



Marine &amp; Offshore

Certificate number: 53926/A0 BV

File number: AP4789

Product code: 3926H

*This certificate is not valid when presented without the full attached schedule composed of 7 sections*

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## TYPE APPROVAL CERTIFICATE

*This certificate is issued to*

**Green Instruments A/S**

Brønderslev - DENMARK

*for the type of product*

**EXHAUST GAS MONITORING AND RECORDING DEVICE**

G7000 Multigas Monitoring System.

**Requirements:**

Bureau Veritas Rules for the Classification of Steel Ships.

IMO Res. MEPC.259(68) - 2015 Guidelines for exhaust gas cleaning systems.

Appendix 3 of the NOx Technical Code 2008.

EC Code: 31

*This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.*

**This certificate will expire on: 21 Aug 2023**

**For Bureau Veritas Marine & Offshore,**

At BV FREDERICIA, on 21 Aug 2018,

Jesper Jensen



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site [www.veristar.com](http://www.veristar.com). Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

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BV Mod. Ad.E 530 June 2017

This certificate consists of 3 page(s)

## THE SCHEDULE OF APPROVAL

### **1. PRODUCT DESCRIPTION :**

- Product model or type designation :  
**G7000 Multigas Monitoring System.**

-Product description:

The G7000 is a continuous emission monitoring system. The modular design of the system makes it possible to monitor different gases according to customer specification. It provides an accurate measurement of SO<sub>2</sub> in ppm, CO<sub>2</sub> in percent as well as presents the SO<sub>2</sub>/CO<sub>2</sub> ratio.

#### **1.1 - Technical Specifications:**

Multigas Monitoring System (CEMS)	<ul style="list-style-type: none"> <li>• Multigas analyzer, multiplexer, gas cooler(s), gas pump(s), condensate pump(s), air conditioner, HMI, PLC.</li> <li>• Optional: in case of gas hose lengths &gt;12m. - hose extension module.</li> <li>• External Communication: Modbus TCP/IP (terminals).</li> </ul>
Gas Analyzer	<ul style="list-style-type: none"> <li>• SO<sub>2</sub>: 0 - 200 ppm; optional 0 -1000 ppm.</li> <li>• CO<sub>2</sub>: 0 - 10 %; optional : 0 - 25%.</li> </ul>
Sample Probes	<ul style="list-style-type: none"> <li>• Number of probes : Up to 5, refer to Installation Layout.</li> </ul>

#### **1.2 - Rating:**

Power Supply	230VAC Nominal 50/60 Hz.
Enclosure Rating	IP 55 (Analyser Cabinet).
Primary gases	SO <sub>2</sub> , CO <sub>2</sub> .

### **2. DOCUMENTS AND DRAWINGS :**

- G7000 Multigas Monitoring System Operation Manual, Version 1.3, dated MAY/2018.
- G7000 Multigas Monitoring System Installation Manual, Version 1.1, dated SEP/2017.
- G7000 Multigas Monitoring System - Product Type Approval - Brief description, Version 1.1, dated MAY/2018.
- Drawing Package\_G7000 Multigas Monitoring System:
  - 03069\_ED\_D, Electrical Documentation Product No. 03069, Rev. D, dated 28/04/2016;
  - 05292\_C, G7000 - Main Component Overview, Rev. C, dated 10/05/2017;
  - 05285\_F, G7000 - Installation Layout, Rev. F, dated 10/05/2017;
  - 05380\_A, G7000 - P&ID, Rev. A, dated 11/11/2016;
  - 05907\_A, G7000 - Multigas Probe - Component Overview, Rev. A, dated 15/06/2017;
  - 05577\_B, G7000 - Flange Socket f. Probe, Rev. B, dated 03/02/2017;
  - 05980\_B, G7000 - Installation Layout - Heated Hose, Rev. B, dated 15/06/2017;
  - 05910, G7000 - Installation Layout - Multigas Probe, Rev. - , dated 15/06/2017;
- STRANDMOLLEN A/S manufactures and distributes industrial gases:
  - Certificate for LABLINE Nitrogen 5.0, Batch Nr. 37734, Bottle Nr. 1862, issued on 30/05/2017.
  - Certificate Nr. 551011902S for LABLINE 10% CO<sub>2</sub> in N<sub>2</sub>, issued on 28/07/2017.
  - Messer Schweiz AG - Certificate Nr. 20173183 for LABLINE 10% SO<sub>2</sub> in N<sub>2</sub>, issued on 08/08/2017.
  - Messer Schweiz AG - Certificate Nr. 20173184 for LABLINE 20% SO<sub>2</sub> in N<sub>2</sub>, issued on 08/08/2017.
  - Certificate Nr. 551011973S for LABLINE 3% CO<sub>2</sub> in N<sub>2</sub>, issued on 28/07/2017.

### **3. TEST REPORTS :**

#### **Delta:**

- Test report No.: DANAK-19/18237, dated 22/08/2017.

#### **RISE Research Institutes of Sweden AB:**

- Vibration test Report on Sample Probe 03101, dated 23/08/2017.

#### **SP Technical Research Institute of Sweden, Electronics - Product Safety:**

- Clasification of degree of protection provided by enclose - Test report, dated 08/07/2011.

#### **AUCOTEAM:**

- Test report - No. 8312/11 - Tests for the certification of the degrees of protection IP54, dated 15/02/2011.

#### **Green Instruments A/S:**

- Performance Test Report 1, TP v2.2, dated 06/09/2017.
- Performance Test Report 2, Version 1.0, dated 11/12/2017.

#### **ABB Automation GmbH;**

- ABB Analyser Uras26 Performance Test Report, Report TP/Uras26/MEPC-EN Rev.A, dated 27/11/2015.

**4. APPLICATION / LIMITATION :**

4.1 - BUREAU VERITAS Rules and Regulations for the Classification of Steel Ships.

4.2 - Approval valid for ships intended to be granted with the following additional class notations: **AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS.**

4.3 - BUREAU VERITAS Environmental Category, **EC Code: 31**

4.4 - Use of the Exhaust Emissions Monitoring System must be included in the engine's technical file and detailed in the ship's on-board monitoring manual, which must be approved by the Administration.

4.5 - The Gas analysers must be operated and calibrated in accordance with the manufacturer's recommendations.

4.6 - The Exhaust Emissions Monitoring System must satisfy the accuracy and calibration requirement specified in the NOx Technical Code and MEPC Resolutions.MEPC.259(68).

**5. PRODUCTION SURVEY REQUIREMENTS:**

5.1 - The above products are to be supplied by **Green Instruments A/S** in compliance with the type described in this certificate.

5.2 - This type of product is within the category HBV of Bureau Veritas Rule Note NR320 and as such does not require a BV product certificate.

5.3 - **Green Instruments A/S** has to make the necessary arrangements to have its works recognised by Bureau Veritas in compliance with the requirements of NR320 for HBV products.

5.4 - For information, **Green Instruments A/S** has declared to Bureau Veritas the following production site:

**Green Instruments A/S**  
**Erhvervsparken 29**  
**9700 Brønderslev**  
**DENMARK**

**6. MARKING OF PRODUCT:**

- Maker's name or trade mark.

- Serial number of the units.

- Equipment type number or model identification under which it was type-tested.

**7. OTHERS:**

It is **Green Instruments A/S**'s responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.

\*\*\* END OF CERTIFICATE \*\*\*