

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Monitoring System**

with type designation(s)
G6100 Water Monitoring System

Issued to
Green Instruments A/S
Brønderslev, Denmark

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 GL.

Location classes:

Temperature	A
Humidity	B
Vibration	A
EMC	A
Enclosure	IP54

Issued at **Høvik** on **2017-05-19**

This Certificate is valid until **2018-12-31**.

DNV GL local station: **Aalborg**

Approval Engineer: **Thorbjørn Hansen**

for **DNV GL**

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Odd Magne Nesvåg
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 G6100 Water Monitoring System is a continuous in situ water monitoring system. As a standard configuration the system monitors PAH, turbidity, pH and temperature.

A system can consist of or be configured with extra measuring modules for G6110 PAH, G6120 Turbidity and G6130 pH/Temperature. An optional sampling system (not covered by this TA certificate) can be necessary depending on the location of the Water Monitoring System (WM).

The G6100 Water Monitoring System communicates typically with an Exhaust Gas Cleaning System (not covered by this Type Approval Certificate) on a fixed communication protocol (ref. document "Main Cabinet, Installation manual", document no. 02481).

Water Monitoring System (WM)			
Cabinet WM: Eldon, MAS Enclosure: IP66			
Controller and I/O: WAGO/ 750-xxx series. Current DNV TAC A-14093 Controller application SW: PLC_V.2.0.2_WMXX			
Display: EXOR UniOP e TOP 500 series. Current DNV TAC A-13304 HMI application SW: HMI_V.2.0.2_WMXX			
Power supply: Mean Well/ SDR-120-24.			
Sensor module	G6110 PAH	G6120 Turbidity	G6130 pH and temperature
Brand/Type	TriOS/ enviroFlu-HC	ABB/ 4690 series	MJK/ pHix Compact
Measuring technique	UV Fluorescence	Nephelometry	Glass electrode
Range	0-5000 ppb Configurable	0-400 NTU/FNU Configurable	0 – 14 pH units
Accuracy	+/- 5 % of range	+/- 3 % of FS	+/- 2 % of FS Fully temperature compensated

Table 1: G6100 Water Monitoring System (WM).

Place of manufacture

Green Instruments A/S
Erhvervsparken 29
9700 Brønderslev
Denmark

Job Id: **262.1-017769-2**
Certificate No: **TAA0000178**

Application/Limitation

The G6100 Water Monitoring System is generally in compliance with the requirements of Resolution MEPC.259(68) - 2015 Guidelines for exhaust gas cleaning adopted on 15. May 2015, Chapter 10 "Washwater".

In order to completely fulfil the requirements of MEPC.259(68) for "washwater monitoring" additional equipment (e.g. data recording) will have to be installed.

DNV-GL shall be notified in writing whenever the G6100 Water Monitoring System is installed in a DNV GL classed vessel. A reference to this Type Approval Certificate shall be included.

This Type Approval Certificate covers hardware and software as listed under Product Description.

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

The system cabinets shall be mounted on vibration dampers according to the manufacturers instruction.

Installation to be made in accordance with maker's specifications. The maximum allowable sample line distance to be observed (ref. document "Main Cabinet, Installation manual", document no. 02481).

Type Approval documentation

Tests carried out

Applicable tests according to Standard for Certification No. 2.4, April 2006.

Performance tests according to "Test Plan, G6100 Water Monitoring System, performance tests", Version 2.2 – December 2014.

Marking of product

G6100 Water Monitoring System

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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 at least every second year and at renewal of this certificate.

END OF CERTIFICATE