



# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: IECEx SIR 05.0024X issue No.:5  
Status: **Current**  
Date of Issue: 2011-02-18 Page 1 of 4

Certificate history:  
Issue No. 5 (2011-2-18)  
Issue No. 4 (2008-3-11)  
Issue No. 3 (2007-10-11)  
Issue No. 2 (2007-4-30)

Applicant: **Rosemount Tank Radar AB**  
S-40251  
Gothenburg  
Sweden

Electrical Apparatus: **Transmitter Head Type TH43**  
*Optional accessory:* (Used in TankRadar Pro and Rosemount 5600 Products)

Type of Protection: **Flameproof, increased safety and intrinsically safe**

Marking: **Ex de IIC T6 Ga/Gb (-40°C to +70°C)**  
**Ex t IIIC T85°C Db IP65**  
**Ex de [ib] [ia] IIC T6 Gb/Ga (-40°C to +70°C)**  
**Ex t IIIC T85°C Db IP65**  
**Ex de [ia] IIC T6 Gb/Ga (-40°C to +70°C)**  
**Ex t IIIC T85°C Db IP65**

Approved for issue on behalf of the IECEx Certification Body: D R Stubbings BA MIET

Position: Certification Manager

Signature:  
(for printed version)

Date:

2011-02-18

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2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:

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Rake Lane  
Eccleston  
Chester  
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United Kingdom

**sira**  
CERTIFICATION



# IECEX Certificate of Conformity

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Manufacturer: **Rosemount Tank Radar AB**  
S-40251  
Gothenburg  
Sweden

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

#### STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

<b>IEC 60079-0 : 2004</b> Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
<b>IEC 60079-1 : 2007-04</b> Edition: 6	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
<b>IEC 60079-11 : 2006</b> Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
<b>IEC 60079-26 : 2006</b> Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga
<b>IEC 60079-31 : 2008</b> Edition: 1	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure 't'
<b>IEC 60079-7 : 2006-07</b> Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

#### TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

IECEX ATR:	File Reference:
UK/SIR/05/R52L11911A.1, UK/SIR/05/R52L11911B	52L11911, 52A16485
GB/SIR/ExTR07.0030/00	QAR-26650
GB/SIR/ExTR11.0034/00	NO/DNV/QAR07.0007/02



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## Schedule

### EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

The Transmitter Head Type TH43 is a device for detecting the level of liquid and solids in a tank using radar technology, a full description of the Transmitter Head Type TH43 is given in the Annexe of this certificate.

### CONDITIONS OF CERTIFICATION: YES as shown below:

- 1 As light alloys may be used as the enclosure (or other parts) they may be at the accessible surface of this equipment, in the event of rare incidents, ignition sources due to impact and friction sparks could occur. This shall be considered when the equipment is being installed in hazardous locations.
- 2 Under certain extreme circumstances, the non-metallic parts of the equipment may be capable of generating an ignition-capable level of electrostatic charge. The equipment shall only be cleaned with a damp cloth.



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## DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

<b>Original dated 2005-10-18</b>	
<b>Issue 1 dated 2006-03-23</b>	
1	Included revised report and minor corrections.
2	Included dust ignition protection.
<b>Issue 2 dated 2007-04-30</b>	
1	The addition of the Fail Safe Board (FS43) between the TA43 Adapter Board and Terminals X1 and Terminal X2 (both X2 (Ex e) and X2 (Ex i)). This version may be used in both IS and non-IS versions of the Transmitter Head Type TH43.
2	The addition of an optional RS48 board that may only be used in a non-IS version of the Transmitter Head Type TH43.
<b>Issue 3 dated 2007-10-11</b>	
1	Corrections to the above to include connection to Output X1
<b>Issue 4 dated 2008-02-05</b>	
1	The use of aluminium as an alternative to stainless steel in the tank seal rod antenna
2	The applicant's name to be changed from SAAB Rosemount Tank Radar AB to Rosemount Tank Radar AB
<b>Issue 5 - this Issue introduced the following change:</b>	
1	Following appropriate re-assessment to demonstrate compliance with the requirements of the EN 60079 series of standards, the documents previously listed, IEC 60079-1:2003 Ed 5, IEC 60079-7:2001 Ed 3, IEC 60079-11:1999 Ed 4, IEC 61241-0: 2004 Ed 1 and IEC 61241-1: 2004 Ed 1, were replaced by those currently listed, the markings were updated accordingly.

**Annexe to:** IECEx SIR 05.0024X Issue 5

**Applicant:** Rosemount Tank Radar AB  
**Electrical Apparatus:** Transmitter Head Type TH43



The Type TH 43 Transmitter Head comprises a cast aluminium alloy casing incorporating three separate chambers, a main flameproof chamber and two increased safety/intrinsically safe connection chambers. An option permits the attachment of a display panel.

