

The Membrane Contactor that you have purchased can be damaged through improper handling and storage. The following guidelines are intended to provide a framework for successful storage of these contactors. If you have any questions, please contact your Membrana representative.

**Handling.** Proper handling of contactors is critical. Care must be taken not to hit or jar (shock) the contactor to minimize the possibility of internal damage. It is recommended that the contactors be stored in a dry, heat-sealed plastic bag or shrink wrap material [0.076 mm (0.003 in.) wall thickness] in their original box.

**Temperature.** Store the contactor dry in their original boxes at temperatures not to exceed 49°C (120°F). Contactors stored at very low temperatures < 5°C (41°F) should be allowed to equilibrate to room temperature prior to introducing water.

**Humidity.** It is recommended that contactors be stored at low to moderate humidity levels (< 60% relative humidity).

**Exposure to Sunlight.** Contactors should not be stored where they are exposed to direct sunlight. Contactors should always be stored in sealed bags, or shrink wrap material, in the original box or other opaque box.

Manufactured with Sound Engineering Practice per Article 3, paragraph 3 of 97/23/EC.

# MicroModule®



This product is to be used only by persons familiar with its use. It must be maintained within the stated limitations. All sales are subject to Seller's terms and conditions. Purchaser assumes all responsibility for the suitability and fitness for use as well as for the protection of the environment and for health and safety involving this product. Seller reserves the right to modify this document without prior notice. Check with your representative to verify the latest update. To the best of our knowledge the information contained herein is accurate. However, neither Seller nor any of its affiliates assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of the suitability of any material and whether there is any infringement of patents, trademarks, or copyrights is the sole responsibility of the user. Users of any substance should satisfy themselves by independent investigation that the material can be used safely. We may have described certain hazards, but we cannot guarantee that these are the only hazards that exist.

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**SERVICE QUESTIONS:** Contact your OEM or your Membrana representative.

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# MicroModule®

## START - UP PROCEDURES for 0.5 x 1 flat and 0.75 x 1 Contactors

## START- UP PROCEDURES

### Steps:

1. Mount contactor as shown below.
2. Refer to start-up procedures below for each mode of operation.

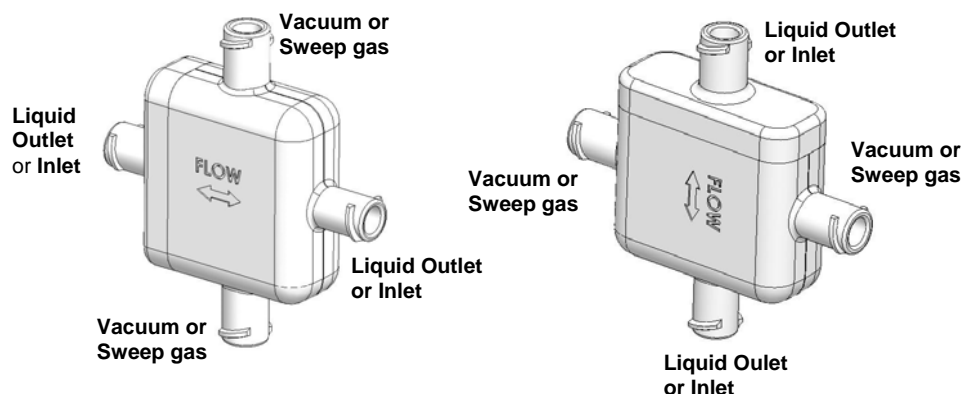
## Membrane Contactors

### NOTES:

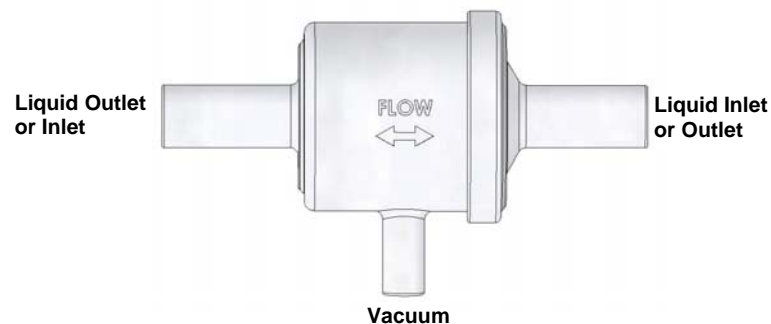
- The liquid pressure should always be higher than the gas phase pressure inside the contactor.
- Liquid Flow is always on the shell side in SuperPhobic® devices.

## CORRECT MOUNTING POSITION AND PORT IDENTIFICATION

### 0.5 x 1 Flat MicroModule®



### 0.75 x 1 MicroModule®



## START- UP PROCEDURES

### A. General start-up instructions for the liquid phase

**Note:** The gas/vacuum port should not be closed off during operation.

1. Connect the liquid in/out ports and the vacuum port as shown in the diagrams above.
2. Slowly introduce liquid to the contactor, making sure that the liquid inlet pressure and liquid flow rate through the contactor never exceed the respective maximum operating limits: If using a SuperPhobic device, the liquid must flow on the shellside. (Labeled with Liquid Inlet/Outlet above).

Product	Maximum Pressure*	Maximum Flow Rate
0.5 x 1	3.1 bar, 25° C (3.2 kg/cm <sup>2</sup> , 45 psig, 77° F)	30 ml/min
0.75 x 1	3.1 bar, 25° C (3.1 kg/cm <sup>2</sup> , 45 psig, 77° F)	200 ml/min

\* using 50 torr (mm Hg) vacuum on lumenside.

3. Adjust liquid flow rate and inlet pressure to the desired levels by adjusting the appropriate valves on the system.

### Vacuum Mode

1. Start vacuum pump following vacuum pump manufacturer's instructions.
2. Apply vacuum to the contactor by opening appropriate valve. You may pull vacuum from one gas port or both gas ports of the 0.5x1 module.
3. Adjust absolute gas pressure on the vacuum side to the desired level at the vacuum port on the contactor.

### Sweep Mode (applies only to the 0.5 x 1 Module)

**Note:** Sweep gas should be introduced at the top lumen port.

1. Set the gas pressure in the contactor to the lowest possible level by adjusting the appropriate valve in the gas delivery system.
2. Set the recommended sweep flow rate by adjusting the appropriate valves. The typical sweep gas flow rate range for the 0.5 x 1 is 50-500 std. cc/min.
3. Introduce sweep gas into the contactor.

**Note:** If using compressed air, make sure it is oil free and air temp is < 20°C. A 0.2 micron filter is recommended with any gas.

### Combo Mode (applies only to the 0.5 x 1 Module)

1. Set the gas delivery pressure to the contactor at ≤ 1 psig (0.07bar, 0.07 kg/cm<sup>2</sup>) by adjusting the appropriate regulator on the gas delivery system.
  2. Set the recommended sweep flow rate by adjusting the appropriate valve. The typical sweep gas flow rate range for using the 0.5 x 1 in combo mode is 10-100 Std cc/min.
  3. Introduce sweep gas into each contactor.
- Note:** If using compressed air, make sure it is oil free and air temp is < 20°C. A 0.2 micron filter is recommended with any gas.
4. Apply vacuum as described in the vacuum section.