

## [1] EC-TYPE EXAMINATION CERTIFICATE

[2] Equipment or Protective System Intended for use  
in Potentially explosive atmospheres  
Directive 94/9/EC

[3] EC-Type Examination Certificate Number: **Nemko 04ATEX1073X** Issue **17**

[4] Equipment or Protective System: **Radar Level Transmitter**  
[5] Applicant and Manufacturer: **Rosemount Tank Radar AB**  
[6] Address: **Gamlestadvägen 18B**  
**SE-40251 Göteborg**  
**Sweden**

[7] This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] Nemko AS, notified body number 0470 in accordance with Article 9 of Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. **D0001348-03**

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

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

[10] If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

[11] This EC-TYPE EXAMINATION CERTIFICATE relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC.  
Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

[12] The marking of the equipment or protective system shall include the following :



**II 1G Ex ia IIC T4 Ga -50°C ≤ Ta ≤ 60°C /70°C**  
**II 1D Ex ia IIIC T69°C/ T79°C -50°C ≤ Ta ≤ 60°C /70°C**  
**II 1/2G Ex ib IIC T4 Ga/Gb -50°C ≤ Ta ≤ 60°C /70°C**  
**II 1/2D Ex ib IIIC T69°C/T79°C Da/Db -50°C ≤ Ta ≤ 60°C /70°C**  
**II 1/2G Ex db ia IIC Ga/GbT4 -40°C ≤ Ta ≤ 60°C /70°C**  
**II 1/2G Ex ia/ib IIC T4 Ga/Gb -50°C ≤ Ta ≤ 60°C /70°C**  
**II 1/2D Ex ia/ib IIIC T69°C/T79°C Da/Db -50°C ≤ Ta ≤ 60°C /70°C**  
**II 1D Ex ta IIIC T69°C/ T79°C -40°C/ -50°C ≤ Ta ≤ 60°C /70°C**

**2016-04-04**

**Asle Kaastad**  
**Certification Manager**

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Postal address:  
P.O.Box 73 Blindern  
N-0314 OSLO, NORWAY

Office address:  
Gaustadalléen 30  
0373 OSLO

Telephone:  
+47 22 96 03 30  
Fax:  
+47 22 96 05 50

Enterprise number:  
NO 974404532

## [13] Schedule

### [14] EC-TYPE EXAMINATION CERTIFICATE No Nemko 04ATEX1073X Issue 17

#### [15] Description of Equipment or Protective System

Type 5300 series Guided Wave Radar and 5400 series Radar Level Transmitter, for measurement of liquid level, liquid level interface and solid level transmitter. The transmitters are designed for various signal protocols: Hart, Foundation Fieldbus, FISCO and RS-485. The transmitters are intrinsically safe as a whole, 'Ex ia', 'Ex ib' or a combination with non-intrinsically safe external signal connection to the 'Ex d' terminal compartment. The 'Ex d' compartment is made with two threaded cable entries (M20 x 1,5 or 1/2" -14 NPT) that need to be fitted with an appropriately certified cable gland and any unused opening need to be closed with a certified blanking element.

The cable glands and blanking element should also have a degree of ingress protection at least IP 66 or IP67

The transmitters may form a separation element between Ga and Gb.

#### Model Code Breakdown for 5400-series.

##### 540a b c d e f g h i j k l m n o p q r s t u v w

The codes 'abcd' are one digits, the rest are two digits except 'w' with more than two digits.

a= 1 denotes low frequency version , a= 2 denotes high frequency version

b= Housing material: Polyurethane covered Aluminium or Stainless steel

c= Signal output: Hart, Foundation Fieldbus, Profibus, Modbus

d= Conduit cable threads: 1/2" -14 NPT, M20x1.5, 2pcs M20x1.5, PG 13.5, M12 4-pin Male Connector, A size Mini 4-pin Male Connector, 2pcs Metal cable glands (1/2"-14 NPT)

e= Product certification codes: E1, I1, IA, KG, KH, KI according to ATEX certificate and E7, I7, IG according to IECEx certificate

f= Antenna specification indicator

g= Type of tank sealing

h= Process connection and material

ijklmnopqrstuvw= Additional options coding for functions, quality assurance etc.

#### Classifications and Safety Data for 5400-series

##### Models For Intrinsically Safe Power Supplies

##### Type 5400 Hart@ 4-20mA

II 1G Ex ia IIC T4 Ga, II 1/2G Ex ib IIC T4 Ga/Gb

II 1D Ex ia IIIC T79°C Da, II 1/2D Ex ib IIIC Da/Db T79°C -50°C ≤ Ta ≤ 70°C  
-50°C ≤ Ta ≤ 70°C

##### Safety Parameters.

Maximum input voltage.	U <sub>i</sub> :	30V
Maximum input current.	I <sub>i</sub> :	130mA
Maximum input power.	P <sub>i</sub> :	1,0W
Maximum internal capacitance	C <sub>i</sub> :	7,26nF

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Maximum internal inductance  $L_i$ : 0  $\mu$ H

**Type 5400 Foundation® Fieldbus**

II 1G Ex ia IIC T4 Ga, II 1/2G Ex ib IIC T4 Ga/Gb

II 1D Ex ia IIIC T69°C Da, II 1/2D Ex ib IIIC Da/Db T69°C -50°C  $\leq$  Ta  $\leq$  60°C

-50°C  $\leq$  Ta  $\leq$  60°C

Safety Parameters.

