Membrane Solutions for the Laboratory

Laboratory Membrane System

The MMS Triple System is an easy to use batch laboratory membrane device for microfiltration, ultrafiltration, nanofiltration and reverse osmosis operations.

Applications such as fractionation, purification and concentration of molecules can be tested.

The Triple System is based on a unique designed flat-sheet cell for crossflow membrane testing up to 40 bar.

Key Features

• Speed control of circulation pump for variable membrane crossflow velocity
• High operating pressures
• Rapid screening of up to three membranes simultaneously
• Cooling/heating jacket on tank for temperature regulation
• Wide range of membranes available
• Optional ceramic test cell
• HMI interface with data logging

Further Information

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Applications

**Food & Extract Sector**
- Protein fractionation & concentration
- Extract fractionation & concentration
- Hydrolysate fractionation & concentration
- Sugar fractionation & concentration
- De-alcoholization of beer and wine
- Soya milk de-bittering

**Bio-Pharmaceutical Sector**
- Fermentation broth clarification
- Enzyme & protein concentration
- Peptide concentration & de-salting
- API purification & concentration
- Oligosaccharide purification & concentration
- Solvent recovery or exchange

**Natural Oils Sector**
- De-waxing
- De-colourization
- Purification
- Concentration
- Oil/water separation

**Aroma and Colorant Sector**
- Herbal extract fractionation & concentration
- Natural colour purification & concentration
- Aroma sterilization
- Aroma concentration
- Evaporator condensate treatment

**Chemical Sector**
- Acid/Caustic recovery
- Catalyst separation
- Solvent exchange & recovery
- Polymer purification & concentration
- Condensate water purification

**Biofuels Sector**
- Organic acid clarification & purification
- Organic acid concentration
- Sugar clarification & concentration
- Ethanol purification
- Condensate water recovery
# Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (L x W x H)</td>
<td>700 x 510 x 510 (mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>50 kg</td>
</tr>
<tr>
<td>Installed power requirement</td>
<td>0.18 kW (220/110V)</td>
</tr>
<tr>
<td>Number of membrane cells</td>
<td>3 (connected in series or parallel)</td>
</tr>
<tr>
<td>Membrane area/cell</td>
<td>28 cm²</td>
</tr>
<tr>
<td>Circulation pump</td>
<td>Speed controllable, magnetically coupled gear pump (CIP and SIP capability)</td>
</tr>
<tr>
<td>Permeate flow rate</td>
<td>1.5 – 7.5 ml/min (for flux values of 10 - 50 Lm⁻²h⁻¹)</td>
</tr>
<tr>
<td>Crossflow</td>
<td>0.5 – 2 L/min (equivalent to approx. 0.5 – 4 m/s)</td>
</tr>
<tr>
<td>Tubing</td>
<td>All tubing and fittings Mat. 316 L</td>
</tr>
<tr>
<td>Feed Tank</td>
<td>Stainless steel 316L, Volume 800 ml, heating/cooling jacket area 0.04 m²</td>
</tr>
<tr>
<td>System hold up volume</td>
<td>50 ml</td>
</tr>
<tr>
<td>Instruments</td>
<td>2 x Pressure transducers (0 – 50 bar)</td>
</tr>
<tr>
<td></td>
<td>1 x Temperature transducer (0 – 100 °C)</td>
</tr>
<tr>
<td></td>
<td>1 x Balance (0 – 2100 g, 0.1 g resolution)</td>
</tr>
<tr>
<td>Gaskets, Seals &amp; O-rings</td>
<td>EPDM (others on request)</td>
</tr>
<tr>
<td>Pressure rating</td>
<td>PN40, driving pressure created by compressed N₂</td>
</tr>
<tr>
<td>Temperature rating</td>
<td>5 – 80 °C (polystat required)</td>
</tr>
<tr>
<td>HMI</td>
<td>Touch panel for process control, indication of parameters and data logging</td>
</tr>
</tbody>
</table>

![Diagram of TripleSystem](image)
Triple System

Options

Diafiltration Kit
The System is equipped with an additional tank, which allows for continuous diafiltration.

Solvent Kit
Seals and O-rings of membrane cell and equipment will be delivered in solvent stable polymer.

Membrane Sheets

<table>
<thead>
<tr>
<th>Type</th>
<th>Specifications</th>
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</thead>
<tbody>
<tr>
<td>Microfiltration</td>
<td>0.05, 0.1, 0.2, 0.45 μm</td>
</tr>
<tr>
<td>Ultrafiltration</td>
<td>2.5, 3.5, 5, 10, 20, 50, 100 kDa</td>
</tr>
<tr>
<td>Nanofiltration</td>
<td>150, 300, 1000 Da</td>
</tr>
<tr>
<td>Reverse Osmosis</td>
<td>90%, 93% and 99% NaCl rejection</td>
</tr>
<tr>
<td>Ceramic - Microfiltration</td>
<td>0.1, 0.2, 0.45, 0.8, 1.4 μm</td>
</tr>
<tr>
<td>Ceramic - Ultrafiltration</td>
<td>15, 50 kDa</td>
</tr>
<tr>
<td>Ceramic - Nanofiltration</td>
<td>500 Da, 700 Da, 1000 Da</td>
</tr>
</tbody>
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