

# FWWG

Fresh  
Water  
Generator



**FARAD**  
HEAT EXCHANGERS

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# Farad FWG Fresh Water Generator

The Farad Fresh Water Generator (FWG) is based on the shell and tube heat exchanger type. The shell and tube type has been proven to be the most reliable technology for fresh water production. It has a single stage arrangement which allows for capacity from 15 to 40 m<sup>3</sup>/day of fresh water. As with all distillation systems, water salinity is low, less than 10 ppm.

Heating medium is main engine jacket water. This ensures that mostly waste heat is used to produce fresh water. As an option, a steam or electric heating skid may be added to allow for operation when the main engine is not working.

## Accessories

- Control panel with motor starters
- Seawater jet ejector
- Distillate pump
- Salinity controller
- Anti-scale dosing system
- Temperature and pressure gauges
- Flow meter

## Principle of operation

The FWG works by evaporating sea water at reduced pressure. Pressure in the shell is kept at 85% vacuum. At this pressure, sea water evaporates at 55 °C. Therefore water can be heated and evaporated by jacket water which exits the engine at approximately 80 °C.

## Evaporator

Steam is produced in the lower part of the FWG, the evaporator. The seawater inside the tubes is heated and partly evaporated by the hot jacket water on the shell side. The steam and brine mixture exits the evaporator in the mid-section of the FWG. The brine settles on the shell's bottom plate, whereas the steam raises to the top of the shell.

## Condenser

The steam is led into the condenser on the higher part of the FWG. In the condenser, steam is condensed by the cold seawater that flows inside the tubes. The condensate is collected in the condenser shell and is evacuated by the distillate pump.

## Daily operation

The FWG is designed for automated use. The salinity controller will automatically divert produced water overboard when salinity is above specification. Produced water is automatically sent to the freshwater tank when salinity is within specification. Usually, about 20 minutes of supervised operation are required at startup, then the FWG will operate in a stable manner.

## Additional equipment

Seawater pump. Farad can supply the seawater pump with the required head and flow rate for evaporator operation. Seawater resistant materials are standard.

## Control panel with touch screen.

Optionally, the control panel can be fitted with a PLC and touch screen, where the process is shown in a mimic diagram. Pressure and temperature transmitters, salinity sensor and chemical tank level are shown in the touch screen for easy operation, overview and control.

## Materials

Evaporator and condenser tubes are made of aluminium-brass for resistance to seawater corrosion. Piping is made of CuNi and stainless steel. The seawater ejector body is made from cast bronze.

## Repairs

The shell and tube design has the inherent advantage of being repairable on site by the ship's crew. A leaking tube can be plugged or replaced. In contrast to a plate type evaporator gasket replacement is a complicated procedure without guaranteed results. For more extensive work Farad can provide timely and cost effective repairs based on years of experience on fresh water generators.

## FARAD Fresh water generator models

FWG models have been sized for 80°C jacket water inlet temperature. Contact Farad with your jacket water temperature to get an accurate capacity calculation.

## FARAD Fresh Water Generator models

		A-15	A-20	A-25	A-30	A-35	A-40
<b>Fresh water production</b>	m <sup>3</sup> /day	15	20	25	30	35	40
<b>Jacket water flowrate</b>	m <sup>3</sup> /h	38	54	56	69	80	85
<b>Jacket water temperature in.</b>	°C	80	80	80	80	80	80
<b>Seawater flowrate</b>	m <sup>3</sup> /h	33	42	60	69	75	90
<b>Electricity consumption</b>	kW	12	12	16	20	20	20



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