

# UO-D 450 - 30,000 AS/FU

## Reverse osmosis units

The reverse osmosis unit is used for the desalination of water with a salinity of up to 1,000 mg/l and is operated with dosing of antiscaling instead of upstream softening. 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 freely adjustable limit values. The unit can be connected to the central control system via optional interfaces.

### BENEFITS

- No additional salt load in wastewater
- 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
- Concentrate flushing device KSE and connection kit ARA for manual cleaning unit MRA already included

### APPLICATIONS

- Desalination of hardness-stabilised water
- Suitable for all industrial applications
- Suitable for reduction of electricity cost



UO-D 10000 AS/FU

# UO-D 450 - 30,000 AS/FU

## Reverse osmosis units

### DESCRIPTION

#### Reverse osmosis

- Base frame made of stainless steel, ready for installation of dosing station
- Stainless steel high-pressure piping with orbital welding
- 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 the dosing station for antiscalant
- Concentrate flushing device KSE and connection kit ARA 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, concentrate and concentrate recirculation
- 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, concentrate and concentrate recirculation

#### 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

- HR modules to increase the desalination rate and DOSIN dosing stations
- Permeate recirculation PR, cleaning unit MRA, concentrate displacement with permeate KVP
- 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 feed water with drinking water quality or appropriately pre-treated well or surface water.

For unit sizes from 450 to 1650 l/h, it might be necessary dilute antiscaling before use to ensure constant dosing and thus stable operation.

The unit is designed for a salinity (TDS) of 1,000 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 <sub>2</sub> )	< 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	75 – 80 %
Permeate back pressure max.	0.3 bar
pH value operation	6.5 – 9.5
pH value cleaning	2 – 12
Ambient temperature	5 – 40 °C

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 450 AS/FU	2.2 / 3 x 380 - 500 / 50 - 60	DN 20 / DN 20 / DN 15	610 x 810 x 1,800	387 156
UO-D 700 AS/FU	2.2 / 3 x 380 - 500 / 50 - 60	DN 20 / DN 20 / DN 15	610 x 810 x 1,800	387 157
UO-D 950 AS/FU	2.2 / 3 x 380 - 500 / 50 - 60	DN 20 / DN 20 / DN 15	610 x 810 x 1,800	387 158
UO-D 1250 AS/FU	2.2 / 3 x 380 - 500 / 50 - 60	DN 20 / DN 20 / DN 15	610 x 810 x 1,800	387 159
UO-D 1650 AS/FU	3.0 / 3 x 380 - 500 / 50 - 60	DN 32 / DN 20 / DN 15	610 x 810 x 1,830	387 160

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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 2200 AS/FU	3.0 / 3 x 380 - 500 / 50 - 60	DN 32 / DN 25 / DN 25	2,480 x 710 x 1,650	387 204
UO-D 2500 AS/FU	3.0 / 3 x 380 - 500 / 50 - 60	DN 32 / DN 25 / DN 25	3,500 x 710 x 1,650	387 205
UO-D 3100 AS/FU	3.0 / 3 x 380 - 500 / 50 - 60	DN 32 / DN 25 / DN 25	3,500 x 710 x 1,650	387 206
UO-D 3800 AS/FU	5.5 / 3 x 380 - 500 / 50 - 60	DN 32 / DN 32 / DN 32	2,900 x 790 x 1,790	387 207
UO-D 5000 AS/FU	5.5 / 3 x 380 - 500 / 50 - 60	DN 40 / DN 32 / DN 32	2,900 x 790 x 1,790	387 208
UO-D 6000 AS/FU	5.5 / 3 x 380 - 500 / 50 - 60	DN 40 / DN 40 / DN 32	3,870 x 790 x 1,830	387 209
UO-D 7000 AS/FU	7.5 / 3 x 380 - 500 / 50 - 60	DN 50 / DN 40 / DN 32	3,870 x 790 x 1,830	387 210
UO-D 8500 AS/FU	7.5 / 3 x 380 - 500 / 50 - 60	DN 65 / DN 50 / DN 32	4,880 x 790 x 1,830	387 211
UO-D 10000 AS/FU	11.0 / 3 x 380 - 500 / 50 - 60	DN 65 / DN 50 / DN 50	4,060 x 840 x 1,880	387 212
UO-D 12000 AS/FU	11.0 / 3 x 380 - 500 / 50 - 60	DN 65 / DN 50 / DN 50	4,930 x 840 x 1,860	387 213
UO-D 15000 AS/FU	11.0 / 3 x 380 - 500 / 50 - 60	DN 65 / DN 50 / DN 50	5,080 x 840 x 1,920	387 214
UO-D 18000 AS/FU	11.0 / 3 x 380 - 500 / 50 - 60	DN 65 / DN 65 / DN 50	6,190 x 840 x 1,880	387 215
UO-D 20000 AS/FU	15.0 / 3 x 380 - 480 / 50 - 60	DN 80 / DN 65 / DN 50	4,990 x 840 x 2,230	387 216
UO-D 25000 AS/FU	18.5 / 3 x 380 - 480 / 50 - 60	DN 80 / DN 65 / DN 50	5,170 x 940 x 2,200	387 217
UO-D 30000 AS/FU	18.5 / 3 x 380 - 480 / 50 - 60	DN 100 / DN 80 / DN 50	6,050 x 990 x 2,360	387 218