Alfa Laval AQUA Blue S-type

Single-stage freshwater generator

Introduction
Alfa Laval provides a range of solutions for converting seawater into fresh water. The AQUA Blue S-type is a thermal vacuum distillation unit that converts seawater into high-quality fresh water by means of an evaporation process where it utilizes waste heat or steam. The process and control system ensure fresh water with salinity levels below 2 ppm.

AQUA Blue S-type is designed for start-and-forget operation in periodically unmanned machine rooms and other automated operations. It is suitable for installation on ships and rigs, as well as in remote onshore locations.

The process used by the AQUA Blue S-type is based on a unique 3-in-1 plate technology that enables desalination in a single plate pack without an outer shell. Evaporation, separation and condensation all occur within the titanium plate pack.

Application
- Marine
- Offshore
- Onshore

Benefits
- Low electrical consumption
- Easy, flexible and compact installation
- Easy operation and maintenance
- High-quality fresh water
- Easy to fit and upgrade

Standard design
The AQUA Blue S-type freshwater generator package consists of

- Titanium plate pack suspended within a frame
- Condenser cooling water system
- Ejector/feed water system
- Hot water system
- Freshwater system containing a freshwater pump and a control sensor that ensures a stable outgoing flow of high quality fresh water
- Steam injection system for steam or hot water operation (if specified)
- Control panel with motor starters and salinometer
- Ejector/Feed water pump with electric motor
- Feed water treatment equipment

Capacity range
The AQUA Blue S-type series covers a capacity range of 5–60m³/24h (1320.9–15850 U.S. gal/24h), depending on the heating medium and cooling water temperatures. An AQUA Blue S-type freshwater generator can be dimensioned to suit any jacket water temperature of 70–95°C (158–203°F) at cooling water/liquid temperatures of 0–40°C (32–104°F)
Using numerous predesigned standard options, Alfa Laval can tailor-make almost any freshwater generation solution with the AQUA Blue S-type. Some of the options can be seen below, but there are others as well.

**Optional design**
- Ejector/feed water pipe
- Fresh water outlet system with bypass
- Build-on control panel
- Build-on feed water treatment equipment
- Root valves for pressure gauges
- Manometer set for ejector/feed and hot water pumps
- Filling line for anti-scale dosing unit
- Counter flanges
- Plate pack protection sheet
- Distance indicators on stay bolts

**Accessories**
- Hot water pump
- Hot water loop for utilizing an additional heat source in combination with hot/jacket water
- Cleaning-in-Place (CIP) unit for AQUA blue
- Spare part kits
- UV sterilizer units
- Rehardening/pH adjustment filter
- Chlorination units
- Dechlorination filters
- Silver ion water sterilizer
- Extra freshwater quality control and dump module

**Working principle**

1. Sea/cooling water inlet
2. Ejector/feed water inlet
3. Sea/cooling water outlet
4. Ejector/feed water outlet
5. Brine outlet
6. Heating medium inlet
7. Heating medium outlet
8. Distillate outlet

The AQUA Blue S-type has the option to taking ejector and feed water from the condenser outlet or from an alternative source. Feed water enters the evaporator section of the plate pack where it is heated and evaporated. The evaporation occurs around 45-65°C (113–149°F) in a vacuum of 75-99%, which is maintained by the brine/air ejector.

**Installation**
AQUA Blue S-type is easily installed. Since there is limited need for service area, the installation can be highly compact.
The heating medium is hot water, such as jacket water from the engine, or by steam. The condenser coolant is taken from the ship’s main cooling system, to which it is also returned. An ejector/feed water pump supplies feed water for evaporation and motive water for the combined brine/air ejector. This water can be taken from the condenser outlet or an alternative source. The fresh water produced is pumped into the storage tank. A control panel supplies electrical power to the ejector/feed pump, freshwater pump and dosing pump, and control voltage to the salinometer and dump valve.

Not only does the AQUA Blue S-type have a small footprint, it also has a service area much smaller than other plate or shell-and-tube freshwater generator models. There is no outer shell that requires extra space to open.

**Recommended service area**
W: 600 mm (23.62 in)

**Dimensions**

<table>
<thead>
<tr>
<th>AQUA Blue S-type</th>
<th>S80</th>
<th>S100</th>
<th>S125</th>
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<tbody>
<tr>
<td>Length (L) (mm)</td>
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<td>Length 1 (L1) (mm)</td>
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<td>Width (W) (mm)</td>
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<td>Height (H) (mm)</td>
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<td>Weight (empty) (kg)</td>
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<td>869–930</td>
<td>942–1049</td>
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<tr>
<td>Weight (empty) (lbs)</td>
<td>1735–1836</td>
<td>1916–2050</td>
<td>2077–2313</td>
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</table>
Material data

1. Frame and pressure plate | C2 painted steel
2. Utility and process plates | Titanium
3. Tightening bolts | Galvanized steel
4. Carrying bar | Aluminium
5. Support column | Aluminium
6. Protection tube | MDPE
7. Motor housing | Painted cast iron
8. Ejector
   Housing | Bronze
   Diffuser | Bronze
   Nozzles one | Duplex steel
   Nozzle two | Bronze
9. Freshwater pump
   House | Bronze
   Impeller | Bronze
   Shaft | Duplex steel
10. Feed water treatment pump
    Dosing head and connectors | Polypropylene
    Membrane | PTFE coated
    Seals | EPDM
    Valve balls | Ceramics
11. Dosing tank | Polyethylene

Electrical data

Main supply voltage
- 50 Hz : 3 x 220–240 V / 3 x 380–415 V / 3 x 600–690 V
- 60 Hz : 3 x 220 V / 3 x 440–480 V / 3 x 690 V

Control voltage
- 50 or 60 Hz : 100 / 110 / 115 / 230 V

Certifications and classification

Alfa Laval freshwater generators are manufactured in accordance with following standards, rules and regulations:
- PED 2014/68 Pressure Equipment Directive
- IEC Publication No 60092, Electric installations on ships
- ISO 9001 certified Quality Management System
- ISO 14001 certified Environmental Management System
- ILO Maritime Labour Convention (MLC) 2006
- WHO Guidelines for Drinking-water Quality, 3rd edition, 2004
- EC drinking water directive 98/83/EC 1998
- EN ISO 15748 Potable water supply on ships and marine structures
- Type, design or drawing approved by all major IACS classification society members.
- Convention for the Safe and Environmentally Sound Recycling of Ships:
  - Supplier Declaration of Conformity (SDoC)
  - Material declaration (MD)

Service support

By choosing Alfa Laval you are choosing the perfect long-term partner for your daily operations. Our service network can reach you wherever you are.

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