

# TECHNOLOGY OFFER

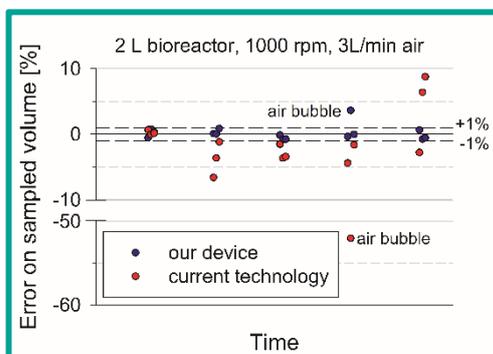
## Automated mass sensor-controlled high-precision rapid sampling of fluids



The developed sampling device is able to withdraw samples from reaction vessels **selectively** (minimized carry-over of sample contents) with **accurate mass** and in a short time (0.9-1.4s). The mass of each sample is **exactly** (error < 0.8%) determined by an automatically controlled sampling routine using a mass sensor and recorded together with the time point of sampling.

### BACKGROUND

One of the typical working steps to study reaction processes in detail is the rapid withdrawal of a sample from a reaction chamber combined with immediate mixing with a quenching solution to stop the reaction process at a predefined time point. One of the **biggest drawbacks** of current automatic sampling devices is assuming and not measuring the **sampled volume** (from calibrations carried out before the reaction is initiated). Therefore, it is **not known** but representing the ultimate basis for post process data analysis. The sample volume however is strongly affected by pressure differences, change of fluid properties as well as co-sampling of gas bubbles. Consequently, current sampling devices do not recognize differences in sample volumes provoked by these changing process conditions and results are afflicted with unknown uncertainty, which finally leads to **false interpretation of results**.



### TECHNOLOGY

The device is able to withdraw fluids from various reactions chambers (fermenters, reactors, flasks and bottles) and transfers the sampled fluid driven by a vacuum pump through a software-controlled 5-valve module to a sample container containing a quenching solution in a short time. A mass sensor determines the exact mass of the sample directly after sampling.

### ADVANTAGES

- Fast sampling combined with determination of the exact mass of the withdrawn sample directly at the time point of sampling
- No need to open the reaction chamber. Sampling does not interfere with the reaction process
- The device is compatible with all reactor types used at lab-scale in bio and chemical sciences
- Carry-over from sample contents from one to another sample is minimal (<5%)
- Sample volume is variable (0.5 – 300 mL) while loss of fluid due to system washing is low (1.5 mL per sample)

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#### KEYWORDS:

Fast sampling  
Exact record of sample mass/volume  
Metabolomics/Omics technologies  
Fermentation technology  
Chemical technology

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#### COOPERATION OPTIONS:

Licensing  
Sale  
Technical cooperation

#### DEVELOPMENT STATUS:

Prototype

#### STATUS OF PATENTS:

EP Patent application filed

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