ELVEFLOW

PLUG & PLAY MICROFLUIDICS

PRODUCT CATALOG 2023

WWW.ELVEFLOW.COM/MICROFLUIDIC-PRODUCTS/

MICROFLUIDIC POETRY JULIEN RIDOUARD

ELVEFLOW PRODUCT CATALOG 2023 **REF:** PC23-0224

STATE OF THE ART

microfluidic instrumentation for all

Elveflow is an Elvesys brand. We build premium flow handling instruments 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 using our **software** and **Software Development Kits** allowing for a full automation of your system.

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

CONTACT:
+33(0).184.163.807
contact@elveflow.com
www.elveflow.com

ADDRESS:
172 Rue de Charonne,
75011 Paris
France

PRODUCTS

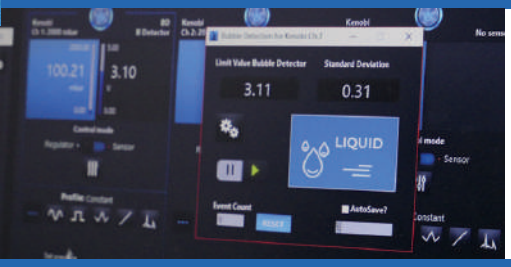
ELVEFLOW
PLUG & PLAY MICROFLUIDICS

FLOW CONTROL SYSTEMS

MEASUREMENT & DETECTION

OEM & CUSTOM

SOFTWARE



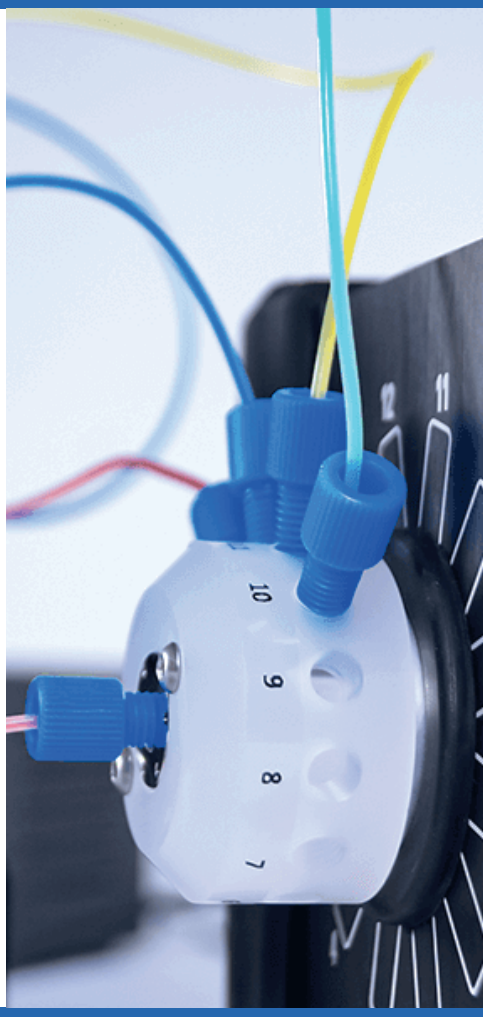
ACCESSORIES

MICROFABRICATION

BLACK HOLE LAB & ELVEFLOW MERGING

The Black Hole Lab and Elveflow merged to provide a unique all-in-one microfabrication setup. No need for cleanroom or experience in microfabrication. Become autonomous in customizing your own microfluidic devices in a short time.

APPLICATION PACKS



ELVEFLOW OVERVIEW

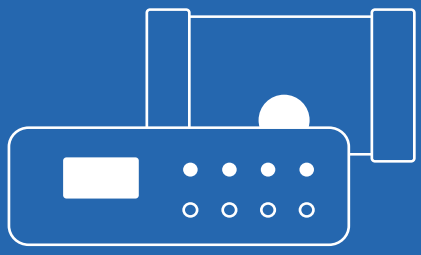
Elveflow develops high-performance, plug-and-play **flow control systems** ideal for microfluidic-based applications. We provide the only microfluidic flow control using Piezo technology that guarantees **fast flow** changes in your microdevice.

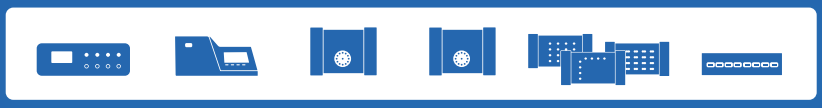
contact@elveflow.com

A TEAM OF MULTIDISCIPLINARY EXPERTS

Our **assistance team** comprises microfluidic experts from different fields - engineers, physicists, and biologists - to provide you with specialized assistance. As a result, our technology generated more than 1000 peer-reviewed publications in chemistry, physics, and biology, with more than 500 citations and ten microfluidic patents.

ELVE FLOW
PLUG & PLAY MICROFLUIDICS





PRODUCTS

FLOW CONTROL SYSTEMS

OB1 MK4

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 MK4 is a **high performance** microfluidic pressure and flow controller. Customize your unit: pick the number of channels you like and **choose for each of them the pressure and vacuum ranges** among the 5 options available.

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

UNIQUE PERFORMANCES

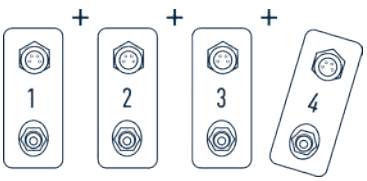
- > Pressure stability **0.005 % FS**
- > Response time **9 ms**
- > Pressure resolution **0.006 % FS**
- > Settling time **down to 50 ms**

PIEZOELECTRIC TECHNOLOGY

CUTTING EDGE PIEZO CONTROL FOR MICROFLUIDICS

APPLICATIONS

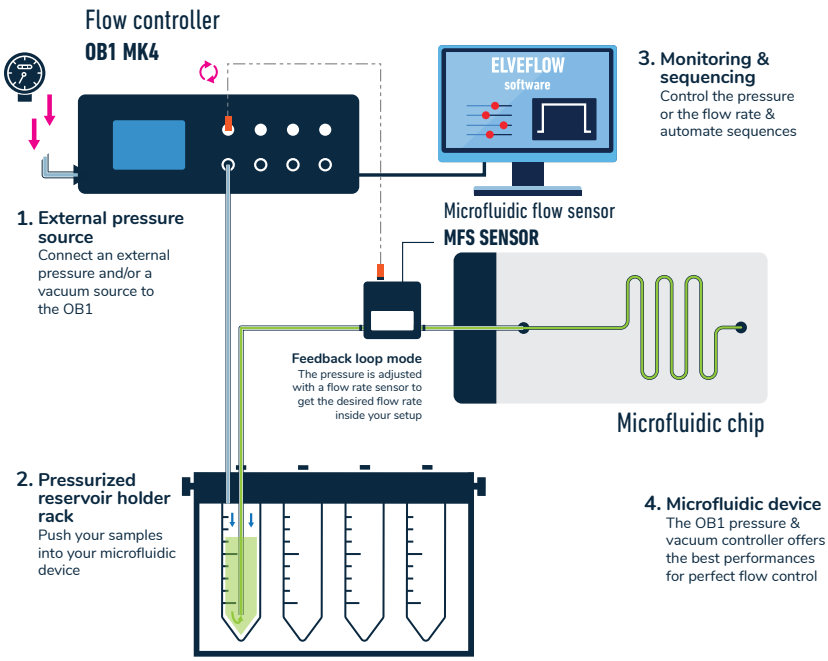
- > Digital microfluidics
- > Flow chemistry & polymer synthesis
- > Cell culture: cell perfusion, sequential injection
- > Droplet-sequencing: RNA sequencing
- > Organ on chip
- > Enhanced oil recovery
- > Lab on a chip



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

Get a one-channel today and add more channels later

HOW IT WORKS



> To **control flow rate or pressure** at any given point of your circuit, you can perform a **feedback loop** with the flow rate. The same can be done with pressure using a pressure sensor.

1 External pressure source

Connect a pressure and/or a vacuum source to your OB1 (required).

Example: Gas cylinder, lab pressure line, compressor (see more p.40)

2 Sample

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

3 Monitoring & sequencing

Automate pressure and flow control using the Elveflow software on your computer.

