



energy recovery<sup>®</sup>

# WATER

*Products Catalog*

# *Water Products*

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# About *Energy Recovery*

An exploded view of a yellow, cylindrical pressure exchanger component. The component consists of a central body with a mesh-like structure at the bottom, a top cap with a circular pattern of four quadrants, and a bottom cap with a similar circular pattern. The components are shown in a disassembled state, floating against a blue background that resembles water.

**Energy Recovery** is a trusted global leader in energy efficiency technology. Building on our pressure exchanger technology platform, we design and manufacture reliable, high-performance solutions that generate cost savings and increase energy efficiency across several industries. With a strong foundation in the desalination industry, Energy Recovery has delivered transformative solutions that increase operational efficiency and provide positive environmental impact to our customers worldwide for more than 30 years. Headquartered in the San Francisco Bay Area, Energy Recovery has manufacturing, research and development facilities across California and Texas with sales and on-site technical support available globally.

We are committed to developing technologies that reduce operating costs for our customers. Our solutions drive long-term value and improve the productivity of our customers' operations by reducing energy consumption and life cycle cost, including repairs, maintenance, and equipment downtime.

# About Energy Recovery Devices

**Energy Recovery** has spent decades perfecting devices that capture and recycle otherwise wasted pressure energy. We have a suite of energy recovery devices (ERDs) that can operate at different pressures, dramatically reducing the energy needs, costs, and emissions associated with reverse osmosis desalination and wastewater applications.

Our industry-leading energy recovery solutions include the low, high, and ultra-high PX<sup>®</sup> Pressure Exchanger<sup>®</sup> (PX), and Turbocharger. Combined with our family of pumps, our solutions are trusted around the world by plants of all sizes to meet their specific energy recovery needs.



**Efficiency**



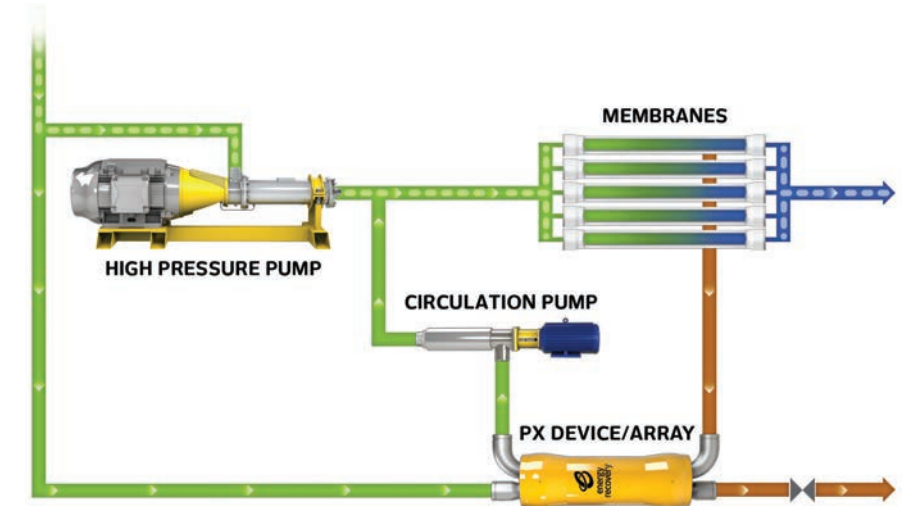
**Resiliency**



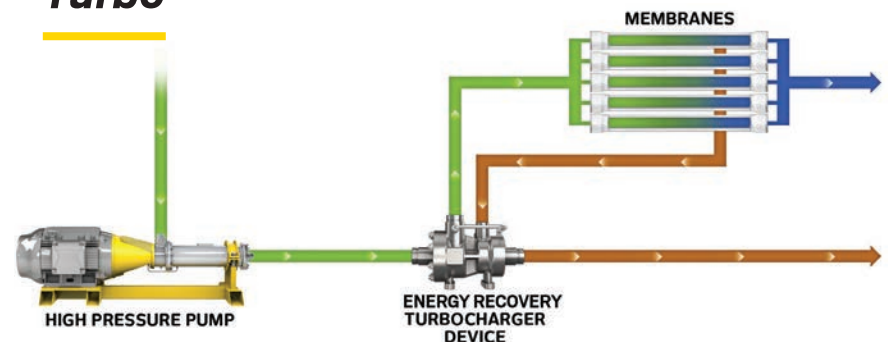
**Reliability**

Simple yet powerful, we make our low, high, and ultra high-pressure PX from corrosion-resistant and highly engineered ceramics for maximum dependability and uptime, with no scheduled maintenance. Our research, development, and manufacturing all take place in-house, allowing us to develop the most advanced devices with speed and precision. We put all our devices through rigorous testing, so they can withstand the harshest conditions and operate at peak efficiency, even after decades of service.

