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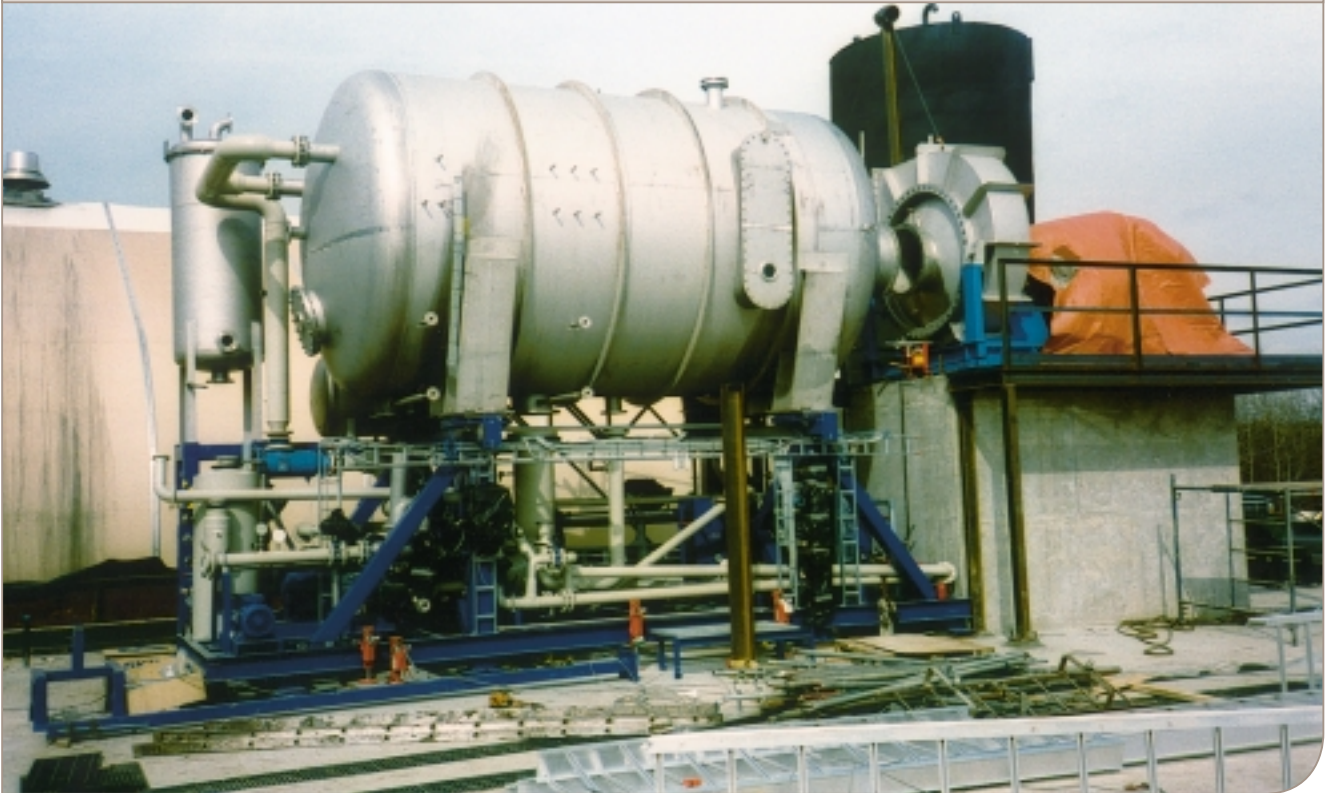
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Vacuum Vapour Compression Distiller

VVC Series



Application

Conversion of sea and brackish water through distillation by Vacuum Vapour Compression for production of high purity water for domestic and industrial use. Applicable on Cruise Liners, Oil & Gas Off-shore Platforms, Power Plants, Industries and remote on-shore locations.

Features

- Simple design
- Plate type evaporator/condenser
- Titanium heat transfer surfaces
- Non-coated materials resistant to seawater and brines
- Compressor with low rotational speed
- Easy access for service
- Simple and reliable automation and control

Benefits

Lowest overall water production costs:

- Low specific energy consumption
- Simple raw water pre-treatment
- 25 years economical life

Highest availability:

- > 90% of yearly hours

Simple operation & maintenance:

- Full access to both heat transfer surfaces for manual cleaning
- Low educational level for operating crew

High distillate purity:

- < 10 $\mu\text{S}/\text{cm}$
- Low costs for technical water treatment

Capacity range

Covers single effect from 100 to 1000 and double effect units from 1000 m³/day to more than 2000 m³/day.

