

## Sea Water RO Systems

### AVRO SWRO-40M Series

The SWRO-40M series are available with capacities ranging from 9000 GDP to 15000 GDP. Designed to convert seawater to drinking water, these systems use our proven technology to give reliable performance and meet the demanding requirements of the marine environment. By using high quality reverse osmosis seawater membranes in the water purification process, the product water is used in a variety of areas including hotels, resorts, navy, and off-shore platforms, etc.

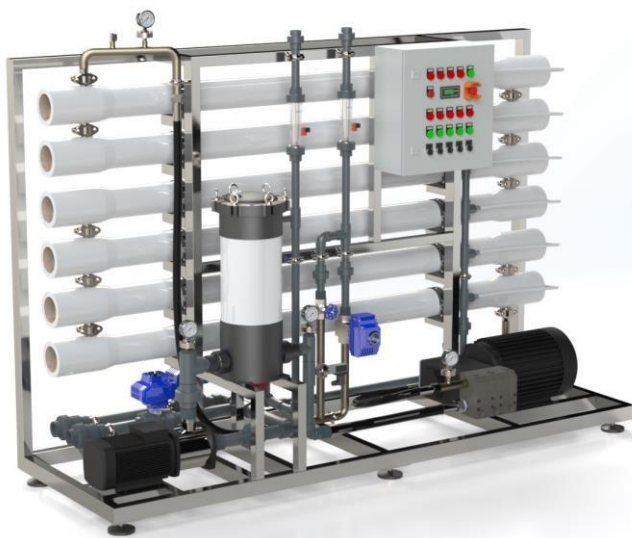
#### Features:

- Auto start-up flush
- Slow Start-up pressure build up
- Auto Shut-down fresh water flush
- Auto Shut-down pressure release
- RO low pressure/high pressure protection
- Pumps and valves switching smoothly
- SS304 Skid with automobile grade coating
- SS304 control panel with automobile grade coating
- Auto and manual 2 modes operation
- With pulsation dampener
- Diaphragm isolation seals to protect pressure switches
- SS2205 & Flurorin Plastic Feed/Flush pump
- Permeate and concentrate water low flow protection

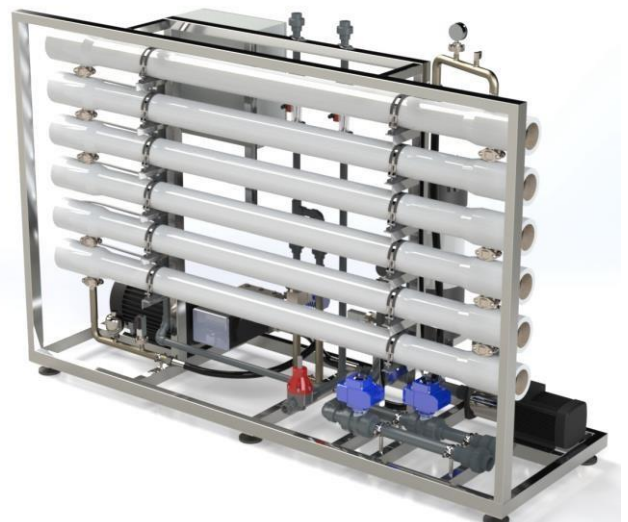


#### Benefits

- Fully Equipped and Customisable to your specification
- Factory Acceptance Test
- Expandable and Skid Mounted
- Low Operation and Maintenance Costs
- Components Easily Accessible
- Easy Maintenance and Servicing
- Pre-Plumbed Wired and Assembled
- SS2205 valves, HP pipe Fittings
- Manufacturing facility ISO9001



**Standard Specifications**



Pre filter

- Housing --- UPVC 20"- 5Cartridges
- Quantity --- 1 pc
- Sediment filter --- 2.5" x 20";

#### Membrane Elements and Housings

- Membrane model --- SW30-4040
- Membrane manufacturer -
- Housing Spec. --- FRP, 1000psi, Side port

#### Feed/flush Pump

- Pump Material --- wetted parts SS2205 & Fluorine Plastic
- Pump Brand --- CNP

#### High Pressure Pump

- Pump Material --- SS316
- Pump Brand --- Annovi Reverberi

#### Connection Port

- Feed Inlet Port
- Permeate Port
- Drain Port

#### Instrumentation

- Flow meters --- Permeate, concentrate
- Conductivity --- Permeate
- Pressure gauge--- Pre-filter, post - filter, pump discharge, concentrate
- Pressure switch --- Feed, RO membrane inlet

#### **Options or Upgrades**

- Timer and relay based control
- HMI Touch Panel
- Ethernet on-line monitor and control
- Anti-scalant Dosing System
- FRP control panel
- Out of specification permeate divert

#### Control system

- PLC Control
- ABB VFD
- HP pump soft start
- Tank level control
- Low pressure/High pressure protection
- Auto feed water and fresh water flush
- Auto level control or manual operation
- Manual control override in the event of main controller failure

#### Motorized valve

- Feed Water Valve --- UPVC; 10bar
- Fresh Water Inlet Valve (for flush)---UPVC; 10bar
- Flush Valve ---SS2205; 128bar