## PX

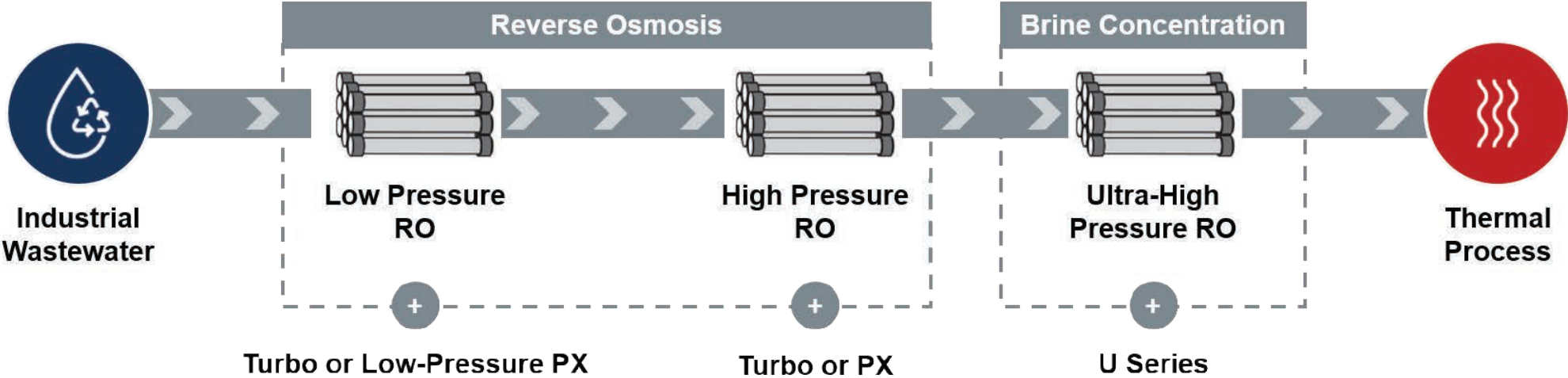


## Turbo



# Energy Recovery Devices for Each RO Stage

Energy Recovery's pressure exchangers, turbochargers, and pumps offer a full suite of energy recovery devices that cover a range of pressure levels and flow rates to accommodate any size plant, or multiple stages of a membrane-based system.



Turbo or Low-Pressure PX






Turbo or PX

U Series




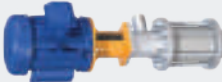
Energy Recovery Solutions



## Pressure Exchanger Offerings



Series	Product	Description	Flow Range	Pressure	Peak Efficiency
<b>Ultra High-Pressure</b>		The PX U Series is an ultra high-pressure solution for UHPRO systems that maximizes water recovery and brine concentration while lowering energy consumption	<b>2.3-56.8 m<sup>3</sup>/h (10-250 gpm)</b>	<b>Up to 120 bar (1,740 psi)</b>	<b>95%</b>
		Our industry-leading pressure exchangers include models with the highest efficiency and lowest life cycle costs for plants of any size	<b>4.5-90.9 m<sup>3</sup>/h (20-400 gpm)</b>	<b>Up to 83 bar (1,200 psi)</b>	<b>97-98%</b>
<b>High-Pressure</b>	<b>PX Q400</b>	<b>Spotlight on Our Flagship High-Pressure PX</b>			
		Energy Recovery's highest-capacity PX for seawater reverse osmosis (SWRO) desalination facilities offering unmatched efficiency, reduced volumetric mixing, and low operational sound levels	<b>65.9-90.9 m<sup>3</sup>/h (290-400 gpm)</b>	<b>Up to 83 bar (1,200 psi)</b>	<b>98%</b>
<b>Low-Pressure</b>		The low-pressure PX line is ideal for brackish desalination and sustainable potable and non-potable water reuse	<b>7-59 m<sup>3</sup>/h (30-260 gpm)</b>	<b>Up to 27.6 bar (400 psi)</b>	<b>97%</b>
<b>PX PowerTrain™</b>		Combines PX® Pressure Exchanger® devices with frame support and ancillary equipment into a compact, ready-to-install, high-performance energy recovery device (ERD) array package for your SWRO train	<b>182-682 m<sup>3</sup>/h (800-3,000 gpm)</b>	<b>Up to 83 bar (1,200 psi)</b>	<b>98%</b>

## Pump Offerings

Series	Product	Description	Flow Range	Pressure	Max Head
<b>Aquabold™</b>		High-pressure, multi-stage centrifugal pump ideal for small to medium-scale reverse osmosis systems	<b>25-290 m<sup>3</sup>/h (100-1,275 gpm)</b>	<b>Up to 83 bar (1,200 psi)</b>	<b>847 m (2,777 ft)</b>
<b>VPXP Pump</b>		High-flow vertical pumps rated for high-pressure applications in SWRO plants with low differential pressure	<b>40-520 m<sup>3</sup>/h (175-2,300 gpm)</b>	<b>Up to 83 bar (1,200 psi)</b>	<b>74 m (242 ft)</b>
<b>HP Pump</b>		Multi-stage, horizontal pumps with Noryl hydraulics work with our PX devices for SWRO trains	<b>10-57 m<sup>3</sup>/h (44-250 gpm)</b>	<b>Up to 83 bar (1,200 psi)</b>	<b>64 m (210 ft)</b>
<b>UHP Pump</b>		Targeting UHPRO processes for ZLD and MLD applications, the UHP pump can be paired with our PX U40 for an end-to-end energy recovery solution	<b>4.5-13.6 m<sup>3</sup>/h (20-60 gpm)</b>	<b>Up to 120 bar (1,740 psi)</b>	<b>64 (210 ft)</b>