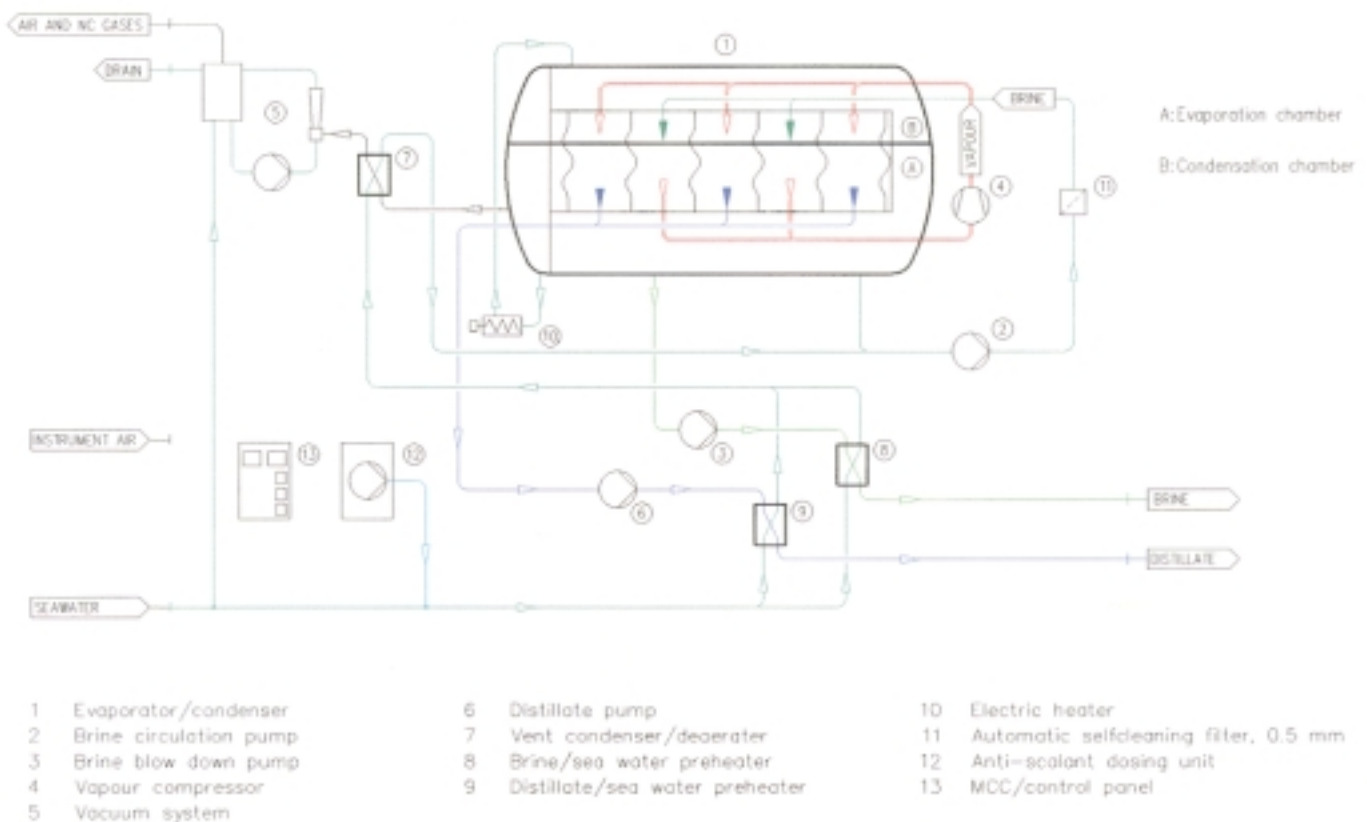
The process

Vapour compression is a distillation process, where evaporation of sea or brackish water is obtained by the application of heat delivered by compressed vapour.

The effect of compressing water vapour is obtained by means of an electrically driven, mechanical centrifugal compressor. The saline water is evaporated at sub-atmospheric pressure on one side of the heat transfer surface, and on the opposite side it is condensed into fresh water which is collected and extracted as product water.

The remaining, concentrated saline water (the brine) is also extracted as blowdown, which has an average concentration factor approx. two times that of the initial value. As an electrical driven process it is considered to be a "clean system". Due to its high efficiency, it becomes the obvious choice for a single purpose, small-capacity installation.

The system includes an optimized and well proven compressor, using a high efficiency centrifugal blower with a low compression ratio. Because the thermal differential in the evaporator/condenser is lower than 5°C, less compression work is required, which results in a low consumption of energy.



Complimentary points:

Maximum raw water recovery:

Since no cooling water is required, the total mass flow of raw water supplied to the system for desalination might be reduced to approx. two times of the product water flow. The overall recovery ratio is therefore higher than any other sea-water desalination process.

Simple raw water pre-treatment:

The system uses one single chemical as anti-scalant, commercially available in most countries, safe for transportation and handling.

