Certificate No:
TAA000034C

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Monitoring System

with type designation(s)
Fuel Gas Analyser, FGA

Issued to
Norsk Analyse AS
Barkåker, **Norway**

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.

Location classes:

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

Issued at **Høvik** on **2022-10-25**
This Certificate is valid until **2027-10-23**.
DNV local station: **East & South Norway CMC**

for **DNV**

Approval Engineer: **Frode Nygård**

Frederik Tore Elter
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

The Fuel Gas Analyser System, FGA, is designed to measure natural gas composition in hazardous areas, calculate calorific value (CV) and methane number. The intention of the gas monitoring system is to monitor the fuel blend (energy value), feeding the marine engine continuously.

The Fuel Gas Analyser system (FGA) comprises the following main units as required:

Analyser Cabinet with analyser module	Tunable T1000 Natural Gas Analyser [1]
Analyser Controller Cabinet with PLC	WAGO 750-8102 [2]
Recovery pump	
Manifolds with 8 solenoid valves	

[1] Hardware is covered by separate type approval certificate TAA00002Y9
[2] Hardware is covered by separate type approval certificate TAA00001J4

Software version at time of testing: V1.1

Measuring range: Methane: 0…100%
Ethane, Propane: 0…20%
Iso-Butane, N-Butane: 0…5%
C5 total: 0-2%
CO_2: 0…10%
Nitrogen: 0…100%

Communication Interface: Modbus TCP/IP (Optional RTU) to external customer monitoring systems.
Power supply: 230VAC 50/60Hz, 590W_{nom}

Place of manufacture

Norsk Analyse AB
Nyängsgatan 5, 663 43 Grums, Sweden

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.

As long as the units are covered by the Type Approval, a product certificate according to Pt.4 Ch.9 Sec.1 will not be required. Correct configuration and set up for each delivery to be tested during commissioning after installation.

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 for evaluation and approval.
Major changes in the software are to be approved before being installed in the computer.
Certification of Application Functions may be required for the particular vessel.

The Fuel Gas Analyser System shall be installed, operated and calibrated in accordance with the requirements and intervals as specified in *Installation Manual Fuel Gas Analyser*.

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 installations 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 DNV-CG-0339, August 2021.
Functional testing according to factory acceptance test procedure FAT

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.

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