# PureBox™ ROWPU-FX

## Reverse Osmosis Water Purification Unit

The RODI Systems PureBox™ Reverse Osmosis Water Purification Unit (ROWPU) is a fully self-contained, fully functional water treatment system housed in a single, compact unit. The PureBox™ ROWPU-FX can produce up to 20,000 GPD from virtually any naturally occurring water supply including fresh water, brackish water, or seawater. It is designed with simplicity and durability in mind and is easy to transport, install, operate, and maintain. The PureBox™ ROWPU-FX is suitable for a number of applications:

- **Emergency Relief**
- **Small Communities**
- **Remote Work Camps**
- **Military Facilities**
- **Hotels and Resorts**
- **Construction Sites**

5,000 GPD PureBox™ ROWPU-FX

## Benefits

The PureBox™ ROWPU-FX water treatment systems are easily described with only three words … simple, effective, and dependable.

**Simple** — The system is designed with simplicity in mind. In fact, the entire treatment system has only three electrically actuated components: a blower, a pump, and one actuated valve. In the majority of applications, the ROWPU-FX requires no chemicals or consumable items.

**Effective** — Even with its simple design, the ROWPU-FX offers state-of-the-art membrane technology to provide treated water of the highest quality. A unique ceramic microfilter precedes the RO component of the system to prevent colloidal fouling of the RO membrane.

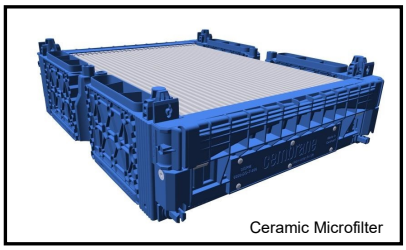
**Dependable** — The simple construction coupled with the high quality components used in the ROWPU-FX result in a water treatment system that is not only effective but also highly dependable, even in the most demanding conditions.

## Treatment Technologies

The PureBox™ ROWPU-FX incorporates the following treatment steps:

**Primary Screen** — The primary screen removes large debris which might otherwise plug the space between the submerged plates of the ceramic microfiltration unit.

**Ceramic Filter** — The ROWPU-FX is equipped with a unique prefilter in the form of a submerged ceramic microfiltration system. This simple, highly durable, and effective filter is instrumental in that it removes suspended solids down to 0.1 micron in size. These solids, if not removed, would lead to rapid fouling of the RO membrane. Such RO membrane fouling is a common and persistent problem in most conventional ROWPU units. The ceramic filter is made of silicon carbide, one of the world's hardest substances. This means long life of the membrane material and it also means that the microfiltration membrane can be stored dry with no affect on performance.


Ceramic Microfilter

**Reverse Osmosis** — Reverse osmosis (RO) is the heart of the ROWPU-FX. By utilizing high rejection thin film composite membrane elements, the ROWPU-FX is capable of removing a vast number of contaminants from the feed water. This includes salinity, heavy metals, arsenic, organic compounds, not to mention viruses and bacteria.

**Disinfection** — The ROWPU-FX is equipped with an ultraviolet (UV) unit to further disinfect the RO permeate.

# PureBox™ ROWPU-FX Specifications

The RODI Systems PureBox™ ROWPU-FX systems incorporate a number of specifications which make them a high quality choice for your water purification application.

**Container** — The system is totally self-contained inside a heavy-duty steel frame or seaworthy intermodal shipping container. Installation is easy and consists of unloading the container and making the necessary piping and electrical connections.

**Construction** — The PureBox™ ROWPUs are constructed of new, industrial quality materials. Piping, vessels, and other system components are supported inside the container with fiberglass structural members.

**Piping** — All low pressure piping is Schedule 80 PVC or other non-metallic materials. High pressure piping utilizes 316 stainless steel. Welded joints are used wherever possible and threaded joints are avoided as much as possible to prevent leaks. All valves and fittings are of industrial quality.

