

- Easy to install
- Easy to operate
- Reliable

## For Ocean's Sake

### Technical Specification

#### Biological Sewage Treatment Plant

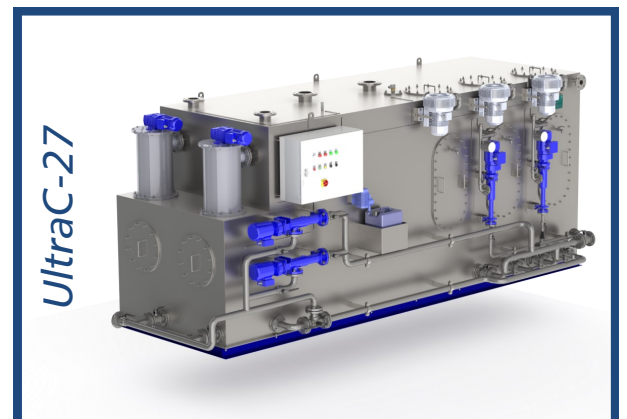
#### "Ocean Clean<sup>®</sup> UltraC-27"

##### 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-27:

Designed hydraulic load:	27.8m <sup>3</sup> /d
Designed biological load:	19.6kg BOD <sub>5</sub> /d
Dimensions (LxWxH):	5483x2130x2091mm
Dry weight / wet weight:	Approx. 2815 / 11455kg
Power supply:	380-690V / 50/60Hz
Power consumption:	Approx. 10kW
Tank and piping material:	Stainless steel: SAE grade 304 EN-standard steel no.: 1.4301



**Ocean Clean<sup>®</sup> - A German manufacturer of Oily Water  
Separators and Biological Sewage Treatment Plants.**



# Biological Sewage Treatment

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## Contents:

1. Foreword
2. Rules and Regulations
3. STP Extensions
4. General Description
5. UltraC-27 - detailed description
6. UltraC-27 - design & calculation
7. UltraC - versions

**Attachments:** Operation scheme, P&ID, Drawings, Certificates

## 1. Foreword:

The UltraC sewage treatment system (STP) is a membrane based biological treatment plant that is designated for the installation and operation on ships. The following pages show the technical specifications for the UltraC-27 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 UltraC STP is type approved and certified according to MARPOL 73/78 and IMO resolution MEPC.115(51) as modified by resolution MEPC.227(64) 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 UltraC in comparison with IMO regulations		
	UltraC	MEPC.227(64)
Total Suspended Solids	< 1 mg/l	35 mg/l
BOD <sub>5</sub>	< 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	6-8.5
Chlorine	0.0 (not used)	0.5 mg/l

## 3. STP Extensions:

Galley water has to be treated by a grease trap or separator before led into the STP. Sludge tank for discharge of excess sludge has to be provided. An effluent storage tank is recommended for using the STP in areas where no liquids may be discharged overboard.



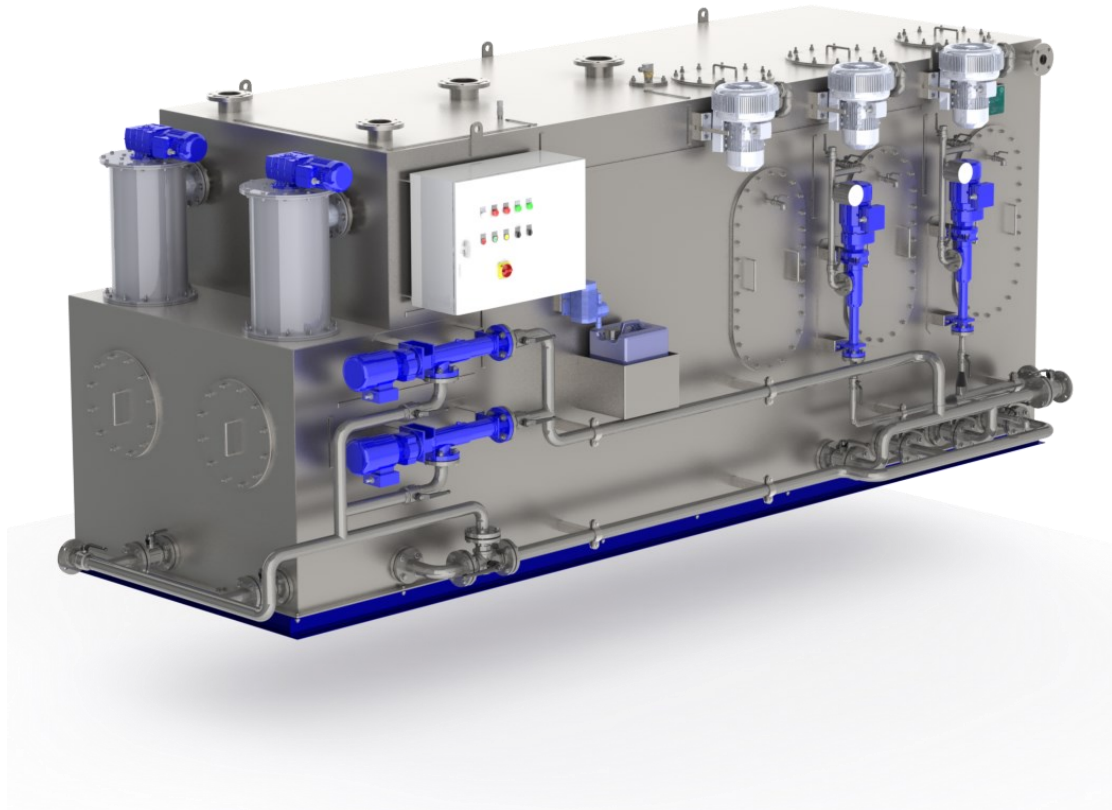


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### "Ocean Clean® UltraC"

#### Biological Sewage Treatment Plant Membrane Based Bio Reactor (MBBR)



#### **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 to plug on. The black water and grey water flows by gravity (vacuum on request) into the STP. Galley water must be led through a grease trap or separator. Incurred excess sludge inside the STP must be discharged acc. instructions into a sludge tank.

The "UltraC-27" is a three chamber system:

Coarse material is removed in the first stage (coarse material tank). Pre-cleaned sewage enters the second stage (activation tank) where it is mixed with activated sludge, i.e. microorganisms that metabolize the organic pollution into CO<sub>2</sub> and water. Filter membranes in the last stage (filter tank) separate the cleaned water from the activated sludge, viruses and bacteria. A filtrate pump discharges the cleaned water into a filtrate tank or directly overboard.

**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.*





## Biological Sewage Treatment

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### 5. "UltraC-27" - detailed description:

#### Electrical system and attached parts:

The electrical control cabinet, including transformer, sensing relays, all necessary switches, control relays and control lamps (LED), is made of mild steel, protected according to IP66, coated with finish RAL 7035 and equipped with cable glands with stuffing bushes acc. to DIN 89280 and door stoppers.

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 that enters the STP is held back by **two self cleaning fine screens**. The cleaning is carried out with brushes and an 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

The biologically active liquid ("activated sludge") and raw sewage are circulated inside the STP to create an even mixture to enable the microorganisms to reduce the pollution. The activation tank is constantly re-circulated to the membrane tank to supply the membrane filter with activated sludge. The **two circulation pumps** are also used to discharge excess sludge and coarse material and to empty the STP.

