

## Seawater desalination units

small capacity packages

***You need to desalinate seawater to supply your house, hotel with fresh drinking water or to water your garden?***

Lenntech has designed ready-to-use packages, skid mounted, easy to 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 microorganism, small sand particles and organic matter.

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

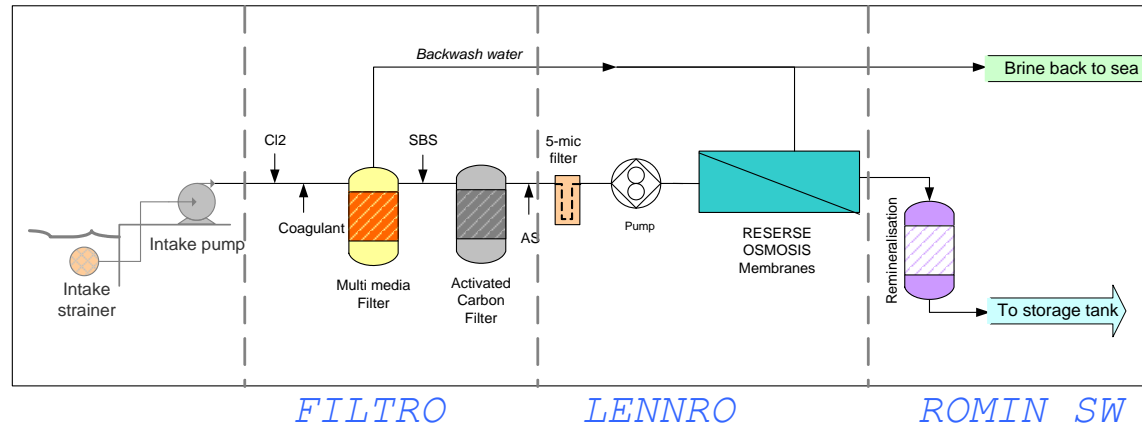
Moreover, reverse osmosis water permeate is slightly acidic and low in calcium and magnesium. Therefore, we add a neutralization / remineralization step that re-equilibrates the water to make safe for your plants and consumers.



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

**All packages include:**

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



|                                   |  |                     |                                     |
|-----------------------------------|--|---------------------|-------------------------------------|
| Chlorination                      | Bacteria control to avoid membrane damage        | Limestone contactor | Neutralization and remineralization |
| 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               |                     |                                     |

**FiltRO** SW is a flexible pretreatment packages with variations depending on 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 an antiscalant injection and a fine filtration of 5 -microns. Optional steps are required for more "dirty" waters, such as pre-coagulation and / or activated carbon.

| Type <i>FILTRO SW</i>                           | 100                          | 250  | 500  | 1000 | 1500 | 2000 | 3000 |
|---|------------------------------|------|------|------|------|------|------|
| Feed flow l/h                                   | 285                          | 715  | 1430 | 2850 | 4290 | 5715 | 8570 |
| <b>Chlorination</b> by NaOCl 12.5%              | 2-3 ppm Cl <sub>2</sub>      |      |      |      |      |      |      |
| <b>Coagulation</b> (option)                     | 10-20 mg/L FeCl <sub>3</sub> |      |      |      |      |      |      |
| <b>Filtration</b>                               | 12 m/h                       |      |      |      |      |      |      |
| Filtration rate                                 | 12 m/h                       |      |      |      |      |      |      |
| Filter diameter (mm)                            | 257                          | 369  | 406  | 552  | 610  | 770  | 927  |
| Filter height (mm)                              | 1400                         | 1680 | 1800 | 1650 | 2000 | 2100 | 2175 |
| Media volume (L)                                | 60                           | 120  | 180  | 240  | 360  | 480  | 715  |
| Connections                                     | 1"                           | 1"   | 1"   | 1"   | 1"   | 1 ½" | 1 ½" |
| <b>Dechlorination</b> by NaHSO <sub>3</sub> 40% | 6-9 ppm NaHSO <sub>3</sub>   |      |      |      |      |      |      |
| <b>Activated carbon</b> (option)                | 10 min                       |      |      |      |      |      |      |
| Residence time                                  | 10 min                       |      |      |      |      |      |      |
| Column diameter (mm)                            | 334                          | 369  | 552  | 770  | 927  | 1074 | 1226 |
| Column height (mm)                              | 1795                         | 2230 | 2300 | 2350 | 2430 | 2465 | 3075 |
| Activated carbon volume (L)                     | 60                           | 120  | 180  | 240  | 360  | 480  | 715  |
| <b>Antiscalant</b>                              | 3 mg/L                       |      |      |      |      |      |      |



**Lenntech** SW is a compact skid-mounted seawater reverse osmosis package designed at low flux of 20 l/h.m<sup>2</sup> for long membrane lifetime. The **Lenntech** high pressure pump pressure delivery is calculated based on your water salinity and varies from 55 to 65 bars. **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                          | LENNTech SW |        |        |        |       |        |        |
|-------------------------------|-------------|--------|--------|--------|-------|--------|--------|
|                               | 100         | 250    | 500    | 1000   | 1500  | 2000   | 3000   |
| Permeate flow * l/h           | 100         | 250    | 500    | 1000   | 1500  | 2000   | 3000   |
| Feed flow l/h (35% Recovery)* | 285         | 715    | 1430   | 2850   | 4290  | 5715   | 8570   |
| Salt Rejection                | 96-99%      |        |        |        |       |        |        |
| <b>Connections</b> Feed       | 1"          | 1"     | 1"     | 1"     | 1"    | 1 1/2" | 1 1/2" |
| Permeate                      | 3/4"        | 3/4"   | 3/4"   | 3/4"   | 1"    | 1"     | 1"     |
| Concentrate                   | 3/4"        | 3/4"   | 3/4"   | 3/4"   | 1"    | 1"     | 1"     |
| <b>Power</b> 400v, 50Hz**     | 2.2 kW      | 3.0 kW | 4.5 kW | 9.0 kW | 13 kW | 18 kW  | 22 kW  |
| <b>Dimensions (mm)</b>        |             |        |        |        |       |        |        |
| Length                        | 1000        | 1000   | 1400   | 1400   | 2400  | 2400   | 2400   |
| Width                         | 1000        | 1000   | 1000   | 1000   | 1000  | 1000   | 1000   |
| Height                        | 1600        | 1600   | 1600   | 1800   | 1800  | 1800   | 1800   |

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

\*\* Also available in 60Hz

| Type                       | ROMIN SW |      |      |      |      |      |      |
|----------------------------|----------|------|------|------|------|------|------|
|                            | 100      | 250  | 500  | 1000 | 1500 | 2000 | 3000 |
| Feed flow l/h              | 100      | 250  | 500  | 1000 | 1500 | 2000 | 3000 |
| <b>Limestone contactor</b> |          |      |      |      |      |      |      |
| Velocity                   | 20 m/h   |      |      |      |      |      |      |
| Filter diameter (mm)       | 159      | 159  | 233  | 257  | 304  | 369  | 469  |
| Filter height (mm)         | 910      | 910  | 910  | 1390 | 1350 | 1660 | 1790 |
| Calcite volume (L)         | 10       | 12.5 | 25   | 50   | 75   | 100  | 150  |
| Connections                | 3/4"     | 3/4" | 3/4" | 3/4" | 1"   | 1"   | 1"   |