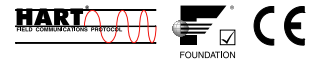


Rosemount 5600 Series Radar Level Transmitter

THE 5600 SERIES FEATURES:

- *Handles a wide range of process conditions due to high sensitivity and unique signal processing features*
- *High repeatability ensuring an extremely reliable and accurate level transmitter even in the toughest conditions*
- *Ultra-wide power supply, 24-240 V AC/DC, 0-60 Hz*
- *FOUNDATION™ fieldbus or analog 4-20 mA superimposed with HART®*
- *High flexibility with interchangeable transmitter heads and antennas*
- *No moving parts and no contact with the liquid*
- *Intelligent software support for easy configuration and setup*
- *Wide selection of antennas and materials*



Contents

Key Features	page 2
Specifications	page 8
Product Certifications	page 12
Dimensional Drawings	page 14
Ordering Information	page 20
Application and Configuration Data Sheet	page 28

Legendary Rosemount Performance Customized For Your Level Process Applications

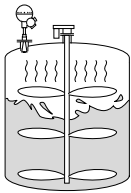
Introduction

The Rosemount 5600 Series is an intelligent non-contacting radar level transmitter. Its high performance microprocessor allows for advanced signal processing and smart echo-tracking features. Together with its high sensitivity the radar transmitter can detect and evaluate all echoes within the tank or vessel. The 5600 Series support and assist the user to a successful configuration of the transmitter in process level applications, from easy to complex process situations.

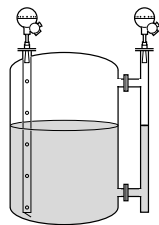
Applications

The Rosemount 5600 uses state-of-the art microwave technology to get highest reliability and precision. It measures the level of liquids, slurries, and solids. The transmitter operates in a wide range of temperatures, pressures, vapor gas mixtures, and various process conditions.

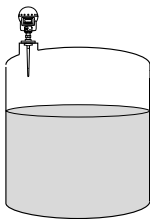
FIGURE 1. Rosemount 5600 Applications



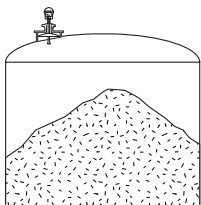
- Applications in process vessels with agitators require a radar transmitter with the 5600's high sensitivity and advanced signal processing to separate the measuring signal from noise created by disturbances.



- Still-pipe or bridle mounting is recommended for LPG applications, where the surface is sometimes boiling, and for some extremely turbulent conditions. The pipe reduces foam and turbulence and also increases surface reflection.



- The Rod antenna is suitable for small nozzle openings on tanks with short measuring range.



- With the parabolic antenna the 5600 Series is suitable for measurement of various types of solid materials (example: cement). Since solid materials quite often generate dusty environments inside their vessels and tanks, the parabolic antenna can be equipped with a protective PTFE cover which prevents dust from sticking to the transmitting portion of the antenna.

5600_PDS_BILD_11_10_09_8

Product Data Sheet

00813-0100-4024, Rev EA

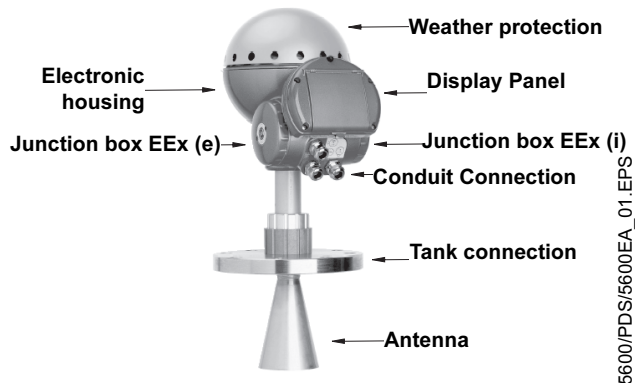
January 2006

Rosemount 5600 Series

Interchangeable Head

A 5600 Radar Level Transmitter consists of a Transmitter Head (TH) and a tank connection including antenna. The TH and the electronics inside are interchangeable without opening the tank.

FIGURE 2. Interchangeable Transmitter Head



Antennas

Rod Antenna

- Suitable for tanks with small openings.
- Existing tank flange can be used as the tank connection.

Cone Antenna

- Suitable for free-propagation and pipe mounted installation.
- Cone extensions are available (see Figure 17 on page Level-17 and Table 12 on page Level-24).
- Optional Cone antennas with cleaning/flushing connection are available (see Figure 17 on page Level-17 and Table 13 on page Level-24).

Process Seal Antenna

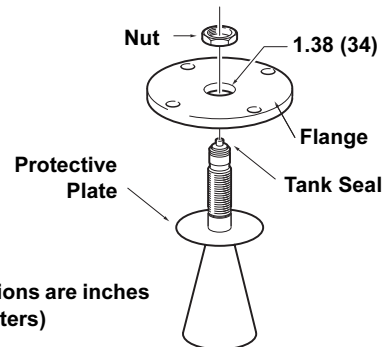
- The dish of the Process Seal is made of PTFE.
- Only exposes material suitable for hygienic or corrosive applications (see Figure 15 on page Level-16 and Table 10 on page Level-23).

Parabolic Antenna

- Suitable for solid materials (example: cement)
- Withstand heavy contamination
- Can be equipped with a PTFE protective cover to reduce the effects of dusty environments

Plate Design

FIGURE 3. Plate Design



Note
Dimensions are inches
(millimeters)

Cone and Rod antennas, except the Cone with Flushing Connection, are designed with a protective plate as shown in Figure 3. The plate and antenna (stainless steel 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. Loose flanges are available (Table 17 on page Level-26).

Rosemount 2210 Display Unit

The Rosemount 2210 offers basic configuration using the 4 software keys on the display itself. Data presentation on the LCD can be customized and allows many viewing alternatives. The 2210 is also used if temperature sensors are to be connected to the 5600 Series. See Table 7 on page Level-20 for available versions.

Electrical Connections

The transmitter has a power supply with an ultra-wide input range from 24 to 240 V AC or DC, 0-60 Hz.

The Transmitter Head has two separate junction boxes. One is for a non-intrinsically safe 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 Outputs can be HART or FOUNDATION fieldbus, either IS or Non-IS. The HART and secondary analog outputs can be either active or passive depending on required options.

Mechanical Mounting

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:

- 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.

FIGURE 4. Rosemount 5600 Beamwidth

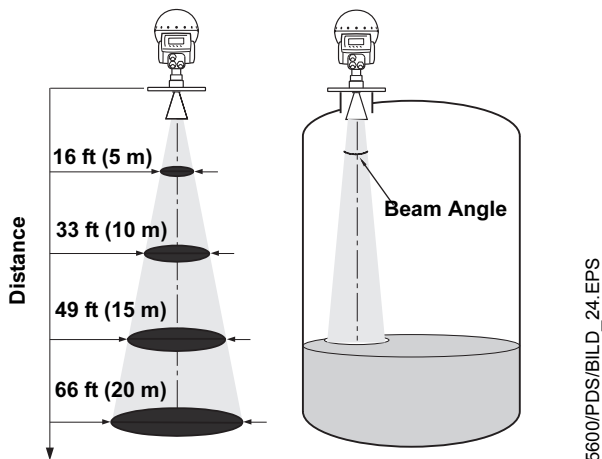
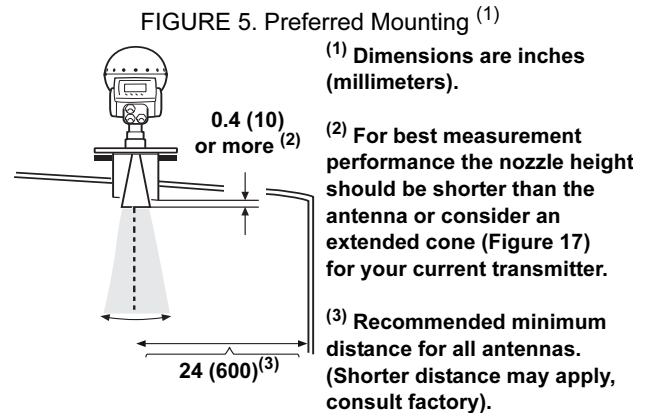


TABLE 1. Rosemount 5600 Beam Diameter and Angle

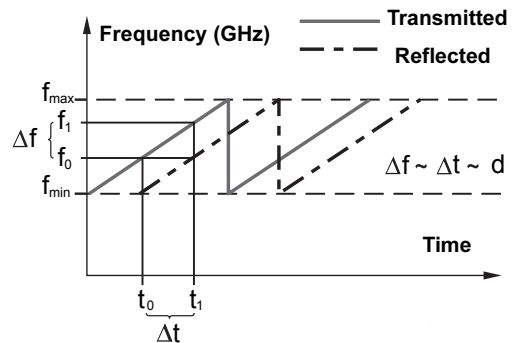
Antenna Type & Beam Angle	Distance, ft (m)			
	16 (5)	33 (10)	49 (15)	66 (20)
	Beam Diameter, ft (m)			
Cone 3 in 25°	7.2 (2.2)	14 (4.4)	22 (6.7)	29 (8.9)
Rod/Cone 4 in/ Process Seal 4 inch 21°	6.2 (1.9)	12 (3.7)	18 (5.6)	24 (7.4)
Cone 6 in/ Process Seal 6 inch 18°	5.2 (1.6)	10 (3.1)	15 (4.7)	21 (6.3)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



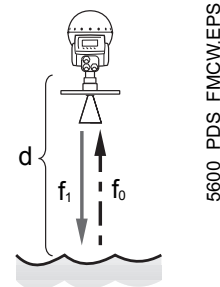
Measurement Principle

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 can be accurately calculated. This method is called FMCW (Frequency Modulated Continuous Wave) and is used in all high performance radar transmitters.

