ELVEFLOW
PLUG & PLAY MICROFLUIDICS

PRODUCT CATALOG

State of the art
microfluidic instrumentation for all

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www.elveflow.com

ELVEFLOW PRODUCTS

MICROFLUIDIC **PRODUCT LINE**

Our product line is built around the best seller OB1 flow controller and includes everything needed to accurately control liquid. All our instruments can be controlled simultaneously on a single computer using our software or standard development kits.

Our instruments are modular, upgradable and come in a standard or OEM version.

PRESSURE / VACUUM CONTROLLERS & GENERATORS

SENSORS

VALVES

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MUX DISTRIB

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OPTICAL DETECTION

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ELVEFLOW
PLUG & PLAY MICROFLUIDICS

ELVEFLOW OVERVIEW

Elveflow focuses on the development of high performance and plug and play flow control systems fitted to microfluidic research. We provide the only microfluidic flow control systems using piezo technology and blazing fast flow changes in your microdevice.

MULTIDISCIPLINARY EXPERTS TO SERVE YOUR NEEDS

Our multidisciplinary team provides a wide range of development and services. Our management is based on senior engineers in microfluidics totaling more than 70 peer reviewed publications, 400 citations and 10 microfluidic patents.

PRESSURE / VACUUM

CONTROLLERS & GENERATORS

ELVEFLOW
PLUG & PLAY MICROFLUIDICS

FOUR-CHANNEL PRESSURE AND VACUUM CONTROLLER

OB1 MK3+ ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/FLOW-CONTROL-SYSTEM/PRESSURE-CONTROLLER/

NEVER BE LIMITED BY ACCURACY
OR RESPONSIVENESS OF YOUR FLOW CONTROLLER

The OB1 MK3 is a high-performance microfluidic pressure and flow controller. Customize your unit, choose from one to four channels among the five pressure ranges available.

✓ MODULAR

✓ UPGRADABLE

✓ SOFTWARE INCLUDED

UNIQUE PERFORMANCES

> Pressure stability 0.005 % FS
> Response time 9 ms
> Pressure Resolution 0.006 % FS
> Settling time 35 ms

CUTTING EDGE PIEZOELECTRIC TECHNOLOGY FOR MICROFLUIDICS

Piezoelectric technology

APPLICATIONS

> Digital microfluidics
> Flow chemistry & polymer synthesis
> Cell culture assays: cell perfusion, sequential injection
> Droplet-sequencing: RNA sequencing
> Organ on chip
> Enhanced oil recovery
> Lab on a chip
> Cell handling

PRINCIPLE

1. Pressure & vacuum controller

Connect a pressure and a vacuum source to your OB1.

2. Monitoring

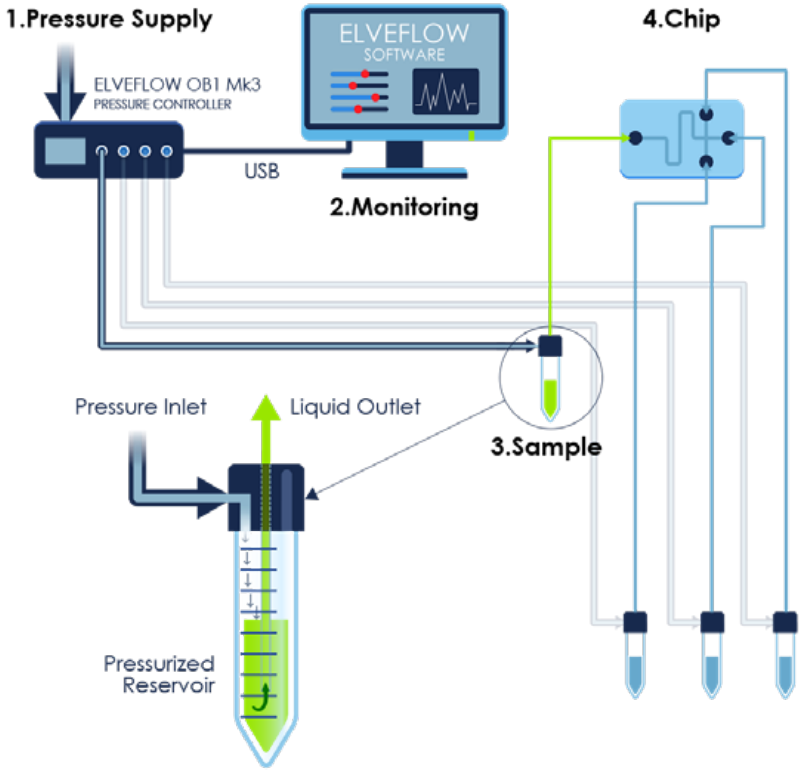
Control the pressure and flow rate using the Elveflow Smart Interface on your computer.
This software enables you to create and automate sequences with a specific pressure or flow.

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 provides full control over the sample injection.



FEATURES & BENEFITS

- **Short settling time**
  Piezo technology allowing a blazing fast flow change in any microdevice
- **Highest flow stability**
  Pressure stability down to 10 µbar ensuring a superior flow performance over a large flow range
- **Accurate flow control**
  Input a flow value into the software. Flow regulation down to 7.5 mL/min

- **Software automation**
  Control all instruments through a single panel. Power the full script module to automate control and injection over days
- **Create your own program**
  Software Development Kits (C++, Python, MATLAB® and LabVIEW® libraries)
- **Enhanced data saving**
  Up to 10 ms sampling rate to take out the best of your results

- **Easy to install and use**
  Start out of the box and set everything up within minutes
- **Customizable**
  Choose from one to four channels among the five pressure range available
- **Upgradable later**
  Get one channel today and add more channels later

