

ELECTRODIALYSIS LABORATORY UNIT P EDR-Z

BASIC DESCRIPTION

Laboratory unit P EDR-Z is suitable for laboratory tests of electro dialysis membrane process. It enables to carry out engineering activity focused on research or technology work in the course of treatment (desalination) of various solutions.

The unit is equipped with electro dialysis (ED) module EDR-Z/10-0.8 of desk type with 10 membrane pairs of heterogeneous RALEX® membranes and with possibility of polarity reversal electrodes. It can be also used for tests of electro dialysis with bipolar membrane (EDBM) on two circuit EDBM module.



UNIT PARTS

- ED module **EDR-Z/10-0.8** – with possibility of polarity reversal electrodes
- Tanks for product - diluate (D), concentrate (C) and electrode solution (E) placed in heating reservoir with connection to external thermostat
- Cells for pH, temperature and conductivity measurement of diluate and concentrate
- Flow-meters of diluate, concentrate and electrode circuit
- Chemically resistant pumps of diluate, concentrate, electrode solution
- Switch board with DC power supply

MODEL WITH AUTOMATIC VOLTAGE REGULATION ON ED MODULE – MANUALLY OPERATED

The processed solution (diluate), concentrate and electrode solution circulate through the unit in multipass regime – it means that the batch regime is possible. Each solution has its own storage tank, pump and distribution system (piping).

Important part is the electro dialysis module of EDR-Z type.

Pumps ensure circulation of solutions, while using potentiometers you can control power of pumps and flow rate of solutions (monitored by rotameters). After running through the electro dialysis module and the cell for pH and conductivity measuring, the solution returns back to the tank.

Power supply is ensured by connecting inputs from DC supply to module electrodes. With switch in “positive” position you can set the required voltage using the appropriate potentiometer. The actual voltage is shown on the display. Also the current running through the module is shown on the display.

APPLICATION SAMPLES

Desalination of various solutions and salt concentrates production by electro dialysis process:

- desalination of organics in water solutions: whey demineralization, wine stabilization, coolant recycling
- water production: demineralization of irrigation or utility water
- concentration of brines: brine concentration prior evaporation, recycling of inorganic fertilizers and another chemical compounds

P EDR-Z UNIT SPECIFICATIONS

Parameter	Value
Max. number of ED modules	1 pc
Reservoir volume	12 l
External tanks volume D, C, E	2x2; 1x0.25 pcs/l
DC power supply	30V /3A
Unit dimension (l x w x h)	780 x 420 x 800 mm
Unit weight without ED module	36 kg

MODULE SPECIFICATIONS

Parameter	Value
Effective area of ED module	1344 cm ²
Effective area of one membrane	64 cm ²
Number of membrane pairs in ED module	10 pcs
Anion-exchange membrane RALEX® AM(H)-PES	10 pcs
Cation-exchange membrane RALEX® CM(H)-PES	11 pcs
Spacer thickness	0.8 mm
Electrodes (anode, cathode) Ti+Pt	2 pcs
Hydraulic connection inner/ outer	∅ 6/8 mm
ED module dimension (l x w x h)	128 x 90 x 250 mm
ED module weight	1.5 kg

OPERATING AND LIMITING MODULE WORKING PARAMETERS

Parameter	Value
Operating voltage (on membrane pair)	1 – 1.2 V
Max. voltage	30 V
Max. electrical current	3 A
Operating flow rate D, C	45-65 l/h
Min. flow rate D, C	25 l/h
Operating flow rate E	50-60 l/h
Min. flow rate E	20 l/h
Operating temperature	20-30 °C
Min./max. temperature	10/35 °C

Capacity (batch process): 95 % desalination of 1 liter of 20g/l Na₂SO₄ takes about 45 minutes at the temperature of 25°C.