**Pressure Vessels** — Membrane pressure vessels are filament wound using fiberglass roving and sealed with an epoxy resin. This results in a corrosion-proof vessel that will last for years with little or no maintenance.

**Membrane Technology** — The PureBox™ ROWPU-FX utilizes ceramic membrane microfiltration followed by spiral wound, thin film composite RO membrane. This allows the ROWPU-FX to operate from virtually any natural surface water source including highly turbid sources that would quickly overwhelm conventional systems. The integrated membrane system results in high quality permeate with only a single pass, low operating pressures, and a long service life with minimal RO membrane fouling.

**High Pressure Pump** — The PureBox™ ROWPU utilizes Wanner Hydra-Cell pumps. These pumps are chosen for their efficiency, dependability, and compact size. These pumps are extremely durable and can even run dry with no damage to the pump.

**Electrical** — All electrical construction is done to recognized standards. Rigid or flexible PVC conduit and PVC junction boxes are used to prevent corrosion. Only NEMA 4X non-metallic enclosures are used. All electrical systems are thoroughly tested before the treatment system is shipped.

**Documentation** — All systems are provided with a complete set of documentation which includes component O&M manuals and wiring diagrams.

**PureBox™ ROWPU General Specifications[1]**

| Feed Required | Container Type | Container Size L x W x H Weight | Ceramic Filter | RO Array | Nominal Product Capacity[2] (Gal/Day) | Power Required |
|---|---|---|---|---|---|---|
| 3.5 gpm Service | Heavy Duty Steel Frame with Removable Side Panels | 4' 6" x 3' x 4' 350 lbs | 65 $ft^2$ | Six 2.5" x 40" Elements in Series | 1,500 @ 10 GFD | 4 kW |
| 7 gpm Service | QuadCon Shipping Container | 8' x 4' 9-3/8" x 6' 10" 2500 lbs | 130 $ft^2$ | Six 4" x 40" Elements in Series | 5,000 @ 10 GFD | 7 kW |
| 33 gpm Service | Intermodal Shipping Container | 20' x 8' x 8' 6" 7500 lbs | 380 $ft^2$ | Four 8" x 40" Elements in Series | 20,000 @ 11 GFD | 26 kW |

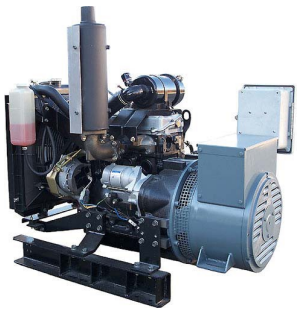
[1] Specifications are subject to change without prior notice.
[2] Actual capacity may vary with feed water quality and temperature.

# PureBox™ ROWPU

# Options

The RODI Systems PureBox™ ROWPU water treatment systems are available with a number of options. This allows clients to customize a system to fit their particular water treatment application.

**Integral Generator** — The system can be equipped with an integral diesel genset. This option also includes an integral fuel tank for extended operation. The genset is capable of operating the entire treatment system in addition to providing auxiliary power for other uses related to the site.



**Hypochlorite Injection** — A chemical injection system can be provided to inject sodium hypochlorite (bleach) into the RO permeate to insure disinfection of the stored permeate. The hypochlorite injection system includes an injection pump and chemical day tank.

**Trailer Mounting** — With this option, the container housing the ROWPU is mounted on a heavy duty trailer. The trailer is equipped with ISO locks at each corner to lock the ROWPU container to the trailer forming an integral mobile treatment system.

**Carbon Adsorption Post-treatment** — In applications where taste, odor, or trace organic contaminants might be present, the ROWPU can be equipped with a carbon adsorption polishing filter.

