

CERTIFICATE OF CONFORMITY



1. **HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS**
2. **Certificate No:** FM16CA0011X
3. **Equipment:** Model 5408 Radar Level Transmitter
(Type Reference and Name)
4. **Name of Listing Company:** Rosemount Tank Radar AB
5. **Address of Listing Company:** Layoutvägen 1
Mölnlycke 43533
Sweden
6. The examination and test results are recorded in confidential report number:
3055743 dated 25th January 2017
7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:
CAN/CSA C22.2 No. 0.4-04:2004 (R2013), CAN/CSA C22.2 No. 0.5-16:2016, CAN/CSA C22.2 No. 25-1966:1966 (R2014), CAN/CSA C22.2 No. 30-M1986:1986 (R2012), CAN/CSA C22.2 No.94-M91:1991 (R2011), CAN/CSA C22.2 No. 213-2016, CAN/CSA C22.2 No. 61010.1:2012, CAN/CSA C22.2 No. 60079-0:2015, CAN/CSA C22.2 No. 60079-1:2016, CAN/CSA C22.2 No. 60079-11:2014, CAN/CSA C22.2 No. 60079-15:2016, CAN/CSA C22.2 No. 60079-26:2016, CAN/CSA C22.2 No. 60079-31:2015, CAN/CSA C22.2 60529:2005 (R2015), ANSI/ISA-12.27.01:2011
8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

Certificate issued by:



J.E. Marquedant
Manager, Electrical Systems

27 October 2017

Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

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10. Equipment Ratings:

Intrinsically Safe (Entity) for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F and G; Temperature Class T4...T2 Tamb = -60°C to +70°C in accordance with Control Drawing No. D7000002-885; Hazardous Locations.

Nonincendive for use in Class I, Division 2, Groups A, B, C, and D; Temperature Class T4...T2 Tamb = -60°C to +70°C; Hazardous Locations.

Class II and III, Division 2, Groups E, F and G; Temperature Class T4...T2 Tamb = -60°C to +70°C; Hazardous Locations.

Explosionproof for use in Class I, Division 1, Groups A, B, C and D; Temperature Class T6...T2 Tamb = -40°C to +70°C; Hazardous Locations.

Dust-Ignitionproof for use in Class II and III, Division 1, Groups E, F and G; Temperature Class T6...T3 Tamb = -50°C to +70°C; Hazardous Locations.

Intrinsically safe (Entity) for use in Zone 0, Group IIC Temperature Class T4...T2 Tamb = -60°C to +70°C in accordance with Control Drawing No. D7000002-885; Explosive Atmospheres.

Intrinsically safe (Entity) for use in Zone 1, Group IIC; Temperature Class T4...T2 Tamb = -60°C to +70°C with a boundary wall separating the wave guide probe for use Zone 0, Group IIC Temperature Class T4...T2 Tamb = -60°C to +70°C in accordance with Control Drawing No. D7000002-885; Explosive Atmospheres.

Intrinsically safe (Entity) for use in Zone 20, Group IIIC; Temperature Class T135°C...T250°C Tamb = -60°C to +70°C; Temperature Class T135°C...T250°C; Tamb = -60°C to +70°C in accordance with Control Drawing No. D7000002-885; Explosive Atmospheres.

Flameproof for use in Zone 1, Group IIC Temperature Class T6...T2 Tamb = -50°C to +70°C with a boundary wall separating the wave guide probe for use Zone 0, Group IIC Temperature Class T6...T2 Tamb = -50°C to +70°C; Explosive Atmospheres.

Dust ignition protection by enclosure for use in Zone 21, Group IIIC T85°...T250°C Tamb = -60°C to +70°C; Explosive Atmospheres.

Enclosure rating of indoor and outdoor, Type 4X; IP6X

SINGLE SEAL -0.5...100Bar, -60°C...+250°C

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11. The marking of the equipment shall include:

IS CL I, II, III, DIV 1, GP A-G T4...T2
NI CL I, DIV 2, GP A-D T4...T2
CL II, III, DIV 2, GP E-G T4...T2
CL I, Zone 0 Ex ia IIC T4...T2 Ga
CL I, Zone 0/1 Ex ib IIC T4...T2 Ga/Gb
Zone 20 Ex ia IIIC T135°C...T165°C Da
-60°C ≤ Ta ≤ +70°C; Type 4X; IP6X
When Installed per control drawing D7000002-885

Class I, Div 1, GPS A, B, C, D T6...T2, -40°C ≤ Ta ≤ +70°C
CL III/III, DIV 1, GPS E, F, G T6...T3, -50°C ≤ Ta ≤ +70°C
CL I Zone 0/1 Ex db IIC T6...T2 Ga/Gb, -50°C ≤ Ta ≤ +70°C
Zone 21 Ex tb IIIC T85°C...T165°C Db, -60°C ≤ Ta ≤ +70°C
Type 4X; IP6X

SINGLE SEAL -0.5...100Bar, -60°C...+250°C

12. **Description of Equipment:**

The Rosemount™ 5408 is a two-wire radar level transmitter for continuous level measurement of liquids and solids. The transmitter continuously emits signal sweeps with a constantly varying frequency towards the product surface. A difference in frequency between the transmitted and the reflected signals is used to calculate change in process material level.

