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| CERTIFICATE NUMBER   | 18-LD1740756-1-PDA            |
| EFFECTIVE DATE       | 01-Apr-2020                   |
| EXPIRY DATE          | 07-Jun-2023                   |
| ABS TECHNICAL OFFICE | London Engineering Department |

## CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

**DANFOSS A/S**

located at

**NORDBORGVEJ 81 - BUILDING E14 S4A, APPROVALS DEPT.,  
NORDBORG, Denmark, DK-6430**

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

### **Product Pressure Transmitter**

**Model MBS 2100/2150**

**MBS 3100/3150**

**MBS 3300/3350**

**MBS 33M**

**DST P30M/35M**

This Product Design Assessment (PDA) Certificate remains valid until 07/Jun/2023 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping

Theodoros Chatzigiakaidas, Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

**DANFOSS A/S**

NORDBORGVEJ 81 - BUILDING E14 S4A

APPROVALS DEPT.

NORDBORG

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Telephone: 45-7488-2222

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**Tier: 3 - Type Approved, unit certification not required**

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**Product: Pressure Transmitter**

**Model: MBS 2100/2150**

**MBS 3100/3150**

**MBS 3300/3350**

**MBS 33M**

**DST P30M/35M**

**Intended Service:**

ABS Classed vessels and offshore installations in accordance with the listed ABS Rules and International Standards.

**Description:**

MBS2100/MBS2150, MBS3100/MBS3150, MBS3300/MBS3350 and DST P30M/P35M are compact high temperature pressure transmitters with integrated pulse-snubber and flexible pressure transmitter program covering different output signals, absolute and gauge (relative) versions, and wide range of pressure and electrical connections for use in severe medium influences like cavitation, liquid hammer or pressure peaks.

MBS33M is a standard temperature pressure transmitter with flexible pressure transmitter program covering a 4-20mA output signal, absolute and gauge (relative) versions, and wide range of pressure and electrical connections.

**Rating:**

Pressure Range: 0-600 bar;

Power Supply: 9 to 32 VDC (4-20mA and 0-10V output signals) and 4.5 to 5.5 VDC (10-90% of supply output signal);

Output Signals: 4-20 mA, 0-10 V and Ratiometric 10-90% of supply;

Enclosure IP Rating: IP65/IP67;

Shock Resistance: 500 g /1 ms;

Operation Temperature: -40C to +125C;

Vibration Stability: 20 g Sinusoidal & 7.5 g Random;

**Service Restriction:**

Unit Certification is not required for this product. Each specific arrangement is to be specifically approved.

**Comments:**

The manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

**Notes/Drawing/Documentation:**

Drawing No. 119-30777-1 - Danfoss A\_S - Test for maritime type approval of ID172 pressure transmitters, Test for marine type approval of ID172 pressure transmitters, Location: Force Technology-Denmark, Issue Date: 29.01.2020, Revision: n/a, Pages: 118

Drawing No. AI308926732183en-000101\_IC.PD.P21.1G02\_DST P30M\_02.2020, Datasheet DST P30M and DST P35M, Revision: 2019.12, Pages: 6

Drawing No. AI308939294195en-000101\_IC.PD.P21.1I.02\_3100\_3150\_02.2020, Datasheet MBS 3100 and MBS 3150, Revision: 2019.12, Pages: 6

Drawing No. AI308943247202en-000101\_IC.PD.P21.1K.02\_3300\_3350\_02.2020, Datasheet MBS 3300 and MBS 3350, Revision: 2019.06, Pages: 6

Drawing No. AI309032027214en-000101\_IC.PD.P21.1N.02\_MBS33M\_12.2019\_HR\_02, Datasheet MBS 33M, Revision: 2019.06, Pages: 5

Drawing No. ID172 Old design versus new design (002), Current versus new ID172 General Purpose Pressure Transmitter, Revision: n/a, Pages: 4

Drawing No. MANUFACTURER'S DECLARATION\_signed, Manufacturer's Declaration, Revision: n/a, Pages: 1

Drawing No. Suggestion\_ABS, Suggestion\_ABS, Revision: n/a, Pages: 5

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**Terms of Validity:**

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**STANDARDS**

**ABS Rules:**

- Steel Vessel Rules (2018): 1-1-4/7.7, 1-1-A3, 1-1-A4, 4-8-3/1.7, 4-9-8/7, 4-9-8/13, 4-9-8/Table1;
- Steel Vessels Under 90 Meters (295 Feet) in Length (2018): 1-1-4/7.7, 1-1-A3, 1-1-A4;
- Facilities on Offshore Installations (2018): 1-1-4/9.7, 1-1-A2, 1-1-A3;
- Offshore Support Vessels (2018): 1-1-4/7.7, 1-1-A3, 1-1-A4, 4-8-3/1.7, 4-9-8/7, 4-9-8/13, 4-9-8/Table1 and Table 2;
- Mobile Offshore Drilling Units (2018): 1-1-4/9.7, 1-1-A2, 1-1-A3, 4-1-1/7.9, 4-3-1/11, 6-1-1/9, 6-1-1/13;
- Steel Vessels for Service on Rivers and Intracoastal Waterways (2018): 1-1-4/7.7, 1-1-A3, 1-1-A4;
- High Speed Crafts (2018): 1-1-4/11.9, 1-1-A2, 1-1-A3;
- Steel Barge Rules (2018): 1-1-4/7.9, 1-1-A3, 1-1-A4;

**National:**

NA

**International:**

IACS UR E10, Rev.7:2018

**Government:**

NA

**EUMED:**

NA

**OTHERS:**

NA