TECHNICAL SPECIFICATIONS

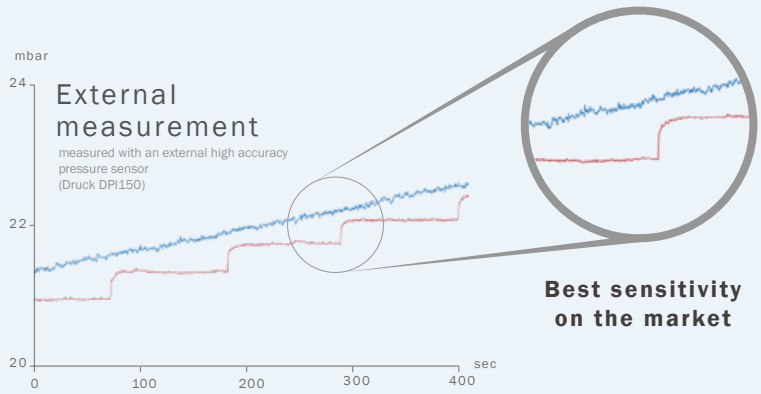
Unit pressure range	**0 - 200** mbar (0 - 2.9 psi)	**0 - 2,000** mbar (0 - 29 psi)	**0 - 8,000** mbar (0-116 psi)	**-900 to 1,000** mbar (-13 psi to 14.5 psi)	**-900 to 6,000** mbar (-13 psi to 87 psi)
Pressure stability [1]	**0.005 % FS** 10 µbar (0.00014 psi)	**0.005 % FS** 100 µbar (0.0014 psi)	**0.006% FS** 500 µbar (0.007 psi)	-900 to 500 mbar: **0.005 % FS** 100 µbar (0.0014 psi) 500 to 1,000 mbar: **0.007 % FS** 150 µbar (0.0021 psi)	-900 to 2,000 mbar: **0.005 % FS** 350 µbar (0.05 psi) 2,000 to 6,000 mbar: **0.007 % FS** 525 µb ar (0.076 psi)
Response time [2]	down to 9 ms				
Settling time [3]	down to 35 ms				
Minimum pressure increment	0.006 % FS 12.2 µbar - 0.00017 psi	0.006 % FS 122 µbar - 0.0017 psi	0.006 % FS 480 µbar - 0.007 psi	0.0064 % FS 122 µbar - 0.0017 psi	0.0061 % FS 420 µbar - 0.006 psi
Input pressure	**1.5 bar - 10 bar** non corrosive, non explosive, dry and oil-free gases, e.g. air, argon, N2, CO2, ...				
Input vacuum [4]	/			any value from 0 to -1 bar	
Liquid compatibility	no liquid should enter the OB1 any aqueous or organic solvent, oil or biological sample solution can be propelled				

Non-contractual information may be changed without notice.

(1) Pressure stability (standard deviation) measured over the full pressure range with an external high accuracy pressure sensor (Druck DPI150) (2) Depending on user computer operating system (3) Volume dependent – Measurement done on 12 mL reservoir for a set point from 0 to 200 mbar (4) The vaccum channels can be used without vacuum source if only positive pressures are desired. If no vaccum channels are present the Vacuum Input can be left open

Sensitivity ramp 21 mbar to 23 mbar

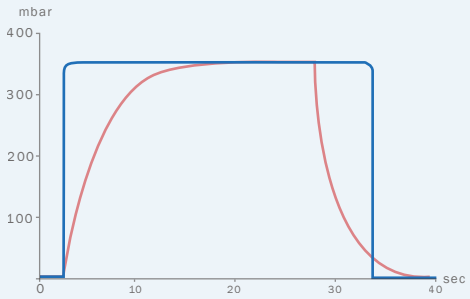
(0.01 mbar steps)



Elveflow — Best competitor on the market

Flow control reactivity

High precision compare to a syringe pump



Elveflow — Syringe pump

It is no coincidence that the most prestigious names trust us

Alphabet · BIO-RAD · GE Healthcare · gsk · illumina · Medtronic · NASA · SANOFI · TOTAL

Griffith University · KAIST · MIT Massachusetts Institute of Technology · PRINCETON UNIVERSITY · Stanford University · UCL Université catholique de Louvain

Elements provided by Elveflow	Included	Optional
Software & libraries Control all Elveflow instruments with the same smart interface.	●	
AF1 connection kit A complete set of accessories fitted for the AF1 pressure generator.		●
Kits Connect any pressure source/syringe pump to your device.		●
Reservoirs Gas tight reservoirs with ergonomic fluidic connection.		●
Flow sensors A line of sensors to monitor very low liquid flow rates.		●
Compressor A safe & secure pressure source for the OB1 pressure controller.		●
Service The Elveflow expertise & support to offer you individually tailored solutions.	●	

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SOFTWARE FEATURES ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/FLOW-CONTROL-SYSTEM/ELVEFLOW-SOFTWARE/

> Pressure & flow rate visualization and recording

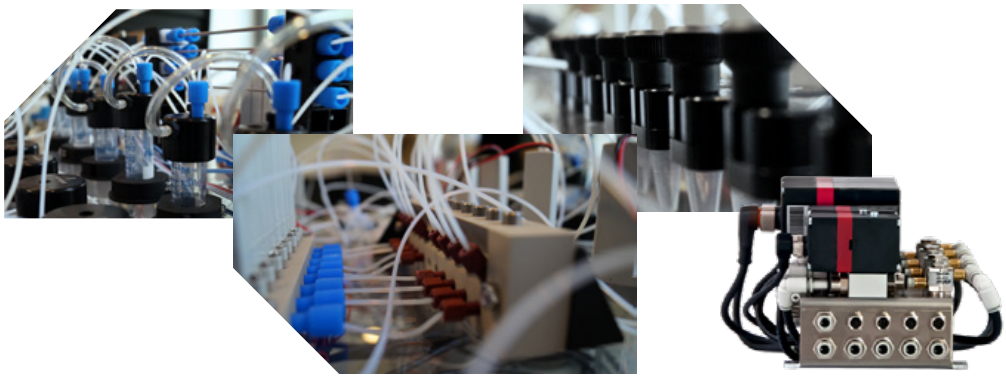
> Programming & automation of complex sequences

> Easy alternative instrument control through the provided C++, Python, MATLAB® and LabVIEW® libraries

NATIONAL INSTRUMENT

National instruments is our technological partner for embedded electronics

A CUSTOM SOLUTION
TO FIT PERFECTLY YOUR PROJECT



Elveflow provides a comprehensive line of OEM fluidic components that can be integrated into your products. Our OEM components allow a seamless integration thanks to their compactness and easy interfacing. A simple serial USB connection allows interfacing through our API, the native in/out triggers provide optimum interactions and we use standard fittings for pneumatic and fluidic connections.

We provide a dedicated software with all fluidic OEM products, as well as libraries for a customized software development (C++, Python, MATLAB® and LabVIEW® libraries).

SERVICES

> Personalized expert advice for our clients and partners
> Creation of technical specification
> Risk management and analysis
> Development and production of mechanics, electronics and software
> Prototyping
> Beta testing, trouble shooting and continuous improvement
> Production, from limited series to large scale
> Maintenance, support and training
> Upgrades of your systems

WHY CHOOSE US AS AN OEM PARTNER?

> **Benefit from our expertise** – Our management is based on senior engineers, and we launched up to 15 new fluidic products in the last 4 years.

> **A receptive and efficient partner** – We are well aware of the importance of keeping up with the fast-changing market you want to address.

> **A soft intellectual property policy** – We believe that intellectual property should never be an obstacle to innovation.

> **A trusted manufacturer** – High profile companies, such as Alphabet, Facebook, Medtronic, Total, Sanofi and Biomerieux already trust us for their scientific instruments. Why not you?

> **A proven track record** – We already successfully carried out several projects taking into account challenging constraints to end up with the best solutions for our partner.

