µFlow

Low gas flow measurements

bioprocess CONTROL

www.bioprocesscontrol.com

Innovation in
low gas flow measurement

A compact and elegant solution

The µFlow is a compact and elegant instrument for measuring ultra-low gas flows with high precision. It has been designed for the on-line, real-time monitoring of all inert and slightly aggressive gases, over a wide detection range and for most indoor laboratory scale applications. Suitable applications include biogas process studies, ethanol fermentation, dark fermentation for bio-hydrogen and leak rate detection.

An entirely new level of precision

The µFlow is a flow meter for ultra-low gas flow detection. Its design and highly precise calibration delivers highly precise measurements (CV≤ 1%) with a resolution of about 10 Nml. The µFlow thus offers a level of precision that is unmatched, meeting the needs of the most demanding biogas/biofuel labs and user applications.

A flow meter with zero labour requirements

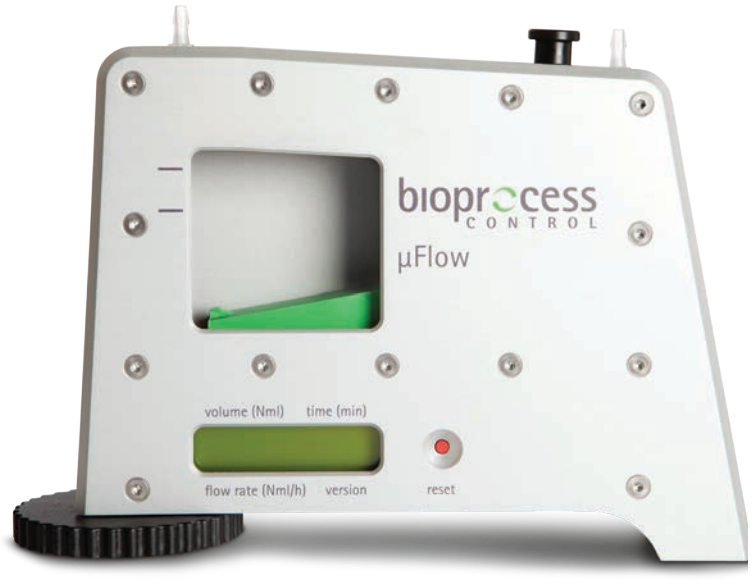
Gas flow measurements have never been so easy. The µFlow has an on-board LCD display for the real-time visualisation of normalised gas volume and flow rate, with a standard analogue output signal option for gas flow rate. Since all gas flow measurements are taken online and in real-time, with the µFlow there are simply no labour requirements, thus freeing up time for more important activities.

Normalisation of key measurements

The µFlow offers real-time temperature and pressure compensation for the normalisation of gas flow rate and volume measurement at 0 °C and 1 atm. This feature will ensure that all gas flow measurements are accurate, and places the µFlow in a league of its own when compared to its peers.

Precision
+/- 1%

10 ml
measuring
resolution



Automatic normalisation of gas flow and volume measurements with real-time temperature and pressure compensation

Gas flow and volume normalisation

The µFlow automatically normalises gas flow and volume measurements with real-time temperature and pressure compensation. This allows for gas measurements and data presentation to be standardised and the impact of measurement conditions minimised. The temperature and pressure of the gas are measured every time a flow cell opens, allowing the user to derive exact kinetic information compensated for any variation over time. The volumes are normalised to 0 °C and 1 atm.

Large detection range

The µFlow provides a large detection range, with high linearity from 20 up to 4000 ml/h. This makes it highly suitable for most lab- and small pilot- scale applications. This flexibility means that the µFlow is an extremely versatile instrument for low gas flow measurements, with a high level of precision. Overall, it is not only an instrument that is a must for biogas labs, but also any application where the precise measurement of inert and slightly aggressive gases is needed.

Measuring range: 20 to 4000 ml/h

Highly flexible solution

The µFlow is a highly flexible low gas flow measurement device. Users can operate it as a stand-alone instrument for a specific application or combine it with other technologies, such as the 5 l and 10 l glass and steel bioreactors offered by Bioprocess Control, providing for an accurate simulation platform.

