



# Membrane evaluation systems

## About MEMS

**MEMS** is a spinoff brand from PHILoS; a prominent firm with 20+ years' expertise in membrane production and system design. It is renowned for its capabilities in delivering comprehensive solutions for various kinds of membrane applications. MEMS meanwhile, is now managed by PHILoS's sister firm Wellspring Expand.

**MEMS** focuses on adopting to customer's mind of work. We have developed our systems which are user friendly and convenient to use. With years of knowledge and experience behind us we are able to offer you the most advanced design and technology in membrane evaluation and manufacturing system. No matter the size, scale, usage or application, all of our customers will benefit from our experts' advice.

## MEMS proposal to customers

We have a long history of membrane research, manufacture, and engineering, and we know exactly what goes on in the lab. We have a greater understanding of the difficulties you face as researchers than anybody else, and we're here to help. While working with researchers, we have studied each of them attentively and attempted to comprehend the psychology of researchers. When doing research, we know that ease of use is the most important factor.

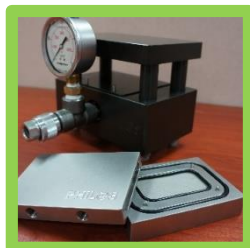
We have witnessed that, despite possessing pricey and properly functioning equipment, many researchers nonetheless employ poorly constructed equipment just because they are more comfortable to use. Most of the times, the pricier the system the more complicated it is and the more room it takes in the lab, while needing a lot of cleaning, and are not even suitable for acquiring desired results. As a result, we at MEMS have made it our duty to supply researchers and developers of membranes with the most user-friendly and convenient equipment. In order to overcome even the smallest obstacles, MEMS was established. So, at MEMS, we offer "A device that understands the researcher's mind" by adapting to the user mind of researchers via our years of expertise, observation, and realization. That's what we'd want to put forward to the community of researchers.



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# Flat sheet membrane evaluation systems

	FCD	FCR	FEU
	Flat sheet membrane permeation cell	Flat sheet membrane permeation cell	Flat sheet membrane evaluation system
	(Disk type)	(Rectangular type)	(UF)
<b>Membrane cell specification</b>	<ul style="list-style-type: none"> <li>- Operating Pressure ; Max 50kg/cm<sup>2</sup></li> <li>- Material ; stainless steel 316L</li> <li>- Membrane support ; sintered porous metal plates, 0.1μm</li> <li>- Membrane size ; 48mmD</li> <li>- Swagelok fitting</li> <li>- Manual hydraulic use</li> </ul>	<ul style="list-style-type: none"> <li>- Operating Pressure ; Max 69kg/cm<sup>2</sup></li> <li>- Material ; stainless steel 316L</li> <li>- Membrane support ; sintered porous metal plates, 0.1μm</li> <li>- Membrane size ; 165mmx122mm</li> <li>- Swagelok fitting</li> <li>- Manual hydraulic use</li> </ul>	<ul style="list-style-type: none"> <li>- Membrane cell quantity : 3 set</li> <li>- Operating Pressure ; Max 10kg/cm<sup>2</sup></li> <li>- Material ; stainless steel 304</li> <li>- Membrane support ; sintered porous metal plates, 0.1μm</li> <li>- Membrane size ; 25mmD</li> </ul>
<b>Feed Tank</b>			- Capacity : 20 liter
<b>Hight pressure pump</b>			<ul style="list-style-type: none"> <li>- Capacity : 10LPM x 7bar</li> <li>- Diaphragm type</li> </ul>
<b>Data logging</b>			<ul style="list-style-type: none"> <li>- Touch screen and data logging</li> <li>- Pressure gauge, flow transmitter, temperature detect</li> </ul>
<b>Heat exchanger</b>			- Temperature range ; 5 ~ 50°C
<b>Instrument</b>			- Pressure gauge, flow transmitter, flow sensor
<b>System power and control</b>			<ul style="list-style-type: none"> <li>- Main power ; 380V x 60Hz, 7kw</li> <li>- Auto steady pressure control</li> </ul>
<b>System dimension (mm)</b>			600 L x 650 W x 1,600 H



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# Flat sheet membrane evaluation systems

