Rosemount™ 5300 Level Transmitter

Guided Wave Radar
Contents
About this guide............................................ 3
Confirm system readiness (HART® only)........... 5
Mount transmitter on tank.............................6
Prepare the electrical connections.............. 11
Connect wiring and power up......................19
Configure.....................................................22
Safety Instrumented Systems (4-20 mA only).. 25
Adjust probe length.....................................26
Product certifications...................................29
1 About this guide

This Quick Start Guide provides basic guidelines for the Rosemount 5300 Level Transmitter. Refer to the Rosemount 5300 Reference Manual for more instructions. The manual and this guide 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 the transmitter is installed by qualified personnel and in accordance with applicable code of practice.
- 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.
- Any substitution of non-recognized parts may jeopardize safety. Repair, e.g. substitution of components etc., may also jeopardize safety and is under no circumstances allowed.

Explosions could result in death or serious injury.

- Verify that the operating atmosphere of the transmitter is consistent with the appropriate hazardous locations certifications.
- To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.
- 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.
- Ground device on non-metallic tanks (e.g. fiberglass tanks) to prevent electrostatic charge build-up.
**WARNING**

Probes with non-conducting surfaces

- 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.

Eliminate the risk of ESD discharge prior to dismounting the transmitter head from the probe.

- Probes may generate an ignition-capable level of electrostatic charge under extreme conditions. During any type of installation or maintenance in a potentially explosive atmosphere, the responsible person should make sure that any ESD risks are eliminated before attempting to separate the probe from the transmitter head.
2 Confirm system readiness (HART® only)

2.1 Confirm HART® revision capability

If using HART based control or asset management systems, confirm the HART capability of those systems prior to transmitter installation. Not all systems are capable of communicating with HART Revision 7 protocol.

Transmitters with a firmware version 2F0 or later can be configured for either HART Revision 5 or 7.

2.2 Confirm correct device driver

**Procedure**

- Verify that the latest Device Driver (DD/DTM™) is loaded on your systems to ensure proper communication. See Table 2-1.
- Download the latest Device Driver from Emerson.com/DeviceInstallKits.

**Table 2-1: Rosemount 5300 Device Revisions and Files**

<table>
<thead>
<tr>
<th>Firmware version (1)</th>
<th>Find Device Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HART® Universal Revision</td>
</tr>
<tr>
<td>2F0 or later</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
<tr>
<td>2A2 - 2E0</td>
<td>5</td>
</tr>
</tbody>
</table>

(1) Firmware version is printed on the transmitter head label, e.g. SW 2E0 or can be found in Rosemount Radar Master (select Device > Properties).

(2) Device revision is printed on the transmitter head label, e.g. HART Dev Rev 4.

2.3 Switch HART® revision mode

If the HART configuration tool is not capable of communicating with HART Revision 7, the device will load a generic menu with limited capability. To switch the HART revision mode from the generic menu:

**Procedure**

1. Locate the “Message” field.
2. In the Message field, enter HART5 or HART7 and then 27 trailing spaces.
3 Mount transmitter on tank

For flexible single lead probes ordered with weight unmounted (option code WU), refer to Adjust probe length before mounting the transmitter.

3.1 Threaded/Flange/Tri-Clamp® tank connection

Procedure

1. Seal and protect the threads.
   
   ▲ Only for NPT threaded tank connection.
   
   Use anti-seize paste or PTFE tape according to your site procedures.

2. Mount the device on tank.

   A. NPT
   B. Flange
   C. Gasket
3. (Optional) Adjust display orientation.

4. Tighten the nut.

Torque 30 ft-lb (40 Nm)
3.2 Install remote housing

Procedure

1. Carefully remove the transmitter.

2. Mount the probe on tank.

3. Mount the remote connection on the probe.

A. Gasket
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)
3.3 Bracket mounting

**Procedure**

1. Mount the bracket to the pipe/wall.
   
   **On pipe:**

   A. *Horizontal pipe*
   
   B. *Vertical pipe*

   **On wall:**

2. Mount the transmitter with probe to the bracket.
4 Prepare the electrical connections

4.1 Cable gland/conduit

For explosion-proof/flameproof installations, only use cable glands or conduit entry devices certified explosion-proof or flameproof.

4.2 Power supply (Vdc)

<table>
<thead>
<tr>
<th>Approval type</th>
<th>HART®</th>
<th>FOUNDATION™ Fieldbus</th>
<th>RS-485 with Modbus®</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>16-42.4</td>
<td>9-32</td>
<td>8-30 (max. rating)</td>
</tr>
<tr>
<td>Non-sparking/energy limited</td>
<td>16-42.4</td>
<td>9-32</td>
<td>N/A</td>
</tr>
<tr>
<td>Intrinsically safe</td>
<td>16-30</td>
<td>9-30</td>
<td>N/A</td>
</tr>
<tr>
<td>FISCO</td>
<td>N/A</td>
<td>9-17.5</td>
<td>N/A</td>
</tr>
<tr>
<td>Explosion-proof/Flameproof</td>
<td>20-42.4</td>
<td>16-32</td>
<td>8-30 (max. rating)</td>
</tr>
</tbody>
</table>
4.3 4-20 mA/HART® communication

4.3.1 Wiring diagram

Figure 4-1: Wiring Diagram for 4-20 mA/HART®

A. Handheld communicator
B. Approved IS barrier (for Intrinsically Safe installations only)
C. HART modem
D. Current meter
E. Load resistance (≥250 Ω)
F. Power supply

Note
Rosemount 5300 Level Transmitters with flameproof/explosion-proof output have a built-in barrier; no external barrier needed.

4.3.2 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 4-2: Intrinsically Safe Installations**

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

**Figure 4-3: Non-Hazardous and Non-Sparking/Energy Limited Installations**

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

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

**Note**
For the Ex d case, the diagram is only valid if the load resistance is at the + side and if the - side is grounded, otherwise the maximum load resistance is limited to 435 Ω.
4.4 **FOUNDATION™ Fieldbus**

4.4.1 **Wiring diagram**

**Figure 4-5: Wiring Diagram for FOUNDATION Fieldbus**

A. *Handheld communicator*
B. *Approved IS barrier (for Intrinsically Safe installations only)*
C. *FOUNDATION Fieldbus modem*
D. *Power supply*

**Note**
Rosemount 5300 Level Transmitters with flameproof/explosion-proof output have a built-in barrier; no external barrier needed.

4.5 **RS-485 with Modbus® communication**

See the Rosemount 5300 Reference Manual for details.

4.5.1 **Power consumption**

- $< 0.5$ W (with HART address=1)
- $< 1.2$ W (incl. four HART slaves)
### 4.5.2 Wiring diagram

**Figure 4-6: Wiring Diagram for RS-485 with Modbus®**

- **A.** “A” line
- **B.** “B” line
- **C.** 120 Ω
- **D.** RS-485 Bus
- **E.** Power supply
- **F.** HART -
- **G.** HART +
- **H.** If it is the last transmitter on the bus, connect the 120 Ω termination resistor.

