Ocean® Clean GmbH

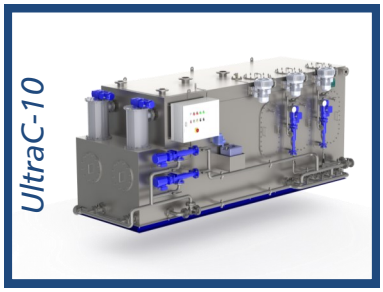
EC-CONFORMITY
MARINE EQUIPMENT DIRECTIVE

Biological Sewage Treatment

- Easy to install
- Easy to operate
- Reliable

For Ocean's Sake

Technical Specification

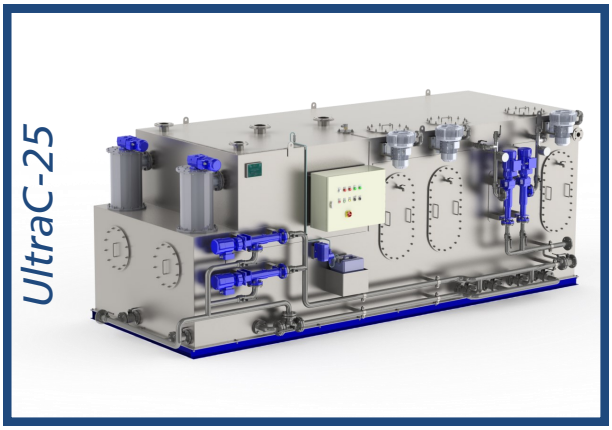


Biological Physical Sewage Treatment Plant

"Ocean Clean® UltraC-25"

General design features of UltraC STPs:

- Space-saving design for corner installation
- Complete unit engineered and MADE IN GERMANY
- For black and grey water or black water only
- For gravity and vacuum systems
- Vacuum pump system available on request
- Customized solutions available on request
- Membrane system for best effluent values
- Compact, reliable and robust design
- Lifetime warranty on tank



Specifications for UltraC-25:

Designed hydraulic load:	25.0m³/d
Designed biological load:	17.6kg BOD_5/d
Dimensions (LxWxH):	7311x2130x2091mm
Dry weight / wet weight:	Approx. 3624 / 14095kg
Power supply:	380-690V / 50/60Hz
Power consumption:	Approx. 12kW
Tank and piping material:	Stainless steel: SAE grade 304
	EN-standard steel no.: 1.4301

Ocean Clean®- A German manufacturer of Oily Water Separators, Biological Sewage Treatment Plants and Waste Handling Components.

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MARINE EQUIPMENT DIRECTIVE

Biological Sewage Treatment

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Contents:

1. Foreword:

The Ocean Clean UltraC **s**ewage **t**reatment **p**lant (STP) is a membrane bioreactor (MBR) that is designed and designated for the installation and operation aboard ships. The following pages show the technical specifications for the STP and its attaching parts.

2. Rules and Regulations:

Sewage treatment plants have to comply with IMO guidelines for effluent standards and undergo performance tests to ensure they are suitable to be operated on board of ships.

The Ocean Clean UltraC STP is type approved and certified according to MARPOL 73/78 and IMO resolution MEPC.227(64) as modified by resolution MEPC.115(51) by the German Traffic Trade Association ("BG Verkehr") - Ship Safety Division.

The UltraC can be operated on board of all ships that carry more than 15 persons or are larger than 400 GRT. **The Certificates are accepted by USCG for non US-flagged vessels.**

Effluent values of Ocean Clean UltraC in comparison with IMO regulations		
	UltraC	MEPC.227(64)
Total Suspended Solids	< 1 mg/l	35 mg/l
BOD_5	< 2.8 mg/l	25 mg/l
COD	< 38 mg/l	125 mg/l
Coliforms	< 1 per 100 ml	100 per 100 ml
pH	7.45 - 8.08	6.0 - 8.5
Chlorine	0.0 (not used)	0.5 mg/l
Phosphorus	n/a	< 1 mg/l
Nitrogen	n/a	< 20 mg/l

3. STP add-ons:

Mandatory:
- Grease trap to remove fats and oil off the galley water
- Sludge tank to store excess sludge

Optional:
- Effluent storage tank to store cleaned water in zero-emission zones
- Grease separator for most effective fat and oil removal off galley water
- Settling tank for sludge treatment and dewatering

When provided with an upstream aerated collecting and mixing tank to buffer peak loads the Ocean Clean UltraC-25 can handle up to 75% more sewage/day with identical technical specifications. Please ask for further details!

Biological Sewage Treatment

- **Easy to install**
- **Easy to operate**
- **Reliable**

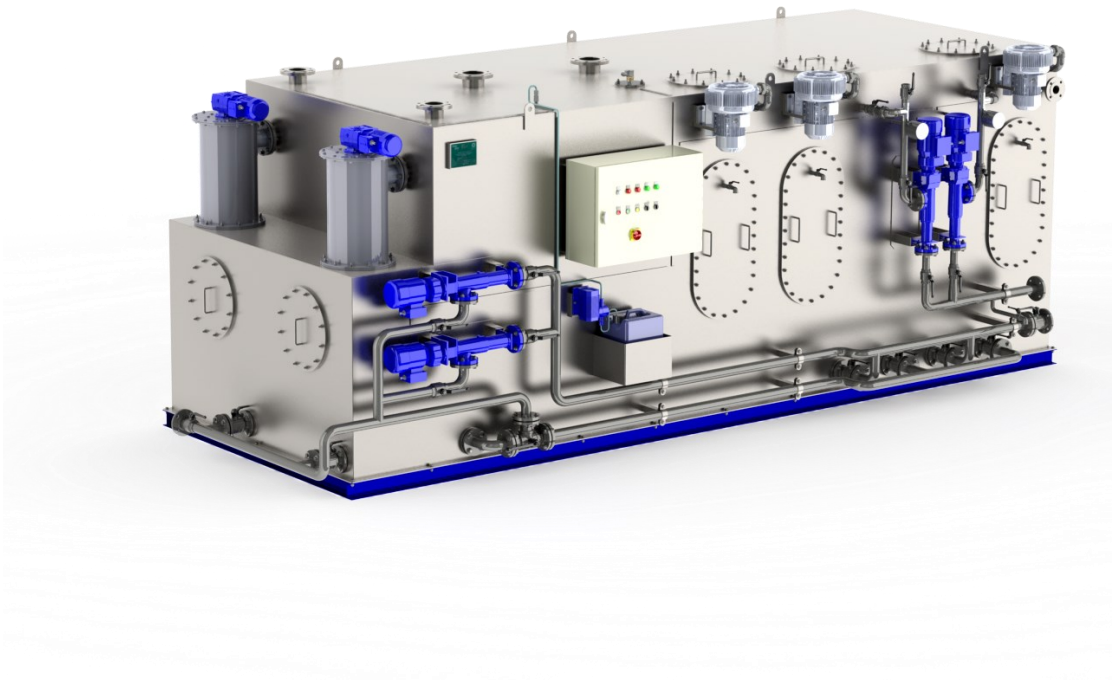
EC-CONFORMITY
MARINE EQUIPMENT DIRECTIVE

"Ocean Clean® UltraC-25"

Biological Physical Sewage Treatment Plant

Membrane BioReactor (MBR)

For Illustration Only



4. General Description:

All accessory units are mounted on the STP (except vacuum unit), with all internal piping and wiring, completely checked and tested, ready-for-connection. Black and grey water (no seawater!) flow to the STP by gravity (vacuum on request). Galley water must be led through a grease trap or separator. Excess sludge inside the STP must be discharged acc. instructions to a sludge tank.