4 Microfluidic device

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

FEATURES & BENEFITS

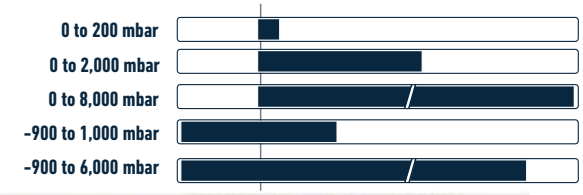
- **Short settling time**
  Operate blazing fast changes in any microdevice with our Piezo technology
- **Highest flow stability**
  Ensure superior flow performance over a large flow range, with pressure stability down to 10 µbar
- **Accurate flow control**
  Input a flow value into the software. Flow regulation down to 7.5 nL/min

- **Software automation**
  Control all instruments through a single dashboard. 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 any number of channels among the five pressure ranges available
- **Upgradable**
  Get a one-channel today and add more channels later

PRESSURE RANGES

FOR EACH CHANNEL:
5 PRESSURE RANGES AVAILABLE



TECHNICAL SPECIFICATIONS

OB1 MK4 CHANNEL PRESSURE RANGE	0 to 200 mbar[1] (0 to 2.9 psi)	0 to 2,000 mbar[1] (0 to 29 psi)	0 to 8,000 mbar[1] (0 to 116 psi)	-900 to 1,000 mbar[1] (-13 to 14.5 psi)	-900 to 6,000 mbar[1] (-13 to 87 psi)
Pressure stability [2]	**0.015 % FS** 30 µbar (0.0004 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 µbar (0.076 psi)
Response time [3]	down to 10 ms				
Settling time [4]	down to 50 ms				
Minimum pressure increment	**0.006 % FS** 12 µbar - 0,00017 ps	**0.006 % FS** 120 µbar - 0,0017 psi	**0.006 % FS** 480 µbar - 0,007 psi	**0.0064 % FS** 120 µbar - 0,0017 psi	**0.0061 % FS** 420 µbar -0.006 psi
Pressure supply	**1.5 bar (or Max pressure + 0.5 bar) to 10 bar** Non corrosive, non explosive, dry and oil-free gases, e.g. air, argon, N2, CO2, ...				
Input vacuum [5]	/			Any value from -0.7 to -1 bar Compatible with vacuum pump or vacuum line	
Liquid compatibility	Non contact pump Any aqueous, oil, or biological sample solution.				

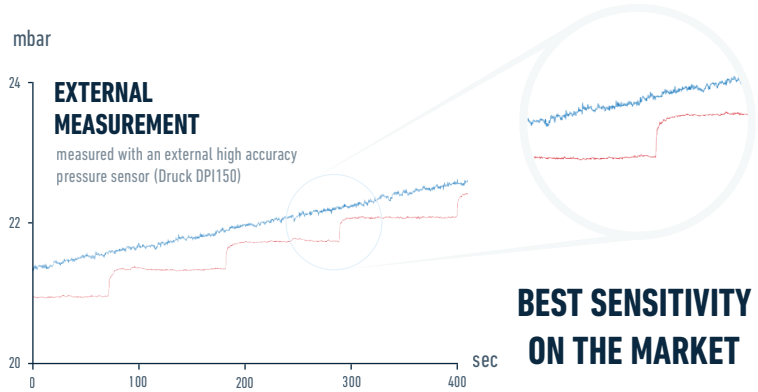
Non-contractual information, may be changed without notice.

POWER CONSUMPTION (maximum): 12 W **CASE DIMENSIONS** (length x width x height): 240 x 223 x 80 mm **WEIGHT:** 1.4 kg to 2.90 kg **TTL TRIGGER:** In and out available 0-5V

(1) Max pressure value might vary by +/- 2.5% (2) Pressure stability (standard deviation) measured over the full pressure range with an external high accuracy pressure sensor (Druck DPI150) (3) Depending on your computer's operating system (4) Volume dependent – Measurement done on 12 mL reservoir for a set point from 0 to 200 mbar (5) The vaccum channels can be used without vacuum source if only positive pressures are desired.

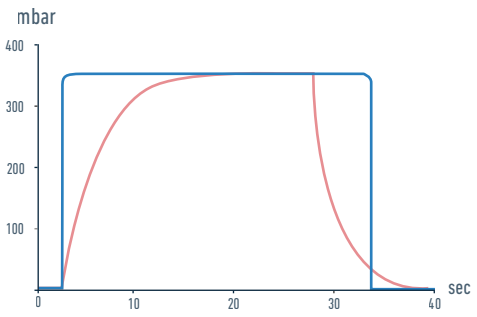
SENSITIVITY RAMP 21 mbar TO 23 mbar

(0.01 mbar steps)



FLOW CONTROL REACTIVITY

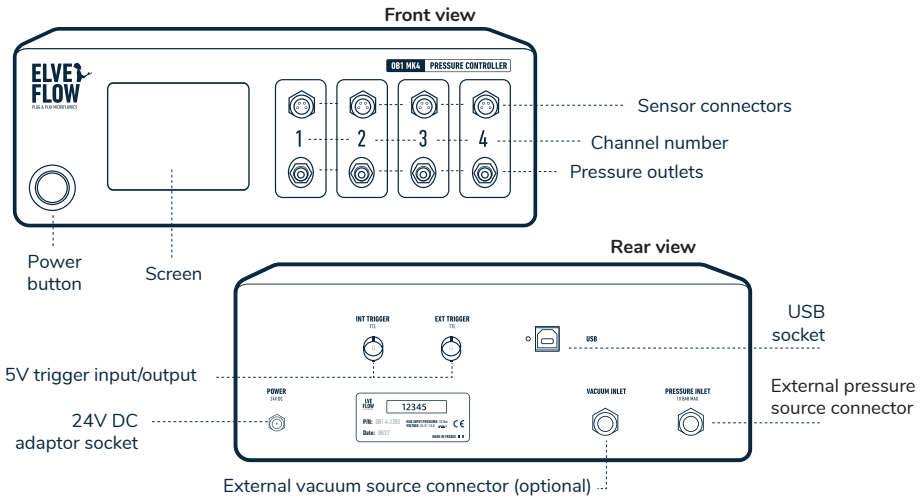
High precision compared to a syringe pump



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

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

INSTRUMENT DESCRIPTION



PRESSURE RANGE COLOR CODE

- **YELLOW** 0 to 200 mbar
- **BLUE** 0 to 2,000 mbar
- **PURPLE** -900 to 1,000 mbar
- **ORANGE** -900 to 6,000 mbar
- **GREY** 0 to 8,000 mbar

PRODUCTS & SERVICES

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

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 Instrument is our technological partner for embedded electronics

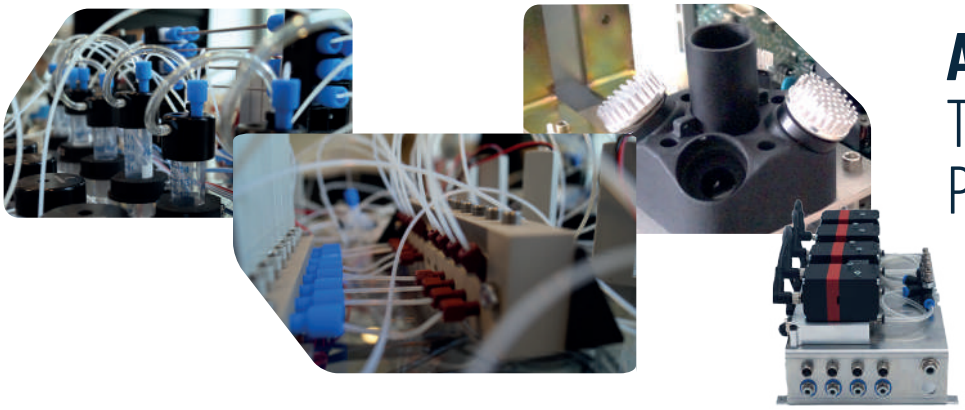
More information:

