ELVEFLOW
PLUG & PLAY MICROFLUIDICS

PRODUCT CATALOG 2019

WWW.ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/

MICROFLUIDIC POETRY © RUDDARD

ELVEFLOW PRODUCT CATALOG 2019 **REF:** PC19-0618

STATE OF THE ART

microfluidic instrumentation for all

Elveflow is part of the **Elvesys** group. We engineer and manufacture premium flow handling instrumentation since 2012. We are proud to have provided **more than 2,000 systems** so far to both academics and industrial users.

Our product line is built around **the best seller OB1 flow controller** and includes everything for accurate liquid handling. All our instruments can be controlled simultaneously on a same computer using our **software** or **Standard Development Kits**.

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

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PRODUCTS

FLOW CONTROL SYSTEMS

MEASUREMENT & DETECTION

OEM & CUSTOM

SOFTWARE

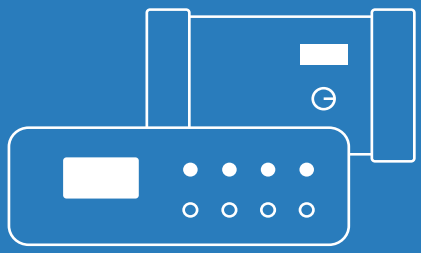
ELVEFLOW OVERVIEW

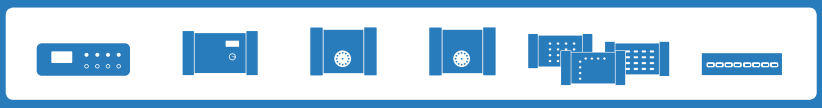
Elveflow focuses on the development of high performance and **plug and play flow control systems** perfect for microfluidic research. We provide the only microfluidic flow control systems using **Piezo technology** and blazing fast flow changes in your microdevice.

MULTIDISCIPLINARY EXPERTS HERE TO HELP YOU

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

ELVE FLOW
PLUG & PLAY MICROFLUIDICS





PRODUCTS

FLOW CONTROL SYSTEMS

OB1 MK3+

MULTI CHANNEL PRESSURE & VACUUM CONTROLLER

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

★ BEST SELLER

DON'T LET YOUR PUMP LIMIT YOUR RESEARCH

BEST RESPONSIVENESS AND ACCURACY ON THE MARKET

The OB1 MK3+ is a **high performance** microfluidic pressure and flow controller. Customize your unit: **choose up to four channels** among the five pressure ranges available.

- ✔ **MODULAR**
- ✔ **UPGRADABLE**
- ✔ **SOFTWARE INCLUDED**

UNIQUE PERFORMANCES

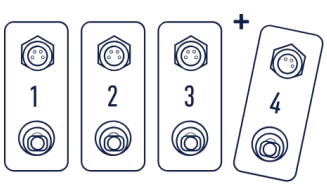
- > Pressure stability **0.005 % FS**
- > Response time **9 ms**
- > Pressure resolution **0.006 % FS**
- > Settling time **down to 35 ms**

PIEZOELECTRIC TECHNOLOGY

CUTTING EDGE PIEZO CONTROL
FOR MICROFLUIDICS

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



CHOOSE FROM 1 TO 4 CHANNELS, AND MORE...

Get a one-channel today and add more channels later

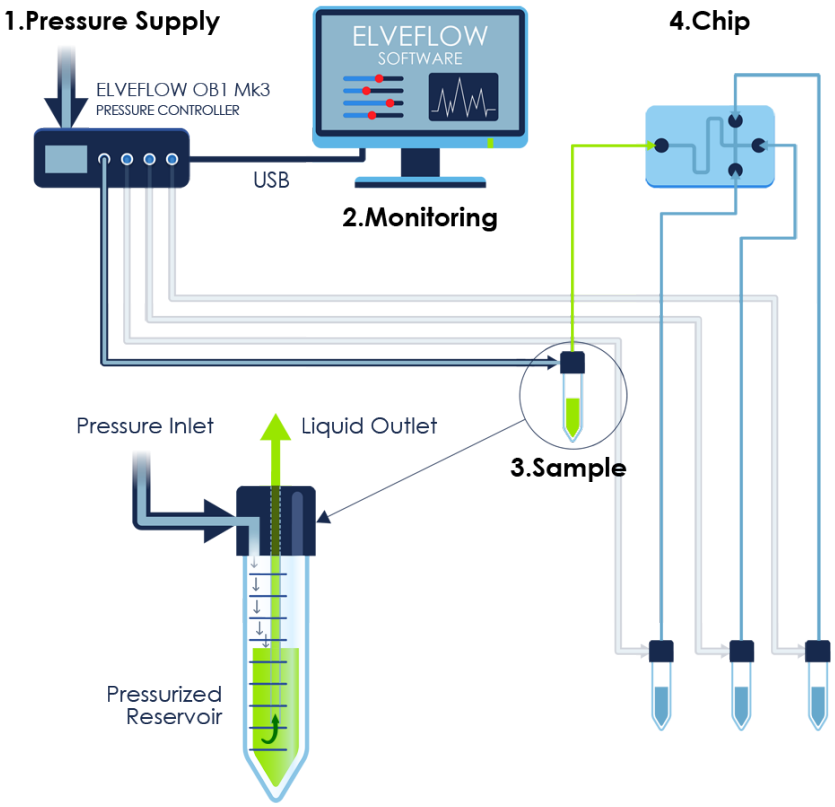
HOW IT WORKS

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's pressure & vacuum features offer precise sample handling, and provide full control over the sample injection.



FEATURES & BENEFITS

- **Short settling time**
Operate blazing fast changes in any microdevice with our Piezo technology

- **Highest flow stability**
Ensure superior flow performance over a large flow range, with pressure stability down to 10 µbar

- **Accurate flow control**
Input a flow value into the software. Flow regulation down to 7.5 nL/min

- **Software automation**
Control all instruments through a single panel. Powerful 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

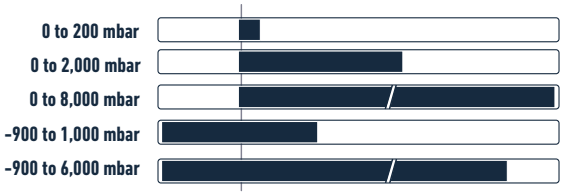
- **Easy to install and use**
Start out of the box and set everything up within minutes

- **Customizable**
Choose from one to four channels among the five pressure ranges available

- **Upgradable later**
Get a one-channel today and add more channels later

PRESSURE RANGES

FOR EACH CHANNEL:
5 PRESSURE RANGES AVAILABLE



TECHNICAL SPECIFICATIONS

CHANNEL PRESSURE RANGE	0 to 200 mbar (0 to 2.9 psi)	0 to 2,000 mbar (0 to 29 psi)	0 to 8,000 mbar (0 to 116 psi)	-900 to 1,000 mbar (-13 to 14.5 psi)	-900 to 6,000 mbar (-13 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 ps	**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				

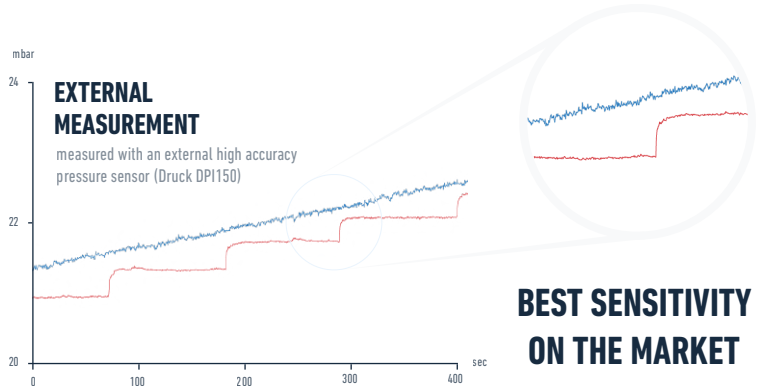
Non-contractual information, may be changed without notice.

