



## High-pressure pumps for land based seawater RO applications

### Dedicated seawater RO pump expertise from a world leader

Danfoss RO Solutions is a division of the Danfoss Group. We and our customers benefit from our close connection to a world leader in development and production of a wide range of mechanical and electronic products and controls. We draw on the extensive Danfoss R&D resources and quality systems, as well as the Group's worldwide manufacturing, distribution and service networks.

We work hard for our growing group of OEM and consulting engineer customers, beginning with extensive pre-sale consultation to determine the right solution for a wide range of seawater RO challenges – and continuing through delivery and uncompromising after-sales support.

The Danfoss Axial Piston Principle (APP) pump is specifically developed for small and medium-sized seawater RO applications, setting new standards for high-pressure pumps with output from 0.6 to 30 m<sup>3</sup>/h (2.6 to 135 gpm).

Our dedicated high-pressure pumps build on decades of development experience to provide exceptional efficiency and reliability in seawater RO applications. Small in size and unsurpassed in

engineering quality, the Danfoss range of APP pumps are at the heart of more than 15,000 seawater RO systems throughout the world.

Danfoss RO Solutions' APP pumps keep fresh water flowing at hotels, resorts and other facilities in coastal regions around the world. APP pumps are suitable for both brackish water (5,000-20,000 ppm/mg/l) and seawater (20,000-50,000 ppm/mg/l).



### Danfoss APP pump advantages

- Extremely low energy consumption, with up to 97% efficiency
- Whisper quiet: Danfoss high-pressure pumps are among the most silent in the industry
- Ultra-low maintenance reduces service costs



# High-pressure pumps from Danfoss RO Solutions: the right choice wherever fresh water matters

## Pump retrofit cuts energy and maintenance costs at resort

**The Challenge:** Shangri-La's Mactan Resort and Spa, located on Cebu Island, is the Philippines' premier five-star resort, requiring 1,000 m<sup>3</sup> of fresh water per day for its 547 rooms, 7 restaurants and bars, massive pools and spa. When the lush seaside retreat needed to retrofit its old seawater plant, management's main objectives were to reduce energy costs and minimize maintenance.



**The Solution:** The Danfoss APP21 pump was chosen as the plant workhorse, along with an energy recovery device. Energy consumption was reduced by an impressive 1.7 kWh/m<sup>3</sup>, which corresponds to yearly savings of € 62,050. Since the self-lubricating APP21 requires no preventive care, maintenance was reduced to a minimum. As an added bonus, noise pollution from the old pump was so radically reduced that the plant is now virtually inaudible from all floors – so guests at Shangri-La's Mactan Resort and Spa can relax more than ever.

## Wind-driven RO system tested by Dutch university

**The challenge:** Delft University of Technology wanted to harness a traditional agricultural windmill to drive a RO plant capable of providing fresh water to a village of 500 inhabitants. Despite the need for high pressure pumping, no electricity would be available to power the pump.



**The solution:** Researchers chose Danfoss SWPE 1.5-1.2 due to the exceptional energy efficiency of the APP pump and APM energy recovery. But it was the pump's long maintenance-free operation that was particularly

**Extensive range of high-pressure pumps for seawater RO applications**

- Compact design & light in weight
- Flexible: "Out of the box" design is possible
- Worldwide service and technical support
- Positive replacement pump, constant flow regardless of pressure

**Reliable performance**

- Wide pressure range – 20-80 bar (290-1160 psi)
- Rugged stainless steel construction: all Duplex or Super Duplex
- Self-lubricating: no oil lubrication necessary, ever

**Cost efficient with low total costs of ownership**

- Market-leading efficiency: up to 97 %
- Ultra-low energy consumption
- Minimal pressure pulsation down to 1.5%, no dampers required
- 8,000 hours maintenance-free operation

appealing for use in remote areas. After successful testing in the Netherlands, the unit was moved to Curacao for operation. The plant is expected to produce 5 m<sup>3</sup> of fresh water per day.

Danfoss APP pumps are available in a wide range of sizes, from 0.6 to 30 m<sup>3</sup>/h (2.6 to 135 gpm), and are thus ideal for all small and medium-sized seawater RO applications.

For more information on our high-pressure pumps and other products (including valves, frequency converters, soft starters, high and low-pressure hoses, connections, filters, coupling kits, electrical motors etc.), please visit [www.ro-solutions.com](http://www.ro-solutions.com) or contact us in Denmark or at one of our regional sales offices.

*All pump parts are made of non-corrosive materials, e.g. Duplex and Super-Duplex stainless steel and carbon-reinforced PEEK.*

