

**BRAVOOSMO ECO**

Reverse osmosis water demineralizers for drinking and industrial water

Rev. 1 - 06/24

**CHARACTERISTICS**

The industrial demineralizers of the BRAVOOSMO ECO series are automatic reverse osmosis systems designed mainly to treat well water, surface water or process water for the production of very high quality demineralized water that can be used in the most varied fields (for example, in the production of food and drinks, in the pharmaceutical industry, as a pre-treatment for boilers and cooling towers, in the production of steam and in the generation of energy, in the purification of water) or to treat waste water for its partial recycling.

The presence of mineral salts dissolved in water represents a problem of considerable importance for many industrial and technological applications. Reverse osmosis is a process that allows you to obtain very high purity demineralized water starting from water rich in salts. Reverse osmosis has many advantages compared to demineralization systems with ion exchange resins: very low operating costs, no use of chemical products, high process reliability, total removal of organic substances, removal of all microorganisms (bacteriologically pure water), small dimensions.

BRAVOOSMO ECO demineralizers are ideal for applications such as: industrial processes, industrial washing, accumulators, cosmetics, galvanics, demineralized water production in general.

The equipment is manufactured and supplied complete and ready for installation.

The BRAVOOSMO ECO reverse osmosis demineralizer systems are supplied assembled on a solid AISI 304 stainless steel skid and manufactured in a compact manner. Thanks to a careful design study, BRAVOOSMO ECO demineralizer systems are optimized to increase system productivity and minimize the concentrated water to be discharged.

The systems are provided with a microprocessor control unit for the automatic management of the process, thus minimizing the interventions of technical personnel during the operation phases of the system.

Made on a robust and elegant stainless-steel structure, they include:

- 5-micron pre-filtration with H.20" models 500/700 melt-blown cartridge
- 5-micron pre-filtration with H.20" BIG MODEL 1250/6000 melt-blown cartridge
- Dosing group: diaphragm dosing pump for the dosing of anti-precipitation product which allows to increase the yield of the system and allows a more rational use of the membranes, extending their life
- Spiral reverse osmosis membranes wrapped in polyamide with 99.0% salt rejection
- Fiberglass pressure vessels, threaded connections



- Flow and pressure indicators
- Electrical levels, pressure switches and various safety devices
- Connection pipes:
 - PVC PN16 low pressure circuit
 - Multilayer high-pressure circuit
- Control panel in thermoplastic material with microprocessor electronic control unit and LCD message display panel

The BRAVOOSMO ECO series (500/2000) devices are complete with #1 empty 50-liter tank for dosing the product for cleaning the membranes; the BRAVOOSMO ECO series models (4000/6000) are complete with #1 empty 100-liter tank.

Supplied with #1 10-liter tank of IDROPERM 3 product for the anti-scaling treatment of osmotic membranes.

Supply: concentrated or diluted via dosing pump.

With a chlorine concentration higher than 0.05 ppm, it is necessary to install a carbon filter (BravoFCA model) not supplied with the BRAVOOSMO ECO; furthermore, if you want the by-pass valve to mix the treated water with the supply water, you must order it separately (see the PRICE LIST/OPTIONAL ACCESSORIES table).

The by-pass valve cannot be installed subsequently.

TECHNICAL DATA

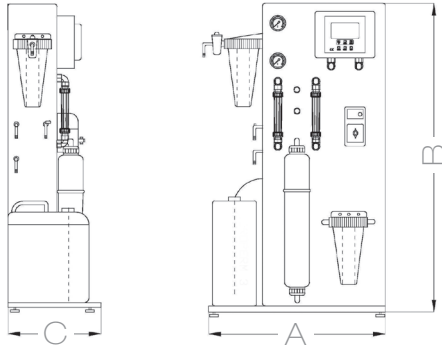
Code		OS500LEECO	OS750LEECO	OS1250LEECO	OS1500LEECO	OS2000LEECO
Model		BRAVOOSMO 500 ECO LE	BRAVOOSMO 750 ECO LE	BRAVOOSMO 1250 ECO LE	BRAVOOSMO 1500 ECO LE	BRAVOOSMO 2000 ECO LE
Demineralized water flow rate	lt/h	500	750	1250	1500	2000
Drain water flow rate	lt/h	170 ÷ 330	250 ÷ 500	420 ÷ 830	500 ÷ 1000	700 ÷ 1340
Supply water flow rate	lt/h	670 ÷ 830	1000 ÷ 1250	1670 ÷ 2080	2000 ÷ 2500	2700 ÷ 3340
Recovery	%	75 ÷ 60	75 ÷ 60	75 ÷ 60	75 ÷ 60	75 ÷ 60
Number of membranes		2	3	5	6	8
Pump power installed	kW	1,5	1,5	1,5	2,2	2,2
Min./max. inlet water working pressure	bar	1 - 5				
Min./max. inlet water working temperature	°C	5 - 40				
Ambient temperature	°C	5 - 40				
Salt reduction LE series membranes	%	99,0				
pH		5,5 - 8,5				
Maximum inlet water hardness	°f	100				
Power supply		400 V - 50/60 Hz				

