



Instead of spreading things around ...



A world leader in SWRO – still setting new standards

Danfoss RO Solutions is a fast-growing division of the Danfoss Group.

As a start-up with an entrepreneurial spirit, we work hard for our growing group of OEM and consulting engineer customers. This begins with extensive presale consultancy to find the right solutions for a wide range of different RO challenges – and continues through on-time delivery and uncompromising after-sales service.

As part of the Danfoss Group, we and our customers benefit from our close connection to our parent company. We draw on Danfoss' wide-ranging R&D resources and best-in-class systems, as well as its worldwide manufacturing, distribution and service networks.

Danfoss A/S is one of the largest industrial companies in Denmark – and world leader in the development and production of a wide range of mechanical and electronic products and controls. Our work is based on our core values: Trust, Passion for Technology, Reliability, Global Perspective with Local Commitment, and Environmental and Social Responsibility.



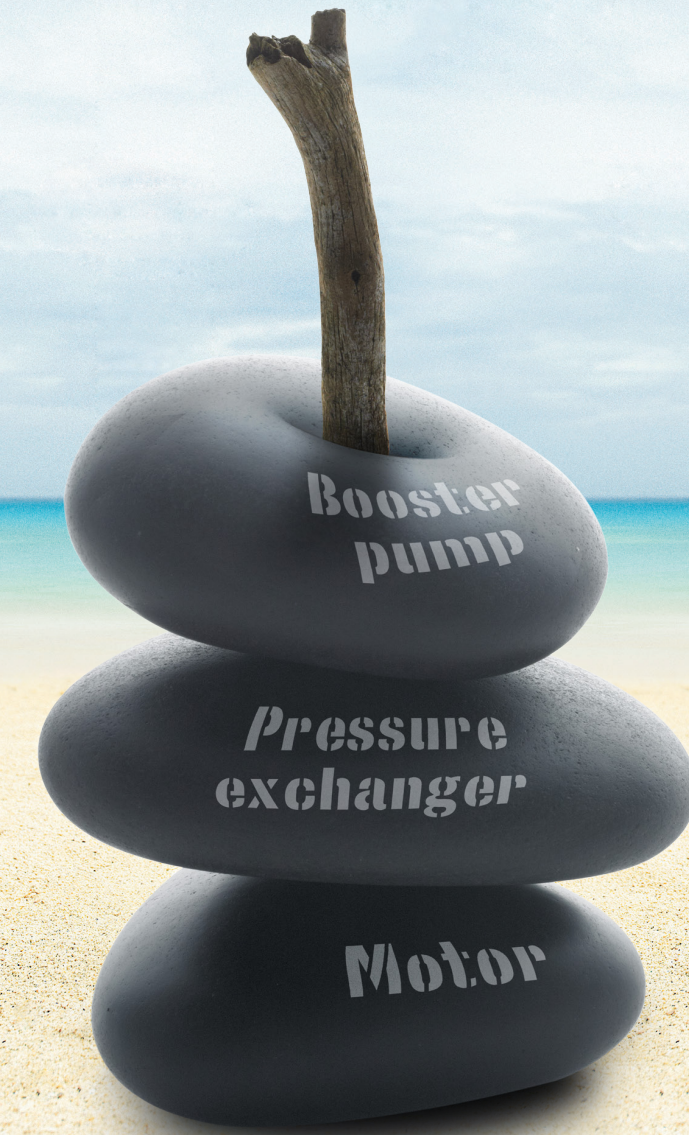
Let us help you optimise your RO project

Our dedicated team of seawater RO experts will be happy to provide design support, technical expertise and customer service. Danfoss RO Solutions is as close as an email or telephone call – from our headquarters in Denmark or from our worldwide network of subsidiaries, distributors and agents.

For more information, please visit www.ro-solutions.com or contact us in Denmark or at one of our regional offices.



The Danfoss RO Solutions range also includes a line of rugged APP high-pressure pumps.