ESI - FREE SOFTWARE
ELVEFLOW SMART INTERFACE - ALL INSTRUMENTS P.37

OEM - ORIGINAL EQUIPMENT MANUFACTURER

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

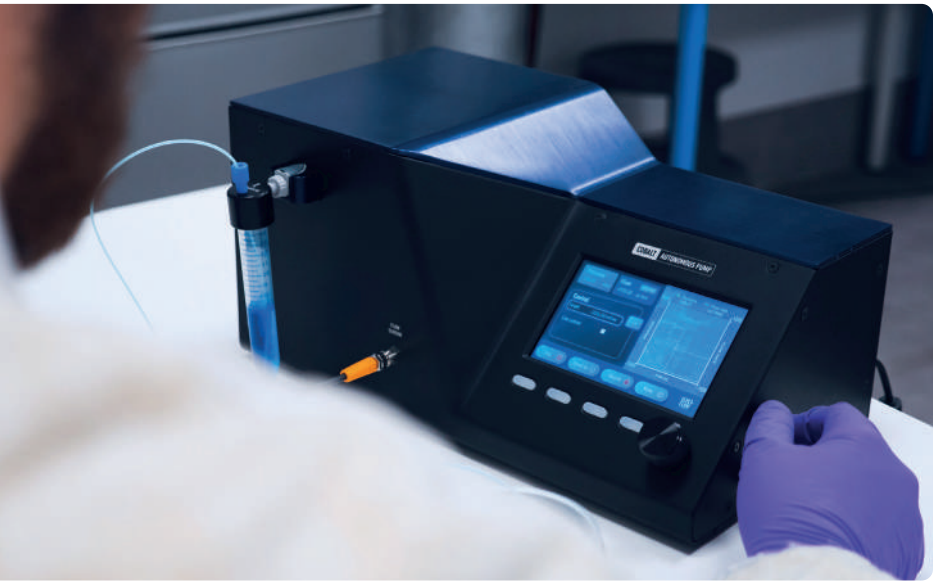
WHY CHOOSE US AS YOUR OEM PARTNER?

- **A receptive and efficient partner** – We are well aware of the importance of keeping up with your fast-changing market.
- **A soft intellectual property policy** – We believe that intellectual property should never be an obstacle to innovation.
- **A trusted manufacturer** – High profile companies already trust us for their scientific instruments. Why not you?
- **A proven track record** – Our team carried out successfully several projects taking into account challenging constraints to end up with the best solutions for our partners.

COBALT

AUTONOMOUS MICROFLUIDIC PUMP

ELVEFLOW.COM/MICROFLUIDIC-PRODUCTS/MICROFLUIDICS-FLOW-CONTROL-SYSTEMS/AUTONOMOUS-VACUUM-PRESSURE-PUMPS/



STANDALONE
PRESSURE-DRIVEN
FLOW CONTROLLER

The Elveflow® Cobalt autonomous microfluidic pump provides easy access to the most stable and accurate pressure and flow control technology. Equipped with its own pressure (and vacuum) source, it does not require an external pressure supply. Also, thanks to its embedded software, It can be controlled it with or without a computer.

- ✔ **MOST STABLE FLOW AND PRESSURE CONTROL**
- ✔ **INTUITIVE USER INTERFACE**
- ✔ **PORTABLE AND COMPACT**

UNIQUE PERFORMANCES*

The Cobalt provides powerful flow control when paired with a MFS flow sensor from our product line:

- > Flow rate range from 200nL/min to 5mL/min
- > Repeatability down to 3.5 nL/min
- > Accuracy down to 20 nL/min

Available in two versions:

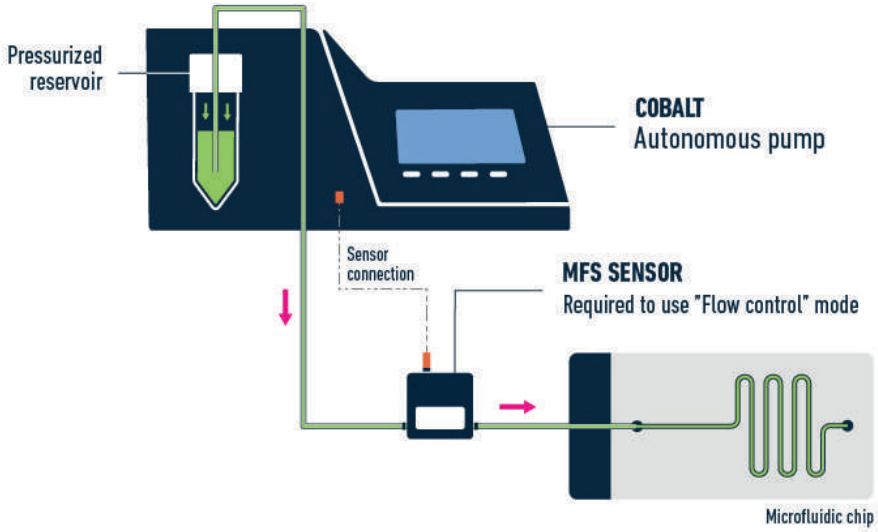
- > pushing only: pressure range 0/2000 mbar
- > push & pull: vacuum and pressure range -900/1000 mbar

* All the values given for water.

APPLICATIONS

- > Lab-on-chip development
- > Bench test or characterisation (chips, sensors, filters, etc)
- > Mechanobiology (cell confinement, tissue engineering, etc)
- > Cell perfusion

The cobalt is included in
THE MECHANOBIOLOGY PACK
www.elveflow.com/microfluidics-application-packs/biology-packs/mechanobiology-pack/



> **Plug it to a power source:**
All you have to do is to turn on your Cobalt. The pressure source is inside.

> **Connect the reservoir:**
No more pneumatic tubing needed. You only have to plug your reservoir to the instrument.

> **Program and run your experiment:**
Automate pressure and flow control using the Elveflow embedded software, no computer needed!

Choose between two Cobalt versions; both allow either gas or flow control when paired with a flow sensor.

> 0 to 2000 mbar positive pressure control.

> -700 to 1000 mbar dual vacuum & pressure control.

The **Cobalt technology** made state-of-the-art microfluidics accessible, autonomous, and user-friendly.

COBALT EMBEDDED SOFTWARE

Cobalt's intuitive embedded software can be fully controlled without the need of external computer. Its user-friendly interface contains a knob button for easy setting modifications.

OPTIONAL
COBALT COMPUTER SOFTWARE

The Cobalt® computer software allows you to control advanced tasks - such as real-time creation, monitoring, and modifications of complex pressure and flow rate profiles - via computer using a USB connection.

TECHNICAL SPECIFICATIONS

	COBALT	COBALT DUAL
PNEUMATICS		
Flow control	Push	Push & pull
Pressure range [1]	0 to 2000 mbar (0 to 29 psi)	-700 to 1000 mbar (-10 to 14 psi)
Minimum pressure increment step	Cobalt Embedded Software (1 mbar) Computer software (0.1 mbar)	
Pressure stability [2]	0.1 mbar	
Electronic response time	Cobalt Embedded Software: down to 10 ms Computer software: down to 100 ms [3]	
Settling time [4]	Down to 75 ms	Down to 105 ms
Pressure Source	No pressure source needed (integrated)	No pressure & vacuum source needed (integrated)
FLOW CONTROL		
Flow sensor compatibility	Possible to pair 1 flow sensor from the Elveflow MFS series (MFS2, 3, 4, 5)	
Flow rates [5]	MFS2: 0 to 7 µL/min | MFS3: 0 to 80 µL/min | MFS4: 0 to 1000 µL/min | MFS5: 0 to 5000µL/min	
Minimum flow rate increment	MFS2: 3.5 nL/min | MFS3: 8 nL/min | MFS4: 0.2 µL/min | MFS5: 1 µL/min	
Flow sensor calibration	User-friendly automated sensor calibration module [6]	
Liquid compatibility	Non contact pump. Any aqueous or organic solvent, oil, or biological sample solution. Recalibration required for non aqueous solutions at the bottem of the game	
CONTROL & MONITORING		
User interfaces	Cobalt Embedded Software Cobalt computer software (Windows) on PC	
Cobalt computer software added functionalities	Custom profile: design, upload, download Recording data: download	
Record frequency range	Cobalt Embedded Software: 1-5-10Hz Computer software: 0-100Hz	
Maximum recording time	Cobalt Embedded Software: up to 6000 sec depending on recording frequency Computer software: unlimited	
OTHER		
Power consumption	36 W (100 V to 240 V - 50 Hz to 60 Hz)	
Case dimensions	328 x 235 x 168 mm (l x w x h)	
Weight	3.3 kg	4.1 kg
Output connectors	Quick Connect	

[1] Max pressure value might vary by +/- 2.5%.