POWER CONSUMPTION (maximum): 12 W **CASE DIMENSIONS** (length x width x height): 240 x 223 x 80 mm **WEIGHT:** 1.7 kg to 3.04 kg (3.1 Kg)

(1) Pressure stability (standard deviation) measured over the full pressure range with an external high accuracy pressure sensor (Druck DPI150) (2) Depending on your 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)

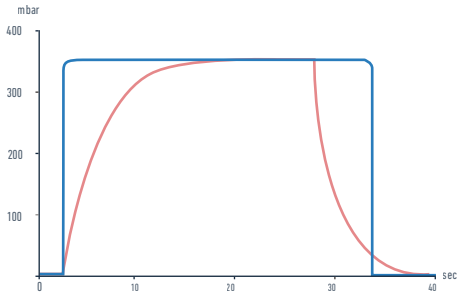


BEST SENSITIVITY ON THE MARKET

ELVEFLOW CLOSEST COMPETITOR ON THE MARKET

FLOW CONTROL REACTIVITY

High precision compared to a syringe pump



ELVEFLOW SYRINGE PUMP

They trust Elveflow's **performances** and **quality**:

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

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

PRODUCTS & SERVICES

ELEMENTS PROVIDED BY ELVEFLOW	INCLUDED	OPTIONAL
Software & libraries Control all Elveflow instruments with the same smart interface	•	
OB1 connection kit A complete set of accessories fitted for the OB1 flow 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	•	

Non-contractual information, may be changed without notice.

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 is our technological partner for embedded electronics

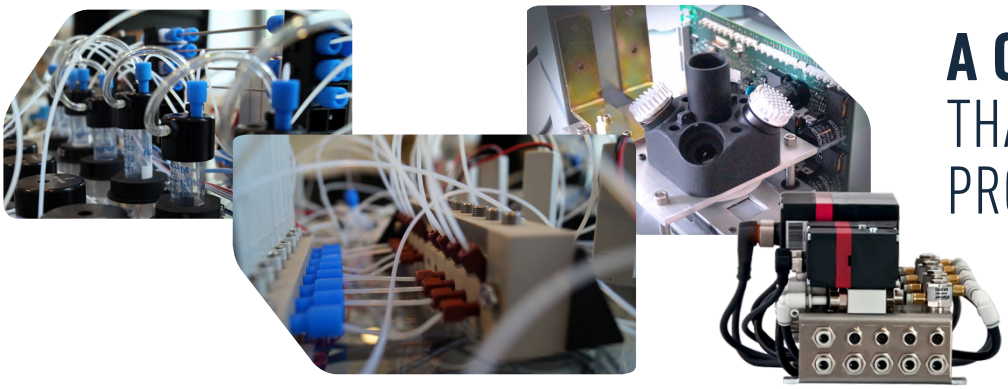
More information:

ESI - FREE SOFTWARE
ELVEFLOW SMART INTERFACE - ALL INSTRUMENTS P.34

OEM

CUSTOM FLUIDIC SYSTEMS

ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/OEM-CUSTOM-FLUIDIC-SYSTEMS/



A CUSTOM SOLUTION THAT FITS YOUR PROJECT PERFECTLY

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 **small footprint** 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 specifications
- Risk management and analysis
- Development and production of mechanics, electronics and software
- Prototyping
- Beta testing, troubleshooting and continuous improvement
- Production, from limited series to large scale
- Maintenance, support and training
- Upgrades of your systems

WHY CHOOSE US AS YOUR OEM PARTNER?

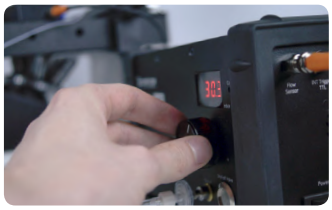
- **Benefit from our expertise** – Our team of senior engineers has launched more than 15 new fluidic products in the last 4 years.
- **A receptive and efficient partner** – We are well aware of the importance of keeping up with the fast-changing market you want to address.
- **A soft intellectual property 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 or Biomerieux already trust us for their scientific instruments. Why not you?
- **A proven track record** – We already carried out successfully several projects taking into account challenging constraints to end up with the best solutions for our partners.

AF1 SERIES

SINGLE CHANNEL AUTONOMOUS PUMP

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

AN AUTONOMOUS PUMP DESIGNED TO MATCH THE NEEDS OF ALL MOBILE SCIENTISTS



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 COMPUTER NEEDED**

UNIQUE PERFORMANCES

- > Pressure resolution **100 µbar**
- > Pressure stability **100 µbar**
- > Response time **50 ms**
- > Settling time **down to 100 ms**

APPLICATIONS

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

HOW IT WORKS

1. **AF1 Pressure Generator**
Fast and accurate pressure and vacuum control for your system.

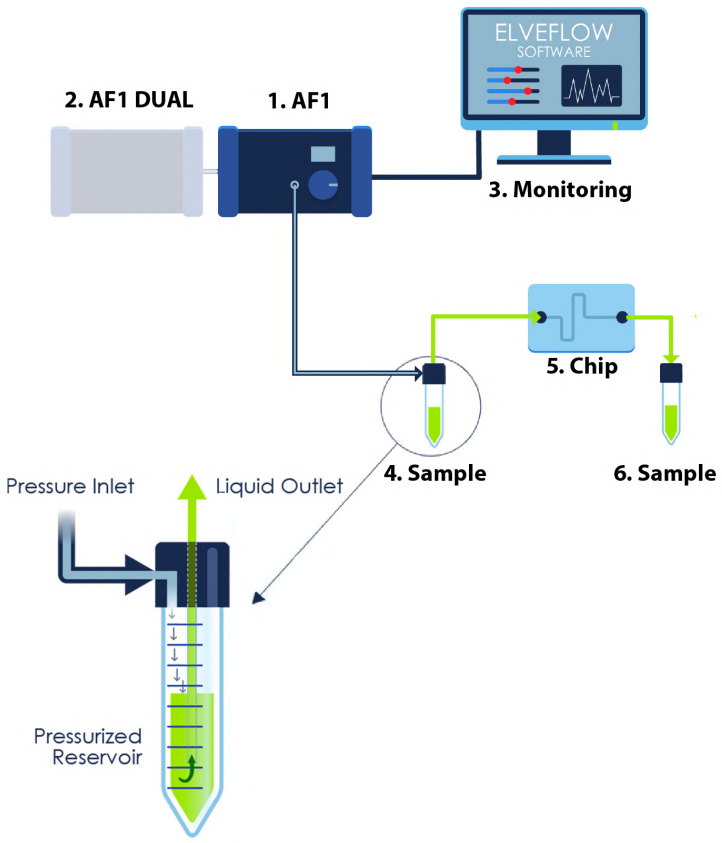
2. **Optional AF1 Dual**
Produces positive and negative pressure.

