A new tide of savings

AQUA Blue freshwater generators

The less po
consumptio

wer
n, the better

Today every chance to save energy counts. That's why we never stop improving our technology.

Our Alfa Laval AQUA Blue freshwater generator builds on over six decades of application innovation, comprising the best aspects of both shell-and-tube and plate-based desalination. With its 3-in-1 AQUA plate technology, it drastically reduces seawater use and power consumption.

But the story doesn't end there. Electrical power requirements were cut in half with the original AQUA Blue C-type – and with the AQUA Blue S-type, we cut them again.

The AQUA story ke

The story of AQUA technology is one of smart innovation that results in energy, space and cost savings. With the AQUA Blue S-type, the benefits are even more remarkable.

Smarter for ship owners

The AQUA Blue S-type is the newest application of Alfa Laval's unique AQUA technology, which was first introduced in 2008. AQUA technology uses specially designed 3-in-1 plates to provide today's most energy-efficient desalination process – literally cutting seawater needs and power requirements in half compared to conventional freshwater generators.

The AQUA Blue S-type has the same high quality and main components as the original AQUA Blue C-type. But it maximizes energy efficiency and capacity-to-footprint ratio by making use of the vessel's existing seawater cooling system pumps. This reduces the electrical power consumption to just one-third that of conventional freshwater generators, and it makes the already small footprint even smaller.

AQUA Blue S-type

eps getting better

Smarter for shipyards

Besides having a footprint up to 15% smaller, the AQUA Blue S-type offers shipyards a considerable amount of new flexibility, including a range of connection alternatives. Because it makes use of the vessel's seawater cooling system pumps, it employs a smaller ejector and a smaller, separately installed ejector/feed water pump. Likewise, the pipework can be both shorter and smaller in diameter.

In addition, the S-type handles a wider span of pressures, which means the configuration can be adapted to the highest or lowest water level. An adapted configuration is able to deal with higher pressure in the overboard line, which allows the freshwater generator to be placed more freely on board.

AQUA Blue C-type

The original AQUA Blue C-type has a combined cooling water and ejector flow – and its own set of advantages. It has one seawater connection, which links it directly to the vessel's sea chest by means of dedicated piping. In other words, the freshwater generator is independent of other equipment and is unaffected by conditions in the vessel's seawater cooling system.

AQUA Blue – from

Whether configured as an S-type or a C-type, the AQUA Blue freshwater generator handles the entire desalination process with a single plate pack and one type of titanium plate. The result is an energy-efficient and easily managed solution.

Serving it all on one plate

AQUA Blue comprises titanium plates with a unique 3-in-1 design. Fitted with two gasket configurations, they allow evaporation, separation and condensation to occur within a single, uncovered plate pack.

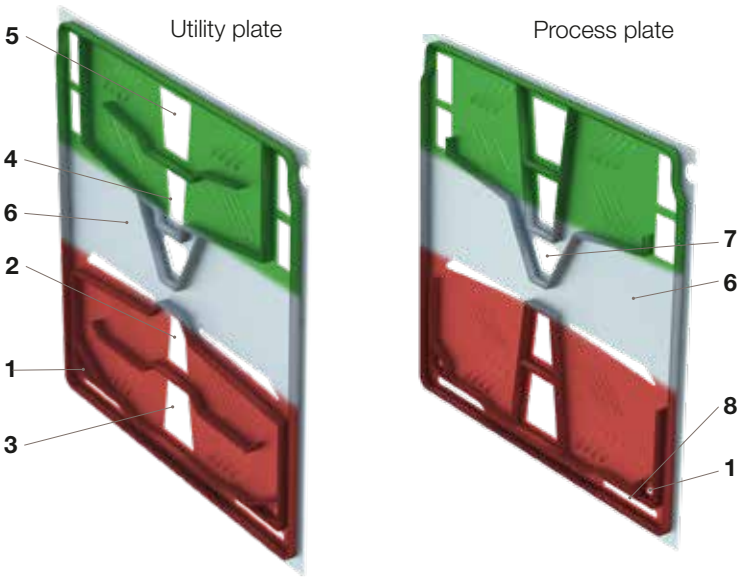
These 3-in-1 plates are the first to be purpose-built for desalination, rather than modified from a heat exchanger design. They combine the best aspects of plate-based and shell-and-tube desalination technologies, drawing on over 60 years of Alfa Laval experience.