The Ocean Clean UltraC is a three tank system:

First stage: Coarse material removal (stored in built-in *coarse material tank*)

Second stage: Biology activation by aerial oxygen (*activation tank*) where microorganisms ("activated sludge") metabolize the organic pollution into CO_2 and water.

Third stage: Membrane filtration (*membrane tank*) to physically separate cleaned water from activated sludge and bacteria. Filtrate discharge via pump to overboard/effluent tank.

Activated sludge for starting up has to be provided by yard from municipal sewage plant!

Ambient air is fed into the STP to support the biological process. The biology has to be checked by taking samples on a regular basis. Only biodegradable waste may be led into the STP. Excessive use of detergents or hazardous substances can destroy the biology and cause malfunctions of the STP.

In accordance with the SOLAS regulation II-I/3-5, new installation of asbestos in context with IMO MSC.1/Circ.1374 and 1379, all materials, products and components including packaging by our company are completely free of asbestos.

5. "UltraC-25" - detailed description:

Electrical system and attached parts:

- Electrical control cabinet

  Including transformer (incl. 24V AC for control voltage), switches, level– and control relays, control lamps (LED), IP66 protection, door stopper, made of mild steel, Finish: coated in RAL 7035

  Cable glands: with stuffing bushes acc. to DIN 89280, nickel-plated brass, reputable maker

  Start-stop level for transfer pump and high level alarm are measured by level switches. One potential-free contact for a common alarm to ECR is provided.

- Fine screen

  Coarse material is filtered by **two self cleaning fine screens** via brushes + electrical gear motor.

Technical details fine screen motor	
Protection class	IP 55, ISO class F
Power [kW]	0.12
Speed [rpm]	6

- Circulation and sludge discharge pump (two for redundancy)

  Circulation: Biologically active liquid ("*activated sludge*") and sewage are circulated in the STP to be mixed and enable microorganisms to clean the water. The activation tank is constantly re-circulated to the membrane tank to supply the membrane filter with activated sludge.

  Sludge discharge: the circulation pump is also used to discharge excess sludge and coarse material and to empty the STP.

- Filtrate pump (two for redundancy)

  The filtrate pump is used to discharge cleaned water via the membrane filter.

Technical details circulation pump / filtrate pump		
	Circulation pump	Filtrate pump
Type	Eccentric screw pump with mechanical seal	
Flange sizes suction / discharge side	DN50, PN16	DN40, PN16
Protection class	IP 55, ISO class F	
Capacity [m^3/h] at [bar]	5.0 at 6	2.5 at 6
Power [kW at Hz]	1.1 at 50	0.75 at 50

The filtrate pump must not be used to empty the STP!

The membrane filter may not dry out once it has been in contact with water. The sensitive material will become brittle and cannot be used again.

- Air blower

  The air feed of the STP is supplied by **3 side channel blower**. It forces ambient air into the tanks via submerged aeration elements (breather tubes) that support the biology and clean the membrane filter.

Technical details side channel blower	
Air flow [m^3/h]	80
Pressure [mbar]	250
Power [kW at Hz]	1.6 at 50 / 2.05 at 60

- Sensors

  Suction pressure (**one vacuum meter**) is measured between filtrate pump and membrane filter to prevent the membrane from destruction and to determine the time for a chemical membrane cleaning.
  Low level, high level and alarm level are sensed by **float switches** inside the activation tank.

Tank:

- The UltraC is a three tank system:

  Coarse material tank including fine screen
  Activation tank including aeration elements
  Membrane tank including membrane filter

  All tanks are accessible via manholes either on top or on the sidewalls of the tank. Flanges for inlet and ventilation pipes are on the top of the STP.

  The control panel as well as all pumps, blower and instruments are located on the front or one side of the unit for easy access and a minimum footprint and maintenance space.

- Tank and piping made of stainless steel

Connections:

- Electrical connections: Please refer to the electrical diagram.
- The Ocean Clean UltraC is factory tested and ready-for-connection. It needs to be fixed to the floor by welding or bolting (please refer to dimensional drawing).

  The following necessary pipe connections need to be produced (standard acc. to ISO/DIN):

Pipe connection	Inlet	Ventilation	Overflow	Outlet	Flushing	Discharge
Size	2xDN 100	2xDN 125	DN 50	DN 50	DN 50	DN 50
Size [pressure class]	PN16	PN16	PN16	PN16	PN16	PN16

  Fresh water pressure for flushing: 2 - 5 bar

6. UltraC-25 - design & calculation

The Ocean Clean UltraC-25 is designed, calculated and type approved to treat a maximum hydraulic load of 25m³/d and a biological load of 17.6 kg BOD_5/d according to the guidelines and specifications of the German BG Verkehr as responsible authority:

	Hydraulic load [litre]					Resulting no. of persons	
Min. requirements acc. BG Verkehr	Grey Water	Black Water Vacuum	Black Water Gravity	Total Vacuum System	Total Gravity System	Vacuum System	Gravity System
Passenger vessel	160	25	70	185	230	**135**	**109**
Seagoing ship except passenger vessel	110	25	70	135	180	**185**	**139**

The Ocean Clean calculation is based on experienced data and customer feedback:

	Hydraulic load [litre]					Resulting No. of persons	
Requirements according to OC experience							
Barge	35	15	35	50	70	500	360
Commercial vessel	95	25	55	120	150	208	167
Naval vessel	135	20	65	155	200	161	125
Stationary Platform	175	25	70	200	245	125	102
Yacht (charter)	190	25	75	215	265	116	94
Working ship	190	25	75	215	265	116	94
River Cruiser	210	25	75	235	285	106	88
Cruiser	240	25	75	265	315	94	79
Yacht (owner)	350	25	75	375	425	67	59

Please ask for a project-specific calculation for further details and a load forecast.

To ensure a solid biological process the feeding of the Ocean Clean UltraC-15 should not fall below the following values:

Minimum required feed	Long-term	Short-term	Design maximum
Hydraulic load [m³/d]	13.9	7.0	25.0
Biological load [kg/d]	13.2	5.9	17.6

As a biological and physical system the UltraC is sensitive to the sewage quality. Intensive use of strong detergents or the inlet of chemicals (e.g. chlorine) will destroy the microorganisms of the activated sludge. Insufficient feeding may reduce the concentration of microorganisms severely and cause difficulties when feeding the STP with the standard load.

Flushing the plant and emptying it completely requires to fill in new activated sludge to restart the biological process. The quality of the activated sludge needs to be checked on a regular basis. Otherwise the membrane filter as physical barrier may clog or get damaged which will make an exchangeservice or a chemical cleaning of the filter membranes necessary.

The UltraC is designed for on-board (engine room) use: 5 - 45°C, up to 95% humidity.

7. UltraC - models

The UltraC STP is available in different versions and sizes.
Following table lists the general standard models.

