

Case story | Enwa

Enwa designs new **plug-and-play** SWRO plant around **Danfoss APP pump**



Double

your plant's capacity
simply by changing
one component - the
electric motor.

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Many factors have contributed to making Enwa a major supplier of SWRO plants for the marine sector. One of them is a strong tradition of listening closely to their customers – and tailoring solutions to suit their changing needs.

So when shipbuilders in East Asia expressed their frustration over long lead times and complex design processes, Enwa listened. Their engineers created a new, modular SWRO plant that worked for a wide range of marine applications right out of the box – all around a single Danfoss APP 3.5 high-pressure pump. And their sales force has been busy collecting orders ever since.

The challenge:

Design a marine SWRO plant that is standardized enough to deliver off-the-shelf – and flexible enough to double capacity as needed

Although SWRO plants are standard features on practically all offshore service ships, there is surprisingly little standardization of marine SWRO plants themselves. Shipbuilders often source their plants from contractors who start the design and procurement process from scratch. This results in as many plant designs, parts lists and maintenance schedules as there are ships. It also

means unnecessarily long lead times and increased complexity. “Shipbuilders in Korea and China told us they were tired of treating every new SWRO project as a brand new engineering challenge,” explains Peter Eriksson Enwa’s Business Development Director, Marine Market. “After all, their basic requirements are quite uniform. Reliability and low maintenance are key, and a small footprint is essential on board modern ships. Of course, compliance with health, safety and environmental regulations is also crucial. One thing that does vary is plant output. Ships’ needs for fresh water varies significantly depending on crew size, engine requirements and other factors.”

The solution:

A plug-and-play SWRO plant built around Danfoss APP pumps – the Enwa way

Enwa’s R&D department was quick to act on the challenge, and set out to design a standardized SWRO plant that shipbuilders could easily configure into a variety of ship designs. The objective was to develop a standard unit that was completely plug-and-play, including pre- and post-treatment, all on a single skid.

In order to reduce complexity and maintenance worries, they opted for a direct-drive system with no gearbox or belts. In keeping with Enwa's strict environmental policy, they also wanted to keep the use of chemicals and the risk of pollution to an absolute minimum. Finally, it was important that every component was as compact as possible, as contemporary shipbuilding practices put space at a premium.

Their search for a high-pressure pump for the new system soon led them to Danfoss.

"We were happy to discover that Danfoss was very open to working with our development team to find just the right pump for our project," says Olle Apelqvist, Product Manager R&D at Enwa. "Together with engineers at Danfoss, we selected an axial piston pump, the APP 3.5, as the heart of our plant. It has the right size, could easily be mounted directly on an electric motor, and requires little maintenance. Since it needs no lubricants, and thus simply cannot leak oil, it fits quite well with our environmental policies as well."

An added advantage of choosing an axial piston rather than a centrifugal or plunger pump was that Enwa could double the plant's capacity simply by changing one component: the electric motor. The system is thus available with motors that run at either 1500 or 3000 RPM.

Unlike centrifugal pumps, positive displacement pumps can easily increase (or decrease) output at the same pressure in proportion to changes in motor speed. And unlike plunger pumps, another type of positive displacement pump, axial piston pumps can easily increase motor speed and pump output without wearing out suction and discharge valves; this saves maintenance and extends pump lifetime, crucial factors onboard ships.

The results:

Strong sales in the marine sector, and even on shore

Since Enwa launched the new modular system in the beginning of 2014, they have experienced excellent sales of the new plug-and-play SWRO plants to shipbuilders in the Far East and Europe. "Clearly, the shipbuilding market was ready for our standardized concept," says Peter Eriksson. "Demand is strong, but since we have been able to streamline procurement and production processes we have been able to keep up with it – and to reduce lead times significantly. The Danfoss APP pump has performed just as we expected: simple to install in a small space, simple maintenance and simply reliable."

Interestingly, the plug-and-play concept has also won orders closer to home – and even on shore. "We recently sold two plants to a harbor in Väderöarna north of Gothenburg," concludes Mats Augustsson, Sales Manager Industry/Landbased Market. "The system is ideal for any remote location – not just maritime – and we are confident that we will see more sales both on and offshore in the coming years."



Enwa designs, manufactures and delivers environmentally friendly water treatment solutions. Working with customers worldwide to provide them with efficient system for specific water treatment needs, Enwa offers solutions for a variety of segments including maritime, oil & gas, private households, industrial and municipal.

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