3. **Monitoring**
Control pressure using your computer or the instrument's front panel knob.

4. **Sample**
Depending on your choice, the liquids can be sucked into the reservoir or be ejected from there since the AF1 can use pressure or vacuum within the same fluidic channel.

5. **Chip**
The liquid is smoothly and precisely injected onto the microfluidic chip using suction force.

6. **Sample**
Depressurize the liquid inside the microfluidic reservoir with your Dual AF1 Vacuum & Pressure Controller (compatible with Eppendorf, Falcon or bottle).



FEATURES & BENEFITS

- **Short settling time**
Piezo technology allowing a blazing fast flow change in any microdevice

- **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 nL/min

- **Software automation**
Control all instruments through a single panel. Powerful 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 ranges available

- **Knob pressure control**
Monitor and control pressure using the front panel knob and screen

TECHNICAL SPECIFICATIONS

AF1 PREMIUM	AF1 200	AF1 1,600	AF1 DUAL
Pressure range	**0 to 200 mbar** (0 to 2.9 psi)	**0 to 1,600 mbar** (0 to 23 psi)	**-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)	**0.006 % FS** 122 µbar (0.007 psi)
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 Controll 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		•
Service The Elveflow expertise & support to offer you individually tailored solutions	•	

Non-contractual information, may be changed without notice

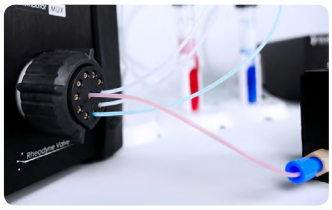
They trust Elveflow's **performances** and **quality**:

MUX DISTRIB

10-WAY BIDIRECTIONAL VALVE

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.

- ✔ **INJECTION OF UP TO 9 LIQUIDS**
- ✔ **NO CROSS CONTAMINATION**

UNIQUE 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: PCTFE and UHWMPE)

APPLICATIONS

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

TECHNICAL SPECIFICATIONS

MUX DISTRIB		SPECIFICATIONS
Performances	Valves actuation 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	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 %
	Wetted materials	PCTFE and UHWMPE
Software	Computer specifications	USB 2.0 port, Intel Pentium II 500 MHz, 1 Go Hard Disk space, 2 Go RAM Windows XP and newer, 32/64 bit. LabVIEW® 2011 is required when using LabVIEW® libraries.
	Connection type	USB
	Provided elements	C++, Python, MATLAB® and LabVIEW® libraries

MUX DISTRIB DIMENSIONS without connectors (length x width x height): 160 x 76 x 117 mm

Non-contractual information, may be changed without notice.

MUX INJ

6-PORT/2-POSITION BIDIRECTIONAL VALVE

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 unidirectional fluid recirculation** and **sample injection**

- ✔ **PRECISE VOLUME INJECTION**
- ✔ **LONG RUN RECIRCULATION**

UNIQUE PERFORMANCES

- Low port-to-port volume: **660 nL**
- Port-to-port switching time: **100 ms**
- **High chemical compatibility** (wetted materials: PCTFE and UHWMPE)
- 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

TECHNICAL SPECIFICATIONS

MUX INJ		SPECIFICATIONS
Performances	Valves actuation 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 %
	Wetted materials	PCTFE and UHWMPE
Software	Computer specifications	USB 2.0 port, Intel Pentium II 500 MHz, 1 Go Hard Disk space, 2 Go RAM Windows XP and newer, 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

MUX SERIES

FLOW SWITCH MATRICES

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

3 UNIQUE FLOW SWITCH MATRICES TO AUTOMATE FLOW HANDLING

- ✔ CONTROL UP TO 16 VALVES INDEPENDENTLY
- ✔ SMALL FOOTPRINT

MUX CROSS CHIP

Stop the flow in microfluidic devices

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

APPLICATIONS: Instantaneous flow stop, small sample injection & sample premixing
WETTED MATERIAL: POM, Viton, PEEK, FKM

MUX FLOW SWITCH

Drug switch into microdevices

- > 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
WETTED MATERIAL: PEEK, FKM

MUX QUAKE VALVE

Open & close bilayer PDMS valves

- > 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
WETTED MATERIAL: POM, Viton, PEEK, FKM

TECHNICAL SPECIFICATIONS

MUX SERIES		CROSS CHIP	FLOW SWITCH MATRIX	QUAKE VALVE
Performances	Valves actuation 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	1/4-28 UNF	10-32 UNF
	Wetted materials	POM, Viton, PEEK, FKM	PEEK, FKM	POM, Viton, PEEK, FKM
	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 and newer, 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

MUX WIRE

VALVES & VALVE CONTROLLER

ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/FLOW-CONTROL-SYSTEM/MMW-MICROFLUIDIC-MUX-WIRE/

PLUG YOUR VALVES **ANYWHERE** IN YOUR MICROFLUIDIC SETUP

- ✔ MIX ALL KIND OF VALVES
- ✔ PLUG FROM 1 TO 16 VALVES
- ✔ EASILY STACK THEM

LOW PRESSURE VALVE 2-WAY OR 3-WAY

2-WAY: Pick default setting: open or closed

- > Compatible with gas or liquid
- > ROCKER® valve technology (flow displacement < 10 nL)
- > Low internal volume: 20 µL & orifice diameter 1.4 mm
- > Wide pressure range: -0.75 bar to 2.5 bar (-11 psi to 37 psi)
- > High chemical resistance. Wetted materials: PEEK + FKM + PVDF and on-demand options: (PEEK or PFA) + (EPDM or FKM or Kalrez) + (PFA or PVDF)

HIGH PRESSURE VALVE 2-WAY OR 3-WAY

2-WAY: Pick default setting: open or closed

- > Compatible with gas or liquid
- > ROCKER® valve technology (flow displacement < 10 nL)
- > Low internal volume: 50 µL & orifice diameter: 1.6 mm
- > Wide pressure range: 0 bar to 4.5 bar (0 psi to 65 psi)
- > High chemical resistance. Wetted materials: PEEK + FKM + PVDF and on demand options: (PEEK or PFA) + (EPDM or FKM or Kalrez) + (PFA or PVDF)

CUSTOM MANIFOLD

On-demand design

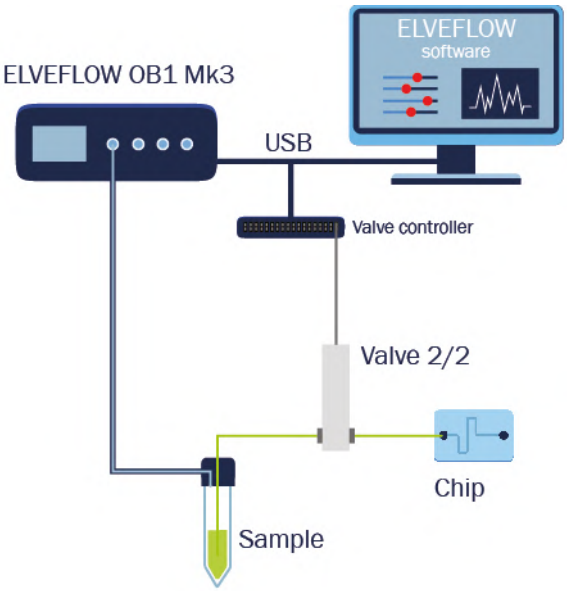
- > We design on demand any fluidic manifold compatible with our valves to meet your requirements.
- > For instance, we can provide you with 4/1 valves with 20 ms closing time.

