

# Rosemount™ 5300 Level Transmitter

## Guided Wave Radar



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# 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](http://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](http://Emerson.com/DeviceInstallKits).

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

Firmware version <sup>(1)</sup>	Find Device Driver	
	HART® Universal Revision	Device Revision <sup>(2)</sup>
2F0 or later	7	4
	5	3
2A2 - 2E0	5	3

(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.

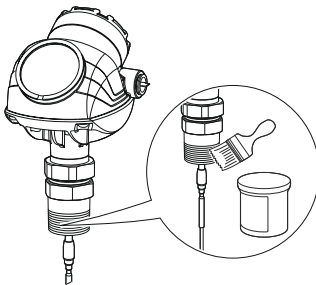
#### 3.1 Threaded/Flange/Tri-Clamp® tank connection

##### Procedure

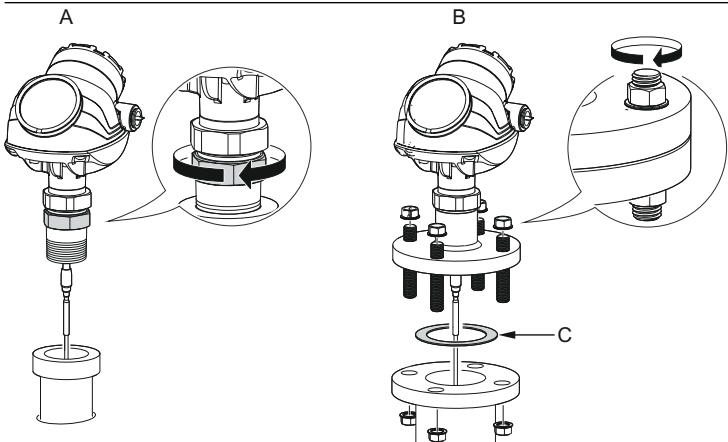
1. Seal and protect the threads.

⚠ Only for NPT threaded tank connection.

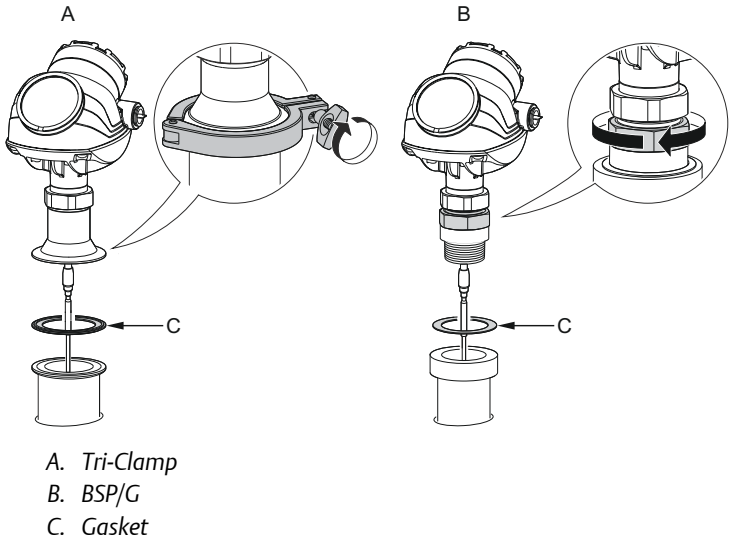
Use anti-seize paste or PTFE tape according to your site procedures.



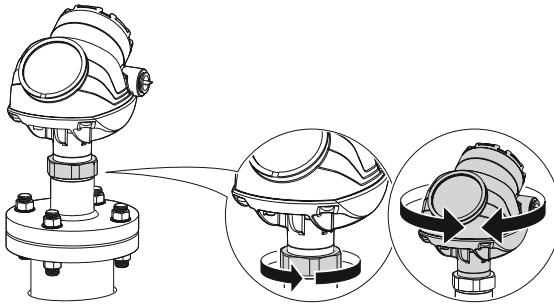
2. Mount the device on tank.



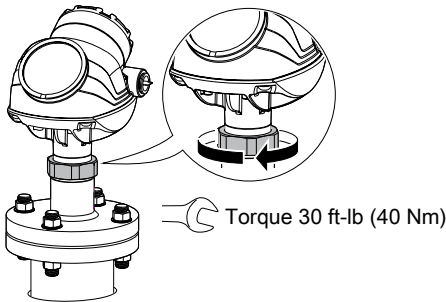
- A. NPT  
B. Flange  
C. Gasket



3. (Optional) Adjust display orientation.



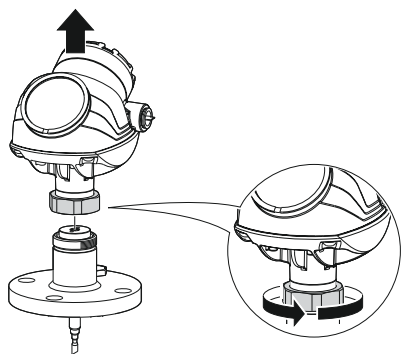
4. Tighten the nut.



