many applications:</p> <ul style="list-style-type: none"> • Use cone antennas (3 to 6 in.) • The gap between the cone antenna and the still-pipe is limited to 0.4 in. (10 mm)

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TABLE 14. Antenna material and o-ring selection ● Applicable - Not applicable

	Cone Antenna	Extended Cone Antenna	Cone with Integrated Flushing Connection	Parabolic Antenna	Process Seal Antenna
Material					
Stainless Steel 316L	●	●	●	●	-
Alloy C22	●	-	-	-	-
Titanium Gr1/Gr2	●	-	-	-	-
Tantalum	●	-	-	-	-
Alloy 400	●	-	-	-	-
PTFE	-	-	-	-	●
Tank Seal					
PTFE	●	●	●	●	-
Quartz	●	●	●	-	-
O-Rings					
Fluoroelastomer	●	●	●	●	-
Kalrez 6375	●	●	●	-	-
EPDM	●	●	●	-	-
Nitrile butadiene	●	●	●	-	-

Product Certifications

SAFETY NOTE AND SPECIAL CONDITIONS FOR SAFE USE (X-MARKINGS IN ATEX, AND IECEX CERTIFICATES)

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 1 G 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

Approved Manufacturing Locations

Rosemount Tank Radar AB – Gothenburg, Sweden

EU Conformity

Complies with 93/98/EEC. The most recent version of the EC declaration of conformity can be found at www.rosemount.com.

ATEX Directive (94/9/EC)

Rosemount Inc. complies with the ATEX Directive.

Ordinary Location Certification for Factory Mutual

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

5600 Series Radar Level Transmitter European ATEX Directive Information

This document lists specific requirements which have to be fulfilled to secure a safe installation and use of 5600 Series Radar Level Transmitter in a hazardous area. Omission may jeopardize safety, and Rosemount will not take any responsibility if requirements as listed below are not fulfilled.

Canadian Registration Number (CRN)

The product design of the Cone Antenna has been accepted and registered for use in Canada.
CRN: 0F1015.9C

Hazardous Locations Certifications

ATEX Approvals

5600 Series Level Transmitter

E1 Certificate Number: Sira 03ATEX1294X
With Intrinsically Safe Outputs (only)

ATEX Marking:  II (2) (1) 1/2 GD

Safety Coding: Ex de IIC T6 Ga/Gb (-40 °C to +70 °C)


Ex t IIIC T85°C Db IP65

With Non-IS Primary Output and IS Display Output

ATEX Marking: Ex de [ib] [ia] IIC T6 Ga/Gb

(-40 °C to +70 °C)

Ex t IIIC T85°C Db IP65


 II (1) 1/2 GD T85 °C

Safety Coding: EEx de [ia] IIC T6 (-40 °C ≤ T_{amb} ≤ +70 °C)

With Non-IS Primary and/or Non-IS Secondary Outputs

ATEX Marking: Ex de [ia] IIC T6 Ga/Gb (-40 °C to +70 °C)

Ex t IIIC T85°C Db IP65

 II 1/2 GD

Special Conditions for Safe Use: See first paragraph of the Produce Certifications Chapter

Passive analog output 4-20 mA,

Label identification = HART passive.

Voltage compliance 7-30 V:

U_i = 30 V

I_i = 200 mA

C_i = 0

L_i = 0

U_o = 0

I_o = 0

U_m = 250 V

Active analog output 4-20 mA,

Label identification = HART active.

Max load 300Ω:

U_o = 23.1 V

I_o = 125.7 mA

P_o = 0.726 W

C_{ext} = 0.14 μF

L_{ext} = 2.2 mH

C_i = 0

L_i = 0

The addition of an extra line out to the display interface circuit, with the addition of safety components and modification of the output parameters at connector X2 (formerly X7). The maximum combined parameters at this connector are as follows:

Connector X2

$U_o = 7.84 \text{ V}$

$I_o = 385.6 \text{ mA}$

$P_o = 0.678 \text{ W}$

$C_i = 0$

$L_i = 0$

$C_o = 9.3 \text{ ?F}$

$L_o = 239 \text{ ?H}$

$L_o/R_o = 52.8 \text{ ?H/ohm}$

FOUNDATION™ fieldbus model:

$U_i < 30 \text{ Vdc}$

$I_i < 300 \text{ mA}$

$P_i < 1.3 \text{ W}$


$C_i = 0 \text{ nF}$

$L_i = 0 \text{ H}$

2210 Display Unit


Certificate Number: Sira 00ATEX2062

Without Temperature Inputs

ATEX Marking:  II 2 G

Safety Coding: Ex ib IIC T4 Gb (Ta -40 °C to +70 °C)

With Temperature Inputs

ATEX Marking:  II 2 (1) G

Safety Coding: Ex ib [ia Ga] IIC T4 Gb (Ta -40°C to +70°C)

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Factory Mutual (FM) Approvals

SPECIFIC CONDITIONS OF USE

1. WARNING – Potential Electrostatic Charging Hazard – The enclosure is constructed from plastic. To prevent the risk of electrostatic sparking the plastic surface should only be cleaned with a damp cloth.

