Rosemount™ 3300 Level Transmitter

Guided Wave Radar
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1  About this guide

This start guide provides basic guidelines for the Rosemount 3300 Level Transmitter. Refer to Rosemount 3300 Level Transmitter Reference Manual for more instructions. The manual and this Quick Start Guide (QSG) are also available electronically on Emerson.com/Rosemount.

⚠️ WARNING

Failure to follow safe installation and servicing guidelines could result in death or serious injury.

- Make sure only qualified personnel perform installation or service.
- Use the equipment only as specified in this Quick Start Guide and the Reference Manual. Failure to do so may impair the protection provided by the equipment.
- Do not perform any service other than those contained in this manual unless you are qualified.
- Flamepath joints are not for repair. Contact the manufacturer.

Explosions could result in death or serious injury.

- Verify that the operating environment of the transmitter is consistent with the appropriate hazardous locations specifications. See Product certifications in this Quick Start Guide.
- In an explosion-proof/flameproof installation, do not remove the transmitter covers when power is applied to the unit.
- Before connecting a handheld communicator in an explosive atmosphere, ensure the instruments are installed in accordance with intrinsically safe or non-incendive field wiring practices.
- To avoid process leaks, only use the O-ring designed to seal with the corresponding flange adapter.

Electrical shock could cause death or serious injury.

- Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.
- Make sure the mains power to the transmitter is off and the lines to any other external power source are disconnected or not powered while wiring the transmitter.

Temperature restrictions apply for Explosion-proof versions. For limits, see certificate-specific information in the Product certifications chapter in this document.
**WARNING**

The electronics enclosures are category 2G or 2D equipment. The probes not covered with plastic and not made of titanium, are category 1G or 1D. The plastic covered probes or probes made of titanium, are only category 1G equipment.

Probes with non-conducting surfaces and light metals:

- Probes covered with plastic and/or with plastic discs may generate an ignition-capable level of electrostatic charge under certain extreme conditions. Therefore, when the probe is used in a potentially explosive atmosphere, appropriate measures must be taken to prevent electrostatic discharge. These probes are not allowed in dust classified areas.

The following probes do not contain plastic or PTFE material, and are allowed to be placed in a Dust classified area:

**Table 1-1: Probes Containing no Plastic or PTFE Material**

<table>
<thead>
<tr>
<th>Code</th>
<th>Material of construction: Process connection/Probe</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>316L SST (EN 1.4404)</td>
</tr>
<tr>
<td>2</td>
<td>Alloy C-276 (UNS N10276) plate design if flanged version</td>
</tr>
<tr>
<td>3</td>
<td>Alloy 400 (UNS N04400) plate design if flanged version</td>
</tr>
<tr>
<td>5</td>
<td>Titanium Gr-1 and Gr-2</td>
</tr>
<tr>
<td>9</td>
<td>Duplex 2205 (EN 1.4462/UNS S31803) (plate design if flanged version)</td>
</tr>
<tr>
<td>L</td>
<td>Alloy 625 (UNS N06625)</td>
</tr>
<tr>
<td>M</td>
<td>Alloy 400 (UNS N04400)</td>
</tr>
<tr>
<td>H</td>
<td>Alloy C-276 (UNS N10276)</td>
</tr>
<tr>
<td>D</td>
<td>Duplex 2205 (EN 1.4462/UNS S31803)</td>
</tr>
</tbody>
</table>

The Material of Construction Code can be found in the ninth character position of the transmitter model code (for example 330xxxxx1xxxxxxx).
• Probes and flanges containing >7.5 percent magnesium or zirconium are not allowed in explosive dust atmosphere. Contact your Emerson sales representative for more information.

Probes and flanges containing light metals:

• When used in category 1/2G installations, probes and flanges containing titanium or zirconium must be mounted in such a way that sparks from impact or friction between these parts and steel cannot occur.

⚠️ WARNING

Any substitution of non-authorized parts or repair, other than exchanging the complete transmitter head or probe assembly, may jeopardize safety and is prohibited.

• Unauthorized changes to the product are strictly prohibited as they may unintentionally and unpredictably alter performance and jeopardize safety. Unauthorized changes that interfere with the integrity of the welds or flanges, such as making additional perforations, compromise product integrity and safety. Equipment ratings and certifications are no longer valid on any products that have been damaged or modified without the prior written permission of Emerson. Any continued use of product that has been damaged or modified without the written authorization is at the customer’s sole risk and expense.
WARNING

Physical access

Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users’ equipment. This could be intentional or unintentional and needs to be protected against.

Physical security is an important part of any security program and fundamental to protecting your system. Restrict physical access by unauthorized personnel to protect end users’ assets. This is true for all systems used within the facility.
2 Mount the transmitter head/probe

2.1 Tank connection with flange

Prerequisites

**Note**
PTFE covered probes must be handled carefully to prevent damage to the coating.

Procedure

1. Place a suitable gasket on top of the tank flange.

   ![Suitable gasket](image)

   **Note**
   Gasket should not be used for PTFE covered probe with protective plate.

   A. PTFE covered probe with protective plate

2. Lower the transmitter and probe with flange into the tank.
3. Tighten bolts and nuts with sufficient torque for the flange and gasket choice.

