

UP-S7 550-20,000 FU

Ultrapure water units (RO + EDI)

The ultrapure water unit is used to produce diluate with a typical conductivity of $< 0.2 \mu\text{S}/\text{cm}$ by complete desalination of softened water according to the principle of reverse osmosis in combination with electrodeionisation (EDI). 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 enables visualisation of the unit as well as optimal control and evaluation of the unit operation. Optionally, data transfer via interfaces, remote access and subsequent expansion or adaptation of the control system are possible (on request at extra charge).

BENEFITS

- Very good permeate quality due to combination of RO and EDI (typ. conductivity $< 0.2 \mu\text{S}/\text{cm}$)
- No chemicals required, continuous operation without interruptions
- Convenient and user-friendly PLC S7-1200
- Equipment with VSD (FU) saves 30 - 50 % electricity cost, maintains permeate production constant and enables a longer lifespan as well as particularly quiet operation
- Permeate recycling PR included

APPLICATIONS

- For continuous diluate supply at high flows
- Ideal for applications with very strict requirements for permeate conductivity (e.g. pharmaceutical, power plant, microelectronics)
- Suitable for reduction of electricity cost



UP-S7 20000 FU

UP-S7 550-20,000 FU

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DESCRIPTION

Pure water system

- Base frame made of stainless steel, pre-filter RO (5 µm) with two glycerine-filled manometers
- High-pressure pump designed as a centrifugal pump
- Low-pressure element(s) with PA/PS composite membrane in GRP pressure vessel(s)
- Electrodeionisation (EDI) module(s) for continuous desalination of RO permeate
- Control cabinet with lockable main switch and rectifier for power supply to the EDI module(s)
- System piped and wired, electrical structure according to VDE 0100 Part 600, VDE 0113 Part 1
- System tested in our own test field, parameterised and preserved

Fittings and instrumentation

- Inlet solenoid valve and sampling valves for feed water, RO permeate and diluate
- Permeate valve for recirculation and conductivity-dependent permeate recirculation
- Valves for setting flow rates of concentrate recirculation, RO concentrate, EDI concentrate and electrode stream
- Pressure sensors and manometers for feed water pressure before and after the pre-filter
- Pressure sensors for operating pressure, RO concentrate, EDI feed water, EDI concentrate inlet, diluate outlet
- Flow sensors for RO feed water, permeate, EDI feed water, EDI concentrate and electrode stream
- Conductivity measurement of permeate with temperature compensation
- Resistance measurement diluate with temperature compensation acc. to ASTM D 1125-95, range 0 - 20 MΩ x cm

Programmable logic controller (PLC) Siemens S7-1200

- Fully automatic monitoring and control of the system with attractive visualisation
- Intuitive operation via 7" touchscreen and keys
- Languages of the plain text display: German / English / others on request for a surcharge
- Circular storage of the operating data and warning / fault messages on SD card (32 GB)
- Optimum operational safety through adjustable limit values with warning and error messages
- Password-protected programming of the operating parameters
- Siemens components and protocols in industry standard for high quality demands

Available inputs

- DIGITAL: external stop, hard water protection (hardness control device limitron), 2x level diluate tank start/stop (tank min/max) and 2x level dosing (pre-empty/empty, also as universal input if no dosing available)
- ANALOGUE: level diluate tank (4 - 20 mA)

Available outputs

- DIGITAL: Collective fault message, collective warning message, universal output (configurable)
- ANALOGUE: Resistance diluate, (4- 20 mA)

Optionally available

- Hardness control unit limitron and DOSIN AS-K dosing station with SAW drip tray
- CO₂ membrane degassing MEG (O₂ degassing or degassing for CO₂ > 30 mg/l on request)
- Interfaces Profinet, Profibus, Modbus RTU/TCP, BACnet; back-up/alternating/parallel RO operation; PP version

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CONDITIONS OF USE

The unit may only be used for the desalination of softened feed water (< 0,1 °dH) 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, a temperature of 15 °C and a CO₂ content of 10 mg/l as well as free diluate outflow. Under these conditions, the projected diluate output is achieved even after three years of operation. The diluate quality 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)	10 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	PLC Siemens S7-1200
Resistance diluate without CO ₂ binding	5 MΩ x cm
Resistance diluate with CO ₂ binding	10 MΩ x cm
Recovery	70 – 75 %
Diluate backpressure max.	0.5 bar
pH value operation	6.5 – 9.5
pH value cleaning	2.0 - 12.0
Ambient temperature	5 - 40 °C

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Product name	Mains connection	Hydraulic connection	Dimensions in mm	Item number
Diluate l/h	kW / V / Hz	feed/diluate/conc.	W x D x H	
UP-S7 550 FU	3.2 / 3 x 380 - 480 / 50 - 60	DN 20 / DN 20 / HT 50	1,040 x 840 x 2,000	425 006
UP-S7 800 FU	4.0 / 3 x 380 - 480 / 50 - 60	DN 20 / DN 20 / HT 50	1,040 x 840 x 2,000	425 016
UP-S7 1100 FU	4.5 / 3 x 380 - 480 / 50 - 60	DN 20 / DN 20 / HT 50	1,040 x 840 x 2,000	425 026
UP-S7 1500 FU	4.5 / 3 x 380 - 480 / 50 - 60	DN 25 / DN 20 / HT 50	1,040 x 840 x 2,000	425 036
UP-S7 2200 FU	7.3 / 3 x 380 - 480 / 50 - 60	DN 25 / DN 20 / HT 50	1,040 x 970 x 2,000	425 056
UP-S7 3000 FU	10.5 / 3 x 380 - 480 / 50 - 60	DN 32 / DN 25 / DN 25+15	3,470 x 820 x 1,880	425 086
UP-S7 4100 FU	12.5 / 3 x 380 - 480 / 50 - 60	DN 40 / DN 32 / DN 32+15	3,210 x 880 x 2,190	425 088
UP-S7 6000 FU	17.0 / 3 x 380 - 480 / 50 - 60	DN 50 / DN 40 / DN 32+15	3,860 x 880 x 2,200	425 090
UP-S7 8200 FU	18.5 / 3 x 380 - 480 / 50 - 60	DN 50 / DN 40 / DN 32+20	5,070 x 880 x 2,200	425 094
UP-S7 12500 FU	24.0 / 3 x 380 - 480 / 50 - 60	DN 50 / DN 50 / DN 50+20	5,070 x 1,190 x 2,160	425 096
UP-S7 20000 FU	40.0 / 3 x 380 - 480 / 50 - 60	DN 80 / DN 65 / DN 50+20	5,070 x 1,500 x 2,200	425 098