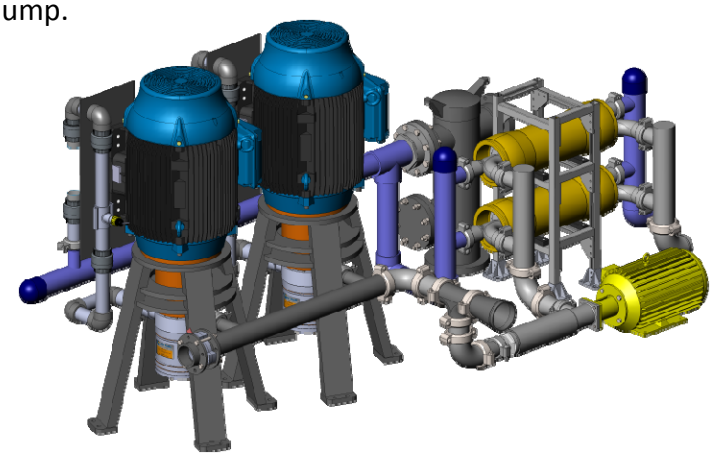
Ocean Pressure Center (OPC)

Ocean Pacific Technologies (OPT) manufactures axial piston pump and energy recovery products **specifically designed for the desalination industry**. Water lubricated axial piston pump technology has been growing in popularity and by unit size in the seawater reverse osmosis (SWRO) industry for more than ten years. A "tipping point" exists for this technology to replace the less efficient centrifugal high pressure pumps that have dominated in large scale SWRO systems for more than 30 years and when combined with an isobaric energy recovery device (ERD) the savings are tremendous. **Compared to centrifugal pump and ERD (Pelton or Turbo) systems, the OPC reduces the energy consumption by as much as 40%.** And our modular pumping solution allows **all size municipal-scale plants** to utilize the same 90% efficient high pressure pump.



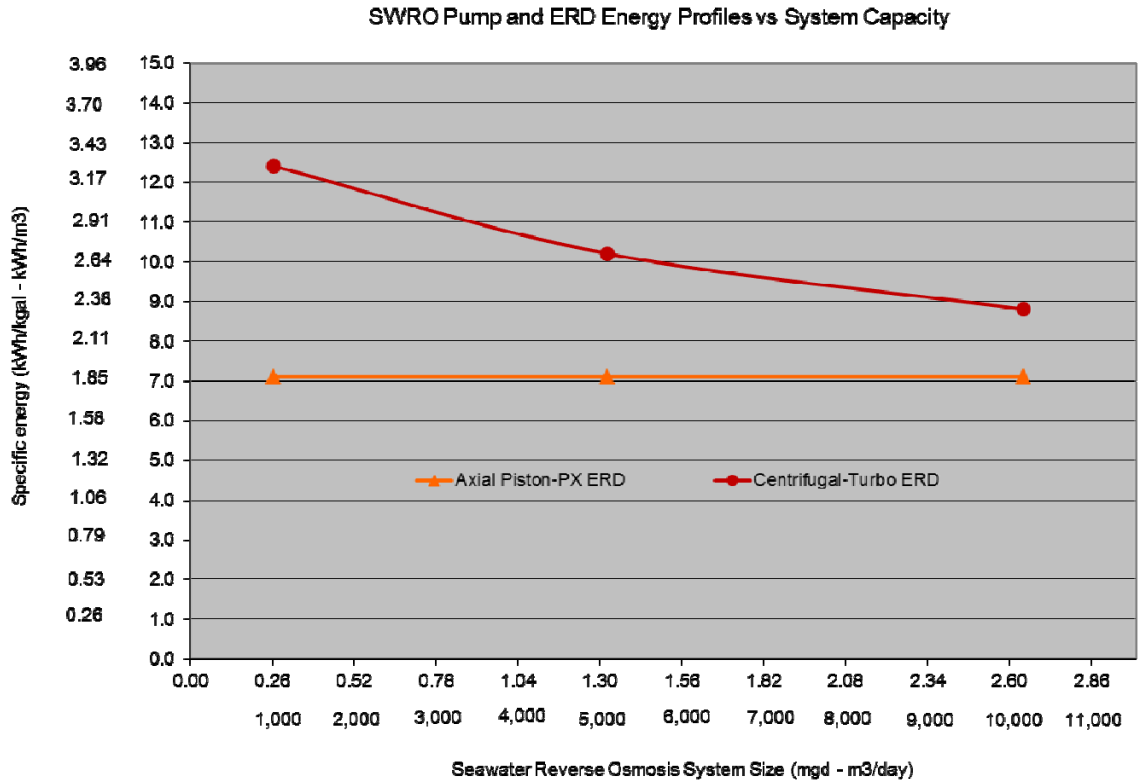
OPC-2000 Modular Pumping and ERD System -- Up to 2,000 m3/day (0.5 mgd) SWRO Capacity

The OPC is a pre-engineered, packaged, turn-key system designed to replace less efficient centrifugal pump and energy recovery systems. Our system employs "off the shelf" proven equipment from the leading pump and energy recovery manufacturers. Our pre-packaged systems can be purchased out right or on a lease to own basis.

Some features and benefits include:

- Up to 40% energy savings over existing high pressure centrifugal pumps and ERD's
- Easy to install requiring only supply power and four connections
- Space and maintenance efficient vertical design
- Fail-safe monitoring and control system for easy and safe operation
- Integrated control of SWRO process (flux and recovery)
- Proprietary monitoring scheme maximizes performance and simplifies troubleshooting
- Elimination of hose connections reduces risk and maintenance
- Online factory monitoring safe-guards equipment and maximizes performance (optional)
- Lower NPSH requirements can help reduce supply energy costs
- Modular design makes it easy to add capacity and/or turn down production rate as desired
- OPT maintains equipment including spare parts and consumables (optional)
- Guaranteed energy savings reduces risk (optional)

The graph below compares the axial piston pump – PX combination to traditional centrifugal pumps and energy recovery systems. The axial piston pump – PX system represents a new energy bench mark that saves as much as 40% of the energy compared to traditional existing systems.



Comparing the Centrifugal-Turbo line (red) to the Axial Piston-PX system (orange) shows how one can save as much as 40% on energy by converting from a centrifugal pump - turbo/Pelton system to an axial piston pump and PX package.

Typical OPC Package Performance and Savings

SWRO system capacity (m3/day)	**1000**	**2000**	**3000**	**4000**	**5000**
Power consumption kW @ 800 psi (55 bar)	79	159	237	315	393
Typical % energy savings	40%	34%	30%	28%	25%
Annual energy savings at $0.40/kWh	$ 185,000	$285,000	$365,000	$430,000	$485,000
Typical specific RO energy (kWh/m3)	1.9				

*Notes: Assumes isobaric energy recovery at 55 bar / 800 psi and 45% recovery. Systems can be design to any specific pressure and flow rate.

Fax or e-mail the following information for a free energy saving analysis

Company name:_____ Individual train capacity:_____

Contact person:_____ Reverse osmosis (RO) recovery rate:_____

Plant location:_____ RO feed pressure:_____

e-mail:_____ Number of trains:_____

ERD Type: ☐ PX, DWEER, iSave ☐ Pelton, Turbo ☐ Other: _____

Feed water: ☐ open intake ☐ well ☐ other:_____

RO feed quality: ☐ Excellent SDI 1-2 ☐ Good SDI 3-4 ☐ Fair SDI < 5

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