



M Series RO Units



These reverse osmosis systems are a reliable and cost effective answer to a wide range of commercial and industrial water purification requirements. Designed to produce from 2,160 to 432,000 gallons per day of high purity water these systems utilize state-of-the-art RO membranes which can provide:

- 99 - 99.99% reduction in dissolved inorganics
- 95 - 99% reduction in organics greater than 150 NMW
- 99%+ reduction in suspended particles, colloids, microorganisms and pyrogens



Each system is supplied completely assembled, factory tested and ready for field installation. Typical applications for these systems include; ultra-pure water for the electronics, pharmaceutical and power industries; process water for the food, beverage and chemical industries and pure water for research, pilot facilities and laboratories.



Product Overview

M Series RO units utilize Reverse Osmosis (RO) technology to produce high purity water by reducing contaminants such as dissolved materials, particles and organic impurities. M Series RO Systems are engineered using the highest quality components and materials for reliable operations and exceptional performance. Our standard systems are available with product water outputs from 1.5 - 300 GPM ((3,160 -432,680 GPD).

M Series 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. M Series 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.

System Features

Skid and Frame Assembly

Membrane systems are manufactured in a skid frame design for ease of installation with minimum floor space requirements. M Series RO Systems are constructed of welding structural carbon steel tubing and finished with corrosion resistant epoxy paint coating.

Cartridge Pre-Filtration Housing

Pre-filtration is available on all systems. The filter housing is constructed of stainless steel or polypropylene.

System Pressure Pump

Standard pressure pumps are constructed with stainless steel housings, impellers and diffuser stage assemblies. Pumps are equipped with TEFC motors and can be wired for 230 or 460 VAC voltage; rated for full load, continuous duty.

Membrane Housings

All systems feature membrane housings constructed of fiberglass reinforced polyester (FRP). Standard housings have a white polyurethane finish. ASME code-stamping is available on all membrane housings.

Instrumentation

All systems are available with a complete instrumentation package for optimal performance monitoring.

- Pre and Post cartridge filter pressure gauges
- Concentrate pressure gauges
- RO inlet pump pressure switches
- RO inlet ORP monitor
- RO inlet pH monitor
- Product and reject flow meters
- Product conductivity monitor
- System temperature indicator
- Pump run hour meter

Membrane Element

Standard reverse osmosis membrane elements are high rejection, thin film composite (TFC) type, in a spiral wound configuration. Membrane elements are tested 99.2% average salt rejection. Other membranes are available on request.

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 starter, operator switches, push-buttons, and status alarm indicator lights.

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 100 PSIG operating pressure. Higher pressure piping and valves are constructed of brass or stainless steel. The following valves are available for accurate flow and pressure control and convenient operation.

- Automatic inlet valve to prevent water flow through the system during shutdown
- RO concentrate and recirculation flow control valves
- Automatic system flush valve for prevention of membrane fouling and scale information
- Inlet, product, sampling valves
- Individual membrane housing product sampling valves
- Isolation valves and blind parts for use with membrane cleaning systems

Standard Features

- Thin Film Composite Membranes
- Fiberglass Membrane Housings
- Stainless Steel Centrifugal Pump
- Brass Or SS High Pressure Components
- Stainless Steel Flow Control
- Cleaning Ports
- Heavy Duty Coated Carbon Steel Frame
- Microprocessor Controller Automatically Controls:
 - Actuated Feed Valve
 - Delayed High Pressure Start-Up
 - Automatic Shut-Down at Tank Full
 - Low or High Pressure Fault Shut-Down
 - Pre-Treatment Lock-Out
 - Feed Water Flush at Shutdown
 - High Product TDS Alarm Shutdown

Operating Parameters

- Operation pressure: 225 PSIG
- 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): 5.0
- Standard electrical power: 460 VAC, 3-phase, 60 Hz.
- Nominal system TDS reduction: 95% - 99%
- Nominal system overall recovery rate: 50% - 75%
- Projected performance and operations based on inlet feed of 10,000 ppm TDS.

