

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MEDB00006MV
Revision No:
2

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV AS under the authority of the Government of Norway.

This is to certify:

That the Oil-content meters

with type designation(s)
15ppm Bilge Alarm, Type BilgMon 488

Issued to

Brannstrom Sweden AB
GOTHENBURG, Sweden

is found to comply with the requirements in the following Regulations/Standards:

Regulation (EU) 2020/1170,
item No. MED/2.3. Marpol 73/78 as amended, Annex I Regulation 14, IMO Res. MEPC.107(49), IMO
MEPC.1/Circ. 643

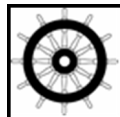
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2025-04-29**.

Issued at **Høvik** on **2021-06-29**

DNV local station:
Sweden CMC

Approval Engineer:
Thomas Grafton



Notified Body
No.: **0575**

for **DNV AS**

.....
Sverre Olav Bergli
Head of Notified Body



The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.
This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV AS of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.
Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

The BilgMon 488 Bilge Alarm 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 when the oil content exceeds 15ppm.

The BilgMon 488 is equipped with two adjustable alarms that are triggered when the oil content of the processed sample exceeds the set limit (15ppm). Alarm outputs consist of relays and indicator LEDs. Additionally, a 0(4) – 20 mA current output signal or a digital signal is available to enable remote surveillance and recording of oil contents. An optional flow sensor can be fitted to generate an alarm when no flow of sample water is present.

The BilgMon 488 uses the principle of scattered light for real time detection and measurement of oil content.

Application

<i>Model</i>	<i>Application</i>
BilgMon 488	Detection of oil content in bilge water. Sending an alarm signal when the oil content exceeds 15ppm. Sending an alarm signal when no flow of the sample water is present.

The BilgMon 488 Oil Content Meter is designed to operate in the following conditions:

Measurement range:	0 to 30 ppm
Measurement precision:	15±5 ppm
Sample water pressure:	Recommended: 1 – 2 bar Maximum: 3 bar
Sample water temperature:	Maximum 50 °C
Working temperature:	0 – 55 °C, max. 90% Relative Humidity
Power Supply:	AC 115 or 230V, 50 - 60 Hz AC 24V, 50 – 60 Hz; or DC 24V
Inclination Range:	0 to 22.5 degrees in each direction

Limitations

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

Installation

The onboard arrangement of the 15ppm Oil-content Meter (Bilge Alarm), 15ppm Bilge Separator and the discharge control device (automatic stopping device) shall function automatically. 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 if the Bilge Alarm fails to function, requires a warm-up period or otherwise be de-energized.
- 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 15 ppm oil and the operation of the automatic stopping device preventing overboard discharge is not more than 20 seconds.

Basis of acceptance

The BilgMon 488 Oil Content Meter has been subjected to performance testing according to IMO Resolution MEPC.107(49), Annex Part 2. The test reports are listed in the “Test reports” section of this certificate and the test results are given in the appendices to this certificate.

The electrical and electronic sections of the BilgMon 488 Oil Content Meter have been subjected to environmental testing according to IMO Resolution MEPC.107(49), Annex Part 3 and the reports are listed in the “Test Reports” section of this certificate.

A new sensor unit processor was added in 2021 due to obsolescence of the original processor. The BilgMon 488 was subjected to a function test using both processors to show that the change did not affect how the software reacts to the input signals. The test report is listed in the “Test reports” section of this certificate.

Type Examination documentation

<i>Drawing Number :</i>	<i>Title</i>	<i>Revision</i>
BM041118.1	BilgMon 488, Dimensions	G (20.03.2020)
BM050113.1	BilgMon 488, General Arrangement, 3-way FW valve	D (02.10.2020)
BM050113.3	BilgMon 488, NO and NC Solenoids Arrangement	D (29.06.2021)
BM050113.4	BilgMon 488, General Arrangement	A (02.10.2020)
BM050113.5	BilgMon 488, NO Solenoid Arrangement.	A (29.06.2021)
BM050113.2	BilgMon 488, Electric Wire Arrangements 115 VAC / 230 VAC	C (19.03.2020)
BM140623.1	BilgMon 488, Electric Wire Arrangements 24 VAC / +24 VDC	C (19.03.2020)
BM200319.1	BilgMon 488, Electric Wire Arrangements 115 VAC / 230 VAC (optional flow input)	A (19.03.2020)
BM200319.2	BilgMon 488, Electric Wire Arrangements 24 VAC / +24 VDC (optional flow input)	A (19.03.2020)
BM041213.1	BilgMon 488, Test Arrangement	A (13.12.2004)
	Instruction Manual BilgMon488 15 ppm Bilge Alarm	Version vBA

Test reports

Performance Test:

- Testing in accordance with the requirements of the specification contained in Part 2 of the Annex to the Guidelines and Specification contained in IMO Resolution MEPC.107(49), witnessed by DNV Malmø, December 2004.
- Test Report "No flow input" testing of Bilge Alarm BilgMon 488, witnessed by DNV GL Gothenburg, September 2020.

Environmental Test:

- DNV Technical Report No.2005-3044, Rev.01 dated 2005-01-21, Environmental testing of 15 ppm Bilge Alarm BilgMon 488.

