Portable brackish water desalination plants

Setaqua BWRO C

seta PHT

11/25

Portable plants
Setaqua BWRO C

BWRO C plants are plants designed to optimise water resources and supply the population and industry while respecting the environment, using Quality Management and Environmental Management Systems.

Features

Our BWROC brackish water desalination plants are designed with the following principles:

- **Plug and play** reverse osmosis treatment system.
- Fully installed inside suitably conditioned containers from which it can be operated.
- Treatment line fully adapted to the needs of each client.
- Fully factory-tested, so start-up time is minimal.
- Self-adjusting to work with different salinities.
- Production flexibility, depending on the quality of the feed water and demand.
- Minimal civil works requirements.
- Easily transportable portable plants.
- Technical assistance and training of the personnel who will operate the plant is provided.
- Possibility of remote control and assistance.

All the elements and equipment that make up the treatment line are installed on **compact racks**, which in turn will be supplied and installed in **40' containers** and duly compartmentalised to house the different elements.

The container is designed and manufactured to maintain its structural integrity within a temperature range of -30°C to 80°C and is suitable for transport by sea, road and rail.l.

2. 1. Design considerations

The design has been conceived as a complete, **pre-assembled, skid-mounted** in a containerised skid, with piping and ductwork installed. All systems have been designed or selected for a service life of not less than 20 years of continuous operation.

Operation of the osmosis plant will be continuous **24 hours** a day, **365 days** a year, with normal shutdowns for maintenance.

The reverse osmosis desalination plants **BWRO C** reverse osmosis plants manufactured by **SETA**[PHT] are designed for drinking water or industrial uses with low salt content up to 6,000 ppm.

For a correct dimensioning and adjustment of the operating parameters, it is necessary to have a detailed analysis of the water to be treated. However, the percentage of rejection of the different ions ranges around the values in the table on the right:

DESIGN PARAMETERS	
Sodium	90 + 96%
Calcium	96 + 98%
Potassium	90 + 96%
Magnesium	96 + 98%
Chlorides	90 + 95%
Nitrates	80 + 85%
Sulphates	96 + 98%
Bicarbonates	94 + 96%
Conductivity	95-99%

2.2. Operating parameters

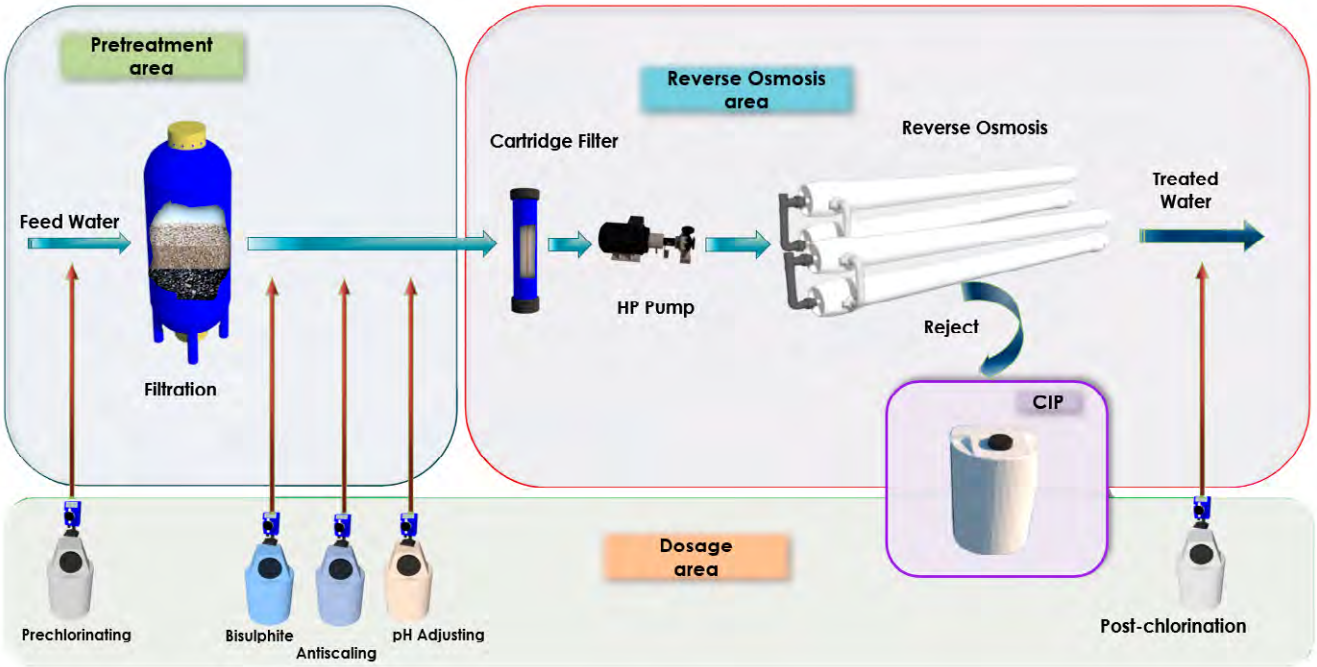
The following operating parameters of the **SETA**[PHT] **BWRO C** plants are taken into account:

MODEL	BWROC 160	BWROC 450	BWROC 600	BWROC 750	BWROC 840	BWROC 1000	BWROC 1600	BWROC 2500
PRODUCTION (m^3/d)	160	450	600	750	840	1.000	1.600	2.500
PRODUCTION (m^3/h)	6,7	18,8	25	31,3	35	41,7	66,7	104,2
RECOVERY (%)	65 - 75	65 - 75	65 - 75	65 - 75	65 - 75	65 - 75	65 - 75	65 - 75
SUPPLY (m^3/h)	8,9-10,3	25-28,9	33,3-38,4	41,7-48,1	46,7-53,8	55,6-64,1	88,9-102,6	160,3-138,9
OPERATING PRESURE (bar)	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15

TREATMENT LINE

Pretreatment
Dosage of sodium hypochlorite
Multimedia filter
Sodium bisulphite dosage
Antifouling dosage
pH adjustment dosage
Reverse osmosis
5 micron safety microfiltration
High pressure pumping
Reverse osmosis desalinator modules
Automatic membrane washing system
Post-treatment
Chlorine residual dosing set
Automatic mixing system
Instrumentation and control panel
REMOTE CONNECTION System

BLOCK DIAGRAM



CHARACTERISTICS OF THE MAIN EQUIPMENT

1. Dosing system for chemical products. dosing system.

The dosage will be carried out by means of an electronic dosing pump, mounted on a polyethylene tank with minimum level control and corresponding alarm.

2. Multi-layer filtration by flint-anthracite.

The filtration equipment includes:

- A set of automatic valves, allowing filtration and washing operations.
- Pressure gauges from 0 to 6 bar for monitoring the degree of clogging.
- PVC interconnecting pipes.
- Pressure transmitters for automatic triggering of washing.
- Flow meter for flow control.

3. High pressure pumping.

Multi-stage vertical pump, built in AISI-316 stainless steel, which pressurises the water to be sent through the desalination modules.

The pumped flow and pressure shall be controlled by a frequency controller.

4. Reverse Osmosis Membranes.

- Aromatic polyamide membranes.
- Spiral winding.
- The unit flux per membrane is less than 28 l/m2/h.
- 8' diameter.
- GRP pressure vessels.

5. Automatic Washing Systemand Flushing.

- Vertical tank, with level fittings.
- Vertical centrifugal pump.

Los materiales utilizados en el diseño de la instalación son **PVC** para las conducciones de baja presión y **Acero Inox 316L/PPR** para las de alta presión en la ósmosis inversa.

Measurement and control systems necessary to ensure the correct operation of the plants are included.

FLOW

- IO Concentrate Flow Rate.
- Osmosis water flow rate.

PRESSURE

- Silex filter inlet.
- Silex filter output.
- Input to Reverse Osmosis modules.
- Output to Reverse Osmosis modules.
- HP Pump Output.
- Aspiration.
- HP membrane inlet pressure switch.

ANALYTICS

- Incoming water conductivity.
- Reverse osmosis permeate conductivity.
- Redoximeter at Reverse osmosis inlet.
- pH meter at Reverse osmosis inlet.
- Sampling at different points in the process.