VALVE CONTROLLER

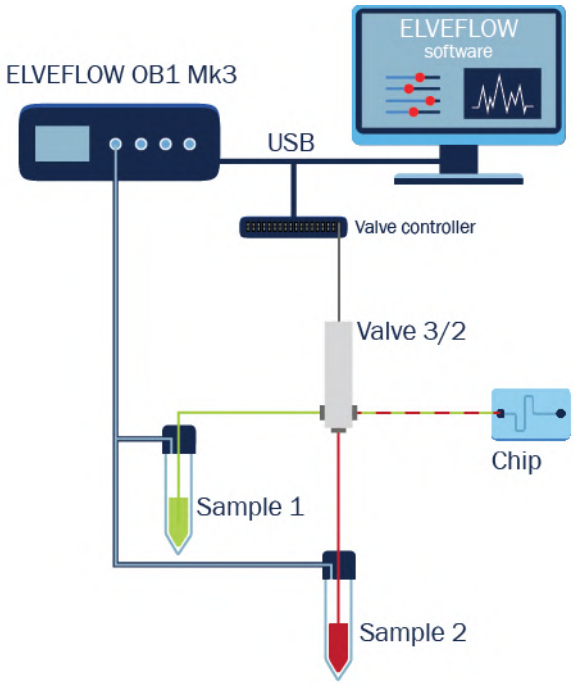
Easily control your microfluidic valves

- > 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	VALVES DESIGN		
Low pressure valve -0.75 bar to 2.5 bar (-11 psi to 37 psi) With casing - Fittings: 1/4-28"	2-way Normally open	2-way Normally closed	3-way
High pressure valve 0 bar to 4.5 bar (0 psi to 65 psi) Without casing - Fittings: 10-32"	2-way Normally open	2-way Normally closed	3-way
Wetted materials (all valves)	PEEK + FKM + PVDF on demand options: (PEEK or PFA) + (EPDM or FKM or Kalrez) + (PFA or PVDF)		

Non-contractual information, may be changed without notice.

VALVE CONTROLLER	SPECIFICATIONS
Number of controlled valves	8
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

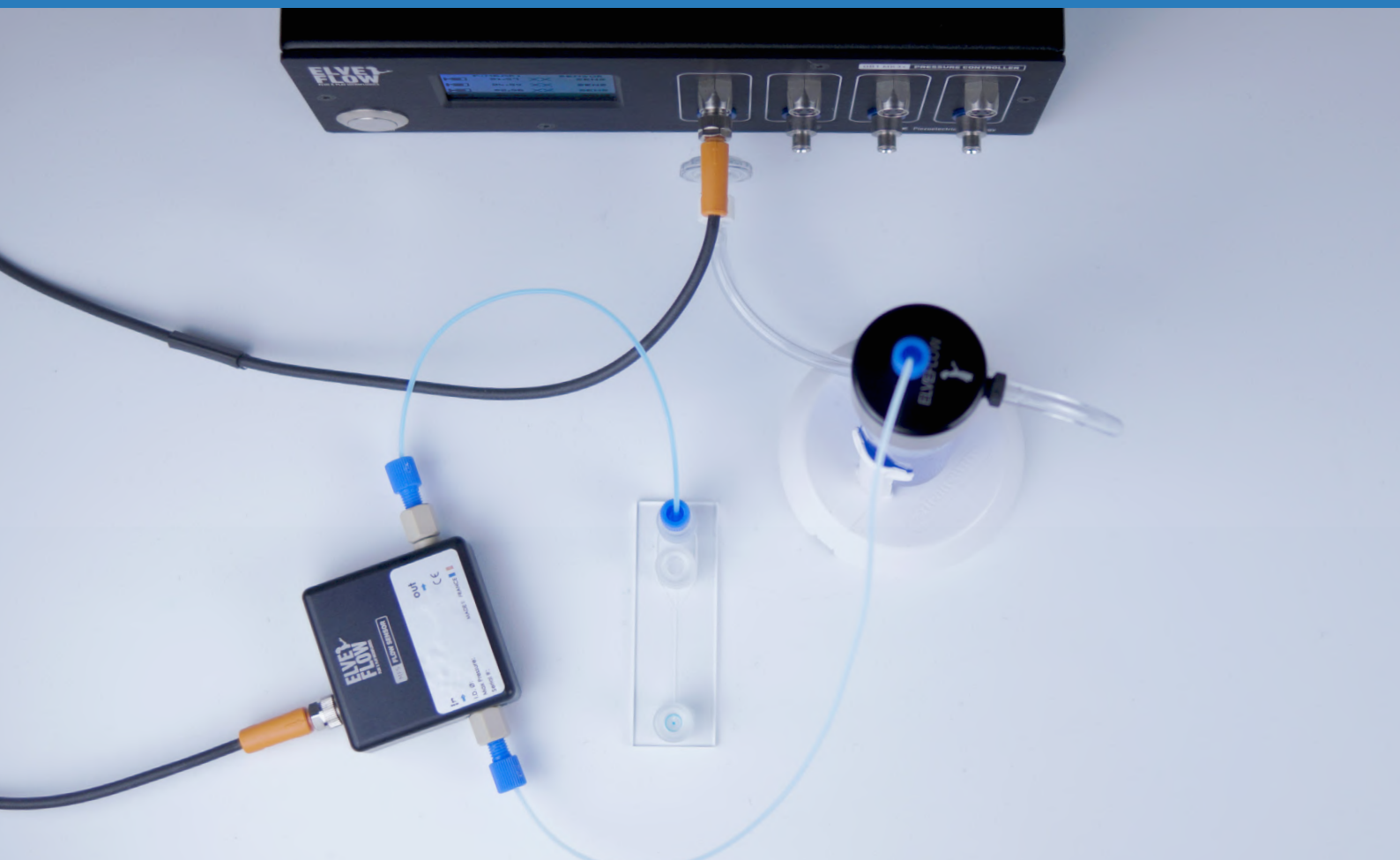
VALVE CONTROLLER DIMENSIONS without connectors (length x width x height): 128 x 81.5 x 31 mm **WEIGHT:** 251 g

Non-contractual information, may be changed without notice.

