



DESMI Ocean Guard CompactClean
Ballast Water Management System

PROVEN TECHNOLOGY

DESMI

CompactClean

The Most Compact Ballast Water Management System on the Market!

DESMI Ocean Guard A/S is part of the DESMI Group, which was founded in 1834 by Henning Smith and is one of Denmark's oldest companies.

For decades DESMI has developed, sold and manufactured pumps for marine applications and today many DESMI pumps are used and installed on board ships all over the world.

The DESMI Group portfolio includes pumps, oil spill response solutions, pumping solutions for defence applications, energy saving systems, automation and contracting activities next to ballast water management systems.

The Smallest Footprints Ever!

Are you looking for a ballast water management system that can be **installed easily** and without relocating other equipment? CompactClean is the answer! Almost as easy as **plug and play!** It is the first ballast water management systems on the market that combines very low space with large flow rates. Only 3.0 m² / 30 sqft is necessary for a 1000 m³/h / 4403 gpm system + 0.84 m² / 9 sqft for the electrical panel, which can however be placed up to 100 m / 328 ft away from the system itself.

The operation of the system is based purely on mechanical treatment and therefore it **does not involve any use of chemicals** or active substances. This eliminates risks of hazards to crew, vessel or the environment.

First treatment step is filtration, second step is UV treatment. During de-ballasting, UV treatment is repeated, but the filtration step is skipped.

- ✓ The smallest footprint in industry
- ✓ Only system in the world with integrated stripping solution
- ✓ Filter and UV unit in seawater resistant Nickel-Alu-Bronze
- ✓ Automatic flow control and lamp dimming
- ✓ Worldwide service network
- ✓ Fully automated operation
- ✓ 2 hours' holding time on USCG TA Certificate
- ✓ IMO type approval according to the new BWMS code from IMO
- ✓ Operational without add-ons
- ✓ Graphic HMI touchscreen interface
- ✓ Automatic generation of PDF reports to authorities
- ✓ Patent pending highly efficient UV unit design
- ✓ Short delivery time
- ✓ Easy maintenance
- ✓ No salinity or temperature limitations
- ✓ Down to UV transmission of just 42% - Also in US Territory!
- ✓ 100% chemical free treatment



CompactClean has **no salinity or temperature limitations**. The CompactClean BWMS has both IMO and USCG type approval, and the BWMS operates in the exact same way both inside and outside US Territory at record-breaking low UV transmission values! This enables compliant performance anywhere in the world in even very dirty and

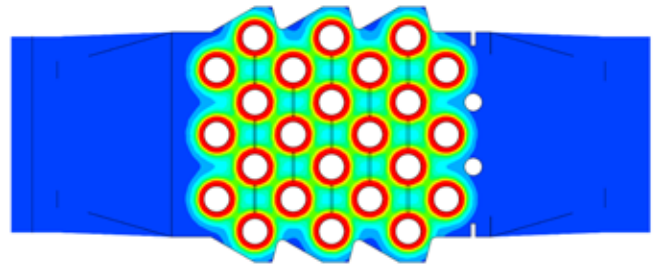
challenging water conditions. This superior performance comes from the unique and patent pending shape of the UV chamber, which has been carefully developed and optimised through hundreds of state-of-the-art CFD (Computational Fluid Dynamics) simulations.

New System Special Features

Smooth Port Operations

Automatic adjustment of treatment in order to cope with extremely challenging water, avoiding alarms and interrupted port operations in dirty and challenging water conditions.

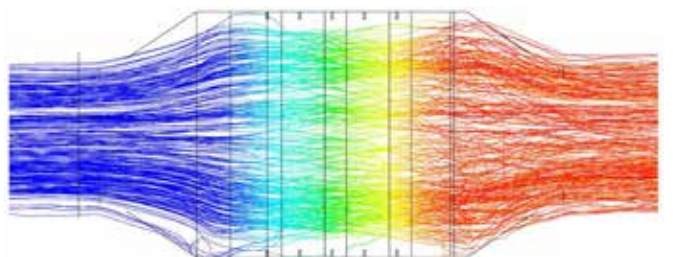
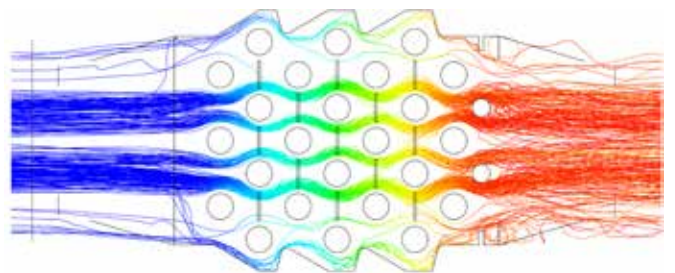
CompactClean does not just raise an “out of compliance” warning in very dirty water conditions as some other systems. Instead, CompactClean automatically reduces flow through the system to ensure compliant treatment even under extreme conditions. This enables the vessel to carry on with its port operations instead of forcing the vessel to interrupt the ballast water discharge and you will save costs relating to delays in harbour.



High Efficiency Keeps your OPEX Down

Patent pending UV unit design with very high treatment efficiency reduces the power consumption.

The special shapes of the CompactClean UV chambers have been developed and optimised on the basis of hundreds of state-of-the-art CFD simulations. This ensures 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!



Easy Reporting to Authorities

Automatic generation of PDF report to authorities, documenting the performed treatment

With the IMO convention in force, vessel owners will experience increasing demands from authorities for documentation of performed ballast water management. Therefore, CompactClean features automatic generation of PDF reports that document the ballast water operations performed, including key parameters monitored during the treatment. The PDF files are automatically stored and can be transferred to a USB memory stick when inserted into the front of the electrical panel.



Integrated and Compliant Solution for Ballast Stripping Operations

The CompactClean filter backflush pump can be used as stripping pump during stripping of ballast tanks.

Use of ejectors for stripping of ballast tanks jeopardizes compliance with the IMO and USCG discharge standards, because untreated drive water is mixed with treated ballast water. In addition, the untreated drive water can introduce significant wear and tear of the system components. As the only system in the world, CompactClean solves this, as the system is fitted with a special filter back-flush pump that can be used as dedicated stripping pump during de-ballasting. One system, one pump: two problems solved!

