

Séon TRO Seawolf Data Sheet

Model - WSTRO12000

**Reverse Osmosis Seawater Desalination System
Trailer Mounted**

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Introduction

Séon TRO Seawolf, a point of use Mobile Water Purification System for standalone desalination; capable of producing pure, safe drinking water direct from the sea using *`Séon Water Purification Technology`*.

Séon TRO Seawolf is equipped with a feed pump, a multi-stage purification system and an integral diesel generator to power the system to enable self contained, all in one operation.

The whole system is housed within an all-terrain trailer to create an all in one, towable, easily deployed package. A choice of Aluminium canopy or UVC resistant canvas protects the system from environmental damage. All components are sourced for their highest quality and proven reliability to ensure the system works when its needed.

`Séon Water Purification Technology` Tough, reliable, high quality mobile water purification systems designed to withstand the harshest of environments to produce fresh, potable water direct from source.



Reverse Osmosis System

Reverse Osmosis (RO) is a time proven method of desalination whilst excellent for both marine and land based applications.

Osmosis is a naturally occurring process and is defined when two solutions of different concentrations are separated by a semi-permeable membrane; then the less concentrated (purer) water will flow towards the saltier (more concentrated) side of the membrane. This will happen until the pressures and concentrations are equalised.

Séon TRO Seawolf reverses this process by pressurising salt water at double the natural osmosis pressure against the membrane surface, resulting in potable water being produced. The principal of operation is such that the feed water has first passed through a sand filter system and a 5-Micron absolute cartridge filter system to maximise the RO system efficiency and operational life.

The filtered feed water then passes through the high pressure pump which increases the pressure to 800/900 PSI (55-62 BAR) prior to entering the 4 membrane pressure vessels.

Each membrane is held in the centre of a stainless steel re-enforced GRP high pressure casing. The pressurised feed water is fed through the membranes and discharged through a pressure regulating valve to sea water discharge.

The product water which permeates through the membranes is piped through a salinity sensor to a solenoid valve which diverts the fresh water either to store or to dump depending on the quality. This operation is controlled by a temperature compensated controller set to reject water that is not well within the WHO directive of a maximum 500ppm salinity for potable water.

The processed product water is suitable for potable storage directly from the system; it should be noted that chlorine dosing is recommended to protect against cross contamination and dramatically increase storage life. Additional chlorine dosing equipment is available upon request.



Operation and Maintenance

Séon TRO Seawolf has been designed for simplicity creating ease of use and maintenance.

- Place free end of inlet pipe into water source.
- Pre-prime inlet pump using priming tap.
- Power up system
- Purge any air from the system.
- Collect potable water.

Séon TRO Seawolf has inbuilt automatic backwash cycles to help preserve membrane life. Inlet and outlet hoses should be sterilised regularly as per instruction manual to prevent bacteria growth from cross contamination during transit. The system may require an acid, descale cycle periodically. (Once every 6-12 months depending on use) Membranes have a minimum working life of 5 years if system is stored as per instructions.

Wananchi has partnered with Sailfish Marine and Cathelco enabling us to offer a global network developed over 50 years of approved agents for localised sourcing of servicing/repairs and parts.



Overall System Operational Specification

Electrical Load	6.25 kW/50Hz
Standard Voltage	380-440V 3-Phase
Noise Level	85 Db (Approximate/not including generator)
Production Capability	0.66 m ³ /Hour (16 m ³ /Day)*
Feed Water Flow	2-2.3 m ³ /Hour
Feed water Pressure	35 PSI (2.4 BAR)
Feed Water P.H. level	2-11
Feed Water SDI	5
Feed Water Salinity	35,000ppm NaCl
Nominal Feed Water Temperature	25°C
Feed Water Temperature Range	5-35°C
Salt Rejection	99.4%
Working Pressure	850PSI (58 BAR)
Product Flow/Membrane Rating	+/-15%
Product Water Quality	<450ppm

**Dependant on feed water flow, membrane condition and water temperature.*



High Pressure (HP) Pump

The high pressure pump delivers the pre-treated seawater to the membranes and pressurises it to working pressure (850 PSI / 58 BAR). The pump is fitted with a vibration dampener for smoothing of outlet flow water. The pump is belt driven from a four pole T.E.F.C motor. The assembly includes a mechanism for tightening and loosening of the drive belts.