4. Loosen the nut that connects the transmitter head to the probe slightly.

5. Rotate the transmitter housing so the cable entries/display face the desired direction.
6. Tighten the nut.

![Image of tightening nut with 60 mm and Torque 30 Lbft (40 Nm)]

2.2 Threaded tank connection

**Prerequisites**

**Note**
PTFE covered probes must be handled carefully to prevent damage to the coating.

**Procedure**

1. For adapters with BSPP (G) threads, place a suitable gasket on top of the tank flange.

![Image of gasket placement]

2. For adapters with NPT threads, use anti-seize paste or PTFE tape according to your site procedures.

![Image of anti-seize paste and PTFE tape usage]
3. Lower the transmitter and probe into the tank.

4. Loosen the nut that connects the transmitter head to the probe slightly.

5. Screw the adapter into the process connection.
6. Rotate the transmitter housing so the cable entries/display face the desired direction.

7. Tighten the nut.

Torque 30 Lbft (40 Nm)
60 mm
2.3 Tank connection with Tri-Clamp®

Prerequisites

Note
PTFE covered probes must be handled carefully to prevent damage to the coating.

Procedure

1. Place a suitable gasket on top of the tank flange.

2. Lower the transmitter and probe into the tank.

3. Tighten the clamp to the recommended torque (see the manufacturer's instruction manual).
4. Loosen the nut that connects the transmitter head to the probe slightly.

5. Rotate the transmitter housing so the cable entries/display face the desired direction.

6. Tighten the nut.

**Torque 30 Lbft (40 Nm)**
2.4 Bracket mounting

**Procedure**

1. Mount the bracket to the pipe/wall.
   
   **On pipe:**
   
   ![Diagram of bracket mounting on pipe]
   
   - **A. Horizontal pipe**
   - **B. Vertical pipe**

   **On wall:**
   
   ![Diagram of bracket mounting on wall]

2. Mount the transmitter with probe to the bracket.
2.5 Install remote housing

**Procedure**

1. Carefully remove the transmitter.

2. Mount the probe on tank.

   A. Gasket

3. Mount the remote connection on the probe.

   Torque 30 ft-lb (40 Nm)
4. Mount the bracket to the pipe.

A. Horizontal pipe
B. Vertical pipe

5. Fasten the housing support.

6. Mount the transmitter head.

Torque 30 ft-lb (40 Nm)
3  **Set jumpers and switches**

Write Protection must be set after configuration (see Configure).

3.1  **Set alarm and write protection on the circuit board**

If alarm and security jumpers are not set, the transmitter operates with the default alarm condition HIGH and Security OFF.

**Procedure**

1. Remove the cover on the circuit side (see label marked circuit side).
2. To set the 4-20 mA alarm output to LOW, move the alarm switch to the LOW position.
3. To enable the security write protection feature, move the write protect switch to the ON position.
4. Replace the cover and tighten securely.

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**Figure 3-1: Circuit Board**

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3.2  **Set alarm and write protection on the LCD display**

**Prerequisites**

To have the LCD display override the circuit board settings, the write protection switch on the circuit board needs to be in the OFF position and the alarm switch on the circuit board needs to be in the HIGH position.

**Procedure**

1. To set the 4-20 mA alarm output to LOW, place jumper between the right and center hole position.
2. To enable the security write protection feature, place jumper between the left and center hole position - ON.
Figure 3-2: LCD Display
4 Connect wiring and power up

4.1 Power supply
For HART®, the input voltage is 11-42 V (11-30 V in IS applications, 16-42 V in Explosion-proof / Flameproof applications). For Modbus®, the input voltage is 8-30 V.

4.2 Cable selection
The transmitter requires shielded twisted pair wiring (18-12 AWG) suitable for the supply voltage and, if applicable, approved for use in hazardous areas.

4.3 Cable/conduit entries
The electronics housing has two entries for ½-14 NPT. Optional M20×1.5 and PG 13.5 adapters are also available. The connections are made in accordance with local or plant electrical codes.

Make sure that unused ports are properly sealed to prevent moisture or other contamination from entering the terminal block compartment of the electronics housing.

Note
Remove any orange caps that may be attached. Use the enclosed metal plug to seal the unused port.

Figure 4-1: Electronics Housing

A. Cable Entry: ½-14 NPT
   Optional adapters: M20, PG13.5
B. Radar electronics
C. Dual compartment housing
D. Flanged process connections
E. Threaded process connections
4.4 Wiring diagram

**Figure 4-2: Non-Intrinsically Safe HART® Output and Type n Approvals: Non-Sparking/ Energy Limited Power Supply**

A. Rosemount 3300 Level Transmitter  
B. Handheld communicator  
C. Load resistance = 250 Ω  
D. Power supply  
E. HART modem  
F. PC  
G. Maximum voltage: $U_m = 250 \text{ V}$  
H. HART: $U_n = 42.4 \text{ V}$

**Note**  
Rosemount 3300 Level Transmitters with Flameproof/Explosion-proof HART Output have a built-in barrier; no external barrier needed.
Figure 4-3: Intrinsically Safe HART Output

A. Rosemount 3300 Level Transmitter
B. Handheld communicator
C. $R_L = 250 \, \Omega$
D. Power supply
E. HART modem
F. PC
G. DCS
H. Approved IS barrier

IS Parameters: $U_i = 30 \, V$, $I_i = 130 \, mA$, $P_i = 1 \, W$, $L_i = C_i = 0$
Figure 4-4: Non-intrinsically Safe Modbus® Output

A. “A” line
B. “B” line
C. 120 Ω
D. Power supply
E. RS485 Bus
F. HART +
G. HART -
H. If the unit is the last transmitter on the bus, a 120 Ω termination resistor is required.