Range of Ocean Clean UltraC models - other versions available on request								
Type	Max. hydraulic load [m^3/d]	Max. biological load [kg BOD_5/d]	Required collecting tank [m^3]	Length [mm]	Width [mm]	Height [mm]	Dry weight ca. [kg]	Wet weight ca. [kg]
UltraC-1	1.8	1.2	-	1766	1527	1555	638	1650
UltraC-2	3.0	2.0	-	1924	1576	1561	710	1780
UltraC-5	6.0	4.2	-	1935	1776	1556	1062	2495
UltraC-9	9.3	6.5	6	1935	1776	1556	1062	2495
UltraC-10	10.0	7.0	-	2132	4048	2066	1762	2995
UltraC-15	15.0	10.6	-	5483	2130	2091	2815	11455
UltraC-25	**25.0**	**17.6**	**-**	**7311**	**2130**	**2091**	**3624**	**14095**
UltraC-27	27.8	19.6	18	5483	2130	2091	2815	o/r
UltraC-46	46.2	32.6	30.1	5938	2470	2091	o/r	o/r

Scope of Supply:

- One STP Ocean Clean UltraC including all necessary attaching parts, ready-for-connection
- Manual and documentation in English language including drawings and spare-parts list
- Factory Acceptance Test (FAT) protocol
- Type approval and all necessary certificates
- No special tools required

Available on request:

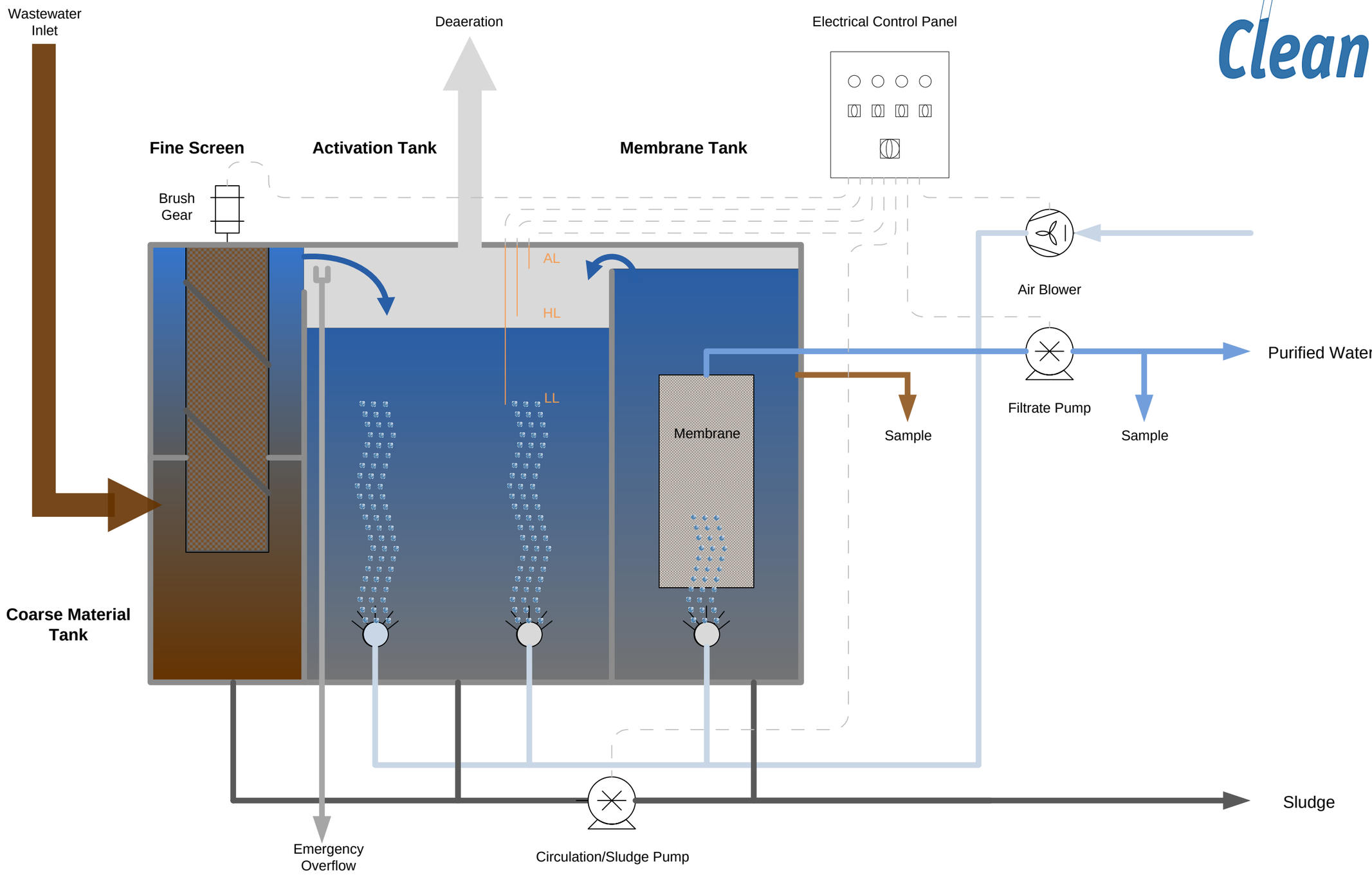
- Thermal dry running protection for pumps
- Vacuum system as stand-by unit (maker: Jets)
- Aeration and mixing and transfer equipment for collecting and mixing tank (transfer pumps, blower, aeration pipes, level sensors, control box)
- Blower and transfer pumps for sludge tank
- Lifting stations including controls
- Class survey certificates (ABS, DNV-GL, LR, …)
- Worldwide commissioning and service
- Tailor-made solutions

Please note that a sufficient maintenance space is always needed to guarantee a good access to all components. The maintenance space requirement of the Ocean Clean UltraC is very small. Please note the attached drawings for details.

