Certificate No:
TAA000030E

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Monitoring System

with type designation(s)
TDLS8000

Issued to
Yokogawa Electric Corporation
Tokyo, **Japan**

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.

Location classes:

Temperature	**B**
Humidity	**A**
Vibration	**A**
EMC	**A**
Enclosure	**B / IP65**

Issued at **Høvik** on **2021-06-22**
This Certificate is valid until **2026-06-21**.
DNV local station: **Yokohama**

Approval Engineer: **Frode Nygård**

for **DNV**

Marta Alonso Pontes
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 TDLS8000 Tunable Diode Laser Spectrometer is designed for real-time gas analysis of gas compounds components in combustion exhaust gas and process gas applications.

The TDLS8000 includes the following main units:
- Laser unit (LU)
- Sensor control unit (SCU)

The I/O Interface include communication using Analog, HART or Modbus Ethernet.

Place of manufacture
Yokogawa Manufacturing Corporation
2, Kominedai, Akiruno-city,
Tokyo, Japan

Yokogawa Corporation of America
2 Dart Road, Newnan, GA 30265,
Georgia, USA

Approval conditions
The Type Approval covers hardware listed under Product description.

For installation of the subject system onboard DNV classed vessels, the following project specific documentation of the actual application shall be submitted for information (I) in each case:

- (I) Reference to this Type Approval certificate
- (I) System block diagram (shall indicate the physical location of the components listed under product description).
- (I) Power supply arrangement (may be part of the System block diagram)

The TDLS8000 shall be installed, operated and calibrated in accordance with the requirements as specified in "TDLS8000 Tunable Diode Laser Spectrometer, User's Manual".

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.

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

Application/Limitation
This Type Approval certificate does not cover the gas sample lines.

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

Type Approval documentation

Tests carried out
Applicable tests according to class guideline DNVGL-CG-0339, December 2019.

Marking of product
The products to be marked with:
- manufacturer name
- product type
- serial number
- power supply ratings
- measurement range, as Suffix Code. See User's Manual

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