Note
Rosemount 3300 Level Transmitters with Flameproof/Explosion-proof Modbus Output have a built-in barrier; no external barrier needed.
4.5 Load limitations

For HART® communication, a minimum loop resistance of 250 Ω is required. Maximum loop resistance is determined by the voltage level of the external power supply, as given by the following diagrams:

**Figure 4-5: Non-Hazardous Installations, and Type n Approvals: Non-Sparking / Energy Limited Power Supply**

A. Loop Resistance (Ohms)
B. External Power Supply Voltage (Vdc)
C. Operating region

**Figure 4-6: Intrinsically Safe Installations**

A. Loop Resistance (Ohms)
B. External Power Supply Voltage (Vdc)
C. Operating region
Figure 4-7: Explosion-proof/Flameproof (Ex d and tb) Installations

Note
For the Ex d and tb installations the diagram is only valid if the HART load resistance is at the + side, otherwise the load resistance value is limited to 300 Ω.

4.6 Connect the transmitter

Procedure
1. Make sure the housing is grounded according to Hazardous Locations Certifications, national and local electrical codes.
2. Verify that the power supply is disconnected.
3. Remove the cover on the terminal side (see label marked field terminals).
4. Pull the cable(s) through the cable gland/conduit.
   For Explosion-proof / Flameproof installations, only use cable glands or conduit entry devices certified Explosion-proof or Flameproof (Ex d IIC (gas) or Ex t IIIIC (dust)).
5. Connect the cable wires (see Wiring diagram).
6. If applicable, use the enclosed metal plug to seal any unused port.
7. Replace the cover and tighten.
8. Tighten the cable gland.
9. Connect the power supply.
5 Configure

If the transmitter is pre-configured at the factory, this section is only necessary to change or verify the settings.

Configuration of the Rosemount 3300 Level Transmitter can be done either with a handheld communicator, the AMS Device Manager, or Radar Configuration Tools (RCT). If using the Radar Configuration Tools, a HART® modem is required.

5.1 Installing the Radar Configuration Tools (RCT) software

To install the RCT software:

Procedure

1. Insert the installation CD into your CD-ROM drive.
2. Follow the instructions.

Need help?
If the installation program does not automatically start, run Setup.exe from the CD.

5.2 Starting RCT

Prerequisites

For optimum performance set COM Port Buffers to 1. Refer to the Rosemount 3300 Level Transmitter Reference Manual for more instructions.

Procedure

Select Programs → Rosemount → RCT.

Need help?
The Help function of the RCT can be reached from the menu or by pressing the F1 key.
5.3 Configuration using the Wizard

Configuration of a Rosemount 3300 Level Transmitter can be done using the installation Wizard for detailed guidance.

Procedure

1. Make sure that the **Tools Bar** is open (Project Bar is ticked within View). Then select the **Wizard** icon or select the View → Wizard menu option.

2. Select the **Start** button and follow the instructions.

5.4 Configuration using the Setup Function

If you are already familiar with the configuration procedure, or if you want to change settings, you may use the setup function.

Procedure

1. Make sure that the **Tools Bar** is open (Project Bar is ticked within View). Then select the **Setup** icon or select the View → Setup menu option.

2. Select the appropriate tab:
   - Info (information about the device)
   - Basics
   - Output
   - Tank Config
   - Volume (specification of tank geometry for volume calculations)
   - LCD (display panel settings)
   - Signal Quality Metrics (for activating/de-activating and display of signal quality metrics, available with the DA1 option)

3. To load the parameters configured in the transmitter into the dialog window, click the Receive Page button.

4. To load any parameter changes back to the transmitter, click the Send Page button.

5.4.1 Setup - Basics

Units

Length, volume, and temperature units can be set. Units are used wherever measurement and configuration data occur.
5.4.2 Setup - Output

Range values

The Lower Range value = 4 mA value
The Upper Range value = 20 mA value
The 4-20 mA range must not include the upper or lower Transition Zone.\(^{(1)}\)

Variable assignment

Rosemount 3301 available measuring parameters: Level, Distance to Level, Total Volume. For fully immersed probe: Interface Level and Interface Distance.

Rosemount 3302 available measuring parameters: Level, Distance to level, Total Volume, Interface Level, Interface Distance, and Upper Product Layer Thickness.

In the **Primary Variable** field, the measuring parameter is entered for the analog signal.

More variables can be assigned if the superimposed digital HART\(^{®}\) signal or a HART Tri-loop\(^{™}\) is used.

\(^{(1)}\) See the Rosemount 3300 Level Transmitter Reference Manual.
Modbus® setup

If the transmitter has the Modbus option, configuration of the communication parameters can be set.
5.4.3 Setup - Tank Config

**Geometry**

See tank picture in window.