Since the µFlow is a compact instrument, users can operate it as a stand-alone instrument or combine it with a data acquisition system, all requiring only a limited amount of space. This flexibility lets users to conduct multiple gas flow and volume measurements without wasting valuable bench space and only little effort.

An integrated gas flow solution

The µFlow is an integrated gas flow measurement device from several perspectives. The unit offers a standard analogue current signal output for automatic data acquisition and provides users with an embedded timer and reset button for easy logging of accumulated gas volume and its flow rate over a defined period of time.

The unit is also precalibrated to ensure measurement accuracy, offers a glass window for the viewing of flow cell movement and has an adjustable foot to ensure the correct installation position for high precision measurements.

The µFlow truly offers an unmatched level of integration, which translates into a highly desirable instrument.

Data acquisition system for **µFlow**

A software application designed for real-time monitoring

The µFlow computer-based software application has been designed for the monitoring and logging of any gas production process, including biogas/biomethane production, ethanol fermentation, dark fermentation for bio-hydrogen and leak detection. This user-friendly application allows you to have a direct visualization of the gas flow variation during the process.

Setting-up an experiment and monitoring its progress are straightforward. Moreover, all the results are presented in a simple format suitable for easy analysis. The µFlow system is a natural and convenient extension for your experiment set-up.

An integrated hardware and software package easy to install and use

A software that can control up to eight µFlow units

A simple experiment setup

The Settings feature of the µFlow software application allows users to define up to eight channels. For each channel, the current flow rate is displayed, based upon the mean value over the last minute of gas production.

Full control of an experiment

The Graph feature of the µFlow software application allows users to follow their experiment in real-time. Users can easily monitor the flow rate of each gas flow channel by selecting and viewing only those channels they wish to see.

Moreover, gas flow measurements are automatically normalised to 1 atm and 0 °C. This flexibility allows µFlow users to always know the status of an experiment, as well as the data being produced.

