

CERTIFICATE OF CONFORMITY



- HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
- Certificate No:** FM19US0068X
- Equipment:** Type-CB Connection Box
(Type Reference and Name) Type-MNS Sensor
- Name of Listing Company:** Senmatic A/S
- Address of Listing Company:** Industrivej 8
Soendersoe 5471
Denmark
- The examination and test results are recorded in confidential report number:
3042101 dated 26th April 2013
- FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:
FM Class 3600:2011, FM Class 3610:2010, FM Class 3810:2005,
ANSI/IEC 60529:2004, ANSI/UL 61010:2004
- 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.
- 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.
- Equipment Ratings:
Type-CB-a0cdefg. Connection Box.
Intrinsically Safe for use in Class I, II, III, Division 1 and 2, Groups A, B, C, D, E, F and G; Temperature Class T4 Tamb = -50°C to +70°C, Class I, Zone 0, Group IIC; Temperature Class T4 Tamb = -50°C to +70°C; Hazardous (Classified) Locations; IP66

Certificate issued by:

J.E. Marquedant
VP, Manager - Electrical Systems

21 May 2019

Date

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

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
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SCHEDULE



US Certificate Of Conformity No: FM19US0068X

Type-CB-abcdefg. Connection Box

Intrinsically Safe for use in Class I, Division 1, Groups A, B, C and D; Temperature Class T6 Tamb = -50°C to +70°C, Class I, Zone 0 Group IIC; Temperature Class T6 Tamb = -50°C to +70°C; Hazardous (Classified) Locations; IP66

Type-MNS Sensor

Intrinsically Safe for use in Class I, Division 1, Groups A, B, C and D; Temperature Class T6 Tamb = -50°C to +70°C; Class I, Zone 0, Group IIC; Temperature Class T6 Ta = -50°C to +70°C; Hazardous (Classified) Locations.

11. The marking of the equipment shall include:

Type-CB-a0cdefg. Connection Box.

Intrinsically Safe apparatus for use in Class I, II, III, Div. 1, Group A, B, C, D, E, F, G T4 or Class I, Zone 0, AEx ia IIC T4

When Installed in accordance with the entity concept and Control Drawing 800-CB-EX.
Ta = -50°C to +70°C

Type-CB-abcdefg. Connection Box

Intrinsically Safe apparatus for use in Class I, Div. 1, Group A, B, C, D T6 or Class I, Zone 0, AEx ia IIC T6

When Installed in accordance with the entity concept and Control Drawing 800-CB-EX.
Ta = -50°C to +70°C

Type-MNS. Sensor.

Class I, Div 1, Groups A, B, C, D T6 or Class I, Zone 0, AEx ia IIC T6
Control drawing 800-MNS-EX

12. **Description of Equipment:**

The Type-CB connection box is designed to provide connection facilities for temperature sensors in hazardous areas. The connection box is intended for installation directly on process connection flanges in explosive areas categorized as zone 0. The entire system of Type-CB Connection box, Type-MNS sensors, transmitters and connection blocks are certified as intrinsically safe Ex ia.

The electronic units in the Type-CB enclosure are PR Electronics 5335D temperature transmitters. An alternative design uses a Rosemount Tank Radar 2240 transmitter instead of the Junction Box.

The Type-MNS Temperature Sensor is a mineral insulated thermometer with the measuring element glass encapsulated platinum for temperature measurement in insulation and concrete surroundings.

Electrical Ratings;

Type-CB enclosure with PR Electronics 5331D or 5335D

The parameters apply for the total of all elements:

Ui = 7.2V; Pi = 700mW; Ii = 400mA; La = 40µH + Lcable; Ca = 500nF + Ccable

Uo = 9.6 V; Po = 60 mW; Io = 25mA; Lo = 33 mH; Co = 2.4 µF

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Type-CB with Rosemount 2240

FISCO Input Parameters: $U_i = 17.5\text{ V}$, $I_i = 380\text{ mA}$, $P_i = 5.32\text{ W}$, $C_i = 2.2\text{ nF}$, $L_i = 2\text{ }\mu\text{H}$

