PRODUCT DATA SHEET

SEA1000

Reverse Osmosis Desalination System

1000.0 m³/day - Seawater (SWRO)

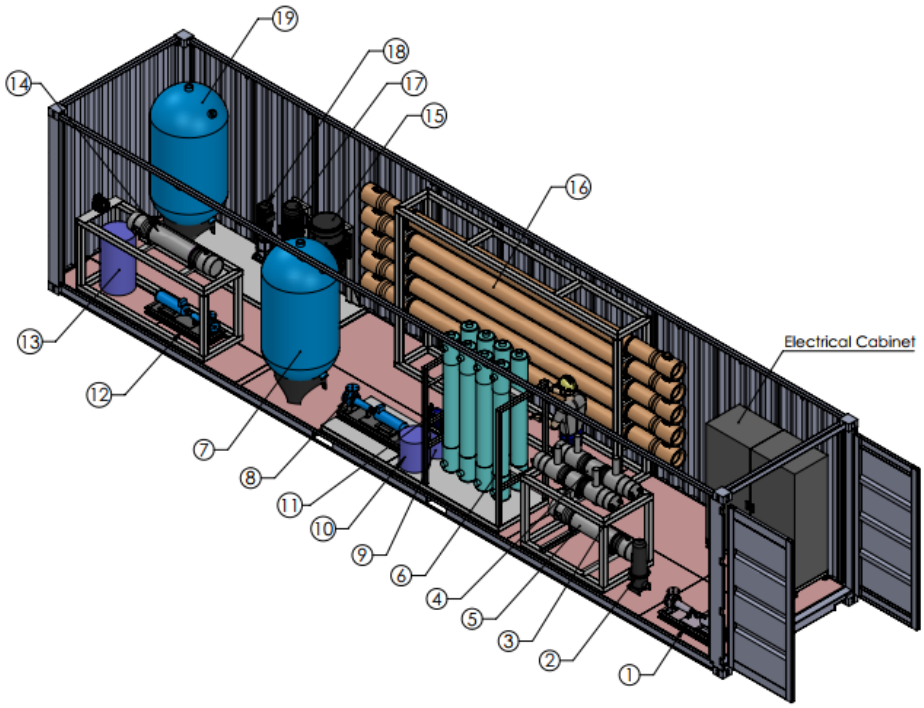
Description

The SEA1000 is a seawater reverse osmosis (SWRO) desalination system designed and built according to advanced engineering standards. It produces 1000.0 m³/day of high-quality fresh water from seawater, with a specific energy consumption of 2.47 kWh/m³ (among the most efficient in its class).

The system incorporates the Danfoss iSave® energy recovery device, which reduces the net energy requirement to 102.9 kW, saving 130.2 kW compared to a conventional configuration.

The system is fully customizable and can be integrated into a 40-foot ISO container. The containerized configuration ensures transportability by sea, road, or rail, and rapid commissioning with minimal civil works.

POS	DESCRIPTION
1	FEED WATER PUMP (Optional)
2	BASKET FILTER 3000 µm
3	SELF CLEANING FILTER 500 µm
4	SELF CLEANING FILTER 50 µm
5	CARTRIDGE FILTER 50 µm
6	ULTRA FILTRATION UNIT (x8)
7	ULTRA FILTRATION TANK
8	BACKWASH PUMP
9	CHEMICAL TANK (Sodium Hypochlorite)
10	CHEMICAL TANK (Citric Acid)
11	DOSING PUMP
12	RO FEED WATER PUMP
13	CHEMICAL TANK (Antiscalant)
14	CARTRIDGE FILTER 5 µm
15	HP PUMP
16	SWRO SYSTEM (x5)
17	ENERGY RECOVERY DEVICE
18	CLEANING PUMP
19	CLEANING TANK



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Company with Quality Management System certified UNI EN ISO 9001:2015 / certificate No. 50 100 16952

Technical Data

TECHNICAL DATA — SEA1000

Performance	
Produced water flow rate (permeate)	41.7 m³/h — 1000.0 m³/day
Feed water flow rate (seawater)	102.9 m³/h
Recovery rate	**40.5 %**
High-pressure pump pressure	70 bar
Permeate quality (TDS)	< 150 ppm
Specific energy consumption	**2.47 kWh/m³ (official Danfoss data iSave®)**
Installed electrical power (net)	102.9 kW (with iSave® system)

Main Components	
Feed pumps	Centrifugal in Super Duplex
Filtration system	Basket and self-cleaning filters — efficiency up to 5 microns
Ultrafiltration	Membrane Toray HFUG-2020AN
High-pressure pump	Danfoss APP
Energy recovery system	iSave® Danfoss — saving 130.2 kW
Reverse osmosis membranes	Toray TM820M-400
Control system	Siemens S7-1200 — remote monitoring with 24/7 technical assistance