- Filtrate pump

The **two filtrate pumps** are used to discharge cleaned water via the membrane filter.

Technical details circulation pumps / filtrate pumps:		
	Circulation pump	Filtrate pump
Type	Eccentric screw pump with mechanical seal	
Flange sizes suction / discharge side	DN25, PN16	
Protection class	IP 55, ISO class F	
Capacity [m³/h] at [bar]	1.0 at 6	0.5 at 6
Power [kW at Hz]	0.55 at 50	0.37 at 50

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

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





# Biological Sewage Treatment

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- **Air blower**

The air feed of the STP is supplied by **three side channel blowers**. They force ambient air into the tanks via submerged aeration elements (breather tubes) that both support the biology and clean the membrane filter.

Technical details side channel blowers:	
Air flow [m <sup>3</sup> /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:

In the first tank coarse material is separated from the sewage.

The second tank is to activate and accelerate the biological process.

In the third tank the activated sludge is separated from the cleaned water by a filter membrane. Tank two and tank three are separated. This is to ensure the membrane is always submerged. Furthermore, this allows cleaning of the membrane without discharging all activated sludge.

- 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:

- For electrical connections please refer to the electrical diagram.
- The UltraC is factory tested and ready to plug in. It needs to be fixed to the floor by welding or bolting. The necessary pipe connections need to be established:

Pipe connection:	Inlet	Ventilation	Overflow	Outlet	Flushing	Discharge
Size [DN]	2xDN100	2xDN125	DN50	DN50	DN50	DN50
Size [PN]	PN16	PN16	PN16	PN16	PN16	PN16





# Biological Sewage Treatment

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## 6. UltraC-27 - design & calculation

The UltraC-27 is designed, calculated and type approved to treat a maximum hydraulic load of 27.8m<sup>3</sup>/d and a biological load of 19.6kg BOD<sub>5</sub>/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	150	121
Seagoing ship except passenger vessel	110	25	70	135	180	206	154

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	556	397
Commercial vessel	95	25	55	120	150	232	185
Naval vessel	135	20	65	155	200	179	139
Stationary Platform	175	25	70	200	245	139	113
Yacht (charter)	190	25	75	215	265	129	105
Working ship	190	25	75	215	265	129	105
River Cruiser	210	25	75	235	285	118	98
Cruiser	240	25	75	265	315	105	88
Yacht (owner)	350	25	75	375	425	74	65

Please see the attached project-specific calculation for further details and a load forecast.

To ensure a solid biological process the feeding of the UltraC-27 should not fall below the following values:

	Long-term	Short-term	Design maximum
Hydraulic load	4.5m <sup>3</sup> /d	3.0m <sup>3</sup> /d	27.8m <sup>3</sup> /d
Biological load	4.24kg/d	3.18kg/d	19.6kg/d

As a biological 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 may clog or get damaged which will make an exchange-service or a chemical cleaning necessary.





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### 7. UltraC - version overview

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

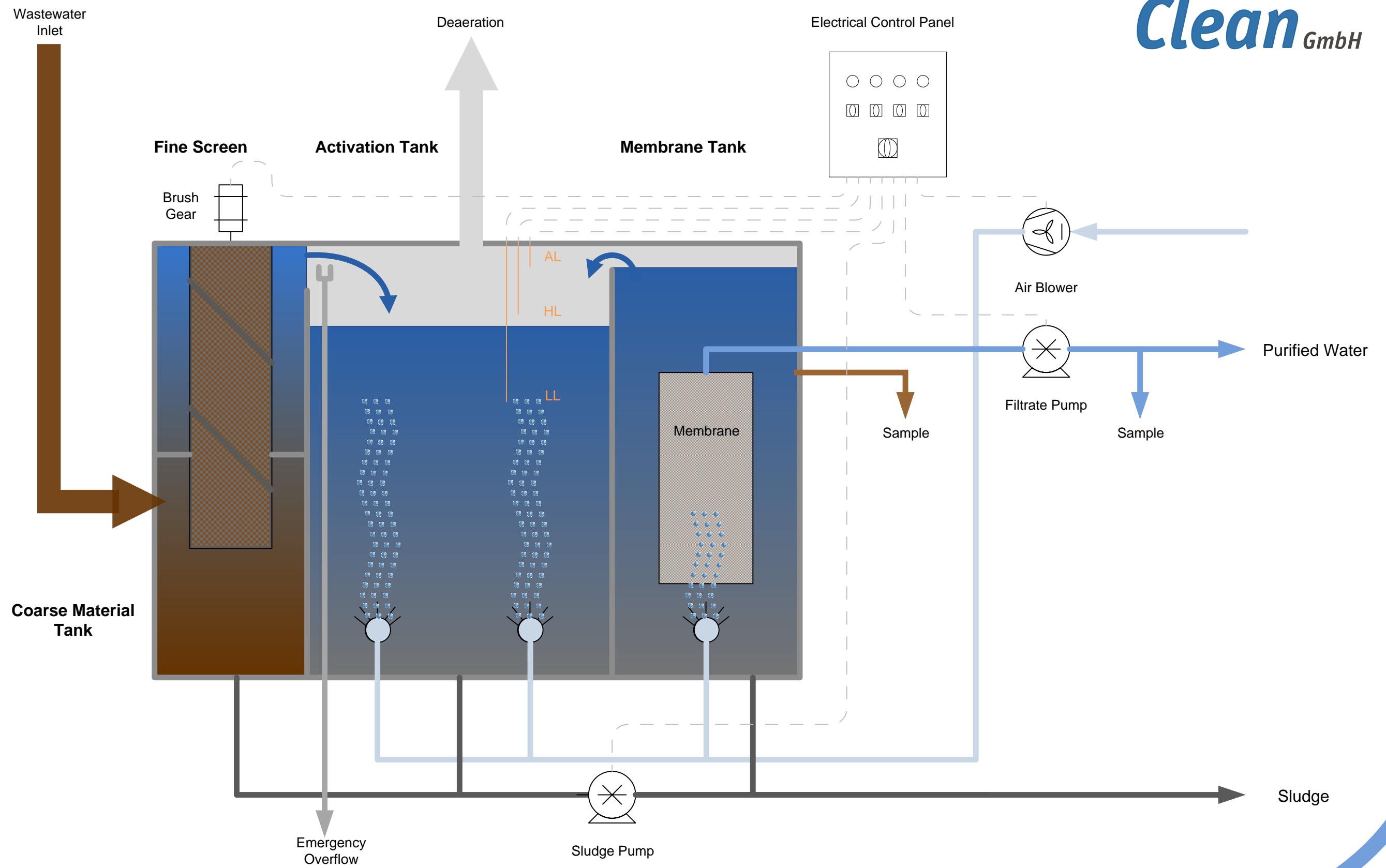
Range of <b>UltraC</b> types - other sizes available on request							
Type	Max. hydraulic load [m³/d]	Max. biological load [kg BOD <sub>5</sub> /d]	Collecting tank [m³]	Length [mm]	Width [mm]	Height [mm]	Net weight [kg]
UltraC-2	2.7	1.9	-	1927	1553	1645	826
UltraC-5	5.0	3.5	-	1927	1627	1645	1062
UltraC-9	9.3	6.5	6.0	1927	1627	1645	1062
UltraC-10	10.0	7.0	-	3911	1999	2112	1967
UltraC-15	15.0	10.6	-	5483	2130	2091	2815
UltraC-27	27.8	19.6	18.0	5483	2130	2091	2815

