

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.

Manufacturer	Danfoss A/S
Address	Nordborgvej 81, Nordborg, 6430, Denmark
Place of Production	Danfoss A/S 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	Pressure transmitter: MBS 33M Pressure transmitter for high temperature: DST P30M DST P35M MBS 2100 Standard MBS 2150 with pulse-snubber MBS 3100 Standard MBS 3150 with pulse-snubber MBS 3300 Standard MBS 3350 with pulse-snubber Low pressure transmitter: MBS 9300



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Trade Name	DST P30M, DST P35M, MBS 2100, MBS 2150, MBS 3100, MBS 3150, MBS 3300, MBS 3350, MBS33M, MBS 9300
Application	Marine applications for use in environmental categories ENV1, ENV2, ENV3 and ENV4 as defined in Lloyd's Register's Type Approval System, Test Specification Number 1 – 2019.
Specified Standard	Manufacturer's specification IACS E10 Rev. 7 / 2018 Test Specification for Type Approval (except MBS21x0)
Ratings	Pressure range: 0 bar to 600 bar Ambient temperature: -40 °C to 125 °C For detailed ratings, pls. refer to appendix.
Additional Tests	Dry heat: +100 °C / 16 h (4-20 mA versions) Dry heat: +125 °C / 16 h Low Temperature: -40 °C / 16 h Degree of protection: IP 65 for plug type (with mating connector) IP 67 for flying lead type
Other Conditions	For transmitter version of flying lead type, the cable used must be marine approved. Special conditions for Safe Use as stated in applicable Ex-certificates and the conditions of the LR Ship Rules & Regulations of Classification of Ships Part 6, Chapter 2 shall be observed when installed in hazardous areas. The Ex-certification does not form part of this certificate. Pressure Transmitter MBS21x0 must comply with IACS E10 Rev.7 / 2018 when

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intended to be installed on ships contracted for construction on or after 1 January 2022.

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.

The Design Appraisal Document No. HTS/ETS 39808-20/MK/TW and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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Appendix

DESCRIPTION Pressure Transmitter MBS-series

Pressure transmitter:
MBS 33M

Pressure transmitter for high temperature:
DST P30M
DST P35M
MBS 2100 Standard
MBS 2150 with pulse-snubber
MBS 3100 Standard
MBS 3150 with pulse-snubber
MBS 3300 Standard
MBS 3350 with pulse-snubber

Low pressure transmitter:
MBS 9300

RATINGS

Type	Pressure range	Temperature range	Power supply	Output signal
MBS 33M	0-1 bar to 0-600 bar	up to -40 – 85 °C	9-32 VDC	4-20 mA
DST P30M DST P35M	0-1 bar to 0-600 bar	up to -40 – 125 °C	9-32 VDC 4.5-5.5 VDC	4-20 mA ratiometric
MBS 2100 MBS 2150	0-1 bar to 0-600 bar	up to -40 – 125 °C	4.75-8 VDC	ratiometric
MBS 3100 MBS 3150	0-1 bar to 0-600 bar	up to -40 – 125 °C	9-32 VDC 9-32 VDC 15-32 VDC 4.5-5.5 VDC	4-20 mA 0-5 V, 1-5 V, 1-6 V 0-10 V ratiometric
MBS 3300 MBS 3350	0-1 bar to 0-600 bar	up to -40 – 125 °C	9-32 VDC 9-32 VDC 15-32 VDC 4.5-5.5 VDC	4-20 mA 0-5 V, 1-5 V, 1-6 V 0-10 V ratiometric
MBS 9300	40 – 400 mbar	up to -20 – 100 °C	9-32 VDC 4.5-5.5 VDC	4-20 mA ratiometric

Hardware / Software versions of DST P3xM, MBS 31x0, MBS 33x0, MBS 33M

4-20 mA versions	HW: issue 02 rev (04060G0971 PCBA)	SW: rev 1.5.0.x
Ratiometric versions	HW: issue 02 rev (04060G0973 PCBA)	SW: rev 1.5.0.x
Absolute Volt versions	HW: issue 02 rev (04060G0975 PCBA)	SW: rev 1.5.0.x

LLOYD'S REGISTER TYPE APPROVAL – DESIGN APPRAISAL DOCUMENT

Issued by: HAMBURG TECHNICAL SUPPORT OFFICE (HPC1562095)

Issued to: DANFOSS A/S

For: PRESSURE TRANSMITTER, TYPES DST P30M/P35M, MBS 21x0 / 31x0 / 33x0 / 33M / 9300

The undernoted documents have been reviewed for compliance with the requirements of the Lloyd's Register Type Approval System Procedure TA14 Version 03 (July 2017) and this Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

ETS 54965	Application Checklist – Appendix to Form TA2502TA	02.03.2020
ETS 54987	Request for Marine Services – Type Approval	16.03.2020
ETS 39049-19	Design Appraisal Document of Type Approval Interims Letter no. IL19-39050	19.11.2019
CPN1920932	Production quality assessment report of Danfoss A/S (Nordbord, DK)	15.11.2019
CPN1800858	Production quality assessment report of Danfoss (Tianjin) Ltd.	25.03.2019
IC.PD.P21.1G.02	Product data sheet Pressure Transmitter DST P30M	05.2020
IC.PD.P21.1I.02	Product data sheet Pressure Transmitter for high temperature MBS 3100 & MBS 3150	05.2020
IC.PD.P21.1K.02	Product data sheet Pressure Transmitter for high temperature MBS 3300 & MBS 3350	05.2020
IC.PD.P21.1N.02	Product data sheet Pressure Transmitter MBS 33M	06.2019
IC.PD.P21.X5.02	Product data sheet Low Pressure Transmitter MBS 9300	07.2019
064g9615 Rev. 06	EU Manufacturer's Declaration of Conformity reg. ATEX Directive 2014/34/EU and EMC Directive EU2014/30/EU	21.08.2019
ETS 56049	Email with list of HW and SW version nos.	21.09.2020
unnumbered	Software Quality Assurance Plan for DAN001 Pressure Firmware (Rev A)	17.09.2020
unnumbered	Software Configuration Management Plan for DAN001 Pressure Firmware (Rev A)	17.09.2020
unnumbered	Software Test Plan for DAN001 Pressure Firmware (Rev A)	17.09.2020
unnumbered	Presentation "Current versus new - ID172 General Purpose Pressure Transmitter"	03.04.2018

TEST REPORTS

119-30777-1	Test Report (Environmental & EMC) for ID172 pressure transmitter	29.01.2020
119-21656-1	Test Report (EMC, IP65) for MBS 9300 low pressure transmitter	10.04.2019
064G0558-01	Test Report (vibration 4 g) for MBS 9300 low pressure transmitter	02.22.2013

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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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