Fully Automated with Easy Integration into Ship Automation System

CompactClean is PLC controlled and supports all generally used main types of communication interfaces.

With CompactClean the crew on board the vessel will hardly notice that they are treating the ballast water. The system is fully automatic and can be seamlessly integrated with already existing systems on the vessel. When wanting to take ballast water on board, press the "Start Ballast" button on the touch screen, and when discharging the ballast water press the "Start De-ballast" button on the touch screen. That's how simple it should be - that's how simple it is!

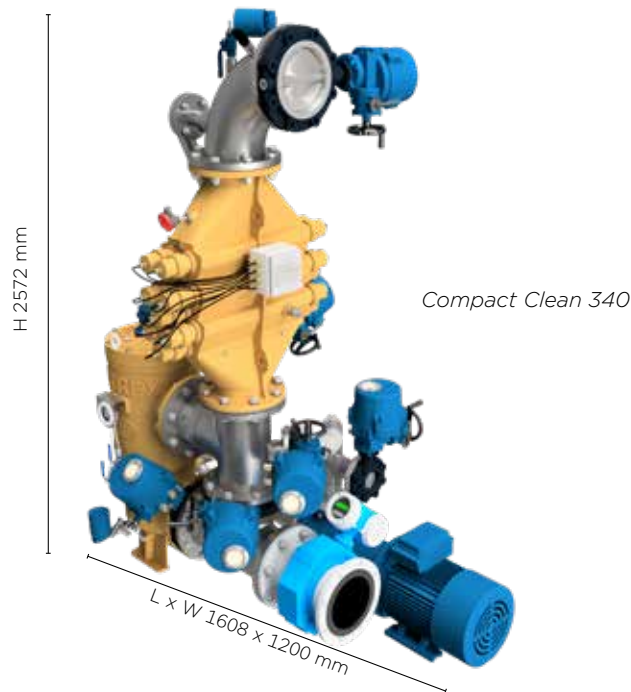
Long Lifetime of Components Gives you Reliable Treatment and Low OPEX

UV unit made of Nickel-Alu-Bronze material with superior corrosion resistance and proven very long lifetime.

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!



