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

Certificate No:
MRA0000050

In accordance with Article 10.1 of EU Regulation 391/2009

This Certificate is issued to

ILSUNG MEASUREMENT CO., LTD.

Busan, **Korea, Republic of**

for
Temperature Gauges/Sensors/Transmitters

with type designation(s)
Temperature Sensors B, MK Series

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 for use in control, alarm, monitoring, and instrumentation systems subject to classification.

Temperature [°C]:	**0°C ~ 55°C**
Vibration:	**±1.6 mm / 4.0 g**
EMC:	**Not relevant**
IP Code:	**IP56**

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 **2030-02-06**.

Issued at **Høvik** on **2025-02-07**

DNV local unit: **Busan, CMC Korea** for **DNV**

Approval Engineer: **Nikolai Arntzen**

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.

Product description

Specifications Type B

- Element: PT100 ohm
- Measuring range: -50 ~ 200°C
- Tolerance class: B (according to IEC 60751:2022)
- Max. Immersion Length(L1): 250 mm

Model: B-X[1]-X[2]-XX[3]-XXXX[4]-XXXXX[5]

X[1] Element	S:	Single
	D:	Double
X[2] Head	R:	Round
	S:	Square
	N:	No Head
XX[3] Stem Diameter	øA (mm):	
XXXX[4] Stem Length	L1 (mm):	
XXXXX[5] Cable Length	L2 (mm):	

Specifications Type MK

- Element: Thermocouple ‘‘K’’ Type
- Measuring range: 0 ~ 650°C
- Tolerance class: 1 (according to IEC 60584-1:2013)
- Max. Immersion Length(L1): 250 mm

Model: MK-X[1]-X[2]-XX[3]-XXXX[4]-XXXXX[5]

X[1] Element	S:	Single
	D:	Double
X[2] Head	R:	Round
	S:	Square
	N:	No Head
XX[3] Stem Diameter	øA (mm):	
XXXX[4] Stem Length	L1 (mm):	
XXXXX[5] Temp. Compensation Cable Length	L2 (mm):	

Manufactured by

Ilsung Measurement Co., Ltd.
56-1, Jwadong-ro, Haeundae-gu
Busan, Korea

Application/Limitation

The Type Approval covers all hardware listed under Product description.

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.

Technical installation and maintenance manual to be provided for each delivery.

Type Approval documentation

Marking of product

- manufacturer name
- serial number
- type designation
- range
- power supply ratings

Other Conditions

The units have been verified for compliance with EU Mutual Recognition Technical Requirements for Temperature Gauges and Transmitters version 0.4, dated 2024-07-01.

Applicable tests according to IACS Unified Requirements E10 rev. 10 have been verified.

Environmental test parameters		DNV location classes
Temperature:	0°C (16 hours) ~ +55°C (16 hours)	A
Vibration:	±1.6 mm / 4 g	B
Humidity:	95%RH @ 55°C, damp heat cyclic	B
EMC:	Not relevant	-
Enclosure:	IP56	B

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)).