System Options

Components

- Stainless steel skid and frame assembly
- Premium efficient pressure pump motor
- Digital inlet feed water pH controller
- Digital inlet feed water ORP controller
- Inlet feed water turbidity monitor
- RO product divert valve
- Touch-screen operator control monitor

Pre-Treatment Systems

- Multi-media filters
- Activated carbon filters
- Water softening systems
- Inlet feed water pH adjustment chemical addition
- Inlet feed water anti-scalant chemical addition
- Inlet feed water dechlorination chemical addition
- Inlet feed water heat exchanger systems

Optional Equipment

- pH Monitor
- Temperature Indicator
- Chemical Dosing System
- Automatic Inlet Shutoff Valve
- Inlet Pre-filter Housing
- Permeate Re-Pressurization Pump
- Low / High Pressure Shut-Off Switches
- Auto Shut-Off (Level / Pressure)
- Feed Pressure Gauges
- System Pressure Gauges
- ORP Monitor
- Permeate Flowmeter
- Concentrate Flowmeter
- Permeate TDS Display
- Feed TDS Display
- Turbidity Meter

RO Product Storage and Distribution Systems

- FRP and HDPE storage tanks with level controls
- Repressurization pumps and controls

Post Treatment Systems

- Integrated electrodeionization (EDI) systems
- Two-bed and mixed bed deionization systems
- UV sterilization
- Degas membrane systems
- Polishing filter

Membrane Cleaning & Maintenance

- Skid mounted membrane Clean-In-Place (CIP) systems
- RO product water membrane flush system

mRO-1 Series

Specifications

Models	mRO-001	mRO-002	mRO-003	mRO-004	mRO-005	mRO-006	mRO-008
Design							
Configuration	Single Pass	Single Pass	Single Pass	Single Pass	Single Pass	Single Pass	Single Pass
Feed Water Source***	TDS < 10,000 ppm	TDS < 10,000 ppm	TDS < 10,000 ppm	TDS < 10,000 ppm	TDS < 10,000 ppm	TDS < 10,000 ppm	TDS < 10,000 ppm
Standard Recovery Rate+	50%-75%	50%-75%	50%-75%	50%-75%	50%-75%	50%-75%	50%-75%
Rejection and Flow Rates							
Nominal Salt Rejection %	99.2%	99.2%	99.2%	99.2%	99.2%	99.2%	99.2%
Permeate Flow* gpm (lpm)	1.5 (5.68)	3.0 (11.36)	4.5 (17.03)	6.0 (22.71)	7.5 (28.39)	9.0 (34.07)	10.0 (37.85)
Minimum Feed Flow gpm (lpm)	2.0 (7.57)	4.0 (15.14)	6.0 (22.71)	8.0 (30.28)	10.0 (37.85)	12.0 (45.42)	13.3 (50.35)
Maximum Feed Flow gpm (lpm)	3.0 (11.36)	6.0 (22.71)	9.0 (34.07)	12.0 (45.42)	15.0 (56.78)	18.0 (68.14)	20.0 (75.71)
Minimum Concentrate Flow gpm (lpm)	0.5 (1.89)	1.0 (3.79)	1.5 (5.68)	2.0 (7.57)	2.5 (9.46)	3.0 (11.36)	3.3 (12.49)
Connections							
Feed inch	1/2" FNA	1/2" FNA	1/2" FNPT	1" FNPT	1" FNPT	1" FNPT	1 1/4" FNPT
Permeate inch	1/2" FNA	1/2" FNA	1/2" FNPT	1" FNPT	1" FNPT	1" FNPT	1" FNPT
Concentrate inch	1/2" FNA	1/2" FNA	1/2" FNPT	1" FNPT	1" FNPT	1" FNPT	1" FNPT
CIP Inch	1/2" FNA	1/2" FNA	1/2" FNPT	1" FNPT	1" FNPT	1" FNPT	1 1/4" FNPT
Membranes							
Membrane(s) Per Vessel	1	1	1	1	1	1	2
Membrane Quantity	1	2	3	4	5	6	8
Membrane Size	4040	4040	4040	4040	4040	4040	4040
Vessels							
Vessel Array	1	1:1	1:1:1	1:1:1:1	1:1:1:1:1	1:1:1:1:1:1	2:2
Vessel Quantity	1	2	3	4	5	6	4
Pumps							
Pump Type	Multi-Stage	Multi-Stage	Multi-Stage	Multi-Stage	Multi-Stage	Multi-Stage	Multi-Stage
Motor HP (kw)	2.0 (1.5)	2.0 (1.5)	2.0 (1.5)	5.0 (3.7)	5.0 (3.7)	5.0 (3.7)	5.0 (3.7)
RPM @ 60 (50 HZ)	3450 (2900)	3450 (2900)	3450 (2900)	3450 (2900)	3450 (2900)	3450 (2900)	3450 (2900)
Electrical ****							
Standard Voltage	460V/60 HZ/3 PH	460V/60 HZ/3 PH	460V/60 HZ/3 PH	460V/60 HZ/3 PH	460V/60 HZ/3 PH	460V/60 HZ/3 PH	460V/60 HZ/3 PH
Voltage Options	220V/60 HZ/3 PH	220V/60 HZ/3 PH	220V/60 HZ/3 PH	220V/60 HZ/3 PH	220V/60 HZ/3 PH	220V/60 HZ/3 PH	220V/60 HZ/3 PH
System Dimensions **							
L x W x H inch (cm)	36 x 30 x 72 (92 x 76 x 183)	36 x 30 x 72 (92 x 76 x 183)	36 x 30 x 72 (92 x 76 x 183)	36 x 30 x 72 (92 x 76 x 183)	36 x 30 x 72 (92 x 76 x 183)	36 x 30 x 72 (92 x 76 x 183)	39 x 36 x 102 (99 x 76 x 260)
Weight lb. (Kg)	560 (250)	590 (270)	620 (280)	650 (300)	680 (310)	700 (320)	750 (340)