FIGURE 6. Frequency Modulated Continuous Wave



The FMCW method is based on a radar sweep with continuous changes in frequency.



Measuring Range

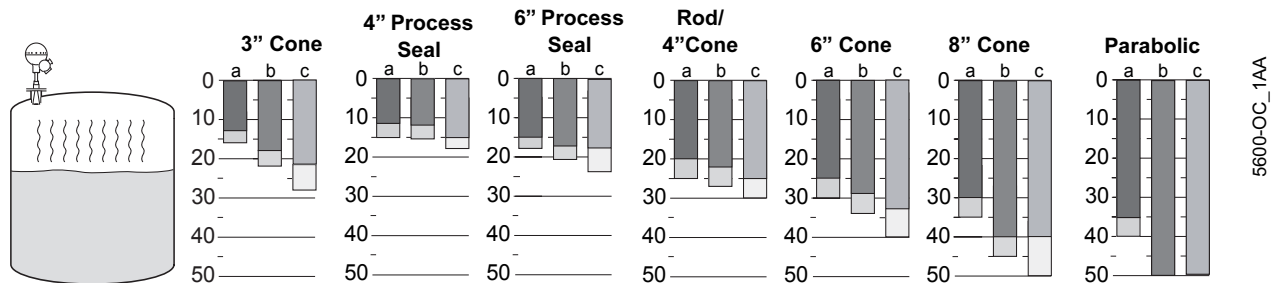
The diagrams below show how the measuring range is influenced by the antenna type, dielectric constant of the liquid (ϵ_r) and the process conditions. For optimum performance the maximum measuring distance should be kept within the range indicated with darker color in the diagrams. Values are valid for free propagation measurement without still-pipes (bridles).

For liquids with ϵ_r that are smaller than 1.9 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).

To increase the measuring range further in turbulent tanks, a still-pipe can be used. For still-pipe mounted 5600 transmitters the typical measuring range is 115-160 ft (35-50 m) in turbulent tanks with liquids having ϵ_r less than 1.9.

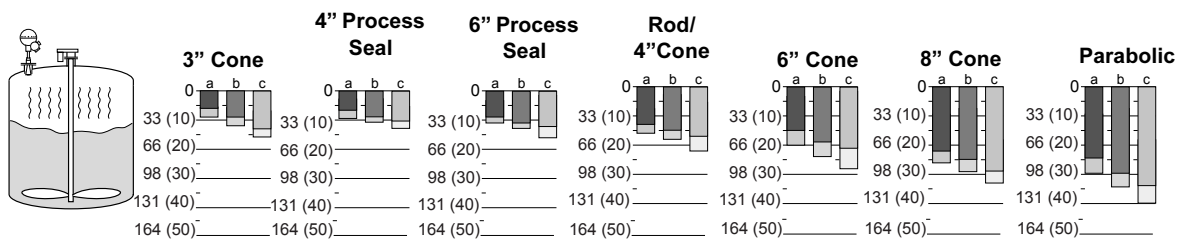
TABLE 2. Categories of liquids	
a	Oil, gasoline and other hydrocarbons, petrochemicals (dielectric constant, $\epsilon_r=1.9-4.0$)
b	Alcohols, concentrated acids, organic solvents, oil/water mixtures and acetone ($\epsilon_r=4.0-10$)
c	Conductive liquids, e.g. water based solutions, dilute acids and alkalis ($\epsilon_r > 10$)

FIGURE 7. Applications with calm product surface⁽¹⁾



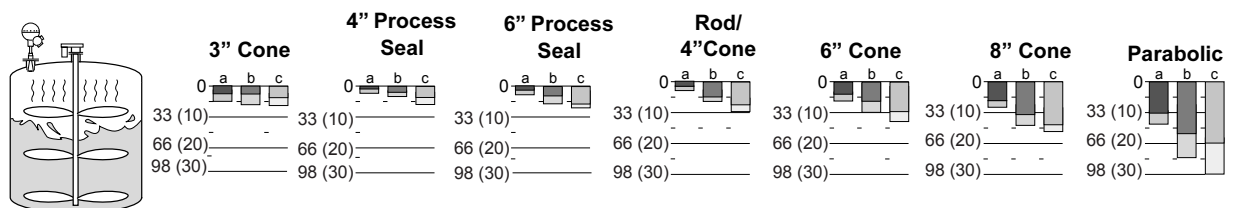
5600-OC_1AA

FIGURE 8. Applications where the product is gently stirred, causing minor turbulence⁽¹⁾



5600-OC_2AB

FIGURE 9. Applications with turbulent product surface conditions⁽¹⁾



5600-OC_3AB

Note: 4" and 6" Process Seal Cones are not recommended for turbulent conditions

(1) Measuring range in ft (m).

System Integration

Level values are transmitted from the transmitter as analog 4-20 mA signals superimposed with HART or FOUNDATION™ fieldbus. The analog outputs are either passive for connection to powered cables or active providing signal power for 4-20 mA. Analog outputs can also be specified as intrinsically safe or non-intrinsically safe.

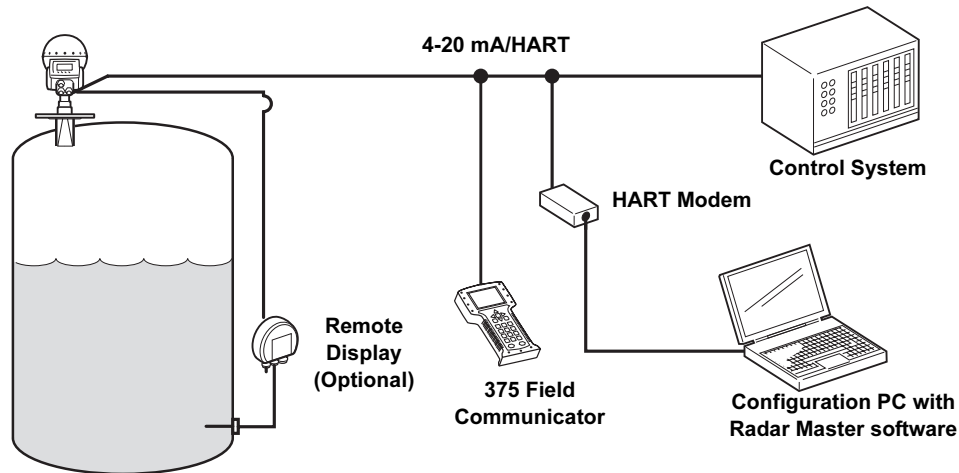
Basic configuration and setup can be done on a HART communicator, via the 2210 Display Unit, AMS, or DeltaV (for FOUNDATION fieldbus).

Rosemount Radar Master is a PC based software package which allows for full configuration, including advanced features such as Spectra plots, offline/online configuration capabilities, logging, extensive online help, etcetera. To communicate with the device using Radar Master either a HART or Modbus Modem (RS485 Sensor Bus Port) is required for the PC. For fieldbus devices Radar Master can only be connected to the Sensor Bus Port (see list of Modems on page 26).



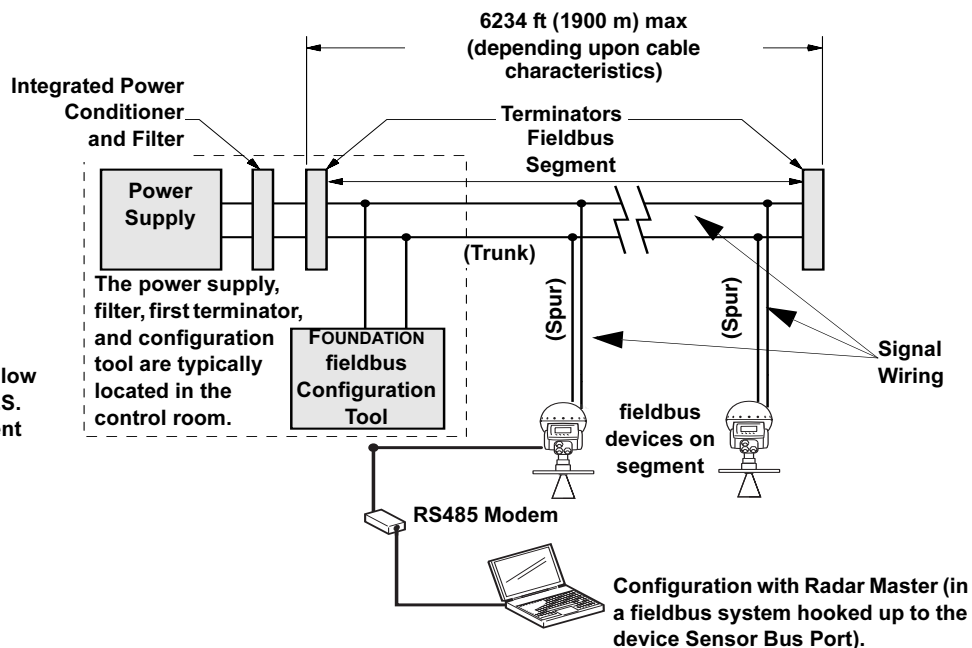
The Rosemount 5600 is a core component of the PlantWeb digital plant architecture.

FIGURE 10. System Integration using the HART Communicator



5600/PDS/BILD_1.EPS

FIGURE 11. FOUNDATION fieldbus field wiring



Note:
Intrinsically safe installations may allow fewer devices per I.S. barrier due to current limitations.

