Confirmation of Product Type Approval

Company Name: GREEN INSTRUMENTS A/S

Address: ERHVERVSPARKEN 29 DK-9700 BROENDERSLEV Denmark

Product: Exhaust Gas Measuring and Monitoring Device

Model(s): G7200 Multi Gas Monitoring System

Endorsements:

Certificate Type	Certificate Number	Issue Date	Expiry Date
Product Design Assessment (PDA)	23-2445633-PDA	04-OCT-2023	03-OCT-2028
Manufacturing Assessment (MA)	20-4468965	06-OCT-2020	02-NOV-2025
Product Quality Assurance (PQA)	NA	NA	NA

Tier
3 - Type Approved, unit certification not required

Intended Service
Emissions measuring device for Exhaust Gasses

Description
Monitoring of CO2, SO2, NO2, NO, CH4, CO, N2O, HC, H2O and other relevant gasses

Ratings
Power Supply: 230 VAC - 50/60 Hz

Material/Enclosure: Painted mild steel RAL 7035/IP55

Measuring range:

- CO2: 0 - 10 % or 0 - 20%

- SO2: 0 - 200 ppm or 0 - 300 ppm

- NO2 0 - 100 ppm

- NO: 0 - 1000 ppm

- CH4: 0 - 5000 ppm

- H2O: 0 - 20000 ppm

- Other ranges upon request

Service Restrictions
- Unit Certification is not required for this product.

- If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

Comments
1. The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

2. Each particular application and installation is to be specifically approved in conjunction with the relevant system. Equipment is not to be installed in weather exposed areas.

3. Compliance with ABS Guide for Exhaust Emission Abatement has not been reviewed.

4. The measurement principles of analyzers are to be in accordance with Sec. 7 of MEPC.340(77).

5. Analyzer performance should be in accordance with the requirements of sections 1.6 to 1.10 of appendix III of the NOX Technical Code 2008.

6. Installations are to be in accordance with the manufacturer’s instruction.

7. Where this system is installed on the vessel with EEMS Notation requested, the following documents are to be submitted in accordance with 6-3-5/3 of the Marine Vessels Rules.

(1) Details of the exhaust emission sampling and piping systems, including details of probes, pre-filters, heated lines, air supply arrangements, pure and calibration gas lines, design pressures, temperatures, materials, and insulation.

(2) Descriptions and schematic diagrams for the control and monitoring systems, including set points for abnormal conditions and details of the location and position at which exhaust emissions monitoring probes are to be located.

(3) Details of all electrical equipment installed for the EEMS equipment and associated systems.

(4) Schematic diagrams and operational descriptions of the exhaust emission monitoring equipment and associated systems power supply arrangements.

(5) Electrical one line diagrams depicting type, size, and protection of electrical cables used in the EEMS control and monitoring equipment.

(6) Operating and maintenance instruction manuals.

(7) Testing procedures during installation and commissioning trials.

8. Following minimum requirements of Exhaust Emission Monitoring Systems are to be complied.

(1) Due consideration is to be given to the safety implications related to the handling and proximity of exhaust gases, the measurement equipment, and the storage and use of pressurized pure and calibration gases. Such implications are to be documented in the operation and maintenance manuals and suitable warning notices positioned at the sample points and measurement equipment in accordance with 6-3-5/9.1 i) of the Marine Vessels Rules.

(2) Hot surfaces of pre-filters or heated lines likely to make contact with the crew during operation are to be suitably guarded or insulated. Where the surface temperatures are likely to exceed 220°C (428°F) and where any leakage, under pressure or otherwise, of fuel oil, lubricating oil or other flammable liquid is likely to make contact with the sampling components or exhaust pipes, these surfaces are to be suitably insulated with noncombustible materials that are impervious to such liquids. Insulation material not impervious to oil is to be encased in sheet metal cladding or an equivalent impervious sheath in accordance with 6-3-5/9.5 iii) of the Marine Vessels Rules.