ACCESSORIES

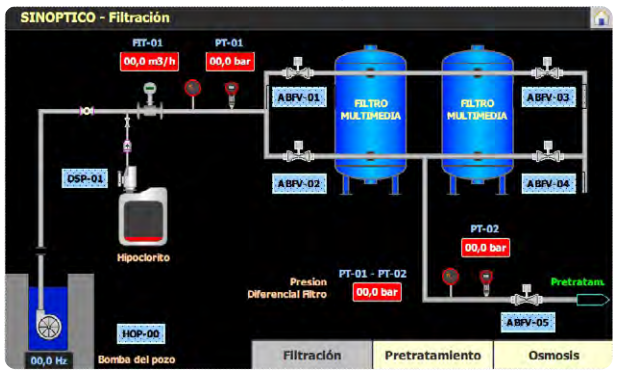
- Maximum, average and minimum level of the chemical washing and chemical cleaning.
- Nivel mínimo en tanques dosificadores.
- pH meter at Reverse Osmosis inlet.
- Sampling at different points in the process.

The reverse osmosis plant is fully **automatic** and is equipped with all the necessary elements for **manual operation**.

REMOTE CONTROL SYSTEM

Remote connection system, via internet, to the automaton for **monitoring and control** of the plant status. The connection will be made via a mobile phone router with a secure **VPN** connection (data SIM card not included).

This system makes it possible to supervise the operation of the plant from any device, thus foreseeing any operating anomaly and avoiding production stoppages and breakdowns.



CONTAINERISATION

Each plant will be installed inside a properly conditioned container, from where it will be operated. They include LED lighting, natural ventilation, non-slip floor, and all the necessary elements for the correct operation of the equipment..

The container can be divided into different differentiated zones, such as:

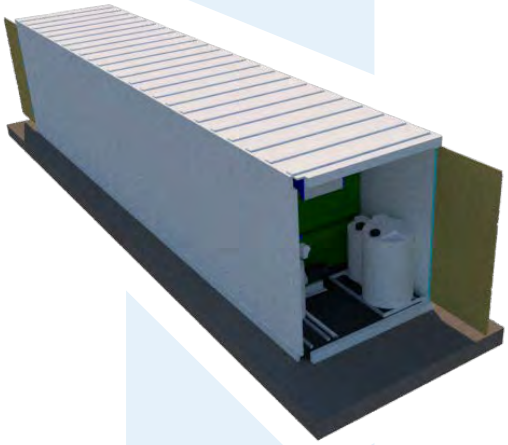
- **Desalination area**
- **Chemicals area**
- **Control area**

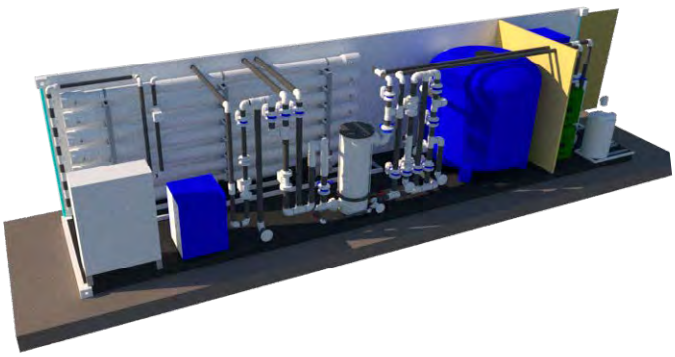
These divisions shall be made by means of a sandwich panel partition.

MODELS

MODEL	TREATED WATER FLOW	DISPOSAL
BWRO C 160	160 m^3/d	Container 40’
BWRO C 450	450 m^3/d	Container 40’
BWRO C 600	600 m^3/d	Container 40’
BWRO C 750	750 m^3/d	Container 40’
BWRO C 840	840 m^3/d	Container 40’
BWRO C 1600	1.600 m^3/d	2 Containers 40’
BWRO C 1600	2.500 m^3/d	1 Container 40’ + 1 Container 20’ + External filter

40’ CONTAINER





Required area: 49 m^2
Width: 3.5 m
Length: 14 m

Water in constant innovation

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