



BALLAST WATER TREATMENT



ABS



Lloyd's
Register



BIO-SEA® by **BIO-UV** is the first only system developed and manufactured in France for treatment of ballast water in **compliance** with **IMO D-2** discharge standard and **USCG** regulation.

The system first cleans ballast water using a screen filter, in order to reduce the amount of total suspended particles, present in **all types of waters**. The filter size will be dependent on the system size according to the ballast pump flow rate.

Then UV stage of the treatment takes place in a **single UV lamp reactor** (chemical free). It inactivates the microorganisms present in the water (bacteria, phytoplankton, zooplankton).



BIO-SEA® skid version

When ballasting, both operations of filtration and UV disinfection are carried out.

When deballasting, only the operation of UV disinfection is completed. This allows re-treating the water that stayed in the ship's ballast tanks during voyage, in order to eliminate the possible biological recontamination, to ensure compliance with the IMO standard and USCG regulation.

The entire operation of the **BIO-SEA®** system is automated (valves opening and closing, filter cleaning, UV intensity regulation in order to apply the correct UV dose, stripping mode) to treat all types of waters.



BIO-SEA® modular retrofit installation

BENEFITS

- Well proven technology
- High UV dose
- Tested in low UV water transmittance conditions
- Not impacted by water temperature, neither by salinity
- Modular : flexible, scalable to any flow rate
- Easy to install, operate and maintain
- Automatic operation, easy-to-use interface
- Automatic regulation of UV dose, power consumption depending on water quality
- Safe: no explosive gases, no induced corrosion, chemical free
- First Class marine components
- Cost efficient solution

STANDARD
MODEL



1ST STEP: MECHANICAL FILTRATION

COMPACT
MODEL

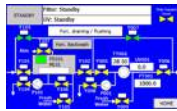


- **40µm screen in order to retain suspended solids and zooplankton**
- **Size to scale** depending on the flow rate to treat
- **Automatic backwash**
- **No disruption of the filtration process during the cleaning cycle** and no significant variation of the treated flow rate
- **Additional suction pump** to allow a complete and performing cleaning
- **Vertical or horizontal** configurations available
- 2 models of filter are available, one **standard** and one **compact**

2ND STEP: UV DISINFECTION



- **Titanium reactor** equipped with a single polychromatic, **medium pressure, high intensity UV lamp**
- A high-quality quartz sleeve protecting the UV lamp
- **Optimized design** by CFD (Computational Fluid Dynamic), taking into account the water quality (UV transmittance) and fluid speeds on the quartz sleeve, in order **to facilitate cleaning and maintenance**
- Lamp driven by **electronic transformer** allowing precise management of the UV lamp in order to optimize its regulation, **reduce the power consumption and prolong its life**
- **Monitoring through UV sensor** (intensity) to adjust the UV dose in order to make a compliant water treatment
- **Modular design**, facilitating the installation of UV reactors in parallel and a better **adjustment to the flow** that has to be treated



MONITORING AND CONTROL

- **Automated operation and monitoring** through sensors and PLC: UV sensor; temperature sensor; flow meter; differential pressure switch; automatic valves
- **Automatic** and/or manual **operations** for **ballasting, deballasting, cleaning and stripping**
- **Touch screen interface** for easy friendly use and understanding
- **Recording** of operations, alarms (10,000 records of each) covering 24 months
- Operator and administrator modes
- Bus communication for remote control and integration to vessel automation system and control command

BIO-SEA® RANGE	
Treatment Capacity	from 30 to 2000 m ³ /h +
Power Supply	400 – 440V; 50-60 Hz; 3-phases
Average Power Consumption per UV reactor	6 kW - 14 kW
Environmental Operating Conditions	T°= 0°C - 55°C; H% = 95
Global Head Loss	< 0,7 bar
Min Operating Pressure	1 bar
Max Operating Pressure	10 bars



info@aun.as +47 32 23 10 90 www.aun.as