FLUIGENT Degasser Device for Microfluidic System User Manual

Contents

FLUIGENT Degasser Device for Microfluidic System

Technical Specifications

- Compatible with a wide range of liquids
- Maximum pressure: 7 bar (1mPA, 100 psig)
- Maximum flow rate: 10 mL/min
- Can connect up to 6 Degassers to one vacuum source

Product Overview
The Degasser creates a low-pressure environment for slower flowing liquids, removing dissolved gas in the liquid to influence fluid behavior and reaction outcomes.

Quick Start Guide
Liquid Connection

1. Position the Degasser in the fluid path before critical components.
2. Connect liquid ports to microfluidic setup.
3. Use gastight tubing and fittings suitable for solvents.
4. Ensure tubing end is flat.
5. Tighten plastic connectors by hand.

Vacuum Connection

1. Connect two 6mm OD pneumatic tubing to each vacuum port.
2. Use a tee connection between the two tubes and connect a 4mm OD pneumatic tubing.
3. Connect the 4mm tubing to the negative pressure output of the vacuum.
4. Maximum pressure should not exceed 7 bars.

Degasser Priming

1. Connect vacuum to power source set at maximum pressure (-1 bar).
2. Test the system for correct operation and secure connections before starting the experiment.
3. Recommended flow rate is up to 2 mL/min for optimal efficiency

FAQ

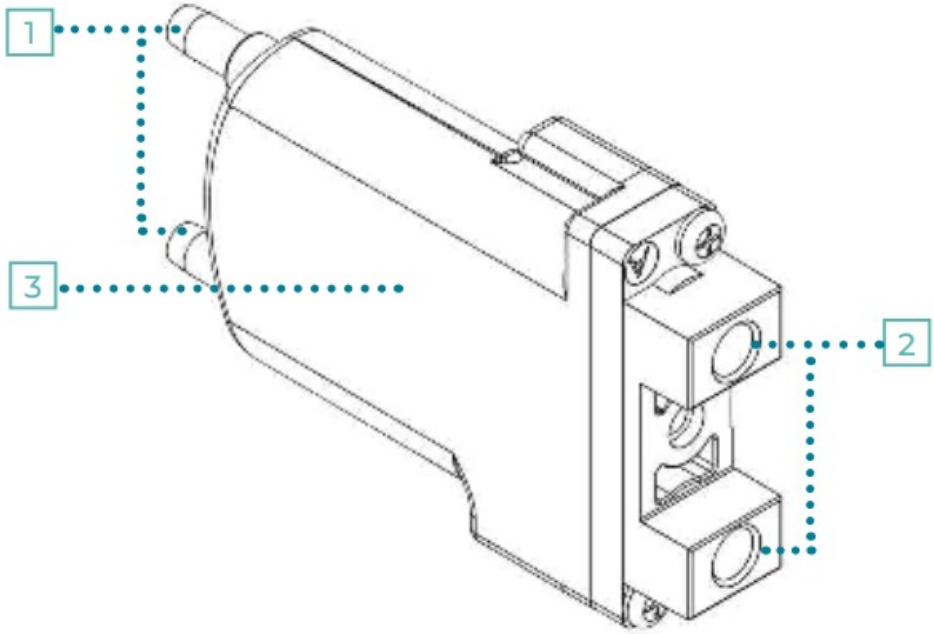
- **How many Degassers can be connected to one vacuum?**
  You can connect up to 6 Degassers to one unique vacuum or negative pressure source for the same experiment or run parallel experiments.
- **How can the Degasser be integrated into the circuit of a microfluidic experiment?**
  The Degasser should be positioned before critical components to remove dissolved gases and bubbles from the fluid before reaching those components.
- **Is it possible to remove already formed bubbles with the Degasser?**
  Yes, the Degasser is efficient at removing air bubbles within the optimal degassing flow rate range of 0 to 2 mL/min.

USER'S MANUAL
DEGASSER

The user's manual starts on the next page:
Allowing one to get the most out of the Degasser device.