Minimal down-time:

The system is constructed with top quality materials plus a simple, but highly reliable compressor which means less maintenance and replacement of parts. This results in a minimal number of down-time during the total service life.

Falling film evaporation on plates:

The process takes place under an optimized falling film evaporation on plates eliminating erosion and corrosion effects on the heat transfer surfaces.

Technical documentation:

Complete information and documentation accompany each freshwater generator.

The Installation Manual provides all information necessary for correct installation:

- Plant description
- Installation
- Technical data and drawings

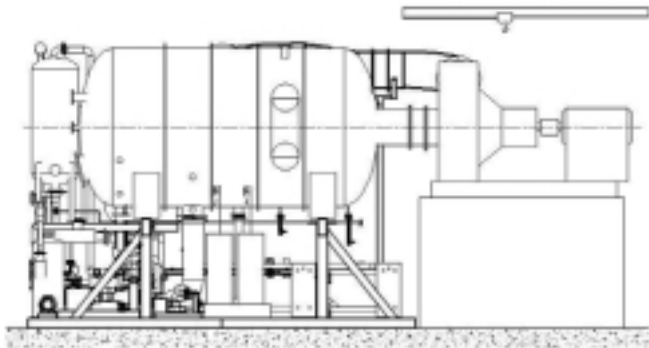
The Instruction Manual provides all information necessary for operation and maintenance:

- Plant description
- Operating instructions
- Chemical dosing of anti-scale chemicals
- Trouble shooting
- Maintenance of major components
- Spare parts drawings
- Technical data and drawings

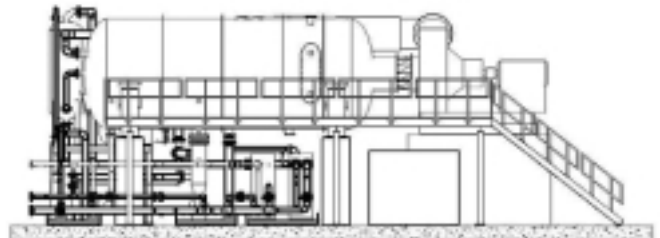


VVC Series

Main dimensions and service area



Skidmounted



Non-skidmounted

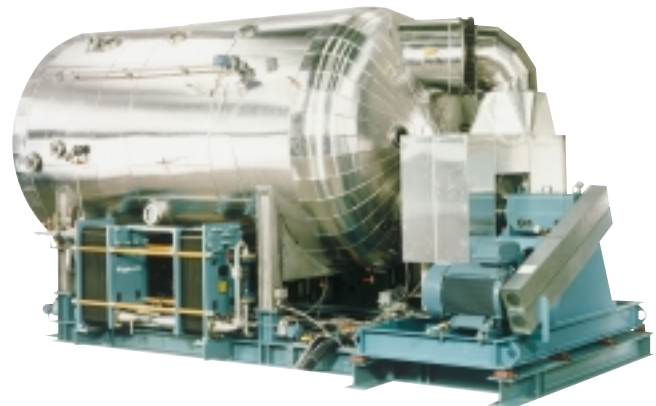
Alfa Laval in Brief

Alfa Laval is a leading global provider of specialized products and engineered solutions.

Our equipment, systems and services are dedicated to helping customers to optimize the performance of their processes. Time and time again.

We help our customers to heat, cool, separate and transport products such as oil, water, chemicals, beverages, foodstuff, starch and pharmaceuticals.

Our worldwide organization works closely with customers in almost 100 countries to help them stay ahead.





ORCA Offshore series

Vacuum vapour compression water makers for the oil and gas industry

Vacuum vapour compression water makers

Fresh water is one of the main utilities required on board any offshore facility. Alfa Laval provides a range of solutions for converting seawater into fresh water. Alfa Laval equipment is designed for automatic PLC-controlled operation with continuous control and monitoring of fresh water quality. Built using titanium and other seawater-resistant materials, the generators feature a simple, compact design that ensures long working life and low operation and maintenance costs. Vacuum vapour compression plants are a simple, efficient method of producing a constant supply of high quality fresh water for both drinking and process use. Using the vacuum distillation process, they convert seawater into fresh water using electricity, but with only minimal power consumption. The process ensures fresh water with salinity levels below 5 ppm.



