

UO-D 250 - 13,500 BW/FU

Brackish water reverse osmosis units

The brackish water reverse osmosis unit is used for desalination of water with a salinity of up to 5,000 mg/l and is operated with a permeate yield of 50 - 75 % depending on the salinity of the feed water. It is equipped with a high-quality centrifugal pump with variable-speed drive (VSD = FU). Frequency-controlled operation reduces electricity cost by 30 - 50 %, extends the lifespan of the unit and keeps permeate production constant irrespective of operation pressure. The RO digital microprocessor controller enables fully automatic operation with logging of all relevant operating data and

BENEFITS

- Use of adapted materials for resistance even to high salt content in the concentrate
- Equipment with VSD (FU) saves 30 - 50 % electricity cost, maintains permeate production constant and enables a longer lifespan as well as particularly quiet operation
- Versatile RO digital controller with logging of operation data and many parametrisation options
- Optionally with PLC Siemens S7-1200
- Control and connection of two dosing units possible (e.g. antiscalant and acid)

APPLICATIONS

- Desalination of brackish water or well and process water with high salt content
- As second stage for existing / new RO units to save water (reduction of wastewater by 50 - 75 %), UO-D 250 BW can also be used as piloting / trial unit
- Suitable for reduction of electricity cost



UO-D 1500 BW/SO

UO-D 250 - 13,500 BW/FU

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DESCRIPTION

Brackish water reverse osmosis

- Stainless steel (SS) base frame from size 2000 on, smaller units also with blue plastic front panel, ready for the installation of two dosing stations
- High-pressure piping in stainless steel with orbital welding and pre-filter RO (5 µm) with two glycerine-filled manometers
- High-pressure pump as low-noise, multi-stage centrifugal pump with variable-speed drive (VSD = FU)
- Low pressure elements with energy-saving PA/PS composite membranes in GRP pressure vessels
- Control cabinet with lockable main switch and power section for controlling the high-pressure pump and dosing units for antiscalant and acid
- Concentrate flushing device KSE and connection set ARA for manual cleaning unit included
- Unit incl. piping and wiring, electrical construction acc. to VDE 0100 Part 600, VDE 0113 Part 1
- Unit tested, parameterised and conserved in own test field

Fittings and instrumentation

- Inlet solenoid valve and sampling valves for feed water and permeate (each vessel and total)
- Valves for adjusting the flow rates of permeate and concentrate
- Permeate check valve per pressure vessel and EC measurement permeate with temperature compensation
- Pressure sensors for pump inlet pressure, operating and concentrate pressure
- Flow sensors for permeate and concentrate

RO digital microprocessor controller

- Fully automatic monitoring and control, easy menu-guided operation with six buttons
- Four-line illuminated display and two LEDs as local signals for operation and fault
- Languages of the plain text display: German / English / French / Spanish
- Circular storage of operation data (1,960 data sets) with adjustable storage interval
- Operational reliability through adjustable limit values with fault message and display
- Password-protected programming of operating parameters

Available inputs

- DIGITAL: external stop (e.g. in case of interrupted feed water supply), motor protection / hard water / level dosing station (empty), 2x level permeate tank (tank min / max) and 3x universal input (configurable)
- ANALOGUE: level permeate tank (4 - 20 mA)

Available outputs

- DIGITAL: collective fault signal, universal output (configurable)
- ANALOGUE: conductivity permeate, measuring range 1 - 999 µS/cm (4 - 20 mA)

Optionally available

- Piping in PP instead of PVC, manual cleaning unit MRA
- Automatic concentrate displacement with permeate KVP and DOSIN dosing stations
- Interfaces Profinet, Profibus, Modbus RTU/TCP, BACnet and Back-up / alternating / parallel RO operation

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CONDITIONS OF USE

The unit may only be used for the desalination of hardness-stabilized brackish water / reverse osmosis concentrate.

For unit sizes from 250 to 1,000 l/h, it might be necessary dilute antiscalant before use to ensure constant dosing and thus stable operation.

The unit is designed for a salinity (TDS) of 5,000 mg/l and a temperature of 15 °C. Under these conditions, the projected permeate output is achieved even after three years of operation. The permeate yield depends on the raw water quality and the pre-treatment. The following parameters must be maintained in the feed water:

| | |
|----------------------------|----------------|
| Free chlorine | not detectable |
| Iron (Fe) | < 0.2 mg/l |
| Manganese (Mn) | < 0.05 mg/l |
| Silica (SiO ₂) | < 25 mg/l |
| Silt density index (SDI) | < 3 |
| Feed water temperature | 5 – 35 °C |
| Feed water pressure | 2 – 6 bar |
| Pressure fluctuation | ± 0.5 bar |

TECHNICAL DATA OF SERIES

| | |
|-----------------------------|---------------------------|
| Controller | RO digital (PLC optional) |
| Desalination rate min. | 97 % |
| Permeate recovery | 50 – 75 % |
| Permeate back pressure max. | 0.3 bar |
| pH value operation | 6.5 – 9.5 |
| pH value cleaning | 2 – 12 |
| Ambient temperature | 5 – 40 °C |

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| Product name | Mains connection | Hydraulic connection | Dimensions in mm | Item number |
|---------------------|--------------------------------|-----------------------|---------------------|-------------|
| Permeate l/h | kW / V / Hz | feed/permeate/conc. | W x D x H | |
| UO-D 250 BW/FU | 2.2 / 3 x 380 - 500 / 50 - 60 | DN 20 / DN 15 / DN 15 | 710 x 730 x 1,760 | 384 501 |
| UO-D 500 BW/FU | 2.2 / 3 x 380 - 500 / 50 - 60 | DN 20 / DN 15 / DN 15 | 710 x 730 x 1,760 | 384 511 |
| UO-D 1000 BW/FU | 2.2 / 3 x 380 - 500 / 50 - 60 | DN 20 / DN 15 / DN 15 | 710 x 730 x 1,760 | 384 531 |
| UO-D 2000 BW/FU | 3.0 / 3 x 380 - 500 / 50 - 60 | DN 32 / DN 25 / DN 25 | 2,480 x 700 x 1,640 | 384 561 |
| UO-D 3000 BW/FU | 5.5 / 3 x 380 - 500 / 50 - 60 | DN 32 / DN 25 / DN 25 | 3,500 x 700 x 1,650 | 384 581 |
| UO-D 4500 BW/FU | 5.5 / 3 x 380 - 500 / 50 - 60 | DN 40 / DN 32 / DN 32 | 2,840 x 750 x 1,790 | 384 601 |
| UO-D 6500 BW/FU | 11.0 / 3 x 380 - 500 / 50 - 60 | DN 50 / DN 32 / DN 32 | 3,850 x 750 x 1,820 | 384 621 |
| UO-D 10000 BW/FU | 11.0 / 3 x 380 - 500 / 50 - 60 | DN 65 / DN 50 / DN 50 | 4,040 x 800 x 1,860 | 384 641 |
| UO-D 13500 BW/FU | 15.0 / 3 x 380 - 480 / 50 - 60 | DN 65 / DN 50 / DN 50 | 5,060 x 890 x 1,860 | 384 661 |