PRODUCT OVERVIEW

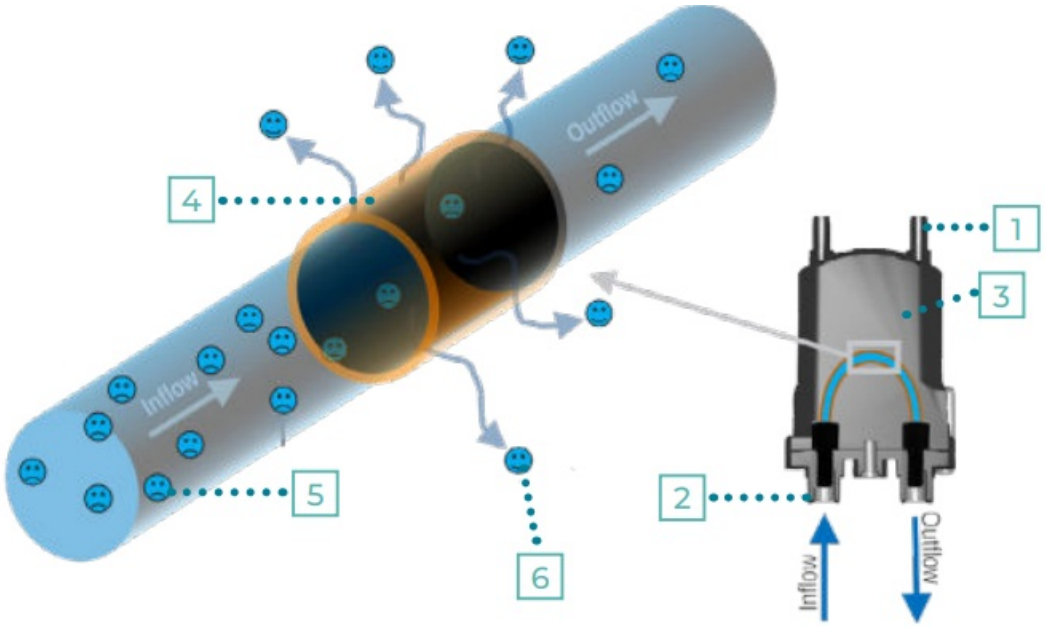
The Degasser is a high-efficiency in-line system that is designed to remove dissolved gases and already formed bubbles from a wide variety of solvents. The degasser is easy to use, provides reliable continuous operation, and eliminates the need for helium sparging to remove gases. The low internal volume of the Teflon AF® tubing used in the degasser provides for quick equilibration and very short startup times, compared to the use of a degasser which uses PTFE® degassing channels that has the same degassing efficiency.



PRODUCT OVERVIEW

1. Vacuum port used with vacuum pomp
2. Liquid port compatible with ¼-28 UNF Flat-Bottom for 1/16″ OD
3. Vacuum chamber an enclosed space, emptied of air and gases by a pump, creating a low-pressure environment.
4. Degassing membrane section Teflon AF® ensure performant degassing for slower flowing liquids and are compatible with a wide range of liquids

5. Dissolved gas in liquid significantly influence fluid behavior and reaction outcomes.
6. Removed gas in vacuum space the lower pressure inside the chamber than outside enables continuous gas removal

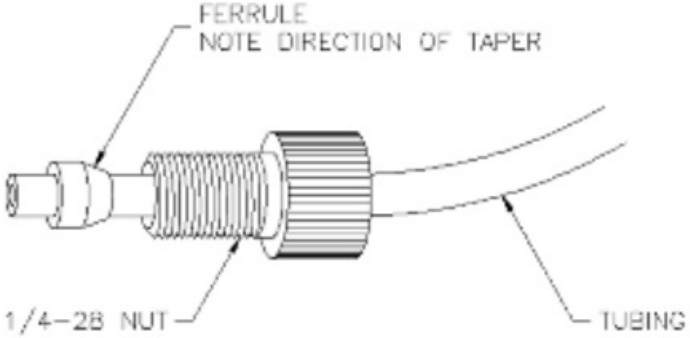


The critical component of the Degasser is a short length of Teflon AF® tubing through which the solvent flows. This tubing is located in a chamber in which a partial vacuum is maintained by a vacuum pump which is constantly running at a low speed. Dissolved gasses migrate across the tubing wall under a concentration gradient produced by the vacuum as the solvent flows within the tubing in accordance with Henry's law. The gases are expelled from the system and the chamber is maintained at a constant, preset vacuum level by varying the vacuum pump speed as needed.

QUICK START GUIDE

TUBING CONNECTION

Position the Degasser in the fluid path of your microfluidic experiment, before any critical components of your experiment
Connect the liquid ports of the fluid degasser to your microfluidic setup a can be used for this purpose.
Push the tubing through the PEEK, 1/4-28 Flat-Bottom for 1/16″ OD and slide a ferrule over the tubing end as shown in the figure just bellow.

