



**TYPE APPROVAL CERTIFICATE**  
No. MAC077317XG

**This is to certify** that the product identified below is in compliance with the regulations herewith specified.

|                             |   |
|-----------------------------|---|
| <i>Description</i>          | <b>BALLAST WATER TREATMENT</b>  |
| <i>Type</i>                 | <b>Optimarin Ballast System (OBS)</b>   |
|                             | <b>Optimarin Ballast System Ex (OBS Ex)</b>   |
| <i>Applicant</i>            | <b>Optimarin AS</b>   |
|                             | <b>Sjøveien 34</b>  |
|                             | <b>4315 Sandnes</b>   |
|                             | <b>NORWAY</b>   |
| <i>Manufacturer</i>         | <b>Optimarin AS</b>   |
| <i>Place of manufacture</i> | <b>Sjøveien 34</b>  |
|                             | <b>4315 Sandnes</b>   |
|                             | <b>NORWAY</b>   |
| <i>Reference standards</i>  | <b>IMO Res. MEPC.174(58); Part C Chapter 1 Section 10 &amp; Section 3 of RINA Rules; Part C Chapter 2 &amp; Chapter 3 of RINA Rules</b> |

Issued in **HAMBURG** on **April 18, 2017**. This Certificate is valid until **April 17, 2022**

RINA Services S.p.A.  
Giuseppe Russo



This certificate consists of this page and 3 enclosures.

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No. **MAC077317XG**  
**Enclosure - Page 1 of 3**  
**Optimarin Ballast System (OBS)**  
**Optimarin Ballast System Ex (OBS Ex)**

***Product Description***

Optimarin Ballast System (OBS) and Optimarin Ballast System Ex (OBS Ex) are automated in-line treatment systems for the biological disinfection of ballast water. Systems operate without chemicals and combine initial filtration with a form of UV treatment to remove organisms.

Each system consists of the following main components: filter, back flush pump, filter control cabinet, flowmeter, UV chamber(s), control panel.

In addition, Optimarin Ballast System Ex (OBS Ex) is prepared for installation in hazardous areas because electrical components are provided with appropriate Ex certificates.

***Technical characteristics***

The treatment of water is performed by mechanical filtration and disinfection by ultraviolet radiation (UV)

The treatment sequence:

- Ballast water uptake: Filter and UV disinfection
- Ballast water discharge: UV disinfection

The system may be fitted with four alternative filters:

- FilterSafe Filter, Model: BS-025H/V to BS-400H/V with capacity from 10 to 1000 m<sup>3</sup>/h and 40µm mesh.
- Filtrex Filter, Model: ACB-906-100 to ACB-999-350 with capacity from 15 to 1040 m<sup>3</sup>/h and 40µm mesh.
- Boll & Kirch Filter, Model: 6.18.2 with capacity from 24 to 2500 m<sup>3</sup>/h and 40µm mesh.
- Boll & Kirch Filter, Model: 6.18.3 with capacity from 83 to 3800 m<sup>3</sup>/h and 40µm mesh.

The UV system is to be configured as follows:

- Chambers mounted in parallel (vertically or horizontally).
- The construction of the chambers (i.e. dimensions, form and material) is exactly the same
- The construction of the two manifolds (i.e. dimensions, form and material) is exactly the same

***Reference documents***

**Test Reports:**

- Report SNO 5643-2008 - Land based testing in acc. with Resolution MEPC.174 (58) (RINA dwg. no. HMMC-8902)
- Report SNO 5828-2009 - Shipboard testing in acc. with Resolution MEPC.174 (58) (RINA dwg. no. HMMC-8905)
- Report L.NR. 5840-2009 - Land based testing for alternate filter (RINA dwg. no. HMMC-8906)
- Report SNO 6284-2012 - Full scale filter tests (RINA dwg. no. HMMC-8907)
- Report 2009-3397 - EMC and Environmental testing of Ballast Water Control System (RINA dwg. no. HMMC-8908)
- Report 9505 330 462 001 - Mech. and Climate test report of the UV Power Cabinet (RINA dwg. no. HMMC-8912)
- Report 9505 330 462 002, rev. 3 EMC test report of the UV Power Cabinet (RINA dwg. no. HMMC-8903)
- Cert. No. A-14198 Eta Plus power cabinet (RINA dwg. no. HMMC-8909)
- Report no.: 20597, Environmental testing of Ballast Water Management System (RINA dwg. no. HMMC-8904)

**Quality Control Procedures:**

- Quality Control Procedures - ISO 9001/14001 Certificate (RINA dwg. no. HMMC-8901)
- Quality Management System for Optimarin AS (RINA dwg. no. HMMC-8901)
- Safety Handbook for Optimarin personnel (RINA dwg. no. HMMC-8901)





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**Optimarin Ballast System (OBS)**  
**Optimarin Ballast System Ex (OBS Ex)**