REVERSE OSMOSIS

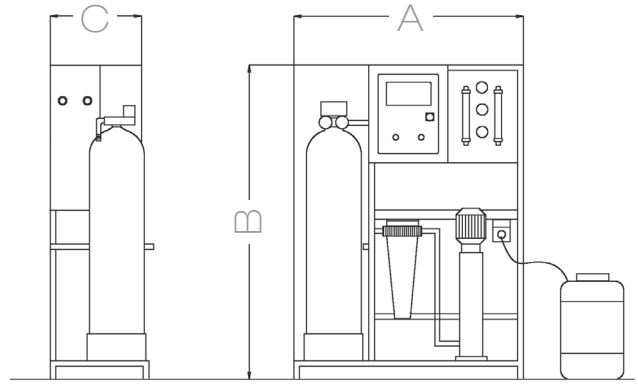
Code		OS4000LEECO	OS6000LEECO
Model		BRAVOOSMO 4000 ECO LE	BRAVOOSMO 6000 ECO LE
Demineralized water flow rate	lt/h	4000	6000
Drain water flow rate	lt/h	1350 ÷ 2700	2400 ÷ 4600
Supply water flow rate	lt/h	5350 ÷ 6700	9400 ÷ 11600
Recovery	%	75 ÷ 60	75 ÷ 60
Number of membranes		4	6
Pump power installed	kW	5,6	5,6
Min./max. inlet water working pressure	bar	1 - 5	
Min./max. inlet water working temperature	°C	5 - 40	
Ambient temperature	°C	5 - 40	
Salt reduction LE series membranes	%	99,0	
pH		5,5 - 8,5	
Maximum inlet water hardness	°f	100	
Power supply		400 V - 50/60 Hz	



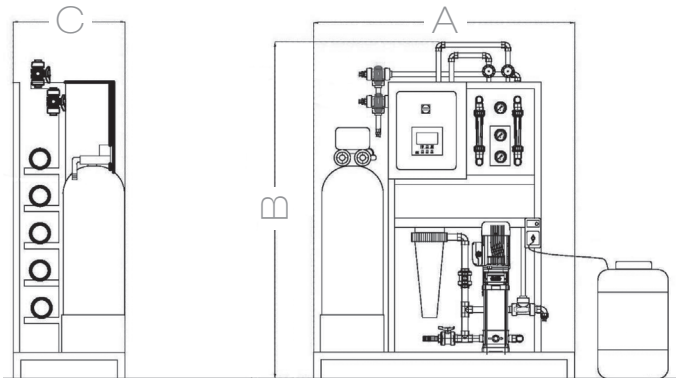
OVERALL DIMENSIONS



Model 80 / 160 / 240 / 320



Model 500 / 700



Model 950 / 1150 / 1450

Code	A	B	C
	mm	mm	mm
OS80LE	720	1250	380
OS160LE	720	1250	380
OS240LE	870	1250	380
OS320LE	870	1250	380
OS500LEPLUS	1220	1650	540
OS700LEPLUS	1220	1650	540
OS950LEPLUS	1400	1600	600
OS1150LEPLUS	1400	1600	600
OS1450LEPLUS	1400	1600	600

Overall dimensions may be subject to changes without notice



EQUIPMENT AND SUPPLY SPECIFICATIONS

BRAVOOSMO ECO is supplied complete with cartridge kit, membranes, IDROPERM 3 product for the anti-scaling treatment of osmotic membranes and empty drum for the product solution to be dosed

instruction - maintenance manual in Italian

(including declaration of conformity). Shipping managed on one or more pallets.



OPTIONAL ACCESSORIES

• PRODOTTO DA DOSARE - VITEC 1135



VITEC 1135 is a liquid product with high anti-scaling and dispersing power based on derivatives of phosphonic acids and polycarboxylic acids. The product is specific for systems in which the water is characterized by high hardness and rich in suspended solids.

To be used as it is

The optimal working pH is between 7 and 10.

The product is neither volatile nor flammable, does not contain nitrogen and should only be used for industrial purposes.

It is certified by the KIWA-ATA Group (No. K44434/02) as a product usable for drinking water in accordance with the "KIWA Regulations for ATA Product Certification" which is one of the most restrictive European regulations for water intended for human consumption.

The product is NSF approved.

VITEC 1135 is not dangerous for transport and, therefore, does not fall within the ADR requirements. Drinking use.

COD. PC090

• START-UP AND TESTING

For the BRAVOOSMO water demineralizer line, models from 80 to 6000 lt/h, START-UP AND TESTING is not required;

The equipment is delivered assembled in all its parts and tested by the manufacturer with relative "basic" calibration; You can request telephone support by calling or sending an email at least two days before the installation itself, to set an appointment for different calibrations after having connected it to the system.

Important NOTES:

1-Check the direction of rotation of the pump (see indicative arrow on the same)

2-insert membrane cleaning product in the appropriate tank supplied and proceed with priming the membrane pump.