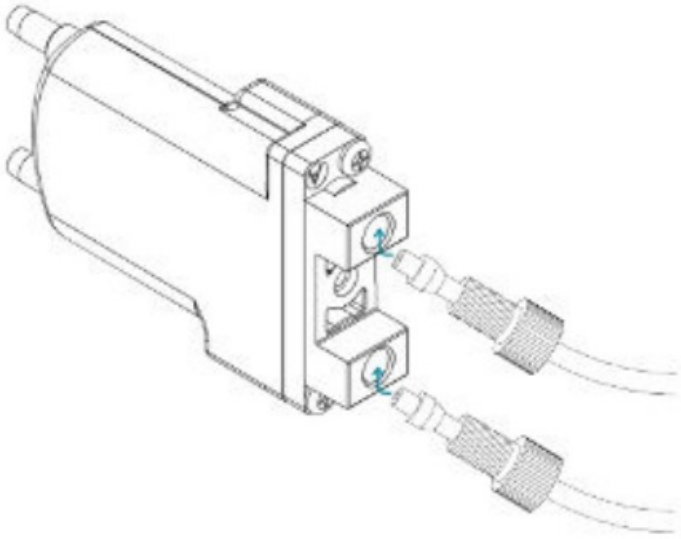


¼-28 Nut, Ferrule and Tubing

Make certain that gastight tubings and fittings are employed that are capable of handling solvents that is going to be used.

- Make sure that the end of your tubing is not angled. If not, cut it so the end I flat.
- Screw the ¼-28 fitting into a port on the front of the degasser.
- The direction of flow through the degasser is not critical

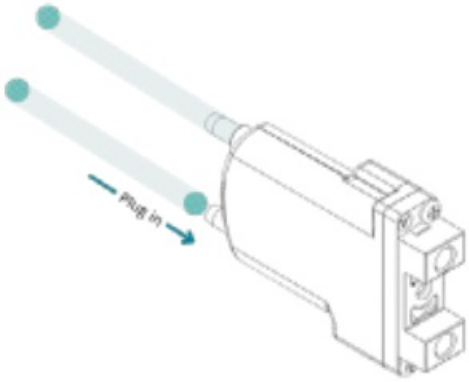
The plastic connectors should be tightened by hand. Do not overtighten the fittings as that will damage the threads.