	FER	FEU3	FER3
	Flat sheet membrane evaluation system	Flat sheet membrane evaluation system	Flat sheet membrane evaluation system
	(SWRO)	(UF X 3 cell)	(SWRO X 3 cell)
<b>membrane cell specification</b>	<ul style="list-style-type: none"> <li>- Membrane cell quantity : 1 set</li> <li>- Operating Pressure ; Max 80kg/cm<sup>2</sup></li> <li>- Material ; stainless steel 316L</li> <li>- Membrane support ; sintered porous metal plates, 0.1μm</li> <li>- Membrane size ; 165mm x 122mm</li> </ul>	<ul style="list-style-type: none"> <li>- Membrane cell quantity : 3 sets</li> <li>- Operating Pressure ; Max 10kg/cm<sup>2</sup></li> <li>- Material ; stainless steel 304</li> <li>- Membrane support ; sintered porous metal plates, 0.1μm</li> <li>- Membrane size ; 25mmD</li> </ul>	<ul style="list-style-type: none"> <li>- Membrane cell quantity : 3 sets</li> <li>- Operating Pressure ; Max 80kg/cm<sup>2</sup></li> <li>- Material ; stainless steel 316L</li> <li>- Membrane support ; sintered porous metal plates, 0.1μm</li> <li>- Membrane size ; 165mm x 122mm</li> </ul>
<b>Feed Tank</b>	- Capacity : 20 liter	- Capacity : 50 liter	- Capacity : 50 liter
<b>Hight pressure pump</b>	<ul style="list-style-type: none"> <li>- Capacity; 33LPM x 40bar (hydra-cell pump)</li> <li>- Stainless steel 316 pump head and check valve</li> <li>- Diaphragm type</li> <li>- 5HP</li> </ul>	<ul style="list-style-type: none"> <li>- Capacity : 10LPM x 7bar</li> <li>- Diaphragm type</li> </ul>	<ul style="list-style-type: none"> <li>- Capacity; 33LPM x 40bar (hydra-cell pump)</li> <li>- Stainless steel 316 pump head and check valve</li> <li>- Diaphragm type</li> <li>- 5HP</li> </ul>
<b>data logging</b>	<ul style="list-style-type: none"> <li>- Touch screen and data logging (USB save)</li> <li>- Pressure gauge, flow transmitter, water temp.</li> </ul>	<ul style="list-style-type: none"> <li>- Touch screen and data logging (USB save)</li> <li>- Pressure gauge, flow transmitter, water temp.</li> </ul>	<ul style="list-style-type: none"> <li>- Touch screen and data logging (USB save)</li> <li>- Pressure gauge, flow transmitter, water temp.</li> </ul>
<b>heat exchanger</b>	<ul style="list-style-type: none"> <li>- Type ; Cooler</li> <li>- Temperature range ; 5 ~ 30°C</li> </ul>	<ul style="list-style-type: none"> <li>- Type ; Cooler</li> <li>- Temperature range ; 5 ~ 30°C</li> </ul>	<ul style="list-style-type: none"> <li>- Type ; Cooler</li> <li>- Temperature range ; 5 ~ 30°C</li> </ul>
<b>instrument</b>	<ul style="list-style-type: none"> <li>- Back pressure regulator : 1500PSI</li> <li>- Differential pressure, Concentrate flow auto control</li> </ul>	<ul style="list-style-type: none"> <li>- Pressure gauge, flow transmitter, turbine flow sensor</li> </ul>	<ul style="list-style-type: none"> <li>- Back pressure regulator : 1500PSI</li> <li>- Differential pressure, Concentrate flow auto control</li> </ul>
<b>System power and control</b>	<ul style="list-style-type: none"> <li>- Main power ; 380V x 60Hz, 7kw</li> <li>- Auto steady pressure control</li> </ul>	<ul style="list-style-type: none"> <li>- Main power ; 380V x 60Hz, 7kw</li> <li>- Auto steady pressure control</li> </ul>	<ul style="list-style-type: none"> <li>- Main power ; 380V x 60Hz, 7kw</li> <li>- Auto steady pressure control</li> </ul>
<b>System dimension (mm)</b>	1,150 L x 850 W x 1,700 H	600 L x 650 W x 1,600 H	1,350 L x 850 W x 1,700 H