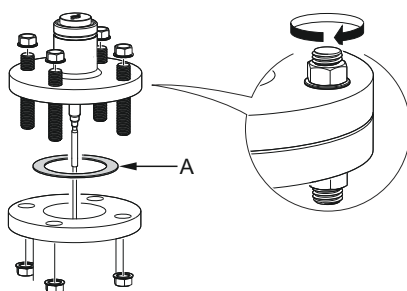
## 3.2 Install remote housing

### Procedure

1. Carefully remove the transmitter.

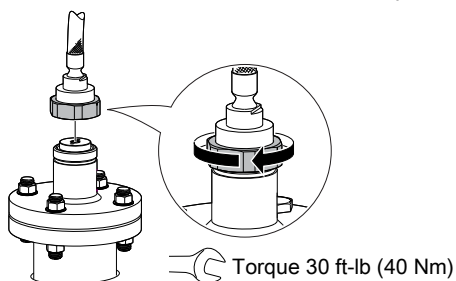


2. Mount the probe on tank.



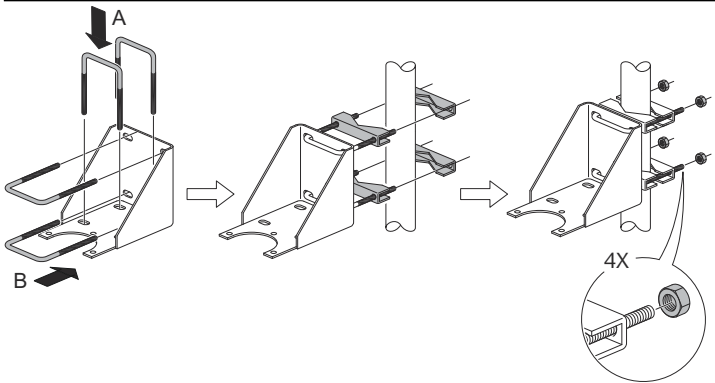
A. Gasket

3. Mount the remote connection on the probe.



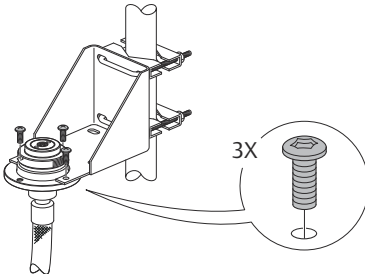


4. Mount the bracket to the pipe.

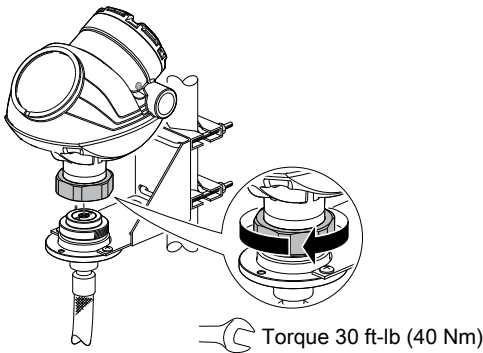


- A. Horizontal pipe
- B. Vertical pipe

5. Fasten the housing support.



6. Mount the transmitter head.

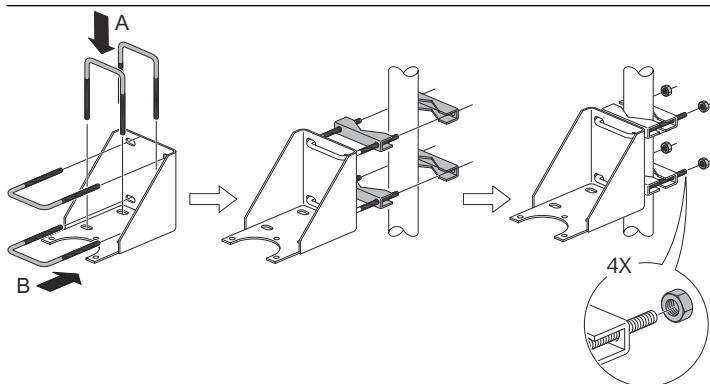


## 3.3 Bracket mounting

### Procedure

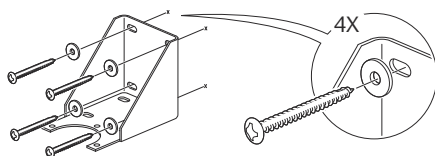
1. Mount the bracket to the pipe/wall.

On pipe:

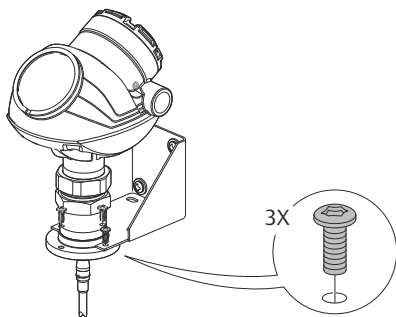


- A. Horizontal pipe  
B. Vertical pipe

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.

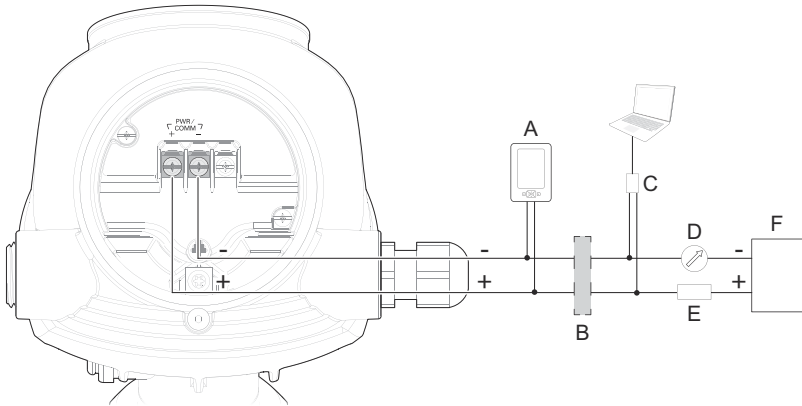
### 4.2 Power supply (Vdc)

Approval type	HART®	FOUNDATION™ Fieldbus	RS-485 with Modbus®
None	16-42.4	9-32	8-30 (max. rating)
Non-sparking/ energy limited	16-42.4	9-32	N/A
Intrinsically safe	16-30	9-30	N/A
FISCO	N/A	9-17.5	N/A
Explosion-proof/ Flameproof	20-42.4	16-32	8-30 (max. rating)

### 4.3 4-20 mA/HART<sup>®</sup> communication

#### 4.3.1 Wiring diagram

**Figure 4-1: Wiring Diagram for 4-20 mA/HART<sup>®</sup>**



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

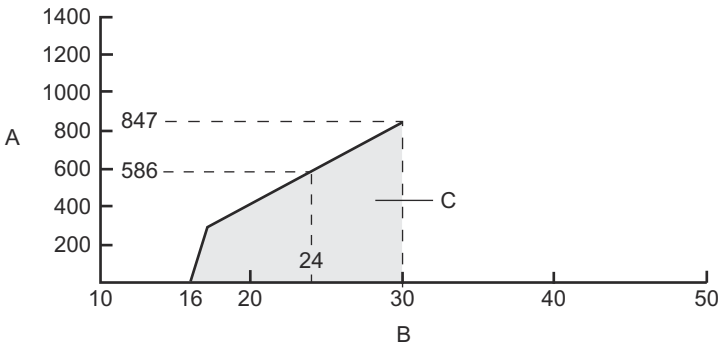
#### Note

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

#### 4.3.2 Load limitations

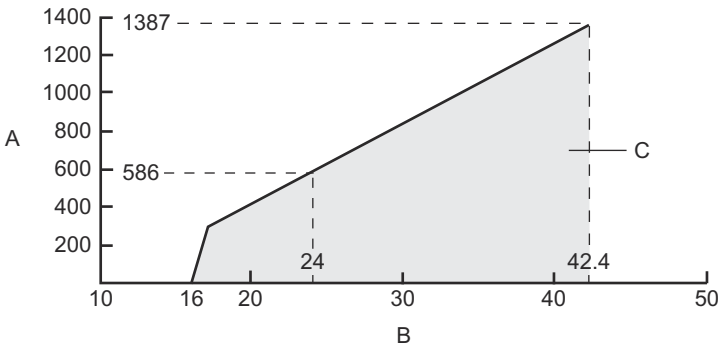
For HART<sup>®</sup> communication, a minimum loop resistance of  $250 \Omega$  is required. Maximum loop resistance is determined by the voltage level of the external power supply, as given by the following diagrams:

**Figure 4-2: Intrinsically Safe Installations**



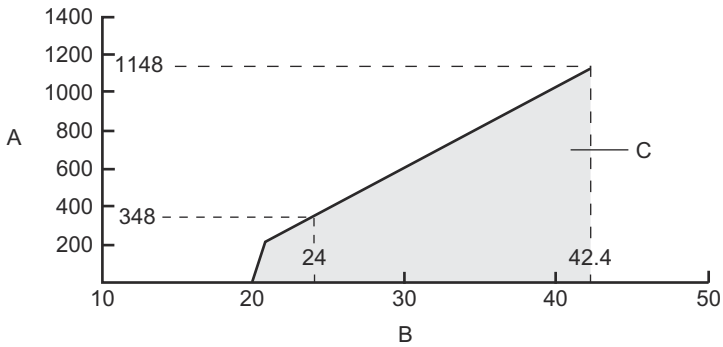
- A. Loop Resistance (Ohms)
- B. External Power Supply Voltage (Vdc)
- C. Operating region

**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

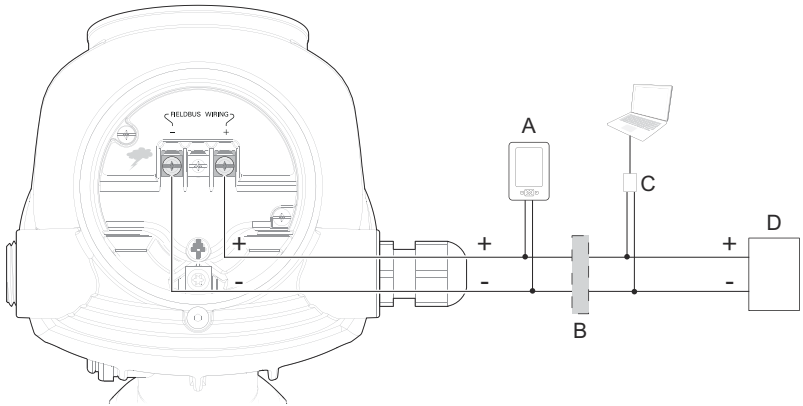
**Note**

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

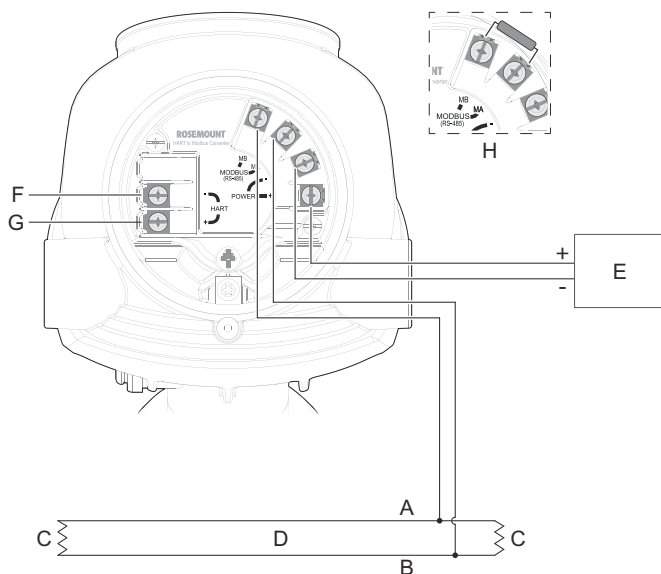
See the Rosemount 5300 [Reference Manual](#) for details.

### 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  $\Omega$
- D. RS-485 Bus
- E. Power supply
- F. HART -
- G. HART +
- H. If it is the last transmitter on the bus, connect the 120  $\Omega$  termination resistor.

### Note

Rosemount 5300 Level Transmitters with Flameproof/Explosion-proof output have a built-in barrier; no external barrier needed.<sup>(1)</sup>

## 4.6 Grounding

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

<sup>(1)</sup> An external galvanic isolator is always recommended to be used for Flameproof/Explosion-proof installations.



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**Note**

Grounding the transmitter via threaded conduit connection may not provide sufficient ground.

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**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.

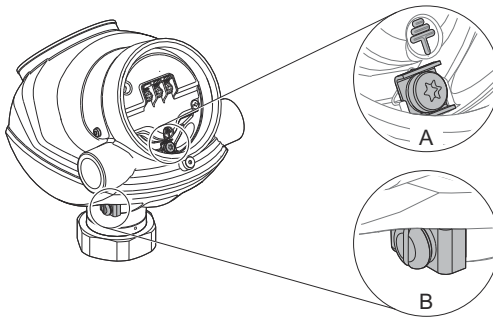
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**Transmitter housing grounding**

The most effective transmitter housing grounding method is a direct connection to earth ground with minimal ( $< 1 \Omega$ ) impedance. There are two grounding screw connections provided (see [Figure 4-7](#)).

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**Figure 4-7: Ground Screws**



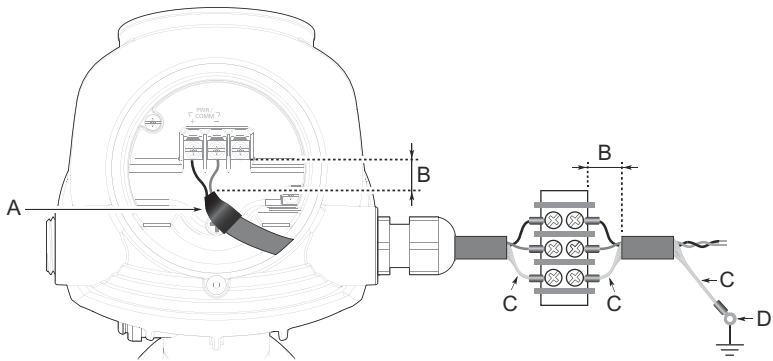
- A. Internal ground screw  
B. External ground screw
- 

**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**

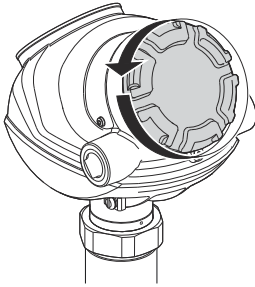


- A. Insulate shield
- B. Minimize distance
- C. Trim shield and insulate
- D. Connect shield back to the power supply ground

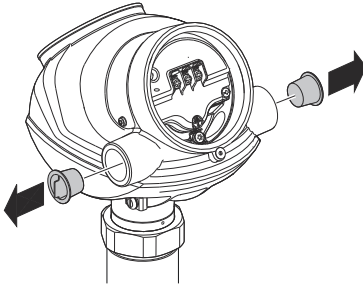
## 5 Connect wiring and power up

### Procedure

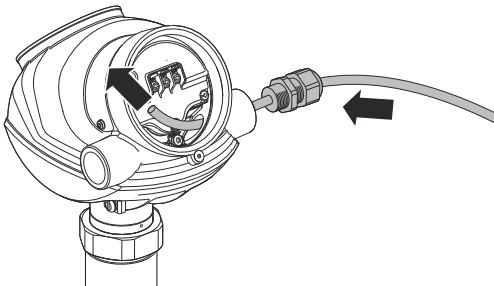
1. ⚠ Make sure the power supply is switched off.
2. Remove the terminal block cover.



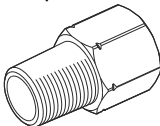
3. Remove the plastic plugs.



4. Pull the cable through the cable gland/conduit.



Adapters are required if M20 glands are used.



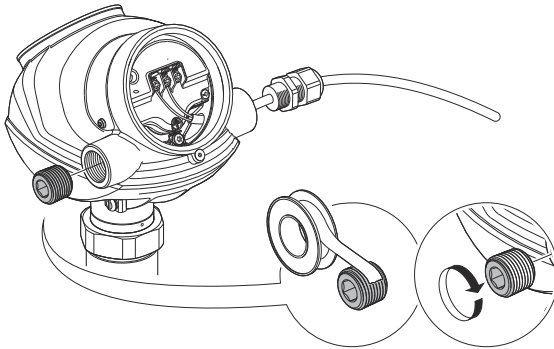
5. Connect the cable wires (see [Figure 4-1](#), [Figure 4-5](#), and [Figure 4-6](#)).
6. Ensure proper grounding (see [Grounding](#)).
7. Use the enclosed metal plug to seal any unused port.

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**Note**

Apply PTFE tape or other sealant to the threads.

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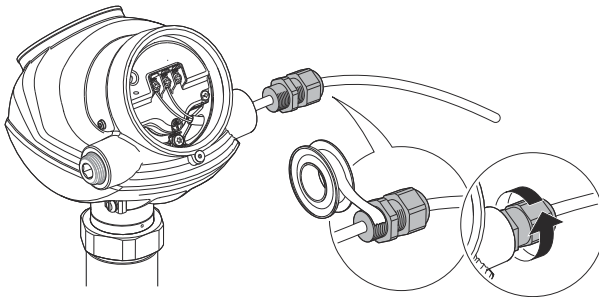
8. Tighten the cable gland.

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**Note**

Apply PTFE tape or other sealant to the threads.