**Note**
Rosemount 5300 Level Transmitters with Flameproof/Explosion-proof output have a built-in barrier; no external barrier needed.\(^{(1)}\)

### 4.6 Grounding

Make sure grounding is done (including IS ground inside Terminal compartment) according to Hazardous Locations Certifications, national and local electrical codes.

\(^{(1)}\) An external galvanic isolator is always recommended to be used for Flameproof/Explosion-proof installations.
**Note**
Grounding the transmitter via threaded conduit connection may not provide sufficient ground.

**Note**
In the explosion-proof/flameproof version, the electronics is grounded via the transmitter housing. After installation and commissioning make sure that no ground currents exist due to high ground potential differences in the installation.

**Transmitter housing grounding**
The most effective transmitter housing grounding method is a direct connection to earth ground with minimal (< 1 Ω) impedance. There are two grounding screw connections provided (see **Figure 4-7**).

**Figure 4-7: Ground Screws**

![Ground Screws Image]

A. Internal ground screw  
B. External ground screw

**Signal cable shield grounding**
Make sure the instrument cable shield is:

- trimmed close and insulated from touching the transmitter housing.
- continuously connected throughout the segment.
- connected to a good earth ground at the power supply end.
Figure 4-8: Cable Shield

A. Insulate shield
B. Minimize distance
C. Trim shield and insulate
D. Connect shield back to the power supply ground
5 Connect wiring and power up

Procedure

1. △ Make sure the power supply is switched off.
2. Remove the terminal block cover.
3. Remove the plastic plugs.
4. Pull the cable through the cable gland/conduit.

Adapters are required if M20 glands are used.
5. Connect the cable wires (see Figure 4-1, Figure 4-5, and Figure 4-6).
6. Ensure proper grounding (see Grounding).
7. Use the enclosed metal plug to seal any unused port.

**Note**
Apply PTFE tape or other sealant to the threads.

8. Tighten the cable gland.

**Note**
Apply PTFE tape or other sealant to the threads.

**Note**
Make sure to arrange the wiring with a drip loop.
9. Mount the cover making sure the cover is secure to meet explosion-proof requirements.

10. Turn the jam screw counterclockwise until it contacts the cover.
    Required for Flameproof installations only.

11. Connect the power supply.
6 Configure

Basic configuration can easily be done either with Rosemount Radar Master, a handheld communicator, AMS Device Manager, DeltaV™, or any other DD (Device Description) or DTM™ compatible host system. For advanced configuration features, Rosemount Radar Master is recommended.

6.1 Configure using Rosemount Radar Master

Procedure

2. Connect to the desired transmitter.
3. In the Guided Setup window, click Run Wizard for guided setup and follow the instructions.
4. In the Guided Setup window, continue with steps 2 to 5.
5. Click View live values from device to verify that the transmitter works correctly.

6.2 Configure using AMS Device Manager or handheld communicator

6.2.1 Connect to device using AMS Device Manager

Procedure

1. Start AMS Device Manager.
2. Select View > Device Connection View.
3. In the *Device Connection View*, double-click the modem icon.
4. Double-click the device icon.

6.2.2 Connect to device using a handheld communicator

**Procedure**

Turn on the handheld communicator and connect to the device.

6.2.3 Configure device

**HART® Device Revision 3**

**Procedure**

1. Select **Configure/Setup > Basic Setup**.
2. Configure steps 1-6 in the *Basic Setup* (Variable Mapping, Probe, Geometry, Environment, Volume, and Analog Out).
3. Select **Finish**.
4. Select **Device Specific Setup**.
5. Select **Restart Device**.

**HART® Device Revision 4**

**Procedure**

1. Select **Configure > Guided Setup**.
2. Select **Level Measurement Setup** and follow the instructions.
3. Select **Device Specific Setup**.
4. Run **Verify Level** to check your level measurement.
5. Consider optional setup, such as **Volume** and **Display**.

**FOUNDATION™ Fieldbus**

**Procedure**

1. Select **Configure > Guided Setup**.
2. Select **Level Measurement Setup** and follow the instructions.
3. (Optional) Select **Volume Calculation Setup**.
4. Select **Device Specific Setup**.
5. Select **Restart Measurement**.
### 6.3 **FOUNDATION™ Fieldbus parameters**

**Table 6-1: FOUNDATION Fieldbus Parameters**

<table>
<thead>
<tr>
<th>Function</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probe type</td>
<td>TRANSDUCTER_1100 &gt; PROBE_TYPE</td>
</tr>
<tr>
<td>Probe length</td>
<td>TRANSDUCTER_1100 &gt; PROBE_LENGTH</td>
</tr>
<tr>
<td>Hold off distance/Upper null zone</td>
<td>TRANSDUCTER_1100 &gt; GEOM_HOLD_OFF_DIST</td>
</tr>
<tr>
<td>Tank height</td>
<td>TRANSDUCTER_1100 &gt; GEOM_TANK_HEIGHT</td>
</tr>
<tr>
<td>Mounting type</td>
<td>TRANSDUCTER_1100 &gt; MOUNTING_TYPE</td>
</tr>
<tr>
<td>Pipe/chamber/nozzle inner diameter</td>
<td>TRANSDUCTER_1100 &gt; PIPE_DIAMETER</td>
</tr>
<tr>
<td>Nozzle height</td>
<td>TRANSDUCTER_1100 &gt; NOZZLE_HEIGHT</td>
</tr>
<tr>
<td>Measurement mode</td>
<td>TRANSDUCTER_1100 &gt; MEAS_MODE</td>
</tr>
<tr>
<td>Product dielectric range (1)</td>
<td>TRANSDUCTER 1100 &gt; PRODUCT_DIELEC_RANGE</td>
</tr>
<tr>
<td>Upper product dielectric constant (2)</td>
<td>TRANSDUCTER 1100 &gt; UPPER_PRODUCT_DC</td>
</tr>
<tr>
<td>Process condition (rapid level changes)</td>
<td>TRANSDUCTER_1100 &gt; ENV_ENVIRONMENT</td>
</tr>
<tr>
<td>Volume calculation method</td>
<td>TRANSDUCTER 1300 &gt; VOL VOLUME CALC METHOD</td>
</tr>
<tr>
<td>Tank diameter (only for ideal tank shapes)</td>
<td>TRANSCLUDER_1300 &gt; VOL IDEAL DIAMETER</td>
</tr>
<tr>
<td>Tank length/height (only for ideal tank shapes)</td>
<td>TRANSCLUDER_1300 &gt; VOL IDEAL LENGTH</td>
</tr>
<tr>
<td>Volume offset</td>
<td>TRANSCLUDER_1300 &gt; VOL VOLUME OFFSET</td>
</tr>
</tbody>
</table>

(1) Applicable to “Liquid Product Level” and “Solid Product Level” measurement modes.