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.

5600 Series Level Transmitter

E5 Certificate Number: 4D5A9.AX

With Intrinsically safe outputs

(all versions except those listed below)

Explosion proof with IS outputs for HAZLOC

Class I, Division 1, Group A, B, C, and D, T6

Max operating temperature +70 °C

Dust ignition proof for use in Class II/III, Division 1, Groups E, F, and G, T5.

Use conductors rated at least 85 °C

Shall be installed in accordance with System control drawing 9150074-994.

With Non-IS Secondary Outputs (codes 1 and 3)

Explosion proof

Class I, Division 1, Group A, B, C, and D, T6

Max operating temperature +70 °C

Dust ignition proof for use in Class II/III, Division 1, Groups E, F, and G, T5.

Use conductors rated at least 85 °C

2210 Display Unit

Certificate Number: 3008356

All Versions

Intrinsic Safe for HAZLOC

Class I, Division 1, Group A, B, C, and D T4

Max operating temperature +70 °C

Shall be installed in accordance with System control drawing 9150074-997.

Canadian Standards Association (CSA Approvals)

5600 Series Level Transmitter

E6 Certificate Number: 2003.153280-1346169

With Non-IS Primary and/or Secondary Outputs

Explosion proof Ex de IIC T6

Shall be installed in accordance with System control drawing 9150074-937.

Factory seal, conduit seal not required.

With IS Display Outputs, IS Primary and/or Secondary Outputs

Explosion proof Ex de [ib/ia] IIC T6

Shall be installed in accordance with System control drawing 9150074-939.

Factory seal, conduit seal not required.

2210 Display Unit

Certificate Number: 2003.153280-1346165

Without Temperature Inputs

Intrinsically safe EEx ib IIC T4 ($-40\text{ °C} \leq T_{\text{amb}} \leq +70\text{ °C}$) With Temperature Inputs

Intrinsically safe EEx ib [ia] IIC T4 ($-40\text{ °C} \leq T_{\text{amb}} \leq +70\text{ °C}$)

Shall be installed in accordance with System control drawing 9150074-944.

IECEx Approvals

5600 Series Level Transmitter

E7 Certificate Number: IECEx SIR 05.0024X

With Intrinsically Safe Outputs (only)

Safety Coding: Ex de IIC T6 Ga/Gb (-40 °C to $+70\text{ °C}$)

Ex t IIIC T85 °C Db IP65

With Non-IS Primary Output and IS Display Output

Safety Coding: Ex de [ib] [ia] IIC T6 Ga/Gb

(-40 °C to $+70\text{ °C}$)

Ex t IIIC T85°C Db IP65

With Non-IS Primary and/or Non-IS Secondary Outputs

Safety Coding: Ex de [ia] IIC T6 Ga/Gb (-40 °C to $+70\text{ °C}$)

Ex t IIIC T85°C Db IP65

Passive analog output 4-20 mA,

Label identification = HART passive.

Voltage compliance 7-30 V:

$U_i = 30\text{ V}$

$I_i = 200\text{ mA}$

$C_i = 0$

$L_i = 0$

$U_o = 0$

$I_o = 0$

$U_m = 250\text{ V rms}$

Active analog output 4-20 mA,

Label identification = HART active.