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

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







Black Water  
Grey Water

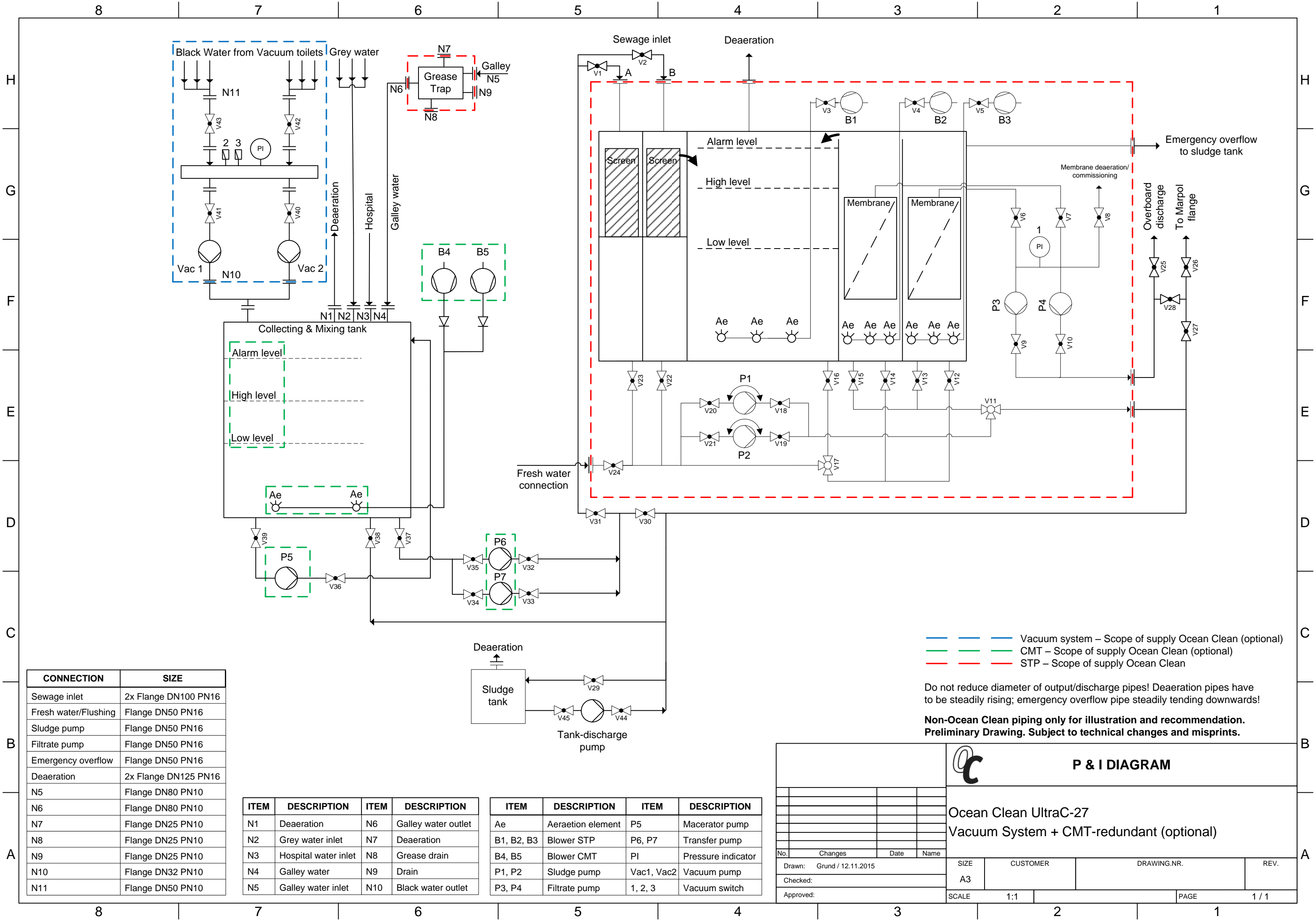
Pre-treated  
Wastewater

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	2x 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
N1	Deaeration	N6	Galley water outlet
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