(2) Applicable to “Interface Level with submerged” and “Product Level and Interface Level” measurement modes.
7 Safety Instrumented Systems (4-20 mA only)

8  Adjust probe length

This section describes how to adjust the length of flexible single lead probes with weight unmounted (option code WU). For other probe types, refer to Section 3 in the Rosemount 5300 Reference Manual.

Procedure

1. Measure tank height.

   Tank height (H):

2. Calculate total probe length.

   Total probe length ($L_{TOT}$) = Tank height (H) – 2 in. (5 cm)

   Total probe length ($L_{TOT}$):

   A. 2 in. (5 cm) clearance
3. Mark where to cut the probe.

4. Slide the weight up.

5. Cut the probe at the mark.
6. Fasten the weight.

<table>
<thead>
<tr>
<th>Weight material</th>
<th>Torque (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless steel</td>
<td>5</td>
</tr>
<tr>
<td>Alloy C-276</td>
<td>2.5</td>
</tr>
<tr>
<td>Alloy 400</td>
<td>2.5</td>
</tr>
<tr>
<td>Duplex 2205</td>
<td>2.5</td>
</tr>
</tbody>
</table>

7. Update transmitter configuration to the new probe length.

Probes length (L):
9  **Product certifications**

Rev 9.17

9.1  **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.

9.2  **Safety Instrumented Systems (SIS)**

SIL 3 Capable: IEC 61508 certified for use in safety instrumented systems up to SIL 3 (Minimum requirement of single use (1oo1) for SIL 2 and redundant use (1oo2) for SIL 3).

9.3  **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).

9.4  **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.

9.5  **USA**

9.5.1  **E5 Explosionproof (XP), Dust-Ignitionproof (DIP)**

**Certificate**  FM16US0444X  


**Markings**  XP CL I, DIV 1, GP B, C, D; DIP CLII/III, DIV 1, GP E, F, G; T4; -50 °C ≤ Ta ≤ 60 °C / 70 °C; Type 4X  

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

1. WARNING – 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.

9.5.2 IS Intrinsic Safety (IS), Nonincendive (NI)

**Certificate**  
FM16US0444X

**Standards**  

**Markings**  
IS CL I, II, III, DIV 1, GP A, B, C, D, E, F, G in accordance with control drawing 9240030-936; IS (Entity) CL I, Zone 0, AEx ia IIC T4 in accordance with control drawing 9240030-936, NI CL I, II, III DIV 2, GP A, B, C, D, F, G; T4; -50 °C ≤ Ta ≤ 60 °C / 70 °C; Type 4X

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

1. WARNING – 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>Entity parameters</th>
<th>Ui</th>
<th>li</th>
<th>Pi</th>
<th>Ci</th>
<th>Li</th>
</tr>
</thead>
<tbody>
<tr>
<td>HART</td>
<td>30 V</td>
<td>130 mA</td>
<td>1 W</td>
<td>7.26 nF</td>
<td>0</td>
</tr>
<tr>
<td>Fieldbus</td>
<td>30 V</td>
<td>300 mA</td>
<td>1.3 W</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

9.5.3 IE FISCO

**Certificate**  
FM16US0444X

**Standards**  

**Markings**  
IS CL I, II, III, DIV 1, GP A, B, C, D, E, F, G; T4; in accordance with control drawing 9240030-936; IS CL I, Zone 0 AEx ia IIC T4 in
accordance with control drawing 9240030-936; \(-50 \, ^\circ C \leq T_a \leq 60 \, ^\circ C / 70 \, ^\circ C\); Type 4X

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

1. **WARNING** – 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>FISCO 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>Ui</td>
<td>17.5 V</td>
<td>380 mA</td>
<td>5.32 W</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### 9.6 Canada

#### 9.6.1 E6 Explosionproof, Dust-Ignitionproof

**Certificate** 1514653

**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-M1987, CSA C22.2 157-92, CAN/CSA C22.2 No. 60529:05, ANSI/ISA 12.27.01-2003

**Markings** Explosionproof CL I, DIV 1, GP B, C, D; Dust-Ignitionproof CL II, DIV 1 and 2, GP E, F, G and coal dust, CL III, DIV 1, Type 4X/IP66/IP67

#### 9.6.2 I6 Intrinsically Safe and Non-Incendive Systems

**Certificate** 1514653

**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-M1987, CSA C22.2 157-92, CAN/CSA C22.2 No. 60529:05, ANSI/ISA 12.27.01-2003

**Markings** CL I, DIV 1, GP A, B, C, D, T4 see installation drawing 9240030-937; Non-Incendive Class III, DIV 1, Haz-loc CL I DIV 2, GP A, B, C, D, Maximum Ambient Temperature +60 °C for Fieldbus and FISCO and +70 °C for HART, T4, Type 4X/IP66/IP67, Maximum Working Pressure 5000 psi, Dual Seal.
### 9.6.3 IF FISCO

**Certificate** 1514653

**Standards**

**Markings**
- CL I, DIV 1, GP A, B, C, D, T4 see installation drawing 9240030-937; Non-Incendive Class III, DIV 1, Haz-loc CL I DIV 2, GP A, B, C, D, Maximum Ambient Temperature +60 °C, T4, Type 4X/IP66/IP67, Maximum Working Pressure 5000 psi, Dual Seal.

### FISCO parameters

<table>
<thead>
<tr>
<th>Ui</th>
<th>Ii</th>
<th>Pi</th>
<th>Ci</th>
<th>Li</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.5 V</td>
<td>380 mA</td>
<td>5.32 W</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### 9.7 Europe

#### 9.7.1 E1 ATEX Flameproof

**Certificate** Nemko 04ATEX1073X

**Standards**

**Markings**
- \( \text{II 1/2G Ex db ia IIC T4 Ga/Gb, (-40 °C ≤ Ta ≤ +60 °C /+70 °C)} \)
- \( \text{II 1D Ex ta IIIIC T69 °C/T79 °C Da, (-40 °C ≤ Ta ≤ +60 °C /+70 °C)} \)
- \( \text{Um = 250 V} \)

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

1. Potential ignition hazards by impact or friction need to be considered according to EN 60079-0:2012 clause 8.3 (for EPL Ga and EPG Gb), and clause 8.4 (for EPL Da and EPL Db), when the transmitter enclosure and antennas exposed to the exterior atmosphere of the tank, is made with light metals containing aluminium or titanium. The end user shall determine the suitability with regard to avoid hazards from impact and friction.
2. Parts of the sensor probes, for type 5300 are non-conducting material covering metal surfaces. The area of the non-conducting part exceeds the maximum permissible areas for Group III according to EN 60079-0:2012 clause 7.4:3. Therefore, when the probe is used in a potentially explosive atmosphere group III, EPL Da, appropriate measures must be taken to prevent electrostatic discharge.

