

Energy recovery device for desalination applications

Energy is generally the most significant cost driver in any seawater reverse osmosis (SWRO) desalination facility. Energy recovery devices, such as the DWEER Dual Work Exchanger Energy Recovery unit, play a crucial role in reducing energy use and costs.

The DWEER device can recover up to 98% of the energy in the high-pressure brine waste stream — making it the most efficient energy recovery device available. Desalination plants can use recovered energy to pressurize feed water, reducing the size of the high-pressure (HP) pump and the energy input needed for HP feed pumps by about 55%.

With the DWEER isobaric device, the HP pump does not have to be connected to the energy recovery device. This permits plants to use fewer, but larger, more efficient pumps.

Features and benefits

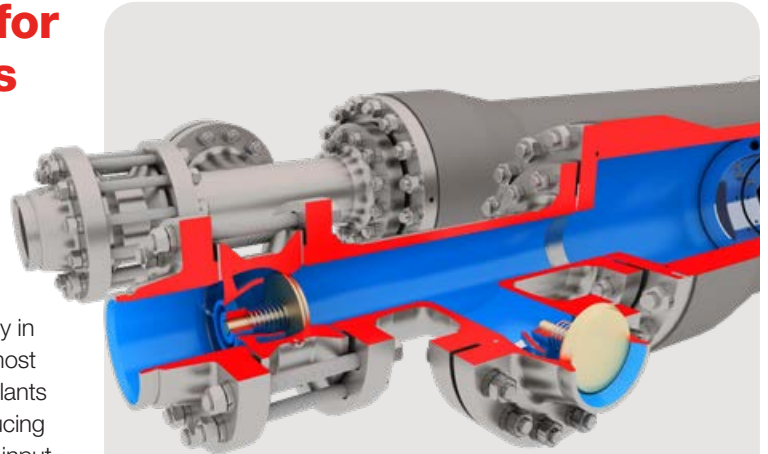
Best-in-class mixing and leakage value — are key elements for the most efficient energy recovery technology available today.

Wide operating range and increased capacity — translate into unmatched operational flexibility and extremely high availability and reliability.

Wide operating range — enables plants to accommodate normal fluctuations in demand easily.

LinX™ valve and actuators — offer precise control of the energy transfer mechanism as well as the operating speed of the system.

Robust design with extremely low maintenance costs — support high availability and 25-year service life and contribute to low total cost of ownership.



How it works

The high-pressure brine from the membranes is directed to a DWEER work exchanger vessel that is pre-filled with low-pressure (LP) feed water. The work exchanger vessel pressurizes the feed water with the brine pressure.

A small recirculation pump equalizes the pressure of the HP feed water leaving the work exchanger, overcoming membrane and system losses. The seawater then joins the flow from the high-pressure pump to form the high-pressure membrane feed flow.

As the end of this half-cycle nears, a valve diverts the high-pressure brine to the opposite work exchanger vessel. This vessel makes an LP stroke at the same time as the other vessel makes its HP stroke. The LP stroke is fed by the low-pressure seawater (from the same source feeding the high-pressure pump), which fills the work exchanger vessel with feed water displacing the brine to discharge, and the cycle repeats.

Available model

- DWEER 1550

Operating parameters

- Brine flows to 350 m³/h (1,550 gpm); greater flows can be achieved by placing multiple DWEER units in parallel
- Pressures to 83 bar (1,200 psi), depending on model material requirements
- Slow-moving equipment with below 5 cpm for the LinX valve to divert HP brine to the vessel in HP use
- Noise level < 80 dba for standard configuration



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