- Set Reference Gauge Height
- Set Upper Null Zone (if needed)
- Set Mounting Type
- Set Diameter (if Mounting Type is Nozzle or Pipe/Chamber)
- Set Nozzle Height (if Mounting Type is Nozzle)

**Probe**

- Set Probe Type (This parameter is pre-configured at factory.)
- Set Probe Length (This parameter is pre-configured at factory. The probe length needs to be changed if the probe is cut in field.)
- Set Probe Angle
- If Remote Housing is mounted, set the Remote Housing length (setting not available in DD/DTM™)

**Miscellaneous settings**

- Set Vapor Dielectric value (if needed)
- Set Upper Product Dielectric value (interface measurements only)
5.5 Additional configuration to fine-tune performance

To fine-tune the transmitter’s performance, it is recommended the Trim Near Zone function be executed after configuration is finished.

For detailed information on how to trim the near zone, see the Rosemount 3300 Level Transmitter Reference Manual.
6  **Environmental conditions**

6.1  **Ambient temperature limits (for use in explosive atmospheres)**

Explosion-proof/Flame-proof version: 
\[-58 \, ^\circ F (-50 \, ^\circ C) \leq T_a \leq +167 \, ^\circ F (+75 \, ^\circ C)\]

Intrinsically safe version: 
\[-58 \, ^\circ F (-50 \, ^\circ C) \leq T_a \leq +158 \, ^\circ F (+70 \, ^\circ C)\]

National deviations may apply, see [Product certifications](#).

6.2  **Process temperature restrictions**

When the Rosemount 3300 is installed in high temperature applications, consider the maximum ambient temperature. Tank insulation should not exceed 4 in. (10 cm).

**Figure 6-1** shows the maximum ambient temperature vs. process temperature.

**Figure 6-1: Ambient Temperature vs. Process Temperature**

![Graph of Ambient Temperature vs. Process Temperature]

A. Ambient temperature °F (°C)
B. Process temperature °F (°C)

6.3  **Pressure limits**

For pressure limits, see the Rosemount 3300 Level Transmitter [Reference Manual](#).
7 Product certifications

Rev 3.7

7.1 European directive information

The EU Declaration of Conformity for all applicable European directives for this product can be found on EU Declaration of Conformity. The most current revision is available at Emerson.com/Rosemount.

7.2 Ordinary location certification

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

7.3 Installing equipment in North America

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

7.4 USA

7.4.1 E5 Explosionproof (XP), Dust-Ignitionproof (DIP)

Certificate  FM 3013394


Markings  XP CL I, DIV 1, GP B, C, D; DIP CLII/III, DIV 1, GP E, F, G; T5 Ta=85°C; Type 4X/IP66

Specific Conditions for Safe Use (X):

1. Potential Electrostatic Charging Hazard – The enclosure contains non-metallic material. To prevent the risk for electrostatic sparking the plastic surface should only be cleaned with a damp cloth.

2. WARNING – The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
7.4.2  **I5 Intrinsic Safety (IS), Nonincendive (NI)**

**Certificate**  FM 3013394


**Markings**  IS CL I, DIV 1, GP A, B, C, D, E, F, G in accordance with control drawing 9150077-944; IS (Entity) CL I, Zone 0, AEx IA IIC T4 in accordance with control drawing 9150077-944, NI CL I, DIV 2, GP A, B, C, D, T4a Ta=70 °C; Suitable for use in CL II/III DIV 2, GP A, B, C, D, T4a Ta=70 °C; Type 4X/IP66

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

1. Potential Electrostatic Charging Hazard – The enclosure contains non-metallic material. To prevent the risk for electrostatic sparking the plastic surface should only be cleaned with a damp cloth.

2. **WARNING** – The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.

<table>
<thead>
<tr>
<th>Uᵢ</th>
<th>Iᵢ</th>
<th>Pᵢ</th>
<th>Cᵢ</th>
<th>Lᵢ</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 V</td>
<td>130 mA</td>
<td>1 W</td>
<td>0 nF</td>
<td>0 mH</td>
</tr>
</tbody>
</table>

7.5  **Canada**

7.5.1  **E6 Explosionproof, Dust-Ignitionproof**

**Certificate**  1250250


**Markings**  Explosionproof CL I, DIV 1, GP C, D; Dust-Ignitionproof CL II, DIV 1 and 2, GP G and coal dust, CL III, DIV 1, Type 4X/IP66

7.5.2  **I6 Intrinsically Safe and Non-Incendive Systems**

**Certificate**  1250250

**Standards**  CSA C22.2 No.0-M91, CSA C22.2 No.25-1966, CSA C22.2 No.30-M1986, CSA C22.2 No.94-M91, CSA C22.2 No.142-
Markings  CL I, DIV 1, GP A, B, C, D, T4 see installation drawing 9150077-945; Non-Incendive Class III, DIV 1, Haz-loc CL I DIV 2, GP A, B, C, D, Maximum Ambient Temperature +70 °C, T4, Type 4X/IP66, Maximum Working Pressure 5000 psi, Dual Seal.

7.6 Europe
7.6.1 E1 ATEX Flameproof

Certificate  KEMA 01ATEX2220X


Markings  II 1/2 G Ex db [ia Ga] IIC T6...T1
II 1/2 D Ex tb [ia Da] IIIC T85 °C...T450 °C Da/Db
II 2 D Ex tb IIIC T85 °C...T135 °C Db

Ambient temperature range  -50 °C to +75 °C
-40 °C to +75 °C with process temperature range -196 °C to -50 °C.

