

# DESMI

Proven Technology  
One Global Company

## Ballast Water Management System - Overview





- I. Introduction
- II. General Description
- III. Hardware (System components)
- IV. Additional Information

# I. Introduction

The background of the slide is a light beige or tan color. It features a faint, embossed or printed design of a book cover. The book cover has a central floral motif, possibly a rose or a similar flower, with several leaves and stems extending outwards. The spine of the book is visible on the left side of the cover design. The overall aesthetic is classic and elegant.

# I. Introduction

## About DESMI

## Global operations



*DESMI HQ Denmark 1834*



*DESMI HQ Denmark anno 2020*





# I. Introduction

## About DESMI



Marine & Offshore

Marine & Offshore Pumps – We supplied marine pumps to the world's fleet - from the largest container ships to the smallest fishing vessels.



Industry

Rotan Gear Pumps - factories, mining, oil & gas, processing, distribution, etc



Defence & Fuel

Fuel handling – navies, agriculture, construction, mining, oil & gas, United Nations, governments, etc



Enviro-Clean

Environmental products – marine oil spill, marine debris, sea weed control, oil spill responders, etc



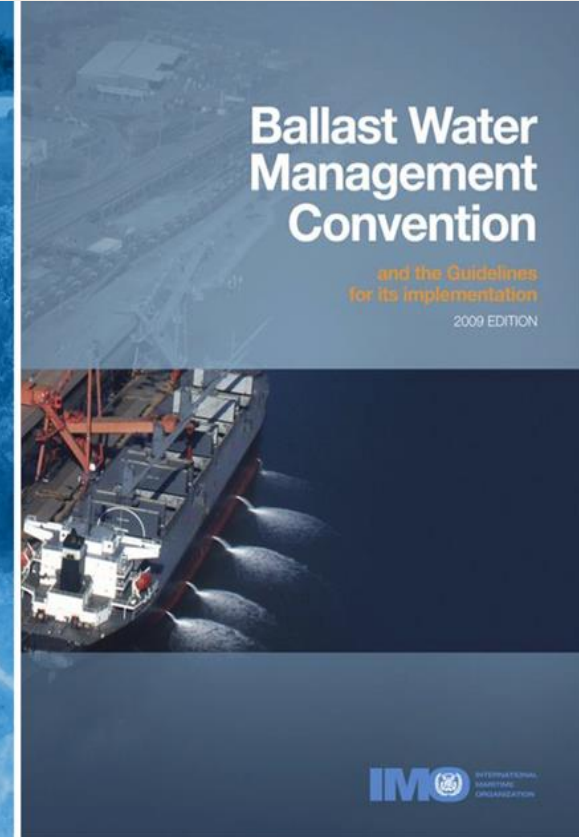
# I. Introduction

## About Ballast Water Management (BWM) Regulation

- IMO adapted the BWM Convention that to help prevent the spread of potentially harmful aquatic organisms in ships' ballast water – enforced on 8 September 2017

There are two ballast water management standards D-1 and D-2

- D-1 standard requires ships to exchange their ballast water in open seas, away from coastal areas.
- The D-2 standard specifies the maximum amount of viable organisms allowed to be discharged – this involves installation of BWMS
- By 8 September 2024 all ships must meet D-2 standard.
- The installed BWMS should be approved



# I. Introduction

## About Ballast Water Management (BWM) Regulation

BWMS required two types of approval:

- 1. IMO:** the treatment systems must be comply with IMO Guidelines.
- 2. USCG (United States Coast Guard):** US legislation requires the ballast water treatment system (BWTS) to be type- approved by the USCG standard.
  - The USCG regulations contain some additional requirements that go beyond the IMO's requirements.

**To be fully compliant for use internationally, IMO type- approval is required**





# I. Introduction

## DESMI BWMS - CompactClean

- DESMI Ocean Guard specialises in the development, manufacturing, sale and service of IMO and USCG certified Ballast Water Management & Treatment Systems with the lowest total cost of ownership.
- DESMI Ocean Guard has developed BWMS – the CompactClean (CC).
- The CC combines minimum footprint with large flow rates
- The CClean BWMS consists of two treatment technologies to disinfect the ballast water: Mechanical filtration and ultraviolet radiation (UV).
- CompactClean can treat ballast water and effectively kill organisms down to 42% UV-T.