Maximum input voltage.	$U_i$ :	30V
Maximum input current.	$I_i$ :	300mA
Maximum input power.	$P_i$ :	1,5W
Maximum internal capacitance	$C_i$ :	4,95 nF
Maximum internal inductance	$L_i$ :	0 $\mu$ H

**Type 5400 Foundation® Fieldbus FISCO**

**FISCO Field Device**

II 1G Ex ia IIC T4 Ga, II 1/2G Ex ib IIC T4 Ga/Gb

II 1D Ex ia IIIC T69°C Da, II 1/2D Ex ib IIIC Da/Db T69°C -50°C  $\leq$  Ta  $\leq$  60°C

-50°C  $\leq$  Ta  $\leq$  60°C

Safety Parameters.

Maximum input voltage.	$U_i$ :	17,5V
Maximum input current.	$I_i$ :	380mA
Maximum input power.	$P_i$ :	5,32W
Maximum internal capacitance	$C_i$ :	4,95 nF
Maximum internal inductance	$L_i$ :	<1 $\mu$ H

**Models For Non-Intrinsically Safe Power Supply**

For all models. Maximum safe voltage: Um 250VAC

**Type 5400 Hart® 4-20mA::**

II 1/ 2 G Ex db ia IIC T4 Ga/Gb

II 1D Ex ta IIIC T79°C Da

-40°C  $\leq$  Ta  $\leq$  to 70°C

Power supply: .....42,4V 25mA

**Type 5400 Foundation® Fieldbus**

II 1/ 2 G Ex db ia IIC T4 Ga/Gb

II 1D Ex ta IIIC T69°C Da

-40°C  $\leq$  Ta  $\leq$  to 60°C

Power supply: .... 32V DC 21mA

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**Type 5400 Modbus RS-485**

II 1/2G Ex db ia IIC T4 Ga/Gb  
II 1D Ex ta IIIC T79°C Da  
-40°C ≤ Ta ≤ to 70°C

Power supply: 8-30VDC 1,2W

**Model Code Breakdown for 5300 series.****530abcdefghijklm. Guided Wave Radar**

- a = Model: Liquid level, Liquid level and interface, Solid level transmitter or Spare probe
- b = Signal output: Hart, Foundation Fieldbus, Modbus
- c = Housing material: Polyurethane covered aluminium or Stainless steel
- d = Conduit/cable Threads: ½-14 NPT, M20 x 1.5, 2pcs M20x1.5, PG 13.5, M12 4-pin Male Connector, A size Mini 4-pin Male Connector, Metal cable glands (1/2-14NPT)
- e = Type of tank sealing (temperature, pressure)
- f = Process connection and probe material
- g = Sealing O-ring material
- h = Probe type
- i = Probe length unit
- j = Probe length
- k = Process connection size
- l = Hazardous locations specification: E1, KA, KB, KC, I1, IA, KE, KF, KG, KI, KJ, KK according to ATEX certificate and E7, KB, KC, I7, IG, KF, KG, KH, KJ, KK, KL according to IECEx certificate
- m = Various additional options coding for function and quality assurance etc.

**Classifications and Safety Data for 5300 series****Models For Intrinsically Safe Power Supplies****Type 5300 Hart® 4-20mA**

II 1G Ex ia IIC T4 Ga  
II 1D Ex ia IIIC T79°C Da  
-50°C ≤ Ta ≤ 70°C

Safety Parameters.

Maximum input voltage.	U <sub>i</sub> :	30V
Maximum input current.	I <sub>i</sub> :	130mA
Maximum input power.	P <sub>i</sub> :	1,0W
Maximum internal capacitance.	C <sub>i</sub> :	7,26 nF
Maximum internal inductance.	L <sub>i</sub> :	0μH

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**Type 5300 Foundation® Fieldbus**

II 1G Ex ia IIC T4 Ga  
II 1D Ex ia IIIC T69°C Da  
-50°C ≤ Ta ≤ 60°C

## Safety Parameters.

Maximum input voltage.	U <sub>i</sub> :	30V
Maximum input current.	I <sub>i</sub> :	300mA
Maximum input power.	P <sub>i</sub> :	1,5W
Maximum internal capacitance.	C <sub>i</sub> :	4,95 nF
Maximum internal inductance.	L <sub>i</sub> :	0μH

**Type 5300 Foundation® Fieldbus FISCO**

FISCO Field Device  
II 1G Ex ia IIC T4 Ga  
or II 1/2G Ex ia/ib IIC T4 Ga/Gb

II 1D Ex ia IIIC T69°C Da  
or II 1/2D Ex ia/ib IIIC T69°C Da/Db  
-50°C ≤ Ta ≤ 60°C