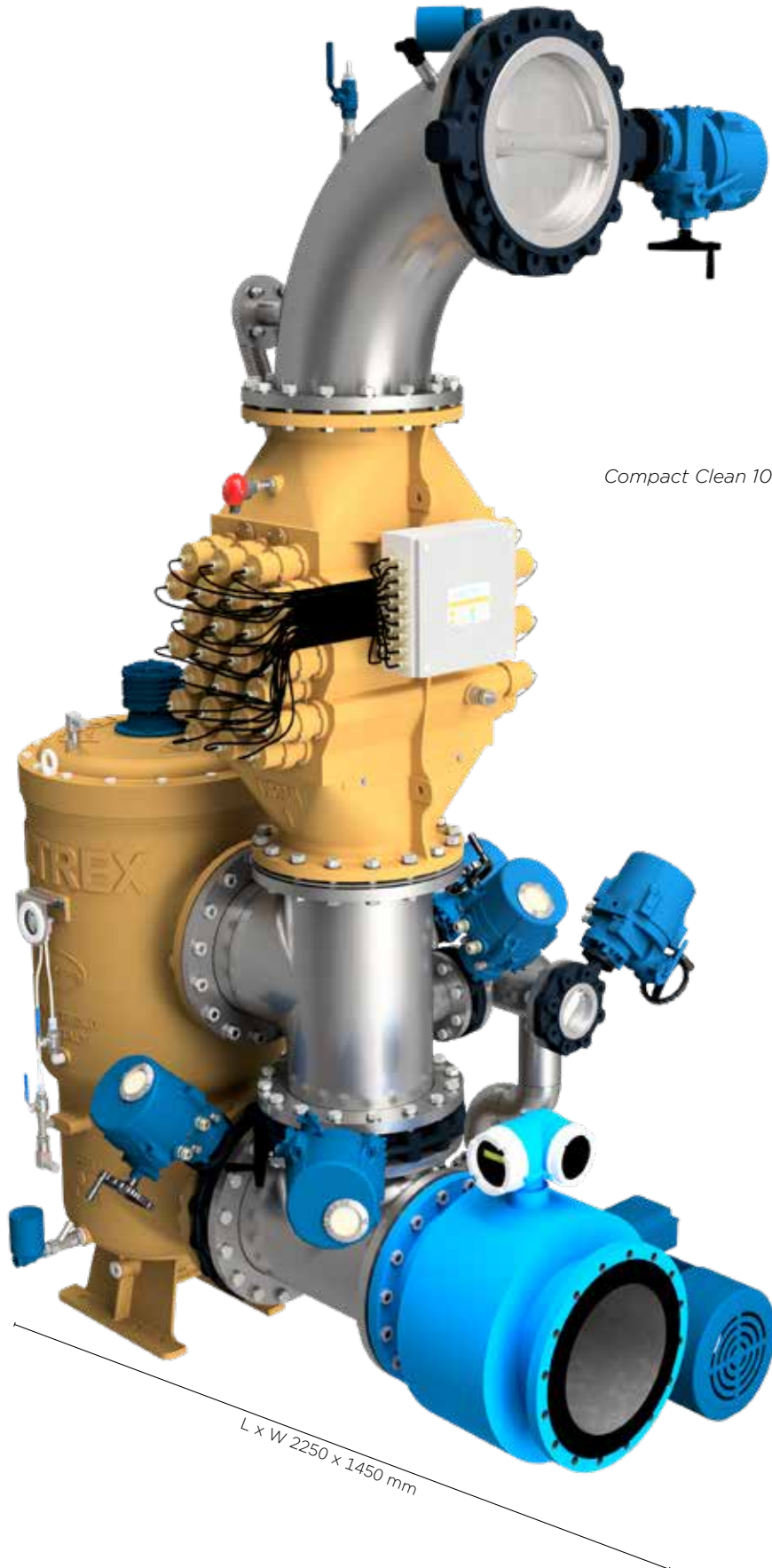
Standard Systems



Description	CC-135	CC-340	CC-500	CC-750	CC-1000	CC-1500	CC-2000	CC-2500	CC-3000
Max. capacity	135 m ³ /h, 595 gpm	340 m ³ /h 1498 gpm	500 m ³ /h 2201 gpm	750 m ³ /h, 3302 gpm	1000 m ³ /h, 4403 gpm	1500 m ³ /h, 6604 gpm	2000 m ³ /h, 8806 gpm	2500 m ³ /h, 11007 gpm	3000 m ³ /h, 13209
Min. capacity ballast operation	25 m ³ /h, 110 gpm	45 m ³ /h, 198 gpm	50 m ³ /h 220 gpm	65 m ³ /h, 286 gpm	95 m ³ /h, 418 gpm	126 m ³ /h, 555 gpm	126 m ³ /h, 555 gpm	126 m ³ /h, 555 gpm	126 m ³ /h, 555 gpm
Min. capacity deballast and stripping operation	5 m ³ /h, 22 gpm	9 m ³ /h, 39 gpm	13 m ³ /h, 57 gpm	19 m ³ /h, 84 gpm	26 m ³ /h, 114 gpm	38 m ³ /h, 167 gpm	52 m ³ /h, 229 gpm	64 m ³ /h, 282 gpm	76 m ³ /h, 335 gpm
Installed power	36 kW	78 kW	93 kW	131 kW	169 kW	245 kW	319 kW	395 kW	471 kW
Min. power	6 kW	11.5 kW	16.5 kW	24.6 kW	32 kW	48 kW	64 kW	80 kW	96 kW
Typical average power consumption	13 kW	25 kW	37 kW	55 kW	73 kW	109 kW	146 kW	182 kW	218 kW
Footprint (L x W x H)	1595x1125 x2035 mm, 63x44x80 in - 1.8 m ² , 19.3 sqft	1602 x 1232 x 2392 mm, 63x48x94 in - 2.0 m ² , 21.5 sq ft	1807 x 1295 x 2614 mm, 71x51x103 in - 2.4 m ² 25.8 sq ft	2072 x 1364 x 3115 mm, 82x54x123 in - 2.9 m ² 31.2 sq ft	2067 x 1469 x 3389 mm, 81x58x133 in - 3.0 m ² 32.3 sq ft	2419 x 1557 x 3746 mm, 95x61x147 in - 3.8 m ² 40.9 sq ft	- - 6.0 m ² , 64.6 sq ft	- - 7.3 m ² , 78.6 sq ft	- - 7.5 m ² , 80.7 sq ft
Electrical Panel* (W x L x H) *Two (2) Electrical Panel for CC-2000, 2500 & 3000	600 x 600 x 1,806 mm, 24x24x71 in - 0.36 m ² 3.9 sqft	600 x 600 x 1,806 mm, 24x24x71 in - 0.36 m ² 3.9 sqft	600 x 700 x 2208 mm 24x28x87 in - 0.42 m ² 4.5 sqft	600 x 1200 x 1803 mm, 24x47x71 in - 0.72 m ² 7.8 sqft	700 x 1200 x 2208 mm, 28x47x87 in - 0.84 m ² 9.0 sqft	700 x 1200 x 2208 mm, 28x47x87 in - 0.84 m ² 9.0 sqft	- - 2 x 0.84 m ² , 2 x 9.0 sq ft	- - 2 x 0.84 m ² , 2 x 9.0 sq ft	- - 2 x 0.84 m ² , 2 x 9.0 sq ft
Backflush/stripping pump capacity	7 - 25 m ³ /h	45 - 90 m ³ /h	45 - 90 m ³ /h	45 - 90 m ³ /h	90 - 130 m ³ /h	90 - 130 m ³ /h			

Many Sizes - for Your Specific Need

H 3485 mm



Compact Clean 1000

L x W 2250 x 1450 mm



Manufactured
by DESMI

UV Transmission

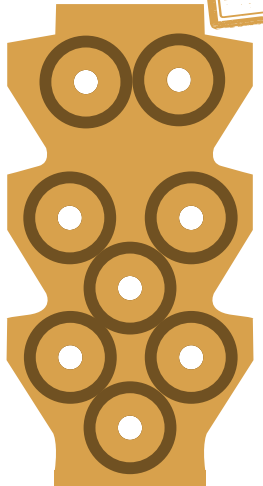
The unique UV unit is designed and manufactured by DESMI. The special patent pending shape ensures the highest possible applied UV dose to all organisms in the treated water.

The CompactClean UV unit is delivered in 6 sizes with max. flow rate from 135 m³/h / 595 gpm to 1500 m³/h / 6604 gpm. Systems with flow ranges up to 3000 m³/h / 13209 gpm can be delivered by installing two UV-units in parallel.

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

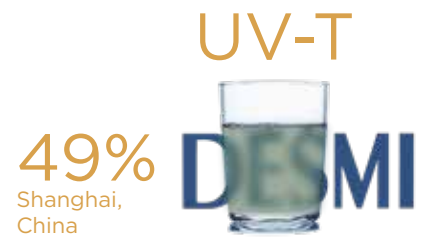


UV unit for 750 m³/h,
3302 gpm



UV unit for 340 m³/h,
1498 gpm

Selecting the Right Ballast Water Management System



What is UV transmission?

UV-T is a measure of the capability of UV light to penetrate water. When the UV-T is high, close to 100%, the water is very clear and the UV light can penetrate deep into the water. On the other hand, when the UV-T is low, the water is very unclear and the UV light can only penetrate a limited distance into the water.

Clearly, the UV-T of the water to be treated is of utmost importance. To kill or render an organism nonviable, a certain UV dose is required, and the applied UV dose is directly proportional with the UV intensity. Therefore, when the UV-T is low, significantly more UV power is needed to treat the water according to the required discharge standards.