[2] Pressure stability (standard deviation) is measured over 60s, 1 minute after the setpoint is reached.

[3] Depending on your computer's operating system.

[4] Volume dependent – Measurement done on 12 mL reservoir for a set point from 100 to 200 mbar.

[5] Indicative, please refer to the MFS documentation for detailed specifications.

[6] For aqueous solutions only.

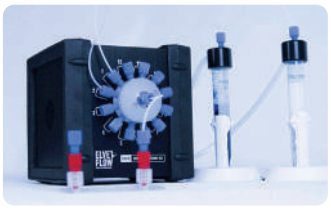
MUX DISTRIB

12-WAY BIDIRECTIONAL VALVE

ELVEFLOW.COM/MICROFLUIDIC-PRODUCTS/MICROFLUIDICS-FLOW-CONTROL-SYSTEMS/MUX-DISTRIB/

Included in our
SEQUENTIAL FLUID INJECTION PACK
ELVEFLOW.COM/MICROFLUIDIC-PRODUCTS/MICROFLUIDICS-APPLICATION-PACKS/SEQUENTIAL-FLUID-INJECTION-PACK/

A ROTARY VALVE DESIGNED TO EASILY EXECUTE FAST MEDIUM SWITCHES



The Sequential Injection Valve is a **bidirectional 13-port/12 way**, which can control the sequential injection of one solution into twelve different lines or twelve solutions into one line.

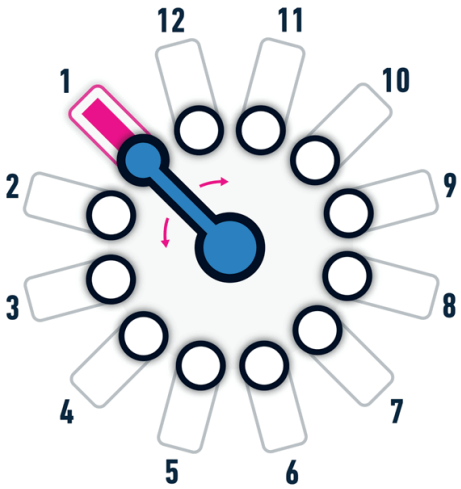
- ✔ **INJECTION OF UP TO 12 LIQUIDS**
- ✔ **NO CROSS CONTAMINATION**

UNIQUE PERFORMANCES

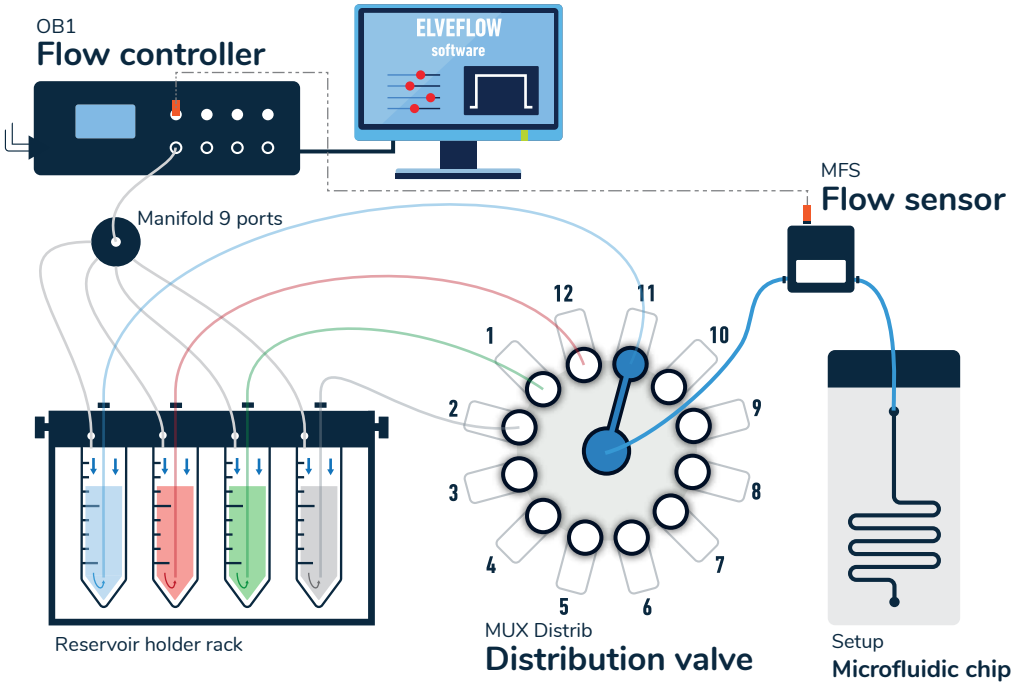
- Typical mechanical response time for port-to-port movement **156 ms**
- Easy setup: standard **¼-28 fluidic fittings**
- Lowest internal volume: **3.5 µL**
- **High chemical compatibility** (wetted materials: PCTFE, PTFE)
- Possibility to chose the **sense of rotation**

APPLICATIONS

- Cell culture on chip
- Cell response to medium change
- Drug screening
- Toxicity tests
- Sensor testing & calibration
- Reagent switch for flow chemistry



HOW IT WORKS



TECHNICAL SPECIFICATIONS

MUX DISTRIB		SPECIFICATIONS
Performances	Port to port switching time (ms)	156 ms
	Max. supported pressure	7 bar
	Internal diameter	0.5 mm
Power supply	Input voltage range, AC	100 V to 240 V
	AC supply frequency	50 Hz to 60 Hz
	Max current consumption	2A peak
	Power consumption (max)	36 W
	Power supply voltage	18-24V DC
Mechanical specifications	Valve type	12 positions / 13 ports rotative valve
	Fluidic connectors	Standard 1/4-28 UNF, flat-bottom
	Operating temperature	5 °C to 40 °C
	Operating humidity	20-70% non condensing
	Wetted materials	PCTFE and PTFE
	Dead volume(1)	None
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

(1) Volume that is stuck in the system (dead end), which is not clearly swept and relies on diffusion to clear out

MUX DISTRIB DIMENSIONS without connectors (length x width x height): 133 x 156 x 133 mm

MUX RECIRCULATION

6-PORT/2-POSITION VALVE

ELVEFLOW.COM/MICROFLUIDIC-PRODUCTS/MICROFLUIDICS-FLOW-CONTROL-SYSTEMS/MUX-RECIRCULATION/

Included in our
RECIRCULATION PACK
ELVEFLOW.COM/MICROFLUIDIC-PRODUCTS/MICROFLUIDICS-APPLICATION-PACKS/ONE-WAY-RECIRCULATION/

MAKE LONG-TERM EXPERIMENTS EASIER AND MORE RELIABLE

The Recirculation Valve is a **6-port/2 position** microfluidic valve allowing switching between two configurations. It can be used in any application that needs **stable unidirectional fluid recirculation** and **sample injection.**

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

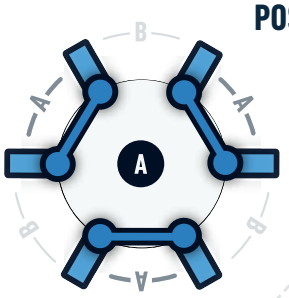
UNIQUE PERFORMANCES

- Recirculate a fluid in a **closed loop**
- Port-to-port switching time: **180 ms**
- **High chemical compatibility** (wetted materials: PCTFE and PTFE)
- No sample **cross-contamination** & **no backflow**

