DNV·GL

Certificate No:
TAA00001EE

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Shaft bearing monitoring

with type designation(s)
Bearing Distance Monitoring System for two stroke diesel engines

Issued to
Dr. E. Horn GmbH & Co. KG
Schönaich Baden-Württemberg, Germany

is found to comply with
DNV GL offshore standards

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Temperature	**B**
Humidity	**B**
Vibration	**B**
EMC	**B**
Enclosure	**Required protection according to the Rules shall be provided upon installation on board.**

Issued at **Hamburg** on **2017-09-28**
This Certificate is valid until **2019-09-27**.
DNV GL local station: **Augsburg**

Approval Engineer: **Andrea Grün**

for **DNV GL**

Joannis Papanuskas
Head of Section

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.

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Product description

Type
BDMS /BDTMS / BDTCMS / BTMS
MDA 312…, GHG02611-x, GHG2621-x, IW000184, FRG00032-x, GHG02088-x, TGL00921, TGL00921-x

Aux. Voltage : 24 V DC +/-25%

Indication Unit : MDA 312…

software Version	MDA 312...	3.43aW	31.8.2017
	MDA 312…..3.43_S60M9		15.11.2016
	MDA 312…	3.43	8.12.2016
	MDA 312…	3.43_SPO	8.12.2016
	MDA 312…	3.43a910	15.08.2017
	MDA 312…	3.43a810	15.08.2017

Transfer Box : GHG02611

Sensors : FRG00032-x (Water in Oil) with Controller P89LPC936
Software Version: FRG00032_AW Version WIO.1.31 /_SPO dated 17.08.2017
TGL00921 /-x (Temperature) with Controller P89LPC936
Software Version: TEMPSENS.2.0 dated 25.7.2017
IW000184 (Distance) Controller ADuC814
Software Version: KREUZKOPFSENSOR_ 4.0 /_SPO dated 16.11.2017

Microcontroller CY8C29466

GHG02611:	-25…+ 70°C
IW000184 :	-25…+ 70 °C
MDA 312… :	-25...+ 85 °C
FRG00032 :	0…+ 85 °C
TGL00921 :	-25…+ 90 °C

Application/Limitation

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV GL Rules for Ships/Offshore Standards Pt.4 Ch.9 Control and Monitoring Systems.

Alarm settings have to be specified by engine manufacturer if system is used for Condition Monitoring.

Product certificate
Each delivery of the application system is to be certified according to Pt.4 Ch.9 Sec.1. The certification test is to be performed at the manufacturer of the application system according to an approved test program before the system is shipped to the yard. After the certification the clause for application software control will be put into force.

Clause for application software control
All changes in software are to be recorded if the system is in use on board. The records of all changes are to be forwarded to DNV GL for evaluation and approval. Major changes in the software are to be approved before being installed in the computer.

Type Approval documentation

Test reports:

- BDMS _ LOTR-DNVGL_TAA00001EE_20170925_Rev01 dated 25-09-2017

Technical Documentation:

- BDMS _ LOTD-DNVGL_TAA00001EE_20170925_Rev01 dated 25-09-2017

Tests carried out

Applicable tests according to Class Guideline DNVGL-CG-0339, November 2016.

Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number

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.

A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE