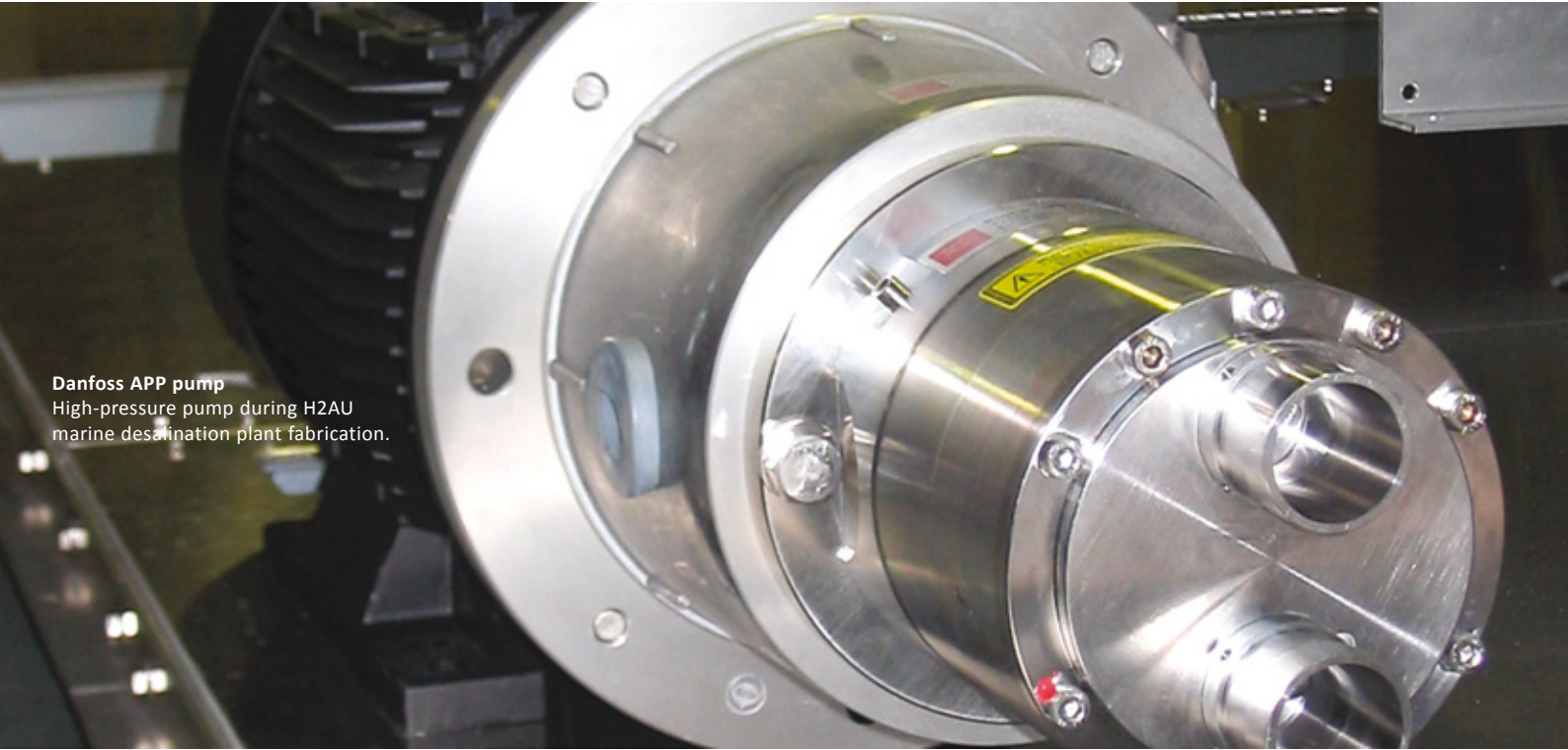


## H2AU selects Danfoss APP pumps for marine desalination



**Danfoss APP pump**  
High-pressure pump during H2AU marine desalination plant fabrication.

### The mission critical choice

For high-reliability, energy-efficient seawater reverse osmosis desalination, H2AU chooses industry-leading Danfoss APP pump solutions.

#### The pioneering story

For a cruise ship with 1,900 passengers sailing the Pacific Ocean, a constant freshwater supply becomes mission critical. That's why P&O Cruises selected H2AU to design, build and install a new seawater reverse osmosis (SWRO) desalination plant for the MV Pacific Sun. And that's why H2AU selected Danfoss APP high-pressure pumps.

The brief was to deliver an SWRO plant to replace an existing evaporator at end-of-life, but with dramatically increased capacity and the best possible energy efficiency, all within the existing confined footprint. Danfoss APP pumps were a key part of the solution foremost for their innovative engineering, compact footprint, and construction in

Duplex and Super-Duplex materials to ensure a lifetime of reliable operation in harsh marine conditions. The self-lubricating design minimises service requirements, with over 8,000 hours maintenance-free operation. To maximise efficiency and minimise operating cost, H2AU's design coupled the industry-leading efficiency of the Danfoss APP pumps with the PX Pressure Exchanger from ERI, Inc.

