



CERTIFICATE NUMBER 19-SG1908491-PDA

EFFECTIVE DATE 23-October-2019

EXPIRATION DATE 22-October-2024

ABS TECHNICAL OFFICE Singapore Engineering Services

---

## CERTIFICATE OF Product Design Assessment

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

**KONGSBERG MARITIME AS**

located at

**SKONNERTVEGEN 1, TRONDHEIM, Norway, 7005**

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 Monitoring Instruments**

**Model BWM (PS-11)**

This Product Design Assessment (PDA) Certificate remains valid until 22-October-2024 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

---

Manoraaju, 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)

## KONGSBERG MARITIME AS

SKONNERTVEGEN 1

7053 RANHEIM

P.O. BOX 2434

TRONDHEIM

Norway 7005

Telephone: +47 92802050

Fax: +47 73581001

Email: km.sales@kongsberg.com

Web: www.kongsberg.com

---

### Tier: 2 - PDA Issued

---

**Product:** Monitoring Instruments

**Model:** BWM (PS-11)

**Intended Service:**

Marine and Offshore Installations.

**Description:**

Bearing wear monitoring for large two stroke diesel engines fitted in marine and offshore installations.

The PS-11 sensor is based on the eddy current principle and is used for measurements against electrically conductive, ferromagnetic materials. The sensors are mounted on specially designed bracket and fixed to the engine frame beneath the crosshead guide. A high-frequency alternating current flows through a coil cast in the sensor housing. The electromagnetic coil field induces eddy currents in the conductive target which alters the AC resistance of the coil. This change in impedance produces a linear electrical signal proportional to the distance of the target from the sensor.

The measurements take place every time the crosshead pin passes Bottom Dead Centre (BDC) during engine running. The sensor is sampling at a speed of 2 kHz and when the crank is a few degrees before BDC the sensor will sense that the surface is approaching. The distance measurement is compared with the reference obtained during installation and commissioning, which in turn determine the bearing wear condition. The signal from the sensor is processed and transmitted to a bearing wear monitoring system via a CAN bus for alarm and indication purposes.

**Rating:**

Sensor Power Supplies: 18 to 32 VDC;

Power consumption: 0.8W to 1W

Protection rating for sensor and source: IP67;

Housing material: Steel to AISI 304;

Operating Temperature: 0 to 80 degree C;

Sensor communication protocol: CANopen bus.

**Service Restriction:**

Unit Certification is not required for this product. If the manufacturer or purchaser requests an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

**Comments:**

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

**Notes/Drawing/Documentation:**

Drawing No. PS-11 Data Sheet, Bearing Wear Monitoring, Revision: 0, Pages: 1

Test Report 129871/Env01 – IACS E10 (2006) tested by Nemko dated 28 July 2009.

**Terms of Validity:**

This Product Design Assessment (PDA) Certificate remains valid until 22/Oct/2024 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.

**KONGSBERG MARITIME AS**

SKONNERTVEGEN 1

7053 RANHEIM

P.O. BOX 2434

TRONDHEIM

Norway 7005

Telephone: +47 92802050

Fax: +47 73581001

Email: km.sales@kongsberg.com

Web: www.kongsberg.com

**Tier: 2 - PDA Issued**

---

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.

**STANDARDS**

**ABS Rules:**

Rules for Conditions of Classification, Part 1 - 2019, 1-1-4/7.7, 1-1-A3, 1-1-A4, which covers the following:  
2019 Rules for Building and Classing Marine Vessels: 4-9-9/13 4-8-3/1.11.1, 4-8-3/Table 1A & 1B, 4-8-3/Table 2;  
2019 Rules for Building and Classing Steel Vessels: 4-9-8/13 4-8-3/1.11.1, 4-8-3/Table 1A & 1B, 4-8-3/Table 2;  
2019 Rules for Building and Classing Offshore Support Vessels: 4-9-8/13 4-8-3/1.11.1, 4-8-3/Table 1A & 1B, 4-8-3/Table 2;  
2019 Rules for Building and Classing Steel Vessels Under 90m in Length: 4-6-3/3.1.1, 4-6-3/Table 1;

Rules for Conditions of Classification (2019) – High-Speed Crafts 1-1-4/11.9, 1-1-A2, 1-1-A3, which covers the following:  
(2019) High Speed Craft: 4-6-3/3.1.1, 4-6-3/Table 1

Rules for Conditions of Classification (2019) – Offshore Units and Structures 1-1-4/9.7, 1-1-A2, 1-1-A3, which covers the following:

(2019) Mobile Offshore Drilling Units Rules: 4-3-3/3.1.1, 4-3-3/Table 1  
(2019) Mobile Offshore Units Rules: 4-3-3/3.1.1, 4-3-3/Table 1  
(2019) Rules for Facilities on Offshore Installations: 3-6/5.1, 3-6/Table 1A & 1B

**National:**

NA

**International:**

NA

**Government:**

NA

**EUMED:**

NA

**OTHERS:**

NA