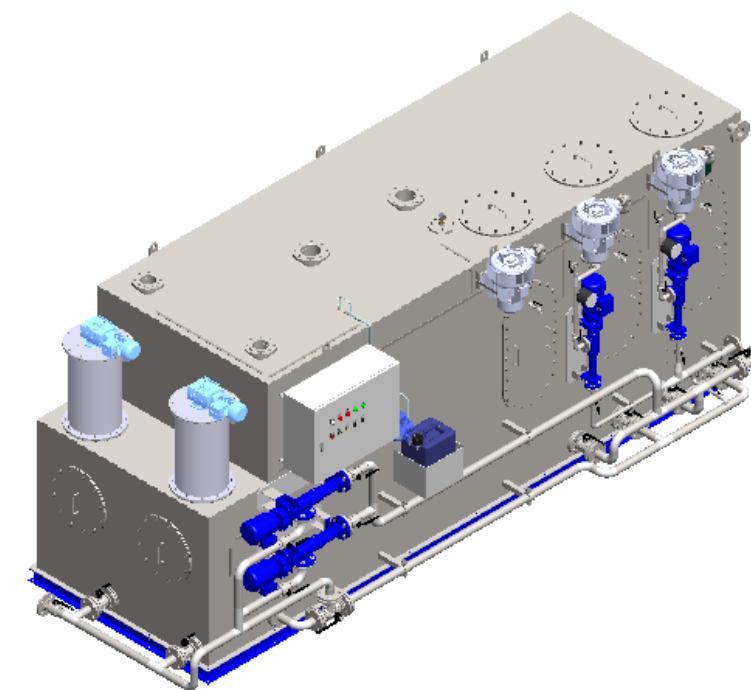
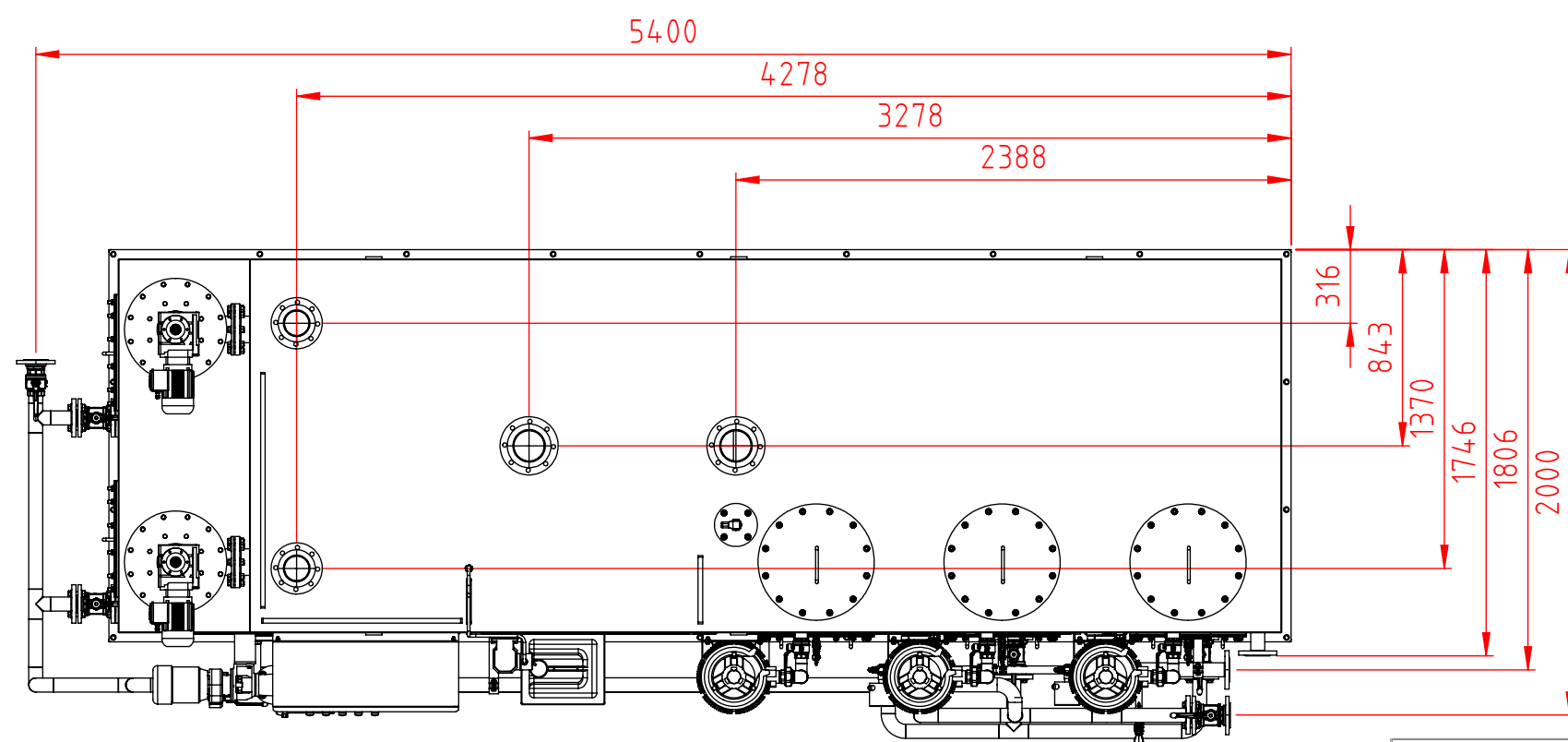
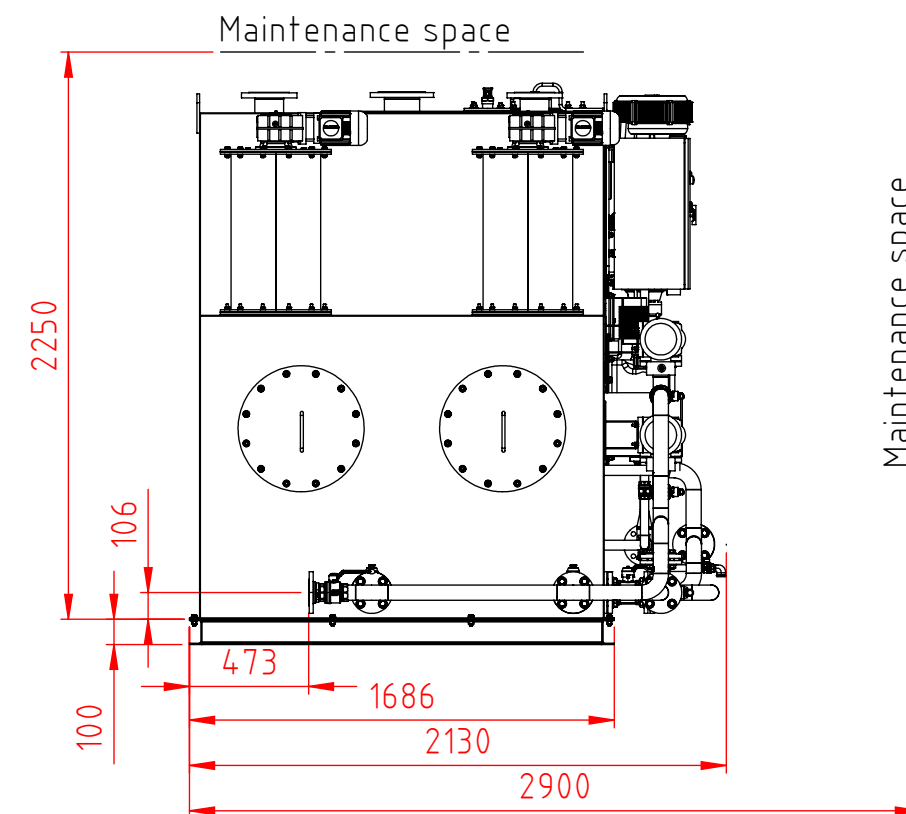
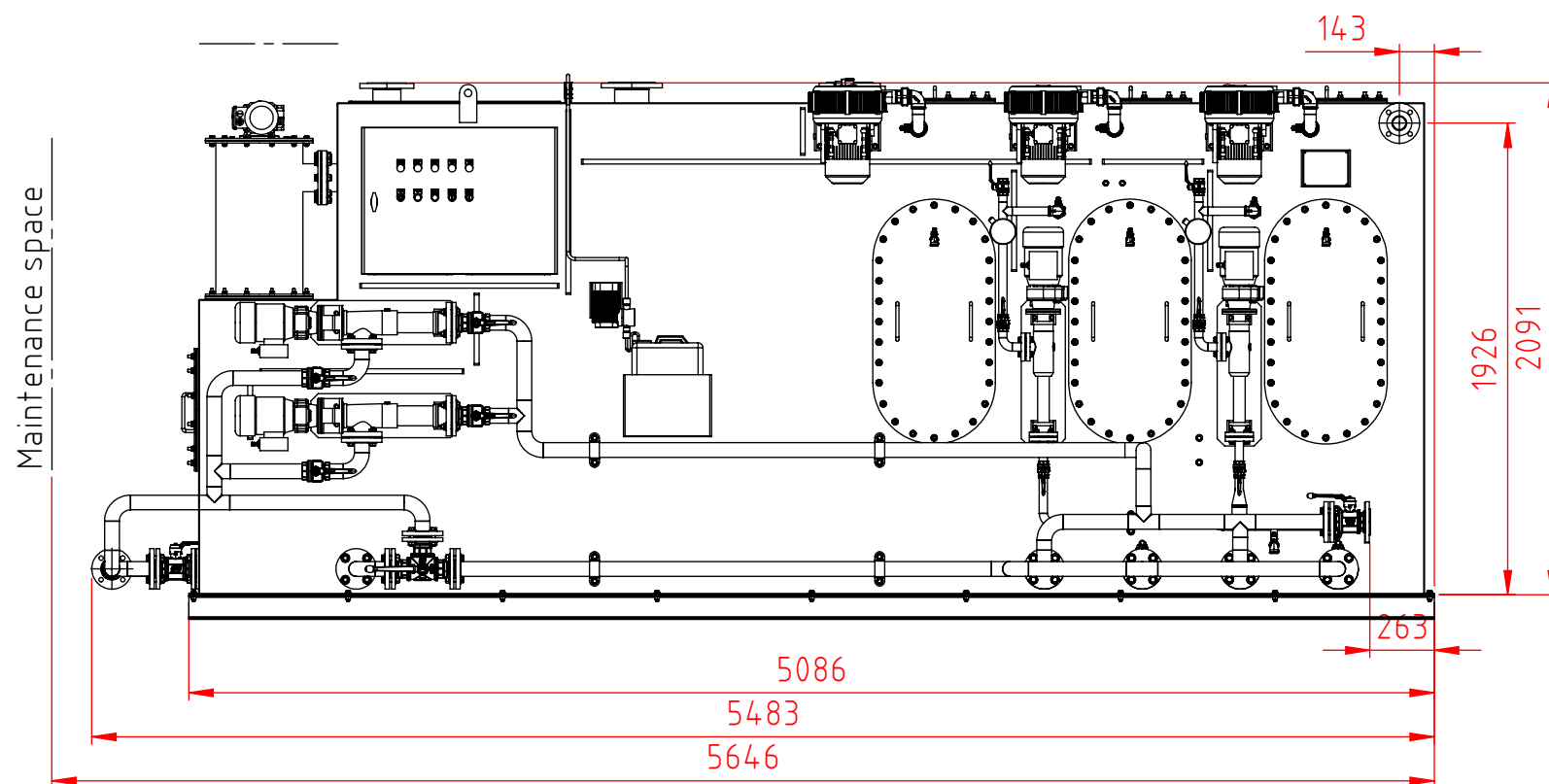
ITEM	DESCRIPTION	ITEM	DESCRIPTION
Ae	Aeraetion element	P5	Macerator pump
B1, B2, B3	Blower STP	P6, P7	Transfer pump
B4, B5	Blower CMT	PI	Pressure indicator
P1, P2	Sludge pump	Vac1, Vac2	Vacuum pump
P3, P4	Filtrate pump	1, 2, 3	Vacuum switch