### CompactClean BWMS



92%  
Brisbane,  
Australia


UV-T



DESMI

74%  
Houston, USA

UV-T



DESMI

49%  
Shanghai,  
China

UV-T



DESMI

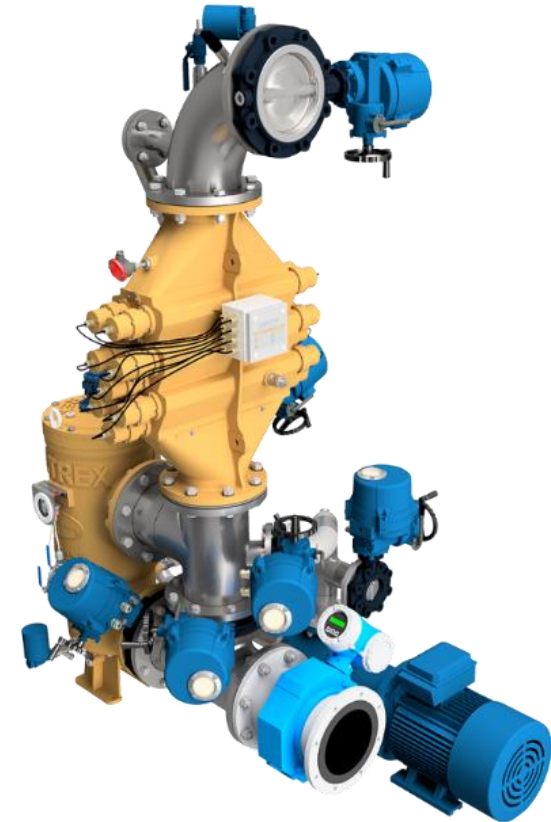


# I. Introduction

## DESMI CompactClean

- The CompactClean does not need a special mode to comply with USCG and IMO requirements, but has just one global approved mode for worldwide operations.
- The advantage of using a single operation mode globally is that it removes the need to know the de-ballast location at the time of ballast uptake.

