

# SENSORS

THERMAL FLOW SENSOR  
CORIOLIS FLOW SENSOR  
LUER-LOCK PRESSURE SENSOR  
LOW VOLUME PRESSURE SENSOR  
LIQUID SENSOR  
SENSOR READING UNIT



**ELVEFLOW**  
PLUG & PLAY MICROFLUIDICS

# MICROFLUIDIC FLOW SENSOR

MFS [ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/MICROFLUIDIC-LIQUID-MASS-FLOW-SENSORS/](http://ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/MICROFLUIDIC-LIQUID-MASS-FLOW-SENSORS/)

## HIGH-ACCURACY FLOW MONITORING AND CONTROL



High accuracy liquid mass flow sensors for **ultra low flow rate** monitoring. Comes with an M8 electrical connection, it can be controlled directly through the Elveflow software.

✓ 5 RANGES

✓ HIGH CHEMICAL COMPATIBILITY

### PERFORMANCES

- > Calibrated flows from **0.07 µL/min** to **5,000 µL/min**
- > Sensor response time **40 ms**
- > Resolution down to **1.5 pL/s**

### FEATURES THAT MATTER

- > When paired with the OB1: directly input the flow rate
- > High chemical and biological compatibility
- > Bi-directional flow rate measurement (positive & negative)

1. Pressure & vacuum controller

Connect a pressure and a vacuum source to your OB1.

2. Monitoring

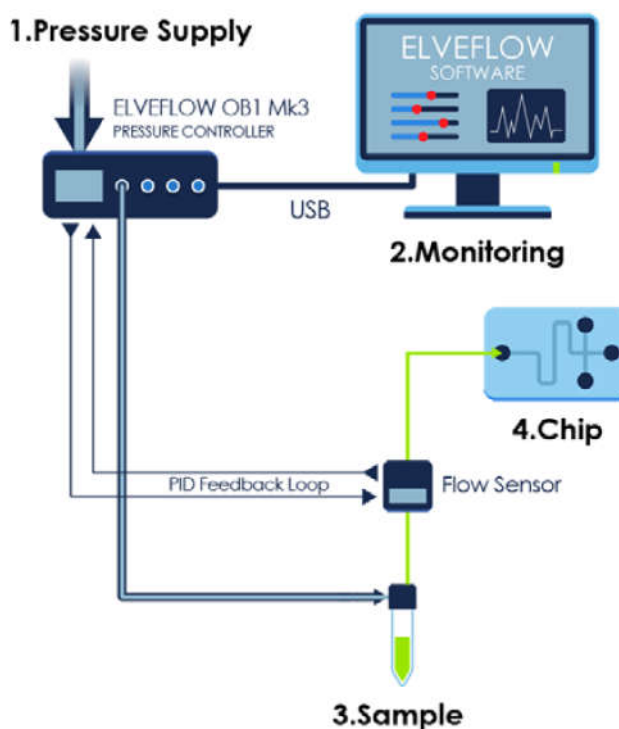
Control the pressure and flow rate using the Elveflow Smart Interface on your computer. This software enables you to create and automate sequences with a specific pressure or flow.

3. Sample

Depending on your choice, the liquids can be sucked into the reservoir or be ejected from there since the OB1 can use pressure or vacuum within the same fluidic channel.

4. Chip

The OB1 pressure & vacuum features offers precise sample handling, and provide full control over the sample injection.



TECHNICAL SPECIFICATIONS

Microfluidic flow sensor	MFS 1	MFS 2		MFS 3		MFS 4		MFS 5
Media calibration	water	water	IPA	water	IPA	water	IPA	water
Flow rate range	0 to ± 1.5 μL/min	0 to ± 7 μL/min	0 to ± 70 μL/min	0 to ± 80 μL/min	0 to ± 500 μL/min	0 to ± 1 mL/min	0 to ± 10 mL/min	0 to ± 5 mL/min
Accuracy m.v. - measured value	10 % m.v. between [-1500 to -75] & [75 to 1500] nL/min	5 % m.v. between [-7 to -0.42] & [0.42 to 7] μL/min	20 % m.v. between [-70 to -4.2] & [4.2 to 70] μL/min	5 % m.v. between [-80 to -2.4] & [2.4 to 80] μL/min	20 % m.v. between [-500 to -2.4] & [2.4 to 500] μL/min	5 % m.v. between [-1 to -0.04] & [0.04 to 1] mL/min	20 % m.v. between [-10 to -0.5] & [0.5 to 10] mL/min	5 % m.v. between [-5 to -0.2] & [0.2 to 5] mL/min
	7 nL/min between [-75 to 75] nL/min	20 nL/min between [-0.42 to 0.42] μL/min	210 nL/min between [-4.2 to 4.2] μL/min	120 nL/min between [-2.4 to 2.4] μL/min	5 μL/min between [-25 to 25] μL/min	1.5 μL/min between [-0.04 to 0.04] mL/min	100 μL/min between [-0.5 to 0.5] mL/min	10 μL/min between [-200 to 200] μL/min
Sensor inner diameter	25 μm	150 μm		430 μm		1.0 mm		1.8 mm
Microfluidic fitting type	UNF 1/4-28							
Microfluidic fitting material	PEEK							
Internal sensor capillary material	quartz				borosilicate glass			

