

**WATER &  
WASTE**  
A WÄRTSILÄ® BUSINESS

# FRESHWATER GENERATORS

SINGLE STAGE DESALINATION UNITS





## Introducing Wärtsilä's freshwater generators

Within the marine world Wärtsilä's Freshwater Generators (FWG) are known as standard for on-board freshwater production. Ship owners, builders and operators can source from the widest range of freshwater making technologies available to the market today. This range includes Reverse Osmosis Plants, Horizontal Inner Tube Evaporators, Multi Flash Evaporators, Single Stage Desalination Plants or a combination of these. Also a growing number of land-based applications is fitted with our equipment. In choosing Wärtsilä as your freshwater production partner you secure a flexible, reliable, and fully automated solution.





## Specialist solutions requiring high customer focus

Our diverse and dedicated team of engineers is developing, manufacturing and distributing freshwater solutions for and to customers worldwide. Thanks to a creative out-of-the-box mindset, this team excels in innovative and specialist solutions, bespoke set-ups that require a high customer focus.

Every successful implementation of a freshwater generator starts with an accurate analysis of the vessel's status, identifying possibilities and needs. In each case our team will strive for a solution that is most energy and space efficient. A higher energy efficiency, for instance, can often be reached by looping to energy sources already available on a vessel. Greater flexibility in construction and sizing can be accomplished by making a combination of different FWG technologies. This approach especially comes in handy when retrofitting engine rooms.

## Building on more than 125 years of history

Our freshwater division in Geesthacht, Germany, is also known as Wärtsilä Serck Como GmbH and part of the bigger Wärtsilä Water & Waste business unit.

The company's expertise in freshwater generation is unrivalled: in 1894 Serck

Como started producing its first evaporator for sea-going vessels. Having survived two world wars, we know what it means to adapt to ever changing circumstances. We believe that it is important to both invest in own innovations and to adapt to new external trends. As water maker specialist our focus is on the future. We are confident to come up with solutions for any technical challenge that will come our way.

## Total water & waste solution

Freshwater generators are part of a much wider water & waste product range, offered by Wärtsilä's eponymous "Water & Waste" business unit. Ship owners, builders and operators that are looking for a single provider for all their water, waste and wastewater challenges, will find the peace of mind they are looking for.

In addition to freshwater solutions, our total solution offer includes ballast water treatment technologies, wastewater, wet and dry waste treatment systems. Thanks to Wärtsilä Water & Waste's global agent and distributor network our after-sales and spare parts services are reliable and well organised. We are able to help our customers from the design phase of their freshwater equipment to the delivery of spare parts.

### Product range



#### Reverse Osmosis Plants



#### Horizontal inner Tube Evaporators



#### Multi Stage Flash Evaporators



#### Single Stage Desalination Plants

# SSD

Wärtsilä's Single-Stage Desalination (SSD) unit generates high quality freshwater in an energy efficient way. With a capacity from 8 to 35 ton/day, it is ideal for converting seawater for use as drinking or technical water onboard ships or offshore installations.

The Wärtsilä SSD is a state-of-the-art desalination unit that meets the need of long-voyage seagoing vessels where freshwater cannot be bunkered. It is also applicable in situations where clean water is required for processes. The system uses vacuum distillation to remove salt and other impurities from the seawater and convert it into high quality freshwater. The design features simple technology with a continuous and user-friendly operation. Waste heat from the diesel engine or other heat sources is used to evaporate the seawater and the system's total electricity consumption is low.

The SSD produces freshwater of the highest quality, simply and reliably. It is easy to operate, requires minimal maintenance. Spare parts are easily accessible, and no special consumables are required. Operating costs are low, and the use of time-consuming manpower is extremely

limited. Like all Wärtsilä installations, the SSD is supported by the marine industry's most extensive global service network.

## Working principle

Seawater is fed into the system, passing through the condenser (1) and air-brine ejector (2). A small part of the seawater is used as feedwater for the evaporator. The air-brine ejector,

driven by the seawater, evacuates both the excessive feed water and the chamber. A heating medium is fed into the evaporator. After approximately 5 minutes a vacuum of 90% is reached and evaporation of the feed water commences. The vapour flows through a demister (3) and is condensed in the condenser section. The distillate is pumped out of the unit.