PRECAUTIONS AND WARNINGS

It is necessary to protect the system from the direct action of sunlight and away from frost. Do not exceed the maximum working pressure indicated. If the supply pressure is higher, install a pressure reducer upstream of the filter. The BRAVOOSMO ECO demineralizers are not equipped with anti-flooding devices to avoid uncontrolled water losses. If necessary, provide these devices separately.

Please remember to install the activated carbon cartridge/filter as it is not supplied. By-pass valve for mixing treated water with supply water excluded.



REFERENCE STANDARDS

Ministerial Decree No. 174/2004: Regulation concerning materials and objects that can be used in fixed systems for the collection, treatment, supply and distribution of water intended for human consumption.

Directive 2014/30/UE: concerning the approximation of the laws of the Member States relating to electromagnetic compatibility.

Directive 2014/35/UE: concerning the approximation of the laws of the Member States relating to electrical equipment intended for use within certain voltage limits.

Art. 4 Par. 3 Of Directive 2014/68/EU (PED).



MAINTENANCE

Periodically check the correct operation of the BravoOSMO ECO system. When the 5-micron filter cartridges

show some clogging, they need to be replaced. Reverse osmosis membranes can lose their efficiency over time, especially due to clogging due to the precipitation of calcium carbonate, but also due to the presence of other pollutants (organic substances, iron, etc.). This causes a progressive decrease in the permeate flow.

To at least partially restore the relevant efficiency, it is possible to carry out washing by recirculating adequate washing solutions in the membranes. Osmotic membranes can lose their efficiency over time despite repeated washing. In this case, their replacement is necessary. In any case, respect all the instructions given in the Use and Maintenance Manual.

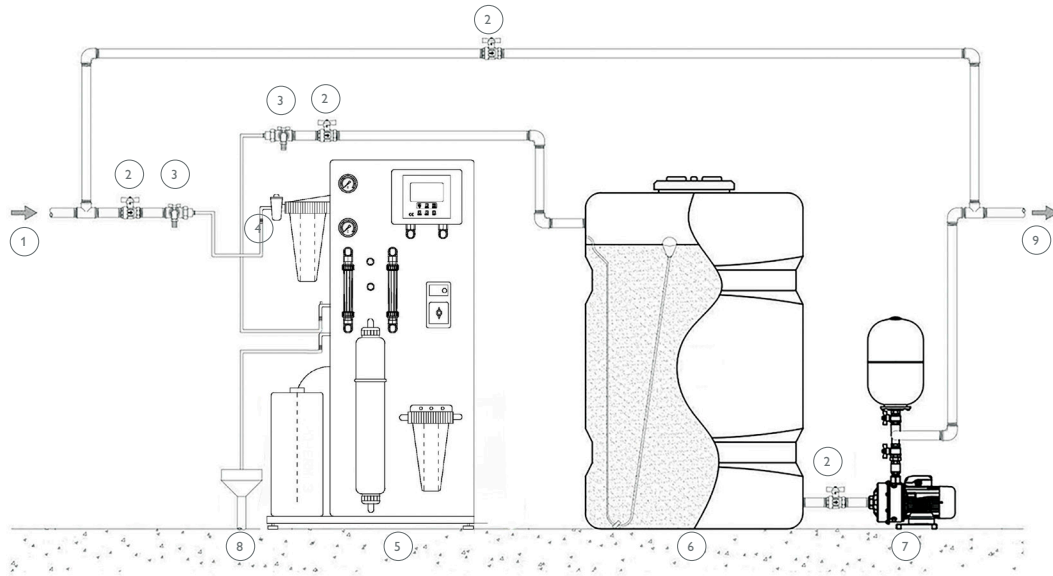


INSTALLAZIONE

The installation of BravoOSMO ECO systems must be carried out exclusively by qualified personnel, in hygienically suitable places and in full compliance with local regulations. BravoOSMO ECO produces demineralized water at 0 pressure. This means that the water produced by the system must be stored in a storage tank at atmospheric pressure and then be released for use with an adequate pumping system. Storage tank and booster station are excluded from the supply. Osmotic water still contains oxygen and carbon dioxide and is, therefore, corrosive. Take this into consideration when manufacturing systems downstream of the reverse osmosis.

It is advisable to install an adequate valve system that allows the system to be excluded in the event of a malfunction without preventing the water supply (by-pass). Provide an adequate waste water collection system for the concentrate. In any case, before carrying out the installation, follow all the instructions given in the Use and Maintenance Manual.

INDICATIVE INSTALLATION DIAGRAM



1. Raw water inlet; 2. By-pass circuit valve; 3. Treated water outlet; 4. Drain.

hange SPARE PARTS

Spare parts for the equipment are available on request in the dedicated price list.

AVERAGE DELIVERY TIMES

2-3 weeks

GENERAL EXCLUSIONS

- Filling the filter material tank
- Equipment start-up and final testing
- Special dedicated packaging, where required - wooden crates
- Lifting and handling means
- Hydraulic and electrical connections to our plant and to our utilities
- Masonry, carpentry and foundation works
- Chemical analyses
- Structural calculations
- Anything not expressly mentioned in the offer