Entity Input Parameters: $U_i = 30\text{ V}$, $I_i = 300\text{ mA}$, $P_i = 1.3\text{ W}$, $C_i = 2.2\text{ nF}$, $L_i = 2\text{ }\mu\text{H}$

$U_o = 5.9\text{ V}$, $I_o = 100\text{ mA}$, $P_o = 150\text{ mW}$, $C_o = 40\text{ }\mu\text{F}$, $L_o = 3\text{ mH}$

Type-MNS Sensors

$U_i = 9.6\text{ V}$; $P_i = 700\text{ mW}$; $I_i = 400\text{ mA}$; $L_i = 40\text{ }\mu\text{H}$; $C_i = 500\text{ nF}$

Operation Temperature Ranges:

The Type-MNS has a service temperature range of -200°C to $+100^\circ\text{C}$ for the probe tip and -50°C to $+70^\circ\text{C}$ at the mounting flange. To avoid the effects of process temperature and other thermal effects care shall be taken to ensure that the temperature at the mounting flange does not exceed $+70^\circ\text{C}$.

Type-CB-a0cdefg. Connection Box.

a = Connection: 0, J, K, L, M or P.

b = Box: 0.

c = Number of sensors: 01 to 24.

d = Module 1: 0, A, B, C or D.

e = Module 2: 0, A, B, C or D.

f = Module 3: 0, A, B, C or D.

g = Module 4: 0, A, B, C or D.

Type-MNS abcdefghijklmno. Sensor.

a = Sensor Length: 200mm to 30,000mm

b = Outer Diameter: 5 or 6

c = Number of Elements: S or D

d = Wiring: 3 or 4

e = Resistance at 0°C : 1

f = Tolerance Class EN 60751: 1, 2, or C.

g = Sensor Tip: A

h = Lead-Out Wire: 1

i = Lead-Out Dimension: 0, 1, 2 or 3.

j = Lead-Out Wire/LK: 200mm, 700mm, 560mm.

k = Junction Box Fitting: 0, 1, 2 or 3.

l = Flange Fitting, 0, 1, 2 or 3

m = Sensor Tip Fitting: 0, 1, 2, 3 or 5.

n = Extension Length L2: 500mm to 10,000mm or none.

o = Tag Number/Project number: Any 20 digits.

13. **Specific Conditions of Use:**

Type-CB-a0cdefg. Connection Box.

1. The sensor for the Type-CB has a service temperature range of -200°C to $+100^\circ\text{C}$ for the probe tip and -50°C to $+70^\circ\text{C}$ at the mounting flange. To avoid the effects of process temperature and other thermal effects care shall be taken to ensure that the temperature at the mounting flange does not exceed $+70^\circ\text{C}$.

2. The enclosure of the Rosemount Tank Radar 2240 contains aluminum and is considered to present a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact or friction.

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Type-CB-a1cdefg. Connection Box.

Type-CB-a2cdefg. Connection Box.

1. The sensor for the Type-CB has a service temperature range of -200°C to +100°C for the probe tip and -50°C to +70°C at the mounting flange. To avoid the effects of process temperature and other thermal effects care shall be taken to ensure that the temperature at the mounting flange does not exceed +70°C.

Type-MNS. Sensor.

1. The Type-MNS has a service temperature range of -200°C to +100°C for the probe tip and -50°C to +70°C at the mounting flange. To avoid the effects of process temperature and other thermal effects care shall be taken to ensure that the temperature at the mounting flange does not exceed +70°C.

14. Test and Assessment Procedure and Conditions:

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

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
26 th April 2013	Original Issue.
10 th September 2013	<u>Supplement 1:</u> Report Reference: – 797-33878-283 dated 15 th July 2013 Description of the Change: US and Canadian Approvals added.
21 st May 2019	<u>Supplement 2:</u> Report Reference: – RR218258 dated 21 st May 2019 Description of the Change: 1. Change of company Logo on the labels. 2. Add model code structure to drawings. 3. Convert Certificate to new format. Issued new certificate number.

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