- 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.

				P & I DIAGRAM			
				Ocean Clean UltraC-27			
				Vacuum System + CMT-redundant (optional)			
No.	Changes	Date	Name	SIZE	CUSTOMER	DRAWING.NR.	REV.
Drawn: Grund / 12.11.2015				A3			
Checked:				SCALE	1:1	PAGE	1 / 1
Approved:							



Revision : 0

Index	Änderung	Datum	Name

Oberfläche:

	Datum	Name
Erst.	13.02.2013	Grund
Gepr.		
Freig.		

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



Maßstab: 1:50 | Gewicht: 2815.00kg

Werkstoff:

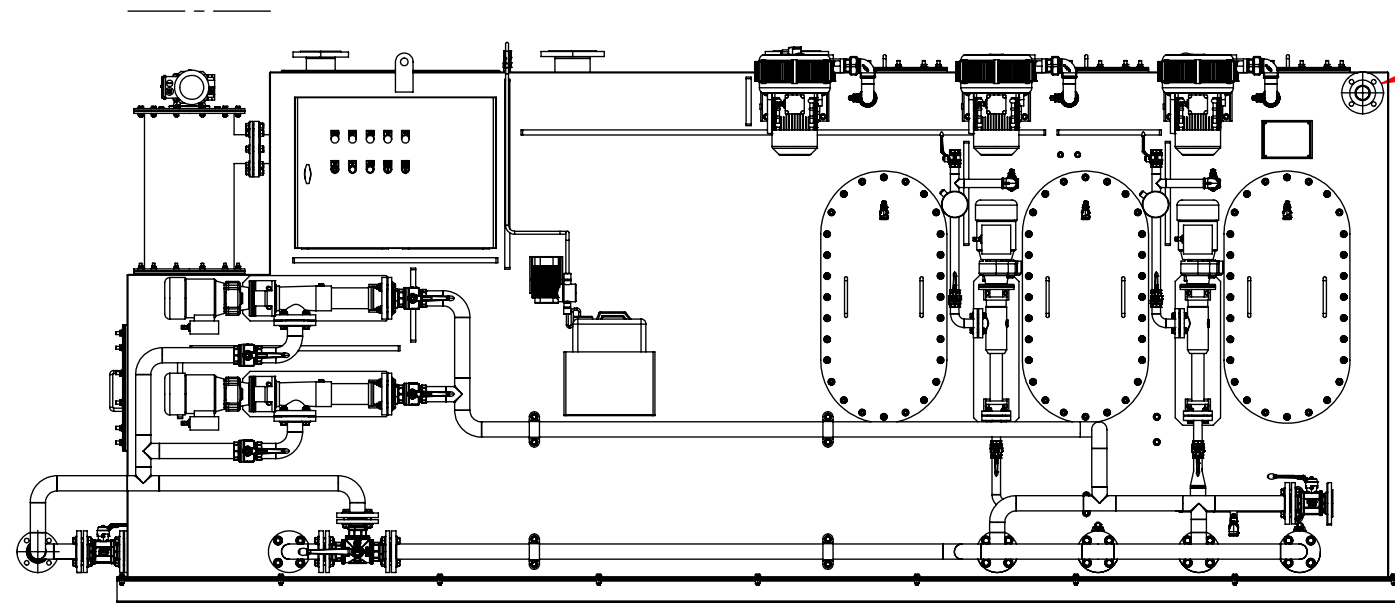
OCS-compact 80

OCS-c80-BG-000

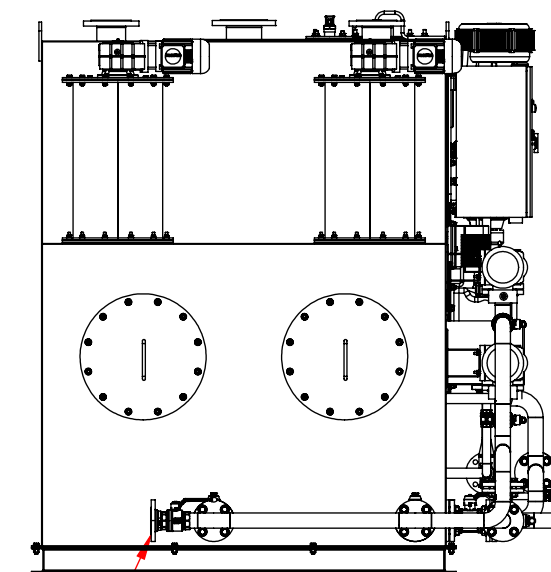
Seite  
1/2

A3

Maintenance space

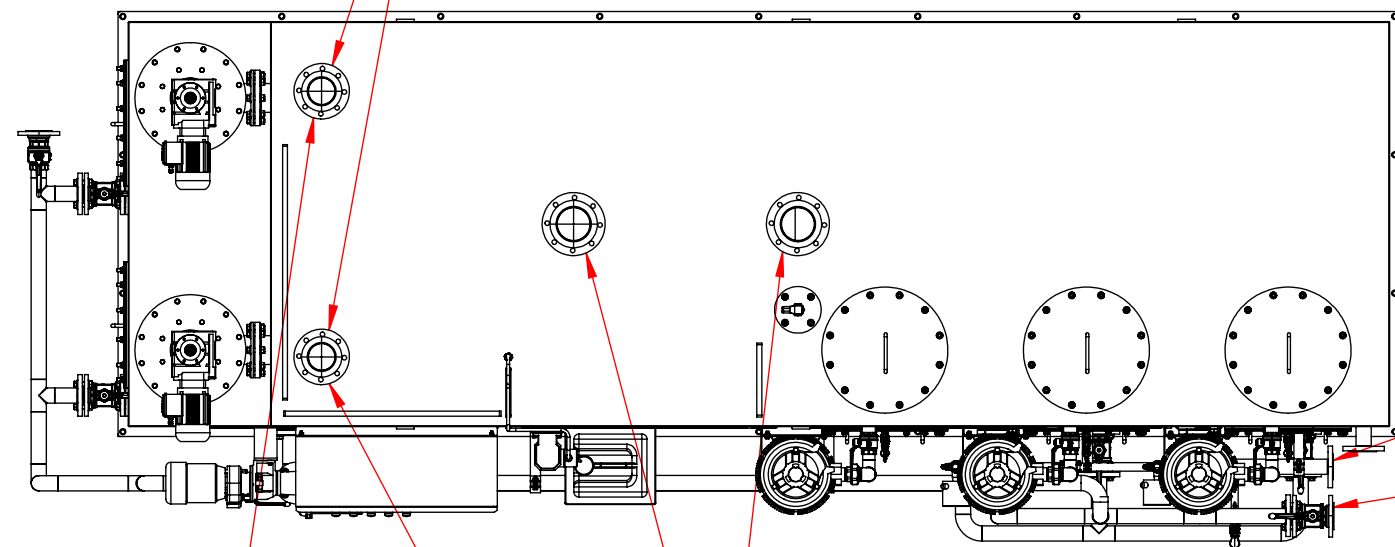


Maintenance space



Maintenance space

Note:  
Sewage inlet "A" and "B" have to be connected to the same sewage inlet pipe!  
Use valves to enable redundancy. Valves have to be fitted horizontally!



Number	Description	Size
1	Sewage Inlet "A"	Flange DN100 PN16
2	Sewage Inlet "B"	Flange DN100 PN16
3	Deaeration <sup>2</sup> <sup>3</sup>	Flange DN125 PN16
4	Flushing Connection	Flange DN50 PN16
5	Sludge Discharge <sup>2</sup>	Flange DN50 PN16
6	Filtrate Discharge <sup>2</sup>	Flange DN50 PN16
7	Emergency Overflow <sup>2</sup>	Flange DN50 PN16

<sup>2</sup> Do not reduce diameter of output/discharge pipes!

<sup>3</sup> Deaeration pipe has to be steadily rising!

Revision : 0

Index	Änderung	Datum	Name

Oberfläche:

	Datum	Name
Erst.	13.02.2013	Grund
Gepr.		
Freig.		

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



Maßstab: 1:50 | Gewicht: 2815.00kg

Werkstoff:

OCS-compact 80

OCS-c80-BG-000

Seite  
2/2

A3



# TYPENPRÜFUNGSZEUGNIS für Abwasser-Aufbereitungsanlagen

*Certificate of Type Approval for Sewage Treatment Plants*

Ausgestellt im Namen der Regierung  
der **BUNDESREPUBLIK DEUTSCHLAND**  
durch die **BERUFGENOSSENSCHAFT 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: UltraC-27  
type: .....

Ausgelegter Flüssigkeitsdurchsatz: 27,80 m<sup>3</sup>/Tag  
having a designed hydraulic loading of: m<sup>3</sup>/d

Durchsatz an organischen Stoffen: 19,60 kg/Tag biochemischer Sauerstoffbedarf (BSB<sub>5</sub>, ohne Nitrifikation)  
an organic loading of: kg per day biochemical oxygen demand (BOD<sub>5</sub>, without nitrification)

Auslegung gemäß Zeichnungen Nrn.: ocs-c80-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.227(64), um die Anforderungen an den Betrieb gemäß Regel 9.1.1 und 9.2.1 MARPOL Anlage IV des Internationalen Übereinkommens zur Verhütung der Meeresverschmutzung durch Schiffe, 1973, geändert durch die Protokolle von 1978 und 1997 (in der geänderten Fassung der Entschließung MEPC.115(51) und MEPC.200(62), zu erfüllen, zufriedenstellend erprobt wurde.