The combination optimizes evaporation and converts more of the feed water into fresh water. So less seawater is needed – along with less electrical power.

The process in brief

Feed water passes through the lower section of the plate pack, where it is evaporated at 40-60°C in a vacuum of 85-95%. As the vapour rises between the plates, it passes through the separator section, which causes brine to fall into the sump at the bottom of the freshwater generator. Only clean fresh-water vapour reaches the top section, where it is cooled and condensed into fresh water.

The result is high-quality fresh water with a maximum salinity of 2 ppm. Thanks to optimized flow distribution across the plates, scaling is avoided.



Green Condensation
Grey Separation
Red Evaporation

1 Seawater feed
2 Heating medium in
3 Heating medium out
4 Sea/cooling water in
5 Sea/cooling water out
6 Evaporated steam
7 Fresh water out
8 Brine out

the inside out

AQUA Blue S80-HW

Room to move and grow

Performing desalination in a single plate pack creates a space-saving and easily maintained freshwater generator. Because the process vacuum is inside the plate pack, no outer shell is necessary. The plate pack simply slides open for maintenance, which keeps the service area within the equipment footprint.

The pumps and pipes associated with AQUA Blue are smaller than those of conventional freshwater generators, especially if an AQUA Blue S-type is used. That simplifies installation, and additional plates can often be added if capacity needs change over time.

Doing the job with l

The AQUA Blue freshwater generator combines high water quality with high energy efficiency. Combined with its low maintenance requirements, this results in low lifecycle costs.

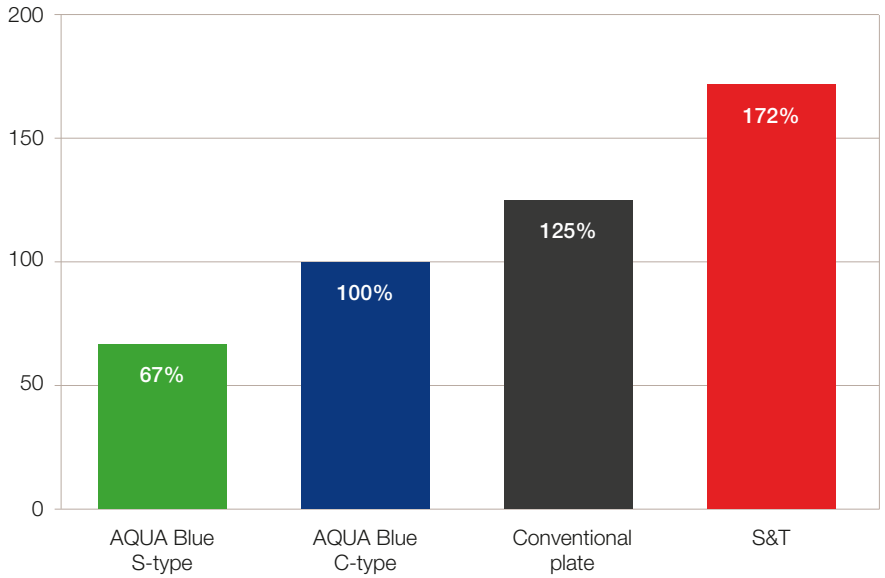
Less seawater, energy and impact

AQUA Blue's optimized technology converts more of the feed water into fresh water. Furthermore, it reduces the seawater used for cooling by half. This means only half the energy is needed for pumping, which is a large portion of the overall power consumption in generating fresh water. If an AQUA Blue S-type is chosen, the use of the vessel's seawater cooling system flow cuts energy use even further.

The difference can be seen in the chart below. Even over a short time, it means a substantial reduction in operating costs – not only compared to shell-and-tube models, but also compared to other plate-based freshwater generators.

Since energy on board ultimately comes from the burning of fuel, it also means a positive effect on CO_2 emissions.

Proportional power consumption



Comparison based on generating 20 m^3 of fresh water over 24 hours.

ess

Less work and worry

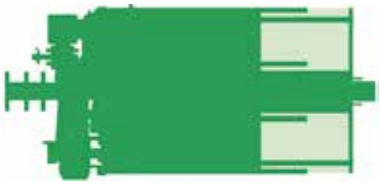
Just as it requires less electrical power, AQUA Blue demands less energy from the crew. AQUA Blue is designed for peace of mind and start-and-forget operation.

