Demonstration of an energy recovery device well suited for modular community-based seawater desalination systems: Result of Danfoss iSAVE 21 testing

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Received 14 July 2011; Accepted 16 November 2012

\textbf{ABSTRACT}

The option of building smaller, decentralized plants is more feasible now that HP pumps and energy recovery devices (ERD) are available for use in small-scale seawater desalination plants with efficiencies comparable to those typically associated with larger plants. A demonstration SWRO system producing 125 cubic meters of product water per day was designed and commissioned utilizing the Danfoss iSave 21 energy recovery device. The desalination subsystem utilizes an inter-staged membrane configuration, low flux, and low recovery design to reduce specific energy consumption, fouling potential, and membrane cleaning requirements. Test results show that a specific energy consumption lower than 2 kWh/m\textsuperscript{3} is easily achievable utilizing standard components, and that the improved second-generation iSave 21 unit has significantly lower lubrication flows than the previous model.

\textit{Keywords: Isobaric energy recovery device; Seawater reverse osmosis; Decentralized SWRO facilities}

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