High-pressure pumps for marine and offshore 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^3/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.

Whether on offshore rigs or aboard private yachts and commercial ships, Danfoss high-pressure pumps are at the heart of seawater RO systems across the seven seas. We have extensive experience in working with OEMs to provide dedicated solutions for small and medium-sized applications at sea.

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

The Royal Navy converts aircraft carrier from flash distillation to RO

The Challenge: HMS Ark Royal is the Royal Navy's largest Invincible-class light aircraft carrier, with a crew of 685 and a Fleet Air Arm of 366. The ship was originally fitted with flash distillers to purify water, but their high energy and maintenance costs led to a conversion to seawater RO in 2005-2006. Salt Separation Services Ltd, who built the new RO plants, wanted to find the right high-pressure pumps for the job.

The solution: Danfoss APP pumps were selected due to their high reliability, low maintenance and small footprint – and are now at the heart of no less than five RO plants aboard HMS Ark Royal: 1 × 150 m^3/day, 2 × 100 m^3/day, and 2 × 5 m^3/day. On the three larger plants, the compact pumps are built into shock-mounted skids so they can easily be routed into position.

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**

Danfoss APP pumps are available in a wide range of sizes, from 0.6 to 30 m^3/h (2.6 to 135 gpm), and are thus ideal for all small and medium-sized sea-water 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** 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.

Danfoss A/S RO Solutions · Nordborgvej 81, D25 · DK - 6430 · Nordborg · Denmark · Phone: +45 7488 1622 · Telefax: +45 7445 3831
Email: Waterpumps@danfoss.com · www.ro-solutions.com