



Certificate No:
TAA000035H

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Miscellaneous Transmitter

with type designation(s)
TpH-D differential pH sensor.

Issued to

TriOS Mess- und Datentechnik GmbH
Rastede, 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.

Temperature	A
Humidity	B
Vibration	A
EMC	B
Enclosure	B (IP68)

Issued at **Hamburg** on **2022-06-24**

This Certificate is valid until **2027-06-09**.

for **DNV**

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

Approval Engineer: **Jens Dietrich**

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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.



Form code: TA 251

Revision: 2021-03

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Product description

Differential pH transmitter with temperature compensation
Measuring principle: Potentiometry
pH measuring range: 0...14pH
Resolution 0.01pH
Response times: T10 falling: <2s, T90 ascending: <2s, T90 falling <5s
Temperature compensation: Pt1000
Measurement interval: 2s
Housing material PPS/PET/NBR
Interface: RS485, Modbus RTU
Power supply: 12...24VDC (+/-10%).

The TpH-D differential pH sensor is generally in compliance with the requirements of Resolution MEPC.259(68) – “2015 Guidelines for exhaust gas cleaning systems”, Chapter 10.2 “Washwater monitoring” and Resolution MEPC.340(77) – “2021 Guidelines for exhaust gas cleaning systems”, Chapter 10.2 “Discharge water monitoring”

Application/Limitation

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV, 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 rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

The TpH-D differential pH sensor is generally in compliance with the requirements of Resolution MEPC.259(68) – “2015 Guidelines for exhaust gas cleaning systems”, Chapter 10.2 “Wash water monitoring” and Resolution MEPC.340(77) – “2021 Guidelines for exhaust gas cleaning systems”, Chapter 10.2 “Discharge water monitoring”.

Correct on-board configuration and integration into the wash water monitoring system will still be subject to verification against the requirements of MEPC.259(68) and MEPC.340(77) for each delivery and is to be tested during commissioning after installation. The TpH-D sensor shall be installed, operated and calibrated in accordance with the requirements and intervals as specified in the operating instructions.

The sensor needs to be connected to a monitoring unit providing:

- sufficient protection to potential surges to the TpH transmitter
- sufficient protection to superimposed conducted low frequencies to the TpH transmitter
- limited power supply variations, to be in the range of +/-10%.

Tests carried out

Applicable tests according to DNV CG-0339, 2021.

Tests according to the relevant parts of the referenced MEPC resolutions.

Marking of product

Manufacturer name, product type, serial number, interface, power supply, measurement range.

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