

TYPE APPROVAL CERTIFICATE

This is to certify:**That the 5 ppm Bilge Water Separator**

with type designation(s)

CD Series: CD 0.25, CD 0.5, CD 1.0, CD 2.0, CD 5.0.**DD Series: DD 2.0, DD 5.0, DD 2.0 Ex, DD 5.0 Ex.****White Box (Optional).**

Issued to

Marinfloc AB
VAREKIL, Sweden

is found to comply with

DNV GL class programme DNVGL-CP-0208 – Type approval – 5 ppm bilge water separators**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL with optional notation Clean (Design).****Type:****CD Series: CD 0.25, CD 0.5, CD 1.0, CD 2.0, CD 5.0.****DD Series: DD 2.0, DD 5.0, DD 2.0 Ex, DD 5.0 Ex.****White Box (Optional).****Capacity:****0,25, 0,5, 1,0, 2,0 & 5,0 m3/hr****2,0 & 5,0 m3/hr****-**Issued at **Høvik** on **2018-09-11**This Certificate is valid until **2023-09-10**.for **DNV GL**DNV GL local station: **Gothenburg**Approval Engineer: **Thomas Grafton**

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.



Product description

CD Models:

The Marinfloc CD model is a fully automated bilge water cleaning system. The cleaning process is based on DAF (dissolved air floatation) and involves four process steps, i) Oil separation by gravity, ii) Aeration, iii) Flocculation and forced floatation, and iv) Filtration. The effluent is clean water meeting the requirements of DNVGL-CP-0208. The supplied unit includes the 5ppm Oil Content Monitor required by DNV GL optional Class Notation **Clean(Design)**.

DD Models:

The Marinfloc DD model is designed to treat deck drains contaminated with oil and mud on offshore units. The DD model is based on the CD model and is built on the same foundation. The DD model has two additional process steps: (a) a dosing pump for Caustic injection is fitted at the beginning of the process; and (b) a sample from the effluent of the Flocculation and Forced Floatation process is sent to a 100ppm oil content monitor which by-passes the filtration process and rejects fluid when the measured oil content is very high. The effluent is clean water meeting the requirements of DNVGL-CP-0208. The supplied unit includes the 5ppm Oil Content Monitor required by DNV GL optional Class Notation **Clean(Design)**.

The DD-Models come in two alternative configurations: the standard model is intended for non-hazardous drains, and the "Ex" model is intended for hazardous drains and/or installation in spaces subject to explosion hazards.

White Box:

An optional White Box system may be fitted to the CD and DD Series. The standard system includes the 5ppm Oil Content Monitor required by DNV GL optional Class Notation **Clean(Design)**, the automatic 3-way valve and the manual 3-way valve (connected to the recirculating facilities and sampling point) required by DNVGL-CP-0208. For the DD Ex models, the 5ppm Oil Content Meter is instead installed as part of the Ex certified separator unit. The White Box includes a recorder that logs the overboard discharge start-stop time and measured oil content. The entire system is contained in locked box, preventing unintentional discharge of effluent exceeding 5ppm oil content.

A White Box may be installed in series on the separator effluent discharge piping replacing the 5ppm Oil Content Monitor (except for DD Ex models), the automatic 3-way valve and the manual 3-way valve (connected to the recirculating facilities and sampling point) required by DNVGL-CP-0208.

Application/Limitation

CD-Series:

Model	Max Flowrate (m³/h)	Supply Pump Capacity (m³/h)
CD 0.25	0.25	0.25
CD 0.5	0.50	0.50
CD 1.0	1.00	1.00
CD 2.0	2.00	2.00
CD 5.0	5.00	5.00

Applicable to all Models	
Operating Pressure:	0.25 – 0.40 MPa
Operating Temperature of Bilge Water:	40 – 60 °C
Power Supply:	400VAC-690VAC, 50-60Hz
Inclination Range:	0 to 22.5 degrees

The CD Series are not to be installed in equipment spaces subject to explosion hazards.

Each CD model is to be provided with a copy of the manufacturer's installation, operating and maintenance instructions, as listed in the Type Examination Documentation.

DD-Series:

Model	Max Flowrate (m³/h)	Supply Pump Capacity (m³/h)
DD 2.0 DD 2.0 Ex	2.00	2.00
DD 5.0 DD 5.0 Ex	5.00	5.00

Applicable to all Models	
Operating Pressure:	0.25 – 0.40 MPa
Operating Temperature of Bilge Water:	40 – 60 °C (Optional Heater for backflushing)
Power Supply:	400VAC-690VAC, 50-60Hz
Inclination Range:	0 to 22.5 degrees

The standard models are not to be connected to hazardous drains or installed in equipment spaces subject to explosion hazards.

The Ex models may be installed in Ex Zone 2 (IEC):

- The Ex models shall be fitted with EX Certified components as listed in the Type Examination Documentation. Components shall be installed in accordance with the Ex rating listed in their IECEx/ATEX certificates, typically IEC Gas Group IIB and Temperature Class T3.
- The Control Cabinet and the 5ppm Oil Content Meter are to be installed in the Ex-e cabinet described in the Type Examination Documentation.

Each DD model is to be provided with a copy of the manufacturer's installation, operating and maintenance instructions, as listed in the Type Examination Documentation.

White Box:

When the White Box system is fitted to the DD Ex models, it shall be mounted together with the Control Cabinet and 5ppm Oil Content Meter in the Ex-e cabinet described in the Type Examination Documentation.