# Hollow fiber membrane evaluation systems

	HEL	HEB	HEP	HEI
	Hollow fiber membrane evaluation system	Hollow fiber membrane evaluation system	Hollow fiber membrane pilot system	i-MBR concentration system
	(Lab, 1inch x 300 mm)	(Bench-scale, 2inch x 600mm)	(Pilot, 3~4inch x 1,000mm)	(Pilot, 2inch x 1,000mm)
<b>Membrane module</b>	- 1 inch x 300mmL - area : 0.045 ~ 0.1m <sup>2</sup>	- 2 inch x 600mmL - area : 0.7 ~ 1.5m <sup>2</sup>	- 3~4 inch x 1,000mmL - area : 3.5 ~ 10m <sup>2</sup>	2 inch x 1,000mmL
<b>Filtration mode</b>	inside out, outside in	inside out, outside in	inside out, outside in	outside in
<b>Operating pressure</b>	max 2 bar	max 2 bar	max 4 bar	1 bar ~ 760mmHg
<b>Pump type</b>	peristaltic pump : 2LPM	peristaltic pump 2LPM	Centrifugal pump : 100LPM	Sanitary Pump : 250LPM Diaphragm pump : 5LPM
<b>Feed and permeate tank</b>	- Capacity ; 1.5 L	- Capacity ; 20 L	- Capacity ; 100 L	- Capacity ; 40 L
<b>Blower</b>	- 10L/min	- 40L/min	- 40L/min	- 40L/min
<b>Instrument</b>	- pressure gauge - Air flow meter - Water flow meter	- pressure transmitter - Water flow sensor - Air flow meter	- pressure transmitter - Water flow sensor - Air flow meter	- pressure transmitter - Water flow sensor - Air flow meter
<b>Data logging</b>	none	- pressure, feed and permeate flow - PLC program - 7" touch screen	- pressure, feed and permeate flow - PLC program - 7" touch screen	- pressure, feed and permeate flow - PLC program - 7" touch screen
<b>System power and control</b>	- Timer control (on/off) - manual control	- Constant flow and static pressure control	- Constant flow and static pressure control	- Constant flow and static pressure control
<b>System dimension (mm)</b>	300 L x 500 W x 600 H	500 L x 600 W x 900 H	300 L x 500 W x 600 H	300 L x 500 W x 600 H



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## MBR test systems

	MBL	MBA
	Lab MBR system	Lab MBR system
	(Lab MBR feasibility test, 2 inch x 300mm)	(Automatic Lab MBR test system)
<b>Membrane module</b>	<ul style="list-style-type: none"> <li>- Submersible MBR</li> <li>- Module dimension ; 2 inch D x 300mm L</li> <li>- Membrane ; PVDF(Braid composite membrane)</li> </ul>	<ul style="list-style-type: none"> <li>- Submersible MBR</li> <li>- Module dimension; 230 L x 80 W x 900 H (mm)</li> <li>- Membrane ; PVDF(Braid composite membrane)</li> </ul>
<b>System (pump and tank)</b>	<ul style="list-style-type: none"> <li>- Suction pump (diaphragm) : 25cc/min</li> <li>- Air blower : 40L/min x 0.15kg/cm<sup>2</sup></li> <li>- MBR tank : acrylic, 200 x 140 x 530H</li> </ul>	<ul style="list-style-type: none"> <li>- Suction &amp; back washing pump : 5 L/min</li> <li>- Feed tank(SUS304) with sight glass, 200L</li> <li>- Permeate &amp; back washing tank (SUS304), 100 L</li> <li>- Blower capacity ; 160 L/min</li> <li>- Constant pressure, constant flow control</li> <li>- Automatic back-wash and aeration</li> </ul>
<b>Instrument</b>	<ul style="list-style-type: none"> <li>- Flow indicator</li> <li>- Pressure gauge</li> <li>- Level sensor</li> </ul>	<ul style="list-style-type: none"> <li>- Digital pressure transmitter; -760 mmHg~4 kg/cm<sup>2</sup></li> <li>- Turbine flow sensor ; 250 ~ 9,000 mL / min (water), 200 L/min (air), Accuracy ; ± 0.5%</li> <li>- Level sensor, temperature transmitter</li> <li>- Electric control SUS304 ball valve</li> <li>- Material ; SUS304, PTFE</li> </ul>
<b>Electrical control panel</b>	<ul style="list-style-type: none"> <li>- Level control, timer control on/off</li> </ul>	<ul style="list-style-type: none"> <li>- Touch screen control and data logging system</li> <li>- PLC control panel</li> <li>- Programming work</li> </ul>
<b>Dimension (mm)</b>	680 L x 300 W x 950 H	2,000 L x 1,000 W x 1,700 H



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