

# HRO 4 – Series Membrane Systems

**Hellenbrand HRO 4 – Series Membrane Systems** are state-of-the-art, versatile systems for treating municipal and brackish water supplies, with flow rates ranging from 500 to 8,000 gallons per day. Minimal energy consumption, low maintenance and operation costs make the HRO 4 – Series reverse osmosis systems the right choice.

**Hellenbrand HRO 4 – Series Membrane Systems** feature a robust, innovative design that allows for versatility in the event of feedwater quality and temperature variations. A C – 21 or C – 23 controller with feed flush comes standard to reliably operate the system. Extra Low Energy Membranes are standard on all systems and offer high rejection and flow rates for quality system performance. Systems also feature a heavy duty 1/2 HP or 1 HP stainless steel multi – stage booster pump for superior performance and corrosion resistance.

## Features

- C – 21 On/Off Switch or C – 23 Controller
- Extra Low Energy Membrane Elements
- Fiberglass Membrane Housings
- 4.5" x 20" Pre – Filter Housing
- 5 – Micron Sediment Filter
- Multi – Stage Stainless Steel Centrifugal Pump
- Motor Thermal Overload Protection
- Pump Operating Pressure Gauge
- Pre – Filter In Pressure Gauge
- Pre – Filter Out Pressure Gauge
- Permeate Flow Meter
- Concentrate Flow Meter
- Concentrate Recycle Flow Meter
- Feed Low Pressure Switch
- Solenoid Valve
- Stainless Steel Concentrate Valve
- Stainless Steel Recycle Valve
- Chemical Injection Port and Plug
- Rubber Bumper Kit

## Options

- C – 23 Controller (500 GPD and 1000 GPD)
- Membrane Expansion Kit (6000 GPD to 8000 GPD)
- Casters
- Levelers
- TDS Meter



**HRO 4 – 4000**  
Reverse Osmosis System

# Hellenbrand<sup>®</sup> HRO 4 – Series Membrane Systems

Product Specifications						
	HRO 4 – 500	HRO 4 – 1000	HRO 4 – 2000	HRO 4 – 4000	HRO 4 – 6000	HRO 4 – 8000
<b>Design</b>						
Configuration	Single Pass	Single Pass	Single Pass	Single Pass	Single Pass	Single Pass
Feedwater Source †	TDS < 2000	TDS < 2000	TDS < 2000	TDS < 2000	TDS < 2000	TDS < 2000
System Recovery with Recycle	50% – 75%	50% – 75%	50% – 75%	50% – 75%	50% – 75%	50% – 75%
<b>Rejection and Flow Rates</b>						
Nominal Salt Rejection	99%	99%	99%	99%	99%	99%
Permeate Flow Rate †††	0.35 gpm	0.69 gpm	1.39 gpm	2.78 gpm	4.17 gpm	5.56 gpm
Concentrate Flow Rate (min)	1.00 gpm	1.00 gpm	1.00 gpm	3.00 gpm	3.00 gpm	3.00 gpm
Concentrate Recycle Flow Rate	Up to 1.00 gpm	Up to 1.00 gpm	Up to 2.00 gpm	Up to 5.00 gpm	Up to 5.00 gpm	Up to 5.00 gpm
<b>Connections</b>						
Feed Connection	¾" FNPT	¾" FNPT	¾" FNPT	¾" FNPT	¾" FNPT	¾" FNPT
Permeate Connection	½" QC	½" QC	½" QC	½" QC	½" QC	½" QC
Concentrate Connection	½" MNPT	½" MNPT	½" MNPT	½" MNPT	½" MNPT	½" MNPT
<b>Membranes</b>						
Membranes Per Vessel	1	1	1	1	1	1
Membrane Quantity	2	3	3	2	3	4
Membrane Size	2521	2521	2540	4040	4040	4040
<b>Vessels</b>						
Vessel Array	1:1	1:1:1	1:1:1	1:1	1:1:1	1:1:1:1
Vessel Quantity	2	3	3	2	3	4
<b>Pumps</b>						
Pump Type	Multi – Stage	Multi – Stage	Multi – Stage	Multi – Stage	Multi – Stage	Multi – Stage
Motor HP	¾ – 1	¾ – 1	¾ – 1	¾ – 1	1 – 1½	1 – 1½
RPM at 60 HZ	3450	3450	3450	3450	3450	3450
<b>Electrical</b>						
Controller	C – 21	C – 21	C – 23	C – 23	C – 23	C – 23
Standard Voltage	110V 1PH 60Hz 12.4A**	110V 1PH 60Hz 12.4A**	110V 1PH 60Hz 12.4A**	110V 1PH 60Hz 12.4A**	110V 1PH 60Hz 9.95A**	110V 1PH 60Hz 9.95A**
<b>System Dimensions</b>						
Approx. Dimension* (L x W x H)	18" x 18" x 48"	18" x 18" x 48"	18" x 18" x 55"	18" x 18" x 55"	26" x 18" x 55"	26" x 18" x 55"
Approx. Weight	100 lbs.	105 lbs.	110 lbs.	120 lbs.	140 lbs.	160 lbs.

**Warranty Evaluation Test Conditions:** Permeate flow rates and salt rejection based on the following test conditions – 550 ppm, filtered and dechlorinated municipal tap water, 77°F / 25°C, 15% recovery, 7.0 pH and the specified operating pressure for membrane element type. Data taken after 60 minutes of operation.

\* Does not include operating space requirements.

\*\* Varies with motor manufacturer.

## Operating Limits<sup>††</sup>

Design Temperature	77°F	Maximum Turbidity NTU	1
Maximum Feed Temperature	85°F	Maximum Free Chlorine ppm	0
Minimum Feed Temperature	40°F	Maximum TDS ppm	2,000
Maximum Ambient Temperature	120°F	Maximum Hardness GPG	1
Minimum Ambient Temperature	40°F	Maximum pH (Continuous)	11
Maximum Feed Pressure psi	85	Minimum pH (Continuous)	3
Minimum Feed Pressure psi	45	Maximum pH (Cleaning 30 minutes)	12
Maximum Operating Pressure psi	200	Minimum pH (Cleaning 30 minutes)	2
Maximum SDI Rating	<3		

† Low temperatures and feedwater quality, such as high TDS levels will significantly affect the systems production capabilities and performance. Computer projections must be run for individual applications which do not meet or exceed minimum and maximum operating limits for such conditions.

†† System pressure is variable due to water conditions. Permeate flow will increase at a higher temperature and will decrease at a lower temperature.

††† Product flow and maximum recovery rates are based on feedwater conditions as stated above. Do not exceed recommended permeate flow.

Scale prevention measures and appropriate filtration for pretreatment must be made for prolonged membrane life.



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