Limitations of Ballast Water Management Systems

It should be acknowledged that all BWMS have limitations. Typically, chemical systems (e.g. electro-chlorination) have limitations related to the salinity of the water to be treated, its temperature or the amount of organic material contained in the water; whereas UV based BWMS have limitations with regard to the UV transmission of the water to be treated. In other words, all BWMS have special circumstances under which they cannot be expected to treat the water according to the IMO and USCG discharge standard. The trick for the ship owner is to select a BWMS that will work under normal operational conditions.

UV transmission of Ballast Water

The UV-T found in different ports around the world varies significantly. Some ports are located at river estuaries, which means that the water in the port is fresh water containing high amounts of sediments, organic particles and dissolved organic compounds. This makes the UV-T very low. Other ports are located on islands in the middle of an ocean, and here the UV-T is typically high. In the same port the UV-T can vary from day to day depending on tide, weather (rain and strong wind), and season.

Port	UV-T
Istanbul, Turkey	95%
San Pedro, CA, USA	95%
Vera Cruz, Mexico	94%
Halifax, NS, Canada	94%
Rotterdam, Netherlands	93%
Port of Singapore	93%
Skagen, Denmark	92%
Brisbane, Australia	92%
Porto Grande, Cape Verde	92%
Wallhamn, Sweden	91%
Houghton, MI, USA	91%
Melbourne, Australia	87%
Erie, PA, USA	87%
Zeebrugge, Belgium	85%
Gothenburg, Sweden	85%
Charleston, SC, USA	84%
Tanjung Pelepas, Malaysia	83%
Baltimore, MD, USA	83%
Hong Kong, China	80%
Houston, TX, USA	74%
Hamburg, Germany	69%
Antwerp, Belgium	66%
Bremerhaven, Germany	60%
Shanghai, China*	55%
New Orleans, USA	54%
Lisbon, Portugal*	53%
Brunswick, GA, USA	51%
Southampton, England	51%
Shanghai, China*	49%
Lisbon, Portugal*	41%

* In the same port the UV-T can vary from day to day depending on tide, weather (rain and strong wind), and season.
Source: DHI & DESMI Ocean Guard

Type Approvals

The CompactClean BWMS has IMO, USCG and Lloyds Register type approval, and the BWMS operates in the exact same way both inside and outside US Territory.

Same operating mode all over the world

The CompactClean system does not need a special US operation mode to meet the USCG requirements in US territory. With just one operation mode used globally, there is no need for knowing the de-ballast location at the time of ballast uptake, in order to determine if the BWMS should be operated in IMO or US mode. Likewise, there are no issues related to mixing IMO and USCG treated ballast water when water is treated in one mode during ballast operation, but then pumped to a tank with remains of water treated in another mode. Mixing of ballast water treated in different modes is also a concern when water is moved internally from tank to tank during a voyage to compensate for consumed fuel. All these issues represent serious complications to the ship operator when using BWMS that must be switched to one operation mode in US and another in the rest of the world. With CompactClean this issue has been solved.



Lloyd's Register

Type Approval Certificate of Ballast Water Management System

This is to certify that the Ballast Water Management System listed below has been examined and tested in accordance with the requirements of the specifications contained in the Code for Approval of Ballast Water Management Systems (MEPC.300(7)). This certificate is valid only for Ballast Water Management systems referred to below on behalf of the Environmental Protection Agency and Danish Maritime Authority, dated 21 September 2019.

This certificate is issued to:	DESAMI OCEAN GUARD A/S
Product:	Lufthavnvej 12 DK-8400 Næstved Denmark
Address:	
Ballast Water Management System supplied:	DESAMI OCEAN GUARD - CompactClean
Under type and model designation and incorporating:	CompactClean CC-30, CompactClean CC-40, CompactClean CC-46, CompactClean CC-150, CompactClean CC-190, CompactClean CC-200, CompactClean CC-300, CompactClean CC-3000, CompactClean CC-3000 CompactClean CC-1000, CompactClean CC-1000, CompactClean CC-3000 CompactClean CC-1000 and CompactClean CC-3000
Ballast Water Management System manufactured by:	DESAMI OCEAN GUARD A/S
To equipment/assembly drawing No.:	67028 - PAID Piping and Instrumentation Diagram Date: 21 September 2019 CompactCleanTM BWMS 35-1500 m ³ /h 67029 - PAID Piping and Instrumentation Diagram Date: 21 September 2019 CompactCleanTM BWMS 2000-3000 m ³ /h
Other equipment manufactured by:	Item: Automatic Self-Cleaning Backwashing Filter Date: 09 July 2019 18857 - ACS (MDE) m ³ /h
To equipment/assembly drawing No.:	35 to 3000
Treatment Rated Capacity:	

A copy of this Type Approval Certificate should be carried on board a vessel fitted with the Ballast Water Management System at all times. A reference to the test protocol and a copy of the test results should be available for inspection on the vessel. If the Type Approval Certificate is issued based on approval by another Administration, reference to that Administration should be made.

Limiting Operating Conditions imposed as described in the Design Approval Document forms part of this Type Approval Certificate.

This certificate remains valid up to the expiry date unless cancelled or revoked, or until such date when it is found that the requirements of the Marine Equipment Directive whatsoever in the annex, provided the conditions in the schedule are complied with and the equipment remains satisfactory in service.

Date of issue:	21 September 2019	Expiry date:	21 September 2023
Certificate No.:	CPN0700106	Signed:	[Signature]
Sheet No.:	1 of 9	Name:	Søren Skjerve Senior Specialist to Lloyd's Register EMEA a subsidiary of the Lloyd's Register Group

Note: This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the equipment tested. The manufacturer should notify the nominated body named on this certificate of any modifications or changes to the equipment in order to obtain a valid Certificate.

This certificate is issued under the authority of the Environmental Protection Agency and Danish Maritime Authority, and is valid for the use of ships using ballast water and on ballast water management plans and ballast records.

