MemBrain®

MEMBRANE INNOVATION CENTRE

# ELECTRODIALYSIS LABORATORY UNIT P EDR-Z/4x

**BASIC DESCRIPTION**

Laboratory unit P EDR-Z/4x is multifunctional four-chamber equipment suitable ***for laboratory tests*** of electrodialysis membrane process, electrodialysis-metathesis or electrodialysis with bipolar membranes. It enables to carry out engineering activity focused on research or technology work in the course of treatment of various solutions.

**UNIT PARTS**

- ED module : four compartment module **EDR-Z/4x10-0.8** or module with bipolar membranes **EDBM-Z/10-0.8**
- Tanks for products - diluates (D1, D2), concentrates (C1, C2) and electrode solution (E) placed in heating reservoir wiht connection to external thermostat
- Flow-meters of diluate, concentrate and electrode circuit: 10-100 l/h
- Chemically resistant pumps of diluates, concentrates and 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 – the batch regime is possible. Each solution has its own storage tank, pump and distribution system (piping). Hydraulic section consists of 5 circulation sealless pumps (for diluates, concentrates and electrode solution), 5 storage tanks, 3-way valves, flow-meters, interconnecting hoses and tubes and cells for pH and conductivity electrodes. Important part is the EDBM module. 3-way valves are used for draining the solutions from tanks but also for connection of external tank. Pumps ensure circulation of solutions, you can control power of pumps and flow rate of solutions on Control Panel, flow is monitored by flow-meters. After running through the electrodialysis module, the solution returns back to the tank. Power supply is ensured by connecting inputs from DC supply to module electrodes. Measured parameters (voltage and current) are transmitted to the control system and displayed on the touch screen. No record and remote control. It is possible to connect mobile measurement sets and record pH, temperature and conductivity (offered as an option).

**APPLICATION EXAMPLES**

- production of acids and bases by EDBM in two or three compartment
    - organic acids: ex. formic, citric, gluconic, succinic, lactic, propionic, fumaric, amino acids
    - inorganic acids: ex. sulfuric
    - inorganic hydroxides: ex. sodium, potassium
- desalination/concentration by EDR
- cation and anion exchange in two salts by EDM

**P EDR-Z UNIT SPECIFICATIONS**

| Parameter | EDR-Z/4x |
|---|---|
| Max. number of ED modules | 1 pc |
| Reservoir volume | 27 l |
| Tanks volume D, C, E | 4x2; 1x0.25 pcs/l |
| DC power supply | 40V / 3A |
| Unit dimension (l x w x h) | 955 x 940 x 400 mm |
| Unit weight without ED module | 47 kg |

**MODULE SPECIFICATIONS**

| Parameter | EDBM-Z/3x10-0.8 | EDR-Z/4x10-0.8 |
|---|---|---|
| Effective area of ED module | 1984 $cm^2$ | 2624 $cm^2$ |
| Effective area of one membrane | 64 $cm^2$ | 64 $cm^2$ |
| Number of membrane cells | 10 pcs | 10 pcs |
| Anion-exchange membrane<br>RALEX® AM(H)-PES<br>RALEX® AM(H)-PP | <br>-<br>10 pcs | 20 pcs |
| Cation-exchange membrane<br>RALEX® CM(H)-PES<br>RALEX® CM(H)-PP | <br>-<br>11 pcs | 21 pcs |
| Bipolar membrane (PP) | 10 pcs | - |
| Spacer thickness | 0.8 mm | 0.8 mm |
| Electrodes (anode, cathode), Ti +Pt | 2 pcs | 2 pcs |
| Hydraulic connection inner/outer | Ø 6/8 mm | Ø 6/8 mm |
| ED module dimension (l x w x h) | 135 x 90 x 250 mm | 149 x 90 x 250 mm |
| ED module weight | 1.7 kg | 1.8 kg |

**OPERATING AND LIMITING MODULE WORKING PARAMETERS**

| Parameter | EDBM-Z/3x10-0.8 | EDR-Z/4x10-0.8 |
|---|---|---|
| Operating voltage (on membrane cell) | 2 - 3 V | 1 – 2 V |
| Max. voltage | 40 V | 40 V |
| Max. electrical current | 3 A | 3 A |
| Operating flow rate D, C | 35 – 60 l/h | 45 – 65 l/h |
| Min. flow rate D, C | 25 l/h | 30 l/h |
| Operating flow rate E | 50-60 l/h | 50-60 l/h |
| Min. flow rate E | 20 l/h | 20 l/h |
| Operating temperature | 20-30 °C | 20-30 °C |
| Min./max. temperature | 10/35 °C | 10/35 °C |