Other Tests:

- Bilgmon488 sensor SWTest, BM210416.1 dated 2021-05-03, witnessed by DNV.

Marking of product

For traceability to this EC Type-Examination, each unit to be marked with;

- Manufacturer's name and trademark
- Type designation
- Serial No.
- Mark of Conformity

Copy of the type approval certificate and operational manual

A copy of this Certificate should be carried aboard a vessel fitted with this 15 ppm Bilge Alarm at all times.

A vessel fitted with a 15 ppm Bilge Alarm should, at all times, have on board a copy of the Operating and Maintenance manuals.

Revision history

<i>Revision</i>	<i>Issue Date</i>	<i>Reason for revision</i>
0	2020-04-30	<p>Renewal of existing certificate MED-B-9899.</p> <p>Appendix detailing the test results added according to IMO Resolution MEPC.107(49) Appendix 2.</p> <p>“Dimensions” drawing updated.</p> <p>“Electrical Wire Arrangements” drawings updated (for different power supply ratings).</p>
1	2020-10-21	<p>Re-issue of the certificate with updates described below.</p> <p>“Electrical Wire Arrangements” drawings updated to include an optional flow sensor.</p> <p>New “General Arrangement” drawing added and “General Arrangement, 3-way FW Valve” drawing updated to show optional flow sensor.</p> <p>Function test of the optional flow sensor included in the “Tests carried out” section.</p> <p>“Instruction Manual” updated to include optional flow sensor.</p>
2	2021-06-29	<p>Re-issue of the certificate with updates described below.</p> <p>Editorial changes.</p> <p>Drawing list updated due to minor changes.</p> <p>Standard operational conditions included in Application section. Limitations moved to new section. Installation requirements moved to a new section.</p> <p>Tests carried out section renamed Test reports. New sub section “Other Tests” added with test report for new processor.</p> <p>Added new sections: Basis of acceptance; Copy of the Type Approval Certificate and Operational Manual; and Revision history.</p>

Appendix – BilgMon 488

Test data and results of tests conducted on a 15 ppm Bilge Alarm in accordance with Part 2 of the Annex to the Guidelines and Specifications contained in IMO Resolution MEPC.107(49).

15 ppm Bilge Alarm submitted by: **Brännströms Elektronik AB
(Now part of “Brannstrom Sweden AB”)**

Test location: **Gothenburg, Sweden**

Organisation conducting the test: **Brännströms Elektronik AB (witnessed by DNV)**

Method of sample analysis: **ISO 9377-2:2000**

Test rig according to drawing: **Bilgmon 488 Test Arrangement, BM041213.1, Ver.A.**

Samples analysed by: **Analycen AB**

Environmental testing of the electronic sections of the 15 ppm Bilge Alarm has been carried out in accordance with part 3 of the annex to the guidelines and specifications contained in IMO Resolution MEPC.107(49). The equipment functioned satisfactorily on completion of each test specified on the environmental test protocol.

Environmental Test(s) carried out at **Environmental Test Laboratory of Det Norske Veritas**, Test report No: **2005-3044**, issued at **Høvik** on **21 January 2005**.

Remarks:
None.

Calibration Test and Response Time

	Test Fluid					
	A		B		C	
	Oil Content Meter Reading	Grab sample	Oil Content Meter Reading	Grab sample	Oil Content Meter Reading	Grab sample
0 ppm	0	0	0	0	3	1
15 ppm	13	3	14	8	14	12
Full scale (ppm)	26	9	29	21	27	13
Water Temperature	50°C		10°C		50°C	
Re-zero	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Recalibrate	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Response Time	3 seconds		3 seconds		3 seconds	

Contaminant(s) and Colour Test

Non-oil particulate matter.
 Meter reading shift with ppm non-oil particulate contaminants and with very salt water.

	Expected Reading	Oil Content Meter Reading
Clean water and 10 ppm Test Fluid "B"	10 ppm	9 ppm
Very salty water (6% common salt with clean water)	10 ppm	13 ppm
Fluid B and Iron Oxide in a concentration of 10 ppm	10 ppm	9 ppm
Fluid B and Iron Oxide in a concentration of 50 ppm	10 ppm	8 ppm
Fluid B and Iron Oxide in a concentration of 100 ppm	10 ppm	6 ppm

Sample Pressure of Flow Test

15 ppm Bilge Alarm reading shift at 50 % of normal: **0 ppm**
 15 ppm Bilge Alarm reading shift at 200 % of normal: **0 ppm**

Deviations from this test should be stated if necessary:
N/A.

Shut-Off Test

	Expected Reading	Oil Content Meter Reading
15 ppm Bilge Alarm before shut-off	15 ppm	15 ppm
15 ppm Bilge Alarm reading after start-up		

Damage to meter as follows:
N/A.



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Utilities Supply Variation Test

110 % voltage effects:	No influence
90 % voltage effects:	No influence
110 % air pressure effects:	N/A
90 % air pressure effects:	N/A
110 % hydraulic pressure effects:	N/A
90 % hydraulic pressure effects:	N/A

Other Comments:
None.

Calibration and Zero Drift Test

Calibration drift:	0 ppm
Zero drift:	0 ppm