MemBrain®

MEMBRANE INNOVATION CENTRE

ELECTRODIALYSIS LABORATORY UNIT P EDR-Z

BASIC DESCRIPTION

Laboratory unit P EDR-Z is suitable ***for laboratory tests*** of electrodialysis 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 ordinarily equipped with electrodialysis (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 electrodialysis 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)
- 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 BUILT-IN MEASUREMENT AND CONTROL

The unit includes flow meters, conductivity sensors, pH sensors, temperature sensors, SW for continuous recording and control. It also measures electrical current and voltage. The measured parameters are stored in USB and can be transmitted to PC connected via ethernet. The unit can be controlled either directly via touch screen or remotely via a PC connected to the network.

APPLICATION SAMPLES

Desalination of various solutions and salt concentrates production by electrodialysis 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
Tanks volume D, C, E	2x2.5; 1x2.0 pcs/l
DC power supply	30V / 3A
Unit dimension (l x w x h)	930 x 1220 x 400 mm
Unit weight without ED module	53 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	Ø 8/12 mm
ED module dimension (l x w x h)	144 x 260 x 100 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 Na_2SO_4 takes about 45 minutes at the temperature of 25°C.