### CompactClean BWMS

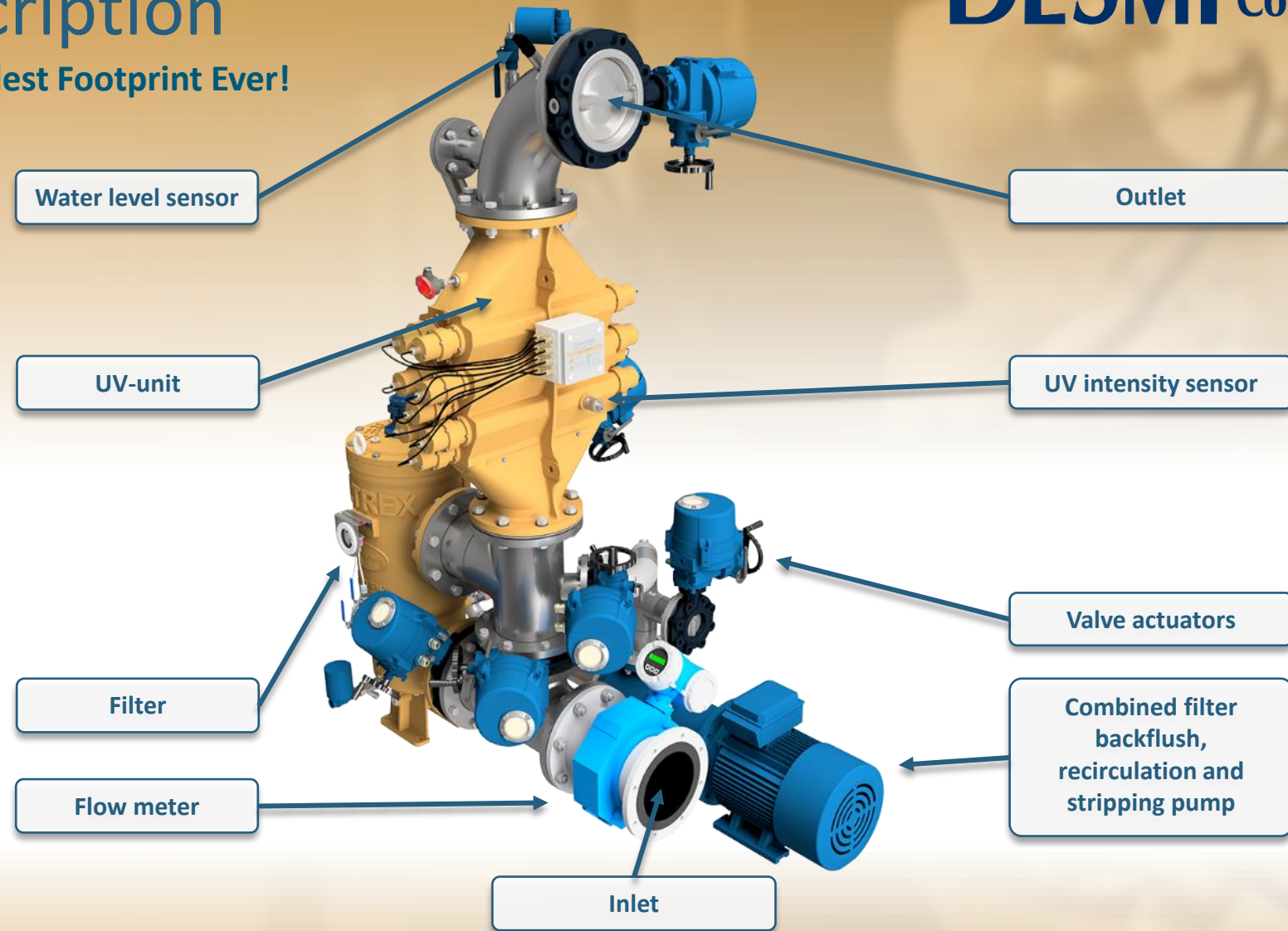


## II. General Description

## II. General Description

System layout: One of the Smallest Footprint Ever!