## Turbocharger Offerings

Series	Product	Description	Flow Range	Pressure
<b>AT Turbocharger</b>	 A compact, industrial-grade turbocharger with a silver finish and various ports.	Efficient, versatile, and reliable energy recovery solution designed with a compact footprint	<b>11-2,272+ m<sup>3</sup>/h (48-10,000+ gpm)</b>	<b>27-83 bar (400-1,200 psi)</b>
<b>LPT Turbocharger</b>	 A low-pressure turbocharger mounted on a yellow base, with a silver finish and various ports.	Low-cost energy recovery solution ideal for low-pressure systems	<b>205-908 m<sup>3</sup>/h (900-4,000 gpm)</b>	<b>45 bar (650 psi)</b>





# *Pressure Exchangers*

*A History of Invention, A Future of Innovation*

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Our pressure exchanger technology is at the heart of many of our products. It is designed to make water treatment processes more efficient and environmentally sustainable, lowering costs, saving energy, reducing waste, and minimizing emissions. This versatile technology can operate at low, high, and ultra-high pressures, and handle a range of fluids from relatively clean to very dirty.

# PX<sup>®</sup> Pressure Exchanger<sup>®</sup>



## → Best-in-Class Energy Recovery for Desalination

Energy Recovery's PX<sup>®</sup> Pressure Exchanger<sup>®</sup> (PX) family of products provides unmatched energy recovery for seawater reverse osmosis (SWRO) desalination and wastewater treatment solutions. Large and small desalination projects around the world rely on the PX to achieve optimal operations and maximum energy savings, and trust our service team and technical specialists to provide support at every project phase.

**Here's why:**



**Flexibility**

**Flexibility** – Our range of PX capacities provides flexibility to optimize train size to specific project requirements, making the PX the ideal solution for new installations and retrofits alike.



**Efficiency**

**Efficiency** – Energy consumption has historically made SWRO cost prohibitive. But with the PX, up to 98% of pressure energy from the reject brine can be recycled back into the system, reducing energy consumption across the SWRO system by as much as 60% and allowing for smaller high-pressure feed pumps.



**Reliability**

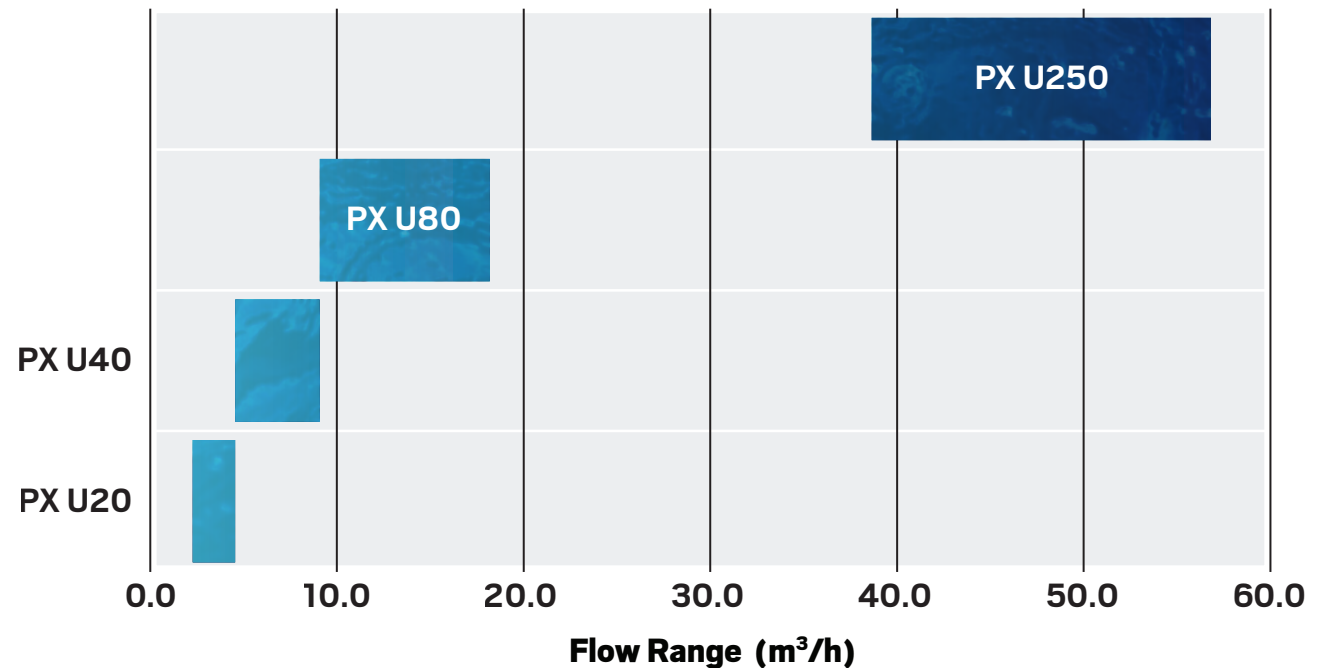
**Reliability** – The PX cartridges have only one moving part and are made with high-purity aluminum oxide ceramic. With a 25-year design life, they are corrosion-proof and three times more abrasion-resistant than steel. All that adds up to unmatched durability.