VACUUM / PRESSURE GENERATOR AND CONTROLLER

AF1 SERIES ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/FLOW-CONTROL-SYSTEM/HIGH-ACCURACY-PRESSURE-PUMPS/

AN AUTONOMOUS PUMP
DESIGNED TO MATCH ALL MOBILE WORKERS' NEEDS

AF1 **200**
0 to 200 mbar

AF1 **1600**
0 to 1,600 mbar

AF1 **DUAL**
-700 to 1,000 mbar

The AF1 is a high performance autonomous pressure and flow controller. It comes in three different ranges and embeds pressure and vacuum sources. It is compatible with ESI Elveflow software.

✓ STANDALONE UNIT

✓ NO PC NEEDED

PERFORMANCES

> Pressure resolution 100 µbar
> Pressure stability 100 µbar
> Response time 50 ms
> Settling time 100 ms

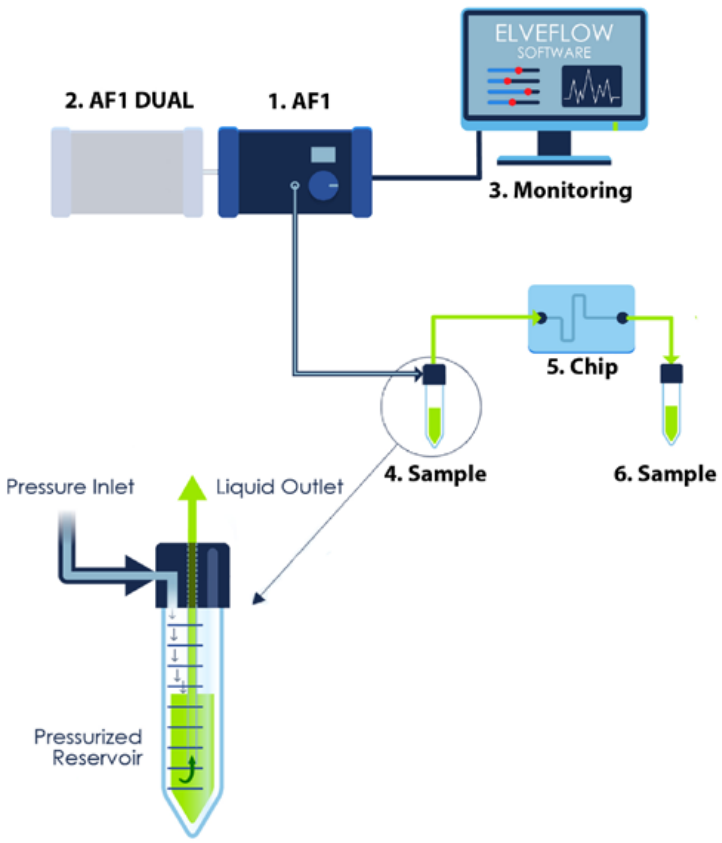
CUTTING EDGE
PIEZOELECTRIC TECHNOLOGY
FOR MICROFLUIDICS
Piezoelectric technology

APPLICATIONS

> Digital microfluidics: micro-droplets, anisotropic articles, double emulsion generation & handling
> Beads and particles manipulation
> Fast liquid sample switching
> Cell culture experiments under medium perfusion

PRINCIPLE

1. **AF1 pressure generator**
   Fast and accurate pressure and vacuum control for your system.
2. **Optional AF1 Dual**
   Produces positive and negative pressure.
3. **Monitoring**
   Control pressure using your computer or the instrument's front panel knob.
4. **Sample 1**
   The tank protects your AF1 from liquid back flow and can also function as a microfluidic reservoir when using the AF1 as a pressure source (compatible with Eppendorf, Falcon or bottle).
5. **Chip**
   The liquid is smoothly and precisely injected onto the microfluidic chip using suction force.
6. **Sample 2**
   Depressurize the liquid inside the microfluidic reservoir with your Dual AF1 Vacuum & Pressure Controller (compatible with Eppendorf, Falcon or bottle).



FEATURES & BENEFITS

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- **High flow stability**
  Pressure stability down to 100 µbar ensuring a superior flow performance over a large flow range
- **Accurate flow control**
  Input a flow value into the software. Flow regulation down to 7.5 mL/min

- **Software automation**
  Control all instruments through a single panel. Power full script module to automate control and injection over days
- **Create your own program**
  Software Development Kits (C++, Python, MATLAB® and LabVIEW® libraries)
- **Enhanced data saving**
  Up to 10 ms sampling rate to take out the best of your results

- **Easy to install and use**
  Start out of the box and set everything up within minutes
- **Several pressure range**
  Choose among the three pressure settings ranges available
- **Knob pressure control**
  Monitor and control pressure using the front panel knob and screen

TECHNICAL SPECIFICATIONS

AF1 unit pressure range premium	**0** to **200** mbar (0 to 2.9 psi)	**0** to **1,600** mbar (0 to 23 psi)	Dual pressure & vaccum controller **-700** to **1,000** mbar (-10 to 14 psi)
Type of pressure	positive	positive	negative & positive
Pressure sensor resolution	0.006 % FS 12.2 µbar (0.0007 psi)	0.006 % FS 122 µbar (0.007 psi)	0.006 % FS 122 µbar (0.007 psi)
Pressure stability (1)	100 µbar 0.05 % FS (0.0014 psi)	1 mbar 0.05 % FS (0.014 psi)	-700 to 500 mbar: **1 mbar** 500 to 1,000 mbar: **5 mbar**
Response time (2)	50 ms		
Settling time (3)	down to 100 ms		
Supply pressure (min - max)	integrated pump no pressure source needed		integrated pressure & vacuum source (1.5 bar/min, 2.5 bar/min)
Liquid compatibility	any aqueous or organic solvent, oil, or biological sample solution can be propelled		
Output connectors	stainless steel female luer lock		

Non-contractual information may be changed without notice.

Power consumption: 15 W (100 V to 240 V - 50 Hz to 60 Hz) **Case dimensions** (length x width x height): 220 x 130 x 130 mm **Weight:** 1.7 kg

(1) Output stability measured at 150 mbar with an external High accuracy pressure sensor (Druck DPI150) (2) Depending on user computer operating system (3) Volume dependent – Measurement done on 12 mL tank for a set point from 0 to 200 mbar

PRODUCTS & SERVICES

Elements provided by Elveflow	Included	Optional
Software & libraries Control all Elveflow Instruments with the same smart interface	●	
AF1 connection kit A complete set of accessories fitted for the AF1 pressure generator		●
Kits Connect any pressure source/syringe pump to your device		●
Reservoirs Gas tight reservoirs with ergonomic fluidic connection		●
Flow sensors A line of sensors to monitor very low liquid flow rates		●
Compressor A safe & secure pressure source for the OB1 pressure controller		●
Service The Elveflow expertise & support offer you individually tailored solutions	●	

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> Pressure & flow rate visualization and recording

> Programming & automation of complex sequences

> Easy alternative instrument control through the provided C++, Python, MATLAB® and LabVIEW® libraries

National instruments is our technological partner for embedded electronics

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/

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)

PRINCIPLE

1. Pressure & vacuum controller

Connect a pressure and a vacuum source to your OB1.