Non-contractual information may be changed without notice.

Electrical input: 8 V  $\overline{\text{---}}$  100 mA    Analog output: 0 - 5 V    Flow sensor size (length x width x height): 58 x 52 x 23 mm    Weight: 102 g

Excellent chemical resistance and bio-compatibility are ensured  
Liquid Flow Sensor enables fast, and non-invasive measurements of very low liquid flow rate below 5 mL/min  
The product comes fully calibrated for water  
Flow calibration for methanol or other media is available on request (all data for medium H<sub>2</sub>O, 20 °C, 1 bar unless otherwise noted)

The recommended storage temperature range from -10 °C to +60 °C  
The operating temperature is -20 °C to +50 °C  
The flow sensor shows bi-directional and linear transfer characteristics

# CORIOLIS FLOW SENSOR ALL LIQUIDS

BFS [ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/MICROFLUIDIC-FLOW-SENSOR-CORIOLIS/](http://ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/MICROFLUIDIC-FLOW-SENSOR-CORIOLIS/)

## THE BEST ACCURACY OF FLOW MEASUREMENT OVER A LARGE RANGE



### STRAIGHTFORWARD COMPATIBILITY WITH ALL LIQUIDS

WATER, OIL, ALCOHOL, MIXTURE...  
WITHOUT REQUESTING  
CALIBRATION

In partnership with [Bronkhorst](#), we have developed a unique Coriolis flow sensor suited to microfluidics. It offers various benefits: precision, wide range, straightforward compatibility with all liquids (no calibration needed).

✓ COMPATIBLE WITH ALL LIQUIDS & GAS

✓ NO CALIBRATION NEEDED

### FEATURES THAT MATTER

- > Compound semiconductor processing
- > Solar cell and FDP technology
- > Food and pharmaceutical industries
- > Medical microchemical or analytical installations
- > Calibration laboratories

### PERFORMANCES

- > Large flow range from 1.6  $\mu\text{L}/\text{min}$  to 3.3  $\text{mL}/\text{min}$
- > Maximum flow rate 3.3  $\text{mL}/\text{min}$
- > Sensor response time 35 ms
- > Accuracy: 2 % of measured value or 0.2 % of measured value

IN PARTNERSHIP WITH  
**BRONKHORST**

≅ Coriolis technology



1. Pressure & vacuum controller

Connect a pressure and a vacuum source to your OB1.

2. Monitoring

Control the pressure and flow rate using the Elveflow Smart Interface on your computer.

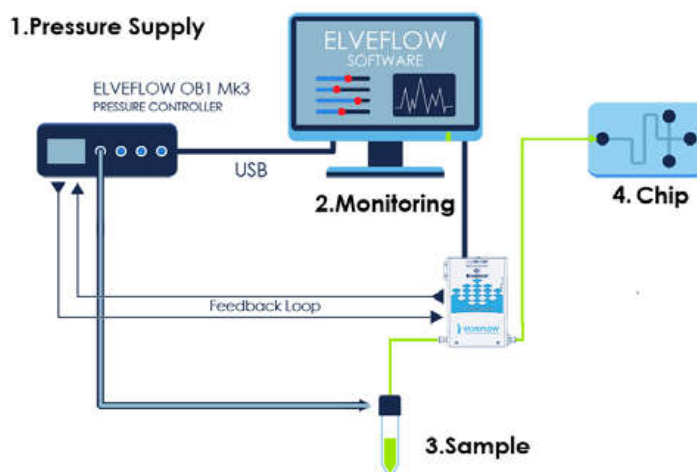
This software enables you to create and automate sequences with a specific pressure or flow.

3. Sample

Depending on your choice, the liquids can be sucked into the reservoir or be ejected therefrom since the OB1 can use pressure or vacuum within the same fluidic channel.