Energy Recovery designs and manufactures ceramic PX components in-house at its California headquarters. This allows us to control the precision and quality of our core components down to the micrometer level, ensuring every PX device performs with maximum reliability. With no scheduled maintenance and proven performance for the long run, the PX offers unbeatably low life cycle costs.

# Ultra High-Pressure

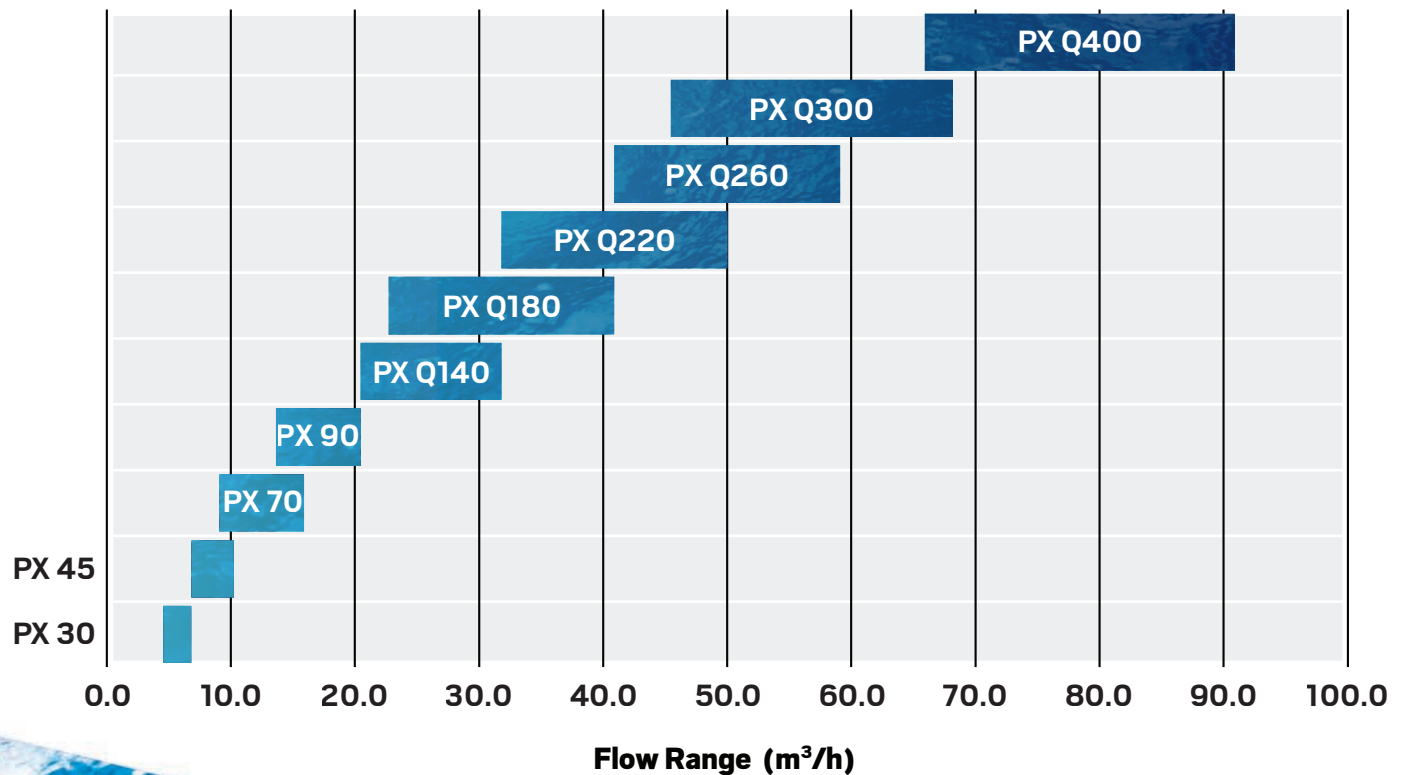


Energy Recovery's PX **U Series** product line for ultra high-pressure reverse osmosis (UHPRO) wastewater treatment is the key to cost-effectively meeting zero or minimal liquid discharge requirements. The PX U Series is tailored for UHPRO applications with operating pressures up to 120 bar (1,740 psi), and its modular design makes it ideal for small or large plants.



# High-Pressure

Our **high-pressure PX solutions** offer unmatched energy recovery for seawater reverse osmosis (SWRO) desalination systems and operate at a wide range of pressure levels up to 1200 psi (83 bar). Large and small desalination projects around the world rely on our range of PXs to achieve optimal operations and maximum energy savings. Designed with only one moving part using highly engineered alumina ceramic, our high-pressure PX line delivers energy savings of up to 60% and efficiencies up to 98%.