## Safety Parameters.

Maximum input voltage.	U <sub>i</sub> :	17,5V
Maximum input current.	I <sub>i</sub> :	380mA
Maximum input power.	P <sub>i</sub> :	5,32W
Maximum internal capacitance.	C <sub>i</sub> :	4,95 nF
Maximum internal inductance.	L <sub>i</sub> :	<1μH

**Models For Non-Intrinsically Safe Power Supply**

Maximum safe voltage: Um 250VAC

**Type 5300 Hart® 4-20mA**

II 1/2G Ex db ia IIC T4 Ga/Gb  
II 1D Ex ta IIIC T 79°C Da

-40°C ≤ Ta ≤ to 70°C

Power supply: .....42,4V 25mA

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**Type 5300 Foundation® Fieldbus**

II 1/2G Ex db ia IIC T4 Ga/Gb  
 II 1D Ex ta IIIC T69°C Da  
 -40°C ≤ Ta ≤ to 60°C  
 Power supply: .... 32V DC 21mA

**Type 5300 Modbus RS-485**

II 1/2G Ex db ia IIC T4 Ga/Gb  
 II 1D Ex ta IIIC T79°C Da  
 -40°C ≤ Ta ≤ to 70°C  
 Power supply: 8-30VDC 1,2W

**Degree of Ingress Protection all models**

IP 66 and IP 67 according to EN 60079-0 and EN 60529

[16] **Report No D0001348-02** and the Descriptive Documents listed in document “Rosemount 5300/5400 Certification Schedule Drawing / Document list for Ex Certificates Nemko 04ATEX1073X and IECEx NEM 06.0001X” Issue 6, dated 2015-12-15.

**Certificate History and Associated Nemko Reports**

Issue	Date	Report	Description
0	2004-07-07	15747	Prime Certificate released
1	2004-10-05	28828	Suppl. 1, Alternative PMMK , closing device
2	2005-02-07	38468	Suppl. 2, minor changes og PMMK and antennas
3	2005-04-25	42665	Suppl. 3, New antennas
4	2006-01-30	48202	Suppl. 4, Change of ambient temp and new antennas, (IECEx)
5	2006-06-28	68314	Suppl. 5 Minor changes
6	2007-05-07	78420	Suppl. 6 (5300 model)
7	2008-05-26	106603	Suppl. 7 Minor changes
8	2008-07-17	110596	Suppl. 8 Minor changes
9	2009-04-20	126469	Suppl. 9 Small changes
10	2010-02-17	140851	Suppl. 10, Variation of PMMDC board for 5300
11	2010-12-14	148718	Issue. 11, Update to new standards, modbus and alternate Ex ia and Ex ib
12	2011-02-03	167602	Issue. 12, Minor changes, New board (EBF 9240030-726, Issue 1, WEEK 1101) and Fieldbus Comm board (00848-4232, Issue AE, Date 02/22/11 ) included.
13	2012-06-20	205055	Issue 13. Change of fuse, diodes and added specifications.
14	2014-09-16	D0001348	Issue 14. Update to standards EN 60079-0: 2012 and EN 60079-11: 2012. Minor

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Postal address:  
**P.O.Box 73 Blindern**  
**N-0314 OSLO, NORWAY**

Office address:  
**Gaustadalléen 30**  
**0373 OSLO**

Telephone:  
**+47 22 96 03 30**  
 Fax:  
**+47 22 96 05 50**

Enterprise number:  
**NO 974404532**

			modifications of electronics and documents.
15	2015-02-25	D0001348-01	Issue 15. Modifications of BBH board, modification of Ex d plug, material spec. and documents.
16	2015-12-16	D0001348-02	Added certification and marking for Ex ia IIIC Da and Ex ib IIIC Db
17	2016-03-21 2015-04-04	D0001348-03	Updates to EN 60079-1: 2014, EN 60079-26: 2015, EN 60079-31: 2014, New model of antenna unit, other minor changes. Certificate updated editorially and updated.

**[17] Specific Conditions for Safe Use**

1. The intrinsically safe circuits do not withstand the 500V AC test as specified in EN 60079-11:2012 clause 6.4.13.
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 EPL 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. The antennas for type 5400 are non-conducting and the area of the non-conducting part exceeds the maximum permissible areas for Group IIC, according to EN 60079-0: 2012 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. Parts of the rod-antennas, 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 antenna is used in a potentially explosive atmosphere group III, EPL Da, appropriate measures must be taken to prevent electrostatic discharge.
5. 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.
6. The Ex ia version of model 5400 may be supplied by an “Ex ib” certified safety barrier. The whole circuit shall then be regarded type “Ex ib”.  
The preferred type “ia” or “ib” shall be indicated on the marking label as specified in the instructions for the transmitter.  
The antenna part, located in the process vessel, is classified EPL Ga and electrically separated from the “Ex ia” or “ib” circuit.
7. 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.

**[18] Essential Health and Safety Requirements**

Covered by item 9

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