ELVE FLOW
PLUG & PLAY MICROFLUIDICS

PRODUCTS

MEASUREMENT & DETECTION

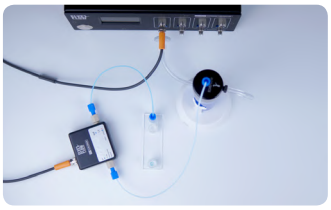


MFS

THERMAL BASED FLOW SENSOR

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**. The thermal based flow sensor comes with an M8 4 pin electrical connection, it can be controlled directly through the Elveflow software.

- ✔ 5 FLOW RATE RANGES
- ✔ HIGH CHEMICAL COMPATIBILITY

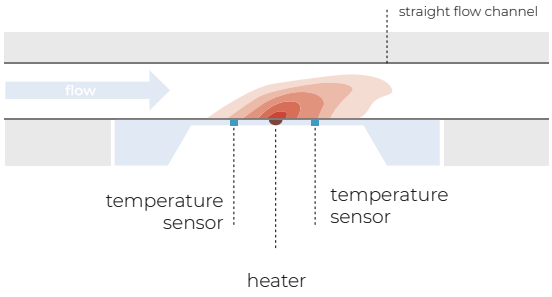
UNIQUE PERFORMANCES

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

APPLICATIONS

- Couple with an OB1 flow controller for direct flow rate control
- Bi-directional flow rate measurement (positive & negative)

PRINCIPLE



HOW IT WORKS

1. Pressure & vacuum controller

Connect a pressure and a vacuum source to your OB1.

2. Monitoring

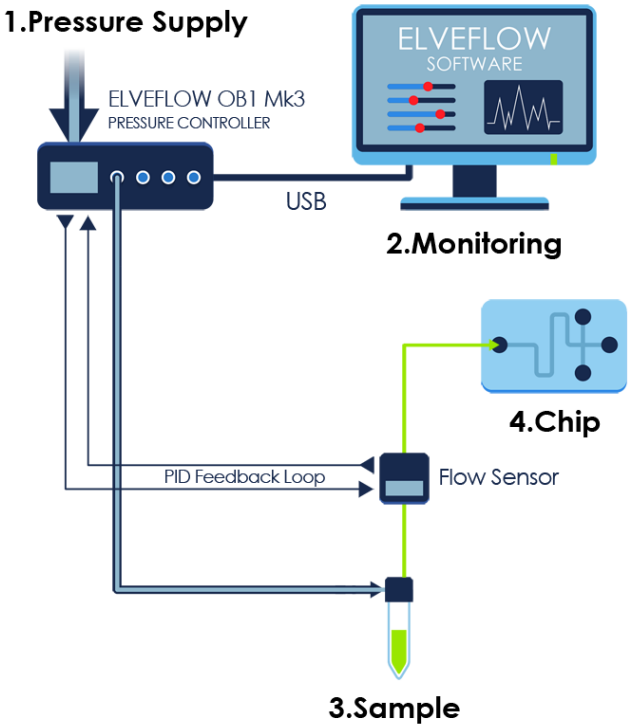
Control the pressure and flow rate using the Elveflow Smart Interface on your computer.
This software enables you to create and automate sequences with a specific pressure or flow.

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.