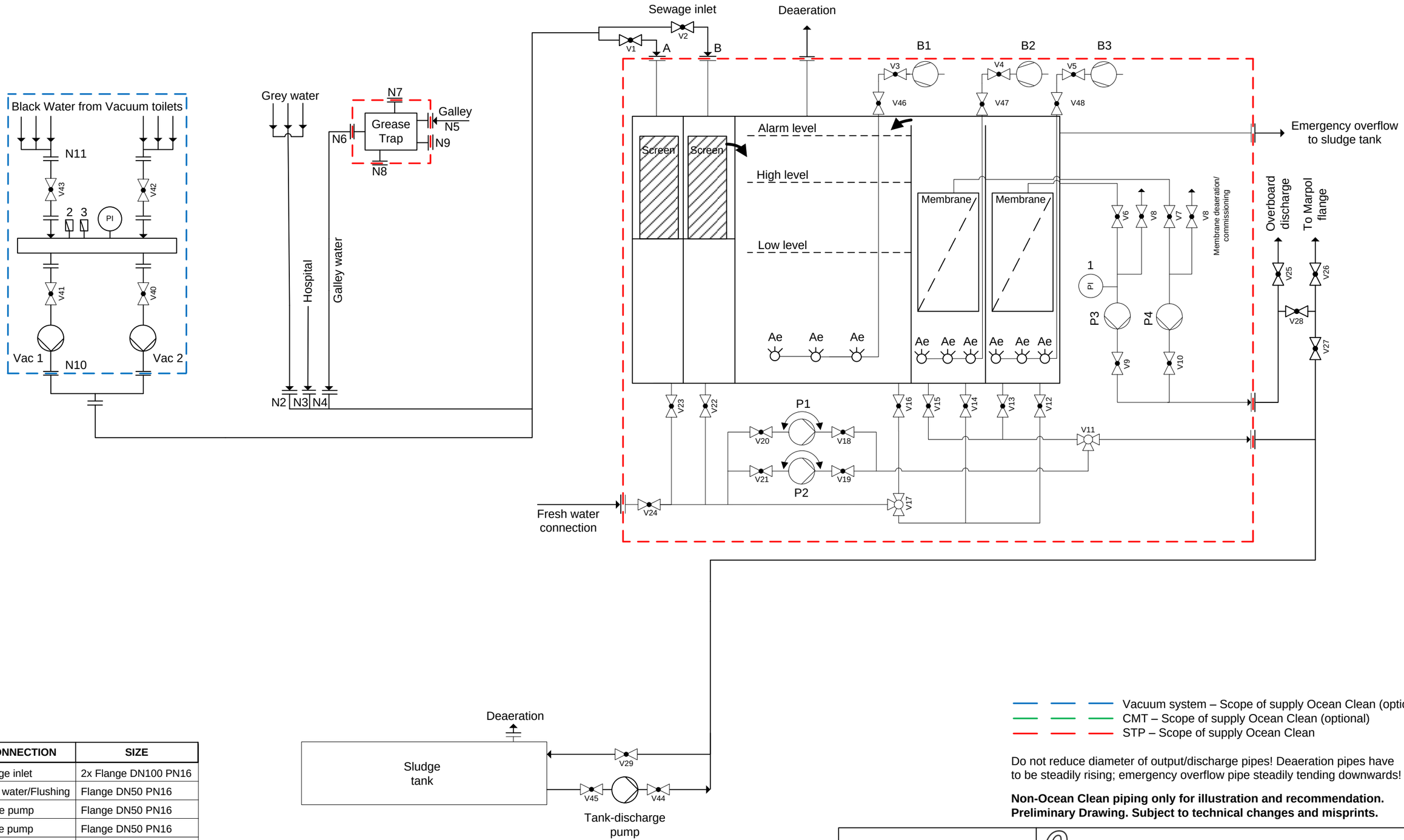
Images and diagrams for illustration only. Subject to technical changes and misprints.

Biological Sewage Treatment Plant UltraC **Operation Scheme**

Ocean® Clean GmbH



Black Water Grey Water	Pre-treated Wastewater	Water Equalizing Biological Process	Filtration+Aeration	Purified Water



CONNECTION	SIZE
Sewage inlet	2x Flange DN100 PN16
Fresh water/Flushing	Flange DN50 PN16
Sludge pump	Flange DN50 PN16
Filtrate pump	Flange DN50 PN16
Emergency overflow	Flange DN50 PN16
Deaeration	Flange DN125 PN16
N5	Flange DN80 PN10
N6	Flange DN80 PN10
N7	Flange DN25 PN10
N8	Flange DN25 PN10
N9	Flange DN25 PN10
N10	Flange DN32 PN10
N11	Flange DN50 PN10

ITEM	DESCRIPTION	ITEM	DESCRIPTION
N2	Grey water inlet	N7	Deaeration
N3	Hospital water inlet	N8	Grease drain
N4	Galley water	N9	Drain
N5	Galley water inlet	N10	Black water outlet
N6	Galley water outlet		

ITEM	DESCRIPTION	ITEM	DESCRIPTION
Ae	Aeraetion element	PI	Pressure indicator
B1, B2, B3	Blower STP	Vac1, Vac2	Vacuum pump
P1, P2	Sludge pump	1, 2, 3	Vacuum switch
P3, P4	Filtrate pump		

Vacuum system – Scope of supply Ocean Clean (optional)
CMT – Scope of supply Ocean Clean (optional)
STP – Scope of supply Ocean Clean

Do not reduce diameter of output/discharge pipes! Deaeration pipes have to be steadily rising; emergency overflow pipe steadily tending downwards!

Non-Ocean Clean piping only for illustration and recommendation. Preliminary Drawing. Subject to technical changes and misprints.

No.	Changes	Date	Name

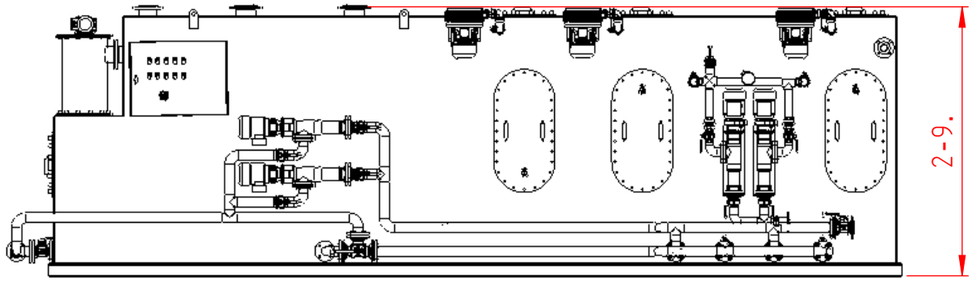
Drawn: M.Hille / 29.10.2015
Checked:
Approved:

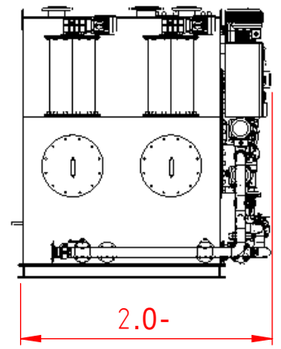
P & I DIAGRAM

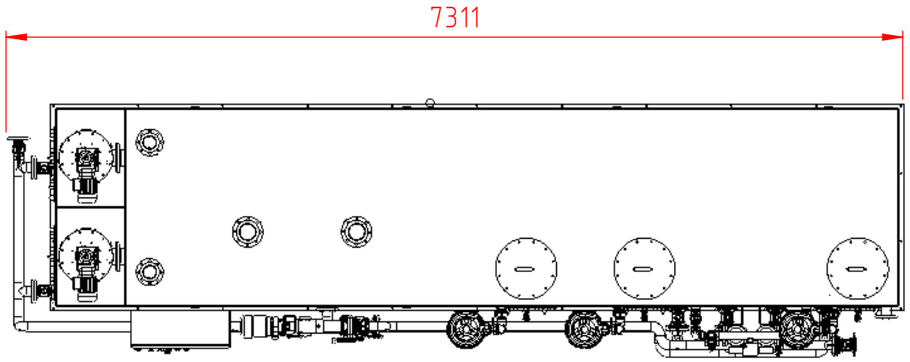
UltraC
Black Water Vacuum System
Grey Water Gravity System

