

## SCOPE OF SUPPLY



### SAILOR C S 3/21

Reverse Osmosis Desalinator for sea water.

**Fresh water production: 160 litres/hour – 3.84 tons/day**

Fresh water quality: 360 mg/l

(based on feed water at 36000 mg/l and 25°C)

Assembled on a 316L stainless steel frame.

Installed power: 2.2 kW (high pressure motor) + 0.55 kW (low pressure motor)

Voltage: 400 Volt, 50 Hz three-phase

The desalinator is composed as follows:

#### **FEED SPECIFICATIONS**

##### **Low pressure pump**

Make:	CALPEDA
Model:	B-CM 22
Construction:	close-coupled;
Pump casing:	bronze G-Cu Sn 10 EN 1982
Lanter Bracket:	bronze G-Cu Sn 10 EN 1982
Impeller:	Brass P- Cu Zn 40 Pb 2 UNI 5705



Mechanical seal:	Carbon – Ceramic - NBR
Shaft material:	Cr-Ni-Mo Steel, 1.4401 EN 10088 AISI 316
Maximum working pressure:	6 bar
Maximum liquid temperature:	+90°C
Maximum environment temp.:	+40°C
Motor:	2-pole induction motor, continuous duty
Installed power:	0.55 kW
Performance:	n ≈ 2900 rpm
Insulation class of the motor:	F
Protection of the motor:	IP 54

Motor constructed in accordance with EN 60034-1; EN 60335-1, EN 60334-30, EN 60335-2-41; IE2.

- Three-way manual valve on suction line to deviate the water from the sea or from a tank for manual unit flushing.
- Double prefilter with polyester reusable cartridges, PENTEK make. Filtration 50 and 5 micron., with **38 l/min. flow rate** allowing a reduced maintenance.

## HIGH PRESSURE

Elastic joint motor-pump coupling system with anti vibration mounts composed of:

### - Motor

Tropicalized motor

Installed Power:	2.2 kW
Revolution per minute:	1450
Voltage:	400V-50Hz-3 phase
Insulation class:	F
Protection degree:	IP55



### - Pump

Make:	CAT
Model:	3CP1221
Materials:	Stainless steel for pump body Die cast aluminium crankcase

	Chrome-moly crankshaft
Crankcase capacity:	0.3 l
Special features:	special concentric, high density, polished, graphite impregnated, solid ceramic plungers
Performance:	from 7 to 140 bar

- N. 3 Reverse Osmosis membranes, spiral wound type in thin film composite;
- N. 3 **Pressure vessels in carbon fibre complying with Standard 97/23/EC-PED, TÜV approved, with end plugs in duplex stainless steel** (weight of one vessel Kg. 1,150). The vessels are coupled with flexible hoses and fittings in 316L stainless steel;

#### **Automatic pressure regulation system**

- Skid mounted device for automatic gradual pressure regulation from 0 to 60 BAR.

#### PRODUCED WATER

- Automatic three-way valve in PVC for the automatic deviation of the produced water out of board when quality of produced water does not reach the preset values;
- Hoses and fittings in non toxic PVC.

#### CONTROL PANEL

Electronic control panel with **microprocessor** "TINY 2", protection class IP 55

- Touch-buttons with the following functions:
  - differential starting of booster pump and high pressure pump
  - starting on booster pump only for:
    - multimedia sand filter operation (if supplied)
    - unit priming
    - unit cleaning
  - starting the automatic membrane flushing system (*if supplied*)
  - *Reset* failure warnings
- Liquid crystal display with the following information:
  - quality of produced water: salinity [ $\mu\text{S}/\text{cm}$ ], temperature [ $^{\circ}\text{C}$ ]
  - electric power consumption in ampere,
  - total quantity of produced water since last starting,
  - currently produced water flow rate,

- pressure (both high pressure and low pressure by transducers),
- operating hours meter,
- starting meter,
- failures reading
- maintenance signals for: oil change, unsafe water and UV lamp change (*if supplied*),
- mushroom-head button for emergency stop,
- the control box shuts down the desalinator automatically in case of high pressure, low pressure and high electric power consumption, with sound alarm,
- manual operation in “emergency” in case of electronic card failure with manual pressure regulation (switch S2 for low pressure pump, switch S1 for high pressure pump) and reading of high and low pressures by means of mechanical gauges,
- possibility for automatic start & stop by means of a floating level probe (*if supplied*).

## INSTRUMENTS

### - **High and low pressure transducers**

Mounting points on the system: prefilter outlet / membrane discharge;

Digital reading on the display of the control panel.

