



EUROPEAN UNION RECOGNISED ORGANISATION (EU RO) MUTUAL RECOGNITION TYPE APPROVAL CERTIFICATE

In accordance with Article 10.1 of EU Regulation 391/2009

Certificate No:
MRA000001F
Revision No:
1

This Certificate is issued to

**Kongsberg Maritime AS Avd Skonnertvegen
Ranheim, Norway**

for

Temperature Gauges/Sensors/Transmitters

with type designation(s)

Series MB0001 to 4999, Series MN0001 to 9999

The product is found to comply with

**EU RO Mutual Recognition Technical Requirements for Temperature Gauges and Transmitters
EU RO Mutual Recognition Technical Requirements for Sensors**

Intended service

Temperature sensors with a range of process- and electrical connections for use in control, alarm, monitoring and instrumentation systems subject to classification; See product description on page 2.

**Temperature [°C]: -55 ~ +85
Vibration: ±1.6 mm / ±4.0 g at 2-25 Hz / 25-100 Hz (See also Other conditions)
EMC: Not relevant (no active components)
IP Code: See product description**

This is to certify:

that the Product referred to herein has been inspected for the Manufacturer, pursuant to the relevant requirements of the European Union Recognised Organisation Mutual Recognition procedure, required by Article 10.1 of EU Regulation 391/2009, and has been found in accordance with those requirements.

This Certificate is valid until **2029-01-29**.

Issued at **Høvik** on **2024-03-11**

DNV local unit: **Trondheim**

Approval Engineer: **Ståle Sneen**



for **DNV**

Digitally signed by
Elter, Frederik Tore
Location: DNV
Høvik, Norway

Frederik Tore Elter
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Form code: MRTA 201

Revision: 2022-12

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Product description

Kongsberg Analogue Temperature Sensors and Thermowells (Protection Wells) in MB- and MN- series:

Type MNxxxx [1][2]: Typically Low Temperature Range: -200°C... +200°C (600°C)

Type MByyyy [1][2]: Typically High Temperature Range: -200°C... +900°C

xxxx and yyyy: Mechanical Design (series) according to Type Approval Documentation.

Examples: Doc. P-TEMPS/RE

Suffix letter no. 1 (Element arrangement):

A: Single Element, 4-wire, Class A,
B: Double Element, 4-wire B/3,
C: Single Element, 2+3-wire,
D: Double Element, 2-wire,
E: Double Element, 3-wire,
F: Single Element, 4-wire,
G: Double Element, 3-wire, Class A,
H: Single Element, 3-wire, Class A,
J: Double Element, 4-wire, Class A,
M: Double Element, 2-wire, B/3,
N: Single Element, 4-wire B/3,
P: Single Element, 4-wire B/10 (LNG),
R: Single Element, 3-wire, B/3,
S: Single Element, 2-wire,
T: Single Element, 3-wire,
W: Single Element, 4-wire B/10 (LPG).

Suffix letter no. 2 (Element type and range):

B: Platinum-30% Rhodium/Platinum-6% Rhodium,
C: Ni100,
E: Ni-Cr/Cu-Ni,
F: Pt50 ohm/0°C,
H: Pt100 ohm/0°C,
J: Fe/Cu-Ni,
K: Ni-Cr/Ni-Al,
M: Pt1000 ohm/0°C,
R: Platinum-13% Rhodium/Platinum,
S: Platinum-10%Rhodium,
T: Cu/Cu-Ni,
U: Pt100 ohm/0°C,
X: SAW, 0-160°C

Installation / Connection Equipment (depending on type):

Thermowells (Protection wells/Thermopockets), flanges, fastening couplings, attached cables, connection boxes, bayonet plugs, cable glands.

Materials (enclosure), typical:

Open deck: Acid resistant steel or equivalent, UV resistant plastics.
Inside tanks: Acid resistant steel, Titanium, Teflon, HD-PE.
Engine room: Stainless steel, Aluminium, Brass, GRP, PVC, surface threaded mild steel.
Inside machinery: Stainless steel, Aluminium, Brass, GRIVORY, surface threaded mild steel.

