



## PRODUCT BULLETIN

Reverse Osmosis (RO) is a process which capable to separate dissolved salts, remove bacteria, pyrogens and organic from water. By using this technology, we can design high capacity units which produce high purity water economically. RO machines operate at optimum pressures depends on feed water and membrane types. Our model are available from 1M<sup>3</sup>/Hr up to 50 M<sup>3</sup>/Hr with single or double pass design.

We manufacture high quality machines and equipment. Each RO system is prepared with utmost care by experienced manufacturing team. Also, all process components are sourced from varies famous, high quality manufacturers.

## SPECIFICATION

Aquasource RO models have all the features necessary for continuous production of high purity water. The machines are built with a simple, yet comprehensive, control system with isolatable alarms to ensure proper operation. An adequate level of pretreatment and operator attention are required for optimum performance.

Machines may be ordered with additional features that provide extra safety and reliability. Features are also available for enhanced performance and monitoring. Options included:

- |                                       |   |
|---------------------------------------|---|
| - A pH monitor/controller             | - Clean-In-Place System                           |
| - Stainless Steel Membrane Housing    | - High Flow Membrane                              |
| - Chemical Feed Pump                  | - Conductivity Meter on Feed Water                |
| - Flushing membranes by Permeate      | - Digital Flow Meters on Permeate and Concentrate |
| - SS304 piping on Permeate connection | - SS304 machine frame work                        |

## APPLICATIONS

Biotechnology	Beverage	Electronics	Power	Potable	Pharmaceutical	Electro-Plating	Others
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## MACHINE FEATURES

- Different kind of RO membranes: GE, Dow, Toray, Trisep and Hydranautics can be available.
- Side Port Membrane Fiber Glass Housings are ideal for corrosive environments.
- All components in contact with permeate are stainless steel or inert plastic to maintain the highest purity of product water.
- Grundfos Pump are mounted to the base to enhance stability and to simplify service.

Grundfos Pump	Reliability	Used on slightly aggressive liquids
	High efficiency	High corrosion resistance
	Service-friendly	Space-saving

- Cutout switch protects the pump against low inlet pressure to the pump.
- Machine frame and panels are coated with epoxy primer and phenolic overcoat painted for good corrosion resistance.
- Low pressure stage by stage Clean-In-Place optimizes and enhances effective cleaning.
- Automatic inlet shut-off valve prevents low flow through machine during shutdown.
- GE Filter Cartridges to pre-protect on the membranes and extend its life.
- Panel mounted conductivity meter (permeate) with rotameter flow meter on permeate and concentrated plus in-line pressure gauges provide performance at a glance.
- Concentrate valve provided in-line to adjust when necessary.
- Membrane housings have individual sample ports to allow for permeate quality testing.



## MATERIAL OF CONSTRUCTION

- Membrane housing : Fiberglass with injection molded PVC end caps
- High Pressure Piping: All wetted components stainless steel 304
- Rigid Low Pressure Piping: PVC or Stainless Steel 304 (option)
- Prefilter:SS304 or PVC housing with pure polypropylene filter cartridges (GE)
- Inlet Piping PVC or SS304 (option)
- Concentrate Valve SS304
- Pump:SS304 stainless steel casting, impeller and shaft/shell
- Permeate Piping: Inlet PVC or SS304 (option)
- Sample Valve for Permeate: PVC or SS304 (option)

## ELECTRICAL

### MOTOR

Motor are supplied on total enclose fan cooling(TEFC). Voltage available on 380VAC,50Hz, three phase.

### CONTROL CIRCUIT

Single phase: 220VAC, 50Hz.

## CONNECTION

Use following table to determine sizes for feed, permeate and concentrate connection :

Flow Rate at Connection	Connection Size/Type
< 4.5 M <sup>3</sup> /Hr	1-inch FNPT
4.5 - 11.5 M <sup>3</sup> /Hr	1½ -inch FNPT
11.5 - 23 M <sup>3</sup> /Hr	2-inch Flange
23 - 57 M <sup>3</sup> /Hr	3-inch Flange

Permeate flow rate based on an inlet pressure at 2.1 bar. Maximum inlet pressure is 4.1 bar; Minimum inlet pressure is 1.4 bar.

## MEMBRANE OPERATING PARAMETES

Contaminant Rejection	Polyamide Membrane (TFC)
Salt Rejection	95-98%
Organic Rejection	>150 MW
Bacteria Rejection	>99%
Pyrogen Rejection	>99%
Particle Rejection	>99%

Assumes water with a typical mixture of Monovalent and polyvalent salts.

Nominal cutoff point for rejection of saccharide-type molecules larger than the stated molecular weight

Feed Water Specification	Polyamide Membrane (TFC)
Silt Density Index (SDI)	<3
LSI	<-0.2
Free Chlorine	0-0.1ppm
Temperature	8-35 °C
Pressure	1.4 - 4.1 Bar

Flow Rate and Rejection will be depended on Temperature variation.

## PREPARATION

Standard preparations include a hydrostatic test of the machine with individual components calibrated and tested prior to assembly, and normally RO membranes element are not installed until machine start up. Upon requests by customer, RO membranes will be installed and equipped inside the machine. If the membranes are installed, all testing will be done prior shipment. A testing data sheet will be included together with shipment. The machine will be packed by plastic with simple package. For long travelling distance, a wooden crate will be provided to ensure better protection.



# Reverse Osmosis Machine

## Aquasource RO machine Model Series

Model Number	RO-0030	RO-0040	RO-0050	RO-0060	RO-0070	RO-0080	RO-0090	RO-0100	RO-0200	RO-0300	RO-0400	RO-0500
Permeate Flow Rates (m <sup>3</sup> /h)	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	20.0	30.0	40.0	50.0
Recovery (%) <sup>1</sup>	75	75	75	75	75	75	75	75	75	75	75	75
Concentrate Flow Rates (m <sup>3</sup> /h)	1.0	1.3	1.7	2.0	2.3	2.7	3.0	3.3	6.7	10.0	13.3	16.7
Recovery (%) <sup>2</sup>	50	50	50	50	50	50	50	50	50	50	50	50
Concentrate Flow Rates (m <sup>3</sup> /h)	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	20.0	30.0	40.0	50.0
No. of Membranes	3	4	5	6	7	8	9	10	20	30	40	50
Net Weight (kg)	719	820	960	1000	1030	1140	1250	1300	1450	1500	1640	1830
Dimensions (cm)												
Height	183	183	183	183	183	183	183	183	183	183	183	183
Width	303	403	303	403	403	403	503	503	605	705	705	705
Depth	102	102	102	102	102	102	102	102	102	150	150	150

<sup>1</sup> - Normal flow Rate for low salt content of feed water (normally smaller than 1000 µs/cm<sup>2</sup>)

<sup>2</sup> - Brackish water with high salt content of feed water (normally larger than 1000 µs/cm<sup>2</sup>)



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