



RWO

Ballast Water Treatment

MARINE WATER TECHNOLOGIES

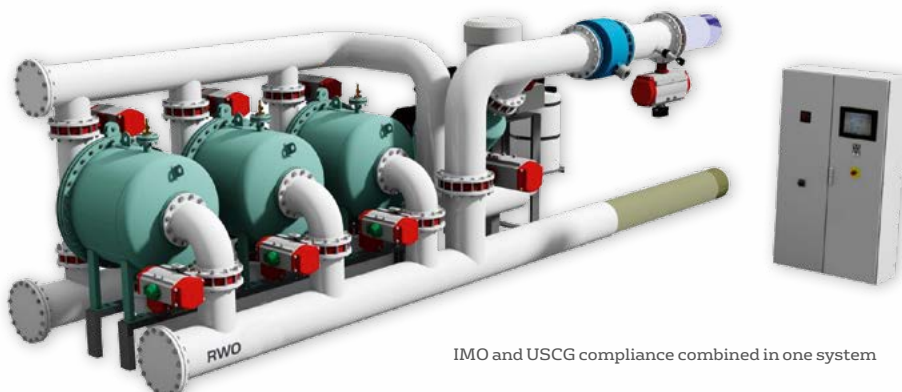
CleanBallast® Ocean Barrier System

RWO

The New CleanBallast® System: Less Complexity – Reduced Costs for Owner

The CleanBallast Ocean Barrier System (CleanBallast OBS) is the next generation of the first CleanBallast ballast water treatment system from RWO which was IMO type approved already in 2010 by the German Flag administration. The system has been designed to treat river, brackish and sea water by means of filtration and disinfection for use as ballast water.

Thousands of hours of operational experience from over 100 installed CleanBallast systems led to the significant improvements done with the new CleanBallast OBS. This way the system was simplified and made even more robust. For full adherence with the most recent legislations, CleanBallast OBS was developed in accordance with IMO Code for Ballast Water Management Systems MEPC.300(72) and USCG 46 CFR 160.60 requirements. Type approval testing was performed under the auspices of DNV, a leading class society and independent laboratory appointed by US Coast Guard.



IMO and USCG compliance combined in one system

How it Works

- > Filtration using superior, advanced disk filtration technology
 - > Full-flow electrochlorination
1. **Disk filtration:** The high quality disk filters have been proven to perform even in water with highest sediment loads while being extremely durable and resistant against corrosion. Reliable filtration without danger of clogging ensures uninterrupted ballast operation and therefore short off-loading operations for the ship's crew.
 2. **Full-flow electrochlorination:** Smaller organisms and algae that are not filtered out are eliminated with a disinfectant produced by electrochlorination of the full ballast flow. A simple process applying electric current converts salt in the intake water into sodium hypochlorite, which is an efficient active substance. The in-situ production is very robust and offers a small footprint while working in difficult environments like turbid waters.

No second treatment during discharge: Discharge of the ballast water requires no filtration or treatment with disinfectant. Only elimination of residual hypochlorite is done by adding the commonly used neutralizing agent sodium thiosulfate.

Models sizes (Treatment rated capacity)	500 ... 3000 m ³ /h
Treatment capacity	10 - 100% of TRC
Ambient temperature range	min. 0°C - max. 55°C
Electrolyte feed temperature	min. -2°C (ice free) - max. 35°C
Sediment load during ballasting	No limitations (within intended field of use)
Electrolyte feed salinity	0.9 - abt. 65 PSU
Operating pressure range	(recommended min.) 0.8 - max. 6.0 bar
pH-value	no limitations (within intended field of use)
TRO dosage	6 mg/L
Power consumption - Marine & brackish water - Fresh water	< 30 kWh/1000 m ³ < 60 kWh/1000 m ³
Differential pressure filter backflushing	0.5 bar