5600/PDS/5600_01A.EPS

Specifications

GENERAL

Product Designation

5600 Series Radar Level Transmitter

Operating Principle

10GHz FMCW radar

Beam Angle

See Figure 2-12 and Table 2-3 on page 9

Microwave Output Power

Max 1.0 mW

Internal Calibration

Internal digital reference for automatic compensation of radar sweep

Signal Processing

Powerful and advanced digital signal processing using FFT and advanced echo handling software

MEASURING PERFORMANCE

Instrument Accuracy (Under reference conditions)

±0.2 in (±5 mm)

Resolution

0.04 in (1 mm)

Temperature Stability

±500 ppm of measured distance within the ambient temperature range

Repeatability

±0.04 in (±1 mm)

Measuring Range

0-164 ft (0-50 m)

Update Time

100 ms

Processors

32-bit Floating DSP

DISPLAY/CONFIGURATION

Display (factory mounted on transmitter)

Protection class IP67

With weather/dirt protection cover; graphical LCD display 128 by 64 pixels with 4 control soft-keys and 7 text lines with 16 characters/line for display and configuration.

Display (remote mounted)

Same as above, mounted in separate enclosure, protection class IP67; max cable length, display - radar transmitter: 330 ft. (100 m); cable type: 4 wire shielded instrument cable, min. 0.5 mm², (AWG 20).

Display with Temperature Inputs (remote mounted)

Same as above, mounted in separate enclosure, protection class IP67; max cable length, display - radar transmitter: 330 ft (100 m); cable type: 4 wire shielded instrument cable, min. 0.5 mm², (AWG 20); temperature measurement 1-3 spot elements PT100 or CU100, or 6 spot elements with common return.

HART Device

Emerson Process Management 375 Field Communicator
Emerson Process Management AMS software

PC/remote Configuration

Rosemount Radar Master, Powerful and Interactive Windows based configuration tool.

Recommended PC hardware specification: ≥ 1 GHz processor, ≥ 128 MbRam, Operating system of Win 2000, Win XP, or Win NT.

To communicate with the device using Radar Master either a HART or Modbus Modem (RS485 Sensor Bus Port) is required for the PC.

For fieldbus devices Radar Master can only be connected to the Sensor Bus Port (see listed Modems on page 26).

ELECTRICAL

Power Supply

Ultra wide power supply 24-240 V AC or DC 0-60 Hz

NOTE

Minimum power required at transmitter power terminals is 20 V

Power Consumption

Maximum 10 W, Nominal 5 W

Outputs

Primary Output:

Alternative 1: HART[®] + 4-20 mA current loop
(non-IS or IS option)

Alternative 2: FOUNDATION[™] fieldbus (non-IS or IS option)

Secondary Outputs:

Analog 4-20 mA current loop, active or passive
(non-IS or IS option)

Analog Output Characteristics

Type

Analog 4-20 mA Current Loop, active (with power supplied by the 5600) or passive (for loop-supplied power)

Galvanic Isolation

> 1500 V RMS or DC

Analog Output Characteristics

See Product Certifications on page Level-12

Alarm Level

Standard: Low=3.8 mA, High=22 mA or freeze,
NAMUR NE43: High=22.50 mA,
Rosemount: Low=3.75 mA

Accuracy

±300 µA at 4 mA

±600 µA at 20mA

Resolution

0.5µA (0.003%)

Linearity

±0.01%

Temperature Drift

± 28 ppm/°F (±50 ppm/°C)

Output Impedance

>10 MΩ

Voltage Compliance

7-30 V (passive output)

External Loop Resistance

<700 Ω (passive output with 24 V external supply)

<300 Ω (active output)

Fieldbus Output Characteristics

Fieldbus Voltage limits: 9 to 32 V

Current Draw: 12.5 mA

For I.S. Applications:

$U_i < 30$ V

$I_i < 300$ mA

$P_i < 1.3$ W

$C_i = 0$ µF

$L_i = 0$ mH

Lift-off Minimum Voltage

9.0 V

Class

Link Master (LAS)

Number of Available VCRs

20

VCR Statistics

Yes

Execution Time

60 ms for AI-block

Instantiation

No (all blocks are instantiated per default)

Available Menus and Methods

Transducer Block

Configure Guage, Restart Device, Set to Factory Defaults,
Sensor Bus

Resource Function Block

Master Reset

Conforming FOUNDATION Fieldbus

ITK 4.6

Advanced 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

Output Cabling

Twisted and shielded pair; min. 0.5 mm² (AWG 20)

Cable Entries

3 × 1/2 inch NPT; for cable glands or conduit entries
Optional: 1/2 inch NPT Cable Gland Kit
Optional: 1/2 inch NPT/ M20 Adapters (Set of 3)

Remote 2210 Display Unit

2x M20 Entries
1x M25 Entry

2210 Display Unit Output Characteristics

With Temperature Output

See Product Certifications on page Level-12

Without Temperature Output

See Product Certifications on page Level-12

Temperature Measurement

1-3 spot elements, PT100 or CU100, or 6 spot elements with common return. Input accuracy ±0.9°F (±0.5°C)

Temperature Measurement Output

Average temperature or individual spots ⁽¹⁾

(1) Individual spots not available in Foundation fieldbus devices

MECHANICAL

Housing/Enclosure

Permanent moulded cast aluminium, chromed and powder painted

Flanges

ANSI, DIN standard,
Material: Stainless steel 316L and Stainless Steel EN 1.4404
Optional: Hot-galvanized carbon steel

Weight, Excluding, Flange

18 lbs (8 kg)

Height Above Flange

15 in (400 mm)

Antenna Dimensions

Cone: See Figure 13 on page Level-15
Rod: See Figure 12 on page Level-14
Process Seal: See Figure 15 and Table 6 on page Level-16
Extended Cone: See Figure 16 on page Level-17
Cone with Integrated Flushing Connection:
See Figure 17 on page Level-17
Parabolic: See Figure 18 on page Level-18

TABLE 3. Antenna material and o-ring selection ● Applicable - Not applicable

	Rod Antenna	Cone Antenna	Process Seal Antenna	Extended Cone Antenna	Cone with Integrated Flushing Connection	Parabolic Antenna
Material:						
Stainless Steel 316L	● ⁽¹⁾	●	-	●	●	●
Hastelloy® C22	-	●	-	-	-	-
Titanium Gr1/Gr2	-	●	-	-	-	-
Tantalum	-	●	-	-	-	-
Monel® 400	-	●	-	-	-	-
PTFE	● ⁽¹⁾	-	●	-	-	-
Tank Seal:						
PTFE	-	●	-	●	●	●
Quartz	-	●	-	●	●	-
O-Rings:						
Viton® Fluoroelastomer	●	●	-	●	●	●
Kalrez®	●	●	-	●	●	-
EPDM	●	●	-	●	●	-
Buna-N	●	●	-	●	●	-

(1) The Rod antenna is a combination of 316L SST and PTFE.

Product Data Sheet

00813-0100-4024, Rev EA
January 2006

Rosemount 5600 Series

ENVIRONMENTAL

Ambient Temperature

-40 to 70°C (-40 to 158°F)

LCD Readable between: -20 to 70 °C (-4 to 158 °F)

Process Temperature Range ⁽¹⁾

-40 to 752°F (-40 to 400°C)

Flange Temperature Range ⁽¹⁾

TABLE 4. 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)
Ethylene Propylene (EPDM)	-40 (-40)	266 (130)
Kalrez [®] 6375	-4 (-20)	527 (275)
Buna-N	-31 (-35)	230 (110)

Pressure Range ⁽¹⁾

Full vacuum to +798 psig (+55 bar), depending on antenna style

Emission Approvals

FCC: K8CPRO, K8CPROX

R&TTE: E813268O-CC

Humidity

IEC 60068-2-3

Climatic Class/Corrosion Class

IEC 68-2-1, IEC 60068-2-52 test KB severity 2

Ingress Protection

IP66, IP 67, and NEMA 4

Vibration

IEC 721-3-4 class 4M4

UV Protection

ISO 4892-2

Electromagnetic Compatibility

EN61326-1: 1997 incl A1:1998 and A2:2001, Immunity 50081-2, Emission 50081-1

Lightning Protection

EN61326, EN61000-4-5, IEC801-5, level 2 kV

Power Supply Fluctuation

IEC 92 Part 504 sec. 3.5

(1) See Figure 12, Figure 13, Figure 15, Figure 16, Figure 17, and Figure 18 for specification of each antenna.

Product Certifications

Approved Manufacturing Locations

Saab Rosemount Tank Radar AB – Gothenburg, Sweden

European Union Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales representative.

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 03ATEX 1294X

With Intrinsically Safe Outputs (only)

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


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

With Non-IS Primary Output and IS Display Output

ATEX Marking:  II (1) 1/2 GD

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

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

ATEX Marking:  II 1/2 GD

Safety Coding: EEx de IIC T6 (T_{amb} -40°C, +70°C)

Max supply voltage: 55 Vdc

Passive analog output 4-20mA,

Label identification = HART passive.

Voltage compliance 7-30V:

$U_i < 30 \text{ V}$

$I_i < 200 \text{ mA}$

$P_i < 1.3 \text{ W}$

$C_i = 0 \text{ } \mu\text{F}$

$L_i = 0 \text{ mH}$

Active analog output 4-20mA,

Label identification = HART active.