Max load 300 Ω :

$U_o = 23.1\text{ V}$

$I_o = 125.7\text{ mA}$

$P_o = 0.726\text{ W}$

$C_o = 0.14\text{ }\mu\text{F}$

$L_o = 2.2\text{ mH}$

$C_i = 0$

$L_i = 0$

The addition of an extra line out to the display interface circuit, with the addition of safety components and modification of the output parameters at connector X2 (formerly X7). The maximum combined parameters at this connector are as follows:

Connector X2

$U_o = 7.84 \text{ V}$

$I_o = 385.6 \text{ mA}$

$P_o = 0.678 \text{ W}$

$C_i = 0$

$L_i = 0$

$C_o = 9.3 \text{ ?F}$

$L_o = 239 \text{ ?H}$

$L_o/R_o = 52.8 \text{ ?H/ohm}$

FOUNDATION™ fieldbus model:

$U_i < 30 \text{ Vdc}$

$I_i < 300 \text{ mA}$

$P_i < 1.3 \text{ W}$

$C_i = 0 \text{ nF}$

$L_i = 0 \text{ H}$

2210 Display Unit

Certificate Number: IECEx SIR 05.0021

Without Temperature Inputs

Safety Coding: Ex ib IIC T4 ($-40 \text{ }^{\circ}\text{C} \leq T_{\text{amb}} \leq +70 \text{ }^{\circ}\text{C}$)

With Temperature Inputs

Safety Coding: Ex ib [ia] IIC T4 ($-40 \text{ }^{\circ}\text{C} \leq T_{\text{amb}} \leq +70 \text{ }^{\circ}\text{C}$)

NCC/INMETRO Approvals

5600 Series Level Transmitter

SPECIAL CONDITIONS FOR SAFE USE (X)

Refer to Certificate: 5100.08 X

Ex de IIC T6 Ga/Gb (-40° to $+70^{\circ}\text{C}$);

Ex de [ib Gb] [ia Ga] IIC T6 Ga/Gb (-40° to $+70^{\circ}\text{C}$);

Ex de [ia Ga] IIC T6 Ga/Gb (-40° to $+70^{\circ}\text{C}$)

China National Quality Supervision and Test Center for Explosion Protected Electrical Products (CQST)

5600 Series Level Transmitter

SPECIAL CONDITIONS FOR SAFE USE (X)

Refer to Certificates:

CNEx09.0324X-5600; CNEx09.0295X-5600;

CNEx09.294X-5600, CNEx08.0092X-5600;

Ex de [ib] [ia] IIC T6 T85°C Ta: -40 to $+70^{\circ}\text{C}$; Ex de IIC

T6/DIP A20 T85°C Ta: -40 to $+70^{\circ}\text{C}$ IP65; Ex de [ia] IIC

T6/DIP A20 T85°C Ta: -40 to $+70^{\circ}\text{C}$ IP65; Ex nAL IIC T6 Ta:

-40 to $+70^{\circ}\text{C}$ Overfill Protection

Cert no: Z-65.16-417

U1 TÜV-tested and approved for overfill protection according to the German WHG regulations

