

RO

Reverse Osmosis equipments

A range of Reverse Osmosis equipment designed to provide the highest performances with flow rates demand from 50 to 1000 l/h



RO REVERSE OSMOSIS

TECHNICAL FEATURES

Direct Osmosis is a phenomenon that happens normally in nature, for instance in the cells of all living organisms, and it is the process where with two solutions of different concentration divided by a semi-permeable membrane (that is allowing water but no salts to go through), the more diluted solution tends to move naturally towards the more concentrated solution till the concentration of the two solutions becomes the same; the pressure created on the membrane because of this flow is called Osmotic Pressure.

Exploiting this principle, it is possible to reverse the process by applying a similar but adverse pressure to the concentrated solution to obtain from it a solution of lower concentration: this process is called Reverse Osmosis.

The osmotic membrane carrying out the best filtering level achievable, behaves like a barrier not only against the salts and inorganic substances making up the saline composition of the water, but also against organic substances such as pesticides, pyrogens, viruses and bacteria; a nominal rejection (reduction capacity) of 100% can be reached with bacteria.

The bigger the difference between the pressure applied and the osmotic pressure, the bigger is the quantity of water produced per unit of surface of semi-permeable membrane.

The supply pressure required varies according to the type of water and salinity to be treated (therefore according to the relative osmotic pressure to overcome):

- System water: from 2-3 up to 18-20 bar
- Brackish water: from 7-8 up to 34-40 bar
- Sea water: from 50-55 up to 70-85 bar

The most suitable membrane (as far as type and dimension are concerned) must be chosen for each system, following a modular criterion, so that the chosen membrane is arranged following a system of elements in series and in parallel.

A reverse osmosis membrane cannot remove 100% of salts (even if today 99.5% can be achieved) and cannot treat 100% of the supplied solution, therefore a reverse osmosis system has a Supply, a Product (also called Permeate) and a Discharge (also called Reject or Concentrate).

These days reverse osmosis technology has undergone such quick development that compact, simple, versatile systems are achieved, characterized by constant output, both in terms of water produced and its quality.

No civil or industrial business exists that can do without specifically treated water; from the water for boilers that must have precise chemical-physical specifications to process water (chemical and pharmaceutical, food, drink industries, etc.) that must adhere to stringent production requirements, the possibilities for use of the reverse osmosis process can be considered endless. In this sector too, reverse osmosis technology has conquered a leading role thanks to its adaptability, cost-effectiveness and running simplicity.

The RO reverse osmosis systems by ATLAS FILTRI use very high quality components and are designed to meet the requirements of any customer, on the basis of the analysis results of the origin water; apart from a standard range, on request ATLAS FILTRI can provide specific solutions.

Every installation can be fitted with pre- and post-treatment systems; ATLAS FILTRI can boast a wide experience in the water treatment and filtering sector, with a wide range of items and equipment for both the domestic/civil and industrial sectors.

- **Domestic uses:** cleaning-up of drinking water, elimination of any smells and tastes connected to the presence of chlorine or chlorine derivatives, pesticides, insecticides, fungicides, heavy metals, micro-organisms, strong reduction in salt content.
- **Technical uses:** in all processes where demineralized water is used, production of drinking water from wells or sources with values within their operational conditions.

NOTES: The system is suitable to treat water with certain chemical-physical and microbiological characteristics that might require pre-treatments, so it's always necessary to have a complete analysis of the water to be treated.

CERTIFICATIONS



EAC

The products are tested and certified under the most stringent procedures worldwide, **in compliance with DM 25 (Italy) and with the sanitary certification EAC/Ghostreghistrizia (Russia).**

SYMBOLS LEGEND



For domestic use



For technical and industrial use



RO40 - RO80 - RO120

PRE-TREATMENT SECTION

Made with a 10" single DP filtration stage: CB EC carbon block cartridge with 5 micron filtration rate.

PRESSURIZATION SECTION

Made up of a brass rotary vane electric pump with by-pass.

PERMEATION SECTION

Made up of high-productivity and low-consumption reverse osmosis permeators (low energy).
The membranes are closed in PRFV vessels capable of withstanding operating pressures of up to 21 bar.
RO40: 1 membrane in 1 vessel
RO80: 2 membranes in 2 vessels
RO120: 3 membranes in 3 vessels

HOSES

Feeding, high pressure and discharge hoses in PVC PN16; permeate hoses in material suitable for pressures until 10 bar.

CONTROL AND HYDRAULIC CONTROL SECTION

- pressure gauge after the 5 micron filter, feed pressure at the membranes
- permeate, concentrate flow sight gauge
- fluxing, recirculation and discharge flow regulators
- protection pressure switch with system lock for low supply water level
- protection pressure switch with system lock for permeator supply high pressure
- membrane solenoid valve for system supply management
- membrane solenoid valves for module fluxing management
- conductivity probes for feed water and permeate

FRAME built in AISI 304 stainless steel section complete with brackets, vessel and hose fixing collars, valves and connections, leads for the various uses, electric control panel.

OPTIONAL

- UV Lamp on permeate line.
- Antiscalant dosing system.
- START/STOP with pressure switch.
- Conductivity meter on permeate line.



RO40 - RO80 - RO120

PERMEATE PRODUCTION 40-80-120 LITRES/HOUR											
CODE	MODEL	PERMEATE ± 10% (T = 20°C)	FINAL SALT REJECTION	MAXIMUM RECOVERY	TDS	SDI	TURBIDITY	HARDNESS	FREE CHLORINE IN	BACTERIA	DIMENSIONS (MAX SIZE)
EA0500003	RO40	40 l/h	≥ 95 %	27 (%)	≤ 1000 ppm	≤ 3	1 NTU MAX	≤ 1 °f	≤ 0,2 mg/l	ABSENT	660 x 400 x H1430 mm
EA0500004	RO80	80 l/h	≥ 95 %	45 (%)	≤ 1000 ppm	≤ 3	1 NTU MAX	≤ 1 °f	≤ 0,2 mg/l	ABSENT	660 x 400 x H1430 mm
EA0500005	RO120	120 l/h	≥ 95 %	58 (%)	≤ 1000 ppm	≤ 3	1 NTU MAX	≤ 1 °f	≤ 0,2 mg/l	ABSENT	660 x 400 x H1430 mm

CHARACTERISTICS

Min/max feed water pressure	1,5 ÷ 4 bar	Total installed power	300 W
Min/max feed water temperature	5°C ÷ 35°C	Monophase electrical supply	230 V / 50 Hz
Feed water minimum flow rate	400 l/h	Supply connection	G 1/2" F
Min/max ambient temperature	5 °C ÷ 40 °C	Permeate / Discharge connections	G 1/2" F
Operating pressure	≤ 12 bar		



CONTROL PANEL

ELECTRO-MECHANICAL CONTROL PANEL

- IP55 electrical box
- Built with microprocessors and fitted with a digital display
- Digital conductivity meter with LCD display to read the conductivity of the feed water and the water produced
- Alarm with visual descriptive display of the kind of problem: feed water low pressure / permeator supply high pressure / permeate high conductivity
- Working hours display with maintenance block at "x" hours
- Fluxing automatic management timed and at each cycle stop
- Storage tank level management
- Clean contact in exchange for external alarm signal
- Possibility of pre-treatment feedback (softener / carbon filter)
- Possibility of feeding an antiscalant metering pump (optional)