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this document as the "Lloyd's Register". Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or by any other act, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

**U. S. Department of Homeland Security
United States Coast Guard
Certificate of Approval**

Expires: 16 April 2024

Coast Guard Approval Number: 162.060/17/1

BALLAST WATER MANAGEMENT SYSTEM
Filtration/Ultraviolet

DESMI Ocean Guard A/S
Lufthavnvej 12
DK - 8400 Næstved DK DENMARK

Name of BWMS: CompactClean

Capacities: 35 - 3,000 m³/h

This is to certify that the above listed BWMS, with the listed treatment capacities, has been satisfactorily examined and tested by Independent Lab Lloyd's Register in accordance with the requirements contained in 46 CFR 162.060. The system shall be installed and operated in accordance with the CompactClean Operation, Maintenance, and Safety Manual (OMSM), Rev. 2, Version 31, dated June 25, 2019.

Operational Limitations:
Salinity: Not Applicable
Water Temperature: Not Applicable
Hold Time: >2 hours
Filter Inlet Pressure: >2 bar
Filter Inlet Flow: >800 W/W2 (at 100% TRC) and >227 W/W2 (at 20% TRC)

The CompactClean "EX" models meet the requirements of 46 CFR 111.105 and may be installed in hazardous locations to which they are certified on a U.S. flag vessel. The main panel and the frequency converter must remain outside of hazardous locations. The BWMS may be installed in hazardous locations to which it is certified on a foreign flag vessel subject to approval of the foreign administration.

The BWMS must be marked in accordance with 46 CFR 162.060-22.

A copy of this Type Approval Certificate shall be carried on board a vessel fitted with the ballast water management system at all times.

This certificate supersedes Approval number 162.060/13 dated April 16, 2019; update approves change to performance claim and hazardous area installation. All equipment manufactured under Approval number 162.060/13 before July 1, 2019 remain approved.

*** End ***

THIS IS TO CERTIFY THAT the above vessel management has submitted to the undersigned satisfactory evidence that the crew specified herein complies with the applicable laws and regulations as outlined on the reverse side of this Certificate, and approval is hereby given. This approval shall be in effect until the expiration date herein unless notice is received to the contrary.

GIVEN UNDER MY HAND THIS 01st DAY OF JULY 2019, AT WASHINGTON, D.C.

[Signature]

J.J. MIN
Chief, Engineering Division
BY DIRECTION OF THE COMMANDANT

DEPT. OF HOMELAND SECURITY, USCG, CGH-16030
(REV. 3-03)

Safety on Board any ship - Including Oil and Chemical Tankers

The CompactClean BWMS is available in an ATEX and IECEx certified version, making installation in hazardous zones onboard oil, chemical or gas tankers possible. The EX certification notation is:

Ex II 2G Ex IIB T4 Gb



and is based on the following components:

- UV sensor: Ex ia
- Temperature: Ex ia
- Pressure: Ex ia
- Water level: Ex ia
- Junction Box: Ex d
- Valves: Ex d
- Motors: Ex d
- UV lamp assembly: Ex d
- Pumps (mechanical ATEX approval)
- Flow meter: Ex d ia [ia]

DESMI guarantees a distance of up to 100 m / 328 ft between the main panel and the Ballast Water Management System.

Safe Zone



**Hazardous Zone
(zone 1)**

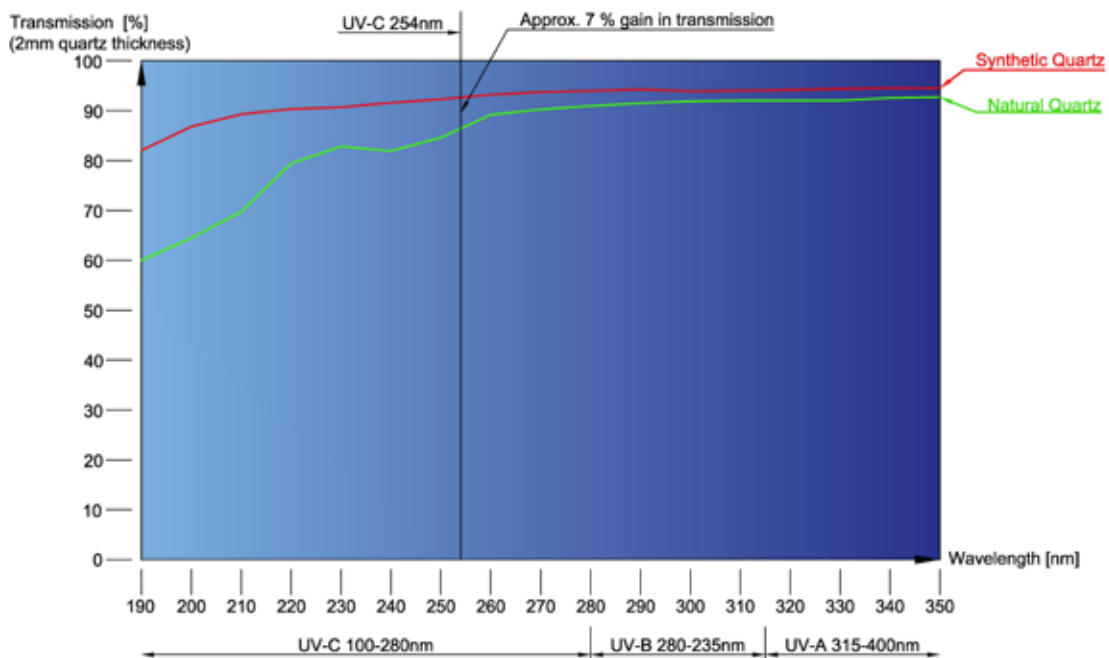


High UV Efficiency

The medium-pressure UV lamps in the reactor employ specially designed lamp tubes of synthetic quartz.

Combined with the reactor's internal design, this ensures optimal UV dosage and high efficiency.

The synthetic quartz tubes support transmission of a broader wavelength spectrum and provide more UV light during disinfection.



The System is Delivered with a Standard Electrical Panel. Additional Remote HMI Screen on e.g. Bridge or in Engine Control Room can be Added

The BWMS is delivered with a main panel that can be placed in any convenient place. The main panel is equipped with an HMI screen, from which the system is controlled and alarms are visualized.

All operations can be done from a secondary screen in the deck control office or on the bridge, if option for installing remote control screens is used.