**DESMI** Ocean Guard A/S  
CompactClean



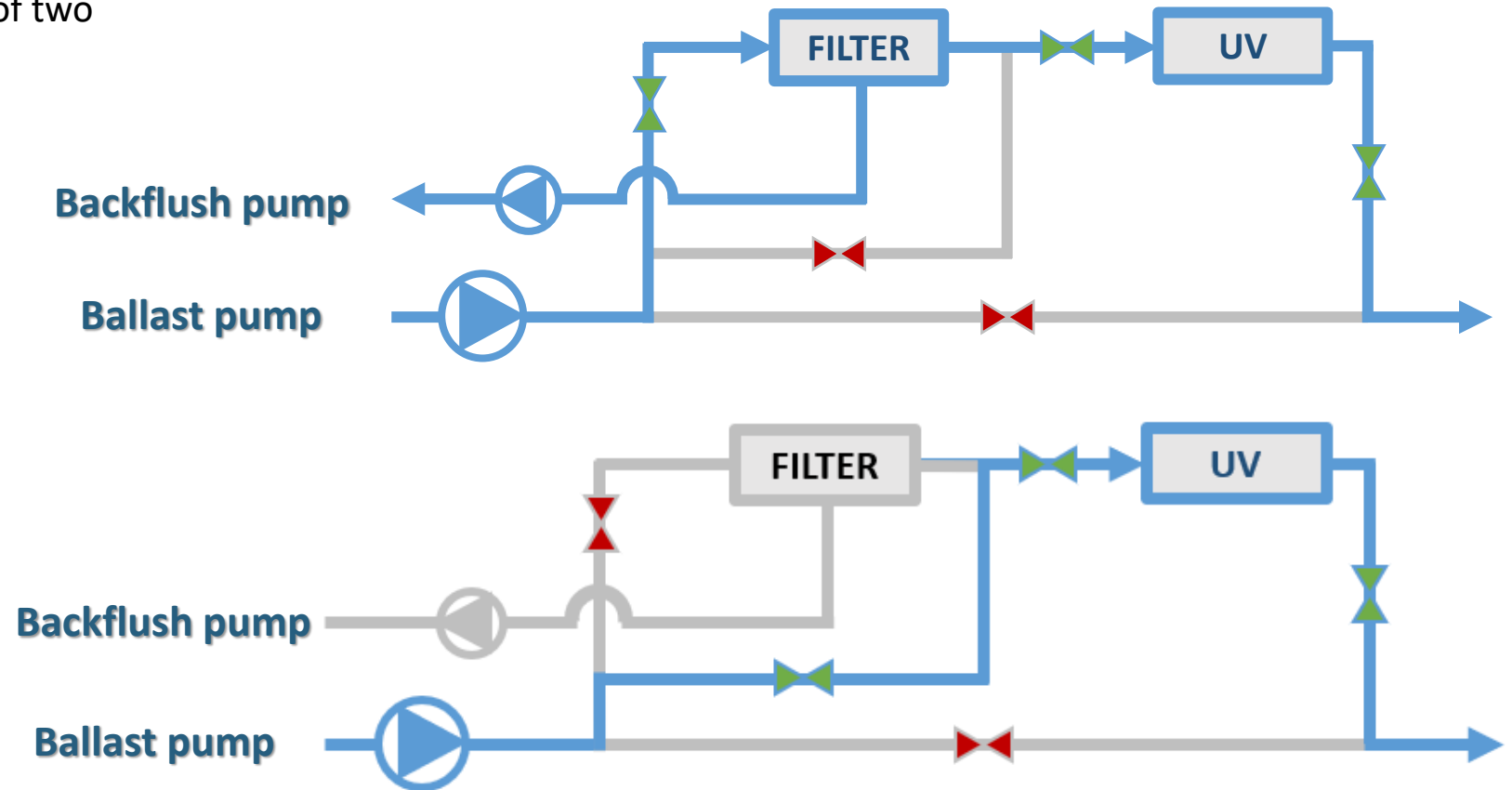
# II. General Description

## Principles of DESMI CompactClean

### CompactClean Operation

The CompactClean™ BWMS consists of two treatment technologies:

- Mechanical filtration
- Ultraviolet radiation (UV).





The background features a faint, golden-toned illustration of a human head in profile, facing right. Inside the head, a diagram of a brain is visible, with several curved lines representing neural pathways or connections extending from the brain area towards the right side of the image. The overall aesthetic is clean and professional, typical of an educational or technical presentation.

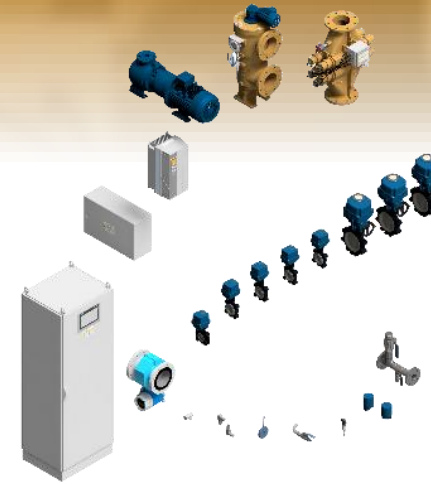
# **III. Hardware (System components)**

# III. Hardware Description

## Delivery Types

The BWMS is available in 3 different delivery types:

- Loose Components (LCD)
- Skid mounted (SKM)
- Containerized (CN..)



**Loose components**



**Skid mounted**



**Deckhouse**

# CompactClean

- 9 new standard systems – from 35 to 2100 m<sup>3</sup>/h for your specific need and room