* Product Flow rates and recovery are based on equipment test parameters

** Does not include operating space requirements

*** Treatment ability of the RO system is dependent on feed water quality. Performance projections must be run for each installation.

**** Operation at 50 HZ supply will reduce unit water production.

Operating Limits

Maximum Feed Temperature °F (°C)	85 (29.00)	Maximum Free Chlorine ppm	0
Minimum Feed Temperature °F (°C)	40 (4.44)	Maximum TDS ppm	10,000
Maximum Ambient Temperature °F (°C)	120 (48.89)	Maximum Hardness gpg + +	0
Minimum Ambient Temperature °F (°C)	40 (4.44)	Maximum pH (Continuous)	11
Maximum Feed Pressure psi (bar)	85 (5.86)	Minimum pH (Continuous)	5
Minimum Feed Pressure psi (bar)	45 (3.10)	Maximum pH (Cleaning 30 Min.)	12
Maximum Operating Pressure psi (bar)	300 (20.68)	Minimum pH (Cleaning 30 Min.)	2
Maximum SDI Rating SDI	<3	Maximum Turbidity NTU	1

Test Parameters: 10,000 TDS Filtered (5 Micron), De-Chlorinated, Municipal Feed Water, 65 psi (4.50 bar) Feed Pressure, 250 psi Operating Pressure, 77 Degrees F (25 Degrees C), Recovery as stated, 7.0 pH. Data taken after 60 minutes of operation.

+ Low temperatures and high feed water TDS levels will significantly affect systems production capabilities. Computer projections should be run for individual applications which do not meet or exceed minimum and maximum operation limits.

+ + Scale prevention measures must be taken to prolong membrane life.

Product information is subject to change without notice. For more detailed information on this or any of our other products please visit the web a www.ipureh2o.com or contact us via email at sales@ipureh2o.com.

mRO-8 Series

Array Specifications

Model	Array	Vessel Quantity	Elements Per Vessel
mRO 8-3-1	1	1	3
mRO 8-3-2	1	2	3
mRO 8-3-3	2:1	3	3
mRO 8-3-4	2:1:1	4	3
mRO 8-3-5	3:2	5	3
mRO 8-3-6	4:2	6	3
mRO 8-6-4	4	4	6
mRO 8-6-6	4:2	6	6
mRO 8-6-8	5:3	8	6
mRO 8-6-10	6:4	10	6

mRo-8 - Series Specifications

Model	Capacity			Number of Elements	Line sizes			Dimensions						Approx. Weight	
	GPM	GPD	M3/hr		Inlet (Inches)	Permeate (Inches)	Concentrate (Inches)	Length		Width		Height		lb	kg
								in.	cm.	in.	cm.	in.	cm.		
mRO 8-3-1	15	21600	3.4	3	1-1/2	1-1/4	1-1/2	156	396	48	122	114	290	1,735	787
mRO 8-3-2	30	43200	6.8	6	1-1/2	1-1/4	1-1/2	156	396	48	122	114	290	2,005	910
mRO 8-3-3	45	64800	10.2	9	2	1-1/2	2	156	396	48	122	114	290	2,275	1,032
mRO 8-3-4	60	86400	13.6	12	2	2	2	156	396	48	122	114	290	2,645	1,200
mRO 8-3-5	75	108000	17.0	15	2-1/2	2	2	156	396	48	122	114	290	2,910	1,320
mRO 8-3-6	90	129600	20.4	18	3	2	2-1/2	156	396	48	122	114	290	3,280	1,488
mRO 8-6-4	120	172800	27.3	24	3	3	3	288	732	84	213	102	259	3,795	1,721
mRO 8-6-6	180	259200	40.9	36	4	3	3	288	732	84	213	102	259	5,275	2,239
mRO 8-6-8	240	345600	54.5	48	4	3	3	288	732	84	213	102	259	5,660	2,567
mRO 8-6-10	300	432000	68.1	60	4	3	3	288	732	84	213	102	259	7,140	3,239