#### Material of Construction

- High - pressure pipeline --- SS2205 and flexible hose
- Low - pressure piping --- UPVC
- Frame --- SS304 automobile grade coating
- Control box --- IP54 (SS304 automobile grade coating)

#### Documentation Included

- Operation and maintenance manual
- Drawings: P&ID, Electrical diagram

- pH Meter
- Clean-in-Place (CIP) ports
- Feed Water Conductivity Meter
- Additional Pretreatment System
- 316 Frame
- SS2507 High Pressure fittings

#### **Working Conditions**

Maximum Feed Temperature °C (°F)	35 (95)	pH (Continuous)	4 ~ 9
Minimum Feed Temperature °C (°F)	5 (41)	Minimum pH (Continuous)	4
Maximum Feed Pressure bar (psi)	5 (72)	Free Chlorine	undetectable
Minimum Feed Pressure bar (psi)	2 (29)	Iron (ppm)	<0.1
Maximum TDS (ppm)	40000	Manganese (ppm)	<0.05
SDI	<5	Organic matter (ppm)	<1

MODEL	SWRO-40M-9000	SWRO-40M-11000	SWRO-40M-12000	SWRO-40M-14000	SWRO-40M-15000
Feed Water TDS <sup>1</sup>	35000ppm	35000ppm	35000ppm	35000ppm	35000ppm
Nominal Permeate rate <sup>2</sup>	1.0m <sup>3</sup> /hr	1.4 m <sup>3</sup> /hr	1.7 m <sup>3</sup> /hr	2.0 m <sup>3</sup> /hr	2.2 m <sup>3</sup> /hr
	(up to 1.5 m <sup>3</sup> /hr)	(up to 1.8 m <sup>3</sup> /hr)	(up to 2.0 m <sup>3</sup> /hr)	(up to 2.4m <sup>3</sup> /hr)	(up to 2.6 m <sup>3</sup> /hr)
Nominal Permeate rate (GPD)	9000	11000	12000	14000	15000
Nominal Permeate rate (M3/day)	36	42	48	56	60
Approximate Concentrate rate	4.5m <sup>3</sup> /hr	4.2m <sup>3</sup> /hr	4.0m <sup>3</sup> /hr	3.6m <sup>3</sup> /hr	3.4m <sup>3</sup> /hr
Approx. Feed rate	6.0m <sup>3</sup> /hr	6.0m <sup>3</sup> /hr	6.0m <sup>3</sup> /hr	6.0m <sup>3</sup> /hr	6.0m <sup>3</sup> /hr
Recovery Rate	25-32%	25-32%	38-43%	38-43%	40-45%
<b>Pump and Motor</b>					
Manufacturer	Annovi Reverberi/ (or Cat )				
Model	RTX-SS-100.100 / (Cat-3537.)				
Motor HP	15.0kw/ ( Cat 21.0Kw)				
Wet contact Material	SS316L/ (Cat-660: Nickle Aluminum Bronze)				
Design flow rate	100 Liters/min (Cat-660: 136 Liters/min)				
Max. Pump pressure	66.7bar				
<b>Membranes Elements and Housings 4080/40120</b>					
Membrane quantity	8	10	12	15	18
Membrane housing	4"; 2-element long	4"; 2-element long	4"; 2-element long	4"; 3-element long	4"; 3-element long
Membrane housing quantity	4	5	6	5	6
Membrane housing array	2→2	3→2	3→3	3→2	3→3
<b>Pre-Filter</b>					
Filter Housing	UPVC MT-CF-5DC2				
PP Cartridge	20" x 5pcs				
Capacity	7.5 m <sup>3</sup> /hr				
<b>Valves</b>					
Motorized inlet Feed & flush valves	1.5" UPVC				
Motorized Flush outlet valve	1" SS2205				
Concentrate valve	1" SS2205; adjustable				
Air release valve	1/2" SS2205;adjustable				
<b>Installation</b>					
Feed /flush Inlet	1.5"BSPT or NPT				
Permeate	1"BSPT or NPT				
Drain	1-1/4"BSPT or NPT				
<b>Package Size</b>					
Approx. Height	1600mm	1700mm	1800mm	1700mm	1800mm
Approx. Width	2600mm	2600mm	2600mm	3700mm	3700mm
Approx. Depth	800mm	800mm	800mm	800mm	800mm
Approx. Shipping Weight	380kg	410kg	450kg	480kg	520kg
<b>Options</b>					
Antiscalant Feed System	Metering pump: 1.0L/hr; Chemical tank: 60-100L				
CIP system	CIP tank: 500L; CIP pump: 5m <sup>3</sup> /h@3bar; CIP filter: UPVC MT-CF-5DC2				
Pretreatment:	As per request				

<sup>1</sup>Treatment ability and working pressure of the RO system are dependent on feed water quality.

<sup>2</sup> Nominal permeate rate listed at temperature 25° , Permeate rate can be reduced by up to 20% as temperature drops.  
Specifications subject to change without notice