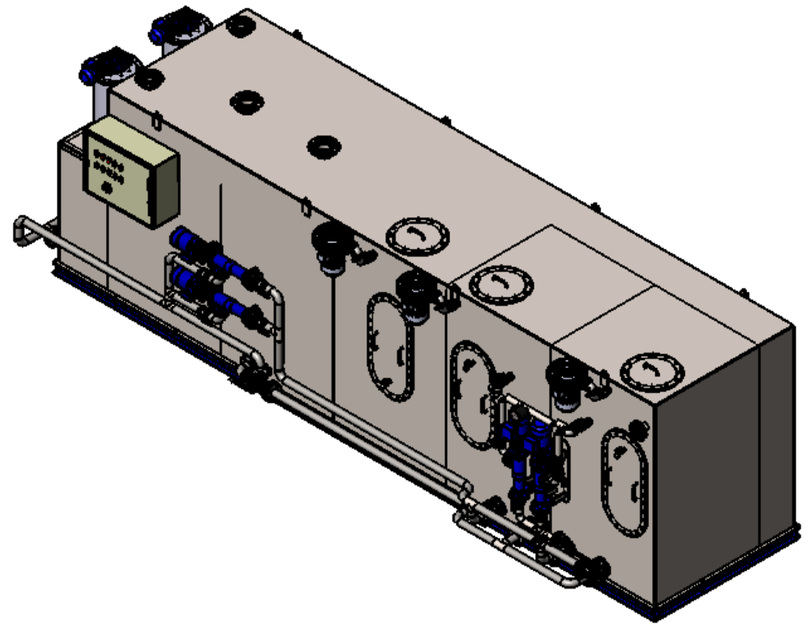
SIZE	CUSTOMER	DRAWING.NR.	REV.
A3			

SCALE 1:1 PAGE 1 / 1









Revision :				Oberfläche:			Maßstab:1:100	Gewicht: 3348.92kg
							- for illustration only -	
					Datum	Name		
				Erst.			Ocean Clean UltraC-25 Dimension Drawing	
				Gepr.				
				Freig.				
								Seite 1/1
Index	Änderung	Datum	Name					A3

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18069 Rostock
Germany
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Fax: +49 (0) 381-811 2939
info@oceanclean.de

TYPENPRÜFUNGSZEUGNIS
für Abwasser-Aufbereitungsanlagen

Certificate of Type Approval for Sewage Treatment Plants

Ausgestellt im Namen der Regierung
der **BUNDESREPUBLIK DEUTSCHLAND**
durch die **BERUFSGENOSSENSCHAFT FÜR TRANSPORT UND VERKEHRSWIRTSCHAFT**

Issued under the authority of the
FEDERAL REPUBLIC OF GERMANY
by Berufsgenossenschaft für Transport und Verkehrswirtschaft

Hiermit wird bescheinigt, dass die Abwasser-Aufbereitungsanlage
This is to certify that the Sewage Treatment Plant

Typ: **OCS-compact 125**
type:

Ausgelegter Flüssigkeitsdurchsatz: 25,00 m³/Tag
having a designed hydraulic loading of: *m³/d*

Durchsatz an organischen Stoffen: 17,60 kg/Tag biochemischer Sauerstoffbedarf (BSB)
an organic loading of: *kg per day Biochemical Oxygen Demand (BOD)*

Auslegung gemäß Zeichnungen Nrn.: ocs-c125-BG000
and of the design shown on Drawings Nos.:

Hergestellt durch: Ocean Clean GmbH, Zum Kühlhaus 5, 18069 Rostock
manufactured by:

einer Prüfung unterzogen und in Übereinstimmung mit der IMO-Entschließung MEPC.159(55), um die Anforderungen an den Betrieb gemäß Regel 9.1.1 der Anlage IV des Internationalen Übereinkommens zur Verhütung der Meeresverschmutzung durch Schiffe, MARPOL 73/78 wie geändert in Entschließung MEPC.115(51), zu erfüllen, zufriedenstellend erprobt wurde.

has been examined and satisfactorily tested in accordance with the International Maritime Organization resolution MEPC.159(55) to meet the operational requirements referred to in Regulation 9.1.1 of Annex IV of the International Convention for the Prevention of Pollution from Ships, MARPOL 73/78 as modified by resolution MEPC.115(51).

Die Erprobungen der Abwasser-Aufbereitungsanlage wurden durchgeführt
The tests on the sewage treatment plant were carried out

an Land bei: Klärwerk Wismar - Wendorf
ashore at:

an Bord von: --
on board at:

und abgeschlossen am: 02.07.2011
and completed on:

Bei der Erprobung wurde ein Abfluss festgestellt, der nach der analytischen Untersuchung folgende Ablaufwerte hat:
The sewage treatment plant was tested and produced an effluent which, on analysis, produces:

(i) ein geometrisches Mittel von nicht mehr als 100 fäkalkoliforme Bakterien/100 ml
(i) a geometric mean of no more than 100 thermotolerant coliforms/100 ml;

(ii) ein geometrisches Mittel der gesamten Schwimm- und Schwebstoffe von 35 mg/l für an Land getestete Anlagen oder der Maximalwert der gesamten Schwimm- und Schwebstoffe übersteigt nicht 35 mg/l plus x mg/l für das umgebende Wasser, das für Spülzwecke verwendet wird, bei Tests an Bord
(ii) a geometric mean of total suspended solids of 35 mg/l if tested ashore or the maximum total suspended solids not exceeding 35 plus x mg/l for the ambient water used for flushing purposes if tested on board

(iii) ein geometrisches Mittel des Biochemischen Sauerstoffbedarfs nach fünf Tagen (BSB_5) mit nicht mehr als 25 mg/l
(iii) a geometric mean of 5-day Biochemical Oxygen Demand (BOD_5) of no more than 25 mg/l

(iv) ein geometrisches Mittel des Chemischen Sauerstoffbedarfs mit nicht mehr als 125 mg/l
(iv) a geometric mean of Chemical Oxygen Demand of no more than 125 mg/l

(v) der pH-Wert des Ausflusses liegt zwischen 6 und 8,5
(v) pH of effluent is between 6 and 8,5

Zulassungs-Nr.: 340.387
Certificate-No.

Die Verwaltung bescheinigt, dass die Anlage bei Neigungen bis zu 22,5° in jede Richtung von der normalen Aufstellung arbeiten kann.
The Administration is satisfied that the sewage treatment plant can operate at angles of inclination of 22.5° in any plane from the normal operating position.

Einzelheiten der Erprobungen und der einzelnen Ergebnisse werden im Anhang aufgezeigt.
Details of the tests and the results obtained are shown on the Appendix to this certificate.

Ein Schild oder ein haltbarer Aufkleber muss an jeder Abwasser-Aufbereitungsanlage angebracht sein mit Angaben über den Hersteller, Typ und die Seriennummern, den Flüssigkeitsdurchsatz und das Herstellungsdatum.
A plate or durable label containing data of the manufacturer's name, type and serial numbers, hydraulic loading and date of manufacture is to be fitted on each sewage treatment plant.

Eine Kopie dieses Zeugnisses muss auf jedem Schiff mitgeführt werden, das mit der oben beschriebenen Abwasser-Aufbereitungsanlage ausgerüstet ist.
A copy of this certificate shall be carried on board any ship equipped with the above described sewage treatment plant.

Dieses Typenprüfungszeugnis gilt bis: **31.08.2016**
This certificate of type test is valid until

Dieses Typenprüfungszeugnis bleibt über das vorstehende Datum hinaus in Kraft, sofern kein Widerruf erfolgt.
Ein Widerruf für auf einem Schiff eingebaute Einrichtungen kann z.B. erfolgen, wenn diese nicht gefahren und/oder nicht gewartet und/oder nicht funktionsbereit sind und/oder nicht innerhalb einer angemessenen Frist an zukünftige Bestimmungen angepasst werden können.
This certificate of type test is in force beyond the above mentioned date unless it is revoked.
A revocation of the equipment installed aboard the ship can follow , but is not limited to, if the equipment is not maintained and/or is not in good working order and/or the equipment can not be modified within an appropriate time frame, due to future regulatory standards.