*has been examined and satisfactorily tested in accordance with the International Maritime Organization resolution MEPC.227(64) to meet the operational requirements referred to in Regulation 9.1.1 and 9.2.1 of MARPOL Annex IV of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 and 1997 Protocols (as amended by resolutions MEPC.115(51) and MEPC.200(62)).*

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: .....

Zulassungs-Nr.: 340.467  
Certificate-No.:

\* nicht zutreffendes streichen  
*Delete as appropriate*

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:*

- (.1) ein geometrisches Mittel von nicht mehr als 100 fäkalkoliforme (thermo-toleranten) Bakterien/100 ml
- (.1) *a geometric mean of no more than 100 thermo tolerant coliforms/100 ml;*
- (.2) ein geometrisches Mittel der gesamten Schwimm- und Schwebstoffe von 35 Qi/Qe mg/l für an Land getestete Anlagen oder der Maximalwert der gesamten Schwimm- und Schwebstoffe übersteigt nicht (35 plus x) Qi/Qe mg/l für das umgebende Wasser, das für Spülzwecke verwendet wird, bei Tests an Bord
- (.2) *a geometric mean of total suspended solids of 35 Qi/Qe mg/l if tested ashore or the maximum total suspended solids not exceeding (35 plus x) Qi/Qe mg/l for the ambient water used for flushing purposes if tested on board*
- (.3) ein geometrisches Mittel des Biochemischen Sauerstoffbedarfs nach fünf Tagen ohne Nitrifikation (BSB<sub>5</sub> ohne Nitrifikation) mit nicht mehr als 25 Qi/Qe mg/l
- (.3) *a geometric mean of 5-day biochemical oxygen demand without nitrification (BOD<sub>5</sub> without nitrification) of no more than 25 Qi/Qe mg/l*
- (.4) ein geometrisches Mittel des Chemischen Sauerstoffbedarfs (COD) mit nicht mehr als 125 Qi/Qe mg/l
- (.4) *a geometric mean of chemical oxygen demand (COD) of no more than 125 Qi/Qe mg/l*
- (.5) der pH-Wert liegt zwischen 6 und 8,5
- (.5) *pH between 6 and 8,5*
- (.6) ~~ein geometrisches Mittel des gesamten Stickstoff von nicht mehr als 20 Qi/Qe mg/l oder mindestens 70 % Reduktion, u.~~
- (.6) ~~*a geometric mean of total nitrogen of no more than 20 Qi/Qe mg/l or at least 70 per cent reduction; and*~~
- (.7) ~~ein geometrisches Mittel des gesamten Phosphor von nicht mehr als 20 Qi/Qe mg/l oder mindestens 80 % Reduktion~~
- (.7) ~~*a geometric mean of total phosphorus of no more than 1,0 Qi/Qe mg/l or at least 80 per cent reduction\*\**~~

Die Verwaltung bescheinigt, dass die Anlage bei Neigungen bis zu 22,5° in jede Richtung von der normalen Aufstellung arbeiten kann.