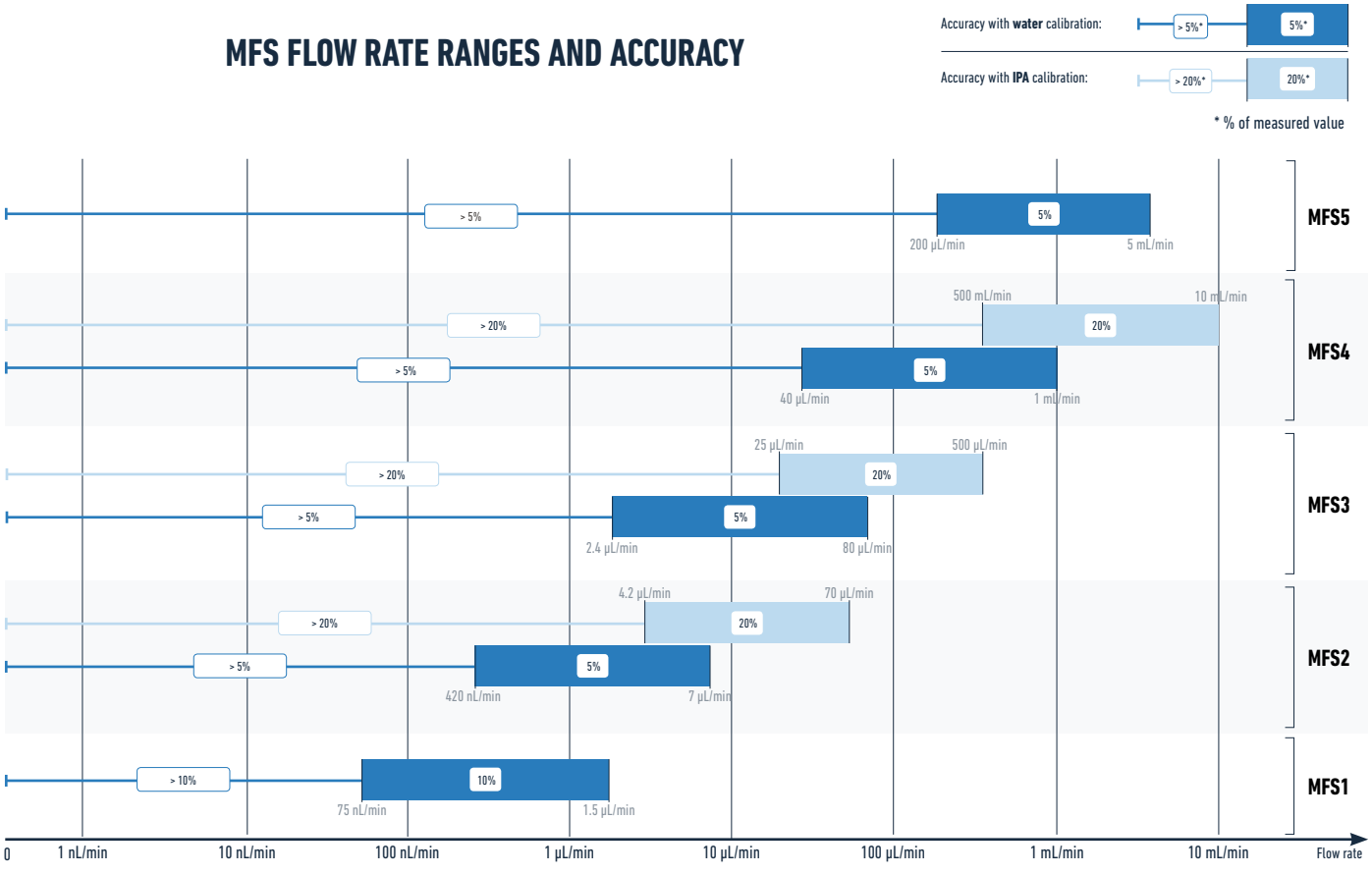
4. Chip

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



TECHNICAL SPECIFICATIONS

MFS FLOW RATE RANGES AND ACCURACY



TECHNICAL SPECIFICATIONS

VALVES	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 applies to negative values (bi-directional)	7 nL/min between [0 to 75] nL/min	20 nL/min between [0 to 0.42] µL/min	210 nL/min between [0 to 4.2] µL/min	120 nL/min between [0 to 2.4] µL/min	5 µL/min between [0 to 25] µL/min	2 µL/min between [0 to 0.04] mL/min	100 µL/min between [0 to 0.5] mL/min	10 µL/min between [0 to 200] µL/min
	10 % m.v. between [75 to 1,500] nL/min	5 % m.v. between [0.42 to 7] µL/min	20 % m.v. between [4.2 to 70] µL/min	5 % m.v. between [2.4 to 80] µL/min	20 % m.v. between [25 to 500] µL/min	5 % m.v. between [0.04 to 1] mL/min	20 % m.v. between [0.5 to 10] mL/min	5 % m.v. between [0.2 to 5] mL/min
Repeatability m.v. - measured value applies to negative values (bi-directional)	0.9 nL/min between [0 to 80] nL/min	3.5 nL/min between [0 to 0.7] µL/min	7 nL/min between [0 to 0.7] µL/min	8 nL/min between [0 to 1.4] µL/min	0.25 µL/min between [0 to 25] µL/min	0.2 µL/min between [0 to 0.04] mL/min	5 µL/min between [0 to 0.5] mL/min	1 µL/min between [0 to 0.2] mL/min
	< 1 % m.v. between [80 to 1,500] nL/min	0.5 % m.v. between [0.7 to 7] µL/min	1 % m.v. between [0.7 to 70] µL/min	0.5 % m.v. between [1.4 to 80] µL/min	1 % m.v. between [25 to 500] µL/min	0.5 % m.v. between [0.04 to 1] mL/min	1 % m.v. between [0.5 to 10] mL/min	0.5 % m.v. between [0.2 to 5] mL/min
Sensor inner diameter	25 µm	150 µm		430 µm		1.0 mm		1.8 mm
Operating pressure	200 bar			100 bar		15 bar		15 bar
Burst pressure	400 bar			200 bar		30 bar		30 bar
Microfluidic fitting type	UNF 1/4-28							
Wetted material	PEEK							
Internal sensor capillary material	Quartz					Borosilicate glass		

⎓

Non-contractual information, may be changed without notice.

ELECTRICAL INPUT: 8V 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 5mL/min
The product comes fully calibrated for water
Flow calibration for methanol or other media is available 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 +10°C to +50°C
The flow sensor shows bi-directional and linear transfer characteristics

BFS

CORIOLIS BASED FLOW SENSOR

ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/MICROFLUIDIC-FLOW-SENSOR-CORIOLIS/

COMPATIBLE WITH ALL LIQUIDS: WATER, OIL, ALCOHOL, MIXTURE... WITH NO CALIBRATION REQUIRED

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**

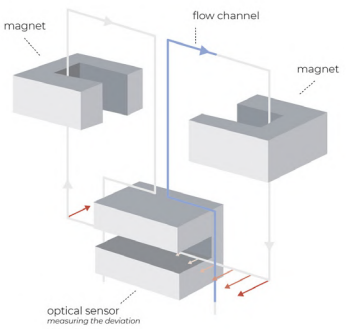
UNIQUE PERFORMANCES

- Large flow range **from 1.6 µL/min to 500 mL/min**
- Maximum flow rate: **500 mL/min**
- Sensor response time: **35 ms**
- Accuracy: **2 %** of measured value or **0.2 %** of measured value

APPLICATIONS

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

PRINCIPLE



HOW IT WORKS

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Connect a pressure and a vacuum source to your OB1.

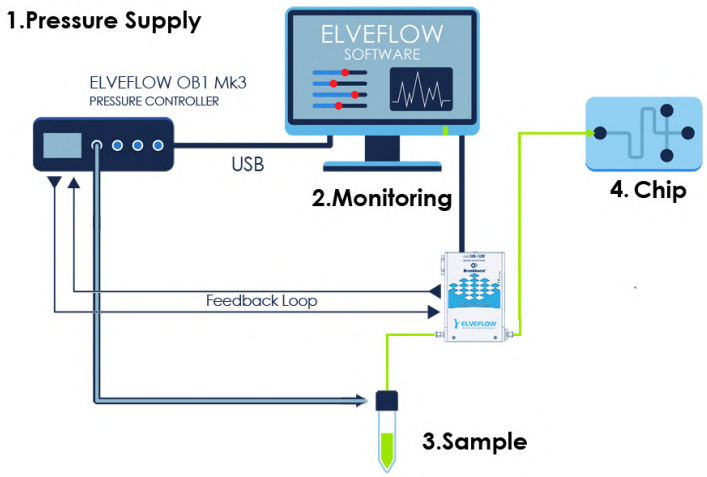
2. Monitoring

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

4. Chip

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



TECHNICAL SPECIFICATIONS

CORIOLIS FLOW SENSOR	BFS 1	BFS 1+	BFS 2	BFS 3
Flow range	0.1 g/h to 200 g/h		1 g/h to 2000 g/h	30 g/h to 30000 g/h
Minimum flow rate (water)	1.6 µL/min		16.6 µL/min	500 µL/min
Maximum flow rate (water)	3.3 mL/min		33.3 mL/min	500 mL/min
PERFORMANCE				
Mass flow accuracy liquids	up to ± 2 % of measured value	up to ± 0.2 % of measured value		
Mass flow accuracy gases	up to ± 0.5 % o measured value			
Repeatability	± 0.05 % of rate ± 1/2 (ZS* x 100/flow) % based on digital output			
Zero stability (ZS) (1)	< ± 0.02 g/h		< ± 0.2 g/h	< ± 6 g/h
Density accuracy	< ± 5 kg/m³			
Temperature accuracy	± 0.5 °C			
Temperature effect (2)	Zero drift: ± 0.01 g/h/°C		Zero drift: ± 0.02 g/h/°C	Zero drift: ± 0.5 g/h/°C
Mounting (3)	Any position, attitude sensitivity negligible			
Device temperature	0...70 °C			
Response time (t 98 %)	0.2 s to fill the tubing then 35 ms			
MECHANICAL PARTS				
Wetted material	Stainless steel 316 L or comparable		Stainless steel 316 L or comparable	
			Optional: Hastelloy-C22	Optional: Hastelloy-C23
Pressure rating	200 bar		200 bar; higher on request	
Sensor inner diameter	250 µm		0.5 mm	1.3 mm
Microfluidic fitting type			SwageLok	
Internal volume	13 µL		0.45 mL	0.82 mL
Calibration	/	Individual calibration certificate		

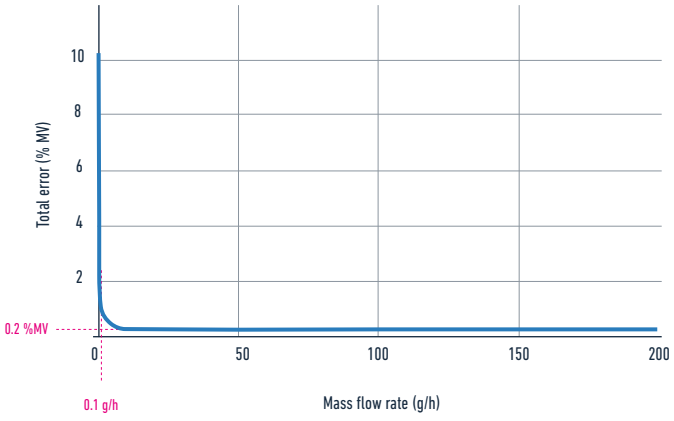
FLOW SENSOR SIZE (length x width x height): 65 x 32 x 144 mm **WEIGHT:** 3 kg

Non-contractual information, may be changed without notice.