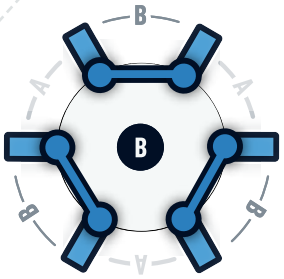
APPLICATIONS

- Cell culture on chip
- Drug screening
- Toxicity tests
- Stem cells assays
- Organ on chip
- SPR or TIR imaging coupled with microfluidics
- Heat sink experiment

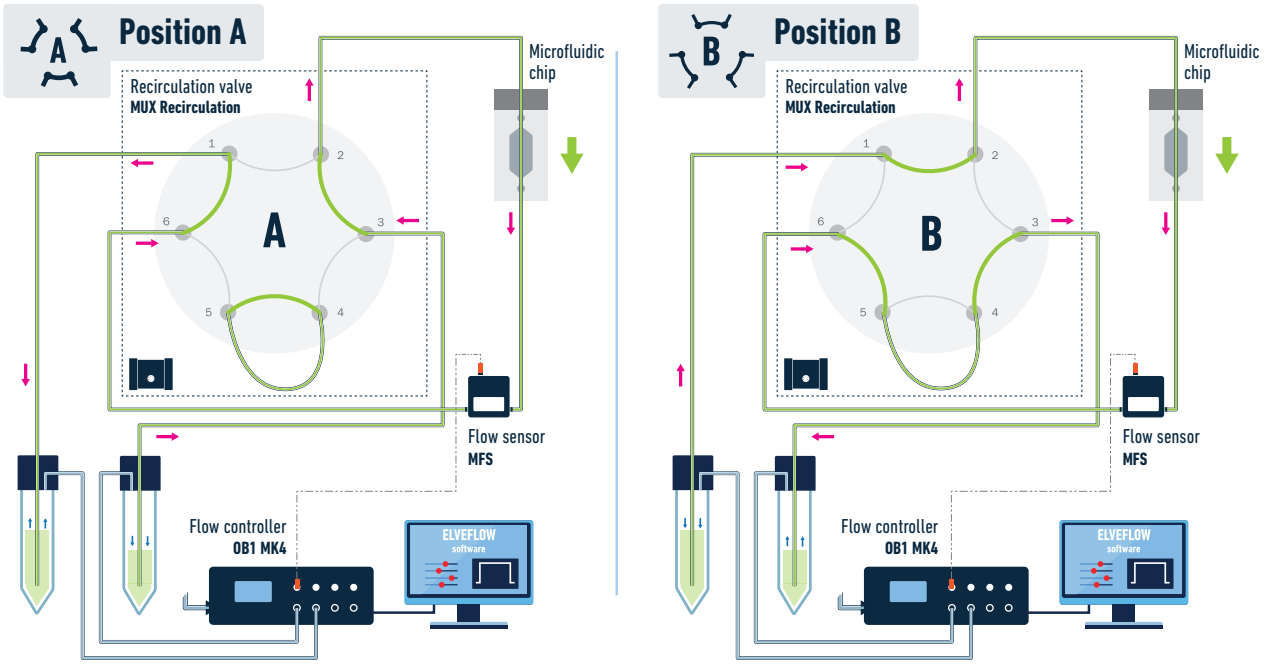
POSITION A



POSITION B



HOW IT WORKS



TECHNICAL SPECIFICATIONS

MUX RECIRCULATION		SPECIFICATIONS
Performances	Port to port switching time (ms)	180 ms
	Max. recommended pressure	7 bar
	Internal diameter	0.5 mm
Power supply	Input voltage range, AC	100 V to 240 V
	AC supply frequency	50 Hz to 60 Hz
	Max current consumption	2A peak
	Power consumption (max)	36 W
	Power supply voltage	18-24V DC
Mechanical specifications	Valve type	6 ports / 2 positions rotative valve
	Fluidic connector	Standard 1/4-28 UNF, flat-bottom
	Operating temperature	5 °C to 40 °C
	Operating humidity	20 to 70 % condensing
	Wetted materials	PCTFE and PTFE
	Dead volume(1)	None
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

(1) Volume that is stuck in the system (dead end), which is not clearly swept and relies on diffusion to clear out

MUX RECIRCULATION DIMENSIONS without connectors (length x width x height): 133 x 156 x 133 mm

Non-contractual information, may be changed without notice.

MUX SERIES

FLOW SWITCH MATRICES

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

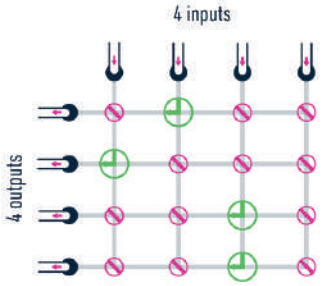
3 UNIQUE FLOW SWITCH MATRICES TO AUTOMATE FLOW HANDLING

- ✔ 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
- > Fluidic connector: 10-32 UNF



APPLICATIONS: Instantaneous stop flow, 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
- > Fluidic connector: 1/4-28 UNF

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
- > Fluidic connector: 10-32 UNF

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 **TTL TRIGGER:** input/output 5 V

VALVES RANGE & MUX WIRE

VALVES & VALVE CONTROLLER

ELVEFLOW.COM /MICROFLUIDIC-PRODUCTS/MICROFLUIDICS-FLOW-CONTROL-SYSTEMS/VALVE-CONTROLLER/

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

- ✔ MIX ALL KINDS OF VALVES
- ✔ PLUG FROM 1 TO 8 VALVES
- ✔ LIQUID INJECTION AUTOMATION

SMART LOW PRESSURE VALVE 2-WAY OR 3-WAY

2-WAY: Pick default setting: open or closed

> Compatible with gas or liquid
> ROCKER® valve technology
> Low internal volume
> Wide pressure range: -0.90 bar to 3 bar (-14 psi to 44 psi)
> Wetted Materials: PEEK, FKM, PVDF

SMART HIGH PRESSURE VALVE 2-WAY OR 3-WAY

2-WAY: Pick default setting: open or closed

> Compatible with gas or liquid
> ROCKER® valve technology
> Low internal volume
> Wide pressure range: -0.75 bar to 6 bar (-11 psi to 87 psi)
> Wetted Materials: PEEK, FKM, PVDF

SMART LOW VOLUME VALVE 2-WAY

> Compatible with gas or liquid
> Low internal volume: 14.7 µL
> Wide pressure range: 0 bar to 5 bar (0 psi to 73 psi)
> Wetted Materials: PEEK, FKM, PVDF

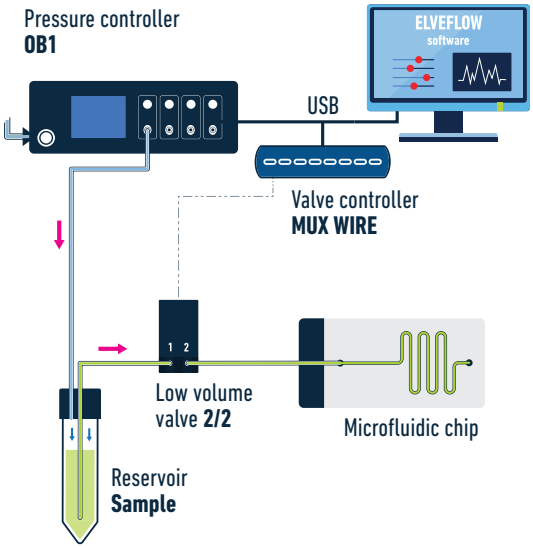
MUX WIRE V3 VALVE CONTROLLER

Easily control your microfluidic valves

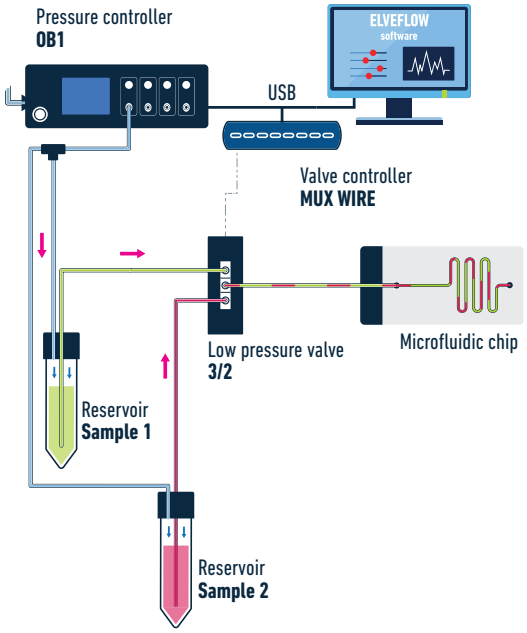
> Fast liquid switching
> Detect automatically all smart valves
> Complex sequences of injection including flushing, rinsing, and sequential injection of several liquids

