

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Cylinder Pressure Measuring Device and Condition Monitoring System**

with type designation(s)

MarPrime®, MarPrime® Ultra

Issued to

MARIDIS Maritime Diagnosis & Service GmbH**Rostock, Germany**

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

Temperature	A
Humidity	A
Vibration	A
EMC	A
Enclosure	NA

Issued at **Hamburg** on **2018-02-20**for **DNV GL**This Certificate is valid until **2023-02-08**.DNV GL local station: **Rostock**Approval Engineer: **Marco Rinkel****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.



Product description

Handheld cylinder pressure measuring device for 2 and 4 stroke engines with indicator cook with dynamical TDC correction.

- Pressure Range: 0...300 bar, accuracy 1% to fullscale output
- Speed Range: 25...2400 rpm
- Max. Numbers of Cylinders: 24

Measurements:

- Pmax./ Pcomp. /Power (ind.) /Speed
- MarPrime® Ultra additionally injection timing, valves timing, valves leakage

Interfaces: USB, RJ45 network

Software Version: V1.10

Circuit board MAR01:

- Connection for pressure sensor
- Connection for Ultrasonic sensor (MarPrime® Ultra)
- 3 x Indication LED
- 1 x operating button
- 1 x USB port
- 1 x LAN (10 Mbit)

Pressure Sensor HTT04

- Measuring Range: 0...300 bar
- Signal output: 4...20 mA
- Max. temperature at measuring cell: 300 °C

Ultrasonic Sensor: VS 900M

- Measuring Range: 100...900Hz
- Temperature Range: -50...100°C

PC based Condition Monitoring System

- Cylinder Pressure Analysis
- Leakage Detection

Software Version 3.2.0.4

Application/Limitation

Ex-certification is not covered by this certificate. Application in hazardous area to be approved in each case according to the Rules and Ex-Certification/ Special Condition for Safe Use listed in valid Ex-certificate issued by a notified/recognized Certification Body.

Equipment for installation and/ or use outside a distance of 5 m from a standard or a steering magnetic compass.

DNVGL CLASS GUIDELINE DNVGL-CG-0052 "Survey arrangement for machinery condition monitoring" to be observed for Survey Arrangements CM.

Clause for application software control

All changes in software are to be recorded as long as 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.

Job Id: **262.1-028225-1**
Certificate No: **TAA00001NH**

Type Approval documentation

See ANNEX

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, November 2016.

Marking of product

The products to be marked with:

- model name
- manufacturer 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

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE

Job Id: **262.1-028225-1**
Certificate No: **TAA00001NH**

ANNEX

Type Approval documentation

(hidden)

Test Report Treo 205-12, (EMC),	2012-11-21
Test Report Treo 234-12, (ENV)	2012-12-19
Protokoll EMV Test MarPrime Ultra	2012-11-02
Protokoll Klimatest Test MarPrime Ultra	2012-11-02
Dokumentation.odt (Technical documentation)	2012-01-19
Software Specification/Documentation MarPrime Version 1.0.2	2012-11-07
ASSESSMENT REPORT Rostock	2018-02-02