# Spotlight on Our Flagship High-Pressure PX

## PX Q400



### → *The Gold Standard in Energy Recovery Devices*

The **PX Q400** is the gold standard in ERDs, performing with unparalleled efficiency of up to 98%. It offers operational sound levels below 77 decibels—comparable to a home vacuum cleaner—to enhance the safety of SWRO plant working environments through reduced audio levels. The PX Q400 also provides <3% volumetric mixing, resulting in lower membrane feed salinity and pressure, and higher desalination system performance.



**Industry-Leading  
Efficiency**



**Reduced  
Mixing**



**Audible  
Improvement**



# Low-Pressure

Energy Recovery's **low-pressure PX solutions** are designed for brackish water reverse osmosis applications. The low-pressure PX solutions handle pressures up to 27.6 bar (400 psi) and have the same unmatched performance when it comes to efficiency (up to 98%), uptime (99.8%), and durability (25+ years) as the standard PX.



## Reliable

*Industry-leading reliability*



## Flexible

*Modular and scalable isobaric device with wide operating range*



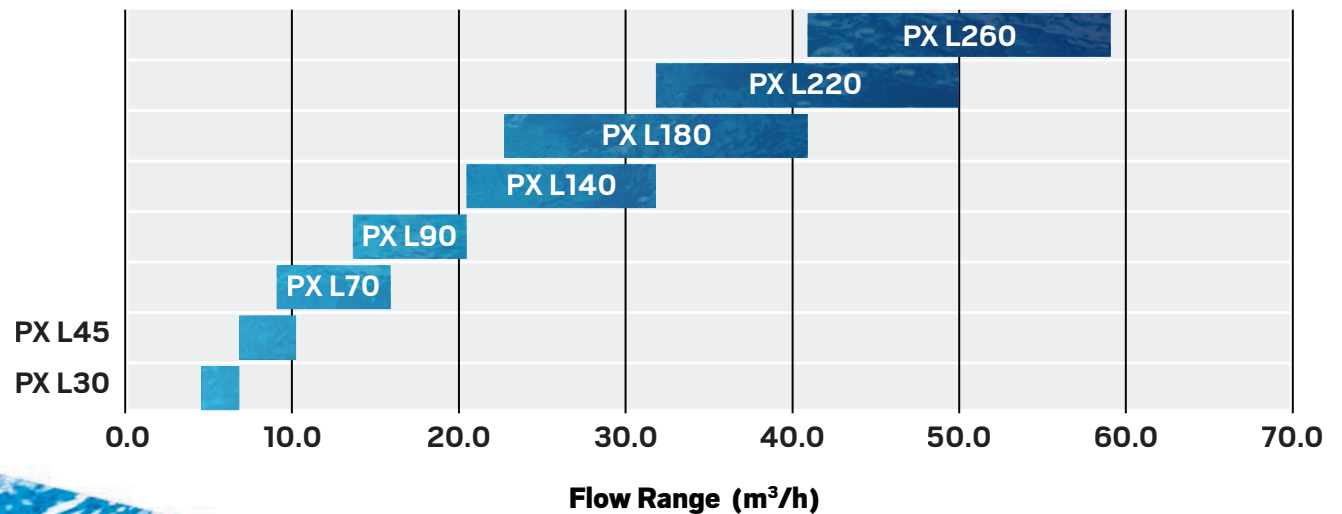
## Affordable

*Short payback period*



## Easy to Retrofit

*Potential to use in existing feed and booster pumps*





# PX PowerTrain™

## → *Trusted Solutions for Desalination*

The **PX PowerTrain™** line combines Energy Recovery's award-winning PX® Pressure Exchanger® (PX) devices with frame support and ancillary equipment into a compact, ready-to-install, high-performance energy recovery device (ERD) array package for your seawater reverse osmosis (SWRO) train. Designed by Energy Recovery's trusted technical experts, the PX PowerTrain™ combines optimized flow paths with our core PX technology to streamline ERD array installation while maintaining industry-leading quality standards. Each PX PowerTrain™ model is designed according to Energy Recovery's strict guidelines for PX operation and performance optimization. It accommodates a wide range of system conditions to manage fluctuations

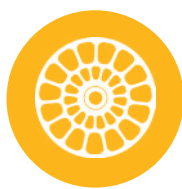
in operating parameters and production demand, which provides unmatched flexibility in a compact, ready-to-install package. These designs are optimized for various SWRO train capacities. You'll save time and money by purchasing one product from a single trusted supplier that offers streamlined installation with just four connection points.

The PX PowerTrain™ can be combined with Energy Recovery's SWRO pumps for an end-to-end pumping and ERD solution.