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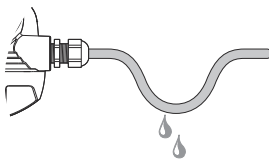


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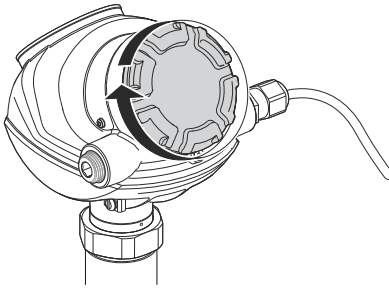
**Note**

Make sure to arrange the wiring with a drip loop.

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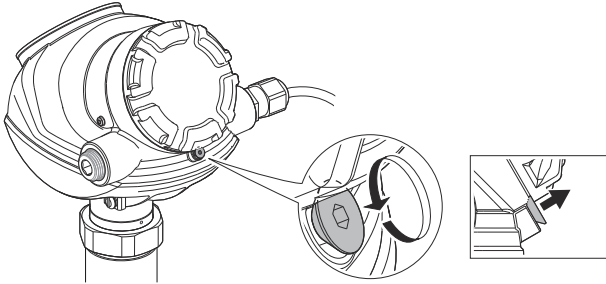


- 9. ⚠ Mount the cover making sure the cover is secure to meet explosion-proof requirements.



- 10. Turn the jam screw counterclockwise until it contacts the cover.

⚠ Required for Flameproof installations only.



- 11. Connect the power supply.

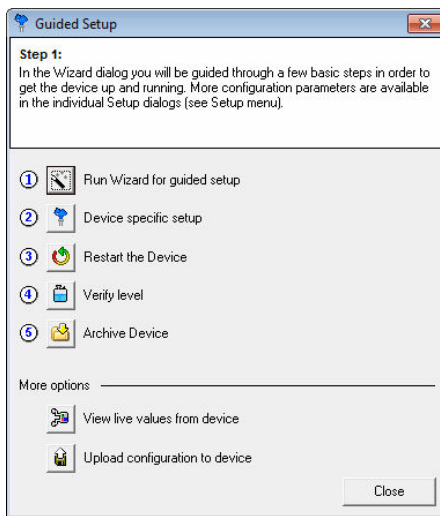
## 6 Configure

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

1. Start Rosemount Radar Master.
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**

Function	Parameter
Probe type	TRANSDUCER_1100 > PROBE_TYPE
Probe length	TRANSDUCER_1100 > PROBE_LENGTH
Hold off distance/Upper null zone	TRANSDUCER_1100 > GEOM_HOLD_OFF_DIST
Tank height	TRANSDUCER_1100 > GEOM_TANK_HEIGHT
Mounting type	TRANSDUCER_1100 > MOUNTING_TYPE
Pipe/chamber/nozzle inner diameter	TRANSDUCER_1100 > PIPE_DIAMETER
Nozzle height	TRANSDUCER_1100 > NOZZLE_HEIGHT
Measurement mode	TRANSDUCER_1100 > MEAS_MODE
Product dielectric range <sup>(1)</sup>	TRANSDUCER 1100 > PRODUCT_DIELEC_RANGE
Upper product dielectric constant <sup>(2)</sup>	TRANSDUCER 1100 > UPPER_PRODUCT_DC
Process condition (rapid level changes)	TRANSDUCER_1100 > ENV_ENVIRONMENT
Volume calculation method	TRANSDUCER 1300 > VOL_VOLUME_CALC_METHOD
Tank diameter (only for ideal tank shapes)	TRANSDUCER 1300 > VOL_IDEAL_DIAMETER
Tank length/height (only for ideal tank shapes)	TRANSDUCER_1300 > VOL_IDEAL_LENGTH
Volume offset	TRANSDUCER_1300 > VOL_VOLUME_OFFSET

- (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)

For Safety Certified installations, refer to the Rosemount 5300 [Reference Manual](#).

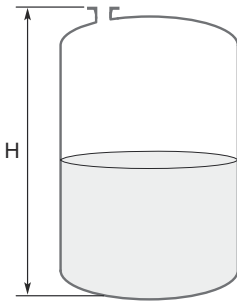
## 8 Adjust probe length

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.

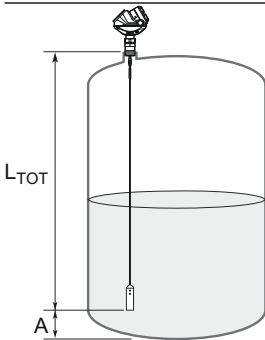
Tank height (H):



2. Calculate total probe length.

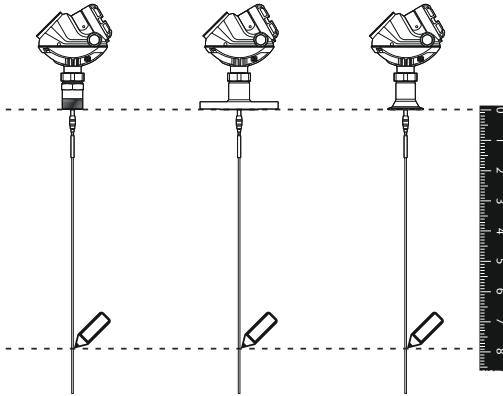
Total probe length ( $L_{TOT}$ ) = Tank height (H) – 2 in. (5 cm)

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

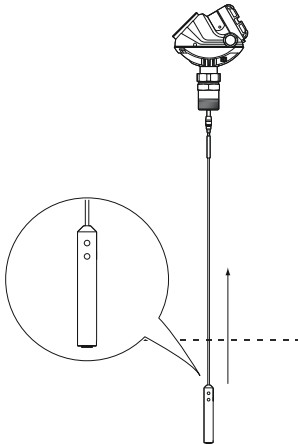


A. 2 in. (5 cm) clearance

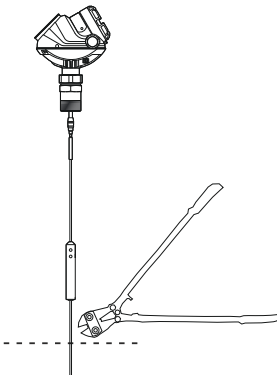
3. Mark where to cut the probe.



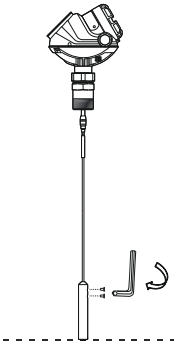
4. Slide the weight up.



5. Cut the probe at the mark.



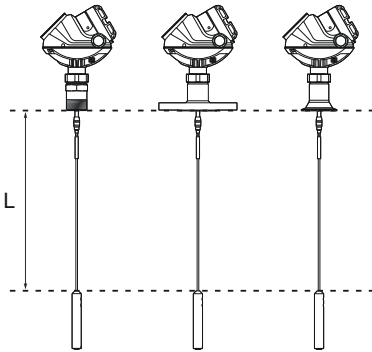
- Fasten the weight.



Weight material	Torque (Nm)
Stainless steel	5
Alloy C-276	2.5
Alloy 400	2.5
Duplex 2205	2.5

- Update transmitter configuration to the new probe length.