The upper enclosure and side covers are constructed of painted aluminum alloy SG100B or stainless steel. The upper enclosure contains two conduit entries, one on each side. It also optionally contains a threaded window display cover on the front and a threaded solid cover in the back where the terminal block is located for power connections. The upper enclosure is approximately 107mm wide by 131mm in depth by 107mm in height by and 210mm in height when the sensor module is added. The sensor model is constructed of 316 stainless steel. A cone shaped or parabolic antenna connects to the sensor module for radar transmission.

Explosionproof/Flameproof and Dust-Ignitionproof:

The ambient operating temperature range of the Model 5408 Radar Level Transmitter is -40°C to +70°C (Explosionproof), -50°C to +70°C (Dust-Ignitionproof & Flameproof), -60°C to +70°C (Dust ignition protection by enclosure). Process temperature range is -40°C to +250°C (Explosionproof), -50°C to +250°C (Flameproof), -50°C to +160°C (Dust-Ignitionproof), -60°C to +250°C (Dust ignition protection by enclosure).

All other installations:

The ambient operating temperature range of the Model 5408 Radar Level Transmitter is -60°C to +70°C. Process temperature range is -60°C to +250°C.

Electrical data:

In type of protection intrinsic safety, connection can only be made to a certified intrinsically safe circuit with the following values:

Ui < 30Vdc; li < 133mA; Pi < 1W; Ci < 7.3nF; Li = 0mH

All other protection techniques, the electronic connection has the following values:

42.4Vdc, 4-20mA;

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Environmental Ratings:
Type 4X / IP6X

Process Sealing between Electrical Systems and Process Fluids –
SINGLE SEAL -0.5...100Bar, -60°C...+250°C

5408 a b c d e f g h i j k l m n o. Radar Level Transmitter

a = Profile: A or F.

b = Measurement Type: 1, 2, 3 or 4.

c = Performance Class: S, R or A.

d = Signal Output: H.

e = Housing Material: A or S.

f = Conduit / Cable Threads: 1 or 2.

g = Hazardous Locations Certifications: E6 or I6.

h = Material of Construction Process Connection: 1, 2, 3, 7, H, M, X or Z.

i = Process Connection Type: F, R, N, G, B, W, C, T, X or Z.

j = Process Connection Size: 2, 3, 4, 6, 8, T, A, B, X or Z.

k = Process Connection Rating: AA, AB, AC, AD, DA, DB, DC, DD, DK, JA, JB, JK, XX or ZZ.

l = Antenna Type, Operating Temperature and Pressure: CAA, CAB, CAC, CAD, CBF, CBK, CBM, CBV, PAS, SAA or ZZZ.

m = Antenna Size: 2, 3, 4, 8, X or Z.

n = Antenna Extensions: S1 or S2.

o = Other: PC1, M5, EF1, EF2, DA1, HR7, OA, C1, C4, C5, C8, AW, EW, Q4, QG, Q5, Q8, QS, QT, Q15, Q25, Q35, Q17, Q66, Q67, Q68, Q79, Q73, Q76, U1, SBS, SDN, SLL, SBV, SRS, SGL, WR3, WR5, PY1, PY2, PR1, PR2, PO1, PO2, XA, XC, A1, and/or PXXXX.

13. Specific Conditions of Use:

- 1. Flamepath joints are not for repair. Contact the manufacturer.*
- 2. Plastic wire-on tag, Plastic part of Process Seal Antenna and Non-standard paint options (paint options other than Rosemount Blue) may cause risk from electrostatic discharge. Avoid installation that could cause electrostatic build-up, and only clean with a damp cloth.*
- 3. Appropriate cable, glands, and plugs need to be suitable for a temperature of 5°C greater than the maximum specified ambient temperature for location where installed.*
- 4. Metric Field Wiring Entries are not allowed for Divisions.*
- 5. The Transmitter can be installed in the boundary wall between a Zone 0 and Zone 1 area. In this configuration, the process connection is installed in Zone 0, while the transmitter housing is installed in Zone 1. Refer to Control Drawing D7000002-885.*
- 6. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP6X and/or Type 4X rating. To maintain the ingress protection ratings, Covers and Sensor Module to be fully tightened and PTFE tape or pipe dope is required for cable entries and blanking plugs. See Instruction Manual on application requirements.*
- 7. Install per Control drawing D7000002-885.*
- 1. Using the box provided on the nameplate, the User shall permanently mark the type of protection chosen for the specific installation. Once the type of protection has been marked it shall not be changed.*
- 9. Display glass shall be positioned in such a way as to minimize the risk of mechanical impact.*
- 10. When Option h = Hazardous Locations Certifications: E6, The applicable temperature class, ambient temperature range and process temperature range of the equipment is as follows;*