### **Easy Installation**

*Customized ERD and frame support for ease of installation*



### **Optimal Operation**

*Engineered according to Energy Recovery guidelines to ensure optimal PX operation*



### **Scalable**

*Train production capacity can be scaled to meet customer specifications*



# *Turbochargers*

## *Energy Savings and Ease of Integration*

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Energy Recovery's family of efficient and reliable turbochargers offers substantial energy savings to both high-pressure seawater and low-pressure brackish reverse osmosis desalination systems. Our turbochargers integrate easily and are simple to operate and service. Its robust centrifugal technology makes the turbocharger stand up well to particulates in water, which minimizes maintenance.

Our turbochargers harness wasted brine energy to boost feed pressure in reverse osmosis systems. It complements the high pressure feed pump in the system, and can also be used to boost a second stage system.





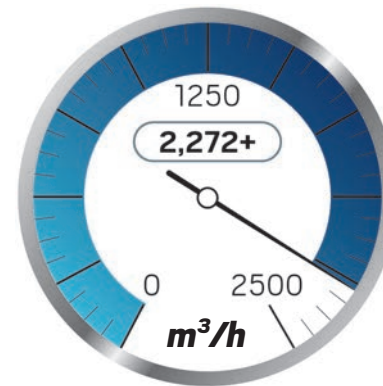
# AT Turbocharger

## → Perfected for High-Pressure Environments

The AT Turbocharger is an efficient, versatile, and reliable solution designed with a compact footprint—no instrumentation or additional equipment is necessary. It requires minimal installation time and operator training. With the turbocharger's completely removable and replaceable hydraulics, plant staff can quickly and inexpensively change operating conditions as needed while maintaining facility uptime.

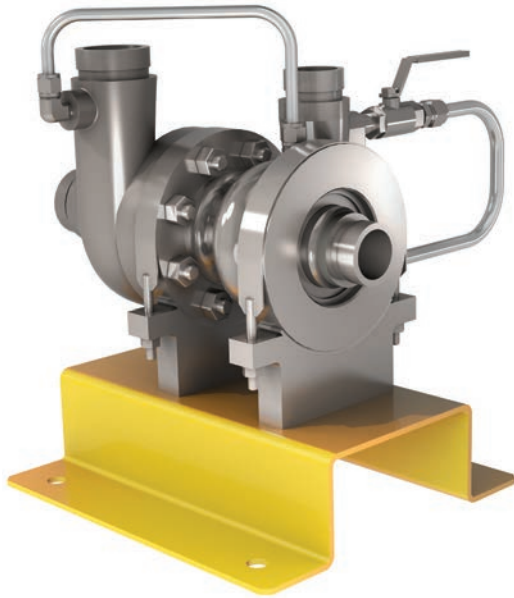
Its modular technology consists of pump and turbine volutes, a turbine nozzle, and pump-side discharge diffuser. Ideal for any size SWRO system, the AT Turbocharger handles flows from 11 to 2,272+ m<sup>3</sup>/h (10,000+ gpm) and pressures from 27 to 83 bar (400 to 1,200 psi).

For a centrifugal solution, the innovative volute insert technology allows systems to perform within a best efficiency range rather than at a single best efficiency point. If system conditions change that require a new operating point, these lightweight inserts can be removed and replaced in hours instead of weeks, maximizing facility productivity.



### **Available Models:**

AT-95, AT-250, AT-350, AT-425, AT-550, AT-875, AT-1100, AT-1500,  
AT-2150, AT-3250, AT-4150, AT-6000, AT-7800, AT-11000



# **LPT** Turbocharger

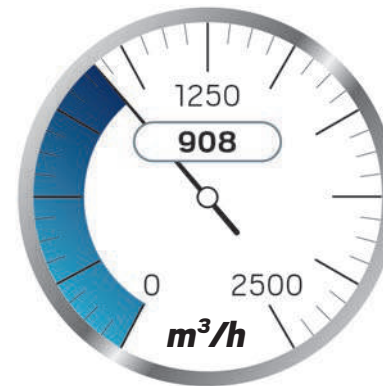
## → **Optimized for Low-Pressure Systems**

The **LPT Turbocharger** is a low-cost energy recovery solution that is ideal for low-pressure systems. Like the AT Turbocharger, our LPT line offers high efficiency, long-term reliability, and versatility in a compact footprint.

Designed for low-pressure applications such as multi-stage brackish reverse osmosis water treatment, this device handles flows from 205-908 m<sup>3</sup>/h (900-4,000 gpm) and pressures up to 45 bar (650 psi).

The LPT is the ideal

solution for two-stage systems where flux balancing and system optimization are desired. It can easily replace a booster pump for this service, providing equal or better performance all while requiring no electrical connections, motors, or drives.