3. 1/2” NPT threads need to be sealed for dust and water ingress protection, IP 66, IP 67 or “Ex t”, EPL Da or Db is required.

9.7.2 I1 ATEX Intrinsic Safety

**Certificate**  
Nemko 04ATEX1073X

**Standards**  

**Markings**  
慎重に注意  
II 1G Ex ia IIC T4 Ga, (-55 °C ≤ T_a ≤ +60 °C/+70 °C)  
II 1D Ex ia IIIC T69 °C/T79 °C Da, (-50 °C ≤ T_a ≤ +60 °C /+70 °C)

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

1. The intrinsically safe circuits do not withstand the 500V AC test as specified in EN 60079-11:2012 clause 6.3.13.

2. Potential ignition hazards by impact or friction need to be considered according to EN 60079-0:2012 clause 8.3 (for EPL Ga and EPG Gb), and clause 8.4 (for EPL Da and EPL Db), when the transmitter enclosure and antennas exposed to the exterior atmosphere of the tank, is made with light metals containing aluminium or titanium. The end user shall determine the suitability with regard to avoid hazards from impact and friction.

3. Parts of the sensor probes, for type 5300 are non-conducting material covering metal surfaces. The area of the non-conducting part exceeds the maximum permissible areas for Group III according to EN 60079-0.2012 clause 7.4:3. Therefore, when the probe is used in a potentially explosive atmosphere group III, EPL Da, appropriate measures must be taken to prevent electrostatic discharge.

4. 1/2” NPT threads need to be sealed for dust and water ingress protection, IP 66, IP 67 or “Ex t”, EPL Da or Db is required.

<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><strong>Entity parameters</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HART</td>
<td>30 V</td>
<td>130 mA</td>
<td>1 W</td>
<td>7.26 nF</td>
<td>0</td>
</tr>
<tr>
<td>Fieldbus</td>
<td>30 V</td>
<td>300 mA</td>
<td>1.5 W</td>
<td>4.95 nF</td>
<td>0</td>
</tr>
</tbody>
</table>
9.7.3 IA ATEX FISCO

**Certificate**  Nemko 04ATEX1073X


**Markings**  II 1G Ex ia IIC T4 Ga (-55 °C ≤ Ta ≤+60 °C) or  
II 1/2G Ex ia/ib IIC T4 Ga/Gb (-55 °C ≤ Ta ≤+60 °C)  
II 1D Ex ia III C T69 °C Da, (-50 °C ≤ Ta ≤+60 °C)  
II 1D Ex ia/ib III C T69°C Da/Db, (-50 °C ≤ Ta ≤+60 °C)

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

1. The intrinsically safe circuits do not withstand the 500V AC test as specified in EN 60079-11:2012 clause 6.3.13.

2. Potential ignition hazards by impact or friction need to be considered according to EN 60079-0:2012 clause 8.3 (for EPL Ga and EPG Gb), and clause 8.4 (for EPL Da and EPL Db), when the transmitter enclosure and antennas exposed to the exterior atmosphere of the tank, is made with light metals containing aluminium or titanium. The end user shall determine the suitability with regard to avoid hazards from impact and friction.

3. Parts of the sensor probes, for type 5300 are non-conducting material covering metal surfaces. The area of the non-conducting part exceeds the maximum permissible areas for Group III according to EN 60079-0.2012 clause 7.4:3. Therefore, when the probe is used in a potentially explosive atmosphere group III, EPL Da, appropriate measures must be taken to prevent electrostatic discharge.

4. The Ex ia version of model 5300 FISCO device may be supplied by an “Ex ib” FISCO power supply, when the power supply is certified with three separate safety current limiting devices and voltage limitation which meets the requirements for type Ex ia.

5. 1/2” NPT threads need to be sealed for dust and water ingress protection, IP 66, IP 67 or “Ex t”, EPL Da or Db is required.

<table>
<thead>
<tr>
<th>FISCO 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>17.5 V</td>
<td>380 mA</td>
<td>5.32 W</td>
<td>4.95 nF</td>
<td>&lt;1 µH</td>
<td></td>
</tr>
</tbody>
</table>

9.7.4 N1 ATEX Type N

**Certificate**  Nemko 10ATEX1072X
**Standards**  

**Markings**  

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
<th>Temperature Range</th>
<th>Ambient Temperature Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>II 3G Ex nA ic IIC T4 Gc</td>
<td>(-50 °C ≤ Ta ≤ +60 °C /+70 °C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II 3G Ex ic IIC T4 Gc</td>
<td>(-50 °C ≤ Ta ≤ +60 °C /+70 °C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II 3D Ex tc IIIIC T69 °C/T79 °C Dc</td>
<td>(-50 °C ≤ Ta ≤ +60 °C /+70 °C)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

1. The transmitter circuits does not withstand 500V AC dielectric strength test according to EN 60079-11 clause 6.3.13 due to earth connected transient suppressing devices. Appropriate measures have to be considered by installation.

<table>
<thead>
<tr>
<th>Safety parameters</th>
<th>Ui</th>
<th>Ii</th>
<th>Pi</th>
<th>Ci</th>
<th>Li</th>
</tr>
</thead>
<tbody>
<tr>
<td>HART</td>
<td>42.4 V</td>
<td>23 mA</td>
<td>1 W</td>
<td>7.25 nF</td>
<td>Negligible</td>
</tr>
<tr>
<td>Fieldbus</td>
<td>32 V</td>
<td>21 mA</td>
<td>0.7 W</td>
<td>4.95 nF</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

**9.8 International**

**9.8.1 E7 IECEx Flameproof**

**Certificate**  
IECEx NEM 06.0001X

**Standards**  

**Markings**  
Ex db ia IIC T4 Ga/Gb (-40 °C ≤ Ta ≤ +60 °C /+70 °C)  
Ex ta IIIIC T69 °C/T79 °C Da (-40 °C ≤ Ta ≤ +60 °C /+70 °C)  
Um=250 VAC, IP66/IP67

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

1. Potential ignition hazards by impact or friction need to be considered according to IEC 60079-0:2011 clause 8.3 (for EPL Ga and EPL Gb) and clause 8.4 (for EPL Da and EPL Db), when the transmitter enclosure and antenna exposed to the exterior atmosphere of the tank, is made with light metals containing aluminum or titanium. The end user shall determine the suitability with regard to avoid hazards from impact and friction.

2. Parts of the sensor probes for the type 5300 are non-conducting and the area of the non-conducting part exceeds the maximum permissible areas for Group III according to IEC 60079-0.2011 clause 7.4:3 Therefore, when the antenna is used in a potentially explosive...
atmosphere group III, EPL Da, appropriate measures must be taken to prevent electrostatic discharge.