Plant Data	
Plant configuration	Container ISO 40' (12.19 × 2.44 × 2.59 m)
Plant weight	Depending on selected options
Electrical supply	400 Vac / 50 Hz / 3F + N
Seawater inlet connection	DN 6" (flanged)
Permeate outlet connection	DN 6" (flanged)
Feed water	Seawater (SWRO)

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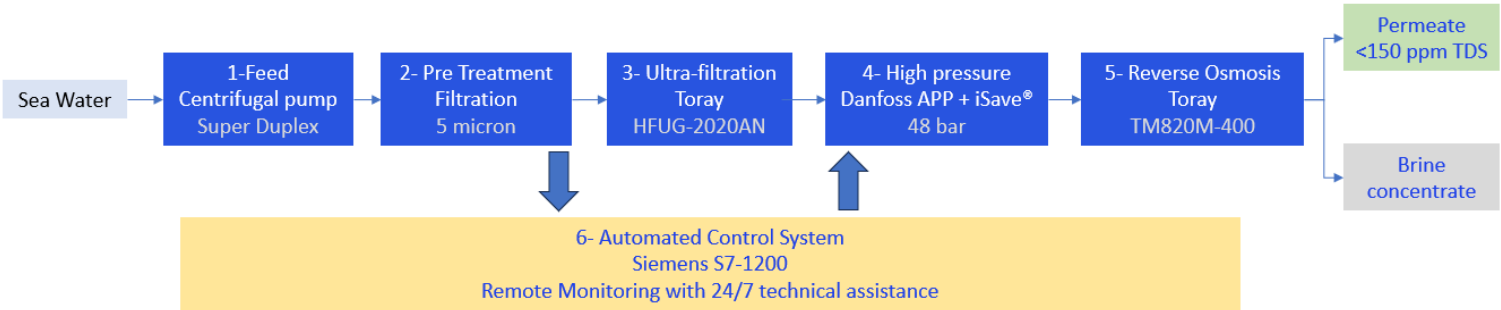
Plant configuration

Section / Components	Description
1. Feed *Single-stage centrifugal pump*	Duplex / Super Duplex material for maximum corrosion resistance in marine environments
2. Pre-treatment *Basket filter + 2 self-cleaning filters + 1 cartridge filter*	Removal of suspended solids and particulate; final filtration to 5 microns to protect the membranes
3. Ultrafiltration *Toray HFUG-2020AN*	Hollow-fibre membranes for removal of bacteria, viruses, and colloids upstream of the RO section
4. High Pressure *Danfoss APP + iSave®*	Danfoss high-pressure pump with integrated iSave® energy recovery — saving 130.2 kW
5. Reverse Osmosis *Toray TM820M-400*	High-efficiency SWRO membranes for seawater desalination — permeate < 150 ppm TDS
6. Control system *Siemens S7-1200*	Automated control system for continuous management and monitoring of all process parameters. Remote monitoring with 24/7 technical assistance available.



Key Features

Design Quality
Design compliant with international standards using FEM and CAD methodologies.
P&IDs, IOM and as-built documentation included in the supply.

Fully Customizable System
Thanks to SEA's integrated engineering, the system is fully configurable to meet specific requirements (flow rate, filtration level, accessories).

iSave® Danfoss — Energy Recovery
Integrated iSave® system saving 130.2 kW: specific consumption 2.47 kWh/m³ (official Danfoss data), among the lowest in the SWRO category.

Containerized
Complete system in 40' ISO container: ready for rapid installation, transportable by sea, road, or rail.

Recovery 40%
Optimized ratio between production and brine discharge, reducing environmental impact and operating costs.

Scheduled Maintenance
Structured O&M plan with multi-year contracts, guaranteed spare parts, and dedicated technical support.

Typical Applications

- Petrochemical industry and refineries
- Power plants (demineralised water for boilers)
- Food and beverage industry (process water)
- Pharmaceutical industry
- Port terminals and offshore platforms
- Coastal communities and islands

Why SEA Engineering Solutions

SEA Engineering Solutions designs and builds water treatment systems with a structured and documented engineering approach:

- Design to international standards — the same used in critical industrial environments
- Complete technical documentation: P&IDs, datasheets, Operating Manuals
- Systems custom-designed for the specific needs of each client
- Structured O&M contracts with dedicated technical support and guaranteed spare parts
- Single point of contact from design to commissioning
- 24/7 support

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The data contained in this datasheet are indicative and subject to change without notice. For customized quotations, please contact our technical office.