Das Typenprüfungszeugnis für die Abwasseraufbereitungsanlage Type OCS-compact 125 wird aufgrund der Erprobung von Type OCS-compact 15 gemäß MEPC.159(55) Anhang Pkt. 5.8 ausgestellt.
The certificate of type test of type OCS-compact 125 will be issued based on the test of type OCS-compact 15 according to IMO-Resolution MEPC.159(55) annex 5.8.

Ausgestellt in: **Hamburg** am: **01.01.2012**
Issued at: *on:*

Berufsgenossenschaft für Transport und Verkehrswirtschaft
- Dienststelle Schiffssicherheit -

Die Abwasser-Aufbereitungsanlage mit der Serien-Nummer ..... entspricht dem geprüften Typ.
The sewage treatment plant with the serial number ..... complies with the tested type.

TYPENPRÜFUNGSZEUGNIS
für Abwasser-Aufbereitungsanlagen

Certificate of Type Test for Sewage Treatment Plants

ANHANG zu Type: OCS-compact 125
Appendix to type: OCS-compact 125

Prüfergebnisse und Einzelheiten der Erprobungen, geprüft mit Hilfe von Proben der Abwasser-Aufbereitungsanlage in Übereinstimmung mit der Entschließung MEPC.159(55)

Test results and details of tests conducted on samples from the Sewage Treatment Plant in accordance with resolution MEPC.159(55)

Abwasser-Aufbereitungsanlage, Typ: **OCS-compact 15**
Sewage Treatment Plant, Type:

Hergestellt durch: Ocean Clean GmbH, Zum Kühlhaus 5, 18069 Rostock
Manufactured by:

Stelle, die die Prüfung durchgeführt hat: BG Verkehr
Organization conducting the test:

Ausgelegter Flüssigkeitsdurchsatz *Designed hydraulic loading*	2,7	Kubikmeter pro Tag *cubic metres per day*
Ausgelegter Durchsatz an organischen Stoffen *Designed organic loading*	1,9	Kilogramm pro Tag BSB *kilograms per day BOD*
Anzahl der untersuchten Ausflussproben *Number of effluent samples tested*	40	
Anzahl der untersuchten Einlaufproben *Number of influent samples tested*	40	
Roh-Abwasserqualität (Einlauf) *Raw sewage (influent) quality*	2575	Milligramm pro Liter Schwebestoffe *milligrams per litre Total Suspended Solids*
Maximaler Flüssigkeitsdurchsatz *Maximum hydraulic loading*	--	Kubikmeter pro Tag *cubic metres per day*
Mindest-Flüssigkeitsdurchsatz *Minimum hydraulic loading*	--	Kubikmeter pro Tag *cubic metres per day*
Durchschnittlicher Flüssigkeitsdurchsatz *Average hydraulic loading*	2,7	Kubikmeter pro Tag *cubic metres per day*
Geometrisches Mittel der gesamten Schwimm- und Schwebstoffe *Geometric Mean of Total Suspended Solids*	1	Milligramm pro Liter *milligrams per litre*
Geometrisches Mittel der fäkalcoliformen Bakterien *Geometric Mean of the thermotolerant coliform count*	1	Bakterien pro 100 Milliliter *coliforms per 100 millilitres*
Geometrisches Mittel des BSB_5 *Geometric Mean of BOD_5*	2,8	Milligramm pro Liter *milligrams per litre*

Art des verwendeten Desinfektionsmittels
Type of disinfectant used --

Wenn Chlor - verbleibendes Chlor:
If Chlorine - residual Chlorine:

Maximum *Maximum*	--	Milligramm pro Liter *milligrams per litre*
Mindestwert *Minimum*	--	Milligramm pro Liter *milligrams per litre*
Geometrisches Mittel *Geometric Mean*	--	Milligramm pro Liter *milligrams per litre*

Wurde die Abwasser-Aufbereitungsanlage geprüft mit:
Was sewage treatment plant tested with:

Frischwasserspülung? *Fresh Water flushing?*	ja/yes ☒	nein/no ☐ *)
Salzwasserspülung? *Salt Water flushing?*	ja/yes ☐	nein/no ☒ *)
Frisch- und Salzwasserspülung? *Fresh and Salt Water flushing?*	ja/yes ☐	nein/no ☒ *)
Wurde Grauwasser zugegeben? *Grey water added?*	ja/yes ☒ - Anteil % *- proportion*	nein/no ☐ *)

Wurde die Abwasser-Aufbereitungsanlage geprüft nach den Umweltbedingungen die in Abschnitt 5.9 der Entschließung MEPC.159(55) festgelegt sind:
Was the sewage treatment plant tested against the environmental conditions specified in section 5.9 of resolution MEPC.159(55):

Temperatur *Temperature*	ja/yes ☒	nein/no ☐ *)
Luftfeuchtigkeit *Humidity*	ja/yes ☒	nein/no ☐ *)
Krängung *Inclination*	ja/yes ☒	nein/no ☐ *)
Vibration *Vibration*	ja/yes ☒	nein/no ☐ *)
Funktionssicherheit der elektr. und elektronischen Bauteile *Reliability of Electrical and Electronic Equipment*	ja/yes ☒	nein/no ☐ *)

Beschränkungen und Betriebsbedingungen
Limitations and the conditions of operation are imposed:

Salzgehalt --
Salinity

Temperatur 5 - 45 °C
Temperature

Luftfeuchtigkeit --
Humidity

Krängung --
Inclination

Vibration --
Vibration

*) Zutreffendes ankreuzen/*mark with a cross where applicable*

Ergebnisse anderer geprüfter Parameter: Roh-Abwasserqualität im Einlauf 704 mg/l BSB5 (geometrisches Mittel)
Results of other parameters tested *Raw sewage (influent) quality 704 mg/l BOD5 (geometric mean)*

Ausgestellt in: **Hamburg** am: **01.01.2012**
Issued at: *on:*

Berufsgenossenschaft für Transport und Verkehrswirtschaft 29

Berufsgenossenschaft für Transport
und Verkehrswirtschaft
- Dienststelle Schiffssicherheit -

European notified body
Identification number 0736

DGUV Test
Prüf- und Zertifizierungsstelle
BG Verkehr
Dienststelle Schiffssicherheit

EC-Type Examination (Module B) Certificate

Certificate-No. **340.387**

Name and address of the manufacturer:	Ocean Clean GmbH, Zum Kühlhaus 5, 18069 Rostock, Germany
Date of issue:	**01.01.2012**
Annex A.1 Item No & Item designation	**A.1/2.6 – Sewage treatment plants**
Product designation:	Sewage treatment plant
Product Type:	**OCS-compact 125**
Intended purpose:	Sewage treatment plants for ships acc. MARPOL 73/78, Annex IV and Helsinki-Convention
Testing based on (Specific standard):	IMO Resolution MEPC.159(55) for sewage treatment plants in acc. with MARPOL 73/78, Annex IV, Reg. 9
Remarks:	

The type tested was found to be in compliance with the Marine-pollution prevention requirements of Marine Equipment Directive (MED) 96/98/EC as amended by Directive 2010/68/EC subject to any conditions in the schedule (part of this certificate).