2. Monitoring

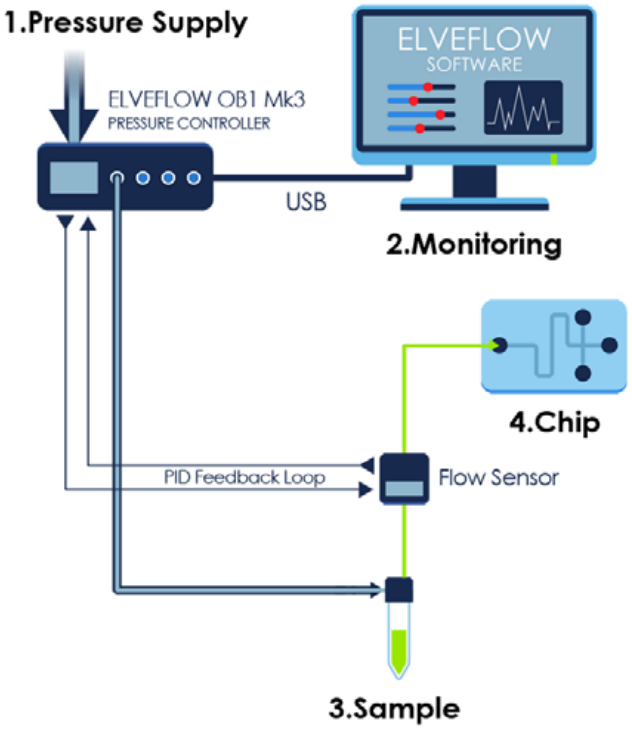
Control the pressure and flow rate using the Elveflow Smart Interface on your computer.
This software enables you to create and automate sequences with a specific pressure or flow.

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 ⎓ 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 availble on request (all data for medium H2O, 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/

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

PERFORMANCES

> Large flow range from 1.6 µL/min to 3.3 mL/min
> Maximum flow rate 3.3 mL/min
> Sensor response time 35 ms
> Accuracy: 2 % of measured value or 0.2 % of measured value

IN PARTNERSHIP WITH BRONKHORST

Coriolis technology

Bronkhorst® FRANCE

FEATURES THAT MATTER

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

PRINCIPLE

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.
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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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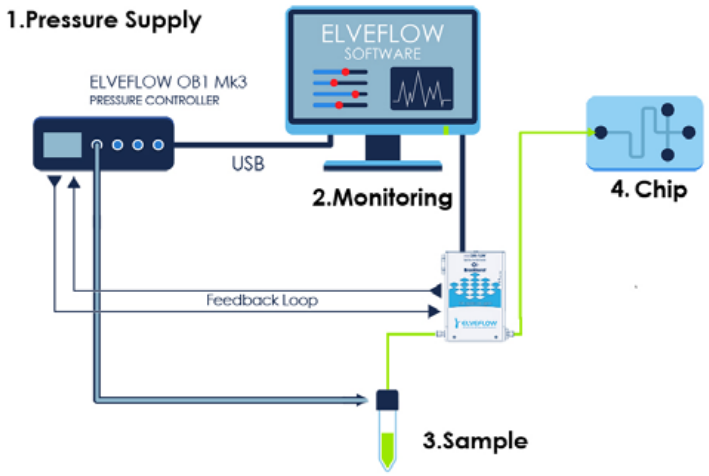

TECHNICAL SPECIFICATIONS

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
Performance		
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) (1)	< ± 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 (2)	Zero drift: ± 0.01 g/h/°C	Zero drift: ± 0.01 g/h/°C
Mounting (3)	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
Mechanical parts		
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

Non-contractual information may be changed without notice.

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/

MEASURE AND CONTROL PRESSURE
ANYWHERE IN YOUR SETUP

PENDING PATENT PENDING

LIQUID FLOW-THROUGH PRESSURE SENSOR
7.5 µL 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.

✓ PRESSURE FEEDBACK OPTION
✓ LOW INTERNAL VOLUME
✓ COMES IN TWO PACKAGES

PERFORMANCES

> Accuracy down to 0.2 % FS
> 5 ranges from 70 mbar to 7000 mbar
> Internal volume 7 µL
> Settling time 20 ms

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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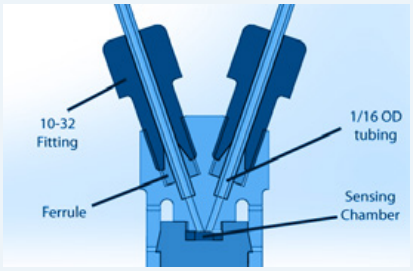


OUR PRESSURE SENSORS WORK AS GAUGE PRESSURE SENSORS,

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/

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.

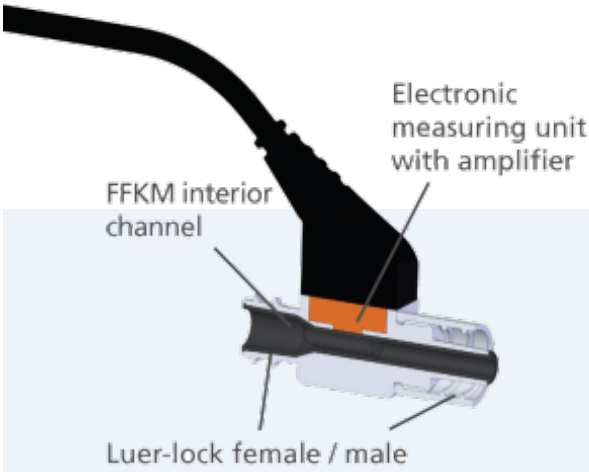
> You can plug our liquid pressure anywhere within your microfluidic setup, record the pressure on your computer and adjust the flow accordingly using our pressure pumps.

[GO TO SUMMARY]

Luer-lock pressure sensor	Specifications
Maximum flow rate [1]	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: **31.2 mm** - inner diameter: between **4 mm** and **1.8 mm**

(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.

MICROFLUIDIC BUBBLE DETECTOR

MBD ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/MICROFLUIDIC-LIQUID-SENSOR/

IDENTIFY IF LIQUID
IS PRESENT IN CLEAR TUBE

The sensor is able to register the presence of fluids inside clear tubing, trigger a signal to another instrument and act accordingly – like stop, wait a certain amount of time, allow enough flow to clear the tubing, or reset the sensor.