# *Pumps*

## *High-Pressure Pumps for SWRO*

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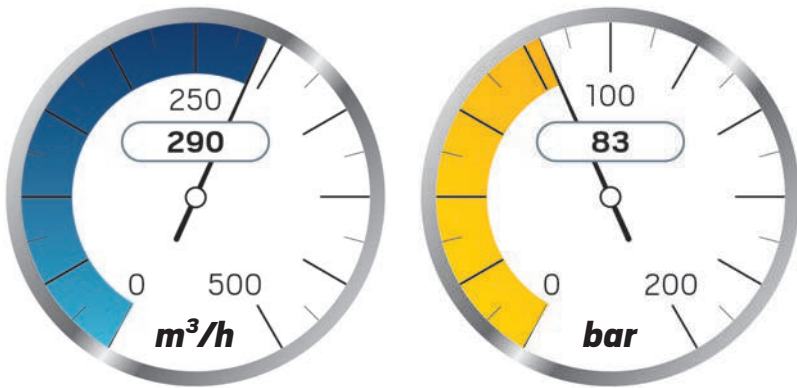
Our line of high-pressure membrane feed and PX circulation pumps are designed specifically for seawater reverse osmosis (SWRO) desalination applications, with the same precision engineering and high-quality standards as our PX and turbochargers. We use corrosion-resistant material to ensure a long and reliable service life in the harshest of environments. When combined with our ERDs, Energy Recovery's pump solutions generate cost savings through high productivity and efficiency and can deliver pressures up to 83 bar (1,200 psi). Our customers trust them to provide improved productivity and optimized operations in high-pressure operating environments.

# AquaBold™

The **AquaBold™** high-pressure pump is a multi-stage centrifugal pump ideal for small to medium-scale reverse osmosis systems. It offers a rugged design with duplex or super duplex casted hydraulics.

## Features and Benefits

- ✓ **Rated for 83 bar (1,200 psi)**
- ✓ **Capacity up to 290 m<sup>3</sup>/h (1,275 gpm)**
- ✓ **Heads up to 847 m (2,777 ft)**
- ✓ **Up to 85% pump efficiency**
- ✓ **Designed for 20-year service life**
- ✓ **Rugged design with duplex or super duplex casted hydraulics**
- ✓ **Low maintenance**



Frame	Number of Stages	Material of Construction	Min Flow (m <sup>3</sup> /h)	Max Flow (m <sup>3</sup> /h)	MAWP (bar)
2x3x5	6 to 25	Duplex or Super Duplex	20	60	83
3x4x7	6 to 20	Duplex or Super Duplex	60	120	83
4x6x9	6 to 15	Duplex or Super Duplex	130	290	83

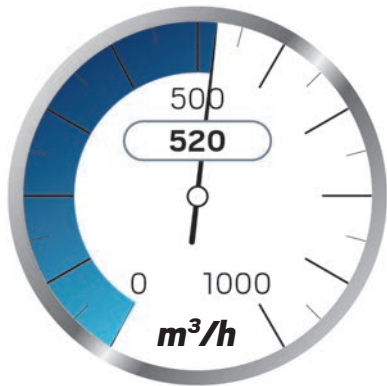
# VPXP Pump



Our high-flow vertical pumps, rated for high-pressure applications with low differential pressure, target SWRO plants with permeate production rates ranging from 640 to 10,000 m<sup>3</sup>/day (168,000 to 2.64M gpd). To optimize energy recovery, our circulation pumps pair with our PX for an end-to-end energy recovery solution that maximizes efficiency and cost savings.

## Features and Benefits

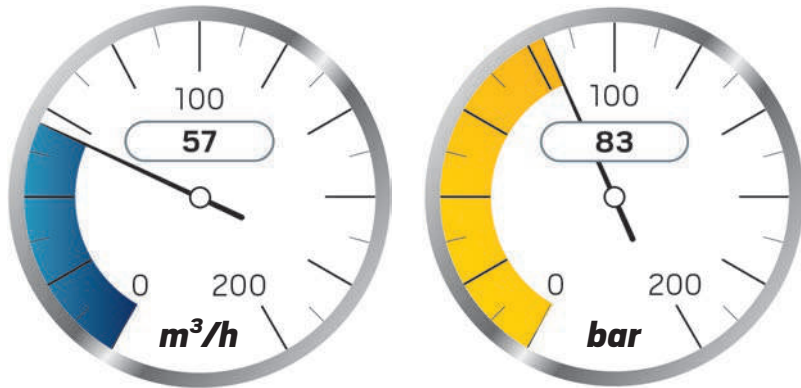
- ✓ **Rated for 83 bar (1,200 psi)**
- ✓ **Capacity up to 520 m<sup>3</sup>/h (2,300 gpm)**
- ✓ **Heads up to 74 m (242 ft)**
- ✓ **Ideal with PX ERD for medium and large SWRO trains (up to 10,000 cmd)**
- ✓ **Compact vertical inline design**
- ✓ **Highly efficient**
- ✓ **Long life and low maintenance**
- ✓ **Low energy consumption**
- ✓ **Reliable performance in high operating pressure**





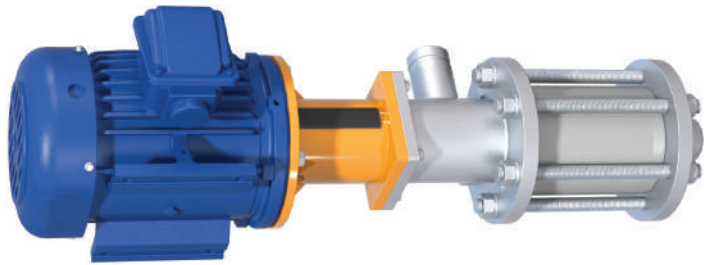
# HP Pump

Our multi-stage, horizontal pumps with Noryl hydraulics work with our PX device as a circulation pump for SWRO trains with production capacity up to 1,000 cmd.