Probe 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](http://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

**Standards** FM Class 3600 – 2011; FM Class 3610 – 2010; FM Class 3611 – 2004; FM Class 3615 – 2006; FM Class 3810 – 2005; ANSI/ISA 60079-0 – 2013; ANSI/ISA 60079-11 – 2012; ANSI/NEMA® 250 – 2003;

**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 I5 Intrinsic Safety (IS), Nonincendive (NI)

**Certificate** FM16US0444X

**Standards** FM Class 3600 – 2011; FM Class 3610 – 2010; FM Class 3611 – 2004; FM Class 3615 – 2006; FM Class 3810 – 2005; ANSI/ISA 60079-0 – 2013; ANSI/ISA 60079-11 – 2012; ANSI/NEMA 250 – 2003;

**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;  $-50\text{ }^{\circ}\text{C} \leq T_a \leq 60\text{ }^{\circ}\text{C} / 70\text{ }^{\circ}\text{C}$ ; 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.

	Ui	Ii	Pi	Ci	Li
Entity parameters HART	30 V	130 mA	1 W	7.26 nF	0
Entity parameters Fieldbus	30 V	300 mA	1.3 W	0	0

### 9.5.3 IE FISCO

**Certificate** FM16US0444X

**Standards** FM Class 3600 – 2011; FM Class 3610 – 2010; FM Class 3611 – 2004; FM Class 3615 – 2006; FM Class 3810 – 2005; ANSI/ISA 60079-0 – 2013; ANSI/ISA 60079-11 – 2012; ANSI/NEMA 250 – 2003;

**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;  $-50^{\circ}\text{C} \leq \text{Ta} \leq 60^{\circ}\text{C}$  /  $70^{\circ}\text{C}$ ; 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.

	Ui	Ii	Pi	Ci	Li
FISCO parameters	17.5 V	380 mA	5.32 W	0	0

## 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  $+60^{\circ}\text{C}$  for Fieldbus and FISCO and  $+70^{\circ}\text{C}$  for HART, T4, Type 4X/IP66/IP67, Maximum Working Pressure 5000 psi, Dual Seal.

	Ui	Ii	Pi	Ci	Li
Entity parameters HART	30 V	130 mA	1 W	7.26 nF	0
Entity parameters Fieldbus	30 V	300 mA	1.3 W	0	0

### 9.6.3 IF FISCO

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



	Ui	Ii	Pi	Ci	Li
FISCO parameters	17.5 V	380 mA	5.32 W	0	0

## 9.7 Europe

### 9.7.1 E1 ATEX Flameproof

**Certificate** Nemko 04ATEX1073X

**Standards** EN 60079-0:2012, EN 60079-1:2014, EN 60079-11:2012, EN 60079-26:2015, EN 60079-31:2014

**Markings**  II 1/2G Ex db ia IIC T4 Ga/Gb, (-40 °C ≤ Ta ≤ +60 °C /+70 °C)  
 II 1D Ex ta IIIC T69 °C/T79 °C Da, (-40 °C ≤ Ta ≤ +60 °C /+70 °C)  
 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** EN 60079-0:2012, EN 60079-1:2014, EN 60079-11:2012, EN 60079-26:2015, EN 60079-31:2014

**Markings**  II 1G Ex ia IIC T4 Ga, (-55 °C ≤ Ta ≤ +60 °C/+70 °C)  
 II 1D 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 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.

	Ui	Ii	Pi	Ci	Li
Entity parameters HART	30 V	130 mA	1 W	7.26 nF	0
Entity parameters Fieldbus	30 V	300 mA	1.5 W	4.95 nF	0

### 9.7.3 IA ATEX FISCO

**Certificate** Nemko 04ATEX1073X

**Standards** EN 60079-0:2012, EN 60079-1:2014, EN 60079-11:2012, EN 60079-26:2015, EN 60079-31:2014

**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 IIIC T69 °C Da, (-50 °C ≤ Ta ≤ +60 °C)  
 II 1D Ex ia/ib IIIC T69 °C Da/Db, (-50 °C ≤ Ta ≤ +60 °C)

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

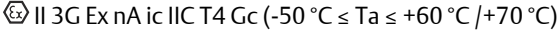
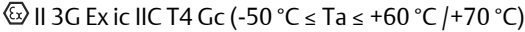

1. The intrinsically safe circuits do not withstand the 500V AC test as specified in EN 60079-11:2012 clause 6.3.13.
2. Potential ignition hazards by impact or friction need to be considered according to EN 60079-0:2012 clause 8.3 (for EPL Ga and EPG Gb), and clause 8.4 (for EPL Da and EPL Db), when 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.

	Ui	Ii	Pi	Ci	Li
FISCO parameters	17.5 V	380 mA	5.32 W	4.95 nF	<1 μH

### 9.7.4 N1 ATEX Type N

**Certificate** Nemko 10ATEX1072X

**Standards** EN 60079-0:2012, EN 60079-11:2012, EN 60079-15:2010, EN 60079-31:2014

**Markings**   
  


### 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.

	U <sub>i</sub>	I <sub>i</sub>	P <sub>i</sub>	C <sub>i</sub>	L <sub>i</sub>
Safety parameters HART	42.4 V	23 mA	1 W	7.25 nF	Negligible
Safety parameters Fieldbus	32 V	21 mA	0.7 W	4.95 nF	Negligible

## 9.8 International

### 9.8.1 E7 IECEx Flameproof

**Certificate** IECEx NEM 06.0001X

**Standards** IEC 60079-0:2011, IEC 60079-1:2014-06, IEC 60079-11:2011; IEC 60079-26:2014, IEC 60079-31:2013

**Markings** Ex db ia IIC T4 Ga/Gb (-40 °C ≤ Ta ≤ +60 °C /+70 °C)  
 Ex ta IIIC 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

**Standards** IEC 60079-0:2011, IEC 60079-1:2014-06, IEC 60079-11:2011; IEC 60079-26:2014, IEC 60079-31:2013

**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.

	Ui	Ii	Pi	Ci	Li
Entity parameters HART	30 V	130 mA	1 W	0 µF	Negligible
Entity parameters Fieldbus	30 V	300 mA	1.5 W	4.95 nF	Negligible

### 9.8.3 IG IECEx FISCO

**Certificate** IECEx NEM 06.0001X

**Standards** IEC 60079-0:2011, IEC 60079-1:2014-06, IEC 60079-11:2011; IEC 60079-26:2014, IEC 60079-31:2013

**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 cm<sup>2</sup> for EPL Gb and 4 cm<sup>2</sup> 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.

	Ui	Ii	Pi	Ci	Li
FISCO parameters	17.5 V	380 mA	5.32 W	4.95 nF	<1 μH

## 9.8.4 N7 IECEx Type N

**Certificate** IECEx NEM 10.0005X

**Standards** IEC 60079-0:2011, IEC 60079-11:2011, IEC 60079-15:2010, IEC 60079-31:2013

**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 IIIC 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.

	Ui	Ii	Pi	Ci	Li
Safety parameters HART	42.4 V	23 mA	1 W	7.25 nF	Negligible
Safety parameters Fieldbus	32 V	21 mA	0.7 W	4.95 nF	Negligible

## 9.9 Brazil

### 9.9.1 E2 INMETRO Flameproof

**Certificate** UL-BR 17.0188X

**Standards** ABNT NBR IEC 60079-0:2013, ABNT NBR IEC 60079-1:2016, ABNT NBR IEC 60079-11:2013, ABNT NBR IEC 60079-26:2016, ABNT NBR IEC 60079-31:2014

**Markings** Ex db ia IIC T4 Ga/Gb (-40 °C ≤ T<sub>amb</sub> ≤ +60 °C /+70 °C)  
Ex ta IIIC T69 °C/T79 °C Da (-40 °C ≤ T<sub>amb</sub> ≤ +60 °C /+70 °C)  
Um=250 V<sub>aC</sub>, 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