ADVANTAGES

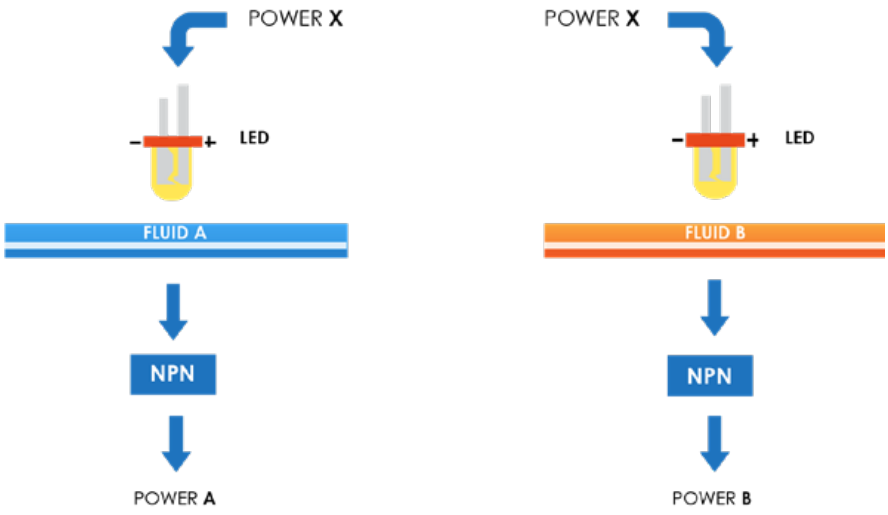
> Cost effective compared to camera
> Based on true/false logic
> Reliable non invasive technique
> Prevents damage in cells with bubble bursts

✓ BUBBLE MONITORING

APPLICATIONS

> Bubble detection
> Liquid level sensing
> Blood processing equipment
> Patent connected medical devices
> Perform bilateral recirculation based on air detection

A light beam is emitted by LED at known power. This light beam goes through the capillary and the fluid passing through. It is then collected by an NPN silicon phototransistor. This phototransistor converts the light power into an electrical power.
When a fluid changes, the optical index and the light absorption coefficient change accordingly. It induces a change in the electrical power and allows to detect changes in the fluid.



SENSOR READING UNIT

MSR ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/MSR-MICROFLUIDIC-SENSOR-READER-V2/

AN ACQUISITION INTERFACE
FOR ALL SENSORS

The sensor reader is an interface allowing the acquisition of many kinds of analog sensors, including Elveflow pressure sensors and flow sensors.

✓ MONITOR UP TO 4 SENSORS

✓ REAL TIME CONTROL & FEEDBACK

PERFORMANCES

> Fast 10 kHz
> Precise 11 bit resolution
> Real-time control & feedback loops
> Read simultaneously up to 4 sensors

FEATURES THAT MATTER

> The sensor reader can be used to monitor flow rate, pressure, or other physical parameters on any type of flow control instrument (syringe pump, peristaltic pump, perfusion, pressure controller).
> It embeds two independent power supplies which allows the use of a wide variety of sensors simultaneously, functioning with different voltages for their power supply.

Sensor reader unit	Specifications		
Number of sensors	4		
Sensor connectors	M8 female (4 pins)		
USB reading current min - max	100 mA - 500 mA		
Sensor power supplies voltage (2 power supplies tunable independently, each feeding 2 sensors)	5 - 25 V		
Total power on the 4 channels	0.9 W		
Sensor inputs			
Impedance	1 MΩ		
Max acquisition frequency	0 - 10 kHz		
Acquisition resolution	11 bits (2048 cts)		
Input range	0 - 10 V	0 - 5 V	0 - 1 V
Resolution (1 bit)	5 mV	2.5 mV	0.5 mV
Noise (full band)	5 mV rms	2.5 mV rms	0.5 mV rms
Analog low-pass filter function characteristics			
Cutoff frequency	60 Hz		
Filter order	3		

Non-contractual information may be changed without notice.

Sensor reader size without connectors (length x width x height): 91 x 69 x 29 mm **Weight:** 320 g

VALVES

SEQUENTIAL INJECTION VALVE
RECIRCULATION VALVE
FLOW SWITCH MATRICES
VALVE CONTROLLERS

ELVEFLOW
PLUG & PLAY MICROFLUIDICS

SEQUENTIAL INJECTION VALVE

MUX DISTRIB ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/FLOW-CONTROL-SYSTEM/FLOW-MULTIPLEXER/

A ROTATIVE VALVE
DESIGNED TO EASILY EXECUTE FAST MEDIUM SWITCHES

The sequential injection valve is a bidirectional 11-port/10 way which can be used as a selector to inject sequentially one liquid sample into ten different lines or ten liquid samples into one line.

✓ UP TO 9 LIQUID INJECTIONS

✓ NO CROSS CONTAMINATION

PERFORMANCES

> Typical mechanical response time for port-to-port movement 280 ms
> Stands up to 9 bar
> Low total internal volume 11.6 µL
> High chemical compatibility (wetted materials: RPC-7)

APPLICATIONS

> Cell culture on chip
> Cell response to medium change
> Drug screening
> Toxicity tests
> Stem cells assays
> Reagent switch for flow chemistry

MUX Distrib		Specifications
Performances	Valves response time	280 ms
	Max. supported pressure	9 bar (125 PSI)
Power supply	Input voltage range, AC	100 V to 240 V
	AC supply frequency	50 Hz to 60 Hz
	Input current, AC	1 A
	Power consumption	35 W
	Safety	IEC/EN 61010-1: 2001
	Shutting down power supply	disconnect AC/DC adapter
Mechanical specifications	Valve type	6 positions / 7ports or 10 positions / 11 ports rotative valve
	Input/Output connectors	1/16 or 1/8 fitting-less tubing connection system
	Operating temperature	10 °C to 40 °C
	Operating humidity	20 to 80 %
Software	Computer specifications	USB 2.0 port, Intel Pentium II 500 MHz, 1 Go Hard Disk space, 2 Go RAM Windows XP/Vista/7/8, 32/64 bit. LabVIEW® 2011 is required when using LabVIEW® libraries.
	Connection type	USB
	Provided elements	C++, Python, MATLAB® and LabVIEW® libraries

Non-contractual information may be changed without notice.

MUX distrib dimensions without connectors (length x width x height): 160 x 76 x 117 mm

RECIRCULATION VALVE

MUX INJ ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/FLOW-CONTROL-SYSTEM/FLOW-MULTIPLEXER/

MAKE LONG-TERM EXPERIMENTS
EASIER AND MORE RELIABLE

The recirculation valve is a bidirectional 6-port/2 position valve allowing to perform switches between two set-up configurations. Applications are stable and unidirectional fluid recirculation.