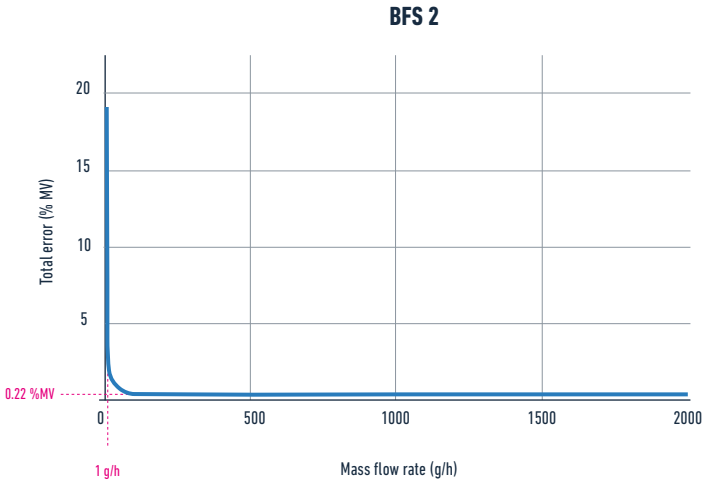
(1) Guaranteed at constant temperature and for unchanging process and environment conditions. (2) Depends on flow rate, heat capacity fluid, T amb., T fluid and cooling capacity.
(3) To be rigidly bolted to a stiff and heavy mass or construction for guaranteed zero stability. External shocks or vibrations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

TOTAL ERROR (% MV)

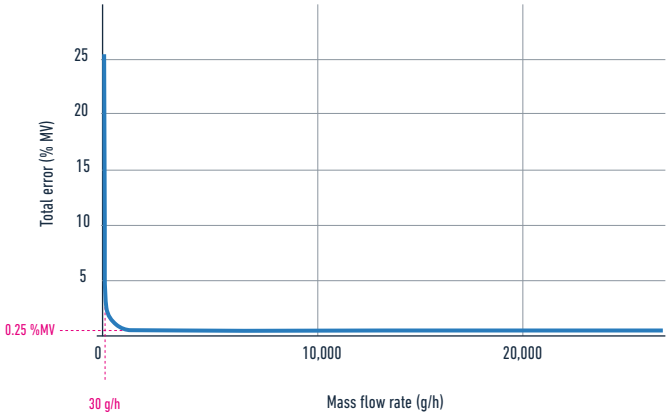
BFS 1+



BFS 2



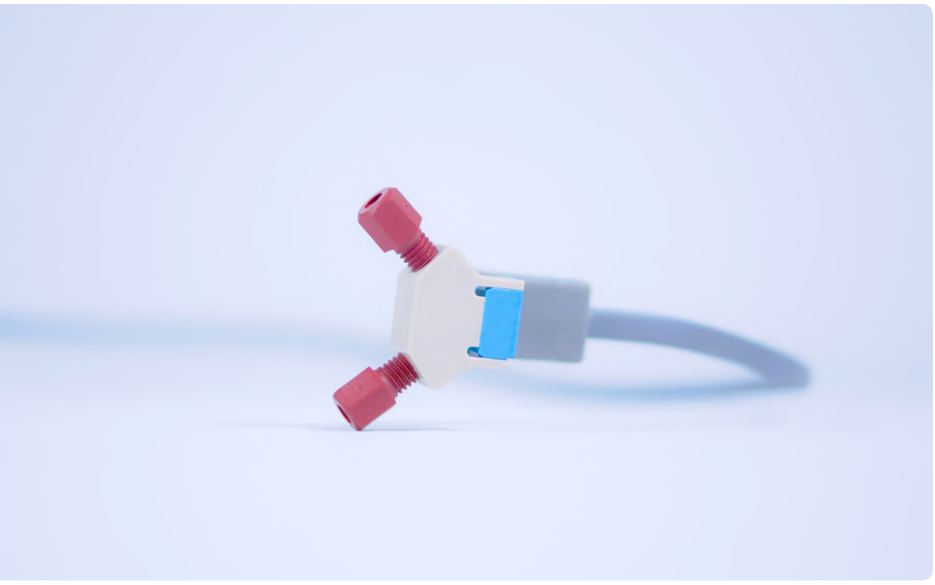
BFS 3



MPS

LOW VOLUME PRESSURE SENSOR

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



MEASURE AND CONTROL PRESSURE ANYWHERE IN YOUR SETUP

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**

✔ **MEASUREMENT & DETECTION**

UNIQUE PERFORMANCES

> Accuracy **down to 0.2 % FS**
> 5 ranges **from 70 mbar to 7,000 mbar**
> Internal volume: **7 µL**
> Settling time: **20 ms**

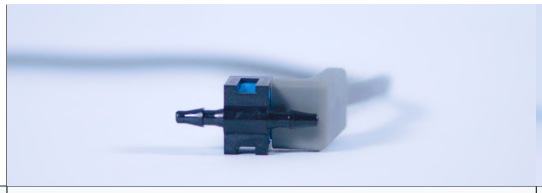
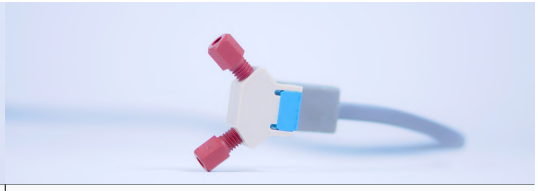
APPLICATIONS

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

TECHNICAL SPECIFICATIONS

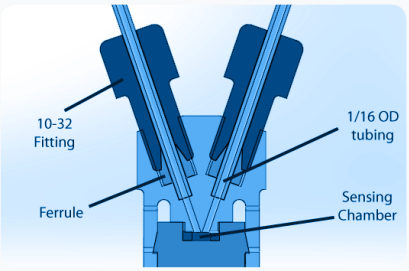
MICROFLUIDIC PRESSURE SENSOR		MPS 0	MPS 1	MPS 2	MPS 3	MPS 4
Sensor range		**70 mbar** 1 psi	**340 mbar** 5 psi	**1 bar** 15 psi	**2 bar** 30 psi	**7 bar** 100 psi
Pressure range min-max		-1 to 1 psi	-5 to 5 psi	-15 to 15 psi	-15 to 30 psi	-15 to 100 psi
Maximum overpressure		20 psi	20 psi	45 psi	60 psi	200 psi
Pressure accuracy liquids		up to ± 0.5 % of measured value	up to ± 2 % of measured value	up to ± 0.2 % of measured value		
Linearity %span	Typical	**0.25**	**0.4**	**0.25**	**0.1**	**0.4**
	Max.	**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	LARGE	SMALL
Sensor design		
Connection type	arrow for 3/32 ID tubing	10-32 thread with ferrule
Internal dead volume	70 µL	7.5 µL
Recommended tubing diameter (inch)	3/32" ID	1/16" OD
Wetted materials	polyetherimide, silicon and fluorosilicone seal	PEEK, silicon and fluorosilicone seal
Electrical connection	4 point measurement M8 connector compatible with Elveflow Sensor Reader and a Sensor Reader	

Non-contractual information, may be changed without notice.