Specific Conditions for Safe Use (X):

1. On application of the transmitter with plastic covered probes, in an explosive gas atmosphere, precaution shall be taken to avoid danger of ignition due to electrostatic charges on the probe.

2. On application of the transmitter in an explosive dust atmosphere, the transmitter shall be installed in such a way that the risk from the electrostatic discharges and propagating brush discharges caused by rapid flow of dust at the label is avoided.

3. For probes and flanges containing light metals, an ignition hazard due to impact or friction needs to be avoided according to EN 60079-0 clause 8.3 when used as Category 1/2 G equipment.
### Temperature class / Maximum surface temperature

<table>
<thead>
<tr>
<th>Temperature class / Maximum surface temperature</th>
<th>Maximum process temperature</th>
<th>Maximum ambient temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>T6 / T 85 °C</td>
<td>+75 °C</td>
<td>+75 °C</td>
</tr>
<tr>
<td>T5 / T 100 °C</td>
<td>+90 °C</td>
<td>+75 °C</td>
</tr>
<tr>
<td>T4 / T 135 °C</td>
<td>+125 °C</td>
<td>+75 °C</td>
</tr>
<tr>
<td>T3 / T 200 °C</td>
<td>+190 °C</td>
<td>+75 °C</td>
</tr>
<tr>
<td>T2 / T 300 °C</td>
<td>+285 °C</td>
<td>+65 °C</td>
</tr>
<tr>
<td>T1 / T 450 °C</td>
<td>+400 °C</td>
<td>+55 °C</td>
</tr>
</tbody>
</table>

#### 7.6.2 I1 ATEX Intrinsic Safety

**Certificate**

BAS02ATEX1163X

**Standards**


**Markings**

II 1G Ex ia IIC T4 Ga (-50°C ≤ Ta ≤ +70°C)

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

1. The equipment is not capable of withstanding the 500V test as defined in EN60079-11. This must be considered in any installation.

2. The enclosure is made of aluminium alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in zone 0.

3. The probes may contain plastic materials greater than 4cm² or be coated with plastic and these can present an electrostatic risk if rubbed or placed in a fast moving air flow.

4. The probes may contain light alloys which can present a risk from frictional ignitions. Care should be taken to protect them from mechanical impact during use or installation.

<table>
<thead>
<tr>
<th>Entity parameters HART</th>
<th>Uᵢ</th>
<th>Iᵢ</th>
<th>Pᵢ</th>
<th>Cᵢ</th>
<th>Lᵢ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30 V</td>
<td>130 mA</td>
<td>1 W</td>
<td>0 nF</td>
<td>0 mH</td>
</tr>
</tbody>
</table>

#### 7.6.3 N1 ATEX Type N: Non-Sparking/Intrinsic Safety

**Certificate**

BAS12ATEX0089X

**Standards**


**Markings**

Ex ic nA IIC T4 Gc (-50°C ≤ Ta ≤ +70°C) Un = 42.4 V
Specific Conditions for Safe Use (X):

1. The equipment is not capable of withstanding the 500V test as defined in EN 60079-11 and EN 60079-15. This must be considered in any installation.

2. The Probes may contain plastic materials greater than 20cm² or be coated with plastic and these can present an electrostatic risk if rubbed or placed in a fast moving air flow.

3. The cable entry must use a suitable, equipment certified cable gland which provides strain relief and any unused openings to the equipment must be blanked off to maintain a degree of protection of at least IP66.

7.7 International

7.7.1 E7 IECEx Flameproof

<table>
<thead>
<tr>
<th>Certificate</th>
<th>IECEx DEK 12.0015X</th>
</tr>
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<tbody>
<tr>
<td>Markings</td>
<td>Ex db [ia Ga] IIC T6...T1 Ga/Gb</td>
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<td></td>
<td>Ex tb IIIC T85 °C...T135 °C Db</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>-50 °C to +75 °C</td>
</tr>
<tr>
<td></td>
<td>-40 °C to +75 °C with process temperature range -196 °C to -50 °C.</td>
</tr>
</tbody>
</table>

Specific Conditions for Safe Use (X):

1. On application of the transmitter with plastic covered probes, in an explosive gas atmosphere, precaution shall be taken to avoid danger of ignition due to electrostatic charges on the probe.

2. On application of the transmitter in an explosive dust atmosphere, the transmitter shall be installed in such a way that the risk from electrostatic discharges and propagating brush discharges caused by rapid flow of dust at the label is avoided.

3. For probes and flanges containing light metals, an ignition hazard due to impact or friction needs to be avoided according to IEC 60079-0 clause 8.3, when used as EPL Ga/Gb equipment.
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<tr>
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<td>+75 °C</td>
</tr>
<tr>
<td>T3 / T 200 °C</td>
<td>+190 °C</td>
<td>+75 °C</td>
</tr>
<tr>
<td>T2 / T 300 °C</td>
<td>+285 °C</td>
<td>+65 °C</td>
</tr>
<tr>
<td>T1 / T 450 °C</td>
<td>+400 °C</td>
<td>+55 °C</td>
</tr>
</tbody>
</table>

7.7.2 I7 IECEx Intrinsic Safety

**Certificate**  
IECEx BAS 12.0062X

**Standards**  

**Markings**  
Ex ia IIC T4 Ga (-50°C ≤ Ta ≤ +70°C)

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

1. The equipment is not capable of withstanding the 500V test as defined in EN60079-11. This must be considered in any installation.