## Technical data

Model	Capacity, ton/day	L x W x H, mm	Specific thermal power, kWh/t	Specific electrical power, kWh/t <sup>1</sup>	Weight, kg <sup>2</sup>	Space required, m <sup>3</sup>
SSD 1-1	8 - 14	970 x 960 x 1680	740	8,5	580	2
SSD 1-2	14 - 22	970 x 960 x 1680	740	8,5	620	2
SSD 2-3	22 - 30	1260 x 960 x 1680	740	8,5	710	2.5
SSD 2-4	30 - 35	1260 x 960 x 1680	740	8,5	750	2.5

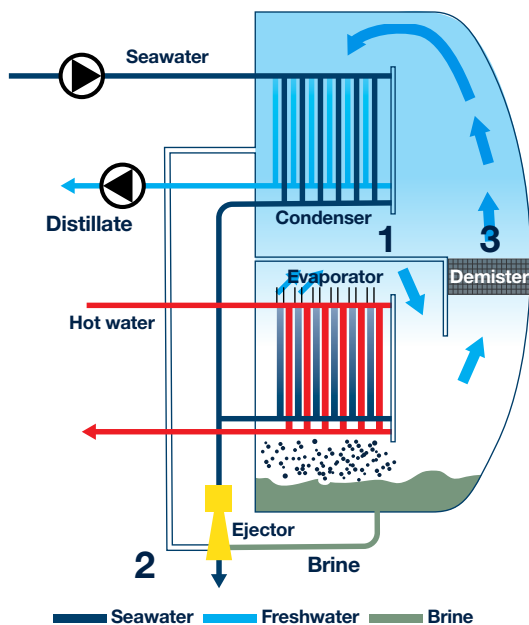
### Variants:

Heating water source: all kind of water between 70 °C and 95 °C, steam or a combination of both  
Water conductivity < 4 µS/cm

<sup>1</sup> values can vary

The weights given for the freshwater generators are in an empty condition. An additional 10% should be assumed for their operational weight.

<sup>2</sup> The weight and dimensions include the control panel.



## Key benefits

- Plug-and-play solution
- Utilising engine waste heat
- Cost-effective thanks to limited need for consumables, special tools & spare parts
- Ease of operation promotes greater safety
- Maintenance friendly
- Excellent reliability
- Control cabinet included
- Water conductivity < 4  $\mu\text{S}/\text{cm}$

## Scope of supply

### Delivered as standard

- Condenser & evaporator plates made from corrosion resistant titanium
- Distillate pump
- Combined air and brine ejector
- Chemical dosing tank including dosing instruments
- Solenoid valve for dumping bad distillate
- Control cabinet, including distillate motor starter and seawater pump motor starter
- High salinity alarm
- Complete documentation and drawing

### Options

- Seawater pump including electric motor
- Mineralization filter for adjusting the pH-value of the distillate
- UV steriliser for disinfection of the distillate
- Counter flanges
- Steam injector
- Booster heater

# Selection criteria

	RO	HiTE	MSF	SSD
Production capacity: 5 - 35 ton/day				•
Production capacity: 35 - 175 ton/day	•	•	•	
Production capacity: 175 - 1500 ton/day	•		•	
High quality distillate < 4 $\mu\text{S}/\text{cm}$		•	•	•
Bespoke design possible	•	•	•	
Able to use ship's rest heat (from engine)		•	•	•
Suitable for land-based applications	•	•	•	
Plug & Play solution, small footprint				•
Fully automatic operation (integrated PLC)	•	•	•	
Need for high filtration	•			•
Able to handle water with oil particles / emulsion		•	•	•
Maintenance less than once times per half year (in full time use)		•	•	•
Low Capex	•			•
Electrical consumption kW/ton distillate <sup>1</sup>	3.5	3.2	3.0	8.5
Modular design for extra flexibility	•			

<sup>1</sup> values can vary

# Service

Wärtsilä Water and Waste has in-house technical service teams that are able to assist customers throughout the lifecycle of their freshwater generation installations. These teams help with the optimisation of efficiency and performance. Customers can also call in our technical support during installation, start-up, operation and maintenance.

Our facility in Geesthacht Germany provides customized solutions with short delivery time and with a tight quality control. Our worldwide network of agents and distributors ensures direct local support for the majority of our customers.

Scope of equipment	Scope of performance
<b>We service following equipment:</b> <ul style="list-style-type: none"> <li>• Reverse osmosis plants</li> <li>• Desalination units</li> <li>• Evaporation systems</li> <li>• Water treatment systems</li> <li>• Cooling</li> <li>• Pre-heating</li> <li>• Condensation</li> </ul>	<ul style="list-style-type: none"> <li>• Project consultancy</li> <li>• Assembly</li> <li>• Commissioning</li> <li>• Training</li> <li>• Maintenance</li> <li>• Inspection / Preventive maintenance</li> <li>• Spare part management</li> <li>• Automation &amp; updates</li> </ul>

All our services can be certified according to following classification societies: TÜV, DEKRA, BV, LROS (Class 2.2), DNV-GL (Class II), RINA, RMROS, CCS, KR and ABS.

## **Contact:**

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