AXEON X2-Series Industrial Reverse Osmosis Systems

Product Overview

AXEON X2-Series Systems utilize Reverse Osmosis (RO) technology to produce high purity water by reducing contaminants such as dissolved minerals, particulates and organic impurities. AXEON X2 Reverse Osmosis Systems are engineered using the highest quality components and materials for reliable operation and exceptional performance. Our standard systems are available with product water outputs from 40 – 325 GPM (57,600 – 468,000 GPD).

AXEON X2 Reverse Osmosis Systems are offered with a variety of options such as pre and post treatment equipment, distribution pumps and integrated controls for a complete water treatment solution. AXEON X2 Reverse Osmosis Systems are skid mounted, pre plumbed and pre wired allowing for quick installation and start up. A variety of membrane types are available including low energy, brackish and low fouling, nanofiltration and ultrafiltration. Our engineers are available for consultation and to assist you in designing your next water treatment solution.

The following are just a few of the industrial applications that benefit from the use of an Industrial Membrane System:

- Boiler Feedwater
- Small Municipalities
- Chemical Manufacturing
- Electronics Manufacturing
- Metal Plating and Finishing
- Ink and Dye Production
- Ice Production Equipment
- Food and Beverage Production
- Bottled Water
- Deionization Pre-Treatment
- X2-6480-115 Industrial Reverse Osmosis System
AXEON X2-Series Water Purification Systems

Designed with high efficiency Reverse Osmosis membranes, the AXEON X2-Series Systems are able to significantly reduce the total dissolved solids (TDS) in both municipal and well water sources. Horizontally mounted pressure vessels contain multiple 8” diameter, 40” long RO membrane elements capable of producing high volumes of purified water.

Key Features

- Over 20 years of Manufacturing Experience
- Conservatively engineered for reliable long term performance
- Factory tested to ensure trouble-free operation

Standard Features

- Filmtec® Thin Film Composite Membranes
- Fiberglass Membrane Housings
- Motor Actuated Feed Valve
- Vertical Stainless Steel Centrifugal Pump
- SS Filter Housing
- SS High Pressure Components
- Low and high Pressure Shut-Off Switch
- Auto Feed Shut-Off
- Stainless Steel Flow Control
- Feed Pressure Gauges (2)
- System Pressure Gauges (3)
- Cleaning Ports
- Permeate Flowmeter
- Concentrate Flowmeter
- Permeate TDS Display
- Feed TDS Display
- Heavy duty coated carbon steel frame
- S-200 Microprocessor Controller Automatically Controls:
  - Motorized Actuated Feed Valve
  - Delayed High Pressure Pump Start-Up
  - Automatic Shut-Down at Tank Full
  - Low or High Pressure Fault Shut-Down
  - Pre-Treatment Lock-Out
  - Feed Water Flush at Shut-Down
  - High Product TDS Alarm Shutdown
- Three Panel Switches For:
  - Auxiliary Output Enable or Disable
  - RO Pump
  - System Power

Optional Equipment

- Permeate Flush System
- pH Monitor
- Temperature Gauge
- Float for Storage Tank*
- Chemical Dosing System
- Feed Booster Pump
- Permeate Re-pressurization Pump
- Programmable Logic Controller
- Differential Pressure Gauge
- ORP Monitor Controller
- Turbidity Meter
- Pre-Treatment Equipment:* Carbon Filter, Antiscalant, Media Filter
- Crating

* Recommended Minimum Options

Operating Parameters

- Operating pressures: 225 psig
  (at projected 3 yr. membrane age)
- Minimum system inlet feed pressure: 30 psig
- Operating temperature range: 50 – 80° F. (10 – 27° C.)
- Maximum inlet free chlorine: 0 ppm
- Maximum inlet silt density index (SDI): 3.0
- Standard electrical power: 460 VAC, 3-phase, 60 Hz.
- Nominal system TDS reduction: 95% – 99%
- Nominal system overall recovery rate: 75% – 80%
- Projected performance and operations based on inlet feed of 10,000 ppm TDS.

Computer projections must be run for individual applications which do not meet or exceed minimum and maximum operating limits.
### Components
- 304 stainless steel skid and frame assembly
- 316 stainless steel high pressure piping and valves
- Premium efficient pressure pump motor instrumentation
- Digital inlet feed water pH monitor controller
- Digital inlet feed water ORP monitor controller
- Inlet feed water turbidity monitor
- RO product divert valve
- Touch-screen operator control monitor

### Pre-Treatment Systems
- Multi-media filters
- Activated carbon filters
- Antiscalant
- Inlet feed water pH adjustment chemical addition
- Inlet feed water antiscalant chemical addition
- Inlet feed water dechlorination chemical addition
- Inlet feed water heat exchanger systems

### RO Product Storage and Distribution Systems
- FRP and HDPE storage tanks with level controls
- Repressurization pumps and controls

### Post-Treatment Systems
- Two-bed and mixed-bed deionization systems
- UV sterilization
- Polishing filter

### Membrane Cleaning and Maintenance
- Skid mounted membrane Clean-In-Place (CIP) systems
- RO product water membrane flush system

