

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Gas Detector

with type designation(s)

G36 Oxygen Analyzer (standalone), G36p Oxygen Analyzer (panel mounted)

Issued to

**Green Instruments A/S
Brønderslev, Nordjylland, 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:

Type	Temp.	Humidity	Vibration	EMC	Enclosure
G36 Oxygen Analyzer (standalone)	A	B	A	B (*3)	C (*1)
G36p Oxygen Analyzer (panel mounted)	B	B	A	B (*3)	B (*2)

(*1-3) See Application/Limitation

Issued at **Høvik** on **2018-01-12**

for **DNV GL**

This Certificate is valid until **2022-12-31**.

DNV GL local station: **Aalborg**

Approval Engineer: **Nils Jarem**

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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 G36/G36p Oxygen Analyzer is designed to measure (by inertization) the content of oxygen with concentration from 0% up to 21.0%.

The G36/G36p Oxygen Analyzer can be used to measure the content of oxygen in stack gas or in the nitrogen or flue gas based inert gas, and continuous monitoring of oxygen level in the atmosphere in engine room compartments or room for inert gas systems or accommodation area.

G36 is a standalone version, while G36p is a version prepared to be front panel mounted.

Software version: 2.

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, 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 GL rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Software control

All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV GL for evaluation and approval before implemented on board. Certification of modified functionality may be required for the particular vessel.

Application/Limitation

The analyzer shall be installed in safe area, and in area with no high concentration of methane.

Additional information describing the notes given to the location classes on the front page:

(*1) G36 is IP67 acc. to 03/YMA304022 from TÜV NORD CERT (not verified by DNV GL).

(*2) G36p is tested to be IP55.

(*3) The connection cables for the main supply, relays, interface and analog output signals should be shielded or provide equivalent protection.

Type Approval documentation

- Performance Test Report G36/G36p , Green Instruments May 2009
- Environmental Test Report No.2008-2631, Danfoss 2008-09-10
- EMC Test Report No.2008-08-22-G1, Jens-EMC 2008-10-22
- Environmental Test Report No.200901677, Danfoss 2009-06-02/03/04
- EMC Test Report No.2009-05-18, Jens-EMC 2009-06-27

- Performance Test Report G36 Oxygen Analyzer , Ver.2.0, June 2013
- Manual Oxygen Analyzer G36, No. 01245, Rev.2.1x, July 2013
- Manual Oxygen Analyzer G36p, No. 01381, Rev.2.1x, July 2013
- G36 Oxygen Analyzer Specification, Ver.1 June 2009
- G36p Oxygen Analyzer Specification, Ver.1 June 2009.

- Marine tests of G36 and G36p, Report No. P17-0136 dated 2017-12-28
- Review of IEC 60092-504:2016 & IEC 60533:2015 in relation to the G36 and G36p Type Approvals dated Sep. 2017.

Type approval renewal assessment report for A-13295, DNV GL Aalborg 2018-01-05.

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, November 2016.

EN 60945: 2002 including IEC 60945 Corrigendum 1 (2008)

IEC 60092-504: 2016

IEC 60533: 2015

EN 50104:2010 (safe area)

Job Id: **262.1-007967-4**
Certificate No: **TAA00001KG**

Marking of product

Type designation according to Product description above.

In addition also marked with part-ID, power supply, consumption and serial number

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