HOW IT WORKS

MICROFLUIDIC 2-WAY VALVE



MICROFLUIDIC 3-WAY VALVE



TECHNICAL SPECIFICATIONS

VALVES RANGE	VALVES TYPE		
Low pressure valve -0.90 bar to 3 bar (-14 psi to 44 psi) Fittings: Standard 1/4-28" Switching time: <10 ms	2-way Normally open Internal volume: 25 µL	2-way Normally closed Internal volume: 25 µL	3-way Internal volume: 32 µL
High pressure valve -0.75 bar to 6 bar (-11 psi to 87 psi) Fittings: 10-32 Switching time: 15 ms	2-way Normally open Internal volume: 55.5 µL	2-way Normally closed Internal volume: 55.5 µL	3-way Internal volume: 58.25 µL
Low volume valve 0 bar to 5 bar (0 psi to 73 psi) Fittings: 10-32 Switching time: 20 ms	2-way Normally closed Internal volume: 14.7 µL		

Non-contractual information, may be changed without notice.

VALVES DIMENSIONS without connectors (length x width x height): **LOW & HIGH PRESSURE:** 52 x 34 x 80 mm **LOW VOLUME:** 57 x 34 x 51 mm

VALVE CONTROLLER	SPECIFICATIONS
Number of controlled valves	8
Bus interface	USB
Power supply	18-24, 1.5 A
Max total power (sum of the power of all connected valves)	36 W
Max valve power	10 W
Valve connectors	USB-C

Non-contractual information, may be changed without notice.

VALVE CONTROLLER DIMENSIONS without connectors (length x width x height): 140 x 96 x 35 mm **WEIGHT:** 374 g **TTL TRIGGER:** input/output 5 V

ELVE FLOW
PLUG & PLAY MICROFLUIDICS

PRODUCTS

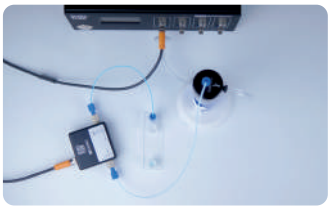
MEASUREMENT & DETECTION

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 volumetric flow sensors for **ultra-low flow rate monitoring** of liquids. The thermal-based flow sensor comes with an M8 4-pin electrical connection and can be directly controlled through the Elveflow software.

- ✔ 5 FLOW RATE RANGES
- ✔ HIGH CHEMICAL COMPATIBILITY

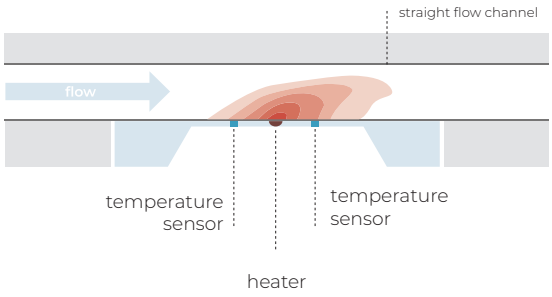
UNIQUE PERFORMANCES

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

APPLICATIONS

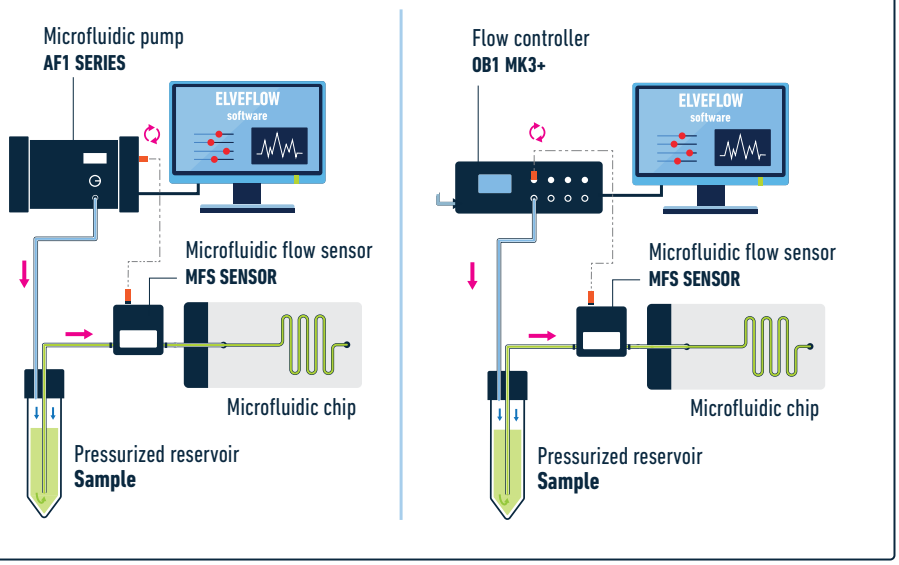
- Couple with an OB1 flow controller for direct flow rate control
- Bi-directional flow rate measurement (positive & negative)