Dimensional Drawings

FIGURE 1. Cone Antenna Dimensions⁽¹⁾

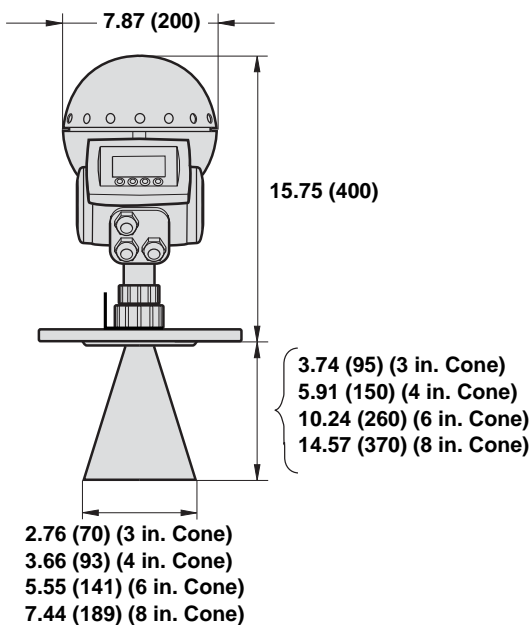


FIGURE 2. Extended Cone Antenna Dimensions⁽¹⁾

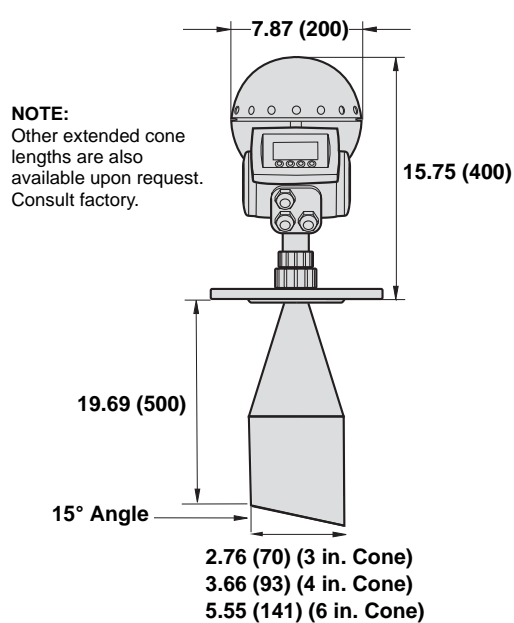


FIGURE 3. Cone Antenna with Integrated Flushing Connection Dimensions⁽¹⁾

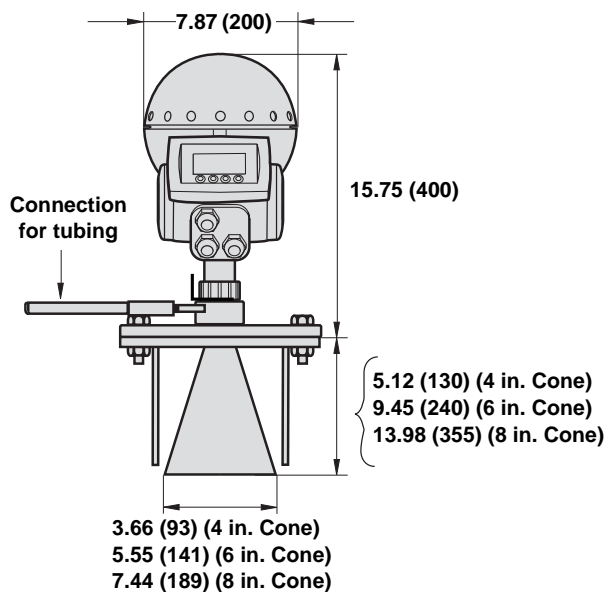
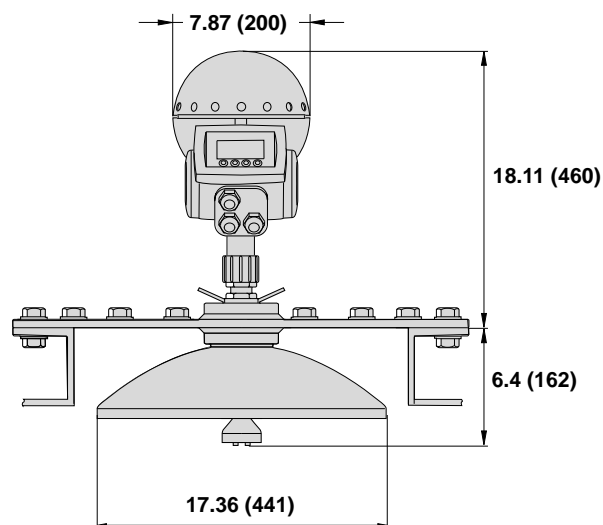
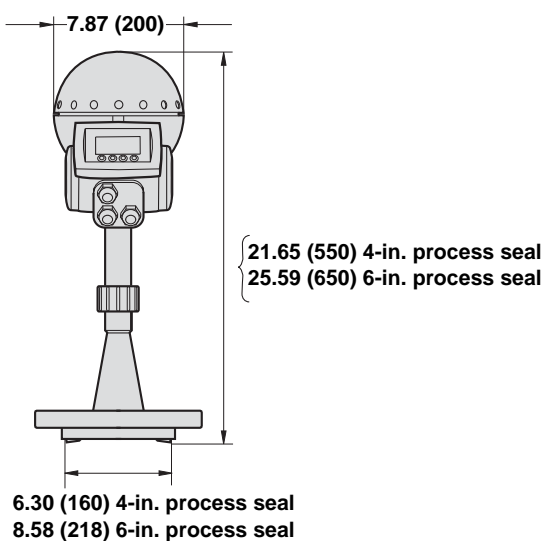


FIGURE 4. Parabolic Antenna Dimensions⁽¹⁾



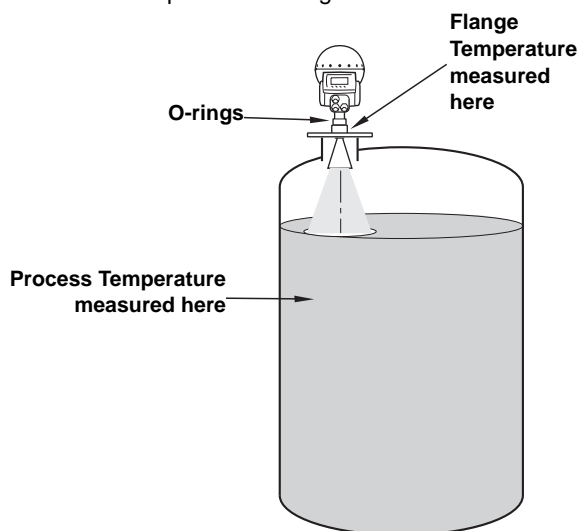
⁽¹⁾ Dimensions are in inches (millimeters)

FIGURE 5. Process Seal Antenna Dimensions⁽¹⁾



(1) Dimensions are in inches (millimeters)

FIGURE 6. Temperature Rating Considerations



NOTE:

Flange temperature depends on mounting conditions, such as nozzle position, distance to maximum product level, nozzle height, presence of insulation, etc.