### X2-Series Water Purification Systems

<table>
<thead>
<tr>
<th>Model</th>
<th>Array</th>
<th>Vessel Quantity</th>
<th>Elements Per Vessel</th>
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<td>X2-3180-15*</td>
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<tr>
<td>X2-4180-20*</td>
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<td>6</td>
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<td>4</td>
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<td>4</td>
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<td>4</td>
</tr>
<tr>
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<td>7</td>
<td>4</td>
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<td>X2-6680</td>
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<td>X2-9680</td>
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<td>6</td>
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<td>X2-10680</td>
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* X2-Series Compact Systems
System Features

**Skid and Frame Assembly**
Membrane systems are manufactured in a skid frame design for ease of installation with minimum floorspace requirements. The AXEON X2 Systems are constructed of welded structural carbon steel tubing and finished with corrosion resistant epoxy paint coating. Stainless steel fastener hardware is standard for corrosion resistance.

**Cartridge Pre-Filtration Housing**
5 Micron prefiltration is standard on all systems. The filter housing is constructed of 316 stainless steel.

**System Pressure Pump**
Standard pressure pumps are constructed with 304 / 316 stainless steel housings, as well as impeller and diffuser stage assemblies. Pumps are equipped with TEFC motors and wired for 230 / 460 VAC voltage, and rated for full load, continuous duty.

**Membrane Housings**
All systems feature membrane housings constructed of fiberglass reinforced polyester (FRP) with 316 stainless steel side-entry feed and concentrate ports. Standard housings have a white polyurethane finish. ASME code-stamping is available on all membrane housings.

**Instrumentation**
All systems feature a complete instrumentation package for optimal performance monitoring. Each of the following instruments are panel-mounted and pre-wired:
- Pre and Post cartridge filter pressure gauges
- Concentrate pressure gauges
- RO inlet pump discharge pressure switches
- Product and reject electronic flow sensors
- Product and feed conductivity monitor
- System temperature indicator
- Pump run hour meter

**Membrane Elements**
Standard reverse osmosis membrane elements are high rejection, thin-film composite (TFC) type, in a spiral-wound configuration. Membrane elements are tested at 99% average salt rejection. All Filmtec® pro-rated membrane elements carry a three-year warranty against defects in quality and workmanship.

**System Controls**
Operations of the system are automatically controlled through a comprehensive microprocessor controller housed in a NEMA-4 industrial electrical enclosure. The control system also includes a pre-wired motor starter, operator switches, push-buttons, and status alarm indicator lights. Standard systems include the following isolated alarm conditions:
- Low inlet pressure
- High pump discharge pressure

**System Piping and Valves**
All membrane systems are completely pre-plumbed and installation ready. Schedule 80 PVC is standard material for all piping and valves under 75 psig operating pressure. Higher pressure piping and valves are constructed of 316 stainless steel. The following valves are provided as standard for accurate flow and pressure control and convenient operation:
- Automatic inlet valve to prevent water flow through the system during shutdown
- Pressure pump discharge throttle valve
- RO concentrate and recirculation flow control valves
- Automatic system flush valve for prevention of membrane fouling and scale formation
- Inlet, product, sampling valves
- Individual membrane housing product sampling valves
- Isolation valves and blind ports for use with membrane cleaning systems
# AXEON X2-Series Industrial Reverse Osmosis Systems

## Overall System Dimensions

### X2-Series Industrial Reverse Osmosis Systems

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity</th>
<th>Number of Elements</th>
<th>Line sizes</th>
<th>Dimensions</th>
<th>Approx. Weight</th>
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<tr>
<td></td>
<td>GPM</td>
<td>GPD</td>
<td>m³/hr</td>
<td>m⁻³/hr</td>
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### Operating Limits

<table>
<thead>
<tr>
<th>Limit</th>
<th>Value</th>
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<tbody>
<tr>
<td>Minimum System Inlet Feed Pressure (psig)</td>
<td>30</td>
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<tr>
<td>Maximum System Inlet Feed Pressure (psig)</td>
<td>225</td>
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<td>Maximum Inlet Free Chlorine (ppm)</td>
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<td>Standard Electrical Power</td>
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<tr>
<td>Nominal System Overall Recovery Rate</td>
<td>75% – 80%</td>
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</table>

NOTES: All flow rates are nominal and dimensions and weights are approximate. Systems rated at 77°F (25°C) using 2000 ppm feed water and approx. 225 psi (16 kg/cm²) pressure. System capacity changes significantly with water temperature and feed TDS. For higher TDS, a water analysis must be supplied and could result in modifications to the system. Chlorine must be removed prior to RO System if present in the feed water. Water must be pretreated by softener or antiscalant to avoid scaling of the membranes.

Projected performance and operations based on inlet feed of 2000 ppm TDS.

Computer projections must be run for individual applications which do not meet or exceed minimum and maximum operating limits.