2. The enclosure is made of aluminium alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in zone 0.

3. The probes may contain plastic materials greater than 4cm² or be coated with plastic and these can present an electrostatic risk if rubbed or placed in a fast moving air flow.

4. The probes may contain light alloys which can present a risk from frictional ignitions. Care should be taken to protect them from mechanical impact during use or installation.

<table>
<thead>
<tr>
<th>U_i</th>
<th>I_i</th>
<th>P_i</th>
<th>C_i</th>
<th>L_i</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 V</td>
<td>130 mA</td>
<td>1 W</td>
<td>0 nF</td>
<td>0 mH</td>
</tr>
</tbody>
</table>

7.7.3 N7 IECEx Type N: Non-sparking/Intrinsic Safety

**Certificate**  
IECEx BAS 12.0061X

**Standards**  

**Markings**  
Ex ic nA IIC T4 Gc (-50°C ≤ Ta ≤ +70°C), Um = 254 V
Specific Conditions for Safe Use (X):

1. The equipment is not capable of withstanding the 500V test as defined in EN 60079-11 and EN 60079-15. This must be considered in any installation.

2. The Probes may contain plastic materials greater than 20cm² or be coated with plastic and these can present an electrostatic risk if rubbed or placed in a fast moving air flow.

3. The cable entry must use a suitable, equipment certified cable gland which provides strain relief and any unused openings to the equipment must be blanked off to maintain a degree of protection of at least IP66.

7.8 Brazil
7.8.1 E2 INMETRO Flameproof

Certificate  UL-BR-17.0192X
Markings  Ex d [ia Ga] IIC T6...T1 Ga/Gb
Ex tb [ia Da] IIIIC T85 °C...T450 °C Da/Db
Ex tb IIIIC T85 °C...T135 °C -/Db

Specific Conditions for Safe Use (X):

1. See certificate for Specific Conditions.

7.8.2 I2 INMETRO Intrinsic Safety

Certificate  UL-BR-17.0192X
Markings  Ex ia IIC T4 Ga (-50°C ≤ Tamb ≤ +70°C)

Specific Conditions for Safe Use (X):

1. See certificate for Specific Conditions.

<table>
<thead>
<tr>
<th>Entity parameters</th>
<th>( U_i )</th>
<th>( I_i )</th>
<th>( P_i )</th>
<th>( C_i )</th>
<th>( L_i )</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 V</td>
<td>130 mA</td>
<td>1 W</td>
<td>0 nF</td>
<td>0 mH</td>
<td></td>
</tr>
</tbody>
</table>
7.9 China
7.9.1 E3 China Flameproof

**Certificate** GYJ17.1035X

**Standards** GB 3836.1-2010, GB 3836.2-2010, GB 3836.4-2010, GB 3836-20-2010, GB 12476.1-2013, GB 12476.4-2010, GB 12476.5-2013

**Markings**
- Ex d [ia Ga] IIC T6-T1 Gb,
- Ex iaD tD 20/A21 IP6X T85°C~T450°C,
- Ex tD A21 IP6X T85°C~T135°C

**Specific Conditions for Safe Use (X):**
1. See certificate for Specific Conditions.

7.9.2 I3 China Intrinsic Safety

**Certificate** GYJ16.1336X

**Standards** GB 3836.1-2010, GB 3836.4-2010, GB 3836.20-2010

**Markings** Ex ia IIC T4 (-50°C ≤ Ta ≤ +70°C),

**Specific Conditions for Safe Use (X):**
1. See certificate for Specific Conditions.

<table>
<thead>
<tr>
<th></th>
<th>U_i</th>
<th>I_i</th>
<th>P_i</th>
<th>C_i</th>
<th>L_i</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entity parameters</td>
<td>30 V</td>
<td>130 mA</td>
<td>1 W</td>
<td>0 nF</td>
<td>0 mH</td>
</tr>
</tbody>
</table>

7.9.3 N3 China Type N

**Certificate** GYJ15.1078X

**Standards** GB 3836.1-2010, GB 3836.4-2010, GB 3836.8-2003

**Markings** Ex ic nA IIC T4 Gc, Un = 42.4 V

**Specific Conditions for Safe Use (X):**
1. See certificate for Specific Conditions.

7.10 Technical Regulations Customs Union (EAC)
7.10.1 EM Technical Regulations Customs Union (EAC) Flameproof

**Certificate** RU C-US.GB05.V.01030
Markings: Ga/Gb Ex d [ia Ga] IIC T6...T1 X

Specific Conditions for Safe Use (X):
1. See certificate for Specific Conditions.

7.10.2 IM Technical Regulations Customs Union (EAC) Intrinsic Safety

Certificate: RU C-US.GB05.V.01030
Markings: 0Ex Ia IIC T4 Ga X

Specific Conditions for Safe Use (X):
1. See certificate for Specific Conditions.