*The Administration confirms 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 should 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:

**30.09.2020**

*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.*

**\*\* ist zu streichen für Schiffe, die keine Fahrgastschiffe sind die beabsichtigen Abwasser in Sondergebieten einzuleiten**

*Delete for ships other than passenger ships intending to discharge sewage effluent in Special Areas*

Das Typenprüfungszeugnis für Type UltraC-27 wird aufgrund der Erprobung von Type OCS-compact 15 gemäß IMO-Entschließung MEPC.227(64) Anhang Pkt. 5.8 ausgestellt.

*The certificate of type test of type UltraC-27 will be issued based on the test of type OCS-compact 15 according to IMO-Resolution MEPC.227(64) annex 5.8.*

Ausgestellt in Hamburg am 01.10.2015  
*Issued at Hamburg on*

**BERUFGENOSSENSCHAFT FÜR TRANSPORT  
UND VERKEHRSWIRTSCHAFT  
- DIENSTSTELLE SCHIFFSSICHERHEIT -**



  
Unterschrift  
*Signature*

Die Abwasser-Aufbereitungsanlage Serien-Nr. \_\_\_\_\_  
*The sewage treatment plant serial No.*

entspricht dem geprüften Typ.  
*complies with the tested type.*

\_\_\_\_\_  
Ort  
*Place*

\_\_\_\_\_  
Datum  
*date*

\_\_\_\_\_  
Firmen-  
stempel  
*Company  
stamp*

\_\_\_\_\_  
Unterschrift  
*Signature*





# TYPENPRÜFUNGSZEUGNIS für Abwasser-Aufbereitungsanlagen

*Certificate of Type Test for Sewage Treatment Plants*

## ANHANG zu Type: UltraC-27

### Appendix to type: UltraC-27

**Prüfergebnisse und Einzelheiten der Erprobungen, geprüft mit Hilfe von Proben  
der Abwasser-Aufbereitungsanlage in Übereinstimmung  
mit der EntschlieÙung MEPC.227(64)**

*Test results and details of tests conducted on samples from the sewage treatment  
plant in accordance with resolution MEPC.227(64)*

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, Dienststelle Schiffssicherheit  
*Organization conducting the test:*

Ausgelegter Flüssigkeitsdurchsatz <i>Designed hydraulic loading</i>	2,7	Kubikmeter pro Tag <i>cubic metres per day</i>
Ausgelegter Durchsatz an organischen Stoffen <i>Designed organic loading</i>	1,9	Kilogramm pro Tag BSB <i>kilograms per day BOD</i>
Anzahl der untersuchten Ausflussproben <i>Number of effluent samples tested</i>	40	
Anzahl der untersuchten Einlaufproben <i>Number of influent samples tested</i>	40	
Abwasserqualität (Einlauf), TSS <i>Total suspended solids influent quality</i>	2575	Milligramm pro Liter Schwebestoffe <i>milligrams per litre Total Suspended Solids</i>
Gesamtstickstoff am Einlauf <i>Total nitrogen influent quality</i>	n.a.	Milligramm pro Liter als Stickstoff* <i>milligrams per litre as nitrogen*</i>
Gesamtposphat am Einlauf <i>Total phosphorus influent quality</i>	n.a.	Milligramm pro Liter als Phosphat* <i>milligrams per litre as phosphorus*</i>
BSB <sub>5</sub> ohne Nitrifikation am Einlauf <i>BOD<sub>5</sub> without nitrification influent quality</i>	704	Milligramm pro Liter <i>milligrams per litre</i>
Maximaler Flüssigkeitsdurchsatz <i>Maximum hydraulic loading</i>	2,7	Kubikmeter pro Tag <i>cubic metres per day</i>
Mindest-Flüssigkeitsdurchsatz <i>Minimum hydraulic loading</i>	--	Kubikmeter pro Tag <i>cubic metres per day</i>
Durchschnittlicher Flüssigkeitsdurchsatz <i>Average hydraulic loading</i>	2,7	Kubikmeter pro Tag <i>cubic metres per day</i>
Abwasserauslauf (Q <sub>e</sub> ) <i>Effluent flow (Q<sub>e</sub>)</i>	2,7	Kubikmeter pro Tag <i>cubic metres per day</i>

\* nicht zutreffendes streichen  
*Delete as appropriate*



Verdünnungsausgleichsfaktor (Qi/Qe) <i>Dilution compensation factor (Qi/Qe)</i>	1	
Geometrisches Mittel der gesamten Schwimm- und Schwebstoffe <i>Geometric mean of total suspended solids</i>	1	Milligramm pro Liter <i>milligrams per litre</i>
Geometrisches Mittel der fäkalcoliformen (thermo-toleranten) Bakterienzahl <i>Geometric mean of the thermotolerant coliform count</i>	1	Bakterien pro 100 Milliliter <i>coliforms per 100 millilitres</i>
Geometrisches Mittel des BSB <sub>5</sub> ohne Nitrifikation <i>Geometric mean of BOD<sub>5</sub> without nitrification</i>	2,8	Milligramm pro Liter <i>milligrams per litre</i>
Geometrisches Mittel des COD <i>Geometric mean of COD</i>	37,5	Milligramm pro Liter <i>milligrams per litre</i>
Geometrisches Mittel des Gesamtstickstoffs <i>Geometric mean of total nitrogen</i>	n.a.	Milligramm pro Liter* oder Prozent* <i>milligrams per litre* or per cent*</i>
Geometrisches Mittel des Gesamtphosphors <i>Geometric mean of total phosphorus</i>	n.a.	Milligramm pro Liter* oder Prozent* <i>milligrams per litre* or per cent*</i>
Höchster pH-Wert <i>Maximum pH</i>	8,08	
Niedrigster pH-Wert <i>Minimum pH</i>	7,45	
Art des verwendeten Desinfektionsmittels <i>Type of disinfectant used</i>	--	
Wenn Chlor - verbleibendes Chlor: <i>If Chlorine - residual Chlorine:</i>		
Maximum <i>Maximum</i>	--	Milligramm pro Liter <i>milligrams per litre</i>
Mindestwert <i>Minimum</i>	--	Milligramm pro Liter <i>milligrams per litre</i>
Geometrisches Mittel <i>Geometric Mean</i>	--	Milligramm pro Liter <i>milligrams per litre</i>
Wurde die Abwasser-Aufbereitungsanlage geprüft mit: <i>Was sewage treatment plant tested with:</i>		
Frischwasserspülung? <i>Fresh water flushing?</i>	ja/yes <input checked="" type="checkbox"/>	nein/no <input type="checkbox"/> *
Salzwasserspülung? <i>Salt water flushing?</i>	ja/yes <input type="checkbox"/>	nein/no <input checked="" type="checkbox"/> *
Frisch- und Salzwasserspülung? <i>Fresh and salt water flushing?</i>	ja/yes <input type="checkbox"/>	nein/no <input checked="" type="checkbox"/> *
Wurde Grauwasser zugegeben? <i>Grey water added?</i>	ja/yes <input checked="" type="checkbox"/> - Anteil % - proportion	nein/no <input type="checkbox"/> *

\* nicht zutreffendes streichen  
*Delete as appropriate*

Wurde die Abwasser-Aufbereitungsanlage geprüft nach den Umweltbedingungen die in Abschnitt 5.9 der Entschließung MEPC.227(64) festgelegt sind:

Was the sewage treatment plant tested against the environmental conditions specified in section 5.9 of resolution MEPC.227(64):

Temperatur <i>Temperature</i>	ja/yes <input checked="" type="checkbox"/>	nein/no <input type="checkbox"/> *
Luftfeuchtigkeit <i>Humidity</i>	ja/yes <input checked="" type="checkbox"/>	nein/no <input type="checkbox"/> *
Krängung <i>Inclination</i>	ja/yes <input checked="" type="checkbox"/>	nein/no <input type="checkbox"/> *
Vibration <i>Vibration</i>	ja/yes <input checked="" type="checkbox"/>	nein/no <input type="checkbox"/> *
Funktionssicherheit der elektr. und elektronischen Bauteile <i>Reliability of Electrical and Electronic Equipment</i>	ja/yes <input checked="" type="checkbox"/>	nein/no <input type="checkbox"/> *

#### Beschränkungen und Betriebsbedingungen

Limitations and the conditions of operation are imposed:

Salzgehalt <i>Salinity</i>	--
Temperatur <i>Temperature</i>	5 - 45 °C
Luftfeuchtigkeit <i>Humidity</i>	--
Krängung <i>Inclination</i>	--
Vibration <i>Vibration</i>	--

Ergebnisse anderer geprüfter Parameter: keine  
Results of other parameters tested none

Auferlegte Einschränkungen:  
Limiting conditions imposed:

Die Abwasser-Aufbereitungsanlage UltraC-27 muss mit einem Vorhaltetank von min. 18,0 m<sup>3</sup> ausgerüstet werden.

The sewage treatment plant UltraC-27 should be equipped with a pre collecting tank of min. 18,0 m<sup>3</sup>.

Ausgestellt in: Hamburg am: 01.10.2015  
Issued at: on:



*Lijsl*  
Berufsgenossenschaft für Transport  
und Verkehrswirtschaft  
- Dienststelle Schiffssicherheit -

\* nicht zutreffendes streichen  
Delete as appropriate



European notified body  
Identification number 0736

**DGUV Test**  
Prüf- und Zertifizierungsstelle  
BG Verkehr  
Dienststelle Schiffssicherheit

## EC-Type Examination (Module B) Certificate

Certificate-No. **340.467**

Name and address of the manufacturer: Ocean Clean GmbH, Zum Kühlhaus 5, 18069 Rostock, Germany

Date of issue: **01.10.2015**

Annex A.1 Item No & Item designation: **A.1/2.6 – Sewage treatment plants**

Product designation: **Sewage treatment plant**

Product Type: **UltraC-27**

Intended purpose: **Sewage treatment plants for ships acc. MARPOL 73/78, Annex IV and Helsinki-Convention**

Testing based on (Specific standard): **IMO Resolution MEPC.227(64) 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 2014/93/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.

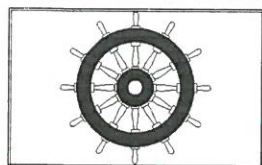
Expiry date: **30.09.2020**

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



Signature (Seifert)



**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 2014/93/EC), Annex B, Module D or Module F (Product Verification), section 5, Statistical Verification.

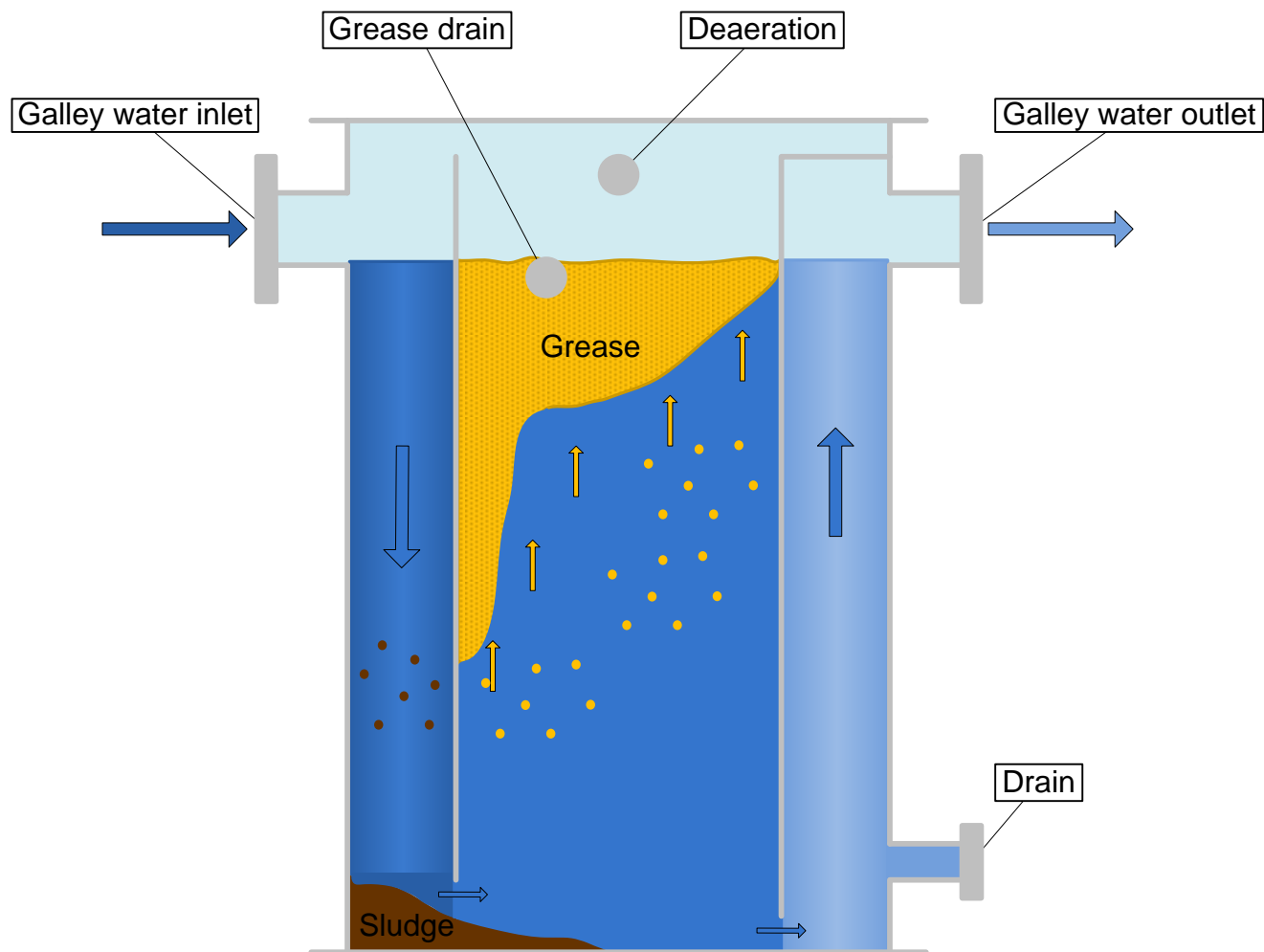
All products will be divided into identical lots of 10 pieces each, starting with serial number OCS-YYMM-0101-XXXX. One (1) random sample will be drawn from each lot and individually examined.



# Fat Trap

## Operation Scheme

*Ocean*<sup>®</sup>  
**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.