**CompactClean 135**  
135 m<sup>3</sup>/h, 595 gpm

**CompactClean 500**  
500 m<sup>3</sup>/h, 2201 gpm

**CompactClean 1000**  
1000 m<sup>3</sup>/h, 4403 gpm

**CompactClean 340**  
340 m<sup>3</sup>/h, 1498 gpm

**CompactClean 750**  
750 m<sup>3</sup>/h, 3302 gpm

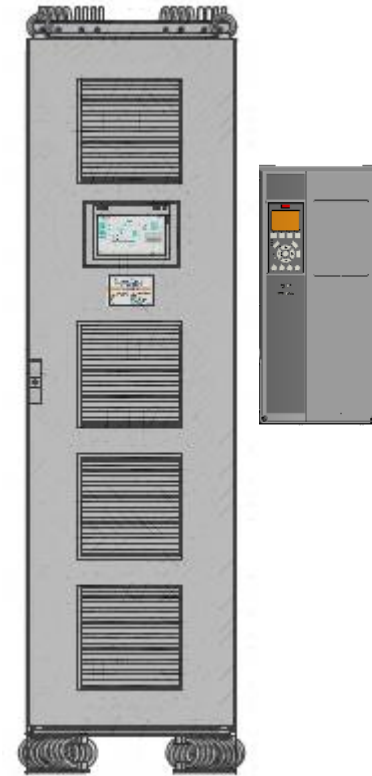
**CompactClean 1500**  
1500 m<sup>3</sup>/h, 6604 gpm

# III. Hardware Description

## CompactClean IECEx

- The BWMS has both EX and NEX versions available with some limitations:
  - The main panel and the FVD has no EX version therefore they always has to be installed in the safe zone.
  - The UV unit, junction box, filter, External control box, the connected sensors and valves and the backflush pump can be installed in a hazardous area on a EX build.

### Safe Zone



### Zone 1





## III. Hardware Description

### Control interface

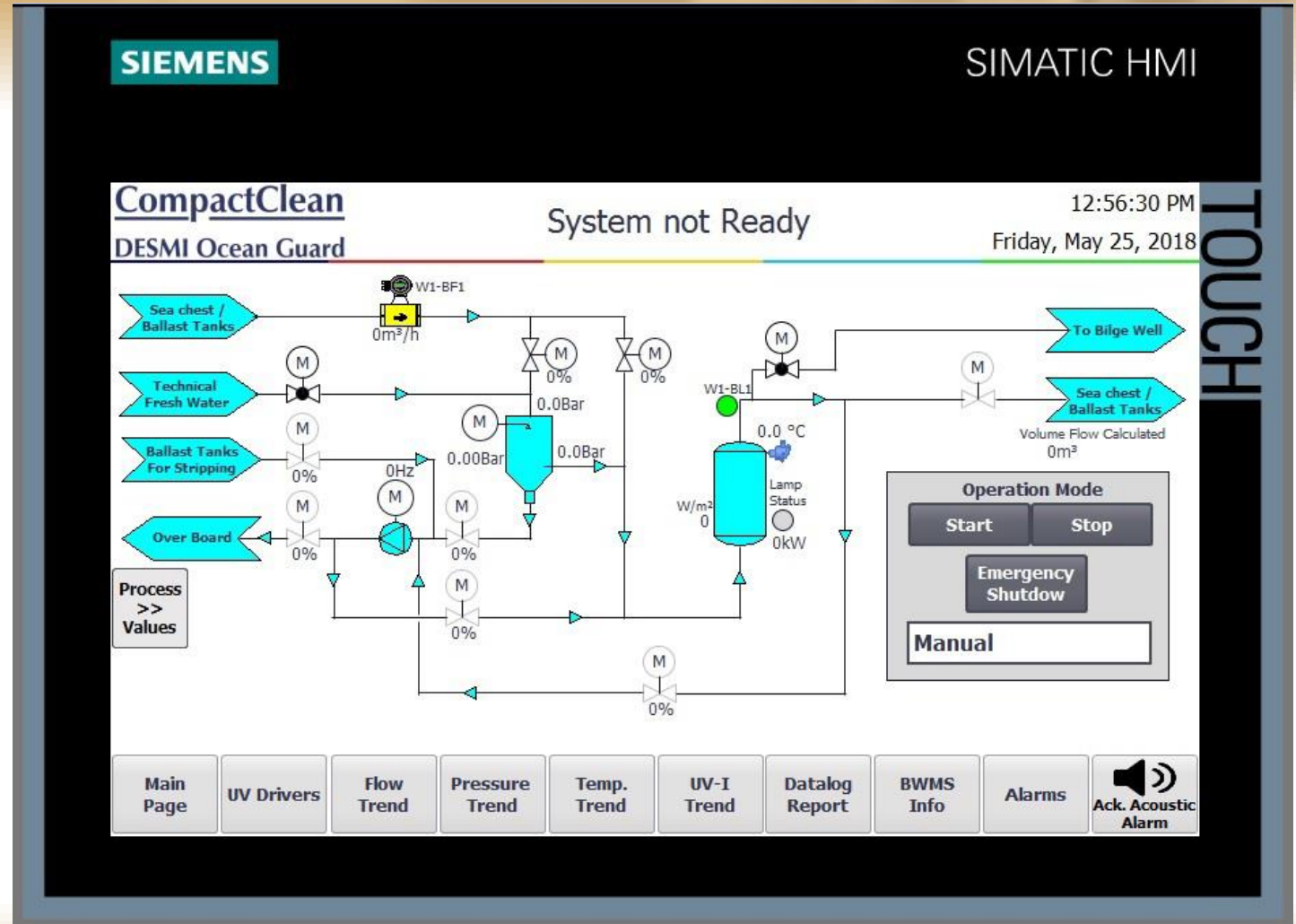
- The size of the panel increases with the system size due to the increased number of lamp drivers.
- The local HMI is housed in the main panel.
- Up to 3 additional HMIs can be added to the system
- HMIs: 2GB system & 2GB Data SD cards



