The SuperPhobic® 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 to prevent the introduction of contaminants into the contactor.

Temperature. Store contactors 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.

SuperPhobic® MEMBRANE CONTACTORS

Certified System

ISO 9001
ISO 14001

SERVICE QUESTIONS: Contact your OEM or your Membrana representative.

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A POLYPORE Company

SuperPhobic® MEMBRANE CONTACTORS

START - UP PROCEDURES

for 1 x 3 and 2 x 6 Radial Flow Contactors

MEMBRANA
A POLYPORE Company

Steps:

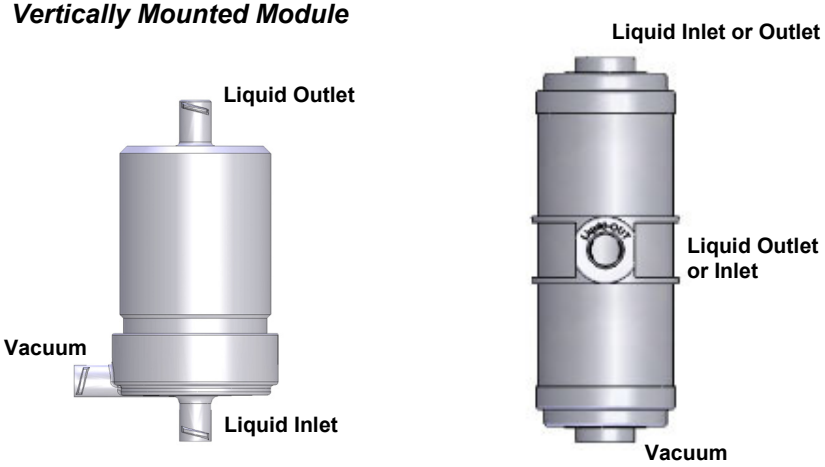
1. Mount contactor vertically or horizontally.
2. Refer to the start-up procedures below. Both contactors operate in vacuum only mode so the start-up is the same for both products. Just be certain to correctly connect the liquid and vacuum ports as shown in the illustrations below.

NOTES:

- The liquid pressure should always be higher than the gas phase pressure inside the contactor.
- Liquid must flow on the shell side (outside) of the fiber.
- The Liquid and Vacuum port identifications are engraved on the 2x6 contactor.
- Incoming fluid should be prefiltered at 10 μm.

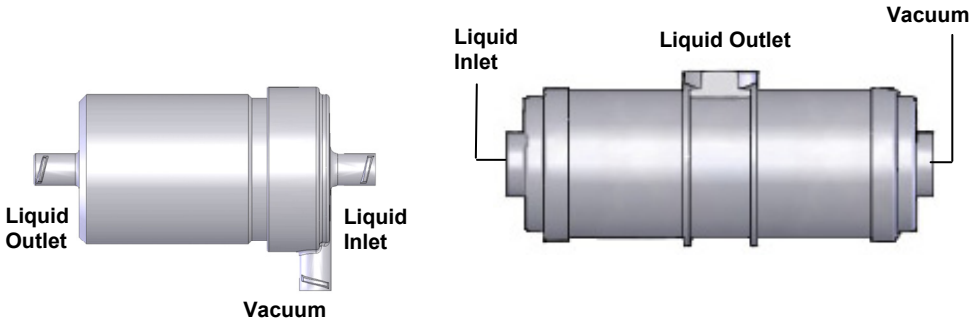
THE OPERATING MODE IS VACUUM ONLY FOR BOTH DEVICES

Vertically Mounted Module



1 x 3 **2 x 6**

Horizontally Mounted Module



1 x 3 **2 x 6**

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 inlet/outlet ports and the vacuum port as shown in the illustrations above. For 2x6, either liquid port can be used for the inlet.
2. Slowly introduce liquid into the contactor, making sure that the liquid inlet pressure and liquid flow rate through the contactor never exceed the respective maximum operating limits: The liquid must flow on the shellside of a SuperPhobic Contactor. (Labeled with Liquid Inlet/Outlet above).

Product	Maximum Pressure*	Maximum Flow Rate
1 x 3	25° C, 3.1 bar (77° F, 3.2 kg/cm^2, 45 psig)	60 ml/min
	40° C, 1.0 bar (104° F, 1.1 kg/cm^2, 15 psig)	
2 x 6	4.1 bar, 25° C (4.2 kg/cm^2, 60 psig, 77°F)	1000 ml/min

* using 50 torr (mm Hg) vacuum on vacuum port.

3. Adjust the 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 the vacuum pump manufacturer's instructions.
2. Apply vacuum to the contactor by opening appropriate valve.
3. Adjust absolute gas pressure on the vacuum side to the desired level at the vacuum port on the contactor (absolute pressure depends on gauge vacuum as well as barometric pressure).

A general rule of thumb regarding the minimum vacuum pressure is to maintain a vacuum level such that the absolute pressure on the vacuum side of the membrane is higher than the vapor pressure of the most volatile component in the liquid (water or solvent, etc.) at the operating temperature.

For example: if an ink is water based and the operating temperature is 25 C, the water vapor pressure would be around 20-22 torr (mm Hg) absolute. If this is the case, then the absolute pressure on the vacuum side should be around 25-30 torr, no lower. Normally, we would suggest pulling a vacuum no deeper than 30 torr.