



Confirmation of Product Type Approval

Company Name: GREEN INSTRUMENTS A/S

Address: ERHVERVSPARKEN 29 Denmark

Product: Optical Smoke Detector

Model(s): G16 Smoke Density Monitor, G16.1 Opacity Transceiver, G16 Ex Opacity Transceiver

Endorsements:

| Certificate Type | Certificate Number | Issue Date | Expiry Date |
|---------------------------------|---------------------------|-------------------|--------------------|
| Product Design Assessment (PDA) | 22-2255723-PDA | 27-MAY-2022 | 26-MAY-2027 |
| 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

ABS Classed Vessels and Offshore Installations in accordance with the listed ABS Rules and International Standards.

Description

The G16 Smoke Density Monitor is designed for continuous emission monitoring in smokestacks and exhaust gas ducts on land and marine based installation. The system is used to determine smoke and dust emission after diesel engines, boilers and incinerators in order to provide precise combustion data for legal and economical sound operation.

Ratings

Input Power: 24VDC, 2A (optional 100-240VAC, 50/60Hz, 1.4A)

Ambient Temp: 0C - +55C

- G16 Smoke Density Monitor & G16.1 Opacity Transceiver

Ingress Protection: IP 66

Housing: Aluminum

- G16 Ex Opacity Transceiver

Ingress Protection: IP 54

Housing: AISI 316

Ex rating: Ex ib, op is IIB T4 Gb / Ex ib op is IIIB T135# Db

Service Restrictions

1. Unit Certification is not required for the product or products covered in this certificate. 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.
2. Unit certification in accordance with MVR 4-9-3/9.5 Table 2 and MVR 4-9-9/15.7 Table 2 is required by the user to use this equipment, where this equipment is part of Category II or III computer-based systems as described in MVR 4-9-3/7.1 Table 1.
3. Certified components G16 Ex Opacity Transceiver are to be used with components according to these specific conditions and the schedule of limitations associated with the components, this certification with suffix "X" can be considered a full Ex certification.
4. G16 Smoke Density Monitor and G16.1 Opacity Transceiver are not intended to be installed in hazardous area.
5. G16 Ex Opacity Transceiver is intended to be installed in hazardous area.
6. G16 product is not intended for fire detection system applications.

Comments

1. The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.
2. This approval is limited to the hardware only. Each particular application/installation and the used application software is to be specifically approved in conjunction with the relevant system in which the units are being used in accordance with MVR 4-9-3 and other application specific requirements.

Notes, Drawings and Documentation

Drawing No. 00014, WELDING SOCKET, Revision: 0, Pages: 1

Drawing No. 02825, ALIGNMENT BRACKET, Revision: 0, Pages: 1

Drawing No. 02860, TRANSCEIVER HOUSE, Revision: 0, Pages: 1

Drawing No. 02879 G16 02880 G26, G16 SMOKE DENSITY MONITOR. G26 AMBIENT OIL MIST DETECTOR, Revision: 2, Pages: 1

Drawing No. 02893, ENCLOSURE FOR JUNCTION BOX, Revision: 0, Pages: 1

Drawing No. 02894, CONTROL AND MONITORING UNIT, Revision: 0, Pages: 1

Drawing No. About our application v1, PRODUCT TYPE APPROVAL BRIEF DESCRIPTION, Revision: 0, Pages:1

Drawing No. Certificate - ISO9001-2016, CERTIFICATTION, Revision: 0, Pages: 1

Drawing No. DNV GL TA for G16 and G26 public, TYPE APPROVAL CERTIFICATE, Revision: 0, Pages: 1

Drawing No. Environmental Test report 6P02723-1, ENVIRONMENTAL TEST REPORT, 07-14-2016, Revision: 0, Pages: 1

Drawing No. G16 Instruction Manual, G16 INSTRUCTION MANUAL, Revision: 0, Pages: 1

Drawing No. G16-G26, G16/G26 SW DESCRIPTION, Revision: 0, Pages: 1

Drawing No. Performance Test Report for G16-G26 - with DNV GL approval, PERFORMANCE TEST REPORT FOR G16-G26, 01-December-2016, Revision: 0, Pages: 1

