

# Water treatment and preparation systems

- Fresh water desalination units
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## Water treatment and preparation systems



At the time being, waters of the World Ocean have become one of the busiest traffic arteries of the modern civilization. Dozens of thousands ships leave and return to their ports every day, are out at sea to implement different tasks: fishery, cargo carriage, patrolling, etc.

Each of these ships is a temporary accommodation for its crew. Thus, it is crucial to ensure the solid comfort for the crew so it can be fully focused on the task at hand. Modern ships are equipped with a whole range of support systems, securing the full control of any aspect of its life.

Due to the steadily growing number of ships, the world community increasingly and tightly controls the impact degree on flora and fauna of the World Ocean.

More stringent demands in respect for the environment are placed on new ships.



Since 2015 Vineta Ltd. has been working to create the first components of such package of systems: waste and oily water treatment units. One of the principal goals was to create a product sample, meeting all the modern requirements for environmental friendliness and safety.

The project was created within the framework of the Programme of the Import Substitution in the machinebuilding of the RF Ministry of Industry and Trade at the expense of Vineta Ltd.

Prototype tests took place in February – March, 2016, under the supervision of the Russian Register of Shipping and the RF Quality Control Agency of the Ministry of Defence. Units got international certificates as per MEPC.107(49) form – oily bilge water; MEPC.227(64) – domestic wastewater. Upon successful tests, units were mounted on Seagoing Tug Sergey Bulk – Project 23470, newly built under drawings of Baltsudoproekt, Central Design Bureau.

At the time being, Vineta Ltd. is the only Russian enterprise able to provide ships and vessels, newly designed or placed under repair, with a full range of the equipment of Russian design, production and IMO approval under MEPC forms to prevent the discharge into the World Ocean (MARPOL 73/78).







# **Fresh water desalination units**

### Function and technical data

• The unit is intended to desalinate fresh water.



### Technical data, main parameters and characteristics

Name	Value
Medium	fresh water under Sanitary Rules and Regulations 2.1.3684 and 1.2.3685 with initial salt content max 500 mg/l
Temperature, °C	from +5 up to +32
Fresh water flow rate, m³/day	max 13.0
WP, MPa	0.7 in fresh water unit
Capacity, m³/h	1.0
Desalinated water quality:	salt content – max 5 mg/l; water hardness (under FOCT 31865-2012) – max 4 dH
Required extreme inlet pressure, MPa	from 0.05 up to 0.10
Control board/location	yes/in-frame
Power, kW	max 5.0
Dry weight, kg	300
LxWxH	1380x706x1600
Maintenance area (availability)	yes

Other technical requirement under the specification



# Units to treat fresh water for domestic use

## Function and technical data

- The unit is intended to onboard treat domestic fresh water and to supply it to the consumers according to the applicable sanitary rules
- The unit secures the storage, distibution, chlorination, decontamination and heating of fresh water.
- The unit incorporates MB-50 mineralizer for the water enrichment
- The control and monitoring of parameters are carried out using the control board, located on the unit foundation



Name	Parameter	
Medium	Fresh water for domestic use	
Temperature, °C	up to +30	
WP, MPa	0.4	
Capacity, m³/h	cold water – 8.5; hot water – 1.0	
Control board/location	yes/in-frame	
Power, kW	42.0	
Dry weight, kg	2110	
LxWxH	5790x2500x2400	
Maintenance area (availability)	yes	



# **Oily water separators СНЛВ type**

### Function and technical data

- Oily water separator is intended to purify ship bilge water from oil products under requirements of MEPC.107 (49).
- It is a three-stage purification system, consisting of the following equipment installed and mounted in series on a single frame:
  - preliminary treatment block,
  - intermediate filter,
  - fine filter.
- The system also includes progressive cavity pump, NEVA-412 oil products content signaling device and control board.
- Approval of the Russian Maritime Register of Shipping.



Name	Value			
Index	СНЛВ 1.0	СНЛВ 2.5	СНЛВ 2.5	
Medium	oily (bilge) water (the composition of the inlet medium to be purified is under the specification)			
Temperature, °C	upon the content of heavy oil products (black product), with its density max 980 kg/m <sup>3</sup> - min +38; upon the content of light oil products (diesel fuel), with its density being max 830 kg/m <sup>3</sup> - min +5			
WP, MPa	0.4 max 0.5		max 0.4	
Capacity, m³/h	1.0	2.5	5.0	
Control board/location	yes/in-frame			
Dry weight, kg	1000	770	1370	
LxWxH	1730x1505x1560	1300x1200x1500	1500x1815x1720	
Power, kW	2.5	7.0	10.0	



# Waste water treatment units **YOCB** type

## Function and technical data

- The unit is designed to disinfect bilge wastewater and galley (grey) room water:
  - The unit secures continuous automatic operation.
  - No chemical agents needed.
  - Complies with the requirements of the Russian Maritime Register of Shipping.



Name	Value			
Index	YOCB 10	YOCB 21	YOCB 50	
Туре	Physical-chemical			
Decontaminant	35% hydrogen peroxide			
Medium	Black- and greywater, sea water			
Capacity, m³/day, min	10	21	50	
Power, kW, max	2.5	3.0	7.0	



# Sea water desalination unit YOMB type

#### 3.0

#### Function and technical data

• The unit is intended to prepare portable quality water out of sea water.

#### Advantages:

- Continuous automatic operation.
- Remote control.
- The climatic version is OM4 as per FOCT 15150 to operate under ambient temperature up to + 50°C and relative humidity of 98%.
- Desalinated water complies with the requirements Sanitary Rules and Norms 2.1.3684-21.



### Technical data, main parameters and characteristics

Name	YOMB-005.10.01 YOMB-015.10.01		УОМВ-030.10.01	
Fresh water capacity, m³/day	51)	15 <sup>1)</sup>	30 <sup>2)</sup>	
Medium	Sea water			
Temperature, °C	-2+ 32			
Flow rate, m <sup>3</sup> /h	2.7	3.5	10.0	
WP in the desalination unit, MPa	6.5			
Max sea water salt content, g/l	42			
Required inlet excessive pressure, MPa	from 0.25	from 0.25 up to 0.5		
Control board/location	yes/separately	yes/in-frame	yes/separately	
Power, kW	4.0	4.3	12.3	
Dry weight, kg	300	460	734	
LxWxH	1128/ 676/ 774	1200/ 864/ 1021	1300/ 888/ 800	
Maintenance area (availability)	yes			

<sup>1)</sup> Standard terms for the capacity calculation:

- sea water salt content 36 g/l;
- sea water temperature +5 °C;

The capacity of units under conditions other than standard ones is shown in diagrams (see Pic. 1 and 2). Other technical requirement under the specification.





Pic 1. Dependence of YOMB-015.10.01 capacity on the sea water temperature and salt content



 $\operatorname{Pic} 2.$  Dependence of YOMB-030.10.01 capacity on the sea water temperature and salt content

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# Ballast water treatment systems СУБВ type

Water treatment and preparation systems

#### **Function and technical data**

- The system is intended to purify the ballast water.
- Purification method: ozone treatment
- It complies with the rules D2, D3 of International Convention for the Control and Management of Ships' Ballast Water and Sediments (2004).
- It is equipped with the control board.



Name	Value				
Capacity, m³/h	160	250	500	1000	3000
Hydraulic resistance, MPa (kgf/cm²), max			0.05 (0.5)		
Filtration degree, mcm			50		
Max WP, MPa (kgf/cm²)			0.6 (6.0)		
Power: - Frequency, Hz - Voltage, V			50 380		



# Note




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