Max load 300Ω:

$U_o < 23.1 \text{ V}$

$I_o < 125.7 \text{ mA}$

$P_o < 0.726 \text{ W}$

$C_{\text{ext}} < 0.14 \text{ } \mu\text{F}$

$L_{\text{ext}} < 2.2 \text{ mH}$

FOUNDATION Fieldbus,

Label identification = FOUNDATION fieldbus.

$U_i < 30 \text{ V}$

$I_i < 300 \text{ mA}$

$P_i < 1.3 \text{ W}$

$C_i = 0 \text{ } \mu\text{F}$

$L_i = 0 \text{ mH}$

2210 Display Unit


E1 Certificate Number: Sira 00ATEX 2062

Without Temperature Inputs

ATEX Marking:  II 2 G

Safety Coding: EEx ib IIC T4 (T_{amb} -40°C, +70°C)

With Temperature Inputs

ATEX Marking:  II 2 (1) G

Safety Coding: EEx ib [ia] IIC T4, (T_{amb} -40°C, +70°C)

Product Data Sheet

00813-0100-4024, Rev EA

January 2006

Rosemount 5600 Series

Factory Mutual (FM)

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

E5 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)

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

E6 Certificate Number: 2003.153280-1346165

Without Temperature Inputs

Intrinsically safe EEx ib IIC T4, (T_{amb} -40°C, +70°C)

With Temperature Inputs

Intrinsically safe EEx ib [ia] IIC T4, (T_{amb} -40°C, +70°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 [ib] [ia] IIC T6 (T_{amb} -40 °C, +70 °C)

With Non-IS Primary Output and IS Display Output

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

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

Safety Coding: Ex de IIC T6 (T_{amb} -40 °C, +70 °C)

Max supply voltage: 55 Vdc

Passive analog output 4-20mA,

Label identification = HART® passive.

Voltage compliance 7-30V:

$U_i = 30$ V

$I_i = 200$ mA

$C_i = 0$ μ F

$L_i = 0$ mH

$U_o = 0$ V

$I_o = 0$ mA

$U_m = 250$ V rms

Active analog output 4-20mA,

Label identification = HART® active.

Max load 300 Ω :

$U_o = 23.1$ V

$I_o = 125.7$ mA

$P_o = 0.726$ W

$C_o = 0.14$ μ F

$L_o = 2.2$ mH

$C_i = 0$ μ F

$L_i = 0$ mH

FOUNDATION™ Fieldbus,

Label identification = FOUNDATION™ fieldbus.

$U_i < 30$ V

$I_i < 300$ mA

$P_i < 1.3$ W

$C_i = 0$ μ F

$L_i = 0$ mH

2210 Display Unit

E7 Certificate Number: IECEX SIR 05.0021

Without Temperature Inputs

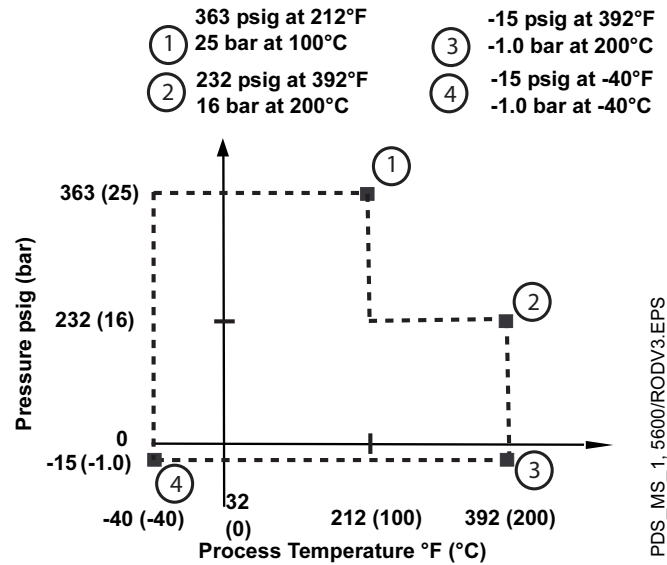
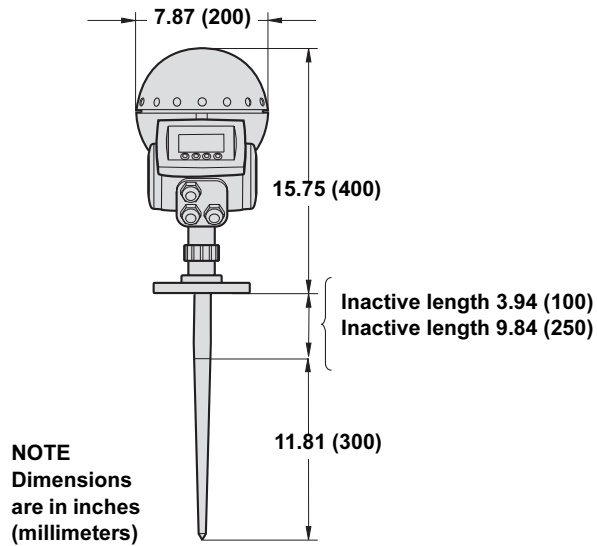
Safety Coding: Ex ib IIC T4 (T_{amb} -40°C, +70°C)

With Temperature Inputs

Safety Coding: Ex ib [ia] IIC T4 (T_{amb} -40°C, +70°C)

Dimensional Drawings

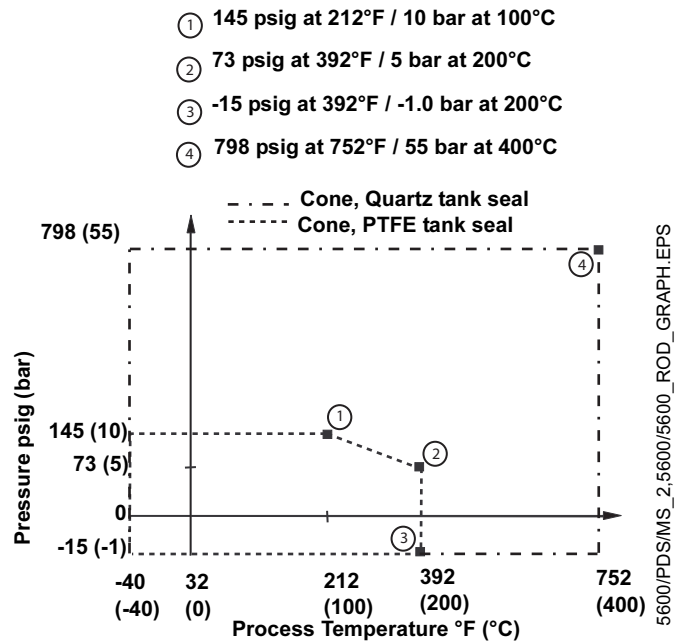
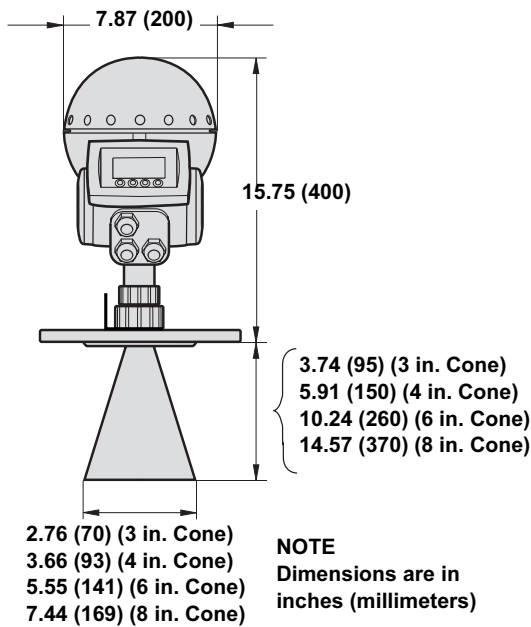
FIGURE 12. Rod Dimensions



PDS_MS_1_5600/RODV3.EPS

Note: Pressure rating may be lower depending on flange selection.
 Minimum / maximum flange temperature rating depends on O-ring selection (See Table 5 and Figure 14 on page Level-15).

FIGURE 13. Cone Dimensions

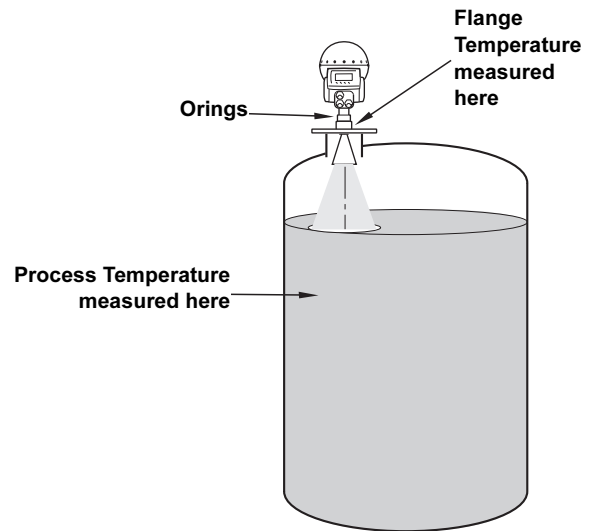


Note: Pressure rating may be lower depending on flange selection.
 Minimum / maximum flange temperature rating depends on O-ring selection (See Table 5 and Figure 14).