3. ½” NPT threads need to be sealed for dust and water ingress protection, IP 66, IP 67 or “Ex t”, EPL Da or Db is required.

9.8.2 I7 IECEx Intrinsic Safety

Certificate IECEx NEM 06.0001X


Markings Ex ia IIC T4 Ga (-55 °C ≤ Ta ≤ +60 °C/+70 °C)
Ex ia IIIC T69 °C/T79 °C Da (-50 °C ≤ Ta ≤ +60 °C/+70 °C)

Special Conditions for Safe Use (X):

1. The Intrinsically safe circuits do not withstand the 500 V AC test as specified in IEC 60079-11 clause 6.3.13

2. Potential ignition hazards by impact or friction need to be considered according to IEC 60079-0:2011 clause 8.3 (for EPL Ga and EPL Gb) and clause 8.4 (for EPL Da and EPL Db), when the transmitter enclosure and antenna exposed to the exterior atmosphere of the tank, is made with light metals containing aluminum or titanium. The end user shall determine the suitability with regard to avoid hazards from impact and friction.

3. Parts of the sensor probes for the type 5300 are non-conducting and the area of the non-conducting part exceeds the maximum permissible areas for Group III according to IEC 60079-0:2011 clause 7.4:3 Therefore, when the antenna is used in a potentially explosive atmosphere group III, EPL Da, appropriate measures must be taken to prevent electrostatic discharge.

4. ½” NPT threads need to be sealed for dust and water ingress protection, IP 66, IP 67 or “Ex t”, EPL Da or Db is required.

<table>
<thead>
<tr>
<th>Entity parameters</th>
<th>Ui</th>
<th>Ii</th>
<th>Pi</th>
<th>Ci</th>
<th>Li</th>
</tr>
</thead>
<tbody>
<tr>
<td>HART</td>
<td>30 V</td>
<td>130 mA</td>
<td>1 W</td>
<td>0 µF</td>
<td>Negligible</td>
</tr>
<tr>
<td>Fieldbus</td>
<td>30 V</td>
<td>300 mA</td>
<td>1.5 W</td>
<td>4.95 nF</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

9.8.3 IG IECEx FISCO

Certificate IECEx NEM 06.0001X
**Standards**  

**Markings**  
Ex ia IIC T4 Ga (-55 °C ≤ Ta ≤ +60 °C)  
Ex ia/ib IIC T4 Ga/Gb (-55 °C ≤ Ta ≤ +60 °C)  
Ex ia IIIc T69 °C Da (-50 °C ≤ Ta ≤ +60 °C)  
Ex ia/ib IIIc T69 °C Da/Db (-50 °C ≤ Ta ≤ +60 °C)

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

1. The Intrinsically safe circuits do not withstand the 500 V AC test as specified in IEC 60079-11 clause 6.3.13

2. Potential ignition hazards by impact or friction need to be considered according to IEC 60079-0:2011 clause 8.3 (for EPL Ga and EPL Gb) and clause 8.4 (for EPL Da and EPL Db), when the transmitter enclosure and antenna exposed to the exterior atmosphere of the tank, is made with light metals containing aluminum or titanium. The end user shall determine the suitability with regard to avoid hazards from impact and friction.

3. Parts of the sensor probes for the type 5300 are non-conducting and the area of the non-conducting part exceeds the maximum permissible areas for Group IIC and according to IEC 6079-0.2011 clause 7.4: 20 cm² for EPL Gb and 4 cm² for EPL Ga. Therefore, when the antenna is used in a potentially explosive atmosphere, appropriate measures must be taken to prevent electrostatic discharge.

4. The Ex ia version of model 5300 FISCO field device may be supplied by an [Ex ib] FISCO power supply when the power supply is certified with three separate safety current limiting devices and voltage limitation which meets the requirements for type Ex ia.

5. ½” NPT threads need to be sealed for dust and water ingress protection, IP 66, IP 67 or “Ex t”, EPL Da or Db is required.

<table>
<thead>
<tr>
<th><strong>FISCO parameters</strong></th>
<th>Ul</th>
<th>li</th>
<th>PI</th>
<th>Ci</th>
<th>Li</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.5 V</td>
<td>380 mA</td>
<td>5.32 W</td>
<td>4.95 nF</td>
<td>&lt;1 µH</td>
<td></td>
</tr>
</tbody>
</table>

9.8.4 N7 IECEx Type N

**Certificate**  
IECEx NEM 10.0005X

**Standards**  

**Markings**  
Ex na ic IIC T4 Gc (-50 °C ≤ Ta ≤ +60 °C /+70 °C)  
Ex ic IIC T4 Gc (-50 °C ≤ Ta ≤ +60 °C /+70 °C)
Ex tc IIC T69 °C/T79 °C Dc (-50 °C ≤ Ta ≤ +60 °C /+70 °C)

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

1. The transmitter circuits does not withstand 500V AC dielectric strength test according to EN 60079-11 clause 6.3.13 due to earth connected transient suppressing devices. Appropriate measures have to be considered by installation.

<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>Safety parameters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HART</td>
<td>42.4 V</td>
<td>23 mA</td>
<td>1 W</td>
<td>7.25 nF</td>
<td>Negligible</td>
</tr>
<tr>
<td>Safety parameters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fieldbus</td>
<td>32 V</td>
<td>21 mA</td>
<td>0.7 W</td>
<td>4.95 nF</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

9.9 Brazil

9.9.1 E2 INMETRO Flameproof

**Certificate**  UL-BR 17.0188X


**Markings**  Ex db ia IIC T4 Ga/Gb (-40 °C ≤ $T_{amb}$ ≤ +60 °C /+70 °C)

Ex ta IIC T69 °C/T79 °C Da (-40 °C ≤ $T_{amb}$ ≤ +60 °C /+70 °C)

$U_m=250 V_{ac}$, IP66/67

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

1. See certificate for Specific Conditions.

9.9.2 I2 INMETRO Intrinsic Safety

**Certificate**  Certificate: UL-BR 17.0188X


**Markings**  Ex ia IIC T4 Ga (- 55 °C ≤ $T_{amb}$ ≤ +60 °C /+70 °C)

Ex ia IIC T69 °C/T79 °C Da (- 50 °C ≤ $T_{amb}$ ≤ +60 °C /+70 °C)

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

1. See certificate for Specific Conditions.
### Entity parameters

<table>
<thead>
<tr>
<th>HART</th>
<th>30 V&lt;sub&gt;dc&lt;/sub&gt;</th>
<th>130 mA</th>
<th>1.0 W</th>
<th>7.26 nF</th>
<th>Negligible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fieldbus</td>
<td>30 V&lt;sub&gt;dc&lt;/sub&gt;</td>
<td>300 mA</td>
<td>1.5 W</td>
<td>4.95 nF</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