General:

The CD and DD Series are fitted with an integral air driven supply pump. The pumping capacity is set to the correct value during commissioning by setting the adjustment valve in the air supply.

The CD and DD models are fitted with an integrated 5ppm Oil Content Monitor complying with DNVGL optional Class Notation **Clean(Design)**. When the optional White Box System is fitted, the 5ppm Oil Content Monitor may instead be supplied as part of the White Box System. Regardless of the installation location, the 5ppm Oil Content Monitor shall be provided with separate DNVGL Type Approval Certificates (to standard DNVGL-CP-0485).

Pumps listed in the Type Examination Documentation may be exchanged for another manufacturer with the same pump speed delivery characteristics curve (all models) and the same Ex certification (DD Ex models). The new and old pump speed delivery characteristics curve and Ex Certificates (where relevant)

shall be included as an Annex to the Manufacturers Declaration of Conformity delivered with the Separator.

The first production model of the CD or DD Series containing the new Control Cabinet Marinfloc CDD (as described in the Type Examination Documentation) shall be subjected to a safety function test to confirm that process control and operation of the three-way valve diverting flow from overboard to bilge tank are unchanged. For the first production model, a Test Protocol signed by the attending DNV GL Surveyor shall be included as an Annex to this certificate delivered with the Separator. (This paragraph will be removed from the certificate when this test has been successfully completed.)

Installation:

The following shall be verified after installation: -

1. An alarm in the 5ppm Oil Content Monitor is always activated whenever clean water is used for cleaning or zeroing purposes.
2. An alarm in the 5ppm Oil Content Monitor is always activated whenever no flow of sample is detected by the Oil Content Monitor
3. Any alarm in the 5ppm Oil Content Monitor will activate the automatic stopping device preventing overboard discharge and lead to recirculation
4. The overall response time (including the response time of the 5 ppm Oil Content Monitor) between an effluent discharge from the 5 ppm Bilge Separator exceeding 5 ppm, and the operation of the Automatic Stopping Device preventing overboard discharge, shall be not more than 20 seconds.
5. By-passing the 5ppm Oil Content Monitor during normal operation shall by no means be possible
6. Every access of the alarm (beyond check on instrument drift, repeatability of the instrument reading, and the ability to re-zero the instrument) requires breaking of a seal.

Type Approval documentation

Job Id: **262.1-012674-4**
Certificate No: **TAP00001HZ**

Tests carried out

Marking of product

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

The marking shall give at least the following information:

- Identification of manufacturer
- Equipment type designation or model identification
- Maximum throughput and maximum influent pressure at which the separator is designed to operate
- 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). The initial certification date defining the beginning of the validity period was 2018-09-11.

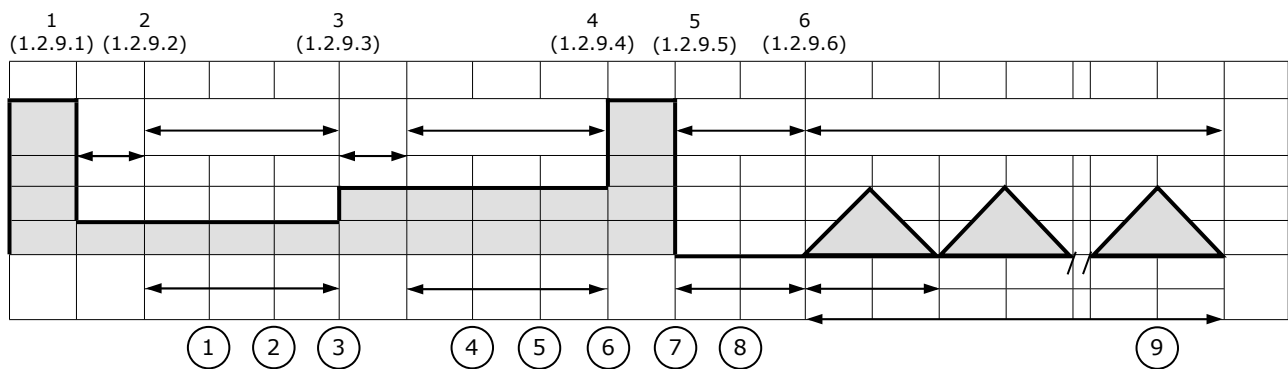
-----This certificate replaces TAP00000BT which is now withdrawn-----

APPENDIX – CD 1

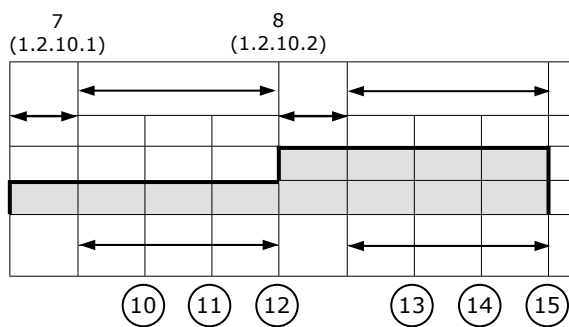
Test data and results of tests conducted on a 5 ppm Bilge Separator in accordance with DNVGL-CP-0208.

TEST RESULTS AND TEST PROCEDURES

TEST FLUID "A"



TEST FLUID "B"



TEST FLUID "C"