PRINCIPLE

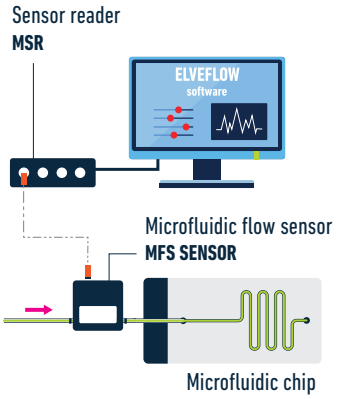


HOW IT WORKS

WITH ELVEFLOW FLOW CONTROLLERS: MONITORING + CONTROL

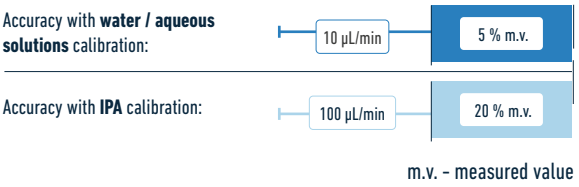


WITH SENSOR READER: MONITORING

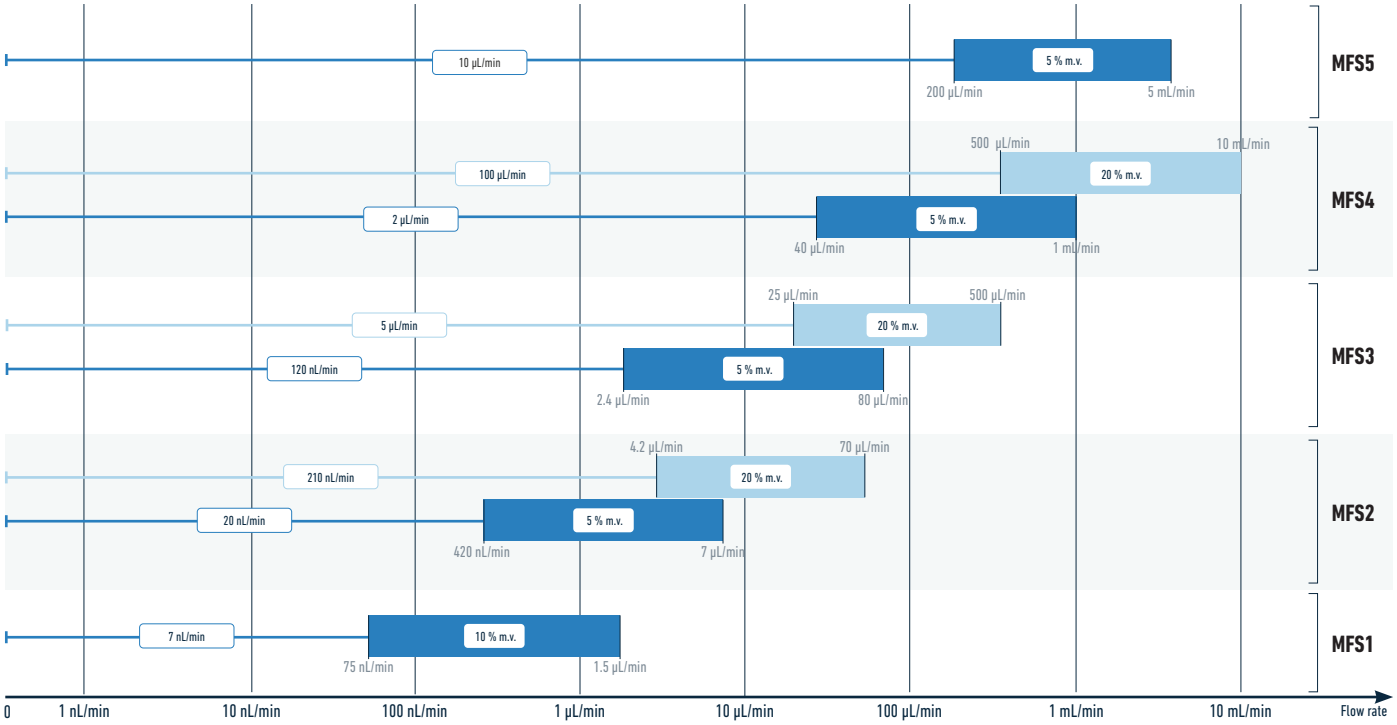


TECHNICAL SPECIFICATIONS

MFS FLOW RATE RANGES AND ACCURACY



m.v. - measured value



TECHNICAL SPECIFICATIONS

MFS FLOW SENSORS	MFS 1	MFS 2		MFS 3		MFS 4		MFS 5
Media calibration	water / aqueous solutions	water / aqueous solutions	IPA	water / aqueous solutions	IPA	water / aqueous solutions	IPA	water / aqueous solutions
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
Pressure drop at full scale flow rate, 23 °C	1 bar	3 mbar	60 mbar	1 mbar	7 mbar	< 1 mbar	5 mbar	< 1 mbar
Total internal volume	1 µL	1.5 µL		5 µL		25 µL		80 µL
Sensor inner diameter	25 µm	150 µm		430 µm		1.0 mm		1.8 mm
Tubing inner length	29 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 ⎓ 7 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 ranges 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, AND MORE. 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**

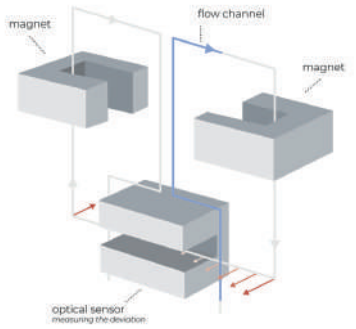
UNIQUE PERFORMANCES

- Large flow range **from 1.6 µL/min to 500 mL/min** (for water)
- Maximum flow rate: **500 mL/min** (for water)
- Sensor response time: **35 ms**
- Mass flow accuracy: **down to 2 %** of measured value (down to 0.2 % of mv on request)

APPLICATIONS

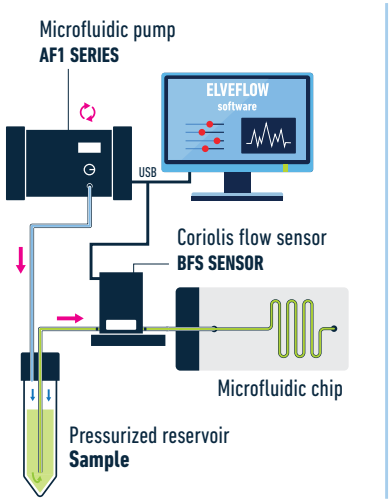
- Coumpound semiconductor processing
- Solar cell and FDP technology
- Food and pharmaceutical industries
- Medical microchemical or analytical installations
- Calibration laboratories

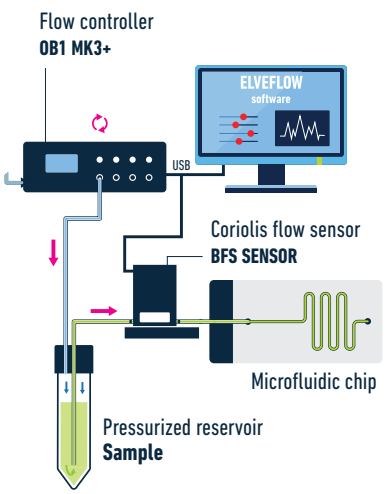
PRINCIPLE



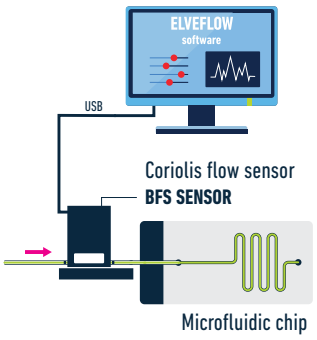
HOW IT WORKS

WITH ELVEFLOW FLOW CONTROLLERS: MONITORING + CONTROL





WITH EXTERNAL EQUIPMENT: MONITORING



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	down to ± 2 % of measured value	down 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)	< ± 0.01 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
Suitable tubings	1/16"		1/16" (1/8" on request)	
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

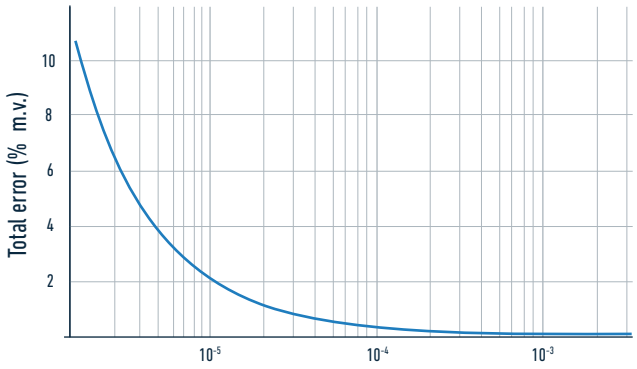
Non-contractual information, may be changed without notice.

(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 stability. External shocks or vibrations should be avoided.

TOTAL ERROR (% m.v.)

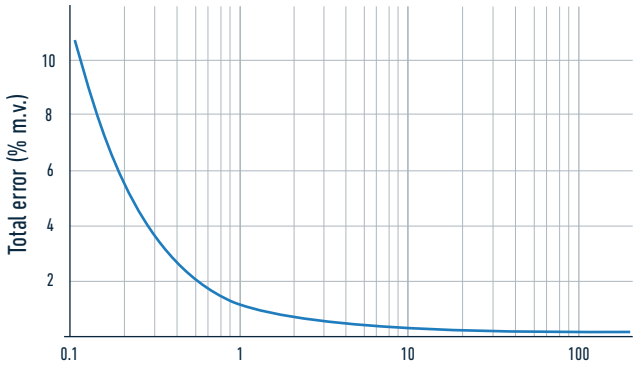
TOTAL ERROR = ACCURACY READING ± [(ZERO STABILITY / FLOW) X 100] [% READING]
m.v. - measured value