✓ PRECISE VOLUME INJECTION

✓ LONG RUN RECIRCULATION

PERFORMANCES

> Low port-to-port volume 660 nL
> Port-to-port switching time: 100 ms
> High chemical compatibility (wetted materials: RPC-7)
> No sample cross-contamination & no backflow

APPLICATIONS

> Cell culture on chip
> Drug screening
> Toxicity tests
> Stem cells assays
> Organ on chip
> SPR or TIR imaging coupled with microfluidics

MUX inj		Specifications
Performances	Valves response time	100 ms
	Max. supported pressure	9 bar (125 PSI)
Power supply	Input voltage range, AC	100 V to 240 V
	AC supply frequency	50 Hz to 60 Hz
	Input current, AC	1 A
	Power consumption	35 W
	Safety	IEC/EN 61010-1: 2001
	Shutting down power supply	disconnect AC/DC adapter
Mechanical specifications	Valve type	6 positions / 7ports or 10 positions / 11 ports rotative valve
	Input/Output connectors	1/16 or 1/8 fitting-less tubing connection system
	Operating temperature	10 °C to 40 °C
	Operating humidity	20 to 80 %
Software	Computer specifications	USB 2.0 port, Intel Pentium II 500 MHz, 1 Go Hard Disk space, 2 Go RAM Windows XP/Vista/7/8, 32/64 bit. LabVIEW® 2011 is required when using LabVIEW® libraries.
	Connection type	USB
	Provided elements	C++, Python, MATLAB® and LabVIEW® libraries

Non-contractual information may be changed without notice.

MUX Inj Dimensions without connectors (length x width x height): 160 x 76 x 117 mm

3 UNIQUE FLOW SWITCH MATRICES
TO AUTOMATE FLOW HANDLING

✓ CONTROL UP TO 16 VALVES ✓ COMPACTNESS

MUX CROSS CHIP
Stop the flow in microfluidic devices in 100 ms

> Rocker peek valves
> Plug & play programmable flow stop
> Complete equilibrium & stop flow in 100 ms
> Ultra low volume injection
> Internal/external trigger

APPLICATIONS : Instantaneous flow stop, small sample injection & sample premixing

MUX FLOW SWITCH
Drug switch into microdevices in less than 300 ms

> Rocker peek valves & peek manifold
> Plug & play USB software
> No samples cross-contamination & no backflow
> Flexible: from 4 to 256 valves
> Internal/external trigger

APPLICATIONS : Drug, reagent & cell medium switch for cell biology and flow chemistry

MUX QUAKE VALVE
Open & close bilayer PDMS valves in less than 50 ms

> Plug & play programmable valve sequence
> Fast valve switch
> Fine valve position tuning
> Flexible: from 16 to 256 peek valves
> Internal/external trigger

APPLICATIONS : PDMS microvalves & micropumps and cell confinement device control

MUX series		Cross chip	Flow switch matrix	Quake valve
Performances	Valve response time	20 ms		
	Max. supported pressure	2 bar (29 PSI)		
Power supply	Input voltage range, AC	100 V to 240 V		
	AC supply frequency	50 Hz to 60 Hz		
	Input current, AC	1 A		
	Power consumption	35 W		
	Safety	IEC/EN 61010-1: 2001		
	Shutting down power supply	disconnect AC/DC adapter		
Mechanical specifications	Valve type	2/2-way Solenoid Valve		3/2-way Solenoid Valve
	Input/Output connectors	10-32 UNF (PEEK tube to port fittings adapters provided)		
	Operating temperature	10 °C to 40 °C		
	Operating humidity	20 to 80 %		
Software	Computer specifications	USB 2.0 port, Intel Pentium II 500 MHz, 1 Go Hard Disk space, 2 Go RAM Windows XP/Vista/7/8, 32/64 bit. LabVIEW® 2011 is required when using LabVIEW® libraries.		
	Connection type	USB		
	Provided elements	C++, Python, MATLAB® and LabVIEW® libraries		

Non-contractual information may be changed without notice.

MUX series dimensions without connectors (length x width x height): 220 x 130 x 130 mm

PLUG YOUR VALVES
ANYWHERE IN YOUR MICROFLUIDIC SETUP

✓ MIX ALL KINDS OF VALVES ✓ PLUG FROM 1 TO 16 VALVES

LOW PRESSURE VALVE 2-WAY OR 3-WAY
2-WAY: Choose normally close or normally open

> Compatible with gas or liquid
> ROCKER® valve technology (flow displacement < 10 nL)
> Low internal volume: 20 µL
> Afford a wide range of pressure: -0.75 bar to 2.5 bar (-11 psi to 37 psi)
> High chemical resistance. Wetted materials: PEEK, EPDM, FKM or Kalrez

HIGH PRESSURE VALVE 2-WAY OR 3-WAY
2-WAY: Normally close or normally open

> Compatible with gas or liquid
> ROCKER® valve technology (flow displacement < 10 nL)
> Low internal volume: 50 µL
> Afford a wide range of pressure: 0 bar to 4.5 bar (0 psi to 65 psi)
> High chemical resistance. Wetted materials: PEEK, EPDM, FKM or Kalrez

CUSTOM MANIFOLD
Design on-demand

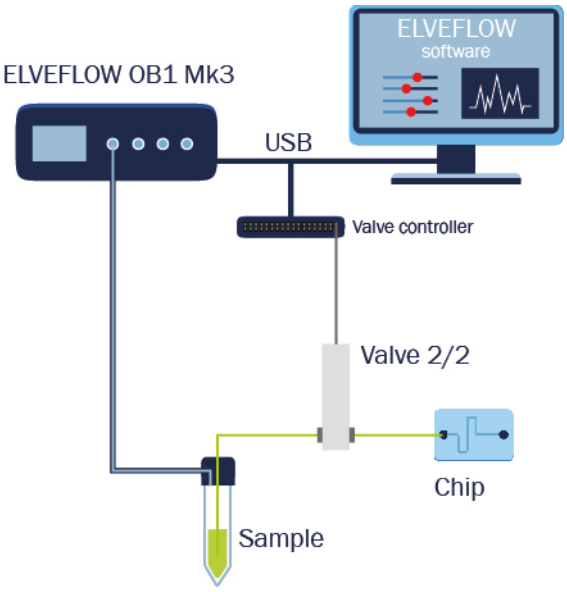
We design on-demand any fluidic manifold compatible with our low pressure valves to meet your requirements.

For instance, we can provide you with 4/1 valves with 20 ms closing time.

