



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

Certificate No:  
**MRA0000052**

In accordance with Article 10.1 of EU Regulation 391/2009

This Certificate is issued to

**Müller Industrie-Elektronik GmbH**  
**Neustadt am Rübenberge, Germany**

for

**Temperature Gauges/Sensors/Transmitters**

with type designation(s)

**MKTS-GL / MKTS-GLex**

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

**The temperature transmitters are intended for use in control and monitoring systems subject to classification**

**Temperature [°C]:** -25°C to +70°C  
**Vibration:** 13.2 to 100 Hz / 0.7 g  
**EMC:** All locations including bridge and open deck  
**IP Code:** 65

## 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 **2028-12-16**.

Issued at **Hamburg** on **2024-12-17**

for **DNV**

DNV local unit: **Hamburg – CMC North/East**

Approval Engineer: **Dariusz Lesniewski**

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

### MKTS-GL, MKTS-GLEx

Programmable compact thermometer (transmitter)

Measuring sensor: 1x Pt100/Pt1000 or 2x Pt100/Pt1000<sup>1)</sup> (2-, 3- or 4-wire), accuracy class A (DIN EN 60751)

Measuring range: -50 up to +200°C

Accuracy: max. 0.1% FS (see data sheet)

Power supply: rated 24V DC (12...30V DC)<sup>2)</sup> (type approved power supply required)

Output signal: analogue 4...20mA, 2-wire or 0...10V / 0.5...10,5V / 2...10V DC, 3-wire

Housing material: stainless steel

Max. length of thermo-well: 300mm

Process connection: G1/4" to G1", NPT1/4" to NPT1" or M14x1,5

Electrical connection: M12 plug-in connector, EN 175301-803 type A connector 4-pole, MIL 6 pole or cable (2m)

Degree of protection: IP65

Firmware version: 1.80

## Manufactured by

Müller Industrie-Elektronik GmbH

Justus-von-Liebig-Straße 24

31535 Neustadt am Rübenberge

GERMANY

## Application/Limitation

The Type Approval covers hardware and firmware listed under product description.

Applicable for a ship as defined in Mutual Recognition provisions Article 10 Regulation on Common Rules and Standards for Ship Inspection and Survey Organizations.

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

Note<sup>1)</sup> Sensors only, no transmitter electronics

Note<sup>2)</sup> Only with type approved power supply

## Type Approval documentation

Name	Number	Date
Test Report	MTN No. 074349.690.24 V1.0	2024-09-13
Test Report	MTN No. 074349.691.24 V1.0	2024-09-13
Test Report	DZS No. H-K00-0774-21	2021-06-16
Test Report	HESCH No. 0257-202410-2	2024-10-18
Test Report	paconsult No. 23DE-01111B Rev.1	2024-05-29
Test Report	paconsult No. 23DE-01111A Rev.1	2024-05-31
Test Report	Müller I-E No. Pressure Test MK-Housing	2024-10-30
Test Report	Müller I-E No. 00610	2024-10-02
Data Sheet	MKTS-GL (Rev. 43-557)	-
Data Sheet	MKTS-GLEx	-
Drawing	MKTS-GL no. 100-03031-01	2023-10-27
Drawing	MKTS-GLEx no. 100-03030-01	2023-10-27
User Manuals	MKTS-GL-M, MKTS-GLEx-M	-
Circuit diagrams, PCB lay-outs, Part lists		n.a.
Software/Firmware	Changelog with Firmware development description: V. 1.07 to V. 1.68 Changelog Bugfixes: V. 1.38 to V. 1.80 Test-table for the Firmware V. 1.80	n.a.
Ex-proof certificate	TÜV 21 ATEX 201293 X	2022-07-29
Ex-proof certificate	IECEX TUN 21.0005X	2022-07-29
EU RO MR TYPE APPROVAL PQA SCHEME PERIODICAL ASSESSMENT CHECKLIST		2024-03-14

## Marking of product

manufacturer name

- serial number
- type designation: GNxxxx-x-xxxx or MKxxxx-x-xxxx
- power supply ratings

## Other Conditions

The temperature transmitters have been verified for compliance with EU Mutual Recognition Technical Requirements for TEMPERATURE GAUGES AND TRANSMITTERS version 0.3, dated 2023-01-01, including the Technical Requirements for SENSORS version 0.5, dated 2023-02-01.

### Environmental test parameters:

Temperature: -25°C and +70°C  
Vibration: 13- to 100Hz / 0.7 g  
EMC: All locations including bridge and open deck  
Enclosure: IP65 (IP ratings according to IEC 60529)

### DNV location classes:

D  
A  
B  
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)).