

# PureBox™ FXM

## Self-Contained Portable Water Treatment System

The RODI Systems PureBox™ water treatment systems are built inside intermodal dry cargo shipping containers that have been specifically modified for water treatment applications. This results in a fully self-contained, fully functional water treatment system that can be delivered to a site and put into operation with a minimum of site preparation. The PureBox™ FXM is one of several versions of the PureBox™ product and is designed to treat naturally occurring fresh waters (such as rivers, streams, lakes, or fresh water wells) that do not require removal of dissolved solids. The PureBox™ FXM is suitable for a number of applications such as:

- **Drinking Water—Especially for Emergency Relief, Small Communities, or Work Camps**
- **Industrial and Municipal Wastewater Treatment and Recycling**
- **Reverse Osmosis and Desalination Pretreatment**

### Benefits

The PureBox™ series of treatment systems has a number of benefits that makes it an excellent choice for your water treatment application.

**Portability** — The system is completely self-contained in an intermodal shipping container. Simply unload the container, make piping and electrical connections, and start treating water.

**Flexibility** — As your water treatment needs change, additional PureBox™ systems may be added or changed easily.

**Security** — The lockable containers provide excellent security for the water treatment equipment.

**Quality** — PureBox™ is designed and built by RODI Systems Corp., a leader in the construction of portable water treatment systems.

**Dependability** — RODI's portable systems are serving as dependable sources of clean water around the world.

### Treatment Technologies

The FXM version of the PureBox™ series of treatment systems has three basic treatment steps to produce pure water from fresh water sources.

**Inlet Screen** — A self-cleaning inlet screen removes large debris which might plug the membrane modules or otherwise have a detrimental effect on the treatment system.

**Membrane Microfilter** — The heart of the FXM system is hollow fiber membrane microfilter technology utilizing crystalline microporous PVDF membrane



manufactured utilizing thermally induced phase separation (TIPS). This results in a membrane fiber that is incredibly strong and chemical resistant. The FXM membrane modules filter from the outside of the fiber to the inside thus providing more surface area and making the modules suitable for high feed turbidity applications. The consistent pore size of the membrane (0.1 micron) produces a filtrate of exceptional quality (<0.1 NTU of turbidity).

**Hypochlorite Injection** — This component of the system includes a chemical injection pump and day tank for the injection of sodium hypochlorite (bleach). This final treatment step insures that the treated water remains safe from bacterial contamination. The injection pump is controlled by an electronic flow sensor. Ultraviolet (UV) disinfection may also be provided as an option.

The RODI Systems PureBox™ FXM water treatment systems incorporate a number of specifications which make them a high quality choice for your water treatment application.

**Container** — The system is totally self-contained inside a modified ISO dry cargo shipping container. Only new or “One Trip” containers are used for our systems. This means the container has only been exposed to one ocean voyage before being modified for use in housing the treatment system.

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

**Piping** — All piping is Schedule 80 PVC or other non-metallic materials. In cases where wetted metallic materials are necessary, only stainless steel is utilized. Socket weld joints are used wherever possible and threaded joints are avoided to prevent leaks. All valves and fittings are of industrial quality.

**Membrane Modules** — The vessels used for the membrane filter are PVC construction in which in-

clude PVDF membrane fibers manufactured via thermally induced phase separation (TIPS). This results in a corrosion-proof system highly resistant to fiber breakage and chemical damage. It is capable of performing for years without replacement.

**Instrumentation and Control** — All systems are controlled with a programmable logic controller (PLC) running RODI Systems proprietary monitoring and control software. The control system monitors all necessary operating parameters of the filtration system and controls all necessary functions including air scouring and chemical cleaning.

**Electrical** — The container is equipped with lights and auxiliary power outlets. All electrical construction is done to NEC requirements. Rigid or flexible PVC conduit and PVC junction boxes are used to prevent corrosion. Only NEMA 4X non-metallic enclosures are used on systems that require large control or electrical enclosures. 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™ FXM General Specifications**

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<b>Nominal Capacity (Gal/Day)</b>	30,000	60,000	80,000	100,000	160,000	240,000
<b>Container Dimensions (L x W x H) (ft)</b>	20 x 8 x 8.5	20 x 8 x 8.5	20 x 8 x 8.5	20 x 8 x 8.5	40 x 8 x 9.5	40 x 8 x 9.5
<b>Number of Membrane Modules</b>	2	4	6	8	12	18
<b>Required Feed Flow (gpm)<sup>1</sup></b>	22	44	58	73	116	176
<b>Power Requirement (kW)<sup>1</sup></b>	4.0	6.0	7.5	10	15	20

<sup>1</sup> These are typical values that could vary depending upon feed water conditions.

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# Performance

## PureBox™ FXM Operating Specifications

Parameter	FXM Outlet
Minimum Inlet Feed Pressure	2 psig
Maximum Feed Temperature	104 Deg F
Maximum Feed Turbidity	300 NTU instantaneous; 100 NTU constant
Typical Flux Rate	20 - 35 GFD
Filtrate Turbidity	<0.1 NTU
Bacteria Removal	≥ 4 log
Design Recovery	90 - 98%
Electrical Requirement	240, 380, or 460 VAC, 3 Phase, 50 or 60 Hz



RODI's FXM systems utilize high performance membrane technology to provide effluent of exceptional quality.

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# Options

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

**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 or air conditioner.



**Ultraviolet Treatment** — Additional bacterial protection can be provided in the form of a UV treatment system on the filtered water before final chlorination.

**Additional Instrumentation** — A number of additional analyzers can be provided to assist the client in monitoring the quality of both inlet and outlet of the system. Available instrumentation includes pH, ORP, chlorine, turbidity, and silt density index.

**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.



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