INTEGRATED ISOBARIC ERD FROM DANFOSS

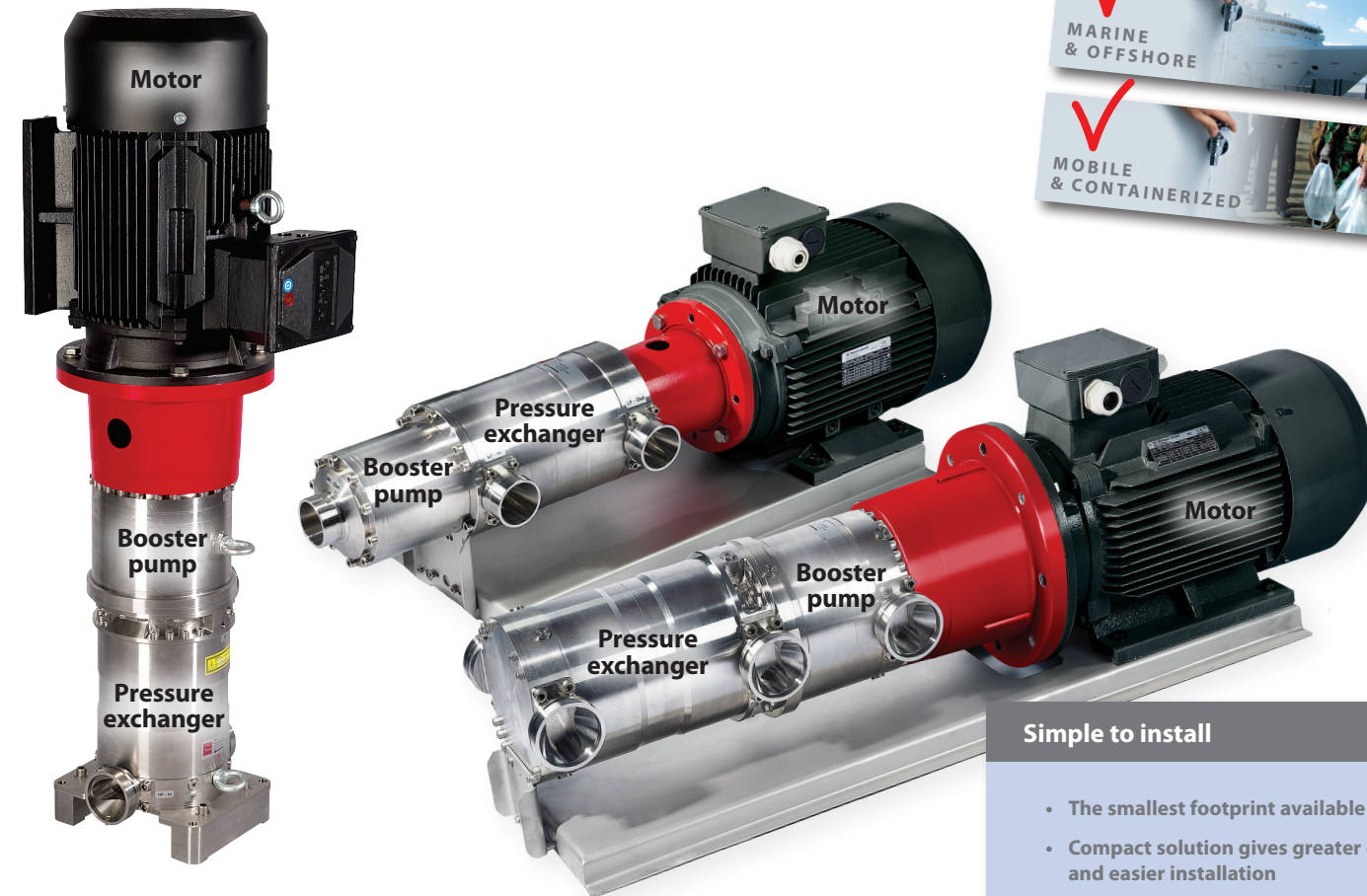
Energy recovery just got simple

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INTEGRATED ISOBARIC ERD FROM DANFOSS



... we simply put them together to save energy, space and components

Until now, isobaric energy recovery devices have depended on separate high-pressure flow meters and booster pumps to send recaptured energy back into the membrane feed flow. Now, Danfoss introduces the first isobaric ERD that is fully integrated with its own positive displacement booster pump and electric motor. The result is fail-safe flow control – without the use of separate high-pressure flow meters.

