

Case story | WatMan Engineering

WatMan specifies Danfoss for the **world's largest** cruise ship

4-train design

Built around
APP 53 pumps
and iSave 70 ERDs

hpp.danfoss.com

Highlights

- Maximum energy efficiency
- Minimum footprint
- Low maintenance

WatMan Engineering chose Danfoss high-pressure pumps and energy recovery devices as key components in the SWRO plant that supplies fresh water to the world's largest cruise ship, *Icon of the Seas*. The Finnish water treatment specialist will also rely on Danfoss to keep the water flowing on the next two ships in the Icon class.

The challenge:

Design and produce the **SWRO plant** for the **world's largest** cruise ship

When Royal Caribbean and Meyer Turku announced the order to build the first two ships of the Icon class back in 2016, it was clear that these cruise ships would be different. Not only would they be the world's largest, at 250k gross tons and 365 meters, but they would also be designed to set new standards for energy efficiency—and require lots of fresh water.

Among other innovations, *Icon of the Seas* is powered by liquid natural gas (LNG) to reduce greenhouse gas and particulate emissions. The ship also uses fuel cells to produce electricity, including the power required for desalination, which provides most of the vessel's fresh water. And with a maximum capacity of 7,600 passengers and 2,350 crew as well as the world's largest floating water park, the ship needs plenty of it.

"When fresh water plays such an important role for the guest experience at a scale like this, energy efficiency and reliability were among the most important criteria for this project," explains WatMan's managing director, Juha Lintujärvi. "However, even though there is more room for everything on a ship of this size, making optimal use of available space is always important in marine SWRO applications, too."

The solution:

A four-train SWRO plant built around **Danfoss APP pumps** and **iSave ERDs**

WatMan won the bid for *Icon of the Seas*' SWRO plant with a four-train design built around Danfoss components. Each train comprises an APP 53 high-pressure pump and an iSave 70 ERD.

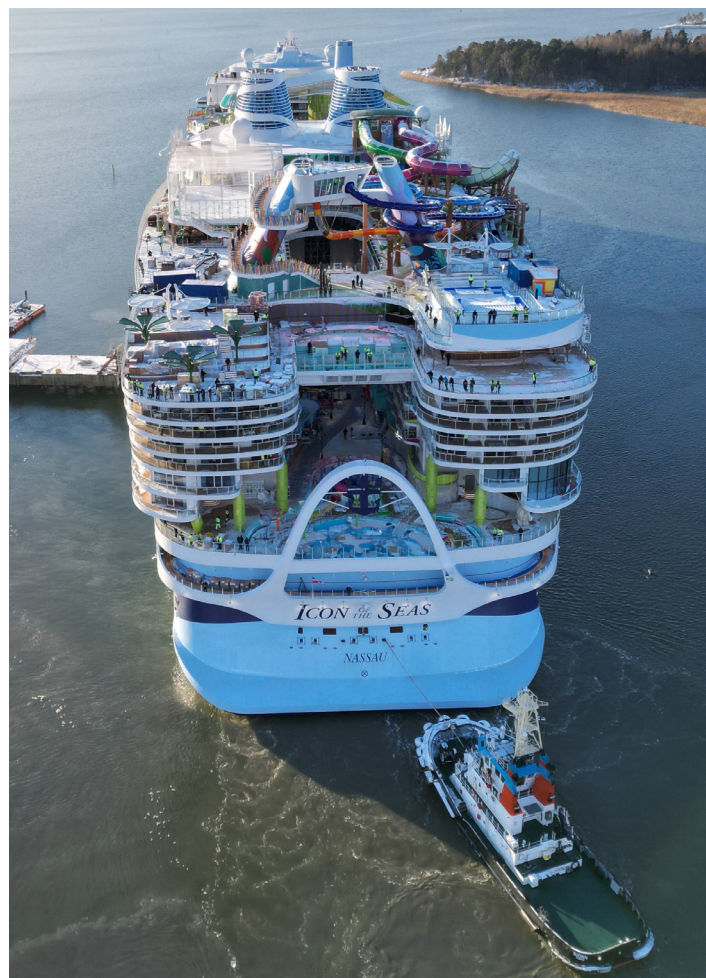
"We have a lot of experience designing SWRO for cruise ships," says Lintujärvi, "and energy efficiency is always critical for these projects because of its financial and environmental consequences. That is one key reason to specify Danfoss pumps and ERDs, which we believe are the most energy-efficient options currently available. But Danfoss components also facilitate flexible and reliable solutions. Rather than working with standard configurations, we tailor each plant design to very specific customer demands and focus on total quality control throughout the design, production, and commissioning phases. This approach maximizes our value add for our customers. The flexibility and dependability of Danfoss's products – and the technical support from their team – help us deliver this."

The results:

Smooth sailing for the first project – and two more on the way

WatMan's SWRO plant was installed and commissioned aboard *Icon of the Seas* in 2023 as planned and will make its maiden voyage with passengers in early 2024.

Royal Caribbean plans to add more Icon-class ships to its fleet soon. "We have signed contracts for SWRO plants for the next two Icon ships, too," says Lintujärvi, "and Danfoss pumps and ERDs are also included in these winning bids."



WatMan
WATER ENGINEERING

About WatMan Engineering: WatMan Engineering Ltd Oy is a Finnish manufacturer of customized water treatment systems for the marine, industrial, and power industries. Its integrated approach emphasizes close cooperation between internal and customer stakeholders in the design, production, and commissioning phases to deliver reliable solutions of lasting quality.

For more information, visit: [watmanengineering.fi/en](https://www.watmanengineering.fi/en)

Danfoss A/S

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