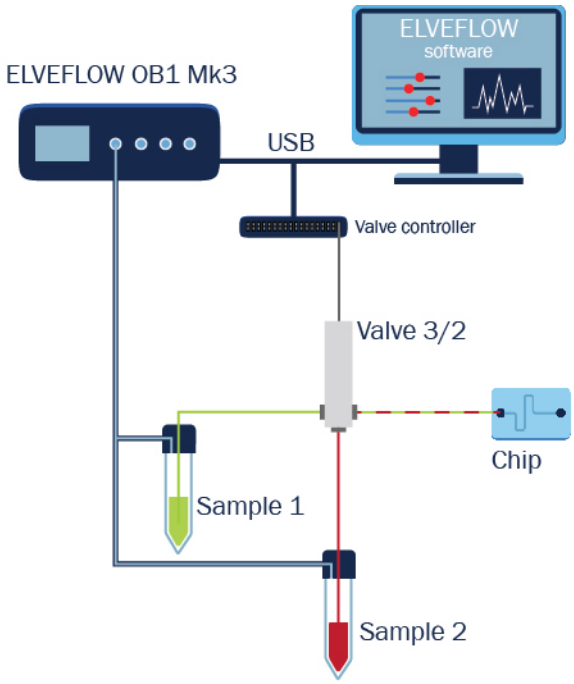
VALVE CONTROLLER
Easily control your microfluidic valves

> Fast liquid switching
> Liquid sampling
> Stop and go flows
> Complex sequences of injection including flushing, rinsing, and sequential injection of several liquids

MICROFLUIDIC 2-WAY VALVE



MICROFLUIDIC 3-WAY VALVE



TECHNICAL SPECIFICATIONS

Valves	Valve design		
Low pressure valve -0.75 bar to 2.5 bar (-11 psi to 37 psi)	**2-way** Normally close	**2-way** Normally open	**3-way**
High pressure palve 0 bar to 4.5 bar (0 psi to 65 psi)	**2-way** Normally close	**2-way** Normally open	**3-way**

Non-contractual information may be changed without notice.

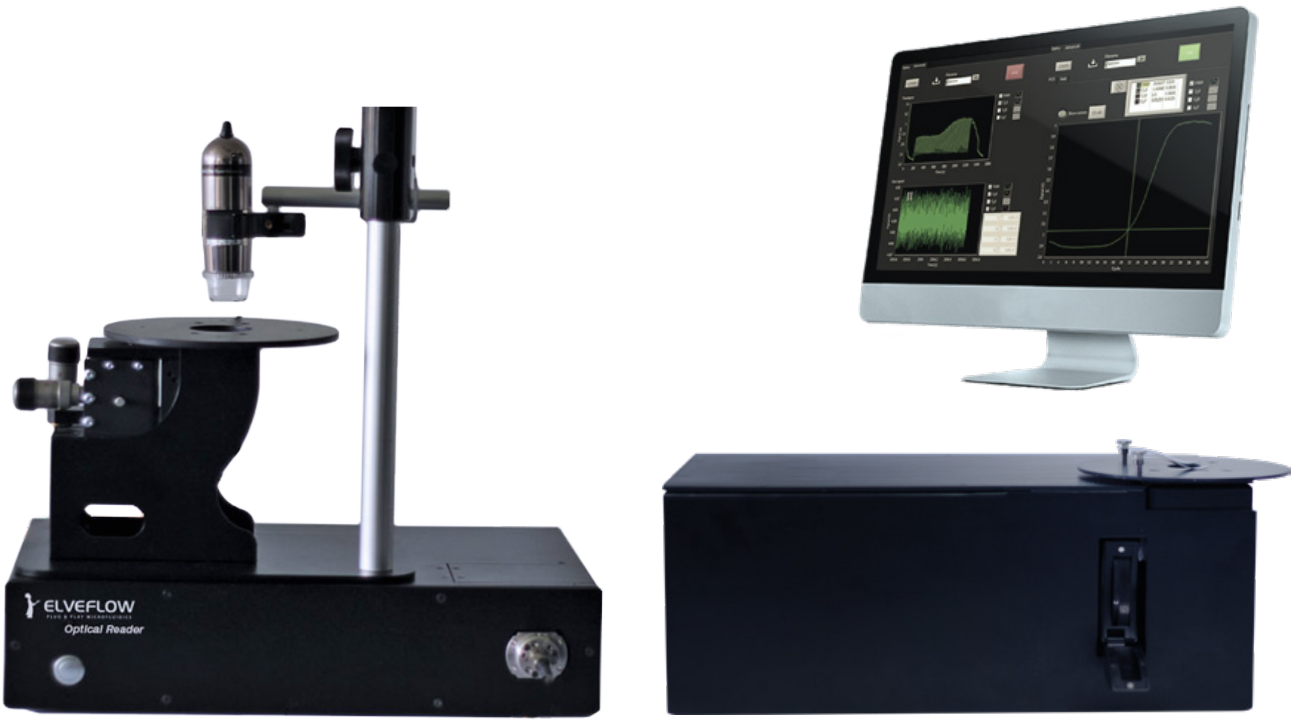
Valve controller	Specifications
Number of controlled valves	16
Bus interface	USB 2.0
Power supply	24 VDC, 1.5 A
Max total power (sum of the power of all connected valves)	35 W
Max valve power	10 W
Valve connectors	WR-MPC 3 2.2

Non-contractual information may be changed without notice.

Valve controller dimensions without connectors (length x width x height): 128 x 81.5 x 31 mm **Weight:** 251 g

FLUORESCENCE DETECTION

OPTOREADER
FLUOREADER

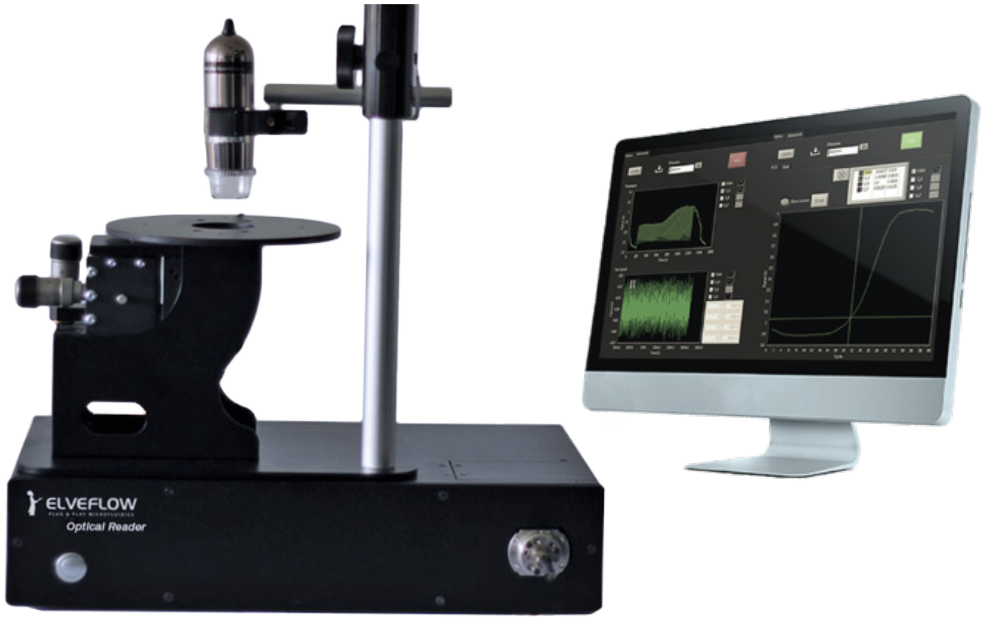


ELVEFLOW
PLUG & PLAY MICROFLUIDICS

OPTICAL READER

OPTOREADER ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/OPTICAL-READER-FOR-MICROFLUIDICS/

HIGH OPTICAL SENSITIVITY
AND REAL-TIME PROCESSING CAPACITY



The optical reader brings about the strength of duplex optical fiber measurement, high optical sensitivity and real-time processing capacity within a compact design.