SENSOR SIZE (length x width x height): **LARGE**: 29 x 13 x 27 mm **SMALL**: 40 x 33 x 19 mm **AMPLIFICATION MODULE SIZE:** 52 x 24 x 24 mm



OUR PRESSURE SENSORS WORK AS GAUGE PRESSURE SENSORS,

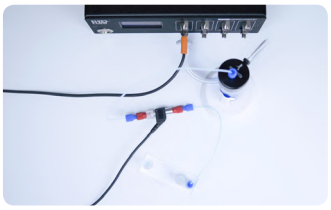
measuring positive and negative pressure relatively to atmospheric pressure.

MFP

LUER-LOCK PRESSURE SENSOR

ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/MFP-MICROFLUIDIC-INLINE-PRESSURE-SENSOR/

MEASURE AND CONTROL PRESSURE OVER A LARGE RANGE



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

- ✔ **HIGH CHEMICAL COMPATIBILITY**
- ✔ **UP TO 16 BAR**

UNIQUE PERFORMANCES

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

APPLICATIONS

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

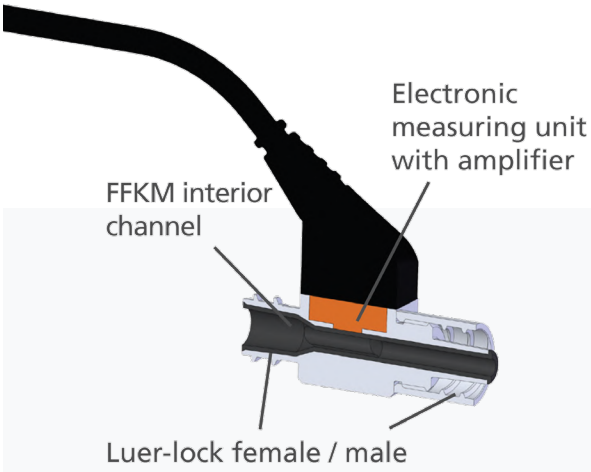
TECHNICAL SPECIFICATIONS

LUER-LOCK PRESSURE SENSOR	SPECIFICATIONS
Maximum flowrate (1)	**100 mL/min**
Pressure range	0 to 16 bar
Power supply	12 to 30 VDC
Wetted materials	housing: coated aluminum interior flow channel: FFKM, molding TPU
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	inner diameter: between **4 mm** and **1.8 mm** length: **31.2 mm**

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

Non-contractual information, may be changed without notice.

SENSOR SIZE (length): 31.2 mm



WIDE MEDIA COMPATIBILITY

(material in contact: FFKM) FDA-certified and therefore, suitable for food industry use.

OUR PRESSURE SENSORS WORK AS GAUGE PRESSURE SENSORS,

measuring positive and negative pressure relativly to atmospheric pressure.

MBD

MICROFLUIDIC BUBBLE DETECTOR

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

CHECK IF LIQUID IS PRESENT IN CLEAR TUBING

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

- ✔ **BUBBLE MONITORING**
- ✔ **LIQUID INTERFACES DETECTION**

UNIQUE PERFORMANCES

- > Cost-effective compared to camera
- > Based on true/false logic
- > Reliable non invasive technique
- > Prevents damage in cells with bubble bursts
- > The microfluidic bubble detector comes in two different casing suited to the use with 1/16" or 1/4" outside diameter tubes

APPLICATIONS

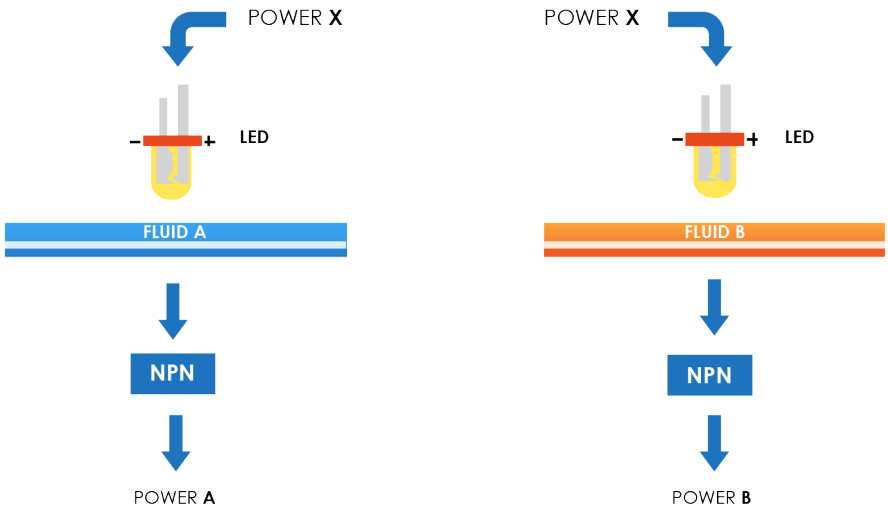
- > Bubble detection
- > Liquid level sensing
- > Blood processing equipment
- > Patient connected medical devices
- > Perform bilateral recirculation based on air detection

TECHNICAL SPECIFICATIONS

DETECTION MODULE SIZE (length x width x height): 68 x 29 x 33 mm **AMPLIFICATION MODULE SIZE:** 69 x 59 x 22 mm

HOW IT WORKS

A light beam is emitted by a 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.



MSR

SENSOR READING UNIT

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**

UNIQUE PERFORMANCES

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

APPLICATIONS

> 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 simultaneousy, functionning with different voltages for their power supply

TECHNICAL SPECIFICATIONS

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 of which 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		

SENSOR READER SIZE without connectors (length x width x height): 91 x 69 x 29 mm **WEIGHT:** 320 g

Non-contractual information, may be changed without notice.

ESI

ELVEFLOW SOFTWARE

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

ESI – ELVEFLOW SMART INTERFACE
A UNIQUE SOFTWARE FOR ALL INSTRUMENTS

- ✔ DIRECTLY INPUT FLOW RATE
- ✔ CUSTOM FLOW PROFILE
- ✔ ADVANCED WORKFLOW AUTOMATION

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

The ESI microfluidic software makes many applications easy, such as: **generation of continuous fluid streams, dosing of volumes, generation of dynamic flow profiles, Optomicrofluidic control**, and many more...

NATIONAL INSTRUMENTS™

National Instrument 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**

PLUG & PLAY MICROFLUIDICS

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