# III. Hardware Description

## Standard Components: Main Cabinet and remote HMIs

- HMI integrated in main panel
- Fully automated operation
- Up to 3 additional HMIs can be added to the system
- Several tabs for:
  - Overview of main operational parameters
  - Active alarms
  - Alarm history
  - UV Drivers information
  - Event log
  - Trend curves
  - Data log
- Automatic generation of pdf reports for authorities
- Options for GPS position logging and Internet Uplink

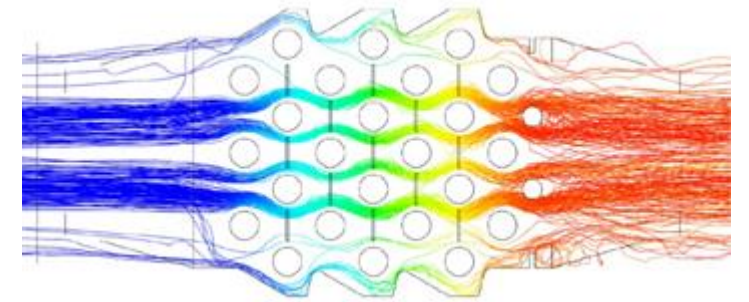
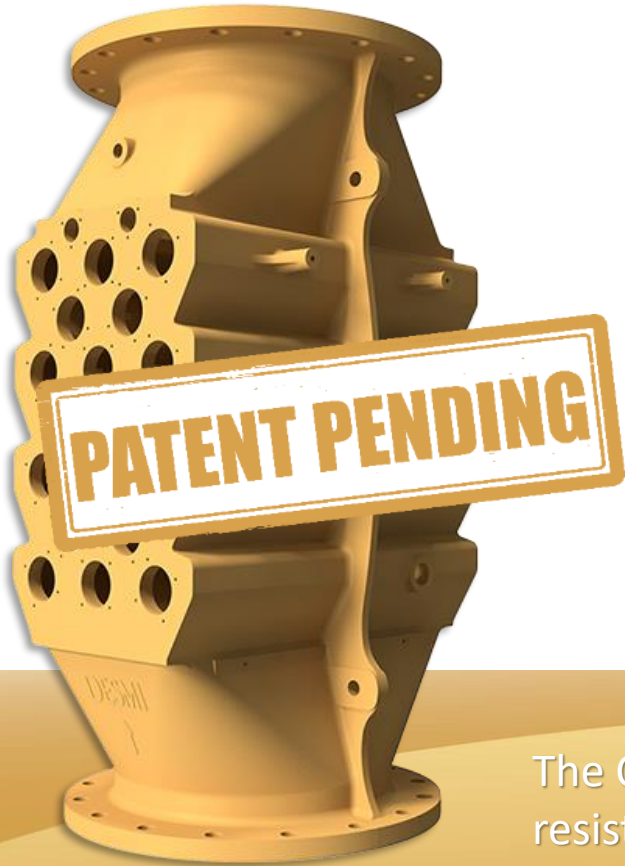


# CompactClean

## UV-Treatment!

- The unique UV unit is designed and manufactured by DESMI.
- The special patent pending shape ensures the highest possible applied UV dose to all organisms in the treated water.
- The special shapes of the CompactClean UV chambers have been developed and optimized to ensure that each kW of generated UV light is utilized to the max, which means that the power consumption is as low as possible, resulting in reduced operational costs!