This certificate may only be used in connection with module(s) **D or F or E** of this directive.

Expiry date: **31.08.2016**

Beauftragte Dienststelle für Transport und Verkehrstechnik 29

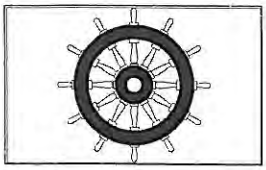
Signature (Seifert)

Installed equipment stays approved beyond the validity date until it is revoked!

Note 1: This certificate will not be valid if the manufacturer makes any changes or modifications to the approved equipment, which have not been notified to, and agreed with the notified body named on this certificate.

Note 2: Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply.

Note 3: The Mark of Conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-control phase module (D, E, or F) of ANNEX B of the Directive is fully complied with and controlled by a written inspection agreement with a notified body.



xxxx/yy

Note 4: "Wheelmark" Format

YY Last two digits of year mark affixed

XXXX Notified Body number undertaking surveillance module

Postal address:
Ottenser Hauptstraße 54
22765 Hamburg

Office:
Brandstwiete 1
20457 Hamburg

Tel: 0 40/3 61 37-0
Fax: 0 40/3 61 37 2 04

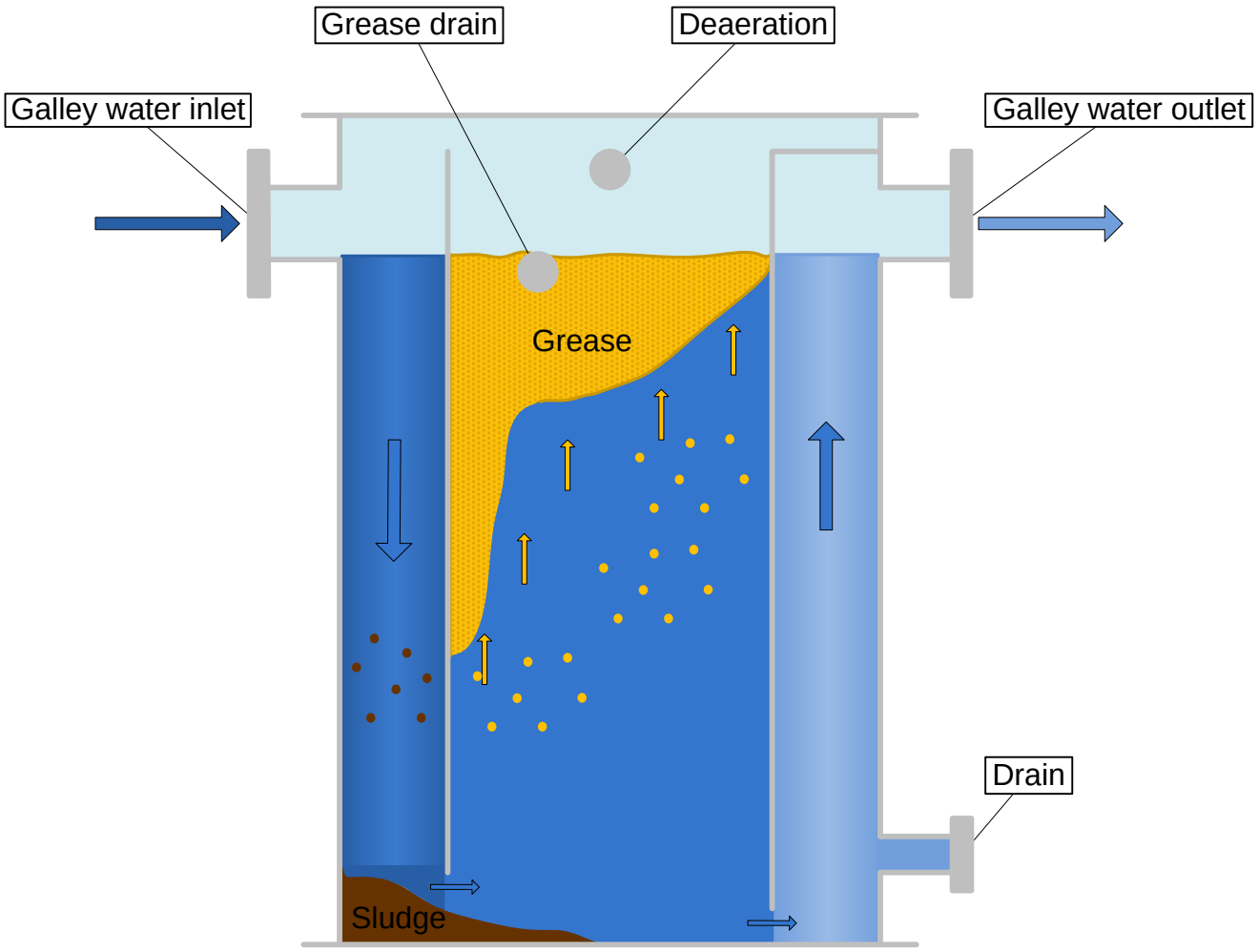
Technical data/approved drawings and additional conditions and remarks:

The Prüf- und Zertifizierungsstelle of the BG Transport und Verkehrswirtschaft verifies and certifies the conformity of the above mentioned product in accordance with the Directive 96/98/EC of the Council as amended (last amendment by directive 2010/68/EC), Annex B, Module D or Module F (Product Verification), section 5, Statistical Verification.

All products will be divided into identical lots of 10 pieces each, starting with serial number OCS-YYMM-0101-XXXX. One (1) random sample will be drawn from each lot and individually examined.