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Temperature Class / Maximum Surface Temperature	Ambient Temperature Range	Process Temperature Range
Divisions Gas Groups:		
T2	-40°C ≤ Ta ≤ 70°C	-40°C to 250°C
T3	-40°C ≤ Ta ≤ 70°C	-40°C to 195°C
T4	-40°C ≤ Ta ≤ 70°C	-40°C to 130°C
T5	-40°C ≤ Ta ≤ 70°C	-40°C to 95°C
T6	-40°C ≤ Ta ≤ 70°C	-40°C to 80°C
Division Dust Groups:		
T3	-50°C ≤ Ta ≤ 70°C	-50°C to 160°C
T4	-50°C ≤ Ta ≤ 70°C	-50°C to 130°C
T5	-50°C ≤ Ta ≤ 70°C	-50°C to 95°C
T56	-50°C ≤ Ta ≤ 70°C	-50°C to 80°C

Temperature Class / Maximum Surface Temperature	Ambient Temperature Range	Process Temperature Range
Zone Gas Groups:		
T2	-50°C ≤ Ta ≤ 70°	-50°C to 250°C
T3	-50°C ≤ Ta ≤ 70°	-50°C to 195°C
T4	-50°C ≤ Ta ≤ 70°	-50°C to 130°C
T5	-50°C ≤ Ta ≤ 70°	-50°C to 95°C
T6	-50°C ≤ Ta ≤ 70°	-50°C to 80°C
Zone Dust Groups:		
T250°C	-60°C ≤ Ta ≤ 70°	-60°C to 250°C
T200°C	-60°C ≤ Ta ≤ 70°	-60°C to 195°C
T135°C	-60°C ≤ Ta ≤ 70°	-60°C to 130°C
T100°C	-60°C ≤ Ta ≤ 70°	-60°C to 95°C
T85°C	-60°C ≤ Ta ≤ 70°	-60°C to 80°C

11. When Option h = Hazardous Locations Certifications: I6, The Model 5408 Level Transmitter will not pass the 500Vrms dielectric strength test between the circuits and the earth ground. This must be taken into account during installation.
12. When Option h = Hazardous Locations Certifications: I6, The applicable temperature class, ambient temperature range and process temperature range of the equipment is as follows;

Temperature Class / Maximum Surface Temperature	Ambient Temperature Range	Process Temperature Range
Divisions Gas Groups:		
T2	-60°C ≤ Ta ≤ 70°C	-60°C to 250°C
T3	-60°C ≤ Ta ≤ 70°C	-60°C to 195°C
T4	-60°C ≤ Ta ≤ 70°C	-60°C to 130°C
Division Dust Groups:		
T3	-60°C ≤ Ta ≤ 70°C	-60°C to 160°C
T4	-60°C ≤ Ta ≤ 70°C	-60°C to 130°C
T5	-60°C ≤ Ta ≤ 70°C	-60°C to 95°C
T6	-60°C ≤ Ta ≤ 70°C	-60°C to 80°C

Temperature Class / Maximum Surface Temperature	Ambient Temperature Range	Process Temperature Range
Zone Gas Groups:		
T2	-60°C ≤ Ta ≤ 70°C	-60°C to 250°C
T3	-60°C ≤ Ta ≤ 70°C	-60°C to 195°C
T4	-60°C ≤ Ta ≤ 70°C	-60°C to 130°C
Zone Dust Groups:		
T250°C	-60°C ≤ Ta ≤ 70°C	-60°C to 250°C
T200°C	-60°C ≤ Ta ≤ 70°C	-60°C to 195°C

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T135°C	-60°C≤Ta≤70°C	-60°C to 130°C
T100°C	-60°C≤Ta≤70°C	-60°C to 95°C
T85°C	-60°C≤Ta≤70°C	-60°C to 80°C

14 Test and Assessment Procedure and Conditions:

This Certificate has been issued in accordance with FM Approvals Canadian Certification Scheme.

15 Schedule Drawings

A copy of the technical documentation has been kept by FM Approvals.

16 Certificate History

Details of the supplements to this certificate are described below:

Date	Description
25 th January 2017	Original Issue.
8 th March 2017	Supplement 1: Report Reference: – 3059735 dated 8 th March 2017. Description of the Changes: <ol style="list-style-type: none">1. Add Stainless Steel housing and covers material option.2. Update IP ratings from IP65 to IP6X.3. Change the glass to metal seal separation element to a newer design.4. Cone Antenna (PTFE version) (same as original design) was tested and approved for a higher pressure (MWP=100 bar). Add additional Cone Antenna rating types.5. Reduce the low ambient and low process temperature ratings for some Approval and Certification listings to -60°C.6. Update/ Correct Certificates, Listings and Controlled documents.7. Circuitry changes made to all approved boards affecting IS approval.
27 th October 2017	Supplement 2: Report Reference: – 3062465 dated 27 th October 2017. Description of the Changes: <ol style="list-style-type: none">1. Addition of a new antennas (“Process Seal Antenna”). Process Seal Antenna with a rated Pressure range of -0.5 Bar to 25 Bar.2. Adding of SINGLE SEAL -0.5...100Bar, -60°C...+250°C marking.3. Adding of the Emerson Process Management Asia Pacific Private Ltd. facility in Singapore as a manufacturing site.4. Corrections of some type errors in existing certificate and Approval report.5. Adding a new option of lubricant.6. Adding a new optional thread anti-seize.

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