

## Reverse Osmose

Serie UO-D 1650-3300 ES



### Reverse Osmosis Units Series UO-D 1650 – 3300 ES

For desalination of hardness stabilised drinking water according to German drinking water regulations (free chlorine not detectable).

Over 40% energy savings due to ultra-low pressure membranes and high pressure pump with frequency converter.

Integrated permeate constant flow control PKR, control for antiscalant metering pump ASK, connection set for manual cleaning unit ARA, concentrate flushing device KSE and preparation for an injection point.



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## Series UO-D 1650-3300 ES

### Unit design

**Stainless steel main frame** with plastic front panel.

**Special inlet filter** with 5 µm-filter cartridge and 2 pressure gauges,

**high pressure pump with frequency converter** low noise, multi-stage centrifugal type,

**low energy spirally wound modules** with energy-efficient PA/PS composite membranes in GRP vessels with inliner.

**Valves** such as sampling valves for feed water and permeate (each vessel and total), inlet solenoid valve, valves to regulate the flow rate of permeate, concentrate and concentrate recirculation flow rate\*, permeate check valve for each pressure vessel.

**Pressure sensors** for pump feed pressure, operating pressure and concentrate pressure.

**Flow sensors** for permeate, concentrate and concentrate recirculation flow rate.

**Conductivity measurement** permeate with temperature compensation.

**Connection set** for cleaning device, T-piece for injection point, concentrate flushing device.

**Control cabinet** with lockable main switch, electrical switchgear for control of the high-pressure pump and antiscalant dosing unit.

\* except UO-D 3300 ES: no concentrate recirculation flow rate

The units are designed for a maximum TDS of 1,000 mg/l, a water temperature of 15°C, a maximum colloidal index of 3 and free permeate outlet.

Under these conditions, the unit still reaches design permeate flow after three years of operation. The permeate recovery depends on the raw water quality and the type of pre-treatment.



**Microprocessor control RO digital** for fully automatic monitoring and control of RO system. **Process visualization with central display of operational status and data (analogue and digital values )** and hours of operation on 4-line, backlit LCD text display. Simple menu-driven operation of the controller with 6 buttons.

**Automatic logging of relevant operating data** (analogue and digital data, 1960 data sets), storage interval programmable.

**Highest operational safety** due to adjustable alarms and limits of the operating parameters with selectable system response.

**Operating conditions:** permeate production, permeate rejection / recirculation, concentrate displacement / flushing, intermittent flushing when system is idle, shutdown by an external signal.

**Analogue inputs:** permeate conductivity (temperature compensated) permeate temperature, feed water, operating and concentrate pressure, flow rates of permeate and concentrate, calculated feed water flow, 2 additional programmable analogue inputs (e.g. for pressure, flow, level measurement).

**Digital Inputs:** (low voltage) for level control of permeate tank with 1 or 2 switches, hardness control unit; shutdown by an external signal, 3 universal inputs.

**Analogue outputs:** 2 universal outputs 4-20mA, e.g. for DDC.

**Digital outputs:** high-pressure pump, valve outputs 3x (24 VDC) for example for feed water, concentrate flushing, permeate rejection or recirculation, collective fault indication as a floating changeover contact, universal output.

**LED indicators** for power and fault, fault alarms as plain text in the display.

Technical Data		UO-D 1650 ES	UO-D 2200 ES	UO-D 2500 ES	UO-D 3300 ES
Permeate flow rate	l/h	1650	2200	2500	3300
Min. salt rejection	%	97	97	97	97
Recovery	%	75	75	75	75
Operating pressure	bar	10	10	10	10
Membrane element / number		4040/6	4040/8	4040/9	4040/12
Voltage	V/Hz	3 x 400/50	3 x 400/50	3 x 400/50	3 x 400/50
Motor power	kW	2.2	2.2	2.2	3.0
Height	mm	1650	1650	1650	1650
Width	mm	2550	2550	3550	3550
Depth	mm	700	700	700	700
Weight approx	Ca. kg	2540	330	350	390

Pre-fusing 16 A, Feed water connection DN 32, Permeate / concentrate connection DN 25, Conductivity range 2-200 µS/cm, Feed water pressure min./max. 2/6 bar, Feed water temperature min./max. 5 / 35 °C, Ambient temperature max. 40°C, pH-value 3 – 11

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