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Technical Data Sheet

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Lab-Scale Bipolar Membrane Electrodialysis Stack





General Product Information

Captura's Bipolar Membrane Electrodialysis (BMED) lab-scale stack is a flexible electrochemical platform designed to support membrane screening, feed compatibility testing, and early-stage process development. The system enables controlled conversion of salt-rich feed streams into acid and base while generating high-quality experimental data to inform pilot- and commercial-scale design. The lab-scale configuration is designed for rapid iteration within laboratory test rigs and is intended for research, development, and validation rather than continuous industrial operation.

Key Features

- Three-compartment BMED architecture (BPM, CEM, AEM) representative of Captura's commercial stack design
- Configurable cell count and active membrane area to support experimental design
- Designed for operation across a wide range of current densities and feed compositions
- Proprietary Captura membranes are made with PFAS-free chemistry
- Clean-in-place (CIP) compatible for simplified operation and maintenance
- Compatible with external power supplies, pumps, and instrumentation

Components and Materials Included

- Membranes (BPM, CEM, AEM) and spacers
- Ni electrodes
- PVC hydraulic blocks
- Bolts and hardware
- Electrical leads and plumbing connections

Not Included

- Power source
- Pumps, tanks, and filters
- Controls and sensors

These components are not included in the standard stack offering. Captura can provide guidance on selection or support in the design and build of a full system.

Technical Specifications of Captura's Lab-Scale BMED Stack[1]

Property	Typical Value	Unit
Stack type	Three-compartment BMED	
Number of cells	5 to 10	
Full stack dimensions	12 x 12 x 24 (L x W x H)	cm
Membrane dimensions	8 x 20	cm
Effective membrane area per type	177 to 355	cm^2
Operating current density	Up to 800	A/m^2
Stack voltage	Up to 20	V
HCl/NaOH generation rate	Up to 0.9	mol/h
HCl/NaOH concentration	0.5 to 1.0	M
Current efficiency	>80	%
Energy consumption[2]	<1.5	kWh/kg-NaOH

[1] The typical values shown in the table above are based on operation with a 0.5 to 1 M NaCl feed. Performance for alternative feeds and compositions can be evaluated on a project-specific basis.
[2]Energy consumption depends on feed salt composition and concentration, operating temperature, current density, product concentration targets, and system configuration.

Note: *Specifications and performance values provided are representative of typical operation and are subject to change based on system configuration, feed composition, and operating conditions. Final specifications are defined on a project-specific basis. This document is provided for evaluation and planning purposes only and does not constitute a final commercial specification.*

Contact

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