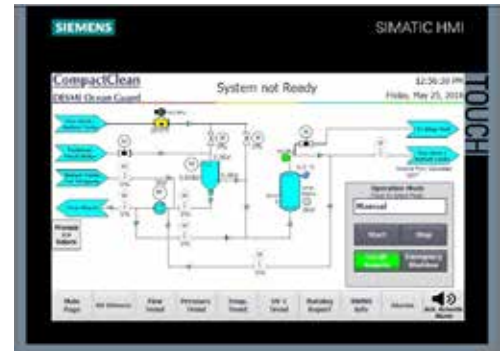
Standard fully automated operating modes for treatment are:

- Ballast
- De-Ballast
- Stripping

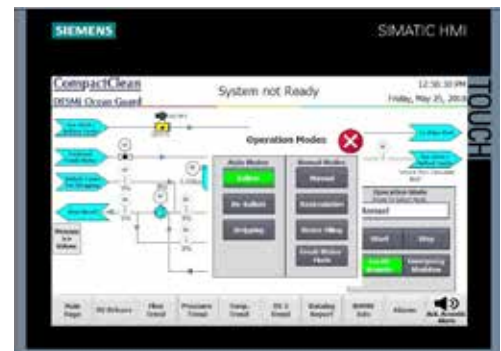
Other automated modes which can be selected are:

- Water Filling
- Recirculation

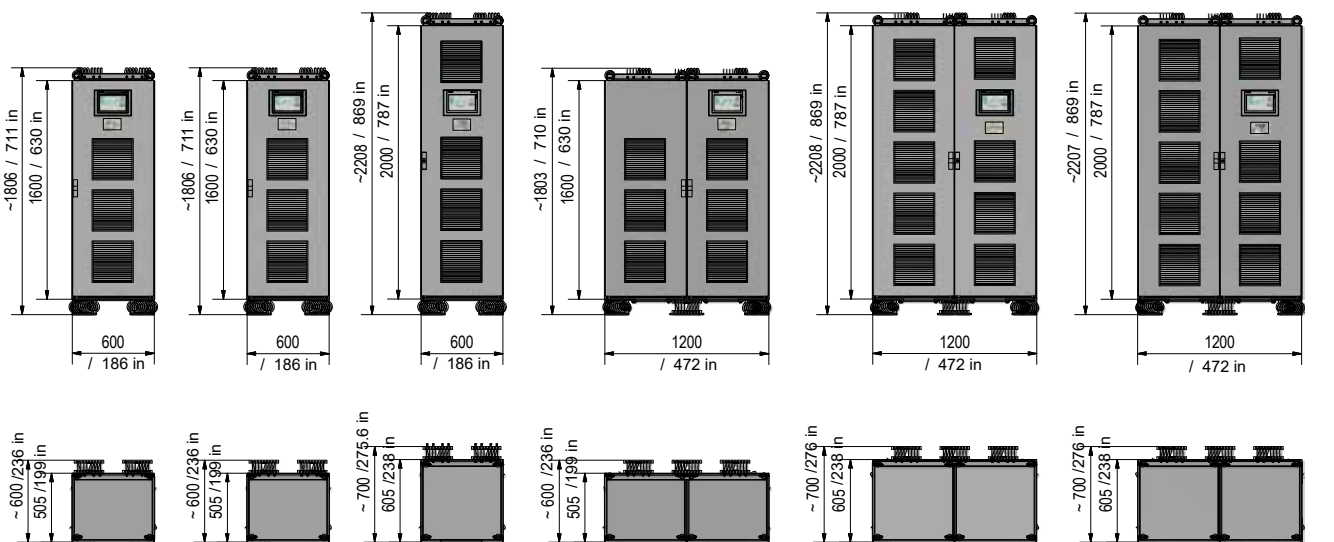
On the HMI screen, the operator can switch between several screen views (main page, active alarms, alarm history, PI-D page and UV drivers) to display all relevant information. During operation, the status of all components and sensors can be monitored, and operational values such as flow, pressure, temperature and UV intensity can be viewed instantaneously; and trend curves can be displayed to see the development over time.