TABLE 5. 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)
Ethylene Propylene (EPDM)	-40 (-40)	266 (130)
Kalrez® 6375	-4 (-20)	527 (275)
Buna-N	-31 (-35)	230 (110)

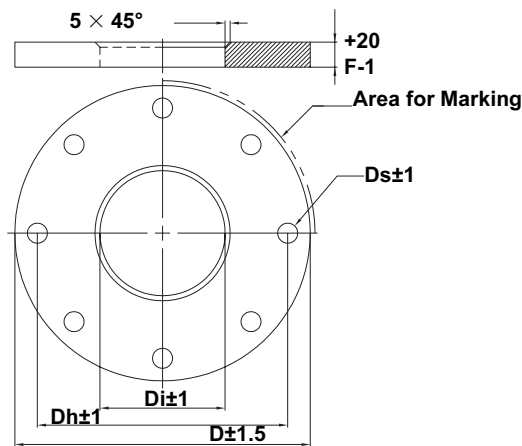
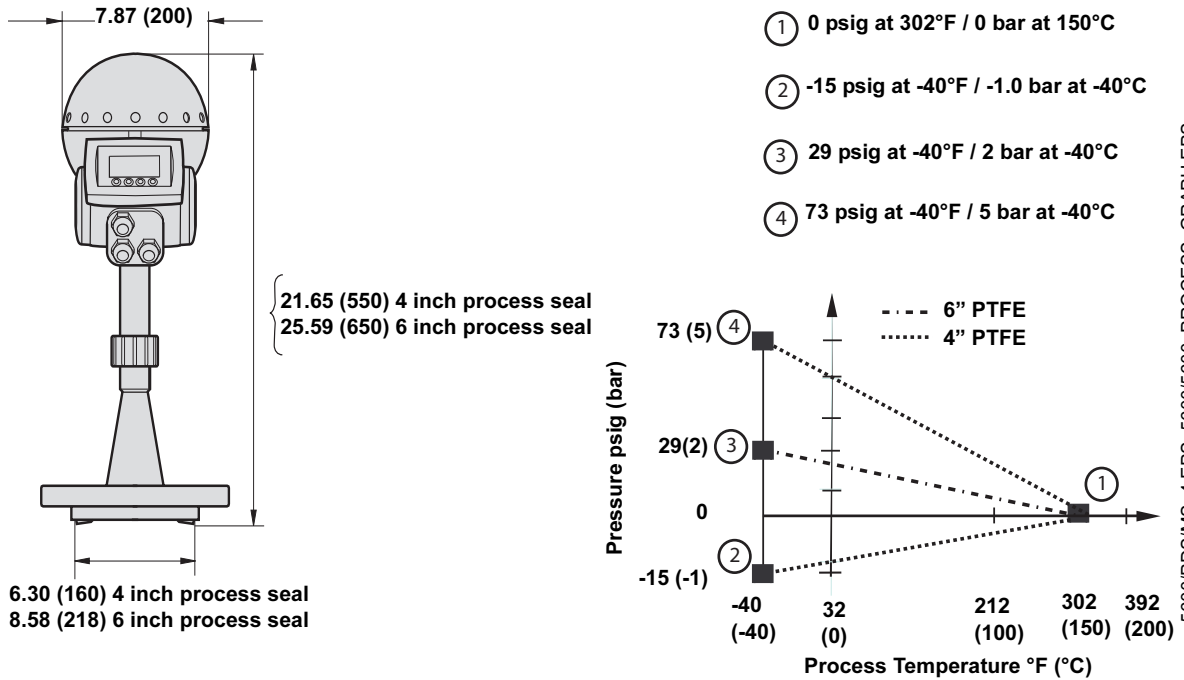
FIGURE 14. Temperature Rating Considerations



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

Rosemount 5600 Series

FIGURE 15. Process Seal Dimensions



Note
Dimensions are in inches (millimeters)

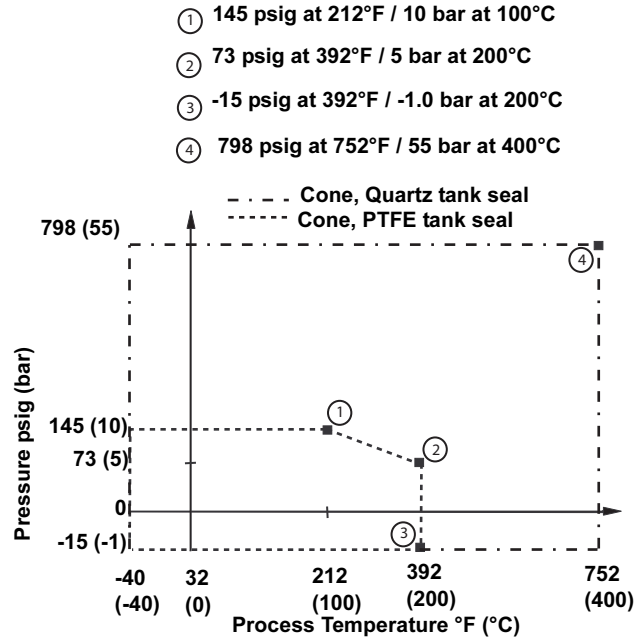
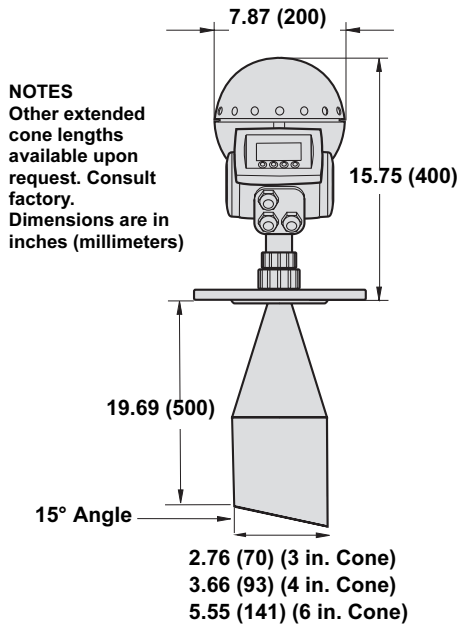
TABLE 6. Dimensions for Stainless Steel Flange and Galvanized Carbon Steel Dimensions are in inches (millimeters)

Flange	Di	D	Dh	Ds	F
ANSI 4 inch Class 150	3.78 (96)	9.02 (229)	7.52 (191)	0.87 (22)	0.87 (22)
ANSI 6 inch Class 150	4.94 (125.5)	10.98 (279)	9.49 (241)	0.87 (22)	0.87 (22)
DN100 PN16	3.78 (96)	8.66 (220)	7.09 (180)	0.71 (18)	0.87 (22)
DN150 PN16	4.94 (125.5)	11.22 (285)	9.45 (240)	0.87 (22)	0.87 (22)

5600/PDS/MS_4.EPS, 5600/5600_PROCESS_GRAPH.EPS

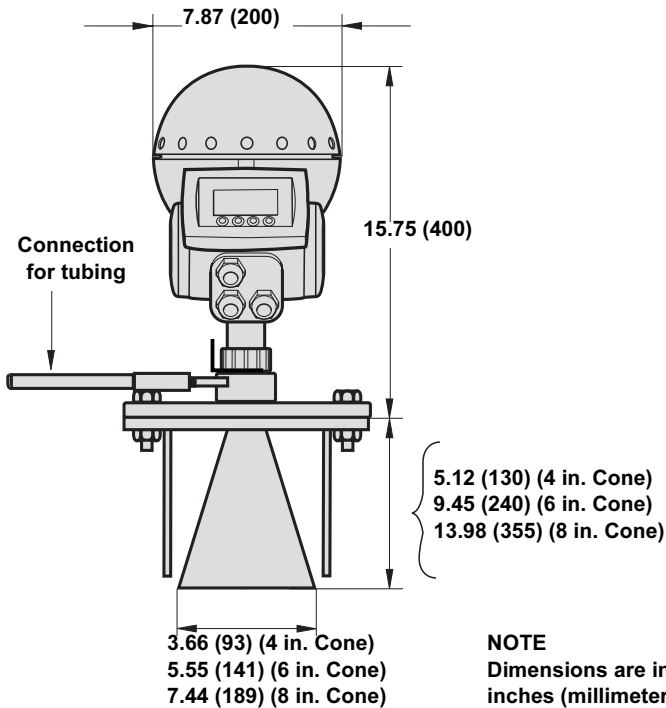
5600_D.D_9150070836AA

FIGURE 16. Extended Cone Dimensions for Stainless Steel Flange



Note: Pressure rating may be lower depending on flange selection.
 Minimum / maximum flange temperature rating depends on O-ring selection (See Table 5 and Figure 14 on page Level-15).

