

**WATER TREATMENT PLANTS
SEA WATER
REVERSE OSMOSIS - MOBILE SYSTEM**





SEA WATER DESALINATION UNITS

Overview

The Reverse osmosis Mobile Units, Mod. RO-BW, are used in desalinization for brackish water are used for drinking or irrigation water production or for industrial use (thermal power station, food, pharmaceuticals, electronics industry, etc.).

The desalinization units operate, efficiently, in a continuous way, therefore the necessary productive capacity is given from the daily need of permeate divided by the 24 hours that the unit is operating. It is advisable to have an accumulation tank of the produced permeate.

The RO BW units are supplied with a sequestrant agent dosage group that prevents the precipitation of incrusting salts on the membranes. In case of request or need treatment units can be equipped with ultrafiltration membrane pre-treatment (UF).

In order to obtain drinking water from the permeate, a post-treatment must be introduced, made up by a mineral salt dosage unit to re-establish the pH, hardness and alkalinity values, and by a final disinfection.

The use of a station for the periodic cleaning of the membranes is always advisable.

DESIGN DATA

- Feed water temperature 5-30 °C
- Feed water TDS up to 3000 mg/l
- Pre-feed pressure 3 bar
- Permeate back pressure 0.5 bar
- Power supply 380/50 V/Hz
- Average recovery 70 %

OPERATIONAL LIMITS

In order to guarantee the long lasting performance of the membranes, the intake water of the reverse osmosis unit must respect the following limits:

- SDI < 3
- Iron < 0,05 mg/l
- Manganese < 0,05 mg/l
- Chlorine and oxidant 0,1 mg/l
- Bacterial and organic substances concentration following the requirements of a drinking water
- Absence of oils, sulphides and polluting substances in general

Construction

- Media filter
 - Sequestrant dosage station, complete with PE tank, the metering pump and the level sensor.
 - Cartridge filter (wire-wound cartridges and 5 micron filtration level).
 - Centrifugal pump, vertical multistage type in Stainless Steel.
 - Reverse osmosis rack composed by high production reverse osmosis modules for brackish water. The modules are housed in PRFV containment vessels.
 - Hydraulic lines, in Duplex for high pressure, in PVC for low pressure.
 - Pressure regulator valve in Stainless Steel.
 - Circulation flow-rate valve in Stainless Steel
- (where requested).
- **Control instruments:**
 - Pressure gauges
 - Flow transmitter (permeate, concentrate, circulation (where requested))
 - Pressure transmitter control
 - Conductivity meter
 - Level control transmitter.
 - Control panel and automation of the RO BW unit.
 - Membranes cleaning station (CIP).
 - Preassembly on skid, in AISI 304.
 - Hydraulic and electrical connections inside the skid of the permeation group.

STA provides integrated solutions in water treatment with innovative processes and technology developed according to environmental and normative standards.

Our operating staff (**About 130 operators**) is composed by a qualified team of engineers and technical operators with a long-lasting experience in the field.

STA offers **preliminary studies, design, construction, and management** of water treatment plants and wastewater treatment plants.

Planning, design and realization of water treatment plants for the production of drinking water and water for industrial and technological uses as well as the desalination of brackish and sea water.

Water treatment plants



STA's technical staff designs, and manufactures treatment systems by selecting, and sizing them after a personalized study based on your necessities.

Our range of products is addressed to very different customers, because "water" is involved in every act of human life, and many productive activities.

STA's plants:

- Filtration systems
- Softening
- Demineralization
- Desalination
- Reverse Osmosis

Technical management and maintenance remote assistance

The operations and maintenance departments of STA are able to provide its customers with a qualified global service, aimed at complying with environmental regulations and the optimization of operating costs.

A system that allows to operate, from remote, directly inside the network of the client, to test the functioning of the main equipments and eventually modify the software. This operation works through a secure VPN that allows a direct control over the industrial web in a secured way. The program of supervision can be displayed on the touch screen positioned on the electric board or on a PC. The electric board is designed for an internet connection through which the program can be viewed and supervised and enabled on any laptop or on supervision stations of STA.



REVERSE OSMOSIS



Overview

Reverse osmosis represents the most convenient and the safest technique for desalinization of different kinds of water.

This treatment is replacing other technologies for water desalinization, thanks to the excellent combination between quality results and low operating costs. Reverse osmosis also guarantees low energy consumption and reasonable expenditure of chemical products.

Furthermore, the waste water parameters fall within the sewage limits, therefore resizing more and more the problem of disposal of eluates (for example for softeners and ion exchange resin demineralization units).

How it works

Reverse Osmosis is the process used when a saline solution comes into contact with a membrane permeable to water (and not to dissolved salts) at a pressure exceeding the osmotic pressure of the solution itself. The passage from water, poor in salts (permeate), occurs through the membrane, whereas on the outside of the membrane a waste water rich in salts (brine) is obtained.

The Reverse Osmosis is a process of physical type, which does not require the use of regenerating chemicals. Reverse Osmosis technology offers total guarantee thanks to its versatility characteristics, performance excellence and ease of use. Over the years have multiplied the types of membranes available, up to the latest low energy, and their quality and reliability is well established also for those specifically designed for targeted applications.

Here below is a list of the main parameters used in the planning stage of Reverse Osmosis and desalinization processes:

- Salinity of the water to be treated
- pH
- Hardness
- Temperature of the water to be treated
- SDI
- Alkalinity
- Recovery factor

The comprehension of the water characteristics must be added to these essential factors in particular, in order to improve a possible pre-treatment, it is fundamental to verify the presence of:

- Suspended solids
- Chlorine or oxidizing agents in general (except oxygen)
- Polluting metals, such as iron and manganese
- Organic substances, sulphides, oils.
- Bacterial concentration

Pre-Treatment

Before the Reverse Osmosis section, it is important to determine the most suitable "pre-treatment" based on the characteristics of the water to be treated in order to guarantee the greater operating continuity of the system and reduce washing frequency. A correct pre-treatment prevents relatively rapid lodgement of the membrane due to grime and/or physical impurities, lodgement due to precipitation of encrusting salts and/or metals, bacterial proliferation, contact with oxidising agents.

Main Applications

Where is require high quality water, chemical and bacteriological, with the advantage, compared to the demineralization, not to have problems related to the discharges of regeneration and handling of chemical products:

- Desalination-production of drinking water from brackish waters
- Production of pure and ultrapure water
- Refining and softening of water
- Irrigation use
- Food industry
- Cosmetics and pharmaceutical industry
- Textile industry
- Steel industry
- In water reuse applications, and wherever you need specific water.
- To remove arsenic, nitrates and other pollutants.



Reverse Osmosis - Sea Water MOBILE UNITS

STA's containerized units are available in a variety of configurations to cover flow requirements from 0,5 to 50 m³/h, with salinity levels up to 38000 ppm of TDS.

The STA Reverse Osmosis systems are supplied in container units (sized 20' and 40') already assembled and electrically and hydraulically tested and ready to use.

Technical Data

Model	Flow rate	
	Feeding	Permeate
	m ³ /h	m ³ /h
500	1,25	0,5
1.000	2,5	1,0
3.000	6,6	3,0
5.000	11,1	5,0
10.000	22,2	10,0
20.000	44,5	20,0
35.000	77,8	35,0
50.000	111,0	50,0

(flow rates above 50 m³/h available on request)





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Certified quality system according to the standards UNI EN ISO 9001 and ISO 14001



BS OHSAS 18001



SOA certified according to the Presidential decree 207/2010

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