Main page



PI-D page



441399
MAIN PANEL 135
WEIGHT: 240 kg / 573 lbs

441400
MAIN PANEL 340
WEIGHT: 260 kg / 573 lbs

441401
MAIN PANEL 500
WEIGHT: 332 kg / 732 lbs

441402
MAIN PANEL 750
WEIGHT: 570 kg / 1256.6 lbs

441403
MAIN PANEL 1000
WEIGHT: 650 kg / 1433 lbs

441404
MAIN PANEL 1500
WEIGHT: 760 kg / 1674.5 lbs

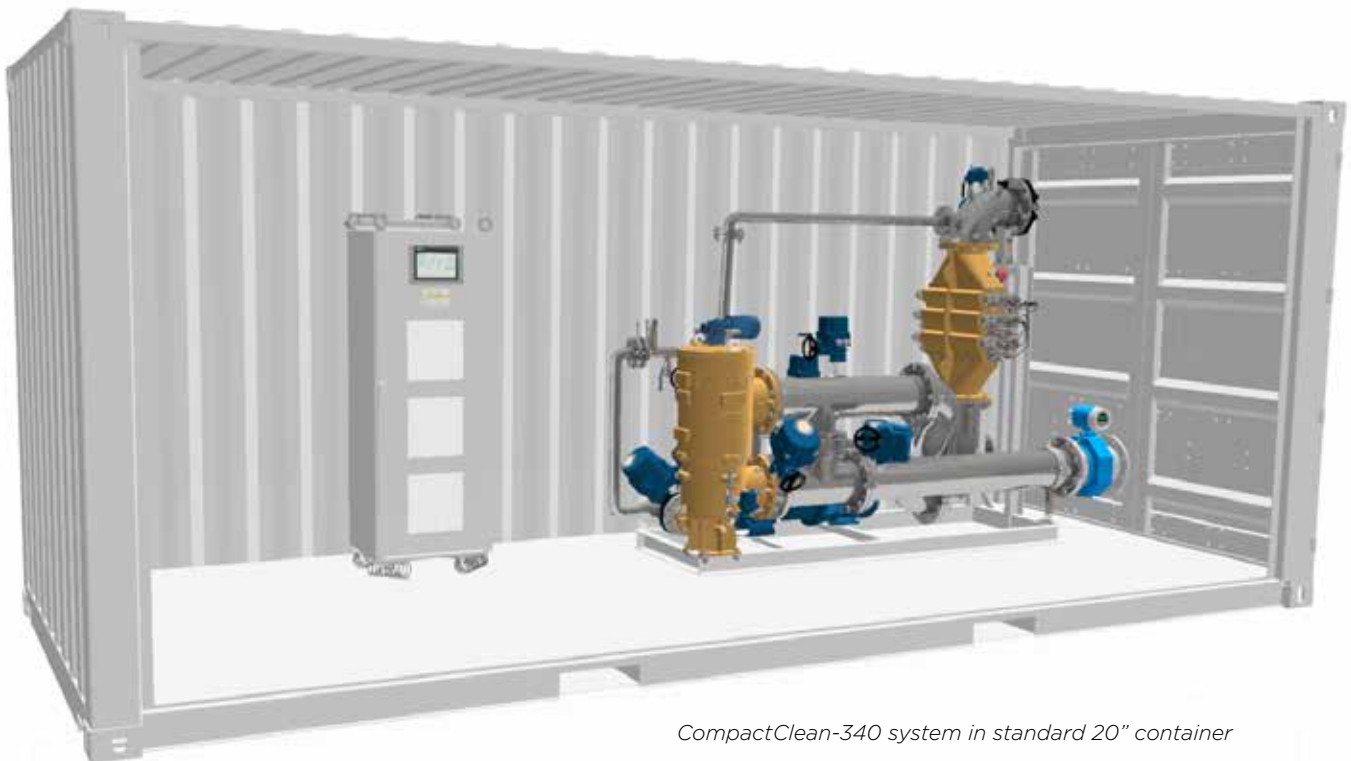
System Configurations

Our systems can be delivered as **loose components, skid-mounted** or **containerized**.

Loose components mean that the system will be assembled on board the vessel, and this is often necessary for retrofit projects or installation of large systems.

We often deliver **skid-mounted systems** as they are the optimum solution for new buildings and small to medium-size systems.

Complete **containerized systems** are a third option, which is used for retrofit on container vessels or on the deck of tankers with no space available elsewhere. Containerized systems can also be used as port-based systems for treatment of ballast water from a ship without a BWMS installed, or a malfunctioning BWMS.



CompactClean-340 system in standard 20" container

System Delivery, Components Delivery & Containerized Delivery



Electrical Panel



UV-unit



Filter



Loose Component Delivery
Product pictures are not scalable



Frequency Converter



Stripping Pump



Skidmounted delivery

Easy
installation
on board
ships



Training Packages

DESMI Ocean Guard offers various training packages for CompactClean Ballast Water Management Systems. It is of utmost importance that the crew has been familiarized with the system and has sufficient knowledge to operate and maintain the system - this ensures problem-free ballast operations.

The training can be tailored to specific needs and is available as on board training modules or at our shore training facilities. Finally, our CBT (Computer Based Training) program is available as online modules.

Various Training Packages

- ✓ On board Training, Crew change and Commissioning
- ✓ DESMI Training Facility
- ✓ CBT - Computer Based Training (e-learning)



We Offer Our Services Throughout the Projects

Besides our products we also offer complete engineering including ship inspection, 3D laser scanning, preparation of drawings and if needed we can offer prefabrication of piping, installation and commissioning plus service agreements where we take care of keeping your ballast water management systems running flawlessly.

Engineering package

The engineering package includes finding space for and integrating our CompactClean™ BWMS on your vessel. This includes ship inspection, development of 3D CAD drawings and generation of production drawings.

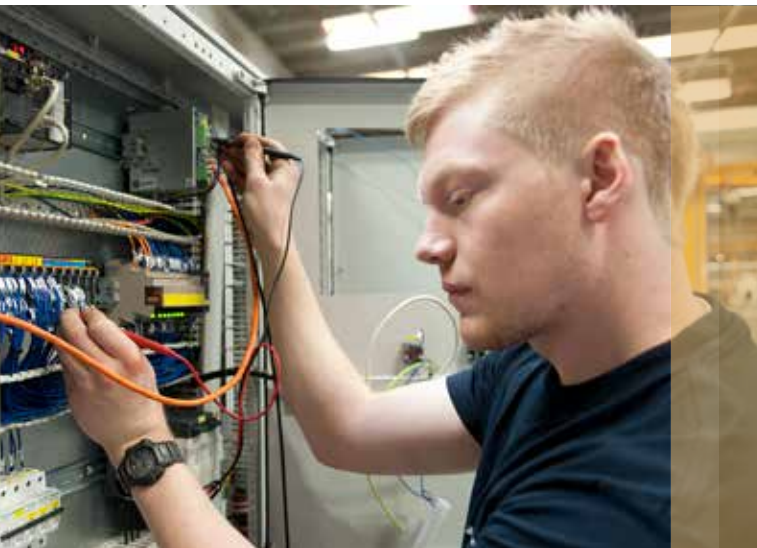
Phase 1: Scanning, processing and producing a 3D as built environment

- Work preparation

- Measuring on board (3D laser scanning, 1 day)
- Inspection of possible locations for installation of equipment
- Check tie-in location into existing piping
- Check wire routings, cable penetrations, available space for additional breakers in main switchboard
- Check for structural modifications in case required
- Processing of laser scans after shipboard visit

Phase 2: Engineering

- Concept model of proposed system, modeled in the available space. Delivered as screenshots in a .pdf file.
- First proposal of possible lay-out and installation
- Update ballast water diagram to new situation



Our BWMS Services

- ✓ Ship Inspections
- ✓ Engineering
- ✓ Delivery of systems
- ✓ Installation and commissioning
- ✓ Service Agreements

Phase 3: After approval of location of the treatment system by Client:

- Preparation of documents for Class approval
- Material specification of piping and valves
- Updated ballast water diagram with treatment system included
- Updated Load Balance
- Updated Single Line diagram
- Additional Class requirements will be discussed on case by case basis

- Routing of piping
- Isometric drawings for fabrication of piping including material specification
- Production drawings for all necessary foundations
- Overview drawings for installation
- Part lists of all materials needed for the installation but outside the scope of supply of the CompactClean system, including cable lists, valves, bolts, nuts, gaskets, pipe supports.
- Installation guide with instructions.