NOTES: All dimensions and weights are approximate. Systems rated at 77°F (25°C) using 10,000 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 feed water. Water must be pre-treated by softener or antiscalant to avoid scaling of the membranes.

EDI Option

Specifications

Models	mRO-001	mRO-002	mRO-003	mRO-004	mRO-005	mRO-006	mRO-008
EDI							
Permeate Flow Rate GPM (LPM)	1.4 (5.30)	2.7 (10.21)	4.1 (15.52)	5.4 (20.44)	6.8 (25.74)	8.1 (30.66)	10.0 (37.85)
Concentrate Flow Rate GPM (LPM)	0.1 (0.38)	0.3 (1.14)	0.4 (1.51)	0.6 (2.27)	0.7 (2.65)	0.9 (3.41)	1.0 (3.76)
Electrode Flow Rate GPM (LPM)	0.05 (0.19)	0.05 (0.19)	0.05 (0.19)	0.05 (0.19)	0.05 (0.19)	0.05 (0.19)	0.05 (0.19)

Cell Configuration							
Cell Size	XL200R	XL300R	XL300R	XL400R	XL400R	XL500R	XL500R
Cell Quality	1	1	1	1	1	1	1

Connections							
Concentrate	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
Electrode	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"

Models	mRO8-3-1	mRO8-3-2	mRO8-3-3	mRO8-3-4	mRO8-3-5	mRO 8-3-6
EDI						
Permeate Flow Rate GPM (M ³ /HR)	13.0 (2.95)	27.0 (6.13)	40.0 (9.08)	54.0 (12.26)	67.0 (15.22)	81.0 (18.40)
Concentrate Flow Rate GPM (M ³ /HR)	2.0 (0.45)	3.0 (0.68)	5.0 (1.14)	6.0 (1.36)	8.0 (1.82)	9.0 (2.04)
Electrode Flow Rate GPM (M ³ /HR)	0.5 (0.01)	1.0 (0.23)	1.0 (0.23)	1.5 (0.34)	1.5 (0.34)	2.0 (0.45)

Cell Configuration						
Cell Size	XL600R	XL600R	XL700R	XL700R	XL700R	XL700R
Cell Quality	1	2	2	3	3	4

Connections						
Concentrate	1/2"	1/2"	1/2"	1/2"	1"	1"
Electrode	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"

* Product Flow rates and recovery are based on equipment test parameters

** Does not include operating space requirements

*** Treatment ability of the RO system is dependent on feed water quality. Performance projections must be run for each installation.

HOW EDI TECHNOLOGY CAN SIGNIFICANTLY REDUCE OPERATING EXPENSES

Electrodeionization (EDI) Technology

EDI technology combines membranes and ion-exchange resins together in a single process that is capable of producing a continuous supply of ultra-pure water.

Ion-exchange resins are suspended between ion-selective membranes and electrodes, which are operated under the influence of a DC potential. In this configuration, the ion-exchange resins effectively remove ions from reverse osmosis permeate while being continuously regenerated by the DC field. The ion-selective membranes operate using the same principles and materials as ion-exchange resins, and are used to transport specific ions away that are captured by the ion exchange resins. The membranes and ion-exchange resins are spaced in a plate and frame type arrangement to produce alternating purifying and concentrating compartments. By "stacking" these compartments, various flow capacity EDI "cells" are created.

EDI Advantages Over Conventional DI Resin Systems:

- EDI cell resins require NO chemicals for regeneration
- EDI cells do not require shutdowns for regeneration
- iPure EDI modules are the smallest and lightest units per unit flow volume processed
- EDI cells provide consistent outlet water quality
- EDI cells require little energy (~5Amps / 10 GPM flow)
- Economical use of capital: low initial cost and reduced operating expenses