9. This system is Computer-based System Category II of 4-9-3 of the Marine Vessels Rules.

Notes, Drawings and Documentation
(1) Drawing No. 11296 Rev.0, P&ID - G7200 Multi Gas Monitoring System,

(2) Drawing No. 11350 Rev.0, G7200 - Electrical Documentation - Multi Gas Monitoring System,

(3) Drawing No. 11703 Rev.0, G7200 - Installation Layout 1 & 2 Stacks Multi Gas Monitoring System,

(4) Drawing No. 11891 Rev.0, G7200 - Component Overview - 2 Stacks Multi Gas Monitoring System,

(5) Drawing No. 11950 Rev.0, G7200 - Component Overview - 1 Stack Multi Gas Monitoring System,

(6) Drawing No. 11956 Rev.0, G7200 - Arrangement Drawing Multi Gas Monitoring System,

(7) Drawing No. 104677, Multi Gas Monitoring System User Manual,

(8) Drawing No. P23-0082-1, Test Report of G7200-Exhaust Gas Monitoring System dated 9 Aug. 2023 issued by EKTOS Testing & Reliability Services A/S,

(9) Drawing Title: G7200 Multi Gas Monitoring System, Test Plan - Environmental test, dated 14 March 2023,

(10) Drawing Title: G7200 IP Rating Assessment

(11) Drawing Title: G7200 Multi Gas Monitoring System, System description,

(12) Drawing Title: G7200 Multi Gas Monitoring System, Test Plan - Performance Test

(13) Drawing Title: G7200 Multi Gas Monitoring System, Test Report - Performance Test, dated 4 May 2023,

(14) Drawing Title: S152402 Software Quality Assurance Plan,

(15) Certificate No.DK015773 Certificate of ISO9001:2015,

(16) Drawing Title: List of approved electronic components G7200 Multi Gas Monitoring System,

(17) Drawing Title: Production Control Plan,

(18) Drawing No. 7P05581, Vibration test on Sample Probe 03101, dated 23 Aug. 2017, issued by RISE Research Institutes of Sweden AB.

Term of Validity
This Product Design Assessment (PDA) Certificate remains valid until 03/Oct/2028 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

ABS Rules
2023 Marine Vessels Rules 1-1-4/7.7, 1-1/Appendix 3 & 4, 4-8-3/Table 2, 4-9-9/Table 1 & Table 2, 6-3-5/9.3 iv) & 6-3-5/9.5 ii)

2023 Mobile Offshore Units Rules 1-1-4/9.7 and 1-1/Appendix 2 & 3, 4-3-1/Table 2

2023 Facilities on Offshore Installations 1-1-4/9.7, 1-1/Appendix 2 & 3

International Standards
NA

EU-MED Standards
NA

National Standards
NA

Government Standards
NA

Other Standards
IACS UR E10 (Rev.8)

MEPC.340(77) Appendix 3 of NOx Technical Code 2008

Corporate ABS Programs
American Bureau of Shipping
Print Date and Time: 11-Oct-2023 3:39

ABS has used due diligence in the preparation of this certificate, and it represents the information on the product in the ABS Records as of the date and time the certificate is printed.

If the Rules and/or standards used in the PDA evaluation are revised or if there is a design modification (whichever occurs first), a PDA revalidation may be necessary.

The continued validity of the MA is dependent on completion of satisfactory audits as required by the ABS Rules. The validity of both PDA and MA entitles the product to receive a **Confirmation of Product Type Approval**.

Acceptance of product is limited to the “Intended Service” details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or prior to the effective date of the ABS Rules and standards applied at the time of PDA issuance. ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. The manufacturer is responsible to maintain compliance with all specifications applicable to the product design assessment. Unless specifically indicated in the description of the product, certification under type approval does not waive requirements for witnessed inspection or additional survey for product use on a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.