The direct path to saving 60 % of energy costs

The patented iSave™ Isobaric Energy Recovery Device captures otherwise wasted pressure from the membrane reject flow and transfers it directly to the membrane feed flow. With its built-in high-pressure positive displacement booster pump and electric motor, the iSave automatically controls high-pressure flow – without the use of separate flow meters – to ensure constant and reliable high-pressure feed to the RO membrane. It's simple, reliable and fully automatic. Due to near-perfect energy transfer, which in many cases reaches up to 95% efficiency, net energy consumption can be reduced by up to 60% compared to systems not using energy recovery.

But energy costs are not all that the iSave reduces. The iSave also enables designers to specify smaller, less costly high-pressure pumps in SWRO systems. And it helps them save space.

Small footprint, big impact

Even though the iSave has the smallest footprint of any isobaric ERD on the market, it makes a dramatic difference on energy bills. With up to 70% of total energy related desalination costs, plus increasing efforts worldwide to reduce carbon emissions, iSave is the perfect solution for a world thirsty for fresh water.

3-in-1 isobaric ERD combines:

- Rotary isobaric pressure exchanger
- High-pressure positive displacement booster pump
- Electric motor

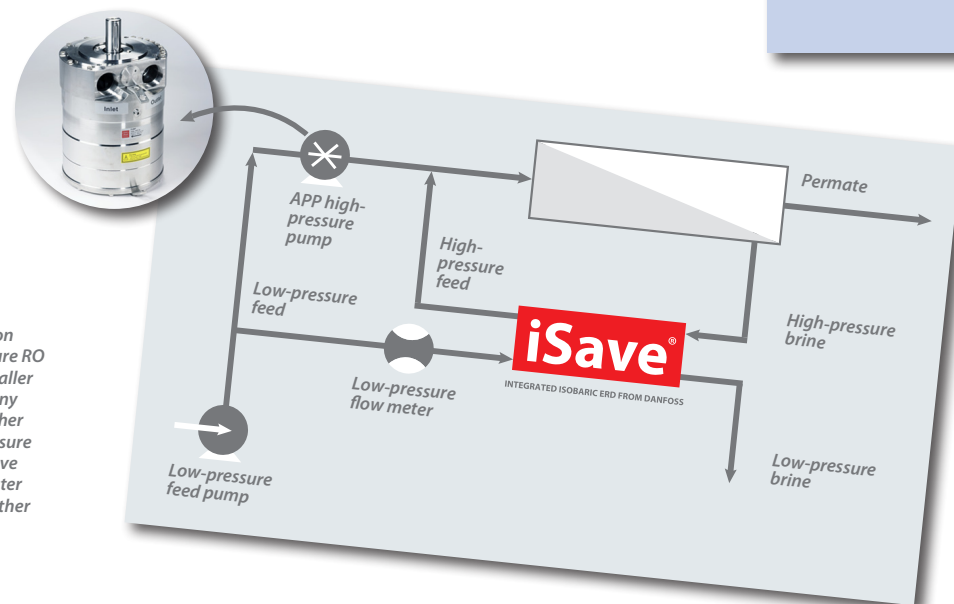
Best-in-class total costs of ownership

- No need for costly high-pressure flow meters
- Highly efficient energy recovery – up to 95% net transfer
- kWh savings of up to 60% compared to applications without ERD
- Reduces size and costs of high-pressure pump
- Simple system design cuts use of stainless steel piping and fittings

iSave range				
Product	Flow range	Pressure range	Efficiency ⁽¹⁾	Available
iSave 21	7-21 m ³ /h	10-82 BAR	up to 93%	NOW
iSave 40	22-40 m ³ /h	10-82 BAR	up to 93%	NOW
iSave 60	39-60 m ³ /h	10-82 BAR	up to 94%	TBA
iSave 77	59-77 m ³ /h	10-82 BAR	up to 95%	TBA

⁽¹⁾ including high-pressure booster pump

Wherever simplicity and space matter
The unique iSave construction enables engineers to configure RO systems that are simpler, smaller and easier to operate than any other available today. Together with compact APP high-pressure pumps, the space-saving iSave ERD produces more fresh water per square meter than any other system on the market.