4. Chip

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TECHNICAL SPECIFICATIONS

Coriolis flow sensor	BFS 1 Mass flow accuracy liquids 2 % of rate	BFS 2 Mass flow accuracy liquids 0.2 % of rate
Flow range	0.1 g/h to 200 g/h	0.1 g/h to 200 g/h
Minimum flow rate (water)	1.6 µL/min	1.6 µL/min
Maximum flow rate (water)	3.3 mL/min	3.3 mL/min
<b>Performance</b>		
Mass flow accuracy liquids	up to ± 2 % of rate	up to ± 0.2 % of rate
Mass flow accuracy gases	up to ± 0.5 % of rate	up to ± 0.5 % of rate
Repeatability	± 0.05 % of rate	± 0.05 % of rate
Zero stability (ZS) <sup>(1)</sup>	< ± 0.02 g/h	< ± 0.02 g/h
Density accuracy	< ± 5 kg/m	< ± 5 kg/m
Temperature accuracy	± 0.5 °C	± 0.5 °C
Temperature effect <sup>(2)</sup>	Zero drift: ± 0.01 g/h/°C	Zero drift: ± 0.01 g/h/°C
Mounting <sup>(3)</sup>	Any position, attitude sensitivity negligible	Any position, attitude sensitivity negligible
Device temperature	0...70 °C	0...70 °C
Response time, meter (t98 %)	0.2 s to fill the tubing then 35 ms	0.2 s to fill the tubing then 35 ms
<b>Mechanical parts</b>		
Material (wetted parts)	Stainless steel 316 L or comparable	Stainless steel 316 L or comparable
Pressure rating	200 bar	200 bar
Sensor inner diameter	250 µm	250 µm
Microfluidic fitting type	UNF 1/4-28	UNF 1/4-28
Internal volume	0.013 mL	0.013 mL

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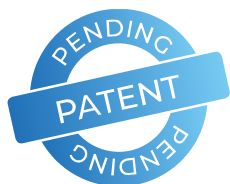
Analog output: 0 - 10 V    Flow sensor size (length x width x height): 65 x 32 x 144 mm    Weight: 3 kg

(1) Guaranteed at constant temperature and for unchanging process and environment conditions. (2) Depends on flow rate, heat capacity fluid, T amb, T fluid and cooling capacity. (3) To be rigidly bolted to a stiff and heavy mass or construction for guaranteed zero stability. External shocks or vibrations should be avoided.

# LOW VOLUME PRESSURE SENSOR

MPS [ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/MICROFLUIDIC-LIQUID-FLOW-THROUGH-PRESSURE-SENSOR/](http://ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/MICROFLUIDIC-LIQUID-FLOW-THROUGH-PRESSURE-SENSOR/)

## MEASURE AND CONTROL PRESSURE ANYWHERE IN YOUR SETUP



**LIQUID FLOW-THROUGH PRESSURE SENSOR**  
7.5  $\mu$ L INTERNAL VOLUME



High accuracy pressure sensor adapted to liquids and compatible with 3/32 ID tubing or 10-32 fittings for 1/16 OD tubing. Monitor low liquid flow rate in your microfluidic setup.

### PERFORMANCES

- > Accuracy down to 0.2 % FS
- > 5 ranges from 70 mbar to 7000 mbar
- > Internal volume 7  $\mu$ L
- > Settling time 20 ms

✓ PRESSURE FEEDBACK OPTION

✓ LOW INTERNAL VOLUME



✓ COMES IN TWO PACKAGES

### FEATURES THAT MATTER

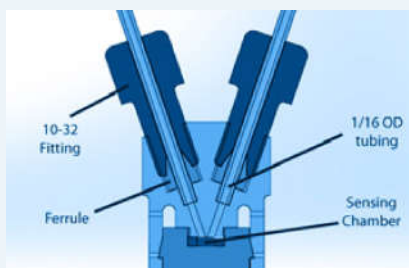
- > You can plug our liquid pressure anywhere within your microfluidic setup, record the pressure on your computer and adjust the flow accordingly using our pressure pumps. The pressure sensors are fitted for Elveflow pressure pumps.
- > Our pressure sensors work as gauge pressure sensors, measuring positive and negative pressure relatively to atmospheric pressure.

