

TripleSystem

Tools enabling Innovation

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.

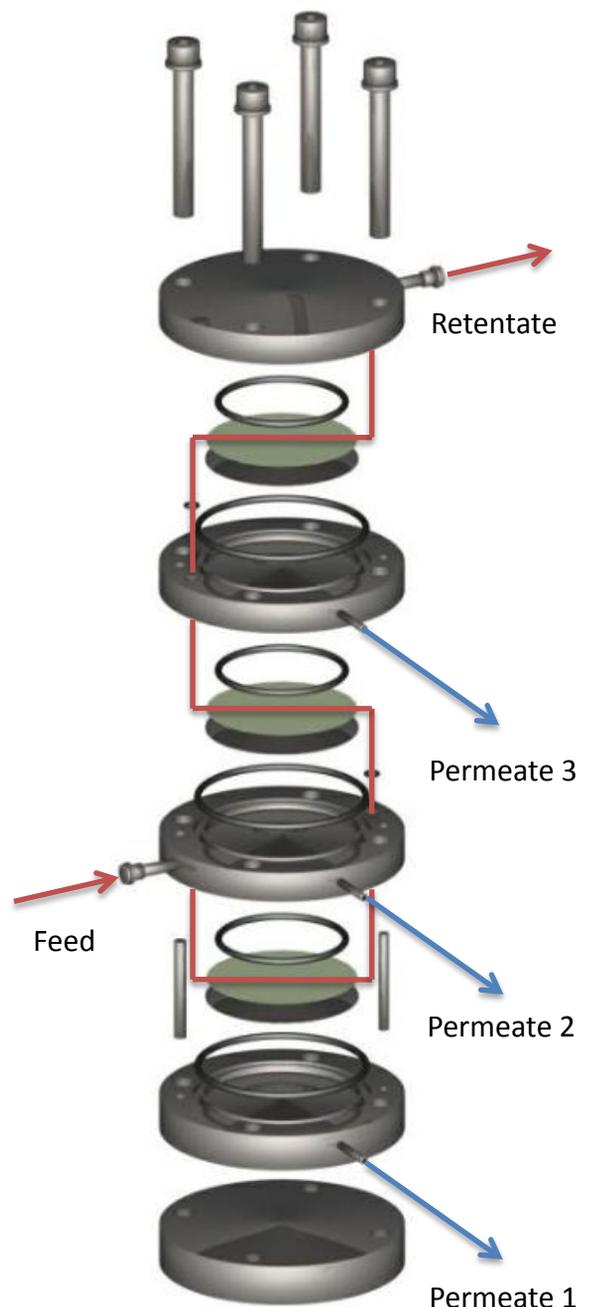
Key Features

- 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

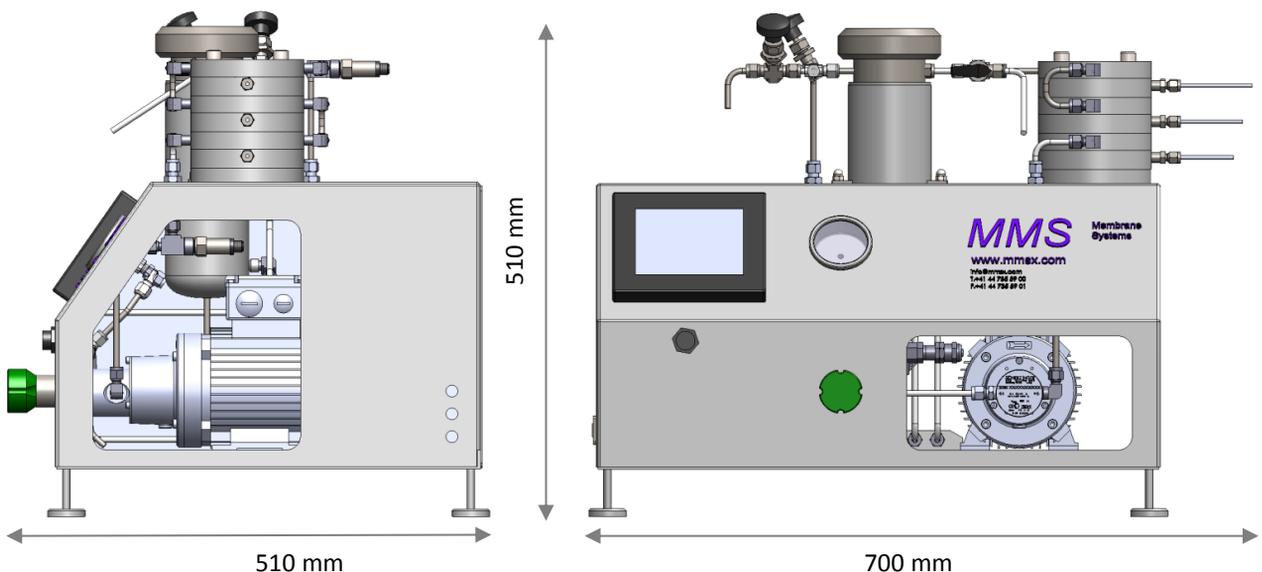


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Specifications

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



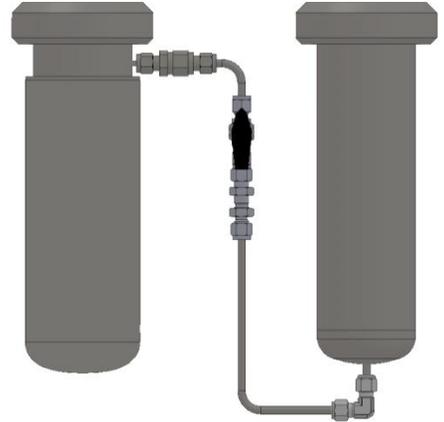
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Options

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

Microfiltration	0.05, 0.1, 0.2, 0.45 μm
Ultrafiltration	2.5, 3.5, 5, 10, 20, 50, 100 kDa
Nanofiltration	150, 300, 1000 Da
Reverse Osmosis	90%, 93% and 99% NaCl rejection
Nanofiltration - Solvent	150, 200, 300 Da
Ceramic - Microfiltration	0.1, 0.2, 0.45, 0.8, 1.4 μm
Ceramic - Ultrafiltration	15, 50 kDa
Ceramic - Nanofiltration	500 Da, 700 Da, 1000 Da