Drawing No. Performance Test result table 1 and 2, PERFORMANCE TEST RESULT TABLE 1, Revision: 0, December 2016, Pages: 1

EKTOS Testing & Reliability Services A/S Report No. P21-0048, Supplementary Test Report of Transceiver Type G16/G26 Ambient Oil Mist Detector dated 12-05-2022, Revision: 0, Pages: 32

EKTOS Testing & Reliability Services A/S Report No. P20-0201-1, Vibration Test of Opacity Transceiver Type G16.1/G26.1 dated 28-04-2021, Revision: 1, Pages: 13

EKTOS Testing & Reliability Services A/S Report No. P21-0036, Vibration Test of G26 Accessories to EX Opacity Transceiver dated 28-04-2021, Revision: 1, Pages: 10

EKTOS Testing & Reliability Services A/S Report No. P20-0201-3, Type approval test of opacity transceiver dated 28-04-2021, Revision: 1, Pages: 64

Drawing No. 02891, G16 Smoke Density Monitor Manual, Revision: 1, Pages: 46

Drawing No. 06772, Type G16/G26 Ex Opacity Transceiver, Revision: G, Pages: 1

Drawing No. CNEX21.0001X, EX Opacity Transceiver Type G16/G26 - IECEx Certificate, Revision: 0, Pages: 5

Drawing No. DTI17ATEX0079X, EX Opacity Transceiver Type G16/G26 -ATEX Certificate, Revision: 0, Pages: 4

Drawing No. Doc 8 - 2022, GI IP Class assesment for the opacity Transceievr Type G16.1/G26.1 & the Ex OPacity Transceievr type G16/G26, Revision: 1, Pages: 9

Drawing No. EXVeritas , 21PQAN0149, Revision: 0, Pages: 2

Drawing No. G16.1/G26.1 Performance Test Report, G16.1/G26.1 Performance Test Report, Revision: 0, Pages: 20

Drawing No. HB-10308-09, Type G16.1/G26.1 Opacity Transceiver, Revision: A, Pages: 1

Drawing No. NA, This document: About the modification of product type approval Opacity Monitor Type G16/G26., Revision: 1, Pages: 14

Term of Validity

This Product Design Assessment (PDA) Certificate remains valid until 26/May/2027 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

2022 Rules for Conditions of Classification 1-1-4/7.7, 1-1-A3 and A4, which covers the following:

2022 Rules for Building and Classing Marine Vessel Rules (MVR): 4-1-1/7.15, 4-9-9/3, 4-9-9/7, 4-9-9/13, 4-9-9/Table 1 and 4-9-9/Table 2

2022 Rules for Building and Classing Steel Barges: 4-1-3/5.7

2022 Rules for Conditions of Classification - Light and High Speed Craft 1-1-4/11.9, 1-1-A2 and A3, which covers the following:

2022 Rules for Building and Classing High Speed Crafts: 4-1-1/37, 4-6-1/9, 4-6-1/11, 4-6-1/15, 4-6-1/17, 4-7-9/15, 4-7-9/ Table 9 and 4-7-9/ Table 10.

2022 Rules for Conditions of Classification - Offshore Units and Structures 1-1-4/9.7, 1-1-A2 and A3, which covers the following:

2022 Rules for Building and Classing Mobile Offshore Units: 6-1-1/9, 6-1-1/13; 4-1-1/7.9, 4-3-1/9, 4-3-1/11, 4-3-1/15, 4-3-1/17

International Standards

IACS UR E10, Rev.8:2021 Test specification for type approval

ASTM D6216-20: 2020 Standard Practice for Opacity Monitor Manufacturers to Certify Conformance with Design and Performance Specifications

EU-MED Standards

NA

National Standards

NA

Government Standards

NA

Other Standards

NA



A handwritten signature in black ink, appearing to read 'James W. ...', is positioned above the printed name and title.

Corporate ABS Programs
American Bureau of Shipping
Print Date and Time: 24-Jun-2022 4:31

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.