Microfluidic pressure sensor	MPS 0	MPS 1	MPS 2	MPS 3	MPS 4
Sensor range	70 mbar 1 psi	340 mbar 5 psi	1 bar 15 psi	2 bar 30 psi	7 bar 100 psi
Pressure range min-max	-1 to 1 psi	-5 to 5 psi	-15 to 15 psi	-15 to 30 psi	-15 to 100 psi
Maximum overpressure	20 psi	-20 psi	45 psi	60 psi	200 psi
Linearity %span	0.25	0.4	0.25	0.1	0.4
	0.5	0.5	0.5	0.2	0.6
Repeatability & hysteresis %span	± 3.0	± 0.4	± 0.2		
Operating temperature	-40 °C to +85 °C				
Specified temperature range	0 °C to +50 °C				

Non-contractual information may be changed without notice.

Package model	Small	Large
Sensor design		
Connection type	10-32 thread with ferrule	arrow for 3/32 ID tubing
Internal volume (µL)	7.5	70
Recommended tubing diameter (inch)	1/16 OD	3/32 ID
Material in contact	PEEK, silicon and fluorosilicone seal	polyetherimide, silicon and fluorosilicone seal
Electrical connection	4 point measurement M8 connector compatible with Elveflow flow reader and any flow reader 4 point sensor adaptor	

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**OUR PRESSURE SENSORS WORK AS GAUGE PRESSURE SENSORS,**  
MEASURING POSITIVE AND NEGATIVE PRESSURE RELATIVELY TO ATMOSPHERIC PRESSURE.

# LUER-LOCK PRESSURE SENSOR

MFP [ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/MFP-MICROFLUIDIC-INLINE-PRESSURE-SENSOR/](http://ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/MFP-MICROFLUIDIC-INLINE-PRESSURE-SENSOR/)

## MEASURE AND CONTROL PRESSURE OVER A LARGE RANGE



**PRESSURE MEASUREMENT WITH NO DEAD VOLUME AND FDA CERTIFIED**

Flow-through pressure sensors adapted to **gases** or **liquids**, and compatible with the **Luer-lock standard**. The flow plus fluid sensor is intended to measure the pressure of fluid media **flowing through the sensor**.

✓ HIGH CHEMICAL COMPATIBILITY

✓ UP TO 16 BAR

### PERFORMANCES

- > Accuracy up to 2 % FS
- > 1 ranges 0 - 16 bar - Overlay 25 bar
- > No dead volume
- > Flow rate up to 100 mL/min

### FEATURES THAT MATTER

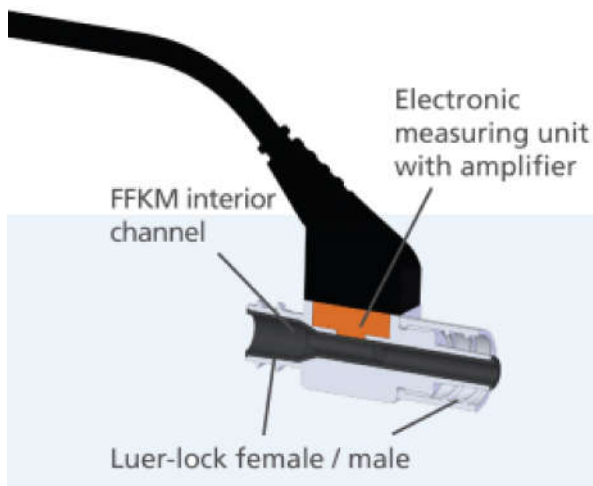
- > Our pressure sensors work as gauge pressure sensors, measuring positive and negative pressure relatively to atmospheric pressure.
- > You can plug our liquid pressure anywhere within your microfluidic setup, record the pressure on your computer and adjust the flow accordingly using our pressure pumps.



Luer-lock pressure sensor	Specifications
Maximum flow rate <sup>(1)</sup>	100 mL/min
Pressure range	0 to 16 bar
Power supply	12 to 30 VDC
Material	housing – coated aluminum Interior flow channel – FFKM modded – PU
Output signal	0.1 to 10 V
Electrical connection	“push-pull” connector / M8 sensor plug
Mechanical connection	LUER-LOCK DIN EN 1707
Temperature range	15 to 45 °C
Internal volume	205 µL
Dimensions	length: <b>31.2 mm</b> - inner diameter: between <b>4 mm</b> and <b>1.8 mm</b>

(1) Depends on the viscosity and primacy pressure of the medium

Non-contractual information may be changed without notice.



**WIDE MEDIA COMPATIBILITY**  
 (MATERIAL IN CONTACT: FFKM) FDA-CERTIFIED AND THEREFORE, SUITABLE FOR FOOD INDUSTRY USE.