Load	5.5 KW - 7.5 HP
Voltage	440v 3-Phase
Speed	1460 RPM
AMPS	30
Frequency	50 HZ
Shaft Ø	38 MM

Design

- Triplex plunger design provides smoother liquid flow.
- V-Packings are completely lubricated and cooled by the liquid being pumped.
- Lubricated Lo-Pressure Seals provide double protection against external leakage.
- Oil bath crankcase assures optimum lubrication.
- Brass, Stainless Steel, Duplex SS or Nickel Aluminium Bronze manifolds for strength and corrosion resistance.
- Oversized crankshaft bearings with greater loading capacity mean longer bearing life.

Easy Maintenance

- Valve assemblies are accessible without disturbing piping.

Data Specifications

Flow	10 gpm (38 l/m)
Pressure Range	100 to 2200 psi
RPM	958 RPM (958 RPM)
Inlet Pressure Range	-5 to 60 psi (-0.35 to 4 bar)
Maximum Liquid Temperature	160°F (70°C)
Bore	0.945" (24 mm)
Stroke	1.180" (30 mm)
Crankcase Capacity	42 oz. (1.26 l)



Pressure Vessels and Membranes

The RO. membranes are housed in GRP pressure vessels sealed with stainless steel reinforced nylon end plugs. Depending on the model the system will have two, three or four membranes in series. Interconnecting pipe work is made from super duplex stainless steel joined with Victaulic couplings.

Membrane type:	Dow Filmtec SW30 4040
Membrane Quantity:	x4
Sodium Chloride Rejection:	99.4%
Max operating pressure:	1000 PSI (69 BAR)
Vessel Test Pressure:	1500 PSI (103 BAR)



Control Panel / System Controls

Séon TRO Seawolf features simple electronic controls for ease of operation. These controls are housed within a IP67 rated, powder coated steel enclosure. Features include:

- Membrane keypad for operation of system
- Fully automated Salinity Controller showing quality of product water in TDS
- Audible alarm with mute button in addition to LED's to indicate fault states
- High pressure switch set to shut down system if the pressure exceeds 1000 PSI (69 BAR)
- Low pressure switch to protect HP Pump from cavitations in feed water create by low feed pressure
- Hour meter
- Fresh water flush switch (optional)



Wet Controls

- Feed pressure gauge(s) to indicate clogging of pre-filters and media filter
- Restrict valve and high pressure gauge to regulate working pressure
- Inlet flow meter
- Product flow meter
- Product water sample tap
- Pressure Relief Valves on Product and Dump piping, maximum pressure in exit pipework (product and dump) to be <6Bar



Connections

- Inlet: 2" BSP
- Brine discharge: 1" BSP
- Fresh water: 1/2" BSP

Both brine discharge and fresh water lines are fitted with over pressure relief valves. The system also features a 1 1/4" BSP maintenance outlet connection within the main frame. Maximum pressure in exit pipework (product and dump) to be <6Bar

Chlorine Dosing – *Optional Extra*

Post water treatment is critical to ensure water quality remains safe for human consumption. Chlorine disinfection is effective against almost all bacteria and viruses as well as algae, fungi, some minerals and man-made chemicals pollutants. As with a municipal mains water system, chlorine disinfection of the water at the end of the treatment process minimises the risk of re-contamination in the distribution system.

To prevent this from occurring, a chlorine dosing system is installed at the end of the purification process. This entails a chlorine dosing pump which measures the flow rate of water and accurately doses the water with the required amount of chlorine. The chlorine is pumped from a separate drum which has been pre-filled with a measured solution of chlorine and sterile water.

A simple test kit is included with the water purification system to monitor the chlorine levels.



Re-Mineralisation

Product water passes through a 10" re-mineralisation cartridge can post RO membranes. The principal is to restore mineral content and alkalinity/CO2 equilibrium of the water. Replacement is simple and occurs after a specified quantity of water has been produced.



Power

Electrical power is provided by a Mecc Alte 3-phase generator with a Perkins diesel engine. This is located centrally within the package for optimum vehicle balance. Designed for professional and intensive use, this quality, British made Mecc Alte generator is capable of spending its lifetime supplying power to sites and demanding applications. These generators are equipped with first class components and complete instrumentation. Mecc Alte have been manufacturing generators for nearly 70 years.

