Certificate No:
TAA000032A

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Emission Monitoring System

with type designation(s)
ScrubberGuard

Issued to
SIGRIST - PHOTOMETER AG
Ennetbürgen, NW, Switzerland

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.

Temperature	**A**
Humidity	**B**
Vibration	**A**
EMC	**A**
Enclosure	**B**

Issued at **Hamburg** on **2022-06-28**
This Certificate is valid until **2027-05-30**.
DNV local station: **Augsburg**

Approval Engineer: **Jens Dietrich**

for **DNV**

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

ScrubberGuard: Monitoring of wash water for exhaust gas cleaning systems.
Compact unit with partly open enclosure.
Non-contact free-fall measurement of turbidity and PAH (polycyclic aromatic hydrocarbons)
Main components: OilGuard, AquaScat, pH sensor, temperature sensor, control unit, pumps and valves for wash water measurement control.

Turbidity measuring principle: 90° scattered light
Measuring range: 0 … 1000 FNU

Oil-in-water measuring principle: UV fluorescence
Phenanthrene equivalent measuring range: 0-1000 µg/l phenanthrene equivalent

pH and temperature measurement:
pH: Glas electrode Measuring range pH: 0…14 pH
Temperature: NTC 22 kΩ, Units:°C, K, °F; range: 0…130 °C

Operation and interfaces Display: 1/4 VGA, 3.5", operation: touchscreen
Control Digital interfaces: Ethernet, Modbus TCP, microSD card optional.

Power Supply: 220VAC, 60Hz; 230VAC, 50Hz.

SW-Version: V129.

Approval conditions

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

As long as the units are covered by the Type Approval, a product certificate according to Pt.4 Ch.9 Sec.1 [1.4] will not be required. Correct on-board configuration and integration into the exhaust gas cleaning system (EGCS) will still be subject to verification against the requirements of MEPC.259(68), MEPC.340(77), (e.g. point of sampling, minimum sample flow) for each delivery and is 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.

The system needs to be delivered with EMI protective measures as shown in the electrical drawing SCRUBBERGUARD-ES, index 6.

Since plastic piping is used for ScrubberGuard, remotely controlled valves must be provided at non-plastic parts of inlet and outlet lines to and from the ScrubberGuard (valves shall be controlled from outside space). This requirement is waived if ScrubberGuard will be installed in scrubber systems where the main pipes of the wash water are also made of plastic.

Tests carried out

Applicable tests based on DNV CG-0339, August 2021.
MEPC.259(68) / MEPC.340(77) Compliance Tests; Functional Performance test.

Marking of product

Manufacturer, Model name, Serial No., Manufacturing date, electric 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.

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