

SAFETY INFORMATION

⚠ **WARNING** - To reduce the risks associated with bursting or exposure to chemicals which, if not avoided, could result in serious injury or death:

- Do not exceed maximum operating pressure or temperature limits.
- Implement workplace safety risk controls in accordance with all applicable local and government regulations.
 - Where there are two lumen ports, ensure that one port is open during operation. For contactors that have only one gas/vacuum port, ensure that it is not blocked during operation.

NOTICE - To reduce membrane contactor or system damage:

- In operation, if the membrane contactor is used with air sweep, then the temperature should not exceed 35°C (95°F). For membrane contactors used with vacuum only this statement does not apply.
- Care must be taken not to drop, hit or impact the contactor to minimize the possibility of product damage.
- 3M™ Liqui-Cel™ Membrane Contactors should be stored dry and in a sealed plastic bag or shrink wrap material to help prevent the introduction of contaminants into the contactor.
- Store 3M™ Liqui-Cel™ Membrane Contactors dry at temperatures < 49°C (120°F). Membrane contactors stored at very low temperatures < 5°C (41°F) should be allowed to equilibrate to room temperature before use.
- 3M™ Liqui-Cel™ Membrane Contactors should be stored in their original box, or other opaque box, and should not be installed where they are exposed to direct sunlight.
- Do not allow membrane contactors containing X40, X50 or X1ND hollow fiber membrane to come into contact with surfactants or organic solvents, such as pure alcohols, glycol, acetone, etc., to reduce the risk of membrane wet out.
- Cumulative exposure of the membrane to oxidants, such as ozone, chlorine, hydrogen peroxide, peracetic acid, etc., should be restricted to reduce the risk of membrane oxidation.
- Filtered, de-chlorinated, and deionized water is recommended for mixing cleaning solutions. If a pH shift occurs water containing sparingly soluble compounds of Ca, Mg, Fe, Al, etc. and silica (SiO₂) etc. could precipitate from the solution and block or damage the membrane. Ensure that your water is clean of these compounds.
- At end of life, dispose of the membrane contactor or cartridges in accordance with all applicable local and government regulations.

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ISO 9001

3M

Liqui-Cel™

Membrane Contactors

Start-up Procedures for 3M™ Liqui-Cel™ MM 0.5×1 and 0.75×1 Series Membrane Contactors

Prior to any start-up procedure, proper installation is required.

Please read, understand, and follow all operating and safety information contained in this guide and the product data sheet prior to using this membrane contactor. Additional general operating information for membrane contactors can be found in the Operating Guide and should also be reviewed prior to using this membrane contactor. These documents are available at 3M.com/Liqui-Cel. Download and retain the instructions for future reference.

3M

Separation and Purification Sciences Division

13840 South Lakes Drive
Charlotte, North Carolina
28273 USA
Phone: +1 980 859 5400

3M Deutschland GmbH Separation and Purification Sciences Division

Öhder Straße 28
42289 Wuppertal Germany
Phone: +49 202 6099 - 0
Fax: +49 202 6099 - 241

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3M.com/Liqui-Cel

Steps:

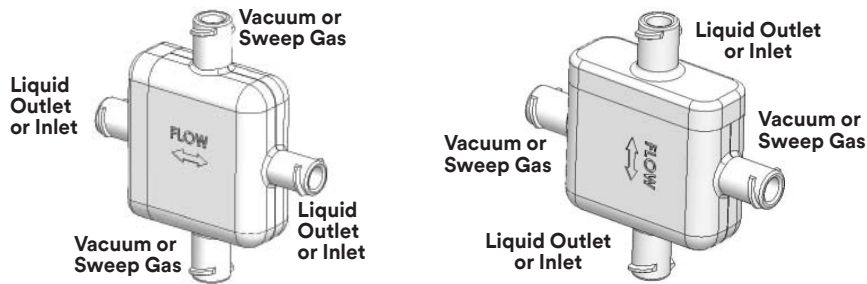
1. Mount contactor as shown below.
2. Refer to start-up procedures below for each mode of operation.

Notes:

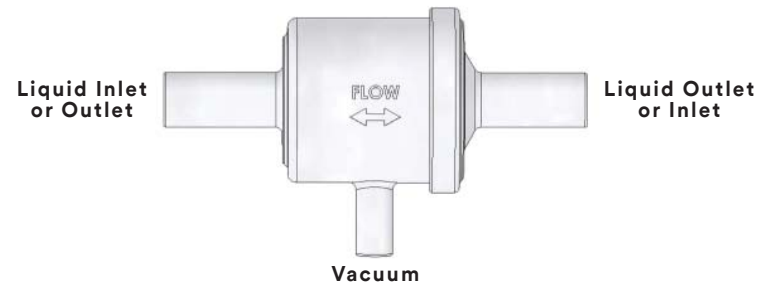
- The liquid pressure should always be higher than the gas pressure inside the contactor.
- Liquids entering the membrane contactor should be prefiltered at 5 micron absolute at 99.9% removal (beta 1000).
- Gas entering the contactor should be filtered at 0.2 micron absolute at 99.9% removal (beta 1000) for high-purity applications. Filtration at 1 micron absolute at 99.9% removal (beta 1000) may be sufficient for industrial applications.
- Upon initial start-up, flush all pipes to drain prior to introducing liquid into the membrane contactors.
- The vacuum pump and/or sweep gas should be on at all time unless the membrane contactors are completely drained.
- Liquid flows on the shellside in these 3M™ Liqui-Cel™ MM Membrane Contactors.

Correct Mounting Position and Port Identification

MM-0.5×1 Series



MM 0.75×1 Series



Start-up Procedures

A. General start-up instructions for the liquid phase

Note: Liquid flows on the shellside. The liquid pressure should always be higher than the gas phase pressure inside the contactor.

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.

Product	Maximum Pressure*	Maximum Flow Rate
0.5 × 1	3.1 barg, 25°C (45 psig, 77°F)	30 ml/min
0.75 × 1	3.1 barg, 25°C (45 psig, 77°F)	200 ml/min

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

B. General start-up instructions for the sweep (strip) gas and vacuum phase.

Sweep (Strip) Gas Mode

(applies only to the 0.5 × 1 Contactor)

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 × 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 < 35°C. A 0.2 micron filter is recommended with any gas.

Sweep (Strip) Gas with Vacuum (Combo) Mode

(applies only to the 0.5 × 1 Contactor)

1. Set the gas delivery pressure to the contactor at ≤ 1 psig (0.07 barg) 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 × 1 in combo mode is 10-100 Std cc/min.
3. Introduce sweep gas to the contactor.

Vacuum Only 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 0.5 × 1 module.
3. Adjust absolute gas pressure on the vacuum side to the desired level at the vacuum port on the contactor.