

Seawater desalination units

Large capacity packages

You need to desalinate seawater to supply a community or a resort hotel with fresh drinking water or to irrigate your field?

Lenntech has designed pre-mounted packages easy to install and operate for non-industrial applications

The desalination core process is reverse osmosis. Semi-permeable membranes are used to separate brine from fresh water.

Why a package?

Reverse Osmosis membranes are very sensitive to pollutants that are present in seawater, such as microorganisms, small sand particles and organic matter.

In order to enhance membrane lifetime and performance, a pretreatment step prior to membrane filtration is necessary.

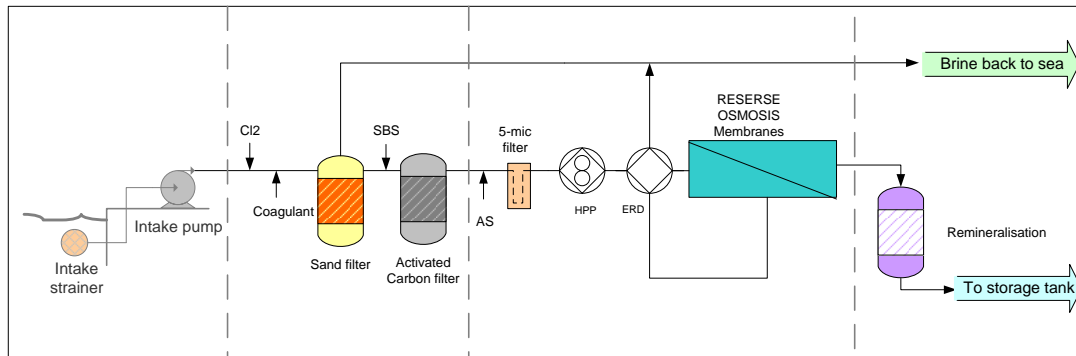
Moreover, reverse osmosis water permeate is slightly acidic and low in calcium and magnesium. Therefore, we add a neutralization/remineralization step that re-equilibrates the water to make it safe for your plants and consumers.



Our packages are designed based on the seawater quality of your intake and the treated water application.

All packages include:

- **PRETREATMENT** *FILTRO SW-L*
- **REVERSE OSMOSIS** *LENNRO SW-L*
- **POST-TREATMENT** *ROMIN SW-L*



FILTRO SW

LENNRO SW

ROMIN SW

Chlorination	Bacteria control to avoid membrane damage
Filtration (with pre-coagulation)	Suspended solids removal
Activated carbon adsorption	Organic matter, odor, color and chlorine removal
SBS injection	Dechlorination
Antiscalant injection	Scale control to avoid membrane clogging
Fine filtration 5 micron	Fine solids removal, police filter

Limestone contactor	Neutralization and remineralization
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FiltRO SW is a flexible pretreatment package that can be adapted to your seawater intake. Usually open intakes are more turbid than beachwells. Also shallow waters are more muddy and slimy than deep intakes. The standard **FiltRO** package includes a chlorination, a multimedia filtration, a dechlorination step and an antiscalant injection. Optional steps are required for more "dirty" waters, such as pre-coagulation and/or activated carbon.

Type <i>FILTRO SW</i>	5	10	20	30	50	70	100
Feed flow m ³ /h	11	22	44	67	111	156	222
Chlorination by NaOCl 12.5%	2-3 ppm Cl ₂						
Coagulation (option)	10-20 mg/L FeCl ₃						
Filtration	8-10 m/h						
Filtration rate	8-10 m/h						
No. of filters in parallel	1	1	1	2	2	3	4
Filter diameter (m)	1.6	2.0	2.5	2.3	3.0	3.0	3.0
Filter height (m)	2.3	2.5	2.8	2.5	3.0	3.0	3.0
Media volume (m ³)	1.4	2.8	5.6	8.3	13.9	19.5	27.8
Connections							
Dechlorination by NaHSO ₃ 40%	6-9 ppm NaHSO ₃						
Activated carbon (option)	10 min						
Residence time	10 min						
No. of filters in parallel	1	1	2	2	4	5	7
Filter diameter (m)	1.8	2.4	2.4	3.0	2.8	2.8	3.0
Filter height (m)	2.3	2.8	2.8	3.0	3.0	3.0	3.0
Activated carbon volume (m ³)	2.8	5.5	11	17	28	39	56
Antiscalant	3 mg/L						



LenRO SW is a compact skid-mounted 1-pass seawater reverse osmosis package designed at low flux of 18 l/h.m² for long membrane lifetime, including high Boron rejection membranes (2-pass RO also available). The **LenRO** high pressure pump is associated to an **Energy Recovery Turbine (ERT)** to minimize energy costs (pressure exchangers also available on request for more energy recovery). All SW-L plants are supplied with an integrated rinsing / cleaning in place station (CIP).