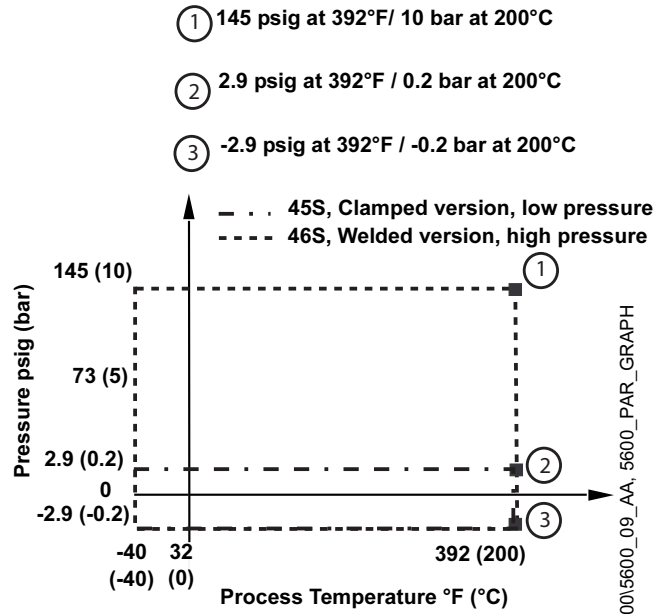
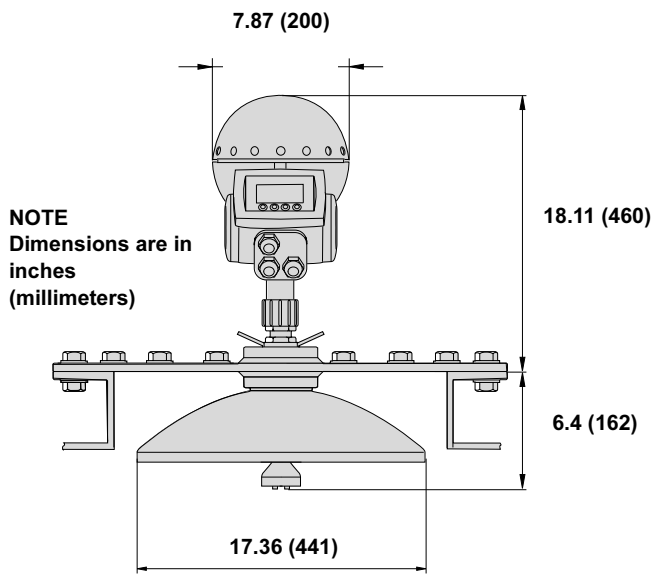
FIGURE 17. Cone with Integrated Flushing Connection Dimensions for Stainless Steel Flange



Maximum: 10 bar at 200 C (145 psig at 392 F)
 See Table 13 on page Level-24 for more

Note: Pressure rating may be lower depending on flange selection.
 Minimum / maximum flange temperature rating depends on O-ring selection (See Table 5 and Figure 14 on page Level-15).

FIGURE 18. Parabolic Dimensions for Stainless Steel Flange



Ordering Information

TABLE 7. Rosemount 5600 Radar Transmitter Selection

Model	Product Description
5601	Radar Level Transmitter for Process Applications
Code	Frequency Band
U	US Market Only (10 GHz)
S	Switzerland Market Only (10 GHz)
A	All Other Markets (10 GHz)
Code	Product Certification
E1	ATEX Flameproof
E5	FM Explosionproof
E6	CSA Explosionproof
E7	IECEX Flameproof
Code	Power Supply
P	24-240 V DC/AC 0-60 Hz
Code	Primary Output
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⁾
7A	FOUNDATION Fieldbus
7B	FOUNDATION Fieldbus, Intrinsically Safe Circuit ⁽¹⁾
Code	Secondary Output ⁽²⁾
0	None
1	4-20 mA, Passive Output ⁽³⁾
2	4-20 mA, Passive Output, Intrinsically Safe Circuit ⁽¹⁾
3	4-20 mA, Active Output ⁽³⁾
4	4-20 mA, Active Output, Intrinsically Safe Circuit ⁽¹⁾
Code	Display Unit
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)
Code	Volume Calculation
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 ⁽⁴⁾	

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

(4) Select the antenna type and options using Table 8, Table 9, Table 10, Table 12, and Table 13.

TABLE 8. Rod Antenna

Code	Antenna Type	Antenna Size	Antenna Material	Note
Rod				
11S		1.5 in. threaded version	SST 316L and PTFE	Inactive Length 4 inch (100 mm)
12S		2 in. (DN50) nozzles	SST 316L and PTFE	Inactive Length 4 inch (100 mm)
13S		3 in. (DN80) nozzles	SST 316L and PTFE	Inactive Length 4 inch (100 mm)
14S		4 in. (DN100) nozzles	SST 316L and PTFE	Inactive Length 4 inch (100 mm)
11L		1.5 in. threaded version	SST 316L and PTFE	Inactive Length 10 inch (250 mm)
12L		2 in. (DN50) nozzles	SST 316L and PTFE	Inactive Length 10 inch (250 mm)
13L		3 in. (DN80) nozzles	SST 316L and PTFE	Inactive Length 10 inch (250 mm)
14L		4 in. (DN100) nozzles	SST 316L and PTFE	Inactive Length 10 inch (250 mm)
1XX		Customer specific rod or material		Consult Factory
Code Tank Seal				
N		Not Applicable		
Code O-ring Material				
V		Viton® Fluoroelastomer		
K		Kalrez® 6375		
E		EPDM		
B		Buna-N		
Code Process Connection				
NR		Antenna with Plate Design		
		<i>NOTE: Customer supplied flange or see Table 17 on page Level-26 for flange options</i>		
XX		Special Process Connection		Consult Factory
Threaded Version				
TN		Threaded 1.5 in. NPT		
TB		Threaded 1.5 in. G		
Code Options				
Q8		Material Traceability Certification per EN 10204 3.1.B		
Typical Model Number: Selected code from Table 7 on page Level-20 11S N F TN				

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TABLE 9. Cone Antenna

Code	Antenna Type	Antenna Size	Antenna Material	Note
Cone				
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
23H		3 in. (DN80) nozzles	Hastelloy C22	Longer Lead-time, Consult Factory
24H		4 in. (DN100) nozzles	Hastelloy C22	Longer Lead-time, Consult Factory
26H		6 in. (DN150) nozzles	Hastelloy C22	Longer Lead-time, Consult Factory
28H		8 in. (DN200) nozzles	Hastelloy 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	Monel 400	Longer Lead-time, Consult Factory
24M		4 in. (DN100) nozzles	Monel 400	Longer Lead-time, Consult Factory
26M		6 in. (DN150) nozzles	Monel 400	Longer Lead-time, Consult Factory
28M		8 in. (DN200) nozzles	Monel 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
Code	Tank Seal			
P	PTFE			
Q	Quartz			
Code	O-ring Material			
V	Viton [®] Fluoroelastomer			
K	Kalrez [®] 6375			
E	EPDM			
B	Buna-N			
Code	Process Connection			
NR	Antenna with Plate Design <i>NOTE: Customer supplied flange or see Table 17 on page Level-26 for flange options</i>			
XX	Special Process Connection			Consult Factory
Code	Options			
Q8	Material Traceability Certification per EN 10204 3.1.B			
Typical Model Number: Selected code from Table 7 on page Level-20 24S P V NR				

TABLE 10. Process Seal Antenna

Code	Antenna Type	Antenna Size	Antenna Material	Note
Process Seal				
34S		4 in. (DN100) nozzles	PTFE	
36S		6 in. (DN150) nozzles	PTFE	
Code Tank Seal				
P		PTFE		
Code O-ring Material				
N		Not Applicable		
Code Process Connection				
NF		None, Customer to supply flange per dimensions on Figure 15		
XX		Special Process Connection		Consult Factory
Stainless Steel Flange				
CA		4 in. ANSI Class 150		
DA		6 in. ANSI Class 150		
JA		DN100 PN16		
KA		DN150 PN16		
Galvanized Carbon Steel Flange				
CC		4 in. ANSI Class 150		Longer Lead-Time, Consult Factory
DC		6 in. ANSI Class 150		Longer Lead-Time, Consult Factory
JC		DN100 PN16		Longer Lead-Time, Consult Factory
KC		DN150 PN16		Longer Lead-Time, Consult Factory
Code Options				
Q8		Material Traceability Certification per EN 10204 3.1.B		
Typical Model Number: Selected code from Table 7 on page Level-20 34S P N JA				

TABLE 11. Parabolic Antenna

Code	Antenna Type	Antenna Size	Antenna Material	Note
Parabolic				
45S		ø18 in. (440mm)	SST with Integrated Inclination	Clamped version
46S		ø18 in. (440mm)	SST with Integrated Inclination	Welded version
4XX		Customer Specific	Customer Specific	Consult Factory
Code Tank Seal				
P		PTFE		
Code O-ring Material				
V		Viton® Fluoroelastomer		
Code Process Connections				
NF		None, Flange Ready		
XX		Special Process Connection		Consult Factory
Code Options				
Q8		Material Traceability Certification per EN 10204 3.1.B		
PB		PTFE Protective Cover (PTFE Bag) Not suitable for hazardous applications.		
Typical Model Number: Selected code from Table 7 on page Level-20 45S P V NR				

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TABLE 12. Extended Cone Antenna

Code	Antenna Type	Antenna Size	Antenna Material	Note
Extended				
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
Code		Tank Seal		
P		PTFE		
Q		Quartz		
Code		O-ring Material		
V		Viton® Fluoroelastomer		
K		Kalrez® 6375		
E		EPDM		
B		Buna-N		
Code		Process Connections		
NR		Antenna with Plate Design <i>NOTE: Customer supplied flange or see Table 17 on page Level-26 for flange options</i>		
XX		Special Process Connection		Consult Factory
Code		Options		
Q8		Material Traceability Certification per EN 10204 3.1.B		
Typical Model Number: Selected code from Table 7 on page Level-20 76S P V NR				

TABLE 13. Cone Antenna with Integrated Flushing Connection

Code	Antenna Type	Antenna Size	Antenna Material	Note
Cone with Integrated Flushing Connection				
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
Code		Tank Seal		
P		PTFE		
Q		Quartz		
Code		O-ring Material		
V		Viton® Fluoroelastomer		
K		Kalrez® 6375		
E		EPDM		
B		Buna-N		
Code		Process Connection		
XX		Special Process Connection		Consult Factory
Stainless Steel Flange Welded to Antenna				
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)
Code		Options		
Q8		Material Traceability Certification per EN 10204 3.1.B		
Typical Model Number: Selected code from Table 7 on page Level-20 94S P K KL				