This enables IMO and USCG compliant management under even very adverse conditions with low UV transmission.

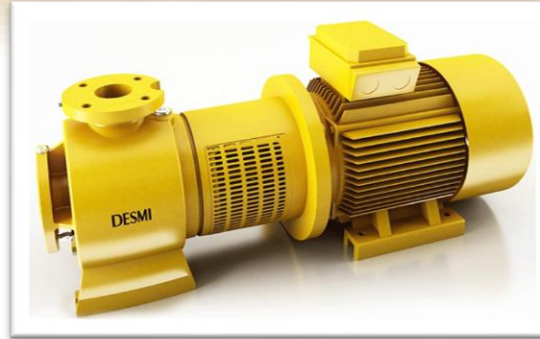


The CompactClean UV units are made of cast Nickel-Alu-Bronze with proven sea-water corrosion resistance. DESMI has decades of good experience with sea water pumps in the same material. Proven Technology keeps the downtime and maintenance costs to a minimum!

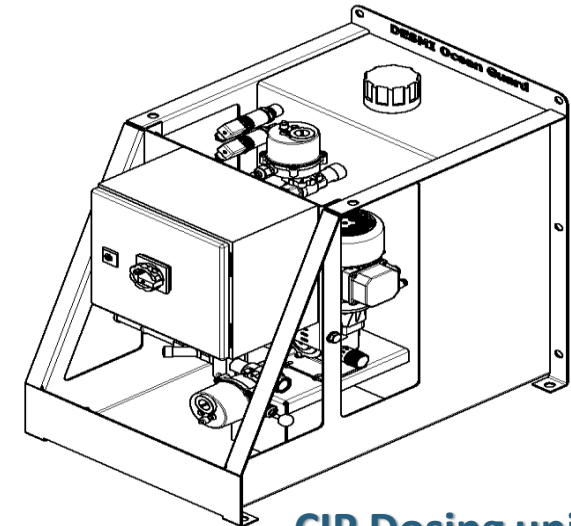
## III. Hardware Description

Standard Components: Backflush / Recirculation / CIP / Stripping(optional) pump

- Since the filter is not used during de-ballast, it is possible to use the same pump for both filter back flushing, Warm up + CIP recirculation and optional stripping purpose.
- By default, the the system has a CIP spool installed on the recirculation pipeline to allow the manual addition of the descaling liquid(citric acid) to the system before starting the CIP operation.



**Backflush Pump**



**CIP Dosing unit**



# IV. Additional Information

The background of the slide is a light beige color. On the right side, there is a faint, semi-transparent image of a person's profile facing left. Overlaid on the brain area of the profile is a diagram of a neural network or brain activity, consisting of several circular nodes connected by thin lines. The overall aesthetic is clean and professional.

# Training

Various ways of getting familiarized with your CompactClean system



## Onboard Training

- ✓ During commissioning of the system or during crew change

## Shorebased Facility Training

- ✓ Fully Operational System available in our shorebased Training facility in Denmark



## CBT – Computer Based Training

- ✓ Offline version available
- ✓ Download and install on your computer
- ✓ Get a detailed run-through of CompactClean
- ✓ System Simulation
- ✓ Be quizzed and become certified user



## Service App

- ✓ Available for download in Google Play store
- ✓ Augmented Reality view of the system
- ✓ Operational Maintenance and Safety Manual (OMSM) available
- ✓ Specialized guides for all system components
- ✓ Service FAQ