Regulation of the seawater flow optimizes AQUA Blue's performance, ensuring high-quality fresh water with a maximum salinity of 2 ppm. The quality is continuously monitored by the control system, while expanded instrumentation offers a clear overview of the process.

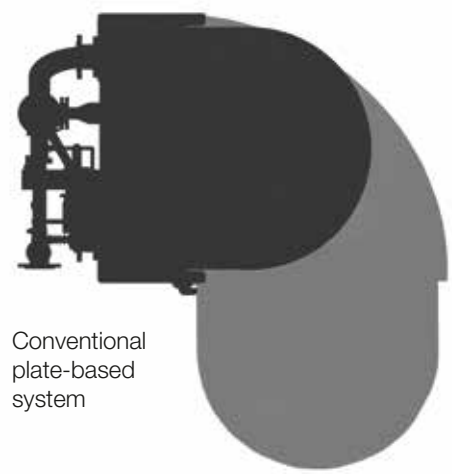
When inspection or maintenance is needed, the plate pack simply slides open for easy access to the interior. But the maintenance intervals are long, thanks to optimized flow distribution that minimizes scaling. For the greatest convenience, most scaling can be removed through Cleaning-in-Place (CIP) – without opening the freshwater generator.

Keeping it simple

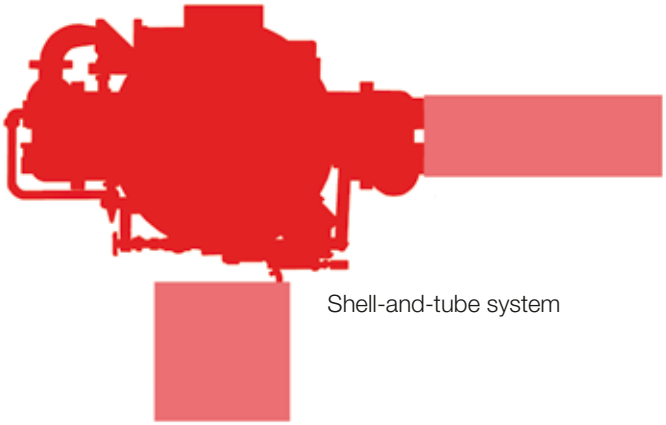
AQUA Blue is good news for shipyards, ship owners and ship operators alike. From start to finish, it offers ease, reliability and the global security of working with Alfa Laval.



AQUA Blue



Conventional plate-based system



Shell-and-tube system

Easy to fit or retrofit

Because it cuts seawater needs in half, AQUA Blue can be installed with smaller pumps, smaller pipes and less space and piping overall. The S-type configuration has a range of connection alternatives and reduces footprint by up to 15% over the already small C-type.

Apart from its minimal equipment size, AQUA Blue has a service area up to 50% smaller than that of shell-and-tube-models. No extra room is needed to open a shell or to withdraw tubes. And since AQUA Blue handles pitch and roll, installation is possible in any direction.

All this, together with the optimized instrumentation, simplifies design and reduces expense. The installation cost for AQUA Blue is far less than that of a shell-and-tube model, and roughly half that of a traditional plate-based solution.

Durable construction

Once installed, the freshwater generator can be expected to last the lifetime of the ship. AQUA Blue has an extremely robust construction, with piping available in duplex steel, stainless steel or bronze. The wetted surfaces are made of titanium, which means they will not corrode or erode.

Lasting performance

AQUA Blue's own reliability is matched by that of working with Alfa Laval. With over 60 years of experience in freshwater generation, Alfa Laval is your guarantee of optimized performance, both today and tomorrow.

Alfa Laval is there to support you, from design and installation to operation anywhere in the world. Wherever your vessel sails, Alfa Laval's global service network is close at hand with tools and expertise to extend equipment performance.