Key Features & Benefits

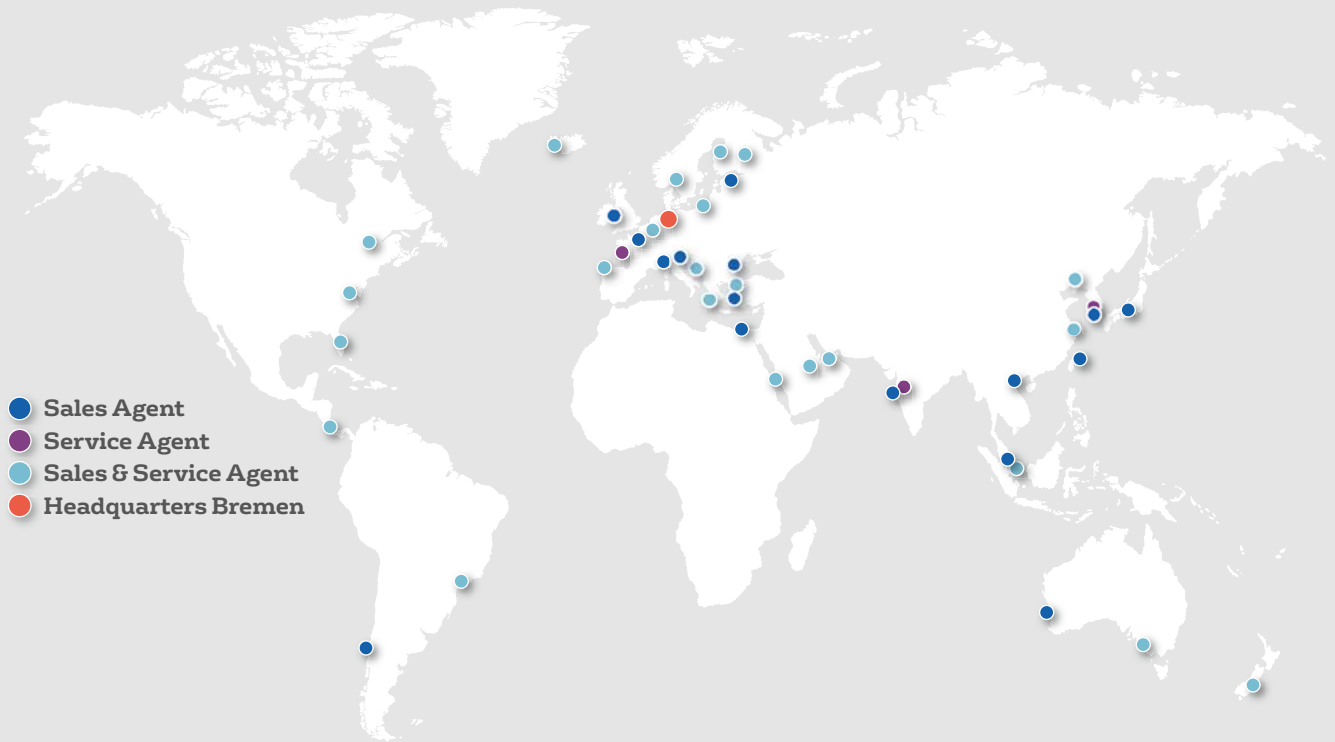
- > Optimized and reliable filtration technology ensures steady and safe ballasting operations, which could shorten port stays
- > Most competitive in view of Total Cost of Ownership (TCO), due to very low OPEX
- > Reduced maintenance due to robust design and simplicity of process for easy operation
- > Amperometric TRO sensor needs no consumables and requires little maintenance

Standard System

1. Control cabinet
2. Filter unit for the removal of particles, sediments and larger organisms
3. Electrochlorination (EC) unit for efficient disinfection of the remaining smaller organisms and bacteria
4. Rectifier unit for the power supply of EC unit
5. Dechlorination unit for dosing of neutralization agent at discharge
6. Multiparameter sensor for feed-back control of process parameters
7. Backflushing pump for automatic cleaning of filter units

The system is fully automatic and controlled by Programmable Logic Controller (PLC). It may be supervised locally using the touch panel on the control cabinet or remotely (as optional) e.g. from the cargo control room. This allows monitoring operation, status messages and alarms from multiple locations. Additionally, the panel PC records data per the applicable IMO/USCG requirements and allows for easy and flexible downloading of operational data (PDF) for reports, Port State Controls etc.

Worldwide Sales & Service Network



Always Near – Always Available

RWO's network of more than 40 qualified sales and service center throughout the world ensure customer benefits due the short communication links to short response times. Thereby, our wide ranging expertise and our products, as well as services has made us a reliable partner in the maritime industry.

Spare Parts

RWO offers original spare parts for all types of water treatment applications. Please contact us for further information: spares@rwo-gmbh.de

Service

Depending on our customers' demands, we offer an individually designed range of services. With our large service network, and our competence in process engineering, we have optimized our service offer: service@rwo-gmbh.de

The Service Range Includes

- > Full service including preventitive maintenance, repairs, supply of spare parts and consumables as well as troubleshooting
- > Optimization and updating of the control and measuring technology
- > Support helpline: standby with agreed response times
- > Training of the operating staff

Your Full Customer Care Experience

With the combination of RWO Spare Part Kit and RWO Service Inspection you will benefit from a full Customer Care Package all around the world.

A Spare Parts Kits

- > Emergency Kit
- > Regular Kit
- > Intermediate Kit
- > Docking Kit

B Service Inspection

- > Basic Inspection
- > Extended Inspection

C Customer Care Packages

- > Gold member
- > Silver member
- > Bronze member
- > Basic member

Keep the Heart of Your OWS Protected

It is crucial to have the right spare parts when you operate your oily water separator. Our spare part kits are available from an Emergency Kit upto a Docking Kit.

- > **Emergency Kit**
Reliable protection right from the start. A reliable kit covering basic parts you need in case of 'emergency'.
- > **Regular Kit**
The best choice to keep your machinery running. This kit contains control cabinet, mechanical and consumables components.
- > **Intermediate Kit**
According to maintenance schedule this kit ensures operational reliability after 2,5 years operation. Recommended to this kit is the **OWS - Basic Service Inspection** to extend the guarantee.
- > **Docking Kit**
An all-round kit, containing additional extended components at recommended interval of 5 years of operation. Recommended to this kit is the **OWS - Extended Service Inspection** which facilitates the renewal of the IOPP-Certification incl. the OMD-Recalibration.

Key Features & Benefits

- > Minimized lifecycle costs
- > Improved OWS performance with OEM-parts
- > Minimized unexpected failures
- > Keeping downtime at a minimum
- > Ensuring operational efficiency
- > Correct and timely maintenance