

# Rosemount™ 5600 Series

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



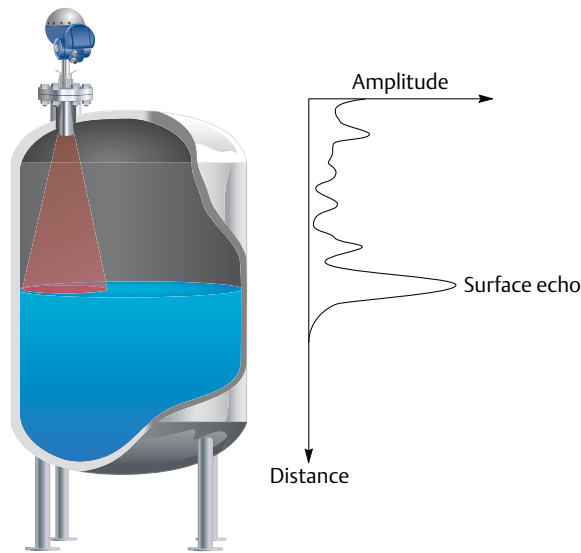
- Best performance and uptime provided by market leading sensitivity
- Unique signal processing allows for challenging process conditions
- Extremely reliable and accurate level transmitter due to its high repeatability
- Easy connection with adjustable power supply, 24-240 Vac/dc, 0-60 Hz
- Easy configuration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

## Contents

Ordering information .....	5	Product certifications .....	27
Specifications .....	14	Dimensional drawings .....	31

## 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

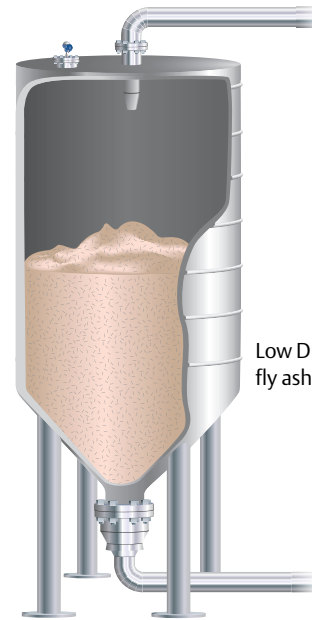
### Best performance and uptime

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

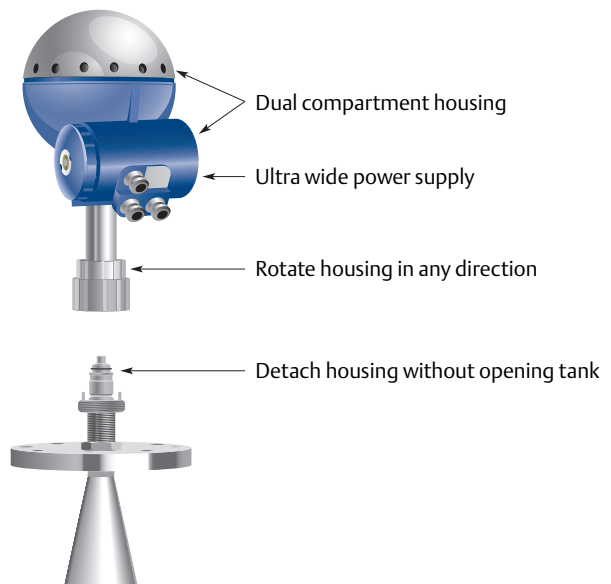
### Robust design reducing costs and increasing safety

- Detachable transmitter head allowing the tank to remain sealed
- Dual compartment housing separating cable connections and electronics, providing safer handling and improved moisture protection
- Adjustable power supply, 24-240 Vac/dc, 0-60 Hz
- Interchangeable transmitter heads and antennas
- Easy replacement by standard tank connections

Full range of antenna styles

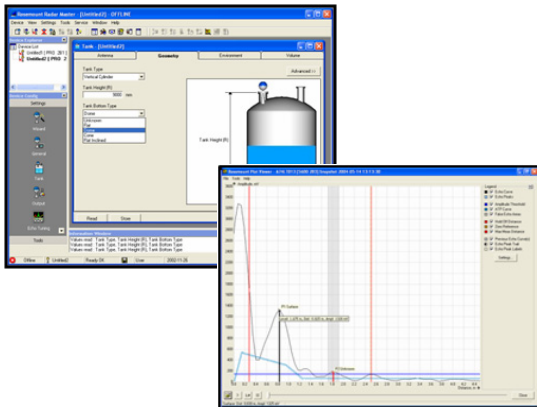


Low DK solids including lime, cement, fly ash, corn, and many more





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 including 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 reducing cost

- Non-contacting, no mechanical moving parts that require maintenance
- No re-calibration or compensation needed due to changing process conditions
- User-friendly software providing 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. (76.2 mm) (DN80) nozzles	SST 316L	Pipe installation only	★
24S	4-in. (101.6 mm) (DN100) nozzles	SST 316L	Free propagation or 4-in. pipe	★
26S	6-in. (152.4 mm) (DN150) nozzles	SST 316L	Free propagation or 6-in. 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. (76.2 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. (152.4 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. (76.2 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. (152.4 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. (76.2 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. (152.4 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 13</a> for flange options.	★
XX	Special process connection			
	<b>Tri-clamp connection</b>	<b>Flange material</b>	<b>Note</b>	
BT	3-in. (76.2 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. (101.6 mm) tri-clamp flange	SST 316L	Longer lead-time, consult factory	
DT	6-in. (152.4 mm) tri-clamp flange	SST 316L	Longer lead-time, consult factory	
ET	8-in. (203.2 mm) 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 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. (76.2 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. (152.4 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 <a href="#">Table 10 on page 13</a> 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 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. (152.4 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>	
<b>Stainless steel flange welded to antenna</b>			<b>Pressure and temperature<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. (152.4 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. (152.4 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)	
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 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 5 45S P V NR</b>				

1. Not suitable for use in Ex environments.