### - **Mechanical high and low pressure gauges**

Material: inox, glycerin filled;

Range: 0-6 bar / 0-100 bar;

Mounting: bracket mounting on the panel;

Mounting points on the system: prefilter outlet / membrane discharge;

Analog reading.

### - **Salinity and temperature probe**

Mounting points on the system: between fresh water outlet and solenoid valve;

Digital reading on the display of the control panel.

### - **Flow transducer**

Type: open collector;

Mounting points on the system: between fresh water outlet and solenoid valve;

Digital reading of the current product water flow and total quantity of fresh water produced since the last

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starting on the display of the control panel.

- **Ampere meter**

Digital reading of the Electrical consumption in Amps on the display of the control panel.

- **Operating hours meter**

Digital reading of the system's operating hours on the display of the control panel.

- **Starting counter**

Digital reading of the system's starts on the display of the control panel.

## ALARMS

- High salinity of the fresh water: both visual and audio with discharge out of board
- Motor protection high pressure pump: both visual and audio with stop of the circuit
- Low pressure / high pressure pump: both visual and audio with stop of the circuit
- Power failure: both visual and audio with stop of the circuit

## INSTALLATION KIT

- 5 meters pipeline for connecting "seawater inlet-prefilters" and "prefilters-high pressure pump".
- 5 meters pipeline in PVC for connecting "discharge".
- 5 meters pipeline in PVC for connecting "produced water" and "brine".
- 1 discharge out of board
- Fittings and clamps
- 1 wrench for filters
- 1 use, maintenance and installation manual.

## HOSE SECTIONS

- Sea water inlet 1"
- Discharge out of board 3/4"
- Produced water outlet 3/8"

The watermaker is complying with rules in force and it is provided with CE mark.

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**OPTIONAL ACCESSORIES FOR FW SYSTEM (please ask for quotation)**

- Automatic membrane flushing system

This device is for the **automatic membranes flushing** with fresh non chlorinated water.

Complete with carbon filter RFC-BB to eliminate chlorine from the water.

The periodical use of this system assures a longer membranes life.

Alternatives for activation (*to be required in case of purchase order*):

Manual starting whenever required.

Automatic starting with every stop of the watermaker.

- Remote control panel with display

Control panel with touch buttons and back lighted liquid crystal display showing all operational values given by the PLC control and with the following functions:

- Start the watermaker;
- Switch-off the watermaker;
- Activation of the automatic membrane flushing system (*if supplied*);
- Activation of the booster pump (i.e. for sand filter backwash operation (*if supplied*));
- Switch of the acoustic alarm in case of failure and reset the control panel.

**Note:** Specify cable length in case of purchase order - for distance over 15 meters ask for quotation.

- PC Interface

Interface with Personal Computer via MODBUS protocol complete with software. **Specify cable length in case of purchase order** - for distance over 15 meters ask for quotation.

- Maintenance Kit for Sailor C S 3-21

- no. 8 Prefilter cartridges 30 micron
- no. 8 Prefilter cartridges 5 micron
- no. 1 Membrane preservative solution
- no. 1 Membrane Clean. Solution Kit A&B
- no. 2 Prefilter O-rings Blue  $\frac{3}{4}$
- no. 1 High pressure hose  $\frac{3}{8}$  - 1020 mm
- no. 2 Pump oil 0,5 lt.

- Multimedia sand filter

Model: TFS/2

Tank in reinforced fiber glass PARK made, capacity: 76,5 lt.

Valves: manual

Filterbed material: multimedia

Capacity during operation: 2 m<sup>3</sup>/h

Capacity during backwash: 4 m<sup>3</sup>/h

Backwash time: 15 minutes

Backwash pressure: 1,5-2 bar

Fittings: 1"

Pressure drop: 0,8 bar

Filtering material composed by one stage of sand 0,315-0,8 and one stage of sand 3-5,6.

Dimensions: 330 x 450 x 1180 (L x W x H)

*or alternatively:*

- **TFD Filter**

Semi-automatic self-cleaning prefilter based on a swirl effect obtained by means of a propeller at the filter inlet.

Preserves the prefilter elements on the R.O. system from marine debris.

The TFD filter needs less washing cycles compared to the standard sand filter and helps to save energy, water and time.

Characteristics:

- 18 m<sup>3</sup>/h at 50 micron filtration / 8 m<sup>3</sup>/h at 20 micron filtration
- Made of reinforced nylon with fiberglass.
- Light and small coarse filtration solution.
- Modular, versatile and easy to maintain.
- High resistance to clogging.
- Easy and quick connection.
- In/Out 1" 1/2
- Drain: 1/2"
- Flow meter on inlet