### 9.9.3 IB INMETRO FISCO

**Certificate**  
UL-BR 17.0188X

**Standards**  

**Markings**  
Ex ia IIC T4 Ga (-55 °C ≤ T<sub>amb</sub> ≤ +60 °C)  
Ex ia/ib IIC T4 Ga/Gb (-55 °C ≤ T<sub>amb</sub> ≤ +60 °C)  
Ex ia IIIC T69 °C Da (-50 °C ≤ T<sub>amb</sub> ≤ +60 °C)  
Ex ia/ib IIIC T69 °C Da/Db (-50 °C ≤ T<sub>amb</sub> ≤ +60 °C)

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

1. See certificate for Specific Conditions.

### FISCO parameters

| 17.5 V<sub>dc</sub> | 380 mA | 5.32 W | 4.95 nF | <1 µH |

### 9.10 China

#### 9.10.1 E3 China Flameproof

**Certificate**  
GYJ16.1095X

**Standards**  
GB 3836.1/2/4/20-2010, GB 12476.1/5-2013, GB 12476.4-2010

**Markings**  
Ex d ia IIC T4 Ga/Gb (-40 °C ≤ T<sub>a</sub> ≤ +60 °C/70 °C)  
Ex tD A20 IP 66/67 T69 °C /T79 °C (-40 °C ≤ T<sub>a</sub> ≤ +60 °C/70 °C)

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

1. See certificate for Specific Conditions.

#### 9.10.2 I3 China Intrinsic Safety

**Certificate**  
GYJ16.1095X

**Standards**  
GB 3836.1/2/4/20-2010, GB 12476.1/5-2013, GB 12476.4-2010
Markings
Ex ia IIC T4 Ga (-50 °C ≤ Ta ≤ +60 °C/+70 °C)
Ex iaD 20 T69 °C/T79 °C (-50 °C ≤ Ta ≤ +60 °C/+70 °C)
Ex iaD/ibD 20/21 T69 °C (-50 °C ≤ Ta ≤ +60 °C)

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

<table>
<thead>
<tr>
<th></th>
<th>Ui</th>
<th>Ii</th>
<th>Pi</th>
<th>Ci</th>
<th>Li</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entity parameters HART</td>
<td>30</td>
<td>130</td>
<td>1</td>
<td>7.26 nF</td>
<td>0 mH</td>
</tr>
<tr>
<td>Entity parameters Fieldbus</td>
<td>30</td>
<td>300</td>
<td>1.5</td>
<td>4.95 nF</td>
<td>0 mH</td>
</tr>
</tbody>
</table>

9.10.3 IC China FISCO

Certificate  GYJ16.1095X
Standards  GB 3836.1/2/4/20-2000, GB 12476.4/5-2013, GB 12476.1-2010
Markings  Ex ia IIC T4 Ga (-50 °C ≤ Ta ≤ +60 °C)
Ex ia/ib IIC T4 Ga/Gb (-50 °C ≤ Ta ≤ +60 °C)
Ex iaD 20 T69 (-50 °C ≤ Ta ≤ +60 °C)
Ex iaD/ibD 20/21 T69 °C (-50 °C ≤ Ta ≤ +60 °C)

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

<table>
<thead>
<tr>
<th></th>
<th>Ui</th>
<th>Ii</th>
<th>Pi</th>
<th>Ci</th>
<th>Li</th>
</tr>
</thead>
<tbody>
<tr>
<td>FISCO parameters</td>
<td>17.5</td>
<td>380</td>
<td>5.32</td>
<td>4.95 nF</td>
<td>&lt;0.001 mH</td>
</tr>
</tbody>
</table>

9.10.4 N3 China Type N

Certificate  GYJ18.1331X
Standards  GB 3836.1-2010, GB 3836.4-2010, GB 3836.8-2014
Markings  Ex nA ic IIC T4 Gc (-50 °C ≤ Ta ≤ +60 °C/+70 °C)
Ex ic IIC T4 Gc (-50 °C ≤ Ta ≤ +60 °C/+70 °C)

Special Conditions for Safe Use (X):
1. See certificate for Specific Conditions.
### 9.11 Technical Regulations Customs Union (EAC)

#### 9.11.1 EM Technical Regulations Customs Union (EAC) Flameproof

**Certificate** RU C-SE.AA87.B.00802

**Markings**
- Ga/Gb Ex db ia IIC T4....T1 X, (-40 °C ≤ Ta ≤ +60 °C/+70 °C)
- Ex ta IIC T69 °C/T79 °C Da X (-40 °C ≤ Ta ≤ +60 °C/+70 °C)

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

#### 9.11.2 IM Technical Regulations Customs Union (EAC) Intrinsic Safety

**Certificate** RU C-SE.AA87.B.00802

**Markings**
- 0Ex ia IIC T4...T1 Ga X, (-55 °C ≤ Ta ≤ +60 °C/+70 °C)
- Ga/Gb Ex ia/ib IIC T4...T1 X, (-55 °C ≤ Ta ≤ +60 °C/+70 °C)
- Ex ia IIC T69 °C/T79 °C Da X, (-50 °C ≤ Ta ≤ +60 °C/+70 °C)
- Da/Db Ex ia/ib IIC T69 °C/T79 °C X, (-50 °C ≤ Ta ≤ +60 °C/+70 °C)

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

<table>
<thead>
<tr>
<th></th>
<th>Ui</th>
<th>li</th>
<th>Pi</th>
<th>Ci</th>
<th>Li</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety parameters HART</td>
<td>42.4 V</td>
<td>23 mA</td>
<td>1 W</td>
<td>7.25 nF</td>
<td>Negligible</td>
</tr>
<tr>
<td>Safety parameters Fieldbus</td>
<td>32 V</td>
<td>21 mA</td>
<td>0.7 W</td>
<td>4.95 nF</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

### 9.12 Japan

#### 9.12.1 E4 Flameproof

**Certificate** CML 17JPN1334X

**Markings** Ex d ia IIC T4 Ga/Gb (-40 °C ≤ Ta ≤ +60 °C/+70 °C)
Special Conditions for Safe Use (X):
1. See certificate for Specific Conditions.