SETTING UP

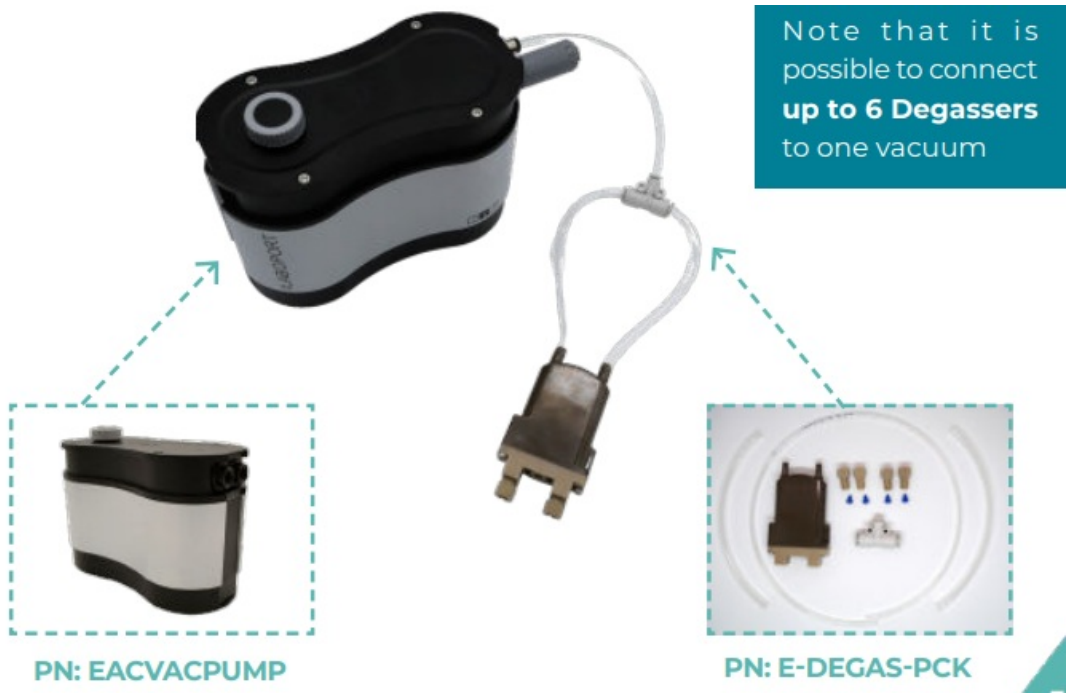
VACUUM CONNECTION

Connect two pieces of 6mm OD pneumatic tubing into each vacuum port



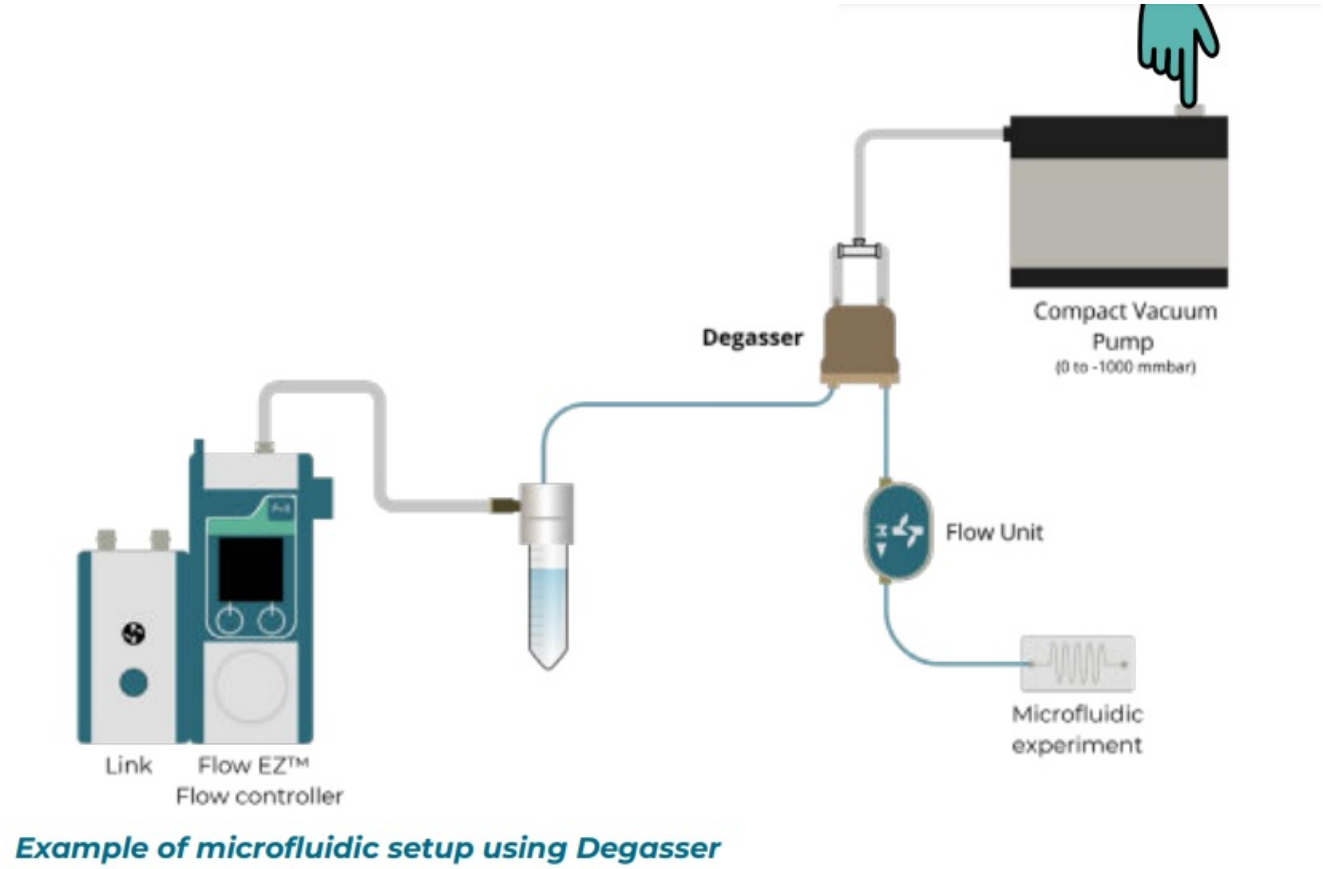
Connect a tee (T pneumatic junction) connection between the two pneumatic tubings. and connect a 4mm OD pneumatic tubing.

Connect the 4mm pneumatic OD tubing to the negative pressure output of the vacuum.



DEGASSER PRIMING

Connect the vacuum to a power source. Ensure that it is set to maximum (-1 bar) before turning it only



Example of microfluidic setup using Degasser

DO NOT apply over 7 bars through the Degasser. The maximum recommend pressure on the tubing is 7 bar (1mPA, 100 psig).

