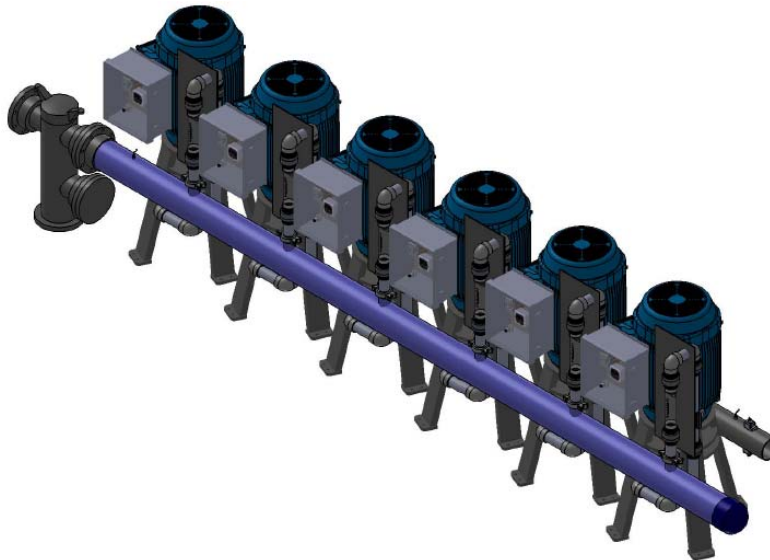




Ocean Pump Package (OPG)

Ocean Pacific Technologies (OPT) manufactures axial piston pump and energy recovery products **specifically designed for the desalination industry**. Positive displacement 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. **Axial piston pump arrays can be used to replace less efficient centrifugal high pressure pumps, reducing energy consumption by as much as 25%**. Our modular pumping solution allows **all size municipal-scale plants** to utilize the same **90% efficient** high pressure pump.



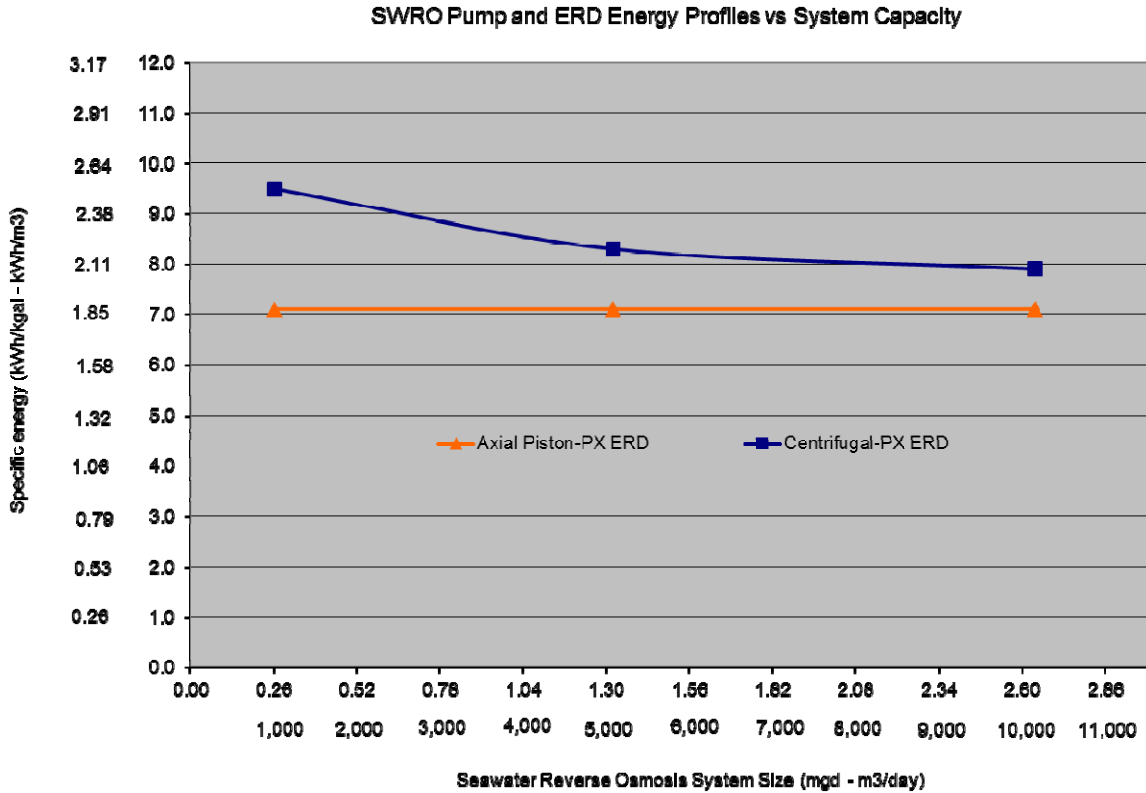
OPT Modular Pumping System -- 6 Pump Array – Up to 5,000 m³/day (1.4 mgd)

The OPG is a pre-engineered, packaged, turn-key system designed to replace less efficient centrifugal pumps. Our system employs “off the shelf” proven equipment from the leading pump manufacturers. Our pre-packaged systems can be purchased out right or leased through the savings in energy costs.

Some features and benefits include:

- Up to 25% energy savings over existing high pressure centrifugal pumps
- Easy to install requiring only supply power, water inlet/outlet connections
- Space and maintenance efficient vertical design
- Fail-safe monitoring and control system for easy and safe operation
- Proprietary monitoring system 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 the traditional centrifugal pumps - PX systems.



Comparing the Centrifugal-PX line (blue) to the Axial Piston-PX system (orange) shows how one can save as much as 25% by replacing a centrifugal pump with our OPG package within an existing isobaric (i-save, PX or DWEER) system. The axial piston pump – PX system represents a new low energy bench mark and it can be applied to essentially any size system. It is **the largest single gain in SWRO efficiency in more than 30 years.**

Typical Ocean Pump Package Performance

SWRO system capacity (m3/day)	1000	2000	3000	4000	5000
Power consumption kW @ 800 psi (55 bar)	74	148	222	296	370
Typical % energy savings	25%	19%	17%	15%	14%
Annual energy savings at \$0.40/kWh	\$ 76,000	\$118,000	\$152,000	\$180,000	\$200,000
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