DNV·GL

Certificate No:
TAP00001H2

TYPE APPROVAL CERTIFICATE

This is to certify:

That the 5 ppm Bilge Alarm

with type designation(s)
TD-107 5.0

Issued to
Benchmark International Inc.
Edmonton, AB, Canada

is found to comply with
DNV GL class programme DNVGL-CP-0485 – Type approval – 5 ppm bilge alarms

Application :

This Type Approval covers system design and prototype testing of 5 ppm Bilge Alarms as required by Type Approval Programme DNVGL-CP-0485.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

5ppm Bilge Alarms are required on vessels with DNV GL Class Notation CLEAN DESIGN.

Issued at **Høvik** on **2018-07-01**
This Certificate is valid until **2023-06-30**.
DNV GL local station: **Vancouver**

Approval Engineer: **Thomas Grafton**

for **DNV GL**

Dag Sæle-Nilsen
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.

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Product description

The TD-107 $^{5.0}$ Bilge Alarm by Benchmark International Inc. is intended for installation on-board ships for monitoring the oil content of bilge water. The unit monitors the effluent from an approved Bilge Water Separator and sends an alarm signal that facilitates the activation of discharge control devices that divert bilge water from overboard to bilge tank(s) when the oil content exceeds 5ppm.

The TD-107 $^{5.0}$ uses fluorometry in combination with a proprietary flow cell to achieve highly accurate oil content measurements.

The 5ppm Bilge Alarm is designed and tested to meet the requirements of the DNV Type approval program DNVGL-CP-0485.

The TD-107 $^{5.0}$ 5ppm Bilge Alarm was previously manufactured by Turner Hydrocarbon Instruments Inc. Benchmark International Inc. has merged with Turner Hydrocarbon Instruments Inc. and Benchmark International Inc. has taken over responsibility for production and certification.

Application/Limitation

The bilge alarm is fitted with a flow status sensor that will detect if the connected Oily Water Separator is functioning. A "Zero Signal Alarm" will be triggered if the measured oil concentration is approximately 0 ppm. This signal alarm shall be connected to the automatic stopping device preventing overboard discharge. This will detect the "no flow of sample" and "cleaning water" conditions that are required to be verified during installation (see below).

The equipment is not permitted to be installed in spaces subject to explosion hazards.

The following shall be verified during installation :

- The alarm is always activated whenever clean water is used for cleaning or zeroing purposes.
- The alarm is always activated whenever no flow of sample through alarm is detected by the flow sensor.
- Any alarm will activate the automatic stopping device preventing overboard discharge and lead to recirculation.
- The overall response time (including the response time of the alarm) between the effluent discharge exceeding 5 ppm oil and the operation of the automatic stopping device preventing overboard discharge is not more than 20 seconds.
- By-passing the alarm during normal operation shall by no means be possible
- Every access of the alarm (beyond check on instrument drift, repeatability of the instrument reading, and the ability to re-zero the instrument) requires the breaking of a seal.

Type Approval documentation

Tests carried out

The equipment is tested in accordance with the requirements of the Type approval program DNVGL-CP-0485.

Marking of product

The final product shall be provided with permanent visible marking, which completely identifies the product and its components according to drawings/equipment specification.

The marking shall give at least the following information:

- Identification of the manufacturer
- Equipment type designation or model identification
- Serial number
- Revision information, as applicable, for all firmware or software modules installed per hardware unit, necessary to identify the equipment

Periodical assessment

Retention survey to be performed according to Type approval program DNVGL-CP-0338:

- This certificate is valid for five years and periodical assessments will be required after 2 years (+/- 90 days) and 3.5 years (+/- 90 days).

--This certificate replaces previous certificate P-14592 which had reached the end of its validity period--

APPENDIX

Test data and results of tests conducted on a 5 ppm Bilge Alarm in accordance with DNVGL-CP-0485.

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