Orca Offshore

Water maker type

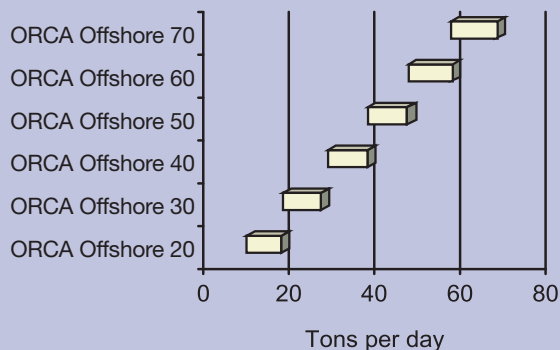


Fig. 1 Capacity range

Features and benefits

- Simple, compact design
- Titanium heat exchanger plates, along with other seawater-resistant materials
- Fully automatic PLC-controlled operation
- Combined ejector water and feed water system
- Freshwater control system
- High quality fresh water
- Low operating cost
- Easy maintenance
- Reliability and long working life
- Few consumables

The ORCA Offshore series covers a capacity range of 20–70 m³/24h. Alfa Laval water makers can be configured to suit any offshore requirement. The ORCA Offshore series is optimized for use on board offshore drilling rigs and production facilities.

Basic equipment

Water maker unit including titanium plate heat exchanger for combination evaporator and condenser, stainless steel distiller shell, air ejector, freshwater pump, compressor incl. piping, PLC control panel with built-in freshwater quality monitoring system. Feed water anti-scale chemical dosing unit.

Additional equipment

- Seawater supply pump with offshore standard electric motor

Optional equipment

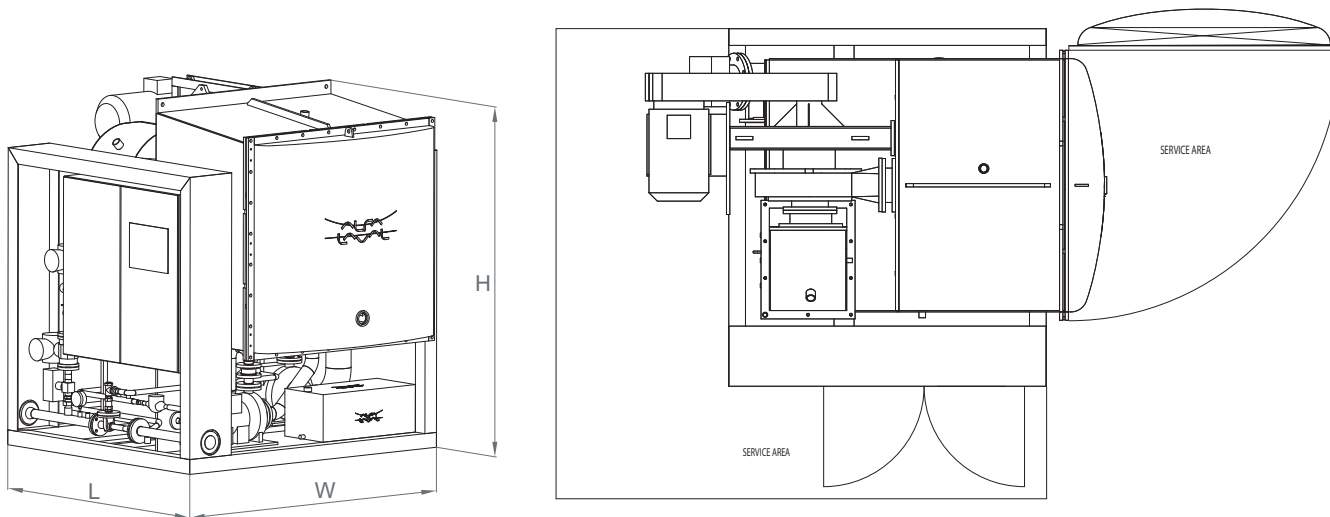
- Freshwater pH adjustment filter
- Silver-ion or UV sterilizers
- De-chlorination chemical dosing unit

All the above additional and optional equipment can be pre-piped, pre-wired and skid mounted.

Technical specifications (standard units without optional equipment)

Water maker type	ORCA Offshore 20	ORCA Offshore 30	ORCA Offshore 40	ORCA Offshore 50	ORCA Offshore 60	ORCA Offshore 70	
Length (L) mm/inch		2450 / 96			2800 / 110		
Width (W) mm/inch		2150 / 85			2150 / 85		
Height (H) mm/inch		2400 / 94			2400/94		
Dry weight kg/lbs		3700 / 8175			4000 / 8818		
Operating weight kg/lbs		3865 / 8521			4185 / 9226		
FW pump motor kW/hp		1.3 / 1.7			1.3 / 1.7		
Brine pump motor kW/hp		1.3 / 1.7			1.8 / 2.4		
SW pump motor kW/hp (option)		12.5 / 1			12.5 / 17		
Circ. pump motor		1.9 / 2.6			3.6 / 4.9		
Electric power (kW installed)		78.5			81		
Power consumption kwh/m ³ fresh water		18			18		
Fresh water quality		WHO standard, less than 5 ppm NaCl					

Dimensions *)



*) Drawing shows ORCA Offshore without options

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