The result for MV Pacific Sun is a twin-train SWRO desalination plant delivering 450 m<sup>3</sup> per day of freshwater, with each SWRO train employing a Danfoss APP 10.2 high-pressure pump. A smaller second-pass RO train utilises a Danfoss APP 1.8 to provide high-purity boiler feedwater top-up. The entire plant





achieves a nominal total energy consumption of 3.4 kWh per m<sup>3</sup> or lower - equating to energy cost-savings of over US\$100,000 per year, compared with traditional SWRO.

**Retrofit success**

The SWRO plant onboard Pullmantur’s MV Ocean Dream featured a quintuplex ceramic plunger pump which had reached end of life and required constant maintenance to keep leaky seals under control. Leaks were placing unnecessary demand on the bilge and costing production capacity and efficiency.

H2AU decommissioned the plunger pump and pulsation damper, and installed a Danfoss APP 26 high-pressure pump and Danfoss pre-filtration, all within the existing footprint. Danfoss flexible high-pressure hose connections enabled a smooth and rapid installation. Completion of the retrofit has eliminated pump leakage, improved capacity and energy efficiency, and freed operators from the previously demanding maintenance requirements and associated plant downtime.

**Danfoss technology**

The Danfoss axial piston positive displacement design proves ideal for SWRO desalination applications by providing a constant and accurate flow regardless of pressure fluctuations, without harmful pulsation. When combined with Danfoss VLT AQUA Drive

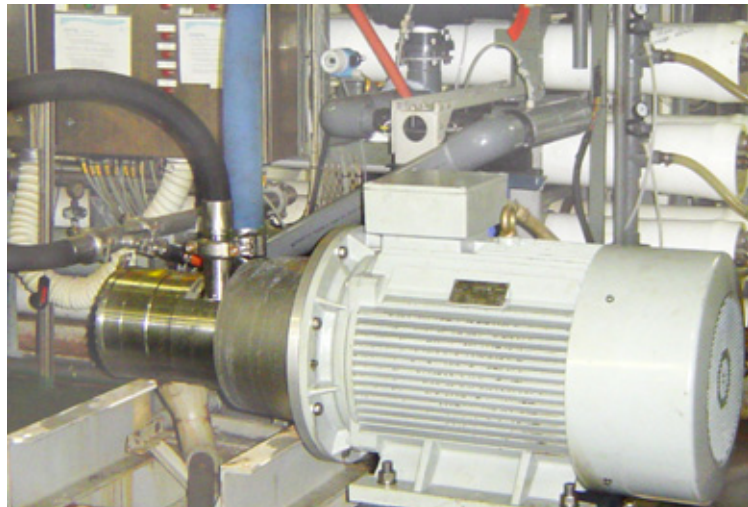
variable speed drives and H2AU’s newly developed real-time plant optimisation control solution, the Danfoss APP pumps enable unbeatable energy efficiency and SWRO membrane performance.

H2AU’s Managing Director, David Murdoch explains: “The Danfoss APP pump family are a perfect compliment to H2AU’s range of MyWater desalination plants. Not only are we impressed with the efficiency, performance and reliability of these pumps, but also the expertise and dedication to customer service provided by Danfoss engineers.”

H2AU also use and recommend Danfoss APP accessories including pre-filters, non-return valves, and high-pressure flexible hoses. And H2AU use the Danfoss SWPE (sea water pump with energy recovery) unit to provide an economical, energy efficient desalination solution for small SWRO plants.

Another example of desalination innovation; delivered by H2AU, powered by Danfoss.

**desalination, our passion.™**

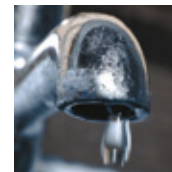
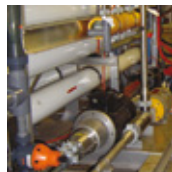


**P&O MV Pacific Sun (left)**  
With H2AU’s pioneering SWRO desalination plant onboard using Danfoss APP high-pressure pumps.

**Retrofit installation**  
Installed onboard MV Ocean Dream to replace outdated plunger pump.

**About H2AU**

At H2AU, we know desalination. You could say it’s our passion. We’re proud to be an innovative Australian desalination leader serving clients across the globe, with over a decade of experience in thermal and membrane desalination. H2AU strives for the highest quality and design excellence; reflected in our turnkey reverse osmosis plants utilising industry-leading components to deliver freshwater at low cost with dependable reliability. H2AU also stands ready to assist; with rapid, responsive services to meet the needs of any desalination requirement.



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