Manufacturer	Mecc Alte
Engine manufacturer	Perkins
Engine Model	403D-15G
Alternator Model	Mecc Alte EC03-2L/4
Frequency	Hz 50
Voltage	400V
Phase and connection	3
Standby power	LTP kVA 17
Prime power	PRP kVA 15
Exhaust emission level	Stage IIIA
Engine cooling system	Water
Nr. of cylinder and disposition	4 in line
Displacement	2216 cm ³
Aspiration	Natural
Speed governor	Mechanical
Oil capacity	10.6 litres
Coolant capacity	7 litres
Fuel	Diesel
Fuel consumption	2.9 litres per hour @ 75% load
Starting system	Electric
Starting engine capability	kW 2
Electric circuit	12V
System Controller	Deep Sea 7120 module



Features

Automatic protection against high engine temperature, low oil pressure and wire loom failure.

Set Mounted Tropical Duty Radiator

Engine Driven Cooling Fan with Protection Guard

Fuel, Lubricating Oil and Air Filter with Restriction Indicator

Mechanical governing at 1500/1800 RPM in accordance with BS5514A1 (1)

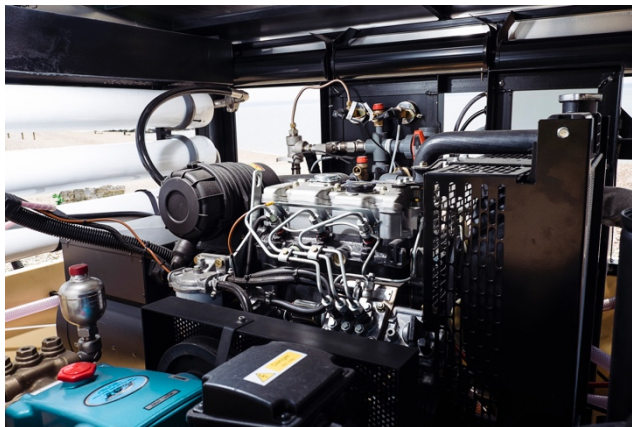
12 Volt electric start with charging alternator

Anti-vibration mountings fitted between the engine/alternator feet and base

Set mounted maintenance free lead acid battery with leads and terminals

Exhaust flexible section with connections

Comprehensive user manual



Ancillary Equipment

Pressure and flow gauges are installed where appropriate to monitor system performance and aid system priming.

All hose connections are made with industry recognised BSP hydraulic fittings. Specific connections can be integrated upon client request.

System is provided with simple test equipment to measure TDS and Chlorine levels.

Water metering enables monitoring of system performance and helps schedule maintenance.



Trailer/Chassis

The Séon TRO Seawolf purification system is mounted and secured within the Wananchi ATT-18, all terrain overland trailer. The trailer features twin, box section tubular steel spars with a fully enclosed, plated steel tub which offers strength and durability for long life.

The trailer is equipped with time proven reliability and easy maintenance R-Flex suspension as standard with lunette eye coupling, hydraulic over-run braking and manual parking brake. Alternative suspension and coupling can be fitted upon request.

Equipment is provided with environmental protection offered by a simple to use UV resistant canvas canopy or alternatively a solid aluminium canopy with roller shutter access hatches. These methods offer quick, ease of access to all controls of the water purification system and ease of access for diesel generator servicing.

Overall Physical Data

Length	2.92 m
Width	1.425 m
Height	1.90 m
Track	1.2 m
Maximum Gross Weight	1800 kg
Lunette Eye Coupling Mechanism	
Overrun hydraulic braking	
Manual Parking Brake	
R-Flex Suspension	
Canvas or aluminium canopy	

Separate data sheet available for the Wananchi ATT-18 All-Terrain Overland Trailer. Please enquire for details.



Ordering

We understand that a remote operational environment can be as individual as the teams working in them. Equipment can be tailored to suit each and every situation, from hose connections, power supply, flow output rates to the trailer the system itself is housed in.

Wananchi can build specific client maintenance training, parts replenishment and maintenance schedules specific to individual project requirement whilst factoring in water source, production volumes and the operational environment.

Contact the team at Wananchi now to discuss your water purification requirements

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MOBILE WATER PURIFICATION



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