9.13 Republic of Korea
9.13.1 EP Flameproof HART

Certificate KTL 15-KB4BO-0297X
Markings Ex d ia IIC T4 Ga/Gb

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

9.13.2 EP Flameproof Fieldbus

Certificate KTL 12-KB4BO-0179X
Markings Ex ia/d ia IIC T4

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

9.14 India
9.14.1 Flameproof, Intrinsically safe

Certificate P392482/1
Markings Ex db ia IIC T4 Ga /Gb
Ex ia IIC T4 Ga

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

9.15 Ukraine
9.15.1 Flameproof, Intrinsically Safe

Certificate UA.TR.047.C.0352-13
Markings 0 Ex ia IIC T4 X,
1 Ex d ia IIC T4 X

Special Conditions for Safe Use (X):
1. See certificate for Specific Conditions.
9.16 Uzbekistan
9.16.1 Safety (import)

**Certificate** UZ.SMT.01.342.2017121

9.17 Combinations

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KA</td>
<td>Combination of E1, E5 and E6</td>
</tr>
<tr>
<td>KB</td>
<td>Combination of E1, E5 and E7</td>
</tr>
<tr>
<td>KC</td>
<td>Combination of E1, E6 and E7</td>
</tr>
<tr>
<td>KD</td>
<td>Combination of E5, E6 and E7</td>
</tr>
<tr>
<td>KE</td>
<td>Combination of I1, I5 and I6</td>
</tr>
<tr>
<td>KF</td>
<td>Combination of I1, I5 and I7</td>
</tr>
<tr>
<td>KG</td>
<td>Combination of I1, I6 and I7</td>
</tr>
<tr>
<td>KH</td>
<td>Combination of I5, I6 and I7</td>
</tr>
<tr>
<td>KI</td>
<td>Combination of IA, IE and IF</td>
</tr>
<tr>
<td>KJ</td>
<td>Combination of IA, IE and IG</td>
</tr>
<tr>
<td>KK</td>
<td>Combination of IA, IF and IG</td>
</tr>
<tr>
<td>KL</td>
<td>Combination of IE, IF and IG</td>
</tr>
</tbody>
</table>

9.18 Additional certifications

9.18.1 SBS American Bureau of Shipping (ABS) Type Approval

**Certificate** 15-LD1340199-1-PDA

**Intended Use** For use on ABS Classed Vessels and Offshore Facilities in accordance with ABS rules and International Standards.

**Note** Housing material A, Aluminum, is not to be used on open decks.

9.18.2 SBV Bureau Veritas (BV) Type Approval

**Certificate** 22378_B3 BV

**Requirements** Bureau Veritas rules for classification of steel ships. EC Code: 41SB

**Application** Class Notations: AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS.
Note
Housing material A, Aluminum, is not to be used on open decks.

9.18.3 SDN Det Norske Veritas Germanischer Lloyd (DNV GL) Type Approval

Certificate  TAA000020G

Intended Use  DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Table 9-1: Application

<table>
<thead>
<tr>
<th>Location classes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>D</td>
</tr>
<tr>
<td>Humidity</td>
<td>B</td>
</tr>
<tr>
<td>Vibration</td>
<td>A</td>
</tr>
<tr>
<td>EMC</td>
<td>B</td>
</tr>
<tr>
<td>Enclosure</td>
<td>C</td>
</tr>
</tbody>
</table>

Note
Housing material A, Aluminum, is not to be used on open decks.

9.18.4 SLL Lloyds Register (LR) Type Approval

Certificate  15/20053

Application  Marine applications for use in environmental categories ENV1, ENV2, ENV3 and ENV5.

Note
Housing material A, Aluminum, is not to be used on open decks.

9.18.5 U1 Overfill prevention

Certificate  Z-65.16-476

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

9.18.6 J8 EN Boiler (European Boiler Approval in accordance with EN 12952-11 and EN 12953-9)

Note
Suitable for use as a level sensor part of a limiting device in accordance with EN 12952-11 and EN 12953-9.
9.18.7 QT Safety-certified to IEC 61508 with certificate of FMEDA data

Certificate exida ROS 13-06-005 C001 R1.3

9.18.8 Suitable for intended use

Compliant with NAMUR NE 95, version 22.01.2013 “Basic Principles of Homologation”

9.19 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 CPA 2012-L135

9.20 Conduit plugs and adapters

**IECEx Flameproof and Increased Safety**

Certificate IECEx FMG 13.0032X


Markings Ex de IIC Gb

**ATEX Flameproof and Increased Safety**

Certificate FM13ATEX0076X


Markings ☑ II 2 G Ex de IIC Gb
Table 9-2: 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 9-3: 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>

Special Conditions for Safe Use (X):

1. When the thread adapter or blanking plug is used with an enclosure in type of protection increased safety “e” the entry thread shall be suitably sealed in order to maintain the ingress protection rating (IP) of the enclosure. See certificate for Specific Conditions.

2. The blanking plug shall not be used with an adapter.

3. Blanking Plug and Threaded Adapter shall be either NPT or Metric thread forms. G½ thread forms are only acceptable for existing (legacy) equipment installations.
INSTALLATION OF INTRINSICALLY SAFE FM APPROVED APPARATUS

9.21 Installation drawings

Figure 9.1: 924030-936 - System Control Drawing for Hazardous Location Installation of Intrinsically Safe FM Approved Apparatus

NON-HAZARDOUS LOCATION

Hazardous Location

Notes:
1. No revision to this drawing without prior Factory Mutual Approval.
2. Associated apparatus manufacturer’s Installation drawing must be followed when installing this product.
3. Dust-Tight seal must be used when installed in Class II and Class III environments.
4. Control equipment connected to the barrier must not use or generate more than 250Vrms or Vac.
5. Resistance between Intrinsically Safe Ground and Earth Ground must be less than 1.0 ohm.
6. Installations should be in accordance with ANSI/ISA 84.1.1-99 “Installation of Intrinsically Safe Systems for Hazardous Locations” and the National Electric Code (ANSI/NFPA 70).
7. The associated apparatus must be Factory Mutual Approved.
8. Connect supply wires to the appropriate terminals as indicated on the terminal block and in the installation documents.

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

WARNING: Substitution of components may impair Intrinsic Safety.

WARNING: Potential Electrostatic Charging Hazard – The enclosure is a non-metallic construction. 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 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 47
February 2019

GRID SIZE A3

ENTITY CONCEPT APPROVAL

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 (Vin or Vc) and max. short circuit current (Isc or Isc) and max. power (Pmax or Pmax) for the associated apparatus must be less than or equal to the maximum safe input voltage (Vmax), maximum safe input current (Imax), and maximum safe input power (Pmax) of the Intrinsically safe apparatus. In addition, the approved max. allowable connected capacitance (Ca or Cc) 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 (La or Li) 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.