Product Data Sheet

00813-0100-4024, Rev EA
January 2006

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TABLE 14. Transmitter Options (multiple selections allowed)

Code	Options	
Material Traceability Certification		
Q8	Material Traceability Certification per EN 10204 3.1B	
Calibration Data Certification		
Q4	Calibration Data Certificate	
Software Configuration		
C1	Custom Software Configuration (CDS required with order)	
Alarm Limits		
C4	NAMUR Alarm Level, High Alarm	
C8	Low Alarm (Standard Rosemount Alarm)	
Conduit Adapters		
G1	1/2 inch NPT Cable Gland Kit	
G2	1/2 inch NPT/ M20 Adapters (Set of 3)	
Conduit Electrical Connector		
GE	M12, 4-pin, Male Connector (eurofast)	Note: Not available with certain hazardous location certifications. Contact an Emerson Process Management Representative for details.
GM	A size Mini, 4-pin, Male Connector (minifast)	
Protective Cover		
PB	PTFE Protective Cover (PTFE Bag)	Note: For Parabolic Antenna only. Not suitable for hazardous applications.
Special Procedures		
P1	Hydrostatic Testing	Note: Not available in combination with Parabolic Antenna option codes.
U1	TÜV Overfill Protection	Note: Requires Secondary Output Code 3 or 4 (Active Output)

TABLE 15. Typical Model Code Examples

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 Viton® Fluoroelastomer O-rings. No options.
5601 U E5 P 7A 2 T V 94S P K CL C1
FM approval, FOUNDATION™ fieldbus output and remote mounted display with temp inputs and a secondary 4-20mA passive IS output. Volume table with up to 100 points. 4 inch Cone Antenna with integrated cleaning, PTFE seal and kalrez® o-rings for high temperature and pressure. Flange is ANSI 4 inch Class 150 stainless steel. Custom configuration selected.

Accessories

TABLE 16. 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
Antenna Accessories		
05600-5001-0001	PTFE Protective Cover (PTFE Bag)	For Parabolic Antenna only. Not suitable for hazardous applications.

Rod and Cone Antenna Flanges

TABLE 17. 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⁾
Galvanized Carbon Steel Flanges (Note: Longer Lead-time, Consult Factory)			
Part Number	Flange Size	Dimensions	Material
05600-1811-0210	ANSI 2 inch Class 150	Acc. To ANSI B16.5	CS ⁽¹⁾
05600-1811-0230	ANSI 2 inch Class 300	Acc. To ANSI B16.5	CS ⁽¹⁾
05600-1811-0310	ANSI 3 inch Class 150	Acc. To ANSI B16.5	CS
05600-1811-0330	ANSI 3 inch Class 300	Acc. To ANSI B16.5	CS
05600-1811-0410	ANSI 4 inch Class 150	Acc. To ANSI B16.5	CS
05600-1811-0430	ANSI 4 inch Class 300	Acc. To ANSI B16.5	CS
05600-1811-0610	ANSI 6 inch Class 150	Acc. To ANSI B16.5	CS
05600-1811-0810	ANSI 8 inch Class 150	Acc. To ANSI B16.5	CS
05600-1810-0230	DN50 PN40	Acc. To EN 1092-1	CS ⁽²⁾
05600-1810-0310	DN80 PN16	Acc. To EN 1092-1	CS ⁽²⁾
05600-1810-0330	DN80 PN40	Acc. To EN 1092-1	CS ⁽²⁾
05600-1810-0410	DN100 PN16	Acc. To EN 1092-1	CS ⁽²⁾
05600-1810-0430	DN100 PN40	Acc. To EN 1092-1	CS ⁽²⁾
05600-1810-0610	DN150 PN16	Acc. To EN 1092-1	CS ⁽²⁾
05600-1810-0810	DN200 PN16	Acc. To EN 1092-1	CS ⁽²⁾

(1) Use gasket type Ia.

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

Application and Configuration Data Sheet

Always fill out the Application Section for ordering and pre-order support.

Fill out the Application Section AND the Configuration Section if the C1 option is ordered.

For a complete list of C1 parameters see last page.

Bold parameters are very important for evaluation of the application and configuration of the device. They should always be filled out.

APPLICATION SECTION

Always fill out this section.

Customer and Sales Person Information

Customer/ End User: _____ Customer Contact: _____

Field Sales Person: _____ Customer Phone/E-mail: _____

Final Destination: _____
(city), (state, province), (country)

Industry:	<input type="checkbox"/> Chemical	<input type="checkbox"/> Power
	<input type="checkbox"/> Food and Beverage	<input type="checkbox"/> Pulp and Paper
	<input type="checkbox"/> Life Sciences	<input type="checkbox"/> Refining
	<input type="checkbox"/> Metals and Mining	<input type="checkbox"/> Water and Waste Water
	<input type="checkbox"/> Oil and Gas	<input type="checkbox"/> Other _____

Process Information

Process Name: _____ Measurement Type: Liquid Level Solid Level
 Interface Level/Interface

Process Media: _____ Dielectric Constant⁽¹⁾: 1.4-1.9 4.0-10.0
 1.9-2.5 >10
 2.5-4.0 Unknown

Process Temperature:

Minimum: _____ degrees F
 degrees C

Maximum: _____ degrees F
 degrees C

Process Pressure:

Minimum: _____ psig
 bar

Maximum: _____ psig
 bar

Process Information (Continued)

Is Vapor Present: None Light Medium Heavy

Turbulence Type: Calm Surface Gently Stirred Turbulent Conditions

Turbulence due to: Chemical Reaction
 Bubbling/boiling
 Agitation
 Air lance
 Splashing during fill

Foam Present: Not Applicable Occasionally Constantly

Foam Type: Not Applicable
 Light (Airy)
 Medium
 Heavy (Dense)

Foam Thickness: _____ Inches
 Millimeters

Rapid Level Changes⁽²⁾ No >1.6-in./s (40 mm/s) > 3.9-in./s (100 mm/s)

Product Build-up Potential: None Film Heavy

Viscosity Most Similar To: Water Olive Oil Syrup/Molasses
 Machine Oil Honey Tar

at Temperature: _____ degrees F degrees C

(1) If Interface Measurement, enter DC of lower product. DC of upper product entered on Page 2.

(2) Due to overall level changes, not to turbulent surface.

Rosemount 5600 Series

Process Information (Continued)

For Interface Products Only⁽¹⁾

Upper Product: _____

Maximum Upper Product Thickness: _____ mm m ft in

Upper Product Dielectric Constant: _____

Fully Submerged Probe⁽²⁾ No Yes

(1) Not available with the Rosemount 5400 and 5600.

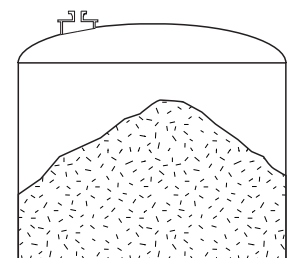
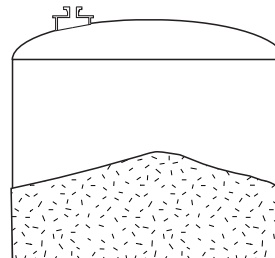
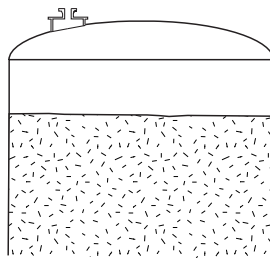
(2) If the probe is fully submerged at all times, the Rosemount 3301 can be used for measuring the interface between the upper and the lower product.

For Solid Products Only⁽¹⁾

Dust: None Constantly Occasionally

Particle Size Most Similar To: Wood chips Fine dust (flour, cement) Grains (rice, corn)
 Small stone/gravel Small rocks/chunks (limestone)

Fill Cycle Surface Profile: Relatively Flat Moderate incline Steep Incline



Material Density: _____ lbs/ft³
 kg/l

(1) Available with the Rosemount 3300 and 5600 only.

Tank Geometry (Required for C1 option)

Tank Shape: Unknown Vertical cylinder
 Spherical Horizontal Cylinder
 Cubical Other (describe: _____)

Tank Material of Construction: Metal Glass lined
 Non-metal Other: _____

Tank Bottom: Unknown
 Flat
 Dome/Dish/Bullet
 Cone
 Other (Inclined or obstructed due to heating coils, pipes, etc.).

Reference Height (R): _____ mm m ft in

Tank Diameter(D): _____ mm m ft in

Tank Nozzle Distance to Wall (d): _____ mm m ft in

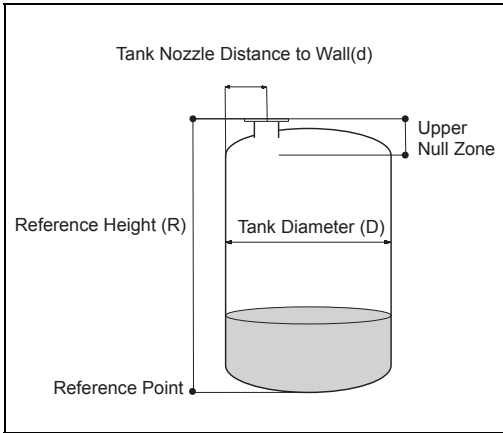
Agitator⁽¹⁾: No Yes

Baffles⁽¹⁾: No Yes

Heating Coils⁽¹⁾: No Around inside of tank wall
 Across Tank bottom

Other Internal Obstacles⁽¹⁾: No Yes

Upper Null Zone⁽²⁾: _____ mm cm m ft in



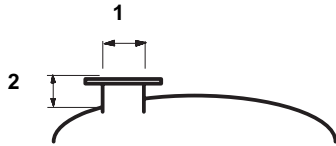
(1) If the answer to this question is 'Yes', please provide a drawing.

