

# UO-D 750 - 1,700 P/FU

## Permeate-staged reverse osmosis units

The permeate-staged reverse osmosis is used for the desalination of softened water with a salinity of up to 1,000 mg/l. Due to the double-stage design, a permeate conductivity of approx. 5  $\mu\text{S}/\text{cm}$  is typically reached. The unit is equipped with one high-quality centrifugal pump with variable-speed drive (VSD = FU) for each stage. 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 (one controller per stage) 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 an optional Profinet interface.

### BENEFITS

- Conductivity permeate < 5  $\mu\text{S}/\text{cm}$
- Flexible installation in confined spaces
- Subsequent upgrade from standard to permeate-staged unit easy to carry out
- 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

### APPLICATIONS

- Desalination of softened water
- Ideal for applications with strict requirements on permeate conductivity (e.g. in surface technology, chemical industry, laboratory technology etc.)



UO-D 1250 P/FU

# UO-D 750 - 1,700 P/FU

## Permeate-staged reverse osmosis units

### DESCRIPTION

#### Permeate-staged reverse osmosis

- Two stainless steel base frames with plastic front
- Pre-filter RO (5 µm) with two glycerine-filled pressure gauges (first stage)
- Two high-pressure pumps with variable-speed drive (VSD = FU) as low-noise, multi-stage centrifugal type
- Low pressure elements with PA/PS composite membrane in stainless steel pressure vessels
- Two control cabinets with lockable main switch and power section for controlling pumps
- Unit incl. piping and wiring, connection of the two stages via hoses (pre-fitted hoses with screw fittings are included)
- 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 (first stage)
- Sampling valves for permeate and concentrate (first and second stage)
- Valves to regulate the flow rate of permeate and concentrate (first and second stage)
- Pressure sensors for pump feed pressure and operating pressure each stage
- Flow sensors for permeate and concentrate each stage
- Conductivity measurement of permeate with temperature compensation each stage

#### Two RO digital microprocessor controllers

- Fully automatic monitoring and control, easy menu navigation 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, 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

- Hardness monitoring device limitron
- HR modules to increase the desalination rate
- Profinet interface (one per stage required)

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## Permeate-staged reverse osmosis units

### 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 <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
Desalination rate min.	99.5 %
Permeate recovery stage 1	75 - 80 %
Permeate recovery stage 2	85 %
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 750 P/FU	2.2 + 2.2 / 3 x 400 + 3 x 400 / 50 - 60 + 50 - 60	DN 20 / DN 20 / DN 15	1,220 x 810 x 1,800	387 192
UO-D 1250 P/FU	2.2 + 2.2 / 3 x 400 + 3 x 400 / 50 - 60 + 50 - 60	DN 20 / DN 20 / DN 15	1,220 x 810 x 1,800	387 193
UO-D 1700 P/FU	4.0 + 2.2 / 3 x 400 + 3 x 400 / 50 - 60 + 50 - 60	DN 32 / DN 20 / DN 15	1,220 x 810 x 1,800	387 194