Component Parameters

Model | Entity Parameters | Ambient Temperature Limit
--- | --- | ---
4-20 mA HART IS Model | Vmax(Uc) <= 30V, (Imax)(Lc) <= 130 mA | -50 <= Ta <= 70 deg C
Fieldbus IS Model | Vmax(Uc) <= 30V, (Imax)(Lc) <= 300 mA | -50 <= Ta <= 80 deg C
Fieldbus FISCO IS Model | Vmax(Uc) <= 175 V, Imax(Uc) <= 380 mA | -50 <= Ta <= 80 deg C

SYSTEM CONTROL DRAWING

for hazardous location installation of Intrinsically Safe FM approved apparatus

9240 030-936

Quick Start Guide
Figure 9-2: 924030-937 - Installation Drawing for Hazardous Location installation of Intrinsically Safe CSA Approved Apparatus

Intrinsically Safe Ex ia
Class I, Division I, Groups A, B, C and D, Temperature Code T4 :

<table>
<thead>
<tr>
<th>Model</th>
<th>Entity Parameters</th>
<th>Ambient Temperature Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-20 mA/HART IS Model</td>
<td>V_{\text{max}} \leq 30V, I_{\text{max}} \leq 130 mA</td>
<td>-50 °C \leq T_a \leq 70 deg C</td>
</tr>
<tr>
<td>Fieldbus IS Model</td>
<td>V_{\text{max}} \leq 30V, I_{\text{max}} \leq 300 mA</td>
<td>-50 °C \leq T_a \leq 60 deg C</td>
</tr>
<tr>
<td>Fieldbus FISCO IS Model</td>
<td>V_{\text{max}} \leq 17.5V, I_{\text{max}} \leq 380 mA</td>
<td>-50 °C \leq T_a \leq 60 deg C</td>
</tr>
</tbody>
</table>

Notes:
1. Entity parameters listed for HART/Fieldbus Model apply only to associated apparatus with linear output.
2. Control equipment connected to the barrier must not use or generate more than 250 Vrms or Vdc.
3. Connect supply wires to the appropriate terminals as indicated on the terminal block and in the installation documents.
4. Installations should be in accordance with ANSI/ISA-RP12.9 "Installations of Intrinsically Safe Systems for Hazardous Locations" and the Canadian Electric Code.
5. Product options bearing the DUAL SEAL marking on the label meets the Dual Seal requirements of 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.
Figure 9-3: D92400030-938 - Installation Drawing for Hazardous Location
Installation of Intrinsically Safe ATEX and IECEx Approved Apparatus

- Location
- Technical specifications
- Installation instructions
- Certification details
- Safety considerations
- Maintenance procedures

Quick Start Guide
February 2019

49
Figure 9.4: 9240031-957 - Installation Drawing Exn

Non-Hazardous Location

Hazardous Location

HART:
42.4 VDC, 23 mA
FOUNDATION FIELDBUS:
32 VDC, 21 mA

Input parameters for Non-sparking / Energy Limited

<table>
<thead>
<tr>
<th>Model</th>
<th>Parameters</th>
<th>Ambient Temperature Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURRENT LOOP / HART</td>
<td>42.4 VDC, 23 mA</td>
<td>−50 ≤ Ta ≤ 70 °C</td>
</tr>
<tr>
<td>FOUNDATION FIELDBUS</td>
<td>32 VDC, 21 mA</td>
<td>−50 ≤ Ta ≤ 60 °C</td>
</tr>
</tbody>
</table>

Input parameters for Energy Limited

<table>
<thead>
<tr>
<th>Model</th>
<th>Parameters</th>
<th>Ambient Temperature Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURRENT LOOP / HART</td>
<td>U = 42.4 V, I = 23 mA, P = 1.0 W, C = 7.25 nF</td>
<td>−50 ≤ Ta ≤ 70 °C</td>
</tr>
<tr>
<td>FOUNDATION FIELDBUS</td>
<td>U = 32 VDC, I = 21 mA, P = 0.7 W, C = 4.95 nF</td>
<td>−50 ≤ Ta ≤ 60 °C</td>
</tr>
</tbody>
</table>

Notes:
1. Connect supply wires to the appropriate terminals as indicated on the terminal block label and in the installation documents.

Specific Conditions for Safe Use (X):
1. The intrinsically safe circuits do not withstand the 500V AC test as specified in IEC 60079-11 clause 6.4.13.

Ex-Certified Product

No modifications permitted without reference to the Ex-certifying Authorities.
EU Declaration of Conformity
No: 5300

We,

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

declare under our sole responsibility that the product,

Rosemount™ 5300 Series Level and Interface Transmitter

manufactured by,

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

to which this declaration relates, is in conformity with the provisions of the European Community Directives, including amendments, as shown in the attached schedule.

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

(signature)

Dajana Prastalo
(name - printed)

Manager Product Approvals
(function name - printed)

2018-01-31
(date of issue)
EMC Directive (2014/30/EU)

EN 61326-1:2013

ATEX Directive (2014/34/EU)

Nemko 04ATEX1073X

Intrinsic Safety (Hart® 4-20mA):
- Equipment Group II, Category 1G, Ex ia IIC T4 Ga
- Equipment Group II, Category 1D, Ex ia IIIC T79° Da

Intrinsic Safety (Foundation ® Fieldbus):
- Equipment Group II, Category 1G, Ex ia IIC T4 Ga
- Equipment Group II, Category 1D, Ex ia IIIC T69° Da

Intrinsic Safety (Foundation ® Fieldbus FISCO):
- Equipment Group II, Category 1G, Ex ia IIC T4 Ga
- Equipment Group II, Category 1/2G, Ex ia/ib IIC T4 Ga/Gb
- Equipment Group II, Category 1D, Ex ia IIIC T69° Da
- Equipment Group II, Category 1/2D, Ex ia/ib IIIC T69° Da/Db

Flameproof (Hart® 4-20mA, Modbus RS-485):
- Equipment Group II, Category 1/2G, Ex db ia IIC T4 Ga/Gb
- Equipment Group II, Category 1D, Ex ta IIIC T79° Da

Flameproof (Foundation ® Fieldbus):
- Equipment Group II, Category 1/2G, Ex db ia IIC T4 Ga/Gb
- Equipment Group II, Category 1D, Ex ta IIIC T69° Da

Nemko 10ATEX1072X

Type of protection N, Non-sparking (Hart@ 4-20mA):
  Equipment Group II, Category 3G, Ex nA ic IIC T4 Gc
  Equipment Group II, Category 3D, Ex tc IIIC T79° Dc

Type of protection N, Non-sparking (Foundation ® Fieldbus):
  Equipment Group II, Category 3G, Ex nA ic IIC T4 Gc
  Equipment Group II, Category 3D, Ex tc IIIC T69° Dc

Intrinsic Safety (Hart@ 4-20mA):
  Equipment Group II, Category 3G, Ex ic IIC T4 Gc
  Equipment Group II, Category 3D, Ex tc IIIC T79° Dc

Intrinsic Safety (Foundation ® Fieldbus):
  Equipment Group II, Category 3G, Ex ic IIC T4 Gc
  Equipment Group II, Category 3D, Ex tc IIIC T69° Dc

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

Nemko AS [Notified Body Number: 0470]
P.O.Box 73 Blindern
0314 OSLO
Norway

ATEX Notified Body for Quality Assurance

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

<table>
<thead>
<tr>
<th>Part Name/部件名称</th>
<th>Hazardous Substances / 有害物质</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lead (Pb)</td>
</tr>
<tr>
<td>Electronics Assembly</td>
<td>X</td>
</tr>
<tr>
<td>Housing Assembly</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.

9.23 China RoHS