**Standards** ABNT NBR IEC 60079-0:2013 , ABNT NBR IEC 60079-11:2013, ABNT NBR IEC 60079-26:2016, ABNT NBR IEC 60079-31:2014

**Markings** Ex ia IIC T4 Ga (- 55 °C ≤ T<sub>amb</sub> ≤ +60 °C /+70 °C)  
Ex ia IIIC T69 °C/T79 °C Da (- 50 °C ≤ T<sub>amb</sub> ≤ +60 °C /+70 °C)

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

1. See certificate for Specific Conditions.

	Ui	Ii	Pi	Ci	Li
Entity parameters HART	30 V <sub>dc</sub>	130 mA	1.0 W	7.26 nF	Negligible
Entity parameters Fieldbus	30 V <sub>dc</sub>	300 mA	1.5 W	4.95 nF	Negligible

### 9.9.3 IB INMETRO FISCO

**Certificate** UL-BR 17.0188X

**Standards** ABNT NBR IEC 60079-0:2013, ABNT NBR IEC 60079-11:2013, ABNT NBR IEC 60079-26:2016, ABNT NBR IEC 60079-31:2014

**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.

	Ui	Ii	Pi	Ci	Li
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 ≤ Ta ≤ +60 °C/+70 °C)  
 Ex tD A20 IP 66/67 T69 °C /T79 °C (-40 °C ≤ Ta ≤ +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.

	Ui	Ii	Pi	Ci	Li
Entity parameters HART	30 V	130 mA	1 W	7.26 nF	0 mH
Entity parameters Fieldbus	30 V	300 mA	1.5 W	4.95 nF	0 mH

### 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.

	Ui	Ii	Pi	Ci	Li
FISCO parameters	17.5 V	380 mA	5.32 W	4.95 nF	<0.001 mH

### 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.



	Ui	Ii	Pi	Ci	Li
Safety parameters HART	42.4 V	23 mA	1 W	7.25 nF	Negligible
Safety parameters Fieldbus	32 V	21 mA	0.7 W	4.95 nF	Negligible

## 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 IIIC 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 IIIC T69 °C/T79 °C Da X, (-50 °C ≤ Ta ≤ +60 °C/+70 °C)  
Da/Db Ex ia/ib IIIC T69 °C/T79 °C X, (-50 °C ≤ Ta ≤ +60 °C/+70 °C)

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

1. See certificate for Specific Conditions.

	Ui	Ii	Pi	Ci	Li
Entity parameters HART	30 V	130 mA	1 W	7.26 nF	0 mH
Entity parameters Fieldbus	30 V	300 mA	1.5 W	4.95 nF	0 mH

## 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

<b>KA</b>	Combination of E1, E5 and E6
<b>KB</b>	Combination of E1, E5 and E7
<b>KC</b>	Combination of E1, E6 and E7
<b>KD</b>	Combination of E5, E6 and E7
<b>KE</b>	Combination of I1, I5 and I6
<b>KF</b>	Combination of I1, I5 and I7
<b>KG</b>	Combination of I1, I6 and I7
<b>KH</b>	Combination of I5, I6 and I7
<b>KI</b>	Combination of IA, IE and IF
<b>KJ</b>	Combination of IA, IE and IG
<b>KK</b>	Combination of IA, IF and IG
<b>KL</b>	Combination of IE, IF and IG

## 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.

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#### Note

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

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### 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**

Location classes	
Temperature	D
Humidity	B
Vibration	A
EMC	B
Enclosure	C

**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

**Standards** IEC60079-0:2011, IEC60079-1:2007, IEC60079-7:2006-2007

**Markings** Ex de IIC Gb

### ATEX Flameproof and Increased Safety

**Certificate** FM13ATEX0076X

**Standards** EN60079-0:2012, EN60079-1:2007, IEC60079-7:2007

**Markings**  II 2 G Ex de IIC Gb

**Table 9-2: Conduit Plug Thread Sizes**

Thread	Identification mark
M20 x 1.5	M20
½ - 14 NPT	½ NPT

**Table 9-3: Thread Adapter Thread Sizes**

Male thread	Identification mark
M20 x 1.5 – 6g	M20
½- 14 NPT	½ - 14 NPT
¾- 14 NPT	¾- 14 NPT
Female thread	Identification mark
M20 x 1.5 – 6H	M20
½ - 14 NPT	½ - 14 NPT
G1/2	G1/2

**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.

# 9.21 Installation drawings

## Figure 9-1: 9240030-936 - System Control Drawing for Hazardous Location Installation of Intrinsically Safe FM Approved Apparatus

**ORIGINAL SIZE A3**

ISSUE	CH. APPROVED	DATE	CH. APPROVED	DATE	ISSUE	CH. APPROVED	DATE	ISSUE	CH. APPROVED	DATE
5	506-506	5/03	506-506	5/03	4	506-506	5/03	4	506-506	5/03
6	506-506	5/03	506-506	5/03	3	506-506	5/03	3	506-506	5/03
7	506-506	5/03	506-506	5/03	2	506-506	5/03	2	506-506	5/03
8	506-506	5/03	506-506	5/03	1	506-506	5/03	1	506-506	5/03

ROSEMOUNT 5300 SERIES

**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 (Voc (V)) and max. short circuit current (Isc (I)) and max. power (Voc X Isc (W) or (V X I) (VA)), 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. The sum of the maximum safe input voltage (Vmax) and maximum safe input current (Imax) of the intrinsically safe apparatus must be greater than the sum of the interconnecting cable capacitance and the unprotected internal capacitance (C) of the intrinsically safe apparatus, and the approved max. allowable connected inductance (La or 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.

Notes:

- No revision to this drawing without prior Factory Mutual approval.
- Associated apparatus manufacturer's installation drawing must be followed when installing this product.
- Dust-Tight seal must be used when installed in Class II and Class III environments.
- Control equipment connected to the barrier must not use or generate more than 250 Vrms or Vdc.
- Resistance between Intrinsically Safe-Ground and Earth Ground must be less than 1 Ω ohm.
- Installations should be in accordance with ANSI/ISA-81.26 "Installation of Intrinsically Safe Systems for Hazardous Locations" and the National Electric Code (ANSI/NFPA 70).
- The associated apparatus must be Factory Mutual Approved.
- 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 live 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 risk of ignition by friction or impact. Care must be taken into account during installation and use to prevent impact or friction.

Model	Entity Parameters	Ambient Temperature
4-20 mA/HART IS Model	Vmax(U) <= 30V, Imax(I) <= 130 mA Pi <= 1W, Ci = 7.26 nF, Li = 0 uH	-50 <= Ta <= 70 deg C
Fieldbus IS Model	Vmax(U) <= 30V, Imax(I) <= 300 mA Pi <= 1.3W, Ci = 0, Li = 0 uH	-50 <= Ta <= 60 deg C
Fieldbus FISCO IS Model	Vmax(U) <= 30V, Imax(I) <= 380 mA Pi <= 5.32W, Ci = 0, Li = 0 uH	-50 <= Ta <= 60 deg C