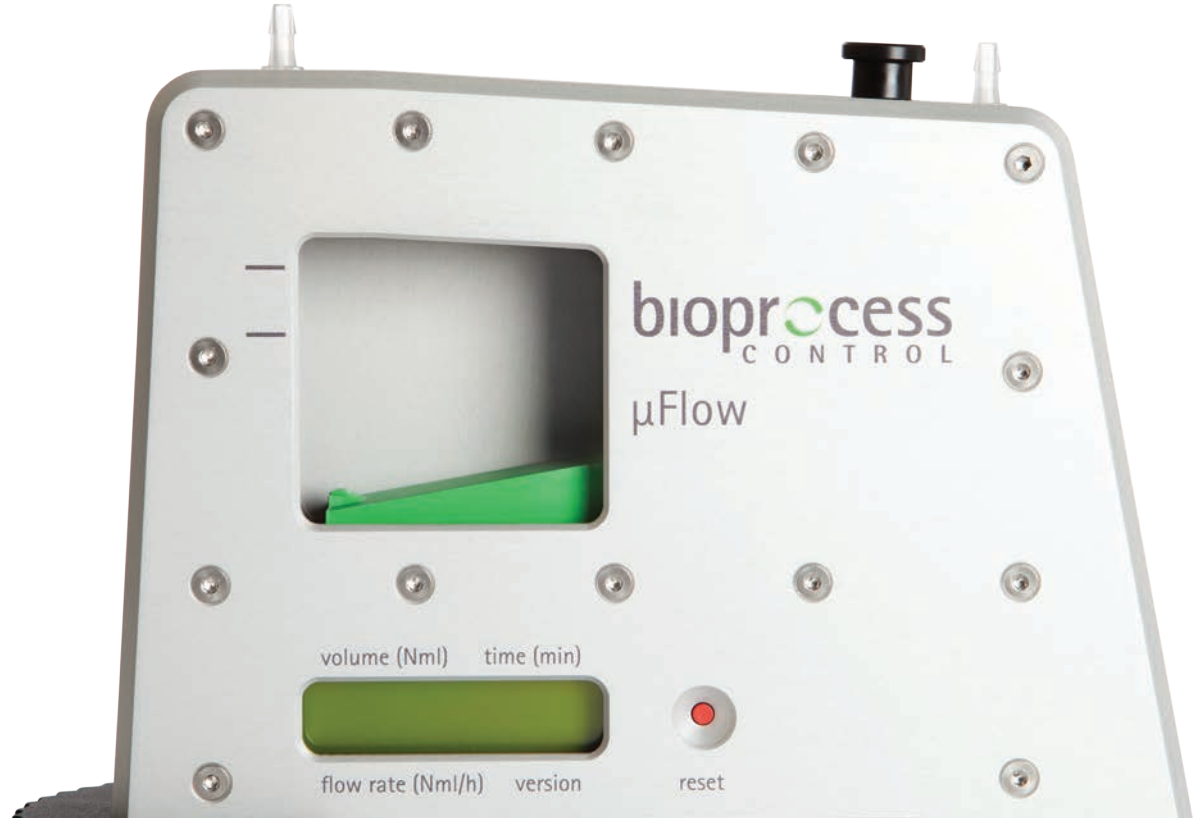
Wide user base and application areas

User base

The µFlow is currently used by academic scientists, public and private laboratories, organic waste handlers, wastewater treatment plants, food and beverage industries and producers of energy, biogas, bio-ethanol and bio-hydrogen.

Application areas

The µFlow can be used for the on-line, real-time monitoring of all inert and slightly aggressive gases, over a wide detection range. It is thus suitable for low gas flow biogas process studies, ethanol fermentation, dark fermentation for biohydrogen production and leak rate detection.



Technical specifications

µFlow unit

Measurement resolution: 10 ml

Measuring range: 20 to 4000 ml/h

Signal output for flow rate: 4–20 mA

Repeatability: 1%

Working principle: liquid displacement and buoyancy

Build-in sensors: pressure and temperature

LCD display: normalised gas flow (Nml/h), volume (Nml) and time (min)

Materials: high quality aluminum

Dimension: 19 x 14 x 6 cm

Weight: 180 g

Power supply: 12 VDC with 100–240 VAC 50/60 Hz power adaptor

Usage: indoor applications for inert and slightly aggressive gases

µFlow data logger (USB Configuration)

Universal data logger (Ethernet Configuration)

Software and data acquisition features

- Automatic data acquisition system which supports up to eight µFlow devices
- Automatic logging of process parameters, real-time display of parameters trend curve and report generation. µFlow data logger: gas flow rate. Universal data logger: gas flow rate, temperature, PH, gas composition, etc.
- Unlimited* logging of data points
- Software running on an external computer
- Supported operating systems: Windows** 8/7/Vista (32-bit and 64-bit), Windows XP SP3 (32-bit)
- Available in two configurations, either with Ethernet or USB interface
- Power supply: 12 V DC / 5 A
- Dimension: Ethernet version 228 x 125 x 53 cm, usb version 170 x 167 x 34 cm
- Usage: indoor

* Depending on the free space available on the HDD used for installation.
** Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

µFlow Features

- Large linear detection range (up to 4000 ml/h) that fits perfectly with most of lab- and small pilot- scale applications
- Embedded timer and reset button for easy logging of accumulated gas volume over a defined period of time
- Automatic gas flow and volume normalisation with real-time temperature and pressure compensation allows for gas measurement standardisation
- Standalone applications and combined usage of the data acquisition system for automatic data logging and display
- Adjustable foot and horizontal gauge to ensure the correct installation position for high precision measurements
- Standard signal output of gas flow rate for automatic data acquisition
- Low maintenance requirements
- Glass window for visualisation of flow cell movement
- Pre-calibration to ensure measurement accuracy

Bioprocess Control – **optimising** the production of **biogas**

Bioprocess Control is a technology and market leader in the area of advanced instrumentation and control technologies for research and commercial applications in the biogas industry.

The company was founded in 2006, and brings to market more than 15 years of industry leading research in the area of instrumentation, control and automation of anaerobic digestion processes. Today Bioprocess Control has product exports to more than 35 countries.

Bioprocess Control has a broad product portfolio covering biochemical methane potential (BMP) tests, substrate analysis, process simulation, gas flow measurements as well as a series of bioreactors. AMPTS – the Automatic Methane Potential Test System has quickly become the preferred analytical instrument around the world. It is used by both academic and industrial actors in the biogas industry.

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