Contract for Supply of CompactClean Ballast Water Management Systems (BWMS) to the Entire Fleet of Turkish Shipowner MISHA Shipping.

MISHA Shipping is a privately held Turkish company with both shipping and shipyard activities. The vessels are shallow-draft dry cargo vessels primarily designed for operations in Russian inland waters, Black Sea and Mediterranean ports, as well as a new generation of sea-river vessels optimized for navigation in Volga and Don channels and unrestricted navigation at sea.

MISHA shipping went through a thorough selection process before the CompactClean system was chosen. Some of the reasons presented are:

"Initially we have studied pros and cons between UV systems and Electrochlorination systems and ended up with UV types which do not have any salinity or temperature limitations since our fleet sails into rivers and icy waters."



Reliability of the maker: ... Having more than 180 years of history, we rely on DESMI to be in the market also in the future.

One of the features of DESMI's CompactClean system that we really like is the dry-running protection backed up with a recirculation system by the back flush pump which comes standard and can also be used as a stripping pump during stripping of ballast tanks.

We found DESMI's CompactClean system having one of the smallest foot print in the market, fits perfectly into our crowded engine rooms".

The contract includes delivery of 10 CompactClean BWMS in sizes from 340 to 750 m³/h.



CompactClean Installation on Board PROVIDANA

The 1000 m³/h / 4403 gpm installation of DESMI Ocean Guard's CompactClean system was conducted in Chengxi Shipyard on the vessel Providana owned by Masterbulk Pte Ltd.

The installation was a full integration of the system, which included:

- A full 1000 m³/h / 4403 gpm CompactClean ballast water management system
- An additional valve package and control system
- Frequency converters on the ballast water pumps
- Deck office operative system
- Internet uplink system



Kevin Leach-Smith, Vice President, Operations, Masterbulk Pte Ltd:

"We chose DESMI's CompactClean system because of the very small footprint and our trust in DESMI as a well-established supplier of marine equipment."

"An installation like this is a large project and requires good cooperation between the owner, technical manager, shipyard and system supplier. All parties did a professional job in making this BWMS installation a smooth and efficient process."

Ship's name	MV "PROVIDANA"
Ship type	General cargo/Container Carrier/(DNV) I.D. no.26604
IMO number	9380788
Built	OSHIMA Shipbuilding Co.,Ltd.-Japan / Ship Hull No.10508
Flag	Singapore
LOA	212.5 metres / 697 feet
GT	39,258 MT
DWT	54,810 MT
Ballast cap.	17,833 MT

Your DESMI Ocean Guard Contact for Ballast Water Management Systems

DESMI offices:

Africa

DESMI Africa Ltd.
Tel.: +255 222 600014

Canada

DESMI Inc.
Tel.: +1 905 321 3471

China

DESMI Pumping Technology (Suzhou) Co., Ltd.
Tel.: +86 512 6274 0400

DESMI Pumping Technology (Suzhou) Co., Ltd.
Shanghai Liaison Office
Tel.: +86 21 6071 06 00-05, 6071 06 07-13

DESMI Pumping Technology (Suzhou) Co., Ltd.
Tianjin Liaison Office
Tel.: +86 22 2317 0467

DESMI Pumping Technology (Suzhou) Co., Ltd.
Guangzhou Liaison Office
Tel.: +86 20 2831 3973

DESMI Pumping Technology (Suzhou) Co., Ltd.
Chongqing Liaison Office
Tel.: +86 23 8823 3518

DESMI Pumping Technology (Xuancheng) Co., Ltd.
Tel.: +86 563 2612 570

Denmark

DESMI A/S - Group Head Quarter
Tagholm 1
DK-9400 Nørresundby
Tel.: +45 96 32 81 11

DESMI Pumping Technology A/S
Tel.: +45 96 32 81 11

DESMI Danmark A/S
Tel.: +45 72 44 02 50

DESMI Contracting A/S
Tel.: +45 96 32 81 11

DESMI Ro-Clean A/S
Tel.: +45 65 48 16 10

DESMI Ocean Guard A/S
Tel.: +45 96 32 81 99

Ecuador

DESMI Latinoamerica S.A.
Tel.: +593 2 326 1939

France

DESMI SARL
Tel.: +33 130 439 710

Germany

DESMI GmbH
Tel.: +49 407 519847

Greece

DESMI Greece
Tel.: +30 2114 111 893

India

DESMI India LLP
Toll Free Number: 1800 123 123 001

Indonesia

DESMI Ro-Clean APAC
Tel.: +62 21 23585636

Korea

DESMI Korea
Tel.: +82 51 723 8801

Netherlands

DESMI B.V.
Tel.: +31 30 261 00 24

Norway

DESMI Norge AS
Tel.: +47 38 12 21 80

Poland

DESMI Sp. z o.o.
Tel.: +48 22 676 91 16

Singapore

DESMI Singapore Pte Ltd.
Tel.: +65 62 50 71 77

Sweden

DESMI Sweden
Tel.: +46 31 304 51 30

UAE

DESMI Pumping Technology A/S (Br.)
Dubai Office
Tel.: +971 4 501 5530

Abu Dhabi Office
Tel.: +971 50-821 4979

U.K.

DESMI Ltd.
Tel.: +44 1782 566900

DESMI FHS Ltd.
Tel.: +44 1782 566900

USA

DESMI Inc.
Tel.: +1 757 857 7041

- DESMI Companies
- DESMI Dealers/Agents

Need more information or specifications? Contact us at info@desmioceanguard.com or read more about DESMI and DESMI's other products and solutions at www.desmi.com

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