



# TYPE APPROVAL CERTIFICATE

Certificate no.:  
**TAA00003CH**  
Revision No:  
**1**

## This is to certify:

that the **Gas Detectors for Exhaust Gas Emissions**

with type designation(s)  
**G7200 Multi Gas Monitoring System**

issued to  
**Green Instruments A/S**  
**Brønderslev, Nordjylland, Denmark**

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	A
Humidity	B
Vibration	A
EMC	A
Enclosure	B / IP54

Issued at **Høvik** on **2023-12-21**

This Certificate is valid until **2028-12-14**.

for **DNV**

DNV local unit: **Denmark CMC**

Approval Engineer: **Frode Nygård**

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: 2023-09

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## Product description

The G7200 is a Multi Gas Monitoring System (MGMS) for the maritime market. The product measures SO<sub>2</sub>, CO<sub>2</sub>, NO<sub>2</sub>, NO, CH<sub>4</sub>, H<sub>2</sub>O and other relevant gasses. The gas analyzer is based on both non-dispersive infrared (NDIR) principle and non-dispersive Ultraviolet (NDUV) principle.

The G7200 MGMS can be used as a Continuous Gas Monitoring System for the SO<sub>2</sub> and CO<sub>2</sub> concentrations in exhaust gas according to the requirements in Appendix 3 of the NOx Technical Code 2008 and the requirements in MEPC. 340(77) – 2021 Guidelines for exhaust gas cleaning systems.

Supported gases and default range:	Accuracy (when calibrated):	Gas analyzer modules
SO <sub>2</sub> 0 - 200[ppm] or 0-300 [ppm] *	±2% of reading or ≤0.3% of full-scale	G7010 or G7230
CO <sub>2</sub> 0 - 10[vol.-%] or 0-20[vol.-%] *	±2% of reading or ≤0.3% of full-scale	G7010 or G7230
NO <sub>2</sub> 0 - 100[ppm] *	±2% of reading or ≤0.3% of full-scale	G7230
NO 0 - 1000[ppm] *	±2% of reading or ≤0.3% of full-scale	G7210
CH <sub>4</sub> 0 - 5000[ppm] *	±2% of reading or ≤0.3% of full-scale	G7210
H <sub>2</sub> O 0 - 20000[ppm] *	±2% of reading or ≤0.3% of full-scale	G7210

\* Other ranges available upon request

The system can be configured of the following main components:

Probes with heated hoses:

- 2 gas sampling probes
- Sample flow: 0.33-1.67 l/min

HMI, PLC Cabinet:

- Enclosure: IP54
- Power Supply: 230V AC 50/60 Hz
- Communication: Modbus TCP/IP (RJ45) Optional Modbus RTU
- Initial Software version: 0.8.0

Analyzer modules:

- G7010 (SO<sub>2</sub>, CO<sub>2</sub>) - NDIR
- G7210 (NO, CH<sub>4</sub>, H<sub>2</sub>O) - NDIR
- G7230 (CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>2</sub>) - NDIR + NDUV

## Approval conditions

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.

## Application/Limitation

When the G7200 is used in installations intended to comply with requirements for SO<sub>2</sub> and CO<sub>2</sub> emission ratio specified in Chapter 6 of MEPC.340(77) - (adopted on 26 November 2021) "2021 Guidelines for Exhaust Gas Cleaning Systems" the following requirements are to be met as well as relevant requirements of Revised MARPOL Annex VI and NOx Technical Code 2008. See also DNV Statement of Compliance Certificate No.:30652-15 HH.

- Principle of detection MEPC.340(77), 6.2
- Accuracy NTC 2008; Appendix III, 1.6
- Precision NTC 2008; Appendix III, 1.7
- Noise NTC 2008; Appendix III, 1.8
- Zero and span drift NTC 2008; Appendix III, 1.9/1.10
- Calibration curve NTC 2008; Appendix IV, 5.5.1

The G7200 shall be installed, calibrated and operated in compliance with the manufacturer's instructions and in accordance with the requirements of DNV Pt.4 Ch.6 and in accordance of the NOx Technical Code 2008, Chapter 5 and associated appendices.

The operating ambient temperature should be 0 – 55°C for the system and the exhaust gas temperature max. 500°C at the probe. (Dew point ≤60°C).

## Type Approval documentation

### Tests carried out

Applicable tests according to class guideline DNV-CG-0339, August 2021.  
Performance Tests for TA.

### 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