<table>
<thead>
<tr>
<th>Entity parameters</th>
<th>$U_i$</th>
<th>$I_i$</th>
<th>$P_i$</th>
<th>$C_i$</th>
<th>$L_i$</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 V</td>
<td>130 mA</td>
<td>1 W</td>
<td>0 nF</td>
<td>0 mH</td>
<td></td>
</tr>
</tbody>
</table>

7.11 Japan
7.11.1 E4 Flameproof with display

Certificate: TC18544
Markings: Ex d [ia] IIB T6
Ex ia IIB T6

Specific Conditions for Safe Use (X):
1. See certificate for Specific Conditions.

7.11.2 E4 Flameproof without display

Certificate: TC 18545
Markings: Ex d [ia] IIB T6
Ex ia IIB T6

Specific Conditions for Safe Use (X):
1. See certificate for Specific Conditions.

7.12 Republic of Korea
7.12.1 EP Korea Flameproof

Certificate: 10-KB4BO-0019X
Markings: Ex d[ia] IIC T6
Specific Conditions for Safe Use (X):

1. See certificate for Specific Conditions.

7.13 India

7.13.1 Flameproof

Certificate P119297/1
Markings Ex d [ia Ga] IIC T6...T1 Ga/Gb

Specific Conditions for Safe Use (X):

1. See certificate for Specific Conditions.

7.13.2 Intrinsically safe

Certificate P428257/1
Markings Ex ia IIC T4 Ga

Specific Conditions for Safe Use (X):

1. See certificate for Specific Conditions.

7.13.3 Intrinsically safe

Certificate P428258/1
Markings II 1G Ex ia IIC T4 Ga

Specific Conditions for Safe Use (X):

1. See certificate for Specific Conditions.

7.14 Combinations

KA Combination of E1 and E6
KB Combination of E5 and E6
KC Combination of E1 and E5
KD Combination of I1 and I6
KE Combination of I5 and I6
KF Combination of I1 and I5
7.15 Additional certifications

7.15.1 U1 Overfill prevention

**Certificate** Z-65.16-416

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

7.16 Pattern approval

**GOST Belarus**

**Certificate** RB-03 07 2765 10

**GOST Kazakhstan**

**Certificate** KZ.02.02.03473-2013

**GOST Russia**

**Certificate** SE.C.29.010.A

**GOST Uzbekistan**

**Certificate** 02.2977-14

**China Pattern Approval**

**Certificate** 2009-L256

7.17 Conduit plugs and adapters

**IECEx Flameproof and Increased Safety**

**Certificate** IECEx UL 18.0016X


**Markings** Ex de eb IIC Gb;
Ex ta IIIC Da

**ATEX Flameproof and Increased Safety**

**Certificate** DEMKO 18 ATEX 1986X


**Markings** II 2 G Ex de IIC Gb,
### Table 7-1: Conduit Plug Thread Sizes

<table>
<thead>
<tr>
<th>Thread</th>
<th>Identification mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>M20 x 1.5</td>
<td>M20</td>
</tr>
<tr>
<td>½ - 14 NPT</td>
<td>½ NPT</td>
</tr>
</tbody>
</table>

### Table 7-2: Thread Adapter Thread Sizes

<table>
<thead>
<tr>
<th>Male thread</th>
<th>Identification mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>M20 x 1.5 – 6g</td>
<td>M20</td>
</tr>
<tr>
<td>½ - 14 NPT</td>
<td>½ - 14 NPT</td>
</tr>
<tr>
<td>¾ - 14 NPT</td>
<td>¾ - 14 NPT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Female thread</th>
<th>Identification mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>M20 x 1.5 – 6H</td>
<td>M20</td>
</tr>
<tr>
<td>½ - 14 NPT</td>
<td>½ - 14 NPT</td>
</tr>
<tr>
<td>G1/2</td>
<td>G1/2</td>
</tr>
</tbody>
</table>

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

1. The Blanking Elements shall not be used with an adapter.
2. Only one adapter shall be used with any single cable entry on the associated equipment.
3. It is the end user’s responsibility to ensure that the ingress protection rating is maintained at the interface of the equipment and the blanking element/adapter.
4. Suitability of the temperature of the devices is to be determined during end-use with suitably rated equipment.
7.18 Installation drawings

Figure 7-1: 9150077-944 - System Control Drawing

ROSEMOUNT 3300 SERIES

Intrinsically Safe Apparatus for use in Class I, II, III, Division 1, Groups A, B, C, D, E, F, G
Class I, Zone B, Area 14

Temperature class: T4 (-50 < t < 70 deg C)

Entity Parameters: 
- Vmax(U) < 30 V, Imax(I) < 130 mA
- C1 = 0 nF, L1 = 0 uH, P1 = 1 W

WARNING: To prevent ignition of flammable or combustible atmospheres, read, understand and adhere to the manufacturer’s live maintenance procedures.

WARNING: Substitution of components may impair Intrinsic Safety.

WARNING: Potential Electrostatic Charging Hazard – The enclosure contains non-metallic material. 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.

FM Approved Product

No revisions to this drawing without prior Factory Mutual Approval.