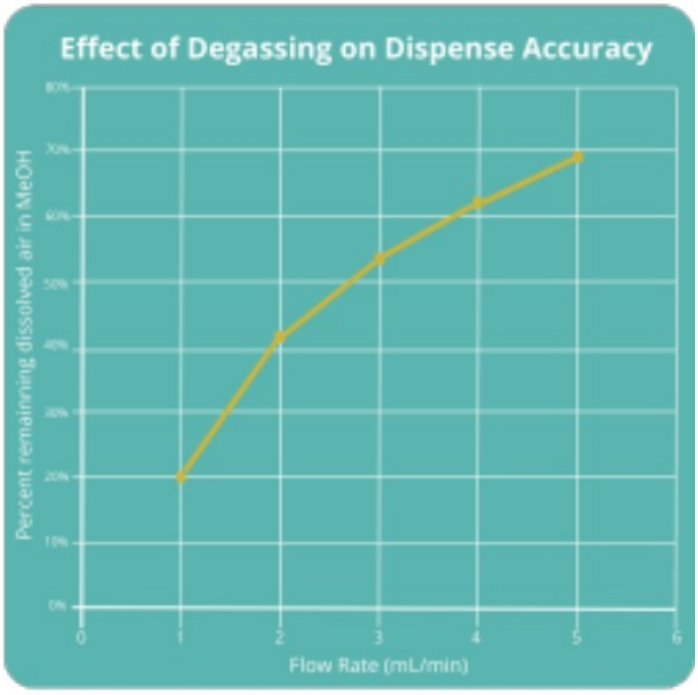
Before starting your microfluidic experiment, test the system to ensure that it is working correctly and to ensure that the connections are secure and leak-free.

Once the degasser is connected, primed, and leak-free, you can start your microfluidic experiment. The flow rate through the degassing device can reach up to 10 mL/min. However, for optimal efficiency, we recommend maintaining a flow rate of 2 mL/min or less.

To shut down the Degasser, simply turn off the vacuum pump.

FAQ

- **How many Degassers can be connected to one vacuum?**
  You can connect up to 6 degassers to one unique vacuum or negative pressure souce for the same experiment or to run parallel experiments using the degasser.
- **What substances are chemically compatible with the Degasser ?**
  The Degasser has a high chemical compatibility with a wide range of solvents. The tubing is resistant to acids, bases, alcohols, ketones, esters, ethers, hydrocarbons, halogenated compounds, and many other organic and inorganic compounds. The tubing is also compatible with water-based solutions. The Degasser is not compatibe with florous based solvents such as Hydro fluoro solvents, Perfluorinated solvents, Hexafluoroisopropanol and also Hexanes (60% n-Hexane), Freons and Sodium Azide. (please for more details see the chemical compatibility chart on the Degasser's Datasheet)
- **How can the Degasser be integrated into the circuit of a microfluidic experiments?**
  The Degasser should be positioned in this fluid path before any critical components of your experiment, such as microfluidic. chips. This is to ensure that any dissolved gases and bubbles are removed f rom the fluid before it reaches these components.
- **Is it possible to remove already formed bubbles with the Degasser?**
  Yes, the degasser is also efficient at removing air bubbles as long as you are in the optimal degassing flow rate range 0 to 2 mL/min.
- **What is the degassing efficiency?**
  The degasser is most efficient between 0 to 2 mL/min, but it can go up to a flow rate of 10 mL/min. Between 0 and 1 mL/min, the degasser can remove up to 90% of the gas dissolved in air-saturated methanol. At 2 mL/min, the degasser can remove up to 60% of dissolved gas.



Plot of typical degassing efficiencies using air saturated methanol measured by UV absorbance.

TECHNICAL SPECIFICATIONS

Degasser	
Recommended continuous degassing flow rate range	1 to 10 mL/min
Chemical compatibility	Organic solvents, pH 1 to 14, organic-aqueous mixtures, high salinity and detergent-containing fluids. (see the Chemical compatibility chart on the Datasheet)
Degassing channel internal volume (mL)	0.48
Maximum pressure tolerability	70 PSI, 480 kPa
Fluidic connections	¼-28 UNF-2B
Vacuum connections	Connection for 6mm OD pneumatic tubing
Fluid contact materials	Teflon™ AF, Teflon™ FEP, PEEK and Glass-filled PPS (Polyphenylene Sulfide)

TECHNICAL SUPPORT

Any questions? E-mail us at: **support@fluigent.com**

Or call our technical support team directly

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Documents / Resources

	FLUIGENT Degasser Device for Microfluidic System [pdf] User Manual Degasser Device for Microfluidic System, Device for Microfluidic System, Microfluidic System, System

References

- Smart Microfluidics - Fluigent
- User Manual