Alfa Laval in brief

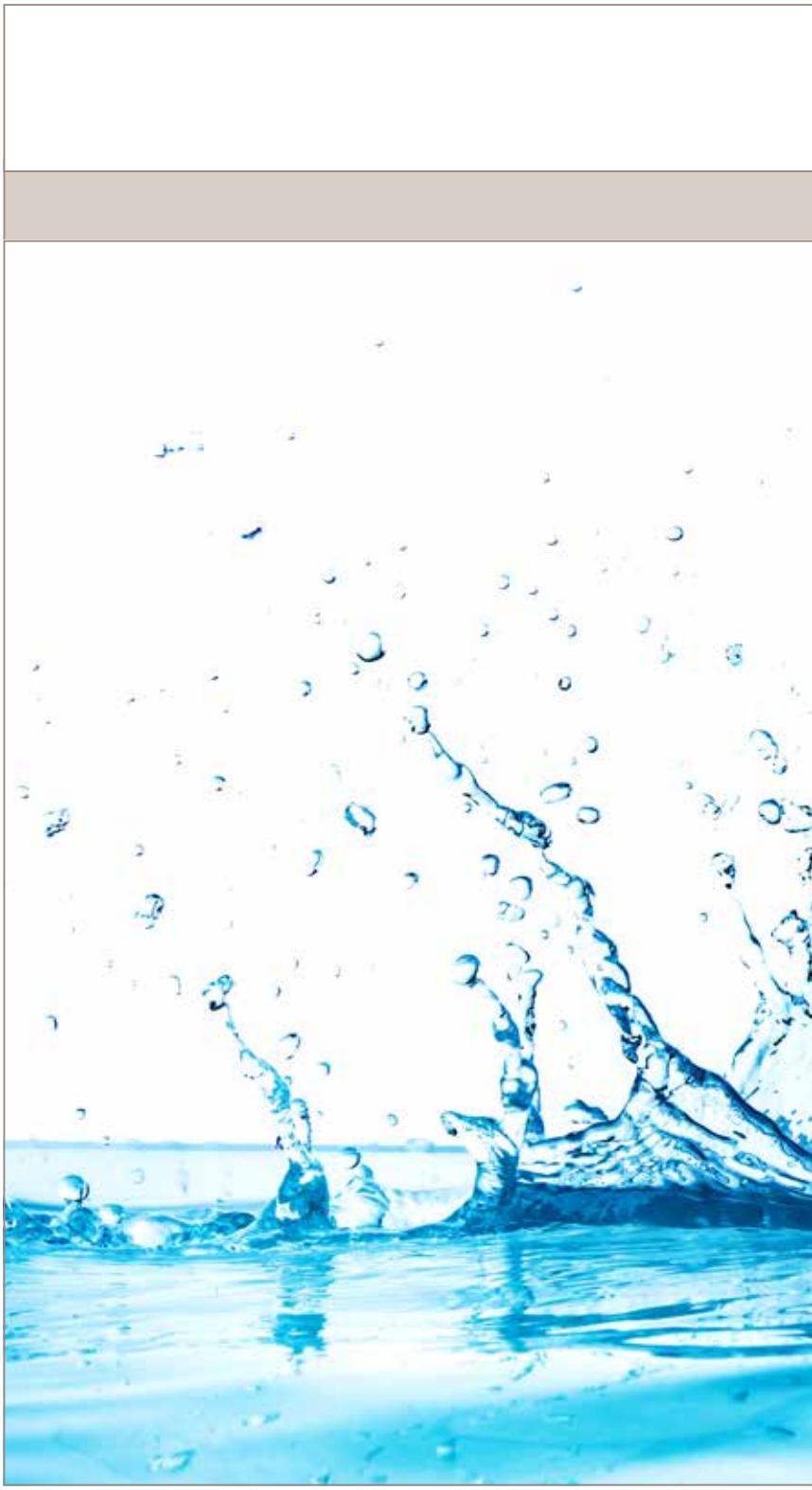
Alfa Laval is a leading global provider of specialized products and engineering solutions.

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, foodstuffs, starch and pharmaceuticals.

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

How to contact Alfa Laval
Contact details for all countries are continually updated on our web site. Please visit www.alfalaval.com to access the information.

AQUA Blue is a trademark owned and registerered by Alfa Laval Corporate AB.
Alfa Laval is a trademark registered and owned by Alfa Laval Corporate AB. Alfa Laval reserves the right to change specifications without prior notification.



100000072-2-EN 1710