TABLE 15. Flange Temperature Range depending on O-ring selection

O-ring Material	Minimum Temperature °F (°C) in air	Maximum Temperature F (°C) in air
Fluoroelastomer	5 (-15)	392 (200)
Ethylene Propylene (EPDM)	-40 (-40)	266 (130)
Kalrez 6375	-4 (-20)	527 (275)
Nitrile butadiene	-31 (-35)	230 (110)

FIGURE 7. Flange

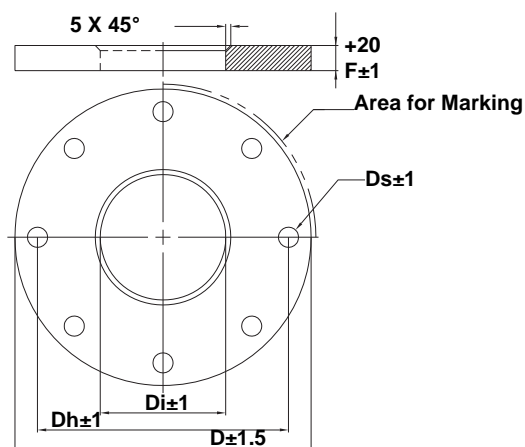


TABLE 16. Dimensions for Stainless Steel Flange are in inches (millimeters)

Flange	Di	D	Dh	Ds	F
ANSI 4 inch Class 150	3.78 (96)	9.02 (229)	7.52 (191)	0.87 (22)	0.94 (23.8)
ANSI 6 inch 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)

Rosemount Level Solutions

Emerson provides a complete range of Rosemount products for level measurement applications.

Vibrating Fork Switches – Point Level Detection

For high and low alarms, overflow protection, pump control, including wide pressure and temperature requirements, and hygienic applications. Flexible mounting. Immune to changing process conditions and suitable for most liquids.

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- Rosemount 2130 Enhanced
- Rosemount 2120 Full-featured
- Rosemount 2110 Compact

Pressure – Level or Interface Measurement

- Rosemount DP Level products are proven, reliable, and can be used in a variety of applications.
- Electronic Remote Sensors improve control on tall vessels and distillation towers
- Tuned-System Assemblies provide cost-efficient measurements and improved performance compared to traditional balanced systems
- 3051SAL, 3051L, and 2051L Level Transmitters combine world class pressure instrumentation with direct-mount seals
- 1199 Seal Systems enable measurements in broad range of process conditions and applications

Ultrasonic – Level Measurement

Top mounted, non-contacting for simple tank and open-air process level measurements. Unaffected by fluid properties such as density, viscosity, dirty coating, and corrosiveness.

Intrinsically Safe versions are available for operating in hazardous areas

- Rosemount 3100 Series Ultrasonic Level Transmitters
- Rosemount 3490 Series Universal Controllers

Guided Wave Radar – Level and Interface Measurement

Multivariable, loop-powered Guided Wave Radar transmitters with a wide range of probe styles to fit different liquids and solids applications. The product line consists of:

- Rosemount 3300 Series – Versatile and easy-to-use transmitter with proven reliability
- Rosemount 5300 Series – Accurate, superior performance transmitter with FOUNDATION™ fieldbus support

Non-contacting Radar – Level Measurement

The Rosemount non-contacting radar family consists of:

- Rosemount 5400 Series Transmitters – Loop-powered superior performance transmitter with a wide range of antennas, for liquid level measurement in most applications and process conditions
- Rosemount 5600 Series Transmitters – Power of 4-wire give maximum sensitivity and performance for solids, challenging reactors, rapid level changes and excessive process conditions.

Chambers for Process Level Instrumentation

- Rosemount 9901 chambers for external mounting of process level measurement and control instrumentation on process vessels
- Global quality assured design and manufacturing
- Optimized for Rosemount 3300 and 5300 Series GWR

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