"When you're working within the constraints of a container, the size of every component really matters..."

"We design containerized SWRO systems that people rely on to produce lots of fresh water in all kinds of environments. When you're working within the constraints of a container, the size of every component – and how they work together – really matters. We like the new iSave's small footprint and the possibilities this gives us to pack more SWRO per cubic meter in our containerized solutions."

*Poul Rasmussen
Sales Director, HOH Water Technology A/S*

HOH Water Technology A/S has years of experience in developing solutions that provide private consumers, the public sector and industry with optimum water quality. HOH employs the latest expertise within membrane technology including reverse osmosis, ion exchange and mechanical filtration. We have supplied emergency units for peacekeeping forces and relief organisations.



"Installation is also much simpler, with everything contained within the one item of equipment..."

"The new generation of isobaric ERD from Danfoss RO Solutions gives us what we're looking for: the very best energy efficiency combined with fail-safe simplicity. Many of our SWRO installations are operated and maintained by crews from all around the world, and often one crew takes over from another without too much training. The iSave means that we no longer have to worry about people making mistakes when adjusting flow controllers. Installation is also much simpler, with everything contained within the one item of equipment – the booster pump and the energy recovery device are a single item."

*Daniel Shackleton
Director, Salt Separation Services Ltd.*

Salt Separation Services Ltd. is a leading engineering company based in the UK. Focus areas are SWRO applications for the shipping, offshore and hospitality segments.



"Naturally, sourcing both pump and ERD from one source offers many advantages..."

"Our customers rely on us to provide reliable systems. We count on Danfoss to supply us with quality components. For the last few years we have used Danfoss RO Solution products and they score highly on quality and reliability. We expect the iSAVE energy recovery device to match the APP pump's proud record. Naturally, sourcing both pump and ERD from one source offers many advantages."

*M. Farghaly
Advanced Watertek LLC.*

Advanced Watertek is an Australian Company, with a Regional Office in Dubai, specialising in the design, manufacture, installation, and commissioning of Reverse Osmosis Desalination Systems. Since its inception in 1984, Advanced Watertek's philosophy has been to utilise only the highest quality components to produce reverse osmosis desalination systems that are easy to operate, easy to maintain and highly reliable, even in the toughest conditions.



Simple to install

- The smallest footprint available in isobaric ERD
- Compact solution gives greater design flexibility and easier installation
- 1 unit instead of 3 as in other isobaric ERD systems

Simple to use

- No risk of overflow/overspin at start-up or during operation
- Motor-controlled rotor spin: flow controlled by electric motor
- Fail-safe operation – ideal for staff of varying skill levels

Simply reliable

- Rotor and other key components in corrosion-resistant Super-Duplex
- Low-pressure shaft seal with long lifetime
- Provides constant flow despite changes in feed water salinity or temperature

No better way to deal with fluctuation in feedwater salinity and temperature



In many circumstances, an SWRO plant draws on feedwater that varies significantly in temperature and salinity. For example, a cruise ship travelling in open ocean water uses feedwater of 3.5% salinity. The same ship, upon entering the Baltic Sea, will find salinity of just 0.7%.

Significant variations in feedwater salinity complicate the life of an SWRO plant, as higher salinity requires higher pressure. Salinity variations present particular challenges to isobaric ERDs, resulting in uneven flows in the

concentrate line. The iSave eliminates this problem by using a positive displacement pump as booster pump. No matter where SWRO takes place, in highly salty or more brackish waters, the iSave automatically maintains constant flow.