✓ FAST ACQUISITION

✓ UP TO 4 COLORS

PERFORMANCES

> Fast acquisition up to 100 kHz
> Best sensitivity in the market, < 1 nM FITC
> Compact, 1-step alignment
> High sample rate: 100 000 samples/s

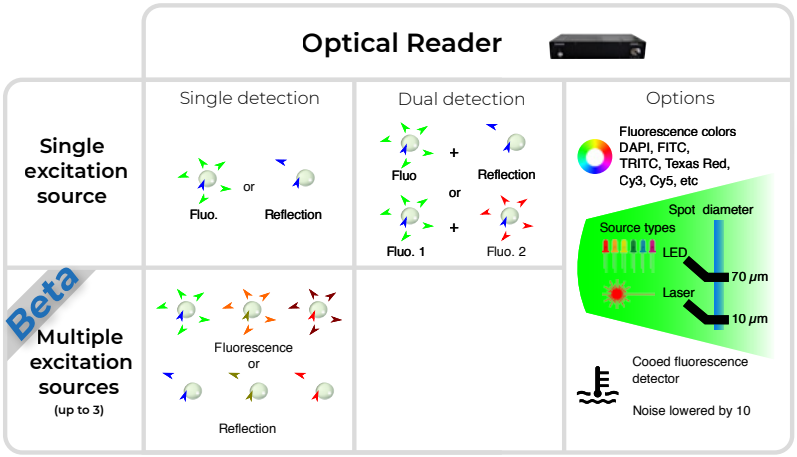
APPLICATIONS

> Microfluidics
> Fiber optic sensor
> Analytical or bio chemistry
> Biology
> Real-time inspection (food, pharmaceutics, etc)
> Aerospace

Optoreader				
Excitation	**Excitation wavelength**	365, 470, 530, 590, 625 nm		
	Fluorescence filter set	DAPI, FITC, TRITC, Texas Red, Cy3, Cy5, etc		
	Light output intensity	0 - 1.5 mW		
	Pulse duration (pulse mode)	10 - 10^7 µs		
	Modulation (lock-in mode)	0.05 - 10 kHz		
Acquisition	**Acquisition frequency**	0 - 100 kHz		
	Acquisition resolution	16 bits		
	Typ. acquisition dynamic	84 dB		
	Technique	Reflection	Fluorescence	
	Measurement range	0 – 12 µW	0 – 0.12 µW	
	Noise equivalent power	10^{-5} W/Hz$^{1/2}$	Base	3 x 10^{-15} W/Hz$^{1/2}$
			Hypersensitive (Analog)	0.3 x 10^{-15} W/Hz$^{1/2}$
			Hypersensitive (Digital)	10 kcps
	Photoelectric sensitivity (532 nm)	0.5 x 10^6 V/W	Base	2 x 10^9 V/W
			Hypersensitivity	10^{10} V/W
	Equivalent fluorescence background (Specified on normal mode, virtually zero in lock-in mode)		< 1 nM FITC	
Optics	**Fiber core diameter**	50, 100, 200, 400 µm		
	Numerical aperture	0.22 – 0.6		
	Focalized spot diameter	35, 75, 150, 300 µm		

Non-contractual information may be changed without notice.

Optoreader dimensions without connectors (length x width x height): 350 x 250 x 120 mm



FLUORESCENCE READER

FLUOREADER ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/FLUORESCENCE-DETECTION-FOR-MICROFLUIDIC-DEVICE/

A COMPACT PLATFORM
FOR FLUORESCENCE DETECTION

The fluoreader is a LED Induced Fluorescence (LEDIF) measuring system designed for microfluidic applications. Faster, more sensitive and less expensive than most optical microscopes, it is a smart alternative for real time optical measurement.

✓ HIGH SENSITIVITY

✓ LARGE DETECTION AREA

PERFORMANCES

> Fast acquisition up to 100 kHz
> Best sensitivity < 20 pW full bandwidth
> 6 reticules selectable with features from 200 µm to 2 mm
> Pulse from 50 µs to 10 s

APPLICATIONS

> Chemical reaction tracking
> Chemical flow throw ultra-sensitive fluorescence detection
> On-chip qPCR
> Cell culture fluorescence measurement for confluency or protein expression tracking

ESI - ELVEFLOW SMART INTERFACE
A UNIQUE SOFTWARE FOR ALL INSTRUMENTS

✓ DIRECTLY INPUT FLOW RATE ✓ CUSTOM FLOW PROFILE

The Elveflow Smart Interface allows an intuitive control of our microfluidic instruments in few clicks. It is thought both for basic control and complex tasks thanks to the use of the scheduler.

The ESI Microfluidic Software makes easy many applications as: generation of continuous fluid streams, dosing of volumes, generation of dynamic flow profiles, optomicrofluidic control, and many more...

National Instruments is our technological partner for embedded electronics

FEATURES THAT MATTER

> Pressure & flow rate visualization and recording

> Programming & automation of complex sequences

> Easy alternative instrument control through the provided C++, Python, MATLAB® and LabVIEW® libraries

Contact us:
ELVEFLOW.COM
CONTACT@ELVEFLOW.COM

Wetted materials

Pressure / vacuum controllers & generators	
OB1 MK3+ - Pressure / vacuum controller	NA
AF1 - Pressure / vacuum generator	NA

Sensors	
MFS - Thermal based flow sensor	Quartz (FS1-FS3) / Borosilicate (FS4-FS5). Fittings PEE
BFS - Coriolis flow sensor	Stainless steel 316 L or comparable
MPS large - Low volume pressure sensor	Polyetherimide, silicon and uorosilicone seal
MPS small - Low volume pressure sensor	PEEK, silicon and uorosilicone seal, silicium membrane
MFP - Luer-lock pressure sensor	FFKM
Bubble detector	NA

Valves	
MUX DISTRIB - Sequential injection valve	RPC-7 (fluidic path) and viton seal
MUX INJ - Recirculation valve	RPC-7 (fluidic path) and viton seal
MUX Flow Switch	PEEK, PFA, FKM
MUX Quake Valve	POM, PFA, FKM, Viton, PEEK, stainless steal
MUX Cross Chip	POM, PFA, FKM, Viton, PEEK, stainless steal

Vannes	
Vannes 2/2	PEEK, EPDM, FKM or Kalrez
Vannes 3/2	PEEK, EPDM, FKM or Kalrez

NA: Non Applicable
EPDM: Ethylene propylene diene terpolymer
FKM: Fluoroelastomer
PFA: Perfluoroalkoxy
POM: Polyoxymethylene
RPC-7: Proprietary Polymer Combination

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