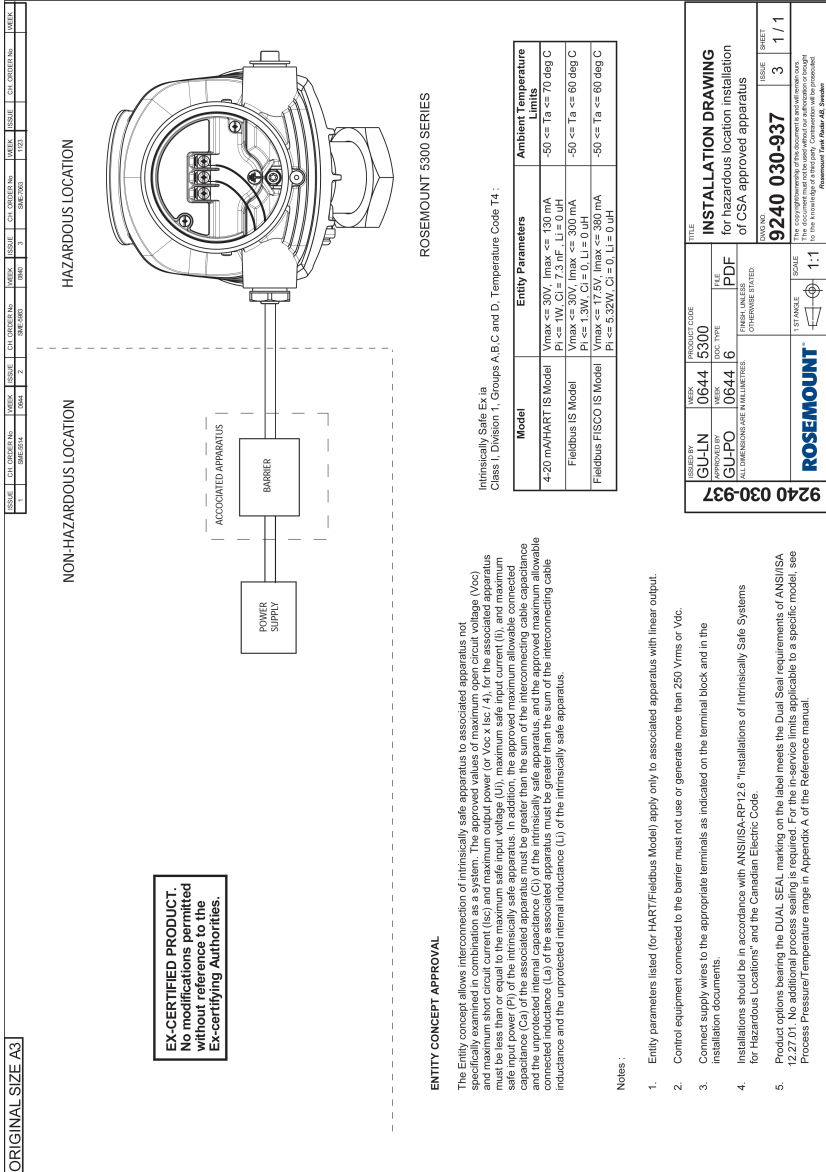
Intrinsically Safe Apparatus for use in Class I, II, III, Division 1, Groups A, B, C, D, E, F, G, S, Class I, Zone 0, AEX in IEC T4, Temperature Class T4 :

<b>9240 030-936</b>		<b>ROSEMOUNT</b>	SCALE: 1:1
REVISED NUMBER: 0644	REVISED CODE: 5300	REVISED DATE: 6/03	SCALE: 1:1
APPROVAL NUMBER: GJ-PO	DOC. TYPE: 6	FINISH NUMBER: 07/03/06 (REVISED)	SCALE: 1:1
ALL DIMENSIONS ARE IN MILLIMETERS			
<b>SYSTEM CONTROL DRAWING</b>			
for hazardous location installation of Intrinsically Safe FM approved apparatus			
DWG. NO. 9240 030-936	ISSUE NO. 5	SHEET NO. 1	DATE: 5/03

**FM Approved Product**  
No revisions to this drawing without prior Factory Mutual Approval.

The copyright information of this document will remain with Rosemount Process Automation Systems.

**Figure 9-2: 9240030-937 - Installation Drawing for Hazardous Location Installation of Intrinsically Safe CSA Approved Apparatus**





# Figure 9-3: D9240030-938 - Installation Drawing for Hazardous Location Installation of Intrinsically Safe ATEX and IECEx Approved Apparatus

ORIGINAL SIZE A3

REV. 2	21-1002012-01	REV. 1	21-1002012-01	REV. 2	21-1002012-01	REV. 1	21-1002012-01	REV. 2	21-1002012-01
REV. 1	21-1002012-01	REV. 0	21-1002012-01	REV. 1	21-1002012-01	REV. 0	21-1002012-01	REV. 1	21-1002012-01

**SPECIFIC CONDITIONS FOR SAFE USE (X) :**

- The intrinsically safe circuits do not withstand the 500V AC test as specified in IEC 60079-11 clause 6.3.15.
- 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 antennas exposed to the exterior are subjected to impact or friction.
- The end user shall determine the suitability with regard to avoid hazards from impact and friction.
- Parts of the probes for type 5300 are non-conducting and the area of the non-conducting part shall be protected from impact or friction. The probe for type 5300 is not to be used in a potentially explosive atmosphere.
- Parts of the probes for type 5300 are non-conducting material covering metal surfaces and the probe shall be protected from impact or friction. The probe for type 5300 is not to be used in a potentially explosive atmosphere group II, EPL Da. Appropriate measures must be taken to prevent electrostatic discharge.
- The Ex ia version of model 5300 FISCO field device may be supplied by an (Ex ia) 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.
- 1/2 NPT threads need to be sealed for dust and water ingress protection, IP 66, IP 67 or 'Ex 1, EPL Da or Db is required.

**INTRINSICALLY SAFE INSTALLATIONS**

The approved values of maximum open circuit voltage (Uo) and maximum short circuit current (Io) and maximum output power (or 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 input power (Pi) of the intrinsically safe apparatus. In addition, the approved maximum allowable connected capacitance (C) and maximum allowable connected inductance (L) of the intrinsically safe apparatus, and the approved maximum 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.

**ROSEMOUNT 5300 SERIES**

**Intrinsic Safety Parameters:**  
 I/20 Ex ia IIC T4 Ga/Gb  
 II 10 Ex ia IIC T69/719° Dst;  
 II 1/2D Ex ia IIC T69/719° Da/Dst

Model	Parameters	Ambient Temperature Limits Gas	Ambient Temperature Limits Dust
4-20 mA/HART (S Model)	Ui ≤ 29V, Ci ≤ 180 nF Pi ≤ 1W, Ci ≤ 7.28 μF, Li = 0	-55 ≤ Ta ≤ 70 deg C	-50 ≤ Ta ≤ 70 deg C
Fieldbus (S Model)	Ui ≤ 30V, Ci ≤ 300 nF	-55 ≤ Ta ≤ 60 deg C	-50 ≤ Ta ≤ 60 deg C
Fieldbus FISCO (S Model)	Ui ≤ 1.5W, Ci = 4.85 nF, Li = 0 Li ≤ 17.5V, Li ≤ 380 nH Pi ≤ 3.2W, Ci = 4.85 nF, Li = 0	-55 ≤ Ta ≤ 60 deg C	-50 ≤ Ta ≤ 60 deg C