(2) The transmitter will not consider echoes in this area. Normally set to suppress nozzle echoes. Preset for 5400 and 5600 based on antenna selection.

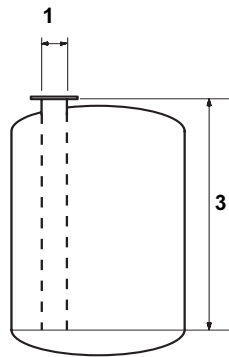
Rosemount 5600 Series

Fitting Dimensions

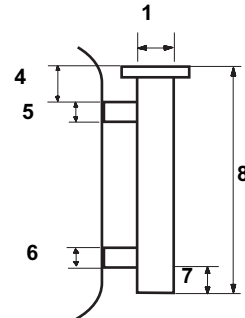
Nozzle



Stilling Well



Bypass Pipe



1. Flange / Thread

- 1-in. NPT / G
- 1.5-in. NPT / G
- 2-in. / DN 50
- 3-in. / DN 80
- 4-in. / DN 100

- 6-in. / DN 150
- 8-in. / DN 200
- Fisher 249B (for Rosemount 3300, bypass pipe)
- Fisher 249C (for Rosemount 3300, bypass pipe)
- Masoneilan (for Rosemount 3300, bypass pipe)

Pressure Class

- 150 lb.
- 300 lb.
- 600 lb.

- PN 16
- PN 40
- PN 64

Other _____

Dimensions

Nozzle 2. _____ in. ft mm cm m

Stilling Well 3. _____ in. ft mm cm m

Bypass Pipe 4. _____ in. ft mm cm m

5. _____

6. _____

7. _____

8. _____

Mounting Nozzle has a valve
Is an isolation window desired?

- Yes No
- Yes No

Additional Application Information

Preferred Device Type: Contacting Non-Contacting

Additional Comments: _____

CONFIGURATION SECTION

Fill out this section if the C1 option (Basic Pre-configuration) is ordered.

Note that the Application Section is required also.

★ Indicates Default Factory Configuration

Customer Information, Model Code, and Tagging Information (Required for C1 option)

Model Number:
(Options)

PO Number: SO Number:

Hardware Tag: (21 characters max) Software Tag: (8 characters max)

Unit Selection

Variable Units
 Use the chosen variable when filling in values in this form

Level: ft in m **mm★**

Volume: cubic feet US gals **cubic meters★** oil barrels

Analog Output (4-20 mA analog output) (Not applicable for FOUNDATION fieldbus devices)

Analog Output 1

Variable Assignment (available in all Radar Transmitters, unless noted)

<input type="checkbox"/>	Level★	<input type="checkbox"/>	Interface Level (3300 only)
<input type="checkbox"/>	Distance	<input type="checkbox"/>	Interface Distance (3300 only)
<input type="checkbox"/>	Upper Product Thickness (3300 only)		
<input type="checkbox"/>	Signal Strength (5400 and 5600 only)		
<input type="checkbox"/>	Volume		

Lower Range Value (4mA):

Upper Range Value (20mA):

Analog Output 2⁽¹⁾

Variable Assignment:

<input type="checkbox"/>	Level	<input type="checkbox"/>	Distance
<input type="checkbox"/>	Signal Strength	<input type="checkbox"/>	Volume

Lower Range Value (4mA)

Upper Range Value (20mA)

Other HART Variable Assignments:
 SV (Available in all Radar Transmitters, unless noted)⁽²⁾:

<input type="checkbox"/>	Level★
<input type="checkbox"/>	Distance
<input type="checkbox"/>	Interface Level (3300 only)
<input type="checkbox"/>	Interface Distance (3300 only)
<input type="checkbox"/>	Upper Product Thickness (3300 only)
<input type="checkbox"/>	Signal Strength (5400 and 5600 only)
<input type="checkbox"/>	Volume

(1) Available with the Rosemount 5600 only.
 (2) If an Analog Out 2 variable is selected the SV HART will have the same variable assignment.

LCD Meter Configuration - Only if M1 is ordered⁽¹⁾

Variables: Level Distance Volume⁽²⁾ Interface Level⁽³⁾
 Interface Distance⁽³⁾ % of Range Upper Product Thickness⁽³⁾ Signal Strength⁽⁴⁾

Variable units according to previous table. Carousel Toggling is used to present more than one variable.

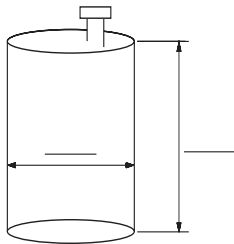
- (1) Pre-configuration of display is not available with Rosemount 5600.
- (2) For meaningful volume units, the remainder of this CDS needs to be filled out.
- (3) Not available with the Rosemount 5400 and 5600.
- (4) Not available with the Rosemount 3300.

Volume Calculation (If applicable)

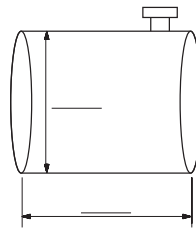
Volume is calculated based on ideal shapes or by a strapping table.
 If volume calculation based on strapping table is needed, please provide an additional file with volume table to be imported or fill in the next page.
 The maximum strapping table points are 10 for the 3300, 20 for the 5400, and 100 for the 5600.

If your transmitter is an ideal shape, please select what ideal shape to use. Add the dimensions for the selected shape.

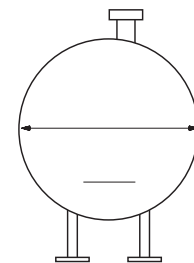
Vertical Cylinder
 Dimensions (*include units*):



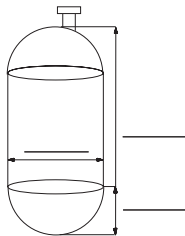
Horizontal Cylinder
 Dimensions (*include units*):



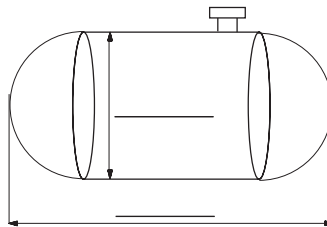
Sphere
 Dimensions (*include units*):



Vertical Cylinder with Bullet Ends⁽¹⁾
 Dimensions (*include units*):



Horizontal Cylinder with Bullet Ends⁽¹⁾
 Dimensions (*include units*):



(1) Available for the Rosemount 3300 and 5400 only.

Product Data Sheet

00813-0100-4024, Rev EA

January 2006

Rosemount 5600 Series

Rosemount 5600 Strapping Table

Pre-configuration of strapping table available only for Rosemount 5600. Strapping table is available for the Rosemount 3300 and 5400 also, but is not included in C1 basic configuration for these transmitters. (Up to 10 points for the Rosemount 3300, 20 for the Rosemount 5400, and 100 points for the 5600 can be used. Data may be submitted to the factory using a data spreadsheet program).

Strap Point Number	Level	Volume
1 (Bottom of Tank)		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

C1 parameters

3300: Hardware Tag, Software Tag, Dielectric Constant/s, Primary Variable Assignment, Secondary Variable Assignment, Variable Units Level, Variable Units Volume, LRV, URV, RGH, Upper Null Zone, LCD Configuration, Volume Configuration (Ideal Tank Shapes)

5400: Hardware Tag, Software Tag, Dielectric Constant, Turbulence Type, Foam Type, Rapid Level Changes, Variable Unit Level, Variable Unit Volume, Primary Variable Assignment, LRV, URV, Tank Shape, Tank Bottom, RGH, LCD Configuration, Fitting Type, Pipe Diameter, Volume Configuration (Ideal Tank Shapes)

5600: Hardware Tag, Software Tag, Dielectric Constant, Rapid Level Changes, Solid Product, Foam, Turbulence, Tank Shape, Tank Bottom, RGH, Primary Variable Assignment, LRV, URV, Secondary Variable Assignment (if ordered), Secondary LRV, Secondary URV, Volume Configuration (Ideal Tank Shapes or Strapping Table)

Rosemount Level Solutions

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

Pressure – Level or Interface Measurement

Emerson has a complete line of Rosemount pressure transmitters and remote seals for measuring level or interfaces in liquid applications. Optimize performance with direct mount, Tuned Seal systems:

- Rosemount 3051S_L, 3051L, and 1151LT Liquid Level Transmitters
- Rosemount 1199 Remote Diaphragm Seals with direct mount or capillary connections

Guided Wave Radar – Level and Interface Measurement

The reliable Rosemount 3300 Series consists of:

- Rosemount 3301 for level measurements of liquids and solids
- Rosemount 3302 for level and interface measurement of liquids

Both can be equipped with a wide range of probes for different applications.

Non-contacting Radar – Level Measurement

The Rosemount non-contacting radar family consists of:

- Rosemount 5400 Series Transmitters – The two loop-powered models utilize different transmitter frequencies, and both can be equipped with a wide range of antennas for liquid level measurement in most applications and process conditions
- Rosemount 5600 Series Transmitters – These radar level transmitters have ultra-high sensitivity and are the perfect choice for measuring level of liquids and solids, even for the most challenging applications

Vibrating Fork Switches – Point Level Detection

The Rosemount 2100 Series is developed for reliable point level measurement of liquids and consists of:

- Rosemount 2110 Compact Vibrating Fork Liquid Level Switch
- Rosemount 2120 Universal Vibrating Fork Liquid Level Switch

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