# On board Survey, 3D scan and Engineering

Assistance for installation by experienced team of engineers

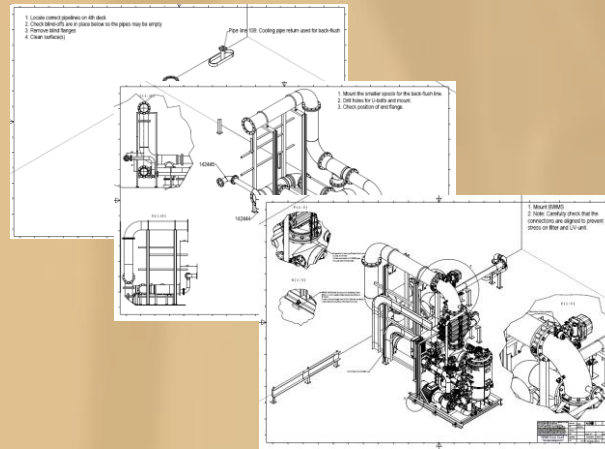
## Feasibility Study

- ✓ Ship inspection
- ✓ Location, space and pipeline, power etc.
- ✓ 3D laser scan
- ✓ Preliminary report



## Engineering Packages

- ✓ Three levels of Engineering
- ✓ Detailed installation drawing, update of PID's and electric diagrams
- ✓ Interfaces with existing CAMS
- ✓ Production drawings of pipespools and material list
- ✓ Output for class



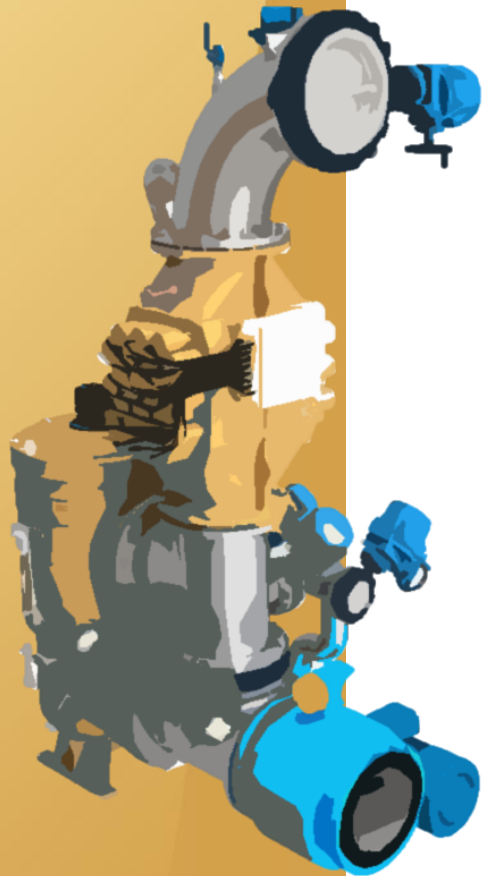
## Review of third party Engineering

- ✓ Comments and recommendations



# CompactClean

## Why CompactClean?



One global operation mode



One of the smallest footprint in industry



100% chemical free treatment



Filter and UV unit in seawater resistant Nickel-Alu-Bronze



Automatic flow control and lamp dimming



Worldwide service network



Fully automated operation



System with integrated stripping solution



Down to UV-Transmission of just 42%



Graphic HMI touchscreen interface



Automatic generation of pdf reports to authorities

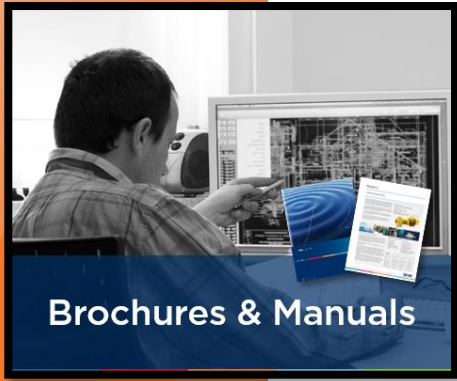


Patent pending highly efficient UV unit design



Easy maintenance





# Find Brochures, Manuals and much more at DESMI.com



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Locate more information about DESMI at our website or at one of our social medias.







# Questions & Answers

Thank You for Your Time  
– We are Ready to Serve You!