



Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

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|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Manufacturer | Danfoss A/S |
| Address | Nordborgvej 81, Nordborg, 6430, Denmark |
| Place of Production | Danfoss (Tianjin) Co. Ltd. No. 9 Quanhui Road, Wuqing Development Area, Tianjin, 301700, China |
| Type | Transmitters/Transducers |
| Description | Temperature sensor with integrated transmitter |
| Trade Name | MBT 5560 |
| Application | Marine, Offshore and Industrial applications for use in environmental categories ENV1, ENV2, ENV3 and ENV4, as defined in Lloyd's Register Type Approval System, Test Specification Number 1 – December 2021. |
| Specified Standard | Manufacturer's specification IACS UR E10 Rev. 8 / 2021 |
| Ratings | Power Supply: 10-30 VDC / 5 VDC (ratiometric) Output: 4...20 mA or ratiometric 10 - 90% Measuring range: -50 °C – 200 °C Ambient temperature: -40 °C - 85 °C |

Matthias Karg

Specialist to Lloyd's Register EMEA
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| Additional Tests | Dry heat test (85 °C / 16 h) Low temperature test (-50 °C / 16 h) Ingress protection (IP65) Shock test (Half-sine; 100 g; 6 ms) |
| Other Conditions | Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations. If the specified standards are amended during the validity of this certificate, the product is to be re-approved prior to it being supplied to vessels to which the amended standards apply. |

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid Certificate.

Previous Version: This certificate supersedes certificate number LR2003404TA issued on 20.05.2020 which is hereby cancelled.

The Design Appraisal Document HPC1562012-22/MK and its supplementary Type Approval Terms and Conditions form part of this Certificate.

LLOYD'S REGISTER TYPE APPROVAL – DESIGN APPRAISAL DOCUMENT

Issued by: HAMBURG TECHNICAL SUPPORT OFFICE

Issued to: DANFOSS A/S

For: TEMPERATURE SENSOR, TYPE MBT5560

The undernoted documents have been reviewed for compliance with the requirements of the Lloyd's Register Type Approval System Procedure TA14 Version 04 (September 2020) and this Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

| | | |
|-------------------------|-----------------------------------------------------------------------------------|------------|
| unnumbered | Type Approval Application Checklist | 12.07.2022 |
| 332285 | Request for Marine Services – Type Approval | 13.09.2022 |
| ETS 39939-20 | Design Appraisal Document of previous certificate no. LR2003404TA | 20.05.2020 |
| LR2003404TA | Previous LR Type Approval Certificate for Temperature sensor MBT5560 | 20.05.2020 |
| PRJ11100391216-3 | Production quality assessment report of Danfoss (Tianjin) | 30.09.2022 |
| CNBJ322373-U Rev 1 | Certificate ISO 9001:2015 of Danfoss (Tianjin) Co., Ltd. (China) | 12.08.2021 |
| 084R1019 Rev 03 | EU Declaration of Conformity (EMC) MBT5560 | 01.09.2022 |
| AI202286432128en-000901 | Data sheet Temperature sensor Type MBT5560 | 02.2021 |
| 121-26513-1 | Test Program acc. to IACS UR E10, Rev. 8 / 2021 for MBT5560 and other transmitter | 06.08.2021 |

TEST REPORTS

| | | |
|-------------|----------------------------------------------------------------------------------|------------|
| 121-29917-1 | Test Report acc. to IACS UR E10 Rev. 8 / 2021 for MBT 5560 and other transmitter | 26.01.2022 |
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LR031/2022

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Certificate No: LR2003404TA-02
Issue Date: 13/12/2022
Expiry Date: 15/03/2025
Reference: HPC1562012-22/MK

Supplementary Type Approval Terms and Conditions

Type Approval certifies that a representative sample of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein. It does not mean or imply approval for any other use, nor approval of any product(s) designed or manufactured otherwise than in strict conformity with the said representative sample.

Type Approval is based on the understanding that the manufacturer's recommendations and instructions and any relevant requirements of the Rules and Regulations are complied with.

Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations. Lloyd's Register EMEA reserves the right to cancel or withdraw this Type Approval Certificate in accordance with the Lloyd's Register Type Approval System Procedure.

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