Type <i>LENRO SW</i>	5	10	20	30	50	70	100
Permeate flow * m ³ /h	5	10	20	30	50	70	100
Feed flow m ³ /h (45% Recovery)*	11	22	44	67	111	156	222
Salt Rejection at 25°C	~95%						
Connections Feed	2"	3"	4"	5"	6 ½ "	7 ½ "	10"
Permeate1	1 ½ "	2"	3"	3 ½ "	4 ½ "	5"	6"
Concentrate	1 ½ "	2"	3"	4"	5"	6"	7"
Power HPP (incl. energy recovery) 400v, 50Hz**	15-20 kW	30-40 kW	50-75 kW	95-110 kW	150-200 kW	200-250 kW	280-360 kW
Dimensions (mm)							
Length	4000	4000	6000	7000	8000	8000	8000
Width	1000	1000	1200	1500	1500	2000	2000
Height	1600	1600	1600	1800	1800	1800	1800
Rinse tank volume (L)	300	550	1000	1500	2500	3500	5200

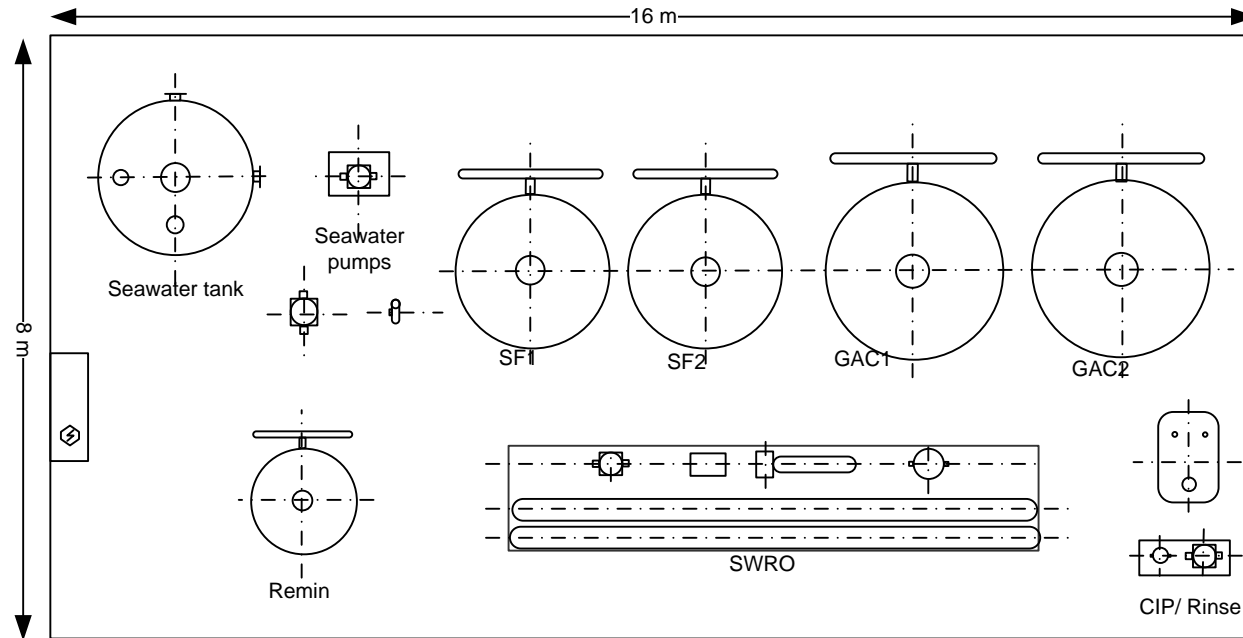
* Under standard conditions : pH=7.6, T=15°C, TDS 35g/L

** Also available in 60Hz

ROmin SW is a calcite contactor that neutralizes permeate water back to 7-7.5 by adding little amounts of calcium and bicarbonates. The **ROmin** step is strongly recommended for irrigation water.

Type <i>ROMIN SW</i>	5	10	20	30	50	70	100
Feed flow m ³ /h	5	10	20	30	50	70	100
Limestone contactor							
Velocity	20 m/h						
Filter diameter (mm)	0.6	0.8	1.2	1.4	1.8	2.1	2.5
Filter height (mm)	1.8	1.8	1.8	1.8	2.2	2.2	2.5
Calcite volume (L)	25	500	1000	1500	2500	3500	5000
Connections	¾"	¾"	¾"	¾"	1"	1"	1"

Typical footprint of SWRO package 30 m³/h



Oou units acan also be containerized in 20 or 40-ft A/C insulated containers.

All parts are ready for interconnection, but interconnecting piping must be supplied on site. Lennotech supervises installation and starts up. Seawater intakes and brine disposal devices available on request