Quick Start Guide May 2019

44 Rosemount 3300 Level Transmitter
NOTE 1.
The Entity concept allows interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in combination as a system. The approved values of max. open circuit voltage (Uo) and max. short circuit current (Io) and max. power (Uo x Io / 4), for the associated apparatus must be less than or equal to the maximum safe input voltage (Ui), maximum safe input current (Ii), and maximum safe power input (Pi) of the intrinsically safe apparatus. In addition, the approved max. allowable connected capacitance (Co) of the associated apparatus must be greater than the sum of the interconnecting cable capacitance and the unprotected internal capacitance (Ci) of the intrinsically safe apparatus, and the the approved max. allowable connected inductance (Lo) of the associated apparatus must be greater than the sum of the interconnecting cable inductance and the unprotected internal inductance (Li) of the intrinsically safe apparatus.

### INTRINSICALLY SAFE ENTITY PARAMETERS

<table>
<thead>
<tr>
<th>GAS GROUP</th>
<th>U (Vmax)</th>
<th>I (Imax)</th>
<th>CI</th>
<th>LI</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>A &amp; B</td>
<td>30V</td>
<td>130 mA</td>
<td>0 nF</td>
<td>0 nH</td>
<td>1W</td>
</tr>
<tr>
<td>C</td>
<td>30V</td>
<td>130 mA</td>
<td>0 nF</td>
<td>0 nH</td>
<td>1W</td>
</tr>
<tr>
<td>D</td>
<td>30V</td>
<td>130 mA</td>
<td>0 nF</td>
<td>0 nH</td>
<td>1W</td>
</tr>
</tbody>
</table>

Note: The entity parameters listed above apply only to associated apparatus with linear output!

NOTE 2.
Installations in Canada shall be in accordance with the Canadian Electric Code.

NOTE 3.
The positive power supply terminal shall be connected to the terminal designated "+SIG/COM" and the negative supply to the terminal designated "-SIG/COM".

NOTE 4.
Product options bearing the Dual Seal marking on the label meets the Dual Seal requirements of the ANSI/ISA 12.27.01. No additional process sealing is required. For the in-service limits applicable to a specific model, see Process Pressure/Temperature range in Appendix A of the Reference manual.
7.19 EU Declaration of Conformity

Figure 7-3: EU Declaration of Conformity

EU Declaration of Conformity
No: 3300

We,

Rosemount Tank Radar AB
Layoutvägen 1
S-435 33 MÖLNLYCKE
Sweden

declare under our sole responsibility that the product,

Rosemount 3300 Series Guided Wave Radar Level and Interface Transmitter

manufactured by,

Rosemount Tank Radar AB
Layoutvägen 1
S-435 33 MÖLNLYCKE
Sweden

is in conformity with the provisions of the European Community Directives, including the latest amendments, as shown in the attached schedule.

Presumption of conformity is based on the application of the harmonized standards, normative documents or other documents and, when applicable or required, a European Community notified body certification, as shown in attached schedule.

__________________________                          ____________________________
(signature)                                                  Manager Product Approvals

Dajana Prastalo                                           (function name - printed)
(name - printed)                                          2019-03-22
(date of issue)
EMC Directive (2014/30/EU)

EN 61326-1:2013

ATEX Directive (2014/34/EU)

BAS02ATEX1163X
Intrinsic Safety
Equipment Group II, Category 1 G, Ex ia IIC T4 Ga


KEMA 01ATEX2220X
Flameproof
Equipment Group II, Category 1/2 G Ex db [iaGa] IIIC T6...T1 Ga/Gb and Equipment Group II, Category 1/2 D Ex tb [ia Da] IIIC T85°C...T450°C Da/Db or Equipment Group II, Category 2 D Ex tb IIIC T85°C...T135°C Db


Baseefa12ATEX0089X
Type of protection N, Non-sparking and Intrinsic Safety
Equipment Group II, Category 3 G, Ex ic nA IIC T4 Ge

ATEX Notified Body for EU Type Examination Certificates and Type Examination Certificates

Notified Body responsible before March 2019
SGS Baseefa Ltd [Notified Body Number: 1180]
Rockhead Business Park, Staden Lane
Buxton, Derbyshire SK17 9RZ
United Kingdom

Notified Body responsible after March 2019
SGS Fimko Oy [Notified Body Number: 0598]
Särkinenintie 3
P.O. Box 30
FI-00211, Helsinki
Finland

DEKRA (formerly KEMA) Quality B.V. [Notified Body Number: 0344]
Utrechtsweg 310
6812 AR Arnhem
Netherlands

ATEX Notified Body for Quality Assurance

DNV Nemko Presafe AS [Notified Body Number: 2460]
Veritasveien 1
1322 HOVIK
Norway
### List of Model Parts with China RoHS Concentration above MCVs

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Hazardous Substances / 有害物质</th>
<th>Lead (Pb)</th>
<th>Mercury (Hg)</th>
<th>Cadmium (Cd)</th>
<th>Hexavalent Chromium 六价铬 (Cr+6)</th>
<th>Polybrominated biphenyls 多溴联苯 (PBB)</th>
<th>Polybrominated diphenyl ethers 多溴联苯醚 (PBDE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronics Assembly 电子组件</td>
<td></td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Housing Assembly 外壳组件</td>
<td></td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

This table is proposed in accordance with the provision of SJ/T11364

O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: Indicate that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

**7.20 China RoHS**