Protection grade (IP Code), cable material and exceptions from above must be found on sensor data sheet or outline drawing.

Manufactured by

Kongsberg Maritime
Trondheim
Norway

Kongsberg Maritime China (Jiangsu) Co., Ltd.
F1-F2, Building 2,
Runzhou District, Zhengjiang
Jiangsu, China

Application/Limitation

Ex-certification is not covered by this certificate. Application in hazardous area to be approved in each case according to the Rules and Ex-Certification/ Special Condition for Safe Use listed in valid Ex-certificate issued by a notified/recognized Certification Body.

Thermowells shall be used when measuring temperature in fluids, steam, or gases under pressure.

Suitable fastening clamps for suspension to be provided for long sensors.

Type Approval documentation

Drawings: MB-810C, MB-811C, MB-812C, MB-814E, MB-828C, MB-970A,
MN-1397E, MN-3288C, MN-3458D, MN-3469C, MN-3470C, MN-3473B.
Data sheets: Kongsberg Temperature Sensors Standard Types, P-TEMPS/RE, rev. F.
Test reports: Autronica: No. C-54, dated 87-02-04 and C-124, dated 93-09-27,
Nemko: No. E10123.01, dated 2013-04-16,
Nemko: No. E10179.00, dated 2010-10-28.

EU RO MR type approval PQA scheme periodical assessment report, DNV Trondheim 2024-01-29.
EU RO MR type approval PQA scheme periodical assessment report, DNV Nanjing 2024-03-06.

Marking of product

The products to be marked with:

- manufacturer name: KONGSBERG
- model name: MNxxxx[1][2] or MByyyy[1][2] (See product description)
- unique serial number or production batch number

Other conditions

The sensors have been verified for compliance with EU Mutual Recognition Technical Requirements for Temperature gauges and transmitters version 0.3, dated 2023-01-01 including EU Mutual Recognition Technical Requirements for Sensors version 0.5, dated 2023-02-01.

Environmental test parameters

Temperature: -55°C ~ +85°C
Vibration: ±1.6 mm / ±4.0 g at 2-25 Hz / 25-100 Hz
MB158, MB1168 and MB1186 have been subjected to the increased vibration levels (10.0 g strain from 40 Hz to 2000 Hz at test temperature of 600°C)
Humidity: 95%RH @ 55°C
EMC: Not relevant (no active components)
Enclosure: See product description

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed annually and at renewal of this certificate.

END OF CERTIFICATE

Generic Statement for EU RO MR Type Approval Certificate

When a product is presented with this EU RO MR Type Approval Certificate for given application, its acceptability with regards to the limitations stated in the certificate conditions defined in 1b, 1c and 1d of the applied Technical Requirement will be evaluated by the EU RO in charge of classing the ship or being in charge of the unit/system certification.

In accordance with Article 10 of Regulation (EC) No 391/2009 of the European Parliament and of the Council of 23 April 2009 "on common rules and standards for ship inspection and survey organizations", the following organizations, recognized by the EU on this date, have agreed on the technical and procedural conditions under which they will mutually recognize this certificate:

- American Bureau of Shipping (ABS);
- Bureau Veritas (BV);
- China Classification Society (CCS);
- Croatian Register of Shipping (CRS);
- DNV;
- Indian Register of Shipping (IRS);
- Korean Register (KR);
- Lloyd's Register Group Ltd. (LR);
- Nippon Kaiji Kyokai General Incorporated Foundation (ClassNK);
- Polish Register of Shipping (PRS);
- RINA Services S.p.A. (RINA).

The scheme for the mutual recognition of class certificates for materials, equipment and components laid down by Article 10(1) of Regulation (EC) No 391/2009 is only enforceable within the Union in respect of ships flying the flag of a Member State. As far as foreign vessels are concerned, the acceptance of relevant certificates remains at the discretion of relevant non-EU flag States in the exercise of their exclusive jurisdiction, notably under the United Nations Convention on the Law of the Sea (UNCLOS). (In accordance with COMMISSION IMPLEMENTING REGULATION (EU) No 1355/2014 amending Regulation (EC) No 391/2009 - recital (25)).