

UO-S7 3,000 - 15,000 KR/FU

Concentrate-staged reverse osmosis units

The concentrate-staged reverse osmosis with high recovery up to 90 % is used for desalination of softened water with a salinity of up to 1,000 mg/l. 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 PLC Siemens S7-1200 allows visualization of the plant as well as optimal control and evaluation of the plant operation, optional data transfer via interfaces, remote access and subsequent control extensions are possible. Extension or adaptation of the controller possible (on request at extra cost).

BENEFITS

- Convenient and user-friendly PLC S7-1200
- High yield of up to 90 % saves water and minimises operating cost
- Equipment with VSD (FU) saves 30 - 50 % electricity cost, maintains permeate production constant and enables a longer lifespan as well as particularly quiet operation
- Concentrate flushing device KSE and connection kit ARA for manual cleaning unit MRA already included

APPLICATIONS

- Desalination of softened water
- Suitable for all industrial applications
- Ideal for minimising water and energy costs



UO-S7 10000 KR

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DESCRIPTION

Concentrate-staged reverse osmosis

- Base frame made of stainless steel and high-pressure piping made of stainless steel with orbital welding
- Pre-filter (5 µm) with two glycerine-filled manometers
- High-pressure pump as low-noise, multi-stage centrifugal pump with variable-speed drive (VSD = FU)
- Special 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
- Including KSE concentrate flushing unit and ARA connection kit for MRA manual cleaning unit
- 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)
- Stainless steel valves for adjusting the flow rates of permeate, permeate recirculation, concentrate and concentrate recirculation, permeate check valve per pressure vessel
- Pressure sensors for feed pressure after pre-filter, pump inlet pressure, operating and concentrate pressure
- Flow sensors for permeate and concentrate as well as permeate and concentrate recirculation of the KR stage
- Conductivity measurement permeate and permeate recirculation KR stage with temperature compensation

Programmable logic controller (PLC) Siemens S7-1200

- Fully automatic monitoring and control of the plant with appealing visualization
- Intuitive operation via 7" touchscreen or 4" touchscreen and buttons (only sizes 3000/3500)
- Languages of plain text display: German / English / others on request at extra charge
- Circular storage of operating data and warning / fault messages on high-capacity SD card (32 GB)
- Optimum operational safety due to adjustable limit values with warning and fault messages
- Password-protected programming of the operating parameters
- Siemens components and protocols in industry standard for high quality requirements

Available inputs

- DIGITAL: External stop, hard water protection (hardness monitoring unit limitron), 2x level permeate tank (tank min / max), 2x level dosing (pre-empty / empty) and universal input (configurable)
- ANALOGUE: Level permeate tank (4 - 20 mA)

Available outputs

- DIGITAL: Collective fault signal, universal output (configurable)
- ANALOGUE: Conductivity permeate (4 - 20 mA)

Optionally available

- Hardness control unit limitron and DOSIN AS-K dosing station with SAW drip tray
- Either PR permeate recirculation or KVP concentrate displacement with permeate
- MRA manual cleaning unit (as alternative to 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 softened feed water with drinking water quality or appropriately pre-treated well or surface water. 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 ₂)	< 25 mg/l
Silt density index (SDI)	< 3
Feed water temperature	5 – 25 °C
Feed water pressure	2 – 4 bar
Pressure fluctuation	± 0.5 bar

TECHNICAL DATA OF SERIES

Controller	PLC Siemens S7-1200
Desalination rate min.	98.5 %
Permeate recovery	85 – 90 %
Permeate back pressure max.	0.3 bar
pH value operation	3.6 – 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-S7 3000 KR/FU	5.5 / 3 x 380 - 500 / 50 - 60	DN 32 / DN 25 / DN 20	3,500 x 700 x 1,740	381 822
UO-S7 3500 KR/FU	5.5 / 3 x 380 - 500 / 50 - 60	DN 32 / DN 25 / DN 20	3,500 x 700 x 1,740	381 832
UO-S7 4000 KR/FU	7.5 / 3 x 380 - 500 / 50 - 60	DN 32 / DN 32 / DN 25	2,950 x 840 x 1,810	381 842
UO-S7 5000 KR/FU	7.5 / 3 x 380 - 500 / 50 - 60	DN 32 / DN 32 / DN 25	2,900 x 840 x 1,810	381 852
UO-S7 6000 KR/FU	7.5 / 3 x 380 - 500 / 50 - 60	DN 40 / DN 40 / DN 25	3,440 x 840 x 1,830	381 862
UO-S7 7000 KR/FU	7.5 / 3 x 380 - 500 / 50 - 60	DN 40 / DN 40 / DN 25	3,920 x 840 x 1,830	381 872
UO-S7 8500 KR/FU	11.0 / 3 x 380 - 500 / 50 - 60	DN 50 / DN 40 / DN 25	4,880 x 790 x 1,830	381 882
UO-S7 10000 KR/FU	11.0 / 3 x 380 - 500 / 50 - 60	DN 50 / DN 50 / DN 32	4,060 x 870 x 1,860	381 962
UO-S7 12000 KR/FU	11.0 / 3 x 380 - 500 / 50 - 60	DN 50 / DN 50 / DN 32	4,930 x 870 x 1,860	381 972
UO-S7 15000 KR/FU	15.0 / 3 x 380 - 480 / 50 - 60	DN 50 / DN 50 / DN 32	5,100 x 940 x 1,860	381 982