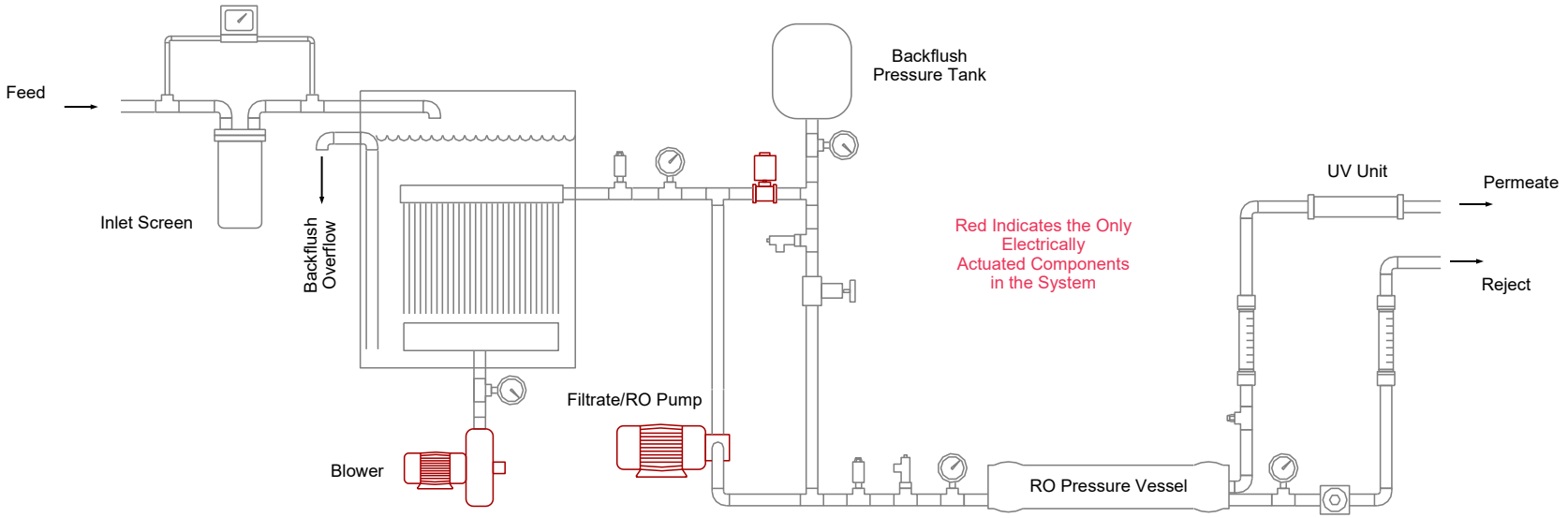
**Climate Control** — The container housing the system can be equipped with approximately 2 inches of solid foam insulation covered with rigid waterproof plastic. The container may also be equipped with an electric heater.

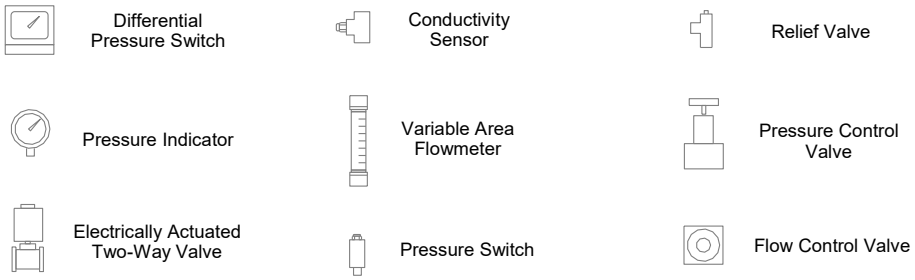
**Operator Training** — Training is available at RODI's facility for those individuals responsible for operating and maintaining the PureBox™ systems. Training and technical support are also available on-site for most locations.

**Remote Monitoring** — This option allows the system to be monitored remotely via the GSM cellular phone network.

# PureBox™ ROWPU-FX Basic System Diagram

The basic version of the RODI Systems PureBox™ ROWPU-FX is illustrated in the diagram below. NOTE: This diagram is for general information only. Certain components on the actual system will vary depending upon system size and selected options. Refer to the system proposal or quotation for specific information on a given system configuration.





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RODI systems

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**NOTE: All specifications are subject to change without notice.**


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