Fat Trap **Operation Scheme**

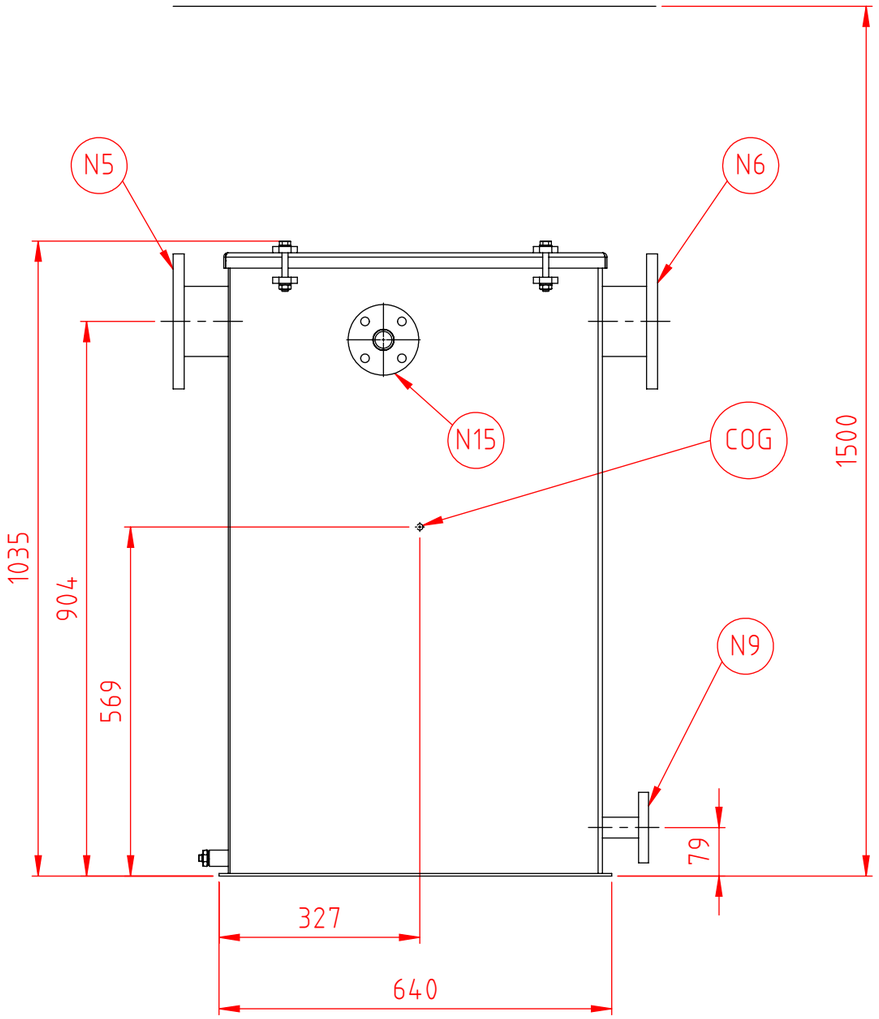
Ocean® Clean GmbH

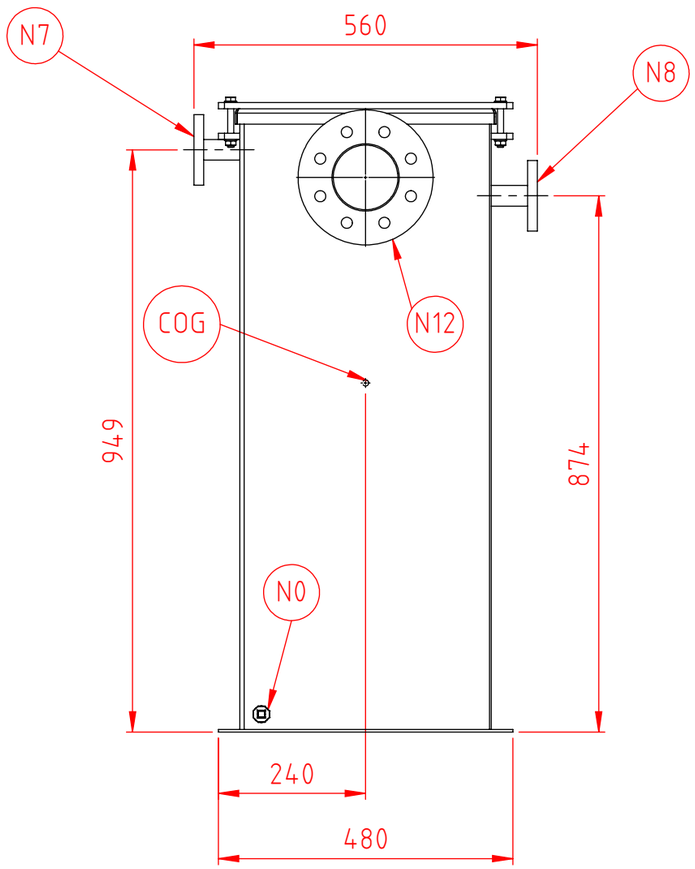


A grease trap removes fat, oil and grease (called FOG) and solids (food particles, sand and grit etc.) by a gravity separation process.

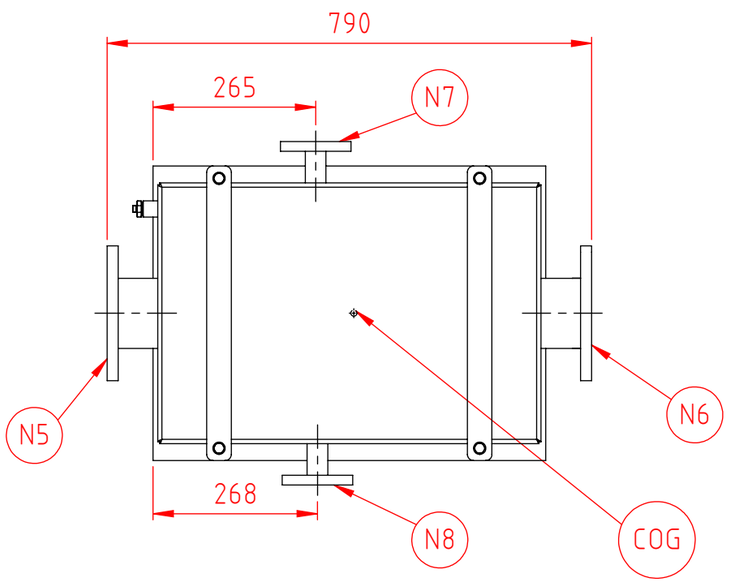
The grease trap slows down the flow of waste water long enough for the FOG and solids to separate. The solids settle to the bottom and the grease floats to the top. The middle layer is free water which is discharged to the sewer.

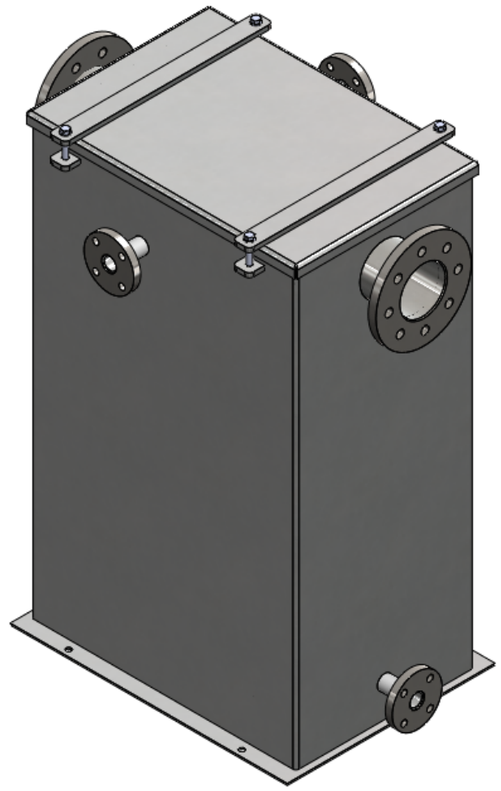
The longer the flow is kept inside the trap, the better job it will do of separating the waste materials.





Pos.	Description	Size
N5	galley water inlet	DN100 PN10
N6	galley water outlet	DN100 PN10
N7	deaeration	DN25 PN10
N8	grease drain	DN25 PN10
N9	drain	DN25 PN10
N0	OC internal use	R 1/2"
COG	center of gravity	





Revision :				Oberfläche:		
					Datum	Name
				Erst.	21.05.2013	M.Hille
				Gepr.		
				Freig.		
Index	Änderung	Datum	Name			

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Zum Kühlhaus 5
18069 Rostock
Germany
Phone: +49 (0) 381-811 2930
Fax: +49 (0) 381-811 2939
info@oceanclean.de

Maßstab: 1:10 | Gewicht: 94.33kg empty

Werkstoff:
mild steel

Fat Frap FT-320

FT-320-BG-100

Seite 1/1

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