**Assembly Drawings, Technical Data Sheets, Manuals:**

- Flow Diagram dwg no. 300142 Rev.2 (RINA dwg. no. HMMC-8691)
- Optimarin BWTS Models (RINA dwg. no. HMMC-8691)
- Bill of Material for Standard OBS system and common components (RINA dwg. no. HMMC-8691)
- Operation, maintenance and safety Manual for OBS with Filter type FS (RINA dwg. no. HMMC-8897)
- Operation, maintenance and safety Manual for OBS with Filter type FX (RINA dwg. no. HMMC-8898)
- Operation, maintenance and safety Manual for OBS with Filter type BK (RINA dwg. no. HMMC-8896)
- Appendices for Operation Manuals:
  - Appendix A - Filter (RINA dwg. no. HMMC-8913)
  - Appendix B - Back Flush Pumps (type Allweiler and Garbarino) (RINA dwg. no. HMMC-8913)
  - Appendix C - Flowmeter (RINA dwg. no. HMMC-8914)
  - Appendix D - Flow Pressure Valve (RINA dwg. no. HMMC-8914)
  - Appendix E - Air Release (RINA dwg. no. HMMC-8914)
  - Appendix F - UV System (RINA dwg. no. HMMC-8914)
  - Appendix G - Butterfly Valves (RINA dwg. no. HMMC-8914)
  - Appendix H - Bypass Valve, OBV01 (RINA dwg. no. HMMC-8914)
  - Appendix I - Cabinets (RINA dwg. no. HMMC-8914)
  - Appendix J - Cables (RINA dwg. no. HMMC-8915)
  - Appendix K - UV Sensor (RINA dwg. no. HMMC-8915)
  - Appendix L - Transmitters (RINA dwg. no. HMMC-8915)
  - Appendix M - UV Lamps (RINA dwg. no. HMMC-8915)
  - Appendix N - Quartz Glass (RINA dwg. no. HMMC-8915)
  - Appendix O - Alarm Horn and Light (RINA dwg. no. HMMC-8915)
  - Appendix P - Tools (RINA dwg. no. HMMC-8915)
  - Appendix Q - UV System: FW-Hydraulic Analysis of Parallel Units (RINA dwg. no. HMMC-8915)
  - Appendix R - Scaling Report Bollfilter (RINA dwg. no. HMMC-8915)
  - Appendix S - Evaluation of Alternative UV Lamps (RINA dwg. no. HMMC-8915)
- Optimarin Ballast System (OBS Ex) for installation in hazardous areas:
  - Complete Bill of Material for all items in OBS Ex (Hazardous installation) (RINA dwg. no. HMMC-8899)
  - Bill of Material - Ex certified components (with certificate reference) (RINA dwg. no. HMMC-8899)
  - Operation, maintenance and safety Manual for Ballast System - Ex Version (RINA dwg. no. HMMC-8900)
  - Appendices for Operation Manual - Version Ex:
    - Appendix A - Ex p (pressurized) system (RINA dwg. no. HMMC-8916)
    - Appendix B - Special Ex cabinets and accessories (RINA dwg. no. HMMC-8917)
    - Appendix C - Filter, Boll & Kirch MK2 (6.18.3) (RINA dwg. no. HMMC-8916)
    - Appendix D - Back flush pump (RINA dwg. no. HMMC-8916)
    - Appendix E - Flow pressure valve (RINA dwg. no. HMMC-8918)
    - Appendix F - Valves and accessories (RINA dwg. no. HMMC-8919)
    - Appendix G - Instrumentation (RINA dwg. nos. HMMC-8939 & HMMC-8940)

***Fields of application***

Treatment of ballast water according to MEPC.174(58).

Maximum capacity of treatment per UV-chamber is 167 m<sup>3</sup>/h.

Ballast water temperature is not limiting condition for this system.

UV intensity below 100 W/m<sup>2</sup> implies that the ballast water is not treated in accordance with this Certificate.





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**Optimarin Ballast System (OBS)**  
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**Acceptance Conditions**

For each installation the following drawings are to be submitted for approval:

- P&I diagram of the ballast system including the integration of treatment system
- Power supply wiring diagram
- Alarms list with shutdown functions and interface with IAS of ship
- Description confirming the arrangement of alarms for bypass of the BWMS system
- List and copy of Ex certificates for equipment in hazardous area

**Remarks**

- Installation on board is to be carried out in accordance with Manufacturer's Instructions.
- This Certificate has not been issued on behalf of any Flag Administration.
- All changes in software are to be recorded and installation shall be carried out according to manufacturer's instructions.

**Marking of product**

Each treatment system is to be marked with:

- Manufacturer's name or trade mark
- Type designation
- Serial number

**HAMBURG April 18, 2017**



A handwritten signature in blue ink, appearing to read 'for [Name]'.