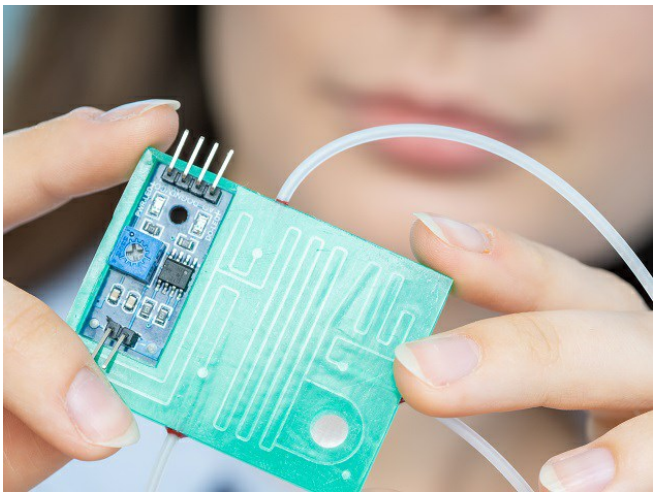
DATASHEET APPLICATION NOTE A058-FP01 - FLOW MEASUREMENT IN MICROFLUIDICS

APPLICATION NOTE

Flow measurement in microfluidics

A manufacturer of microfluidic systems was looking for a flow solution to measure micro fluids more efficiently. At the start of their search, thermal mass flow meters were used. However, they observed that the thermal mass flow measurements in their application were too unstable and could not be reproduced. Bronkhorst suggested an alternative solution, using Coriolis technology for the microfluidic flow meter.

In microfluidic systems, liquids behave in a different way compared to flow in 'normal' channels. Due to the small size of the channels, the 'fluid-wall' phenomena play a dominating role. Microfluidic devices find their application in fields such as pharmaceutics and biotechnology, reducing the number of chemicals and experimental time.



Application requirements

For this application, the microfluidic systembuilder desired to limit the number of flow instruments by simplifying the solution. In the consisting setup, five mass flow meters were used to cover a specific flow range. A second wish was to improve the accuracy and repeatability of the measurement itself.

Important topics

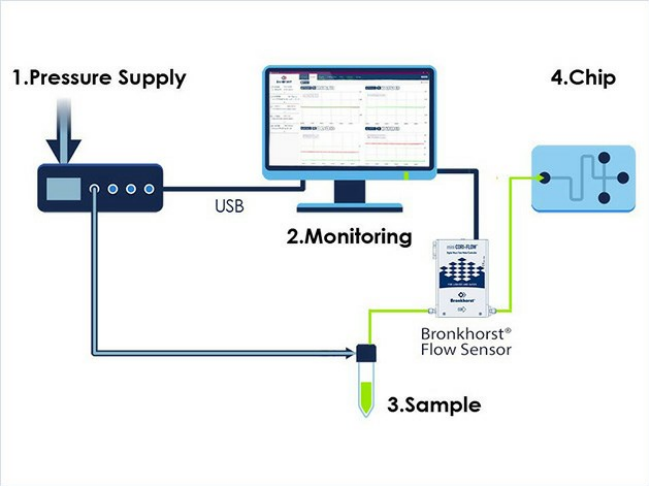
- Simplified solution, using fewer flow meters
- Better accuracy and repeatability
- Stable flow measurement

Process solution

Looking at the user's needs, Bronkhorst concluded that the ML120 mini CORI-FLOW flow meter series would be able to cover the entire microfluidics range needed. The idea was to test this *Coriolis* flow meter and to compare the results with the ones from the *thermal* mass flow meter. During two months the ML120 device was tested thoroughly.

The test results stated that using the *Coriolis-based* flow meter the accuracy, stability and repeatability were better than the original setup with *thermal* mass flow meters. Moreover, the results showed that it was possible to replace five thermal mass flow meters by one Coriolis-based flow meter (ML120 mini CORI-FLOW series) with a large dynamic range to cover the same range. Not even was the test succeful, but the customer integrated the ML120 device in their product range as well.

As part of further cooperation with Bronkhorst, the microfluidic system builder developed a user guide for (future) users and a selling guide for the sales engineers. Moreover, some programming work in LabVIEW is performed to communicate with Bronkhorst devices.



Flow scheme

Recommended Products

MINI CORI-FLOW™
ML120V00

- Flow range 0…200 g/h
- Pressure rating 200 bar
- Independent of fluid properties
- High accuracy, fast measurement

BRONKHORST (UK) LTD

1 Kings Court

Willie Snaith Road

Newmarket Suffolk CB8 7TG

Tel. +44 1223 833222

sales@bronkhorst.co.uk