## Features and Benefits

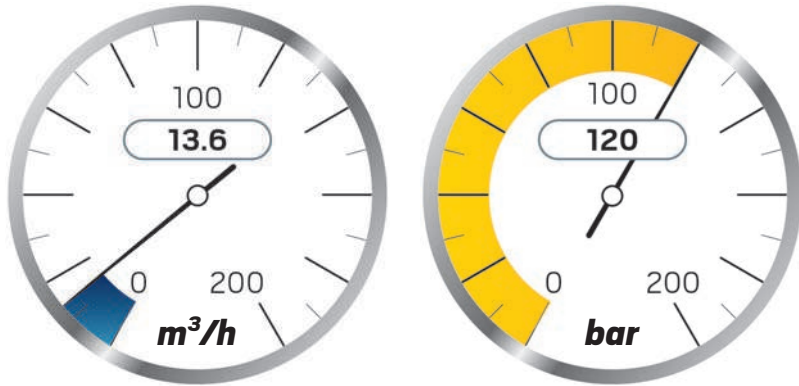
- ✓ **Rated for 83 bar (1,200 psi)**
- ✓ **Capacity up to 57 m<sup>3</sup>/h (250 gpm)**
- ✓ **Heads up to 64 m (210 ft)**
- ✓ **Ideal with PX ERD for small SWRO trains (<1000 cmd)**
- ✓ **Enhanced corrosion resistance**
- ✓ **Longer bearing life and wear cycle**
- ✓ **Low maintenance**



# **UHP** Pump

The **UHP Circulation Pump** can be paired with our PX U40 for an end-to-end energy recovery solution that maximizes efficiency and cost savings.

## **Features and Benefits**



- ✓ **Operates at pressures up to 120 bar (1,740 psi)**
- ✓ **Flow capacity up to 13.6 m<sup>3</sup>/h (60 gpm)**
- ✓ **Heads up to 64 (210 ft)**
- ✓ **Super duplex and Noryl wetted material**
- ✓ **Enhanced corrosion resistance**
- ✓ **Longer bearing life and wear cycle**
- ✓ **No scheduled maintenance**

# *After Sale* **Support**

While our desalination products have little to no scheduled maintenance, we know that technical and operational questions can arise, which is why we offer our customers technical support and consultation every step of the way. From anywhere in the world, our customers can speak with experienced technical field services professionals for support at every project phase, including design review, project construction, commissioning, and operations.



***With our customer care program, customers enjoy:***

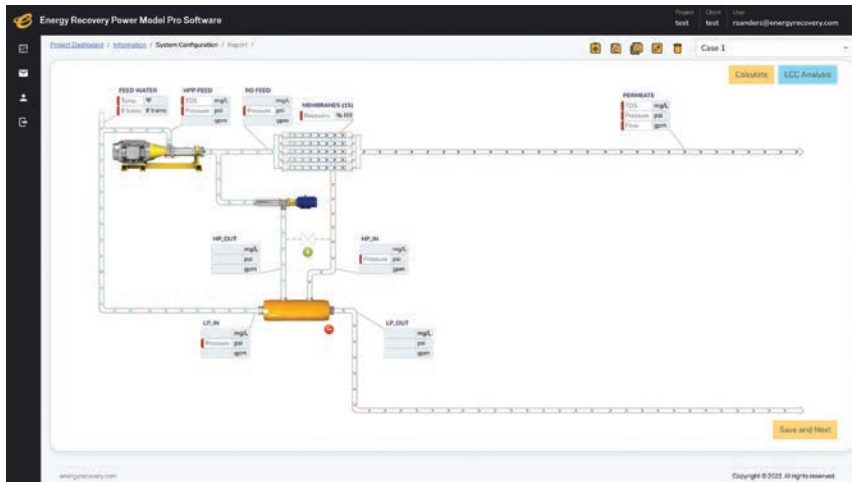
- ✓ ***Unlimited phone consultations with our technical experts***
- ✓ ***Competitive rates for on-site commissioning, maintenance and technical support***
- ✓ ***Streamlined purchasing of replacement parts***
- ✓ ***Customizable customer care service contracts to fit the needs of your operations***



# Power Model Pro

## → A Cloud-Based Configuration Tool to Plan for Wastewater or Desalination Plants

Power Model Pro is a secure, easy-to-use cloud-based product configurator tool that allows you to optimize the hydraulic pumping system of a reverse osmosis system using our products.



**power model PRO**

## Features and Benefits

- ✓ **All-in-one platform that enables energy recovery device (ERD) and pump selection and performance projection, without the need for external software**
- ✓ **Cloud-based platform that's secure and protected**
- ✓ **Featuring a wide range of our products to design a configuration that works for your needs**
- ✓ **Delivers shareable report that includes potential energy savings**

To register, reach out to your sales representative or contact

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energy recovery®

## Contact Us

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