



Certificate No:  
**TAA000033S**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Monitoring System**

with type designation(s)  
**SPM - Shaft Power Meter**

Issued to

**Aquametro Oil & Marine GmbH**  
**Rostock, Germany**

is found to comply with

**DNV 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.**

<b>Temperature</b>	<b>B</b>
<b>Humidity</b>	<b>B</b>
<b>Vibration</b>	<b>A</b>
<b>EMC</b>	<b>A</b>
<b>Enclosure</b>	<b>B</b>

Issued at **Hamburg** on **2021-12-21**

This Certificate is valid until **2026-12-20**.

for **DNV**

DNV local station: **Hamburg – CMC North/East**

Approval Engineer: **Dariusz Lesniewski**

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**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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



## Product description

The Shaft Power Meter (SPM) is designed to measure, log and report values such as shaft rpm, shaft torque and shaft power. Applicable to feature fuel and propulsion efficiency, engine and hull and thrust performance as well as to monitor shaft power limitation.

System main components:

- SPM bracket incl. traverse / Sensor A / Sensor B
- SPM Magnetic Belts
- SPM Measurement Box – (electronic board “MWE\_211105”)
- SPM Converting Box – (electronic board “MWA\_211105”)
- SPM Control Cabinet
  - o SPM PLC SW based on PLC type Wago 750-814 / WAGO PLC Firmware 17
  - o LC-Display
  - o Power supply filter 24 VDC extern / PLC
  - o Analog output (AO)
  - o Digital output (DO)

FPS/SPM Web Portal (FPS):

- SPM configuration, calibration and visualization of measurements
- SPM logfiles and reporting
- SPM sensor / magnetic belt positioning
- SPM settings acc. shaft design and shaft material parameter
- SPM data transfer from / to SPM converting box
- SPM data visualization on SPM display in control cabinet
- SPM data output configuration and settings

Additional features of FPS (FPS Smart) applicable for monitoring, control and reporting of fuel and propulsion efficiency are available on request (\*not scope of this certification).

SPM Hardware and Software Version: SPM SW 004/001/001

FPS Hardware and Software Version: SPM SW 003/002/003

## Approval conditions

The following documentation of the actual application is to be submitted for approval in each case:

- Reference to this Type Approval Certificate
- System block diagram
- Power supply arrangement (may be part of the System block diagram)

The Type Approval covers hardware and software listed under Product description.

Correct configuration and set up for each delivery to be tested during commissioning after installation.

### Software control

All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV for evaluation and approval before implemented on board. Certification of modified functionality may be required for the particular vessel.

## Type Approval documentation

### Tests carried out

Applicable tests according to class guideline DNV-CG-0339, August 2021.

### Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number
- power supply ratings

### 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.



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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