



Picture: UP 2200

## **UP 1500 – UP 3000** **RO + EDI Systems for ultra-pure water**

Vertical frame system for desalination of softened drinking water operating on the principle of reverse osmosis (RO) in conjunction with the electro-deionization method (EDI).

# UP 1500 – UP 3000

## RO + EDI Systems for ultra-pure water

### Unit design

**Stainless steel main frame** with plastic front panel housing the instruments and controls,

Special inlet filter with 5 µm filter cartridge, **high-pressure pump** low noise, multi-stage centrifugal type, **low energy spirally wound modules** with energy-efficient PA/PS composite membranes in GRP vessels with inliner, permeate recirculation subject to conductivity.

**Electro-deionization module** for continuous desalination of the RO permeate, consisting of a carefully designed robust housing containing a series of special ion selective membranes which create alternating concentrate and desalination chambers filled with mixed-bed ion exchanges resins. Two special electrodes are used to create an DC electric field across the chambers.

**Valves** such as sampling valves for feed water, RO permeate and EDI product, inlet solenoid valve, control valves made of stainless steel to regulate the flow rate of permeate, RO concentrate, RO concentrate recirculation and EDI concentrate.

**Pressure monitoring** vibration-resistant pressure gauges for inlet and outlet pressure, pre-filter, pump pressure, operating pressure, RO concentrate pressure, pressure EDI feed water, inlet pressure EDI concentrate, product output pressure, pressure switch for monitoring the feed water pressure,

**Flow meters** for permeate, RO concentrate, RO concentrate recirculation, EDI feed water, EDI concentrate, electrolyte, control of minimal EDI concentrate flow rate,

**Permeate conductivity measurement**, temperature compensated, measuring range 0 – 200 µS/cm,

**Product water resistivity measurement**, constant on-line with temperature compensation as defined by ASTM D 1125-95, measuring range 0 – 20 MΩ x cm.

**Control cabinet** with lockable main switch, **electrical**

**switchgear** for control of the high-pressure pump, **integral power supply** for supply of voltage to the EDI module

**RO 1000 microprocessor control system** for fully automated monitoring and control of the system with two line text display (16 characters per line) for display of **operational status**: permeate conductivity, temperature, operating hours, password-protected programming of the operating sequences.

**Malfunction displays** for low pressure feed motor overload, high conductivity.

**Additional connections**: Inputs (low voltage) for level control with 1 or 2 float switches, shut-down by external signal (forced stop, regeneration),

**Outputs** for Pretreatment (230 V/50 Hz), solenoid valves for permeate discard and -recycling, and DDC (collective malfunction signal on volt-free changeover contact).

Unit is completely wired, pre-assembled and ready for installation. Electrical equipment in accordance with VDE 0100 part 600, VDE part 1.

**Options**: Membrane degassing, dosing stations, concentrate flushing unit KSE, pipeworks in PP on request

The units are designed for softened feed water (< 0.1 °GH) with a maximum TDS of 1,000 mg/l, a water temperature of 15 °C, a maximum colloidal index of 3, a CO<sub>2</sub> content of 10 mg/l and a SiO<sub>2</sub> content of 20 mg/l. Under these conditions, the units still reach design product flow after three years of operation. The EDI product recovery depends on the raw water quality and the type of pre-treatment.

Technical data		UP 1500	UP 1700	UP 2200	UP 3000
Product flow rate	l/h	1,500	1,700	2,200	3,000
Resistivity EDI product (with free CO <sub>2</sub> )	MΩ x cm	5	5	5	5
Resistivity EDI product (without free CO <sub>2</sub> )	MΩ x cm	> 10	> 10	> 10	> 10
Recovery	%	70	70	70	70
Operating pressure	bar	15	16	16	16
Membrane element / number		4040 / 6	4040 / 6	4040 / 8	4040 / 11
Voltage	V/Hz	3 x 400/50	3 x 400/50	3 x 400/50	3 x 400/50
Power consumption	kW	4.1	7.1	7.1	7.8
Feed water connection	DN	32	32	32	32
Product water connection	DN	25	25	25	25
Waste water connection	HT	50	50	50	50
Height	mm	1,950	1,950	1,950	2,200
Width	mm	2,450	2,450	2,450	3,550
Depth	mm	850	850	850	850
Weight approx.	kg	320	330	400	600
Code no.		425 042	425 062	425 052	425 075

pH value feed water min./max. 5.0 / 9.5, feed water pressure min./max. 2/6 bar, feed water temperature min./max. 5/35 °C, ambient temperature max. 40 °C, pre-fusing max. 16 A