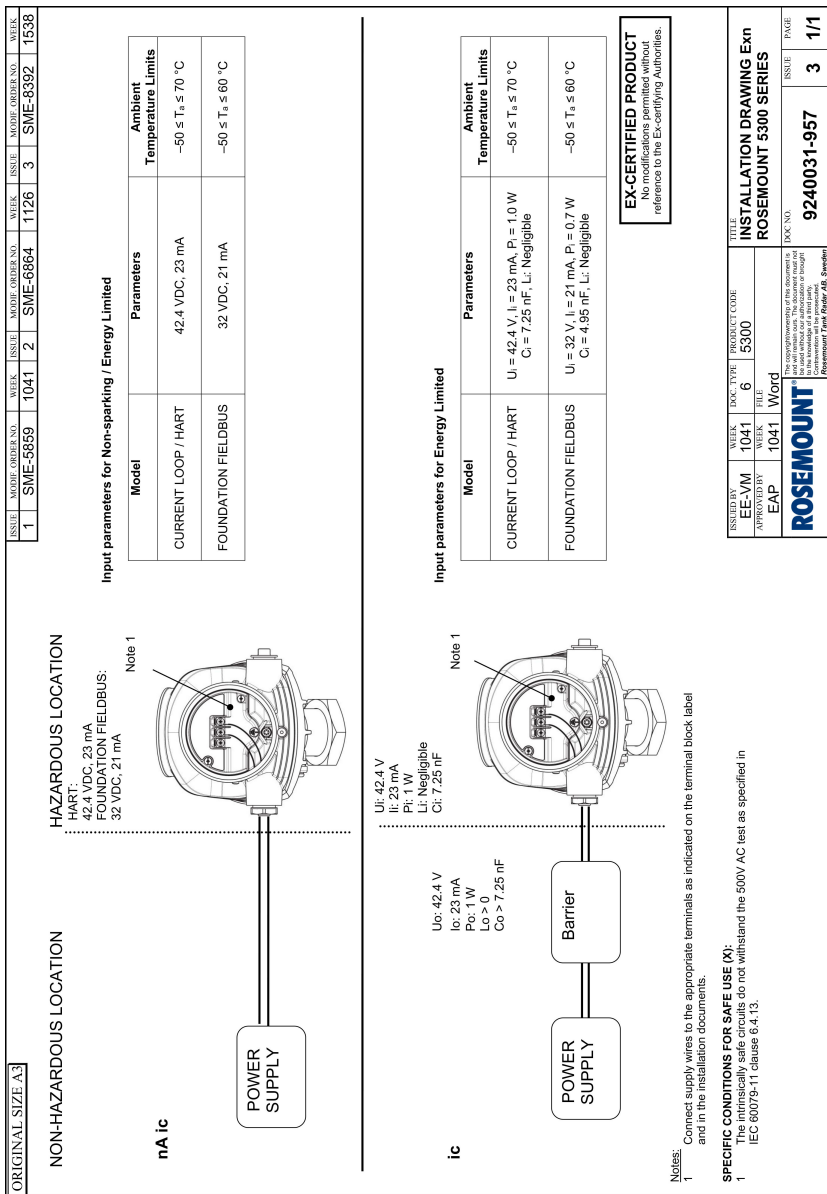
**Notes :**

- Safety parameters listed (for HART/Fieldbus Model) apply only to associated apparatus with linear output.
- Control equipment connected to the barrier must not use or generate more than 250 Vrms or Vdc.
- Connect supply wires to the appropriate terminals as indicated on the terminal block table and in the installation documents
- When model 5300 is supplied by an Ex ia certified safety barrier, following EPL classification applies for different parts of the transmitter:
  - The antenna part, located in the process vessel, is classified EPL Ga.
  - Transmitter head, is classified EPL Gb.

**EX-CERTIFIED PRODUCT.**  
 No modifications permitted without reference to the Ex-certifying Authorities.



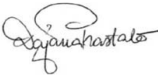
REVISED BY	MSBK	PRODUCT CODE	TITLE
GU-LIN	0644	5300	INSTALLATION DRAWING
APPROVED BY	MSBK	DOC. TYPE	for hazardous location installation of IATEX and IECEx approved apparatus
GU-PO	0644	16	D9240030-938
MULTI-MEDIA FILE IN MULTIMEDIA FOLDER NAME: DRAWING			
			SCALE
			1:1
			ISSUE
			6
			SHEET
			1 / 1

Figure 9-4: 9240031-957 - Installation Drawing Exn



## 9.22 EU Declaration of Conformity

Figure 9-5: EU Declaration of Conformity

	
<h3>EU Declaration of Conformity</h3> <p><b>No: 5300</b></p> <hr/>	
<p>We,</p> <p><b>Rosemount Tank Radar AB</b> Layoutvägen 1 S-435 33 MÖLNLYCKE Sweden</p>	
<p>declare under our sole responsibility that the product,</p> <p><b>Rosemount™ 5300 Series Level and Interface Transmitter</b></p> <p>manufactured by,</p> <p><b>Rosemount Tank Radar AB</b> Layoutvägen 1 S-435 33 MÖLNLYCKE Sweden</p>	
<p>to which this declaration relates, is in conformity with the provisions of the European Community Directives, including amendments, as shown in the attached schedule.</p> <p>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.</p>	
 _____ (signature)	_____ <b>Manager Product Approvals</b> (function name - printed)
_____ <b>Dajana Prastalo</b> (name - printed)	_____ <b>2018-01-31</b> (date of issue)



**Schedule  
No: 5300**

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**EMC Directive (2014/30/EU)**

EN 61326-1:2013

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**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

EN 60079-0:2012/A11:2013; EN 60079-1:2014; EN 60079-11:2012; EN 60079-26:2015;  
EN 60079-31:2014



**Schedule  
No: 5300**

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**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

EN60079-0:2012; EN60079-11:2012; EN60079-15:2010; EN60079-31:2013



**Schedule  
No: 5300**

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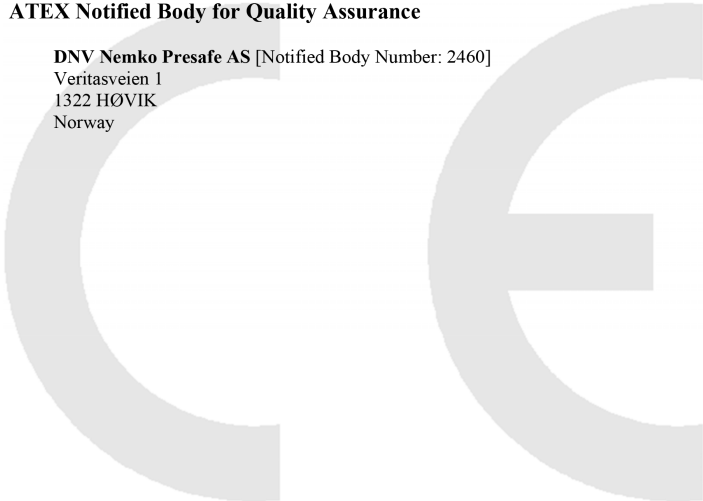
**ATEX Notified Body for EU Type Examination Certificates and Type Examination Certificates**

**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  
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## 9.23 China RoHS

**List of Model Parts with China RoHS Concentration above MCVs**  
**含有China RoHS管控物质超过最大浓度限值的部件型号列表**

Part Name 部件名称	Hazardous Substances / 有害物质					
	Lead 铅 (Pb)	Mercury 汞 (Hg)	Cadmium 镉 (Cd)	Hexavalent Chromium 六价铬 (Cr +6)	Polybrominated biphenyls 多溴联苯 (PBB)	Polybrominated diphenyl ethers 多溴联苯醚(PBDE)
Electronics Assembly 电子组件	X	O	O	O	O	O
Housing Assembly 壳体组件	O	O	O	O	O	O

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

本表格系依据SJ/T11364的规定而制作。

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

O: 意为该部件的所有均质材料中该有害物质的含量均低于GB/T 26572所规定的限量要求。

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.

X: 意为在该部件所使用的的所有均质材料里，至少有一类均质材料中该有害物质的含量高于GB/T 26572所规定的限量要求。



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