The main flameproof enclosure has an aluminium alloy, screw-on lid and extension tube. The chamber of the enclosure contains control circuitry, monitoring circuitry and a radar emission device. The extension tube, which is intended to go into the zone 0 area to act as a waveguide through which the radar emissions pass, houses a spigot fitting bushing with a non-metallic insert pressed into it.

The two increased safety/intrinsically safe connection enclosures have aluminium alloy screw-on lids, the chambers contain certified terminal facilities. Connection to external circuits is by means of apertures in the wall that accommodate suitable cable glands or conduit. Connection to the main chamber is by means of certified multicore cable bushings screwed into the inter-compartmental wall.

**Ex de IIC T6 Ga/Gb** - A flameproof version with connections made by means of increased safety but with non- intrinsically safe primary and/or non- intrinsically safe secondary outputs. This unit does not have display outputs. The following options may be chosen as specified outputs:

1) One of the following non-IS Primary Output Options (PO) may be fitted via connector X3 and Terminal X1 (Ex e):

- a) HART/4-20mA, Board TA43 – Passive current loop or
- b) HART/4-20mA, Board TA43 – Active current loop or
- c) TRL2 Bus, Board TM40 – (Exists as a Non-IS option only) or
- d) Profibus, Board AA40 – (Exists as a Non-IS option only) or
- e) Foundation Fieldbus, Board FF43
- f) RS48 Output, Non-IS

2) One of the following non-IS Primary Output Options (PO) may be fitted via X5 and Terminal X2 (Ex e):

- a) HART/4-20mA, Board TA43 – Passive current loop or
- b) HART/4-20mA, Board TA43 – Active current loop or
- c) TRL2 Bus, Board TM40 or
- d) Profibus, Board AA40 or
- e) Foundation Fieldbus, Board FF43
- f) RS48 Output, Non-IS

3) Non-IS circuit – Secondary Output Options (SO) may be fitted via X6 and Terminal X2 (Ex e):

- a) Secondary Output Options 4-20mA, Board XA40 + IS40 – Active current loop or
- b) Secondary Output Options 4-20mA, Board XA40 – Passive current loop

4) Radar & Signal Processing Unit connected to waveguide.

5) Power Supply Unit, Board PS43, Ultra wide 24-240VAC/DC

**Annexe to:** IECEx SIR 05.0024X Issue 5

**Applicant:** Rosemount Tank Radar AB  
**Electrical Apparatus:** Transmitter Head Type TH43



**Ex de [ib] [ia] IIC T6 Ga/Gb** - A flameproof version with connections made by means of increased safety and with the option of non-intrinsically safe and/or intrinsically safe outputs. An intrinsically safe source can be connected to either an integral or remote display unit. The following options may be chosen as specified outputs:

1) One of the following non-IS Primary Output Options (PO) may be fitted via connector X3 and Terminal X1 (Ex e):

- a) HART/4-20mA, Board TA43 – Passive current loop or
- b) HART/4-20mA, Board TA43 – Active current loop or
- c) TRL2 Bus, Board TM40 – (Exists as a Non-IS option only) or
- d) Profibus, Board AA40 – (Exists as a Non-IS option only) or
- e) Foundation Fieldbus, Board FF43
- f) RS48 Output, Non-IS

2) One of the following IS Primary Output Options (PO) may be fitted via X5 and Terminal X2 (Ex ib):

- a) HART/4-20mA, Board TA43 – Passive current loop or
- b) HART/4-20mA, Board TA43 – Active current loop or
- c) Foundation Fieldbus, Board FF43

3) One of the following IS Secondary Output Options (SO) may be fitted via X6 and X2 (Ex ib):

- a) Secondary Output Options 4-20mA, Board XA40 + IS40 – Active current loop or
- b) Secondary Output Options 4-20mA, Board XA40 – Passive current loop

4) A Display Interface (part of TA43) with the following options fitted via X7 and Terminal X2 (Ex ia):

- P – display factory mounted on transmitter
- R – display remotely mounted
- T – display remotely mounted with temperature inputs
- N or O – None display mounted

5) Radar & Signal Processing Unit connected to waveguide.

6) Power Supply Unit, Board PS43, Ultra wide 24-240VAC/DC

**Annexe to:** IECEx SIR 05.0024X Issue 5

**Applicant:** Rosemount Tank Radar AB  
**Electrical Apparatus:** Transmitter Head Type TH43



**Ex de [ia] IIC T6 Ga/Gb** - A flameproof version with connections made by means of increased safety and with non-intrinsically safe outputs. An intrinsically safe source can be connected to either an integral or remote display unit. The following options may be chosen as specified outputs:

- 1) One of the following non-IS Primary Output Options (PO) may be fitted via connector X3 and Terminal X1 (Ex e):
  - a) HART/4-20mA, Board TA43 – Passive current loop or
  - b) HART/4-20mA, Board TA43 – Active current loop or
  - c) TRL2 Bus, Board TM40 – (Exists as a Non-IS option only) or
  - d) Profibus, Board AA40 – (Exists as a Non-IS option only) or
  - e) Foundation Fieldbus, Board FF43
  - f) RS48 Output, Non-IS
  
- 2) A Display Interface (part of TA43) with the following options fitted via X7 and Terminal X2 (Ex ia):
  - P – display factory mounted on transmitter
  - R – display remotely mounted
  - T – display remotely mounted with temperature inputs
  - N or O – None display mounted
  
- 3) Radar & Signal Processing Unit connected to waveguide
  
- 4) Power Supply Unit, Board PS43, Ultra wide 24-240VAC/DC.

**Annexe to:** IECEx SIR 05.0024X Issue 5

**Applicant:** Rosemount Tank Radar AB  
**Electrical Apparatus:** Transmitter Head Type TH43



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**Input/Output parameters**  
**TH 43 Electrical Parameters**

**Connector X4 and Terminal X1 (Ex e)**

$$U_m = 250 \text{ Vrms}$$

The Power Supply Unit i.e. board PS43, is input rated 24-240 VAC/DC, 10 W maximum. PS43 is electrically attached to TA43 and it delivers 12 V and 5 V to the TA43. The circuits that are either part of TA43 (e.g. Hart modem) or separate boards (e.g. CA40) are designed to operate from a DC supply voltage of up to 30 V and a current of 200 mA.

**XA40 Analogue Circuit**

For the purposes of a system assessment the circuit has the following safety description:

$$\begin{aligned} U_i &= 30 \text{ V} \\ I_i &= 200 \text{ mA} \\ C_i &= 0 \\ L_i &= 0 \\ U_o &= 0 \\ I_o &= 0 \end{aligned}$$

When used in conjunction with the IS 40 power supply the safety description is:

$$\begin{aligned} U_o &= 23.1 \text{ V} \\ I_o &= 125.7 \text{ mA} \\ P_o &= 0.726 \text{ W} \\ C_o &= 0.14 \mu\text{F} \\ L_o &= 2.2 \text{ mH} \\ C_i &= 0 \\ L_i &= 0 \end{aligned}$$

**TA43 Passive Analogue Circuit**

For the purposes of a system assessment the circuit has the following safety description:

$$\begin{aligned} U_i &= 30 \text{ V} \\ I_i &= 200 \text{ mA} \\ C_i &= 0 \\ L_i &= 0 \\ U_o &= 0 \\ I_o &= 0 \\ U_m &= 250 \text{ V} \end{aligned}$$

**TA43 Active Analogue Circuit**

$$\begin{aligned} U_o &= 23.1 \text{ V} \\ I_o &= 125.7 \text{ mA} \\ P_o &= 0.726 \text{ W} \\ C_o &= 0.14 \mu\text{F} \\ L_o &= 2.2 \text{ mH} \\ C_i &= 0 \\ L_i &= 0 \end{aligned}$$

**Date:** 11 February 2011

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**Sira Certification Service**

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**Annexe to:** IECEx SIR 05.0024X Issue 5

**Applicant:** Rosemount Tank Radar AB  
**Electrical Apparatus:** Transmitter Head Type TH43



### IS 40 Intrinsically Safe Galvanically Isolating Supply

For the purposes of a system assessment the circuit has the following safety description:

$U_o = 23.1 \text{ V}$   
 $I_o = 125.7 \text{ mA}$   
 $P_o = 0.726 \text{ W}$   
 $C_o = 0.14 \text{ }\mu\text{F}$   
 $L_o = 2.2 \text{ mH}$   
 $C_i = 0$   
 $L_i = 0$

### TA43 Display Interface

The addition of an extra line out to the display interface circuit, with the addition of safety components and modification of the output parameters at connector X2 (formerly X7). The maximum combined parameters at this connector are as follows:

#### Connector X2

$U_o = 7.84 \text{ V}$   
 $I_o = 385.6 \text{ mA}$   
 $P_o = 0.678 \text{ W}$   
 $C_i = 0$   
 $L_i = 0$   
 $C_o = 9.3 \text{ }\mu\text{F}$   
 $L_o = 239 \text{ }\mu\text{H}$   
 $L_o/R_o = 52.8 \text{ }\mu\text{H}/\text{ohm}$

This output meets the requirements for an intrinsically safe level of protection [EEx ia]

### FF43 Foundation Fieldbus Interface

This certificate relies on the following previously certified product. When used as a part of the Transmitter Head TH43, the key attributes listed in the table below shall still be maintained by the original certificate BAS01ATEX1385U.

$U_i < 30\text{V}$   
 $I_i < 300\text{mA}$   
 $P_i < 1.3\text{W}$   
 $C_i = 0$   
 $L_i = 0$