

Containerized

Sea Water Desalination System

With Capacity of ~100 m³/day

(4,200 Liter/Hour)

1. Basic Design

Parameters assumed for the preliminary design of the RO system:

- TDS = 36,000 mg/l
- Water design temperature = 22°C
- pH = 7.8

The treated water quality are within the international standards set by the WHO for drinking water:

- TDS < 500 mg/l
- Turbidity < 5.0 NTU (expected to be <1NTU)
- pH = 6.5 – 8.5
- Residual free chlorine : 0.2 – 0.5 mg/l

The produced water are disinfected, chemically balanced and microbiologically free.

2. Treatment Process

For the above scope the following treatment process has been designed:

- Intake & brine pipes - 100 meter flexible pipe with protecting screen and 30 meter brine flexible pipe
- LP raw water feed pump – to deliver the raw water from the intake to the system.
- Biocide dosing (non-oxidizing biocide) - prevention of biological growth in the water treatment plant equipment.
- Coagulation – to enhance the performance of the pre-filtration stage.
- Screen filter – to remove “large” particles from the raw water.
- Sand filtration in pressure vessels – for removal of particles and colloidal matter. With automatic backwash.
- Anti-scalant dosing system – for prevention of scaling on the RO membranes.
- Micronic cartridge filtration – 5 micron cartridges, for removal of residual solids, turbidity and final SDI reduction.
- High pressure feed pump, to provide the high pressure required for sea water desalination by reverse osmosis.
- Desalination by complete sea water RO (SWRO) membrane separation system. Spiral wound sea water RO membranes in pressure vessels.
- Provision for automatic flush of the SWRO membranes with permeate at each extended stop of the plant.

- CIP (Cleaning In Place) unit to clean and sanitize the RO membranes in place without removing them from the unit.
- Soda ash (Na_2CO_3) dosing – for re-mineralization.
- Post-chlorination dosing system, to maintain a residual disinfection in the final treated water.

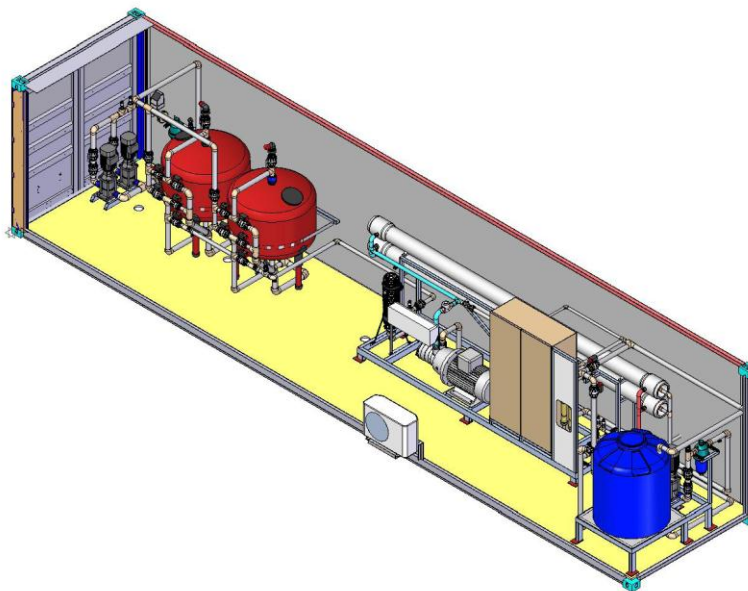
3. Supplied System

The complete system is to be supplied in a SS skid mounted pre-assembled, pre-wired and pre-piped all installed inside an isolated container that will be equipped with an access door, internal lighting, linoleum floor with floor drains and an A/C unit for climate control.

This mode of supply allows for a simple and quick on-site installation and commissioning. This will include the feed pump, media filter, cartridge filter; HP feed pump and sea water RO membranes in pressure vessels, chemical pre- and post-treatment, CIP unit and the system's central control and electrical panel.

The whole system is designed to operate automatically (with the exception of membrane CIP cycles), complete with a PLC based control, safeties and on-line process controls.

The system will be supplied in a "ready-to-use" mode after validation tests in our factory, with complete a complete operations + maintenance manual, including drawings and equipment literature.



3D- Modeling of similar Containerized Sea Water Reverse Osmosis