BFS 1+



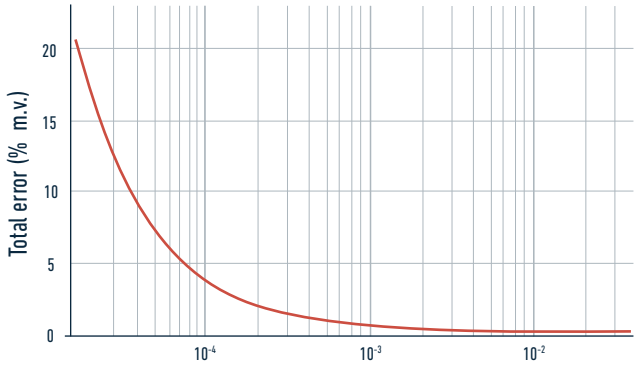
Volume flow rate (L/min) - log scale

water at 20 ° C



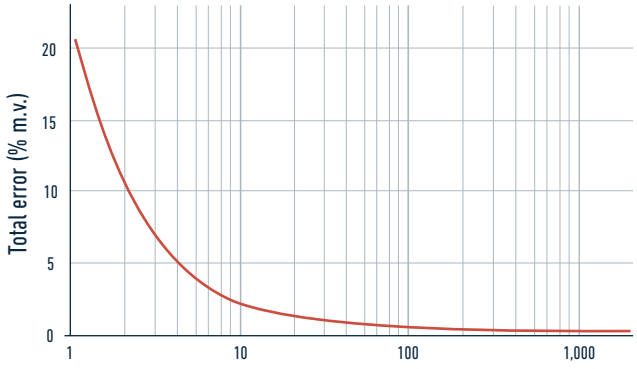
Mass flow rate (g/h) - log scale

BFS 2



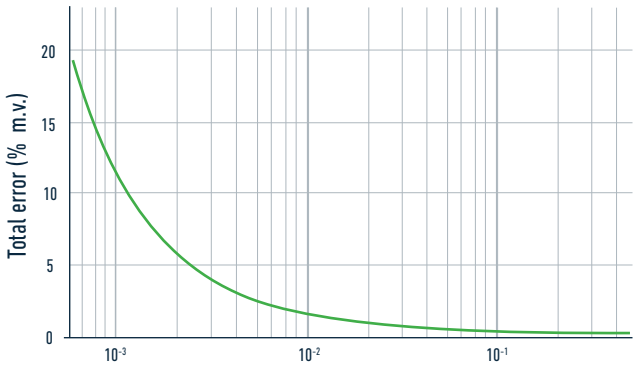
Volume flow rate (L/min) - log scale

water at 20 ° C



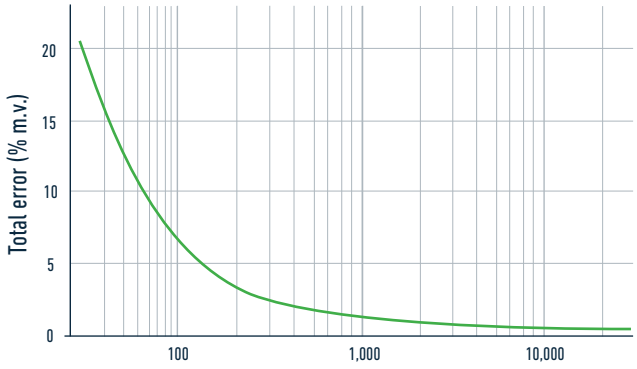
Mass flow rate (g/h) - log scale

BFS 3



Volume flow rate (L/min) - log scale

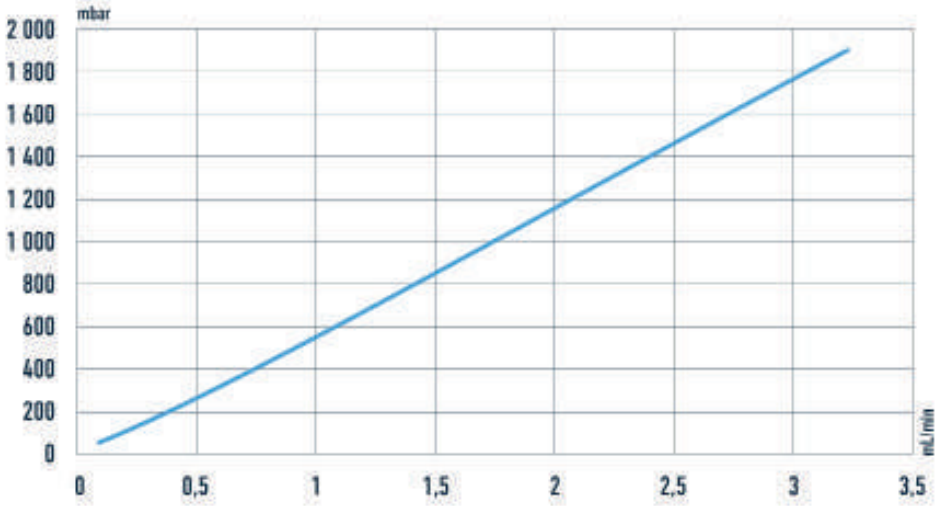
water at 20 ° C



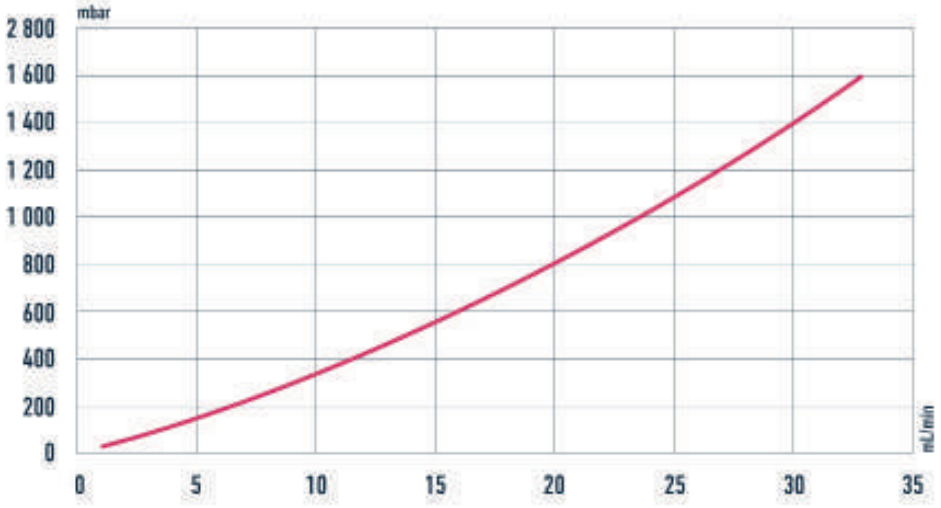
Mass flow rate (g/h) - log scale

BFS FLOW SENSOR PRESSURE DROP (FOR WATER @20°C)

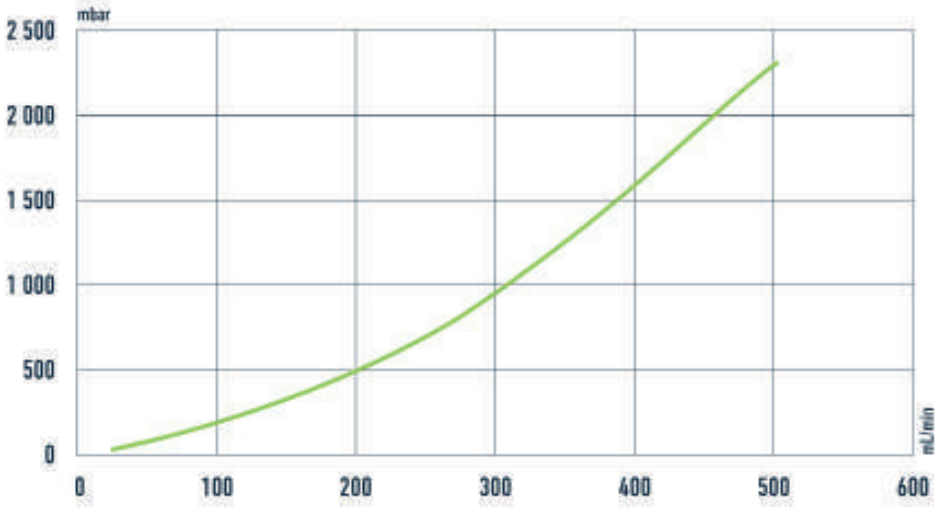
BFS 1 FLOW SENSOR PRESSURE DROP VS FLOW RATE (FOR WATER @20°C)



BFS 2 FLOW SENSOR PRESSURE DROP VS FLOW RATE (FOR WATER @20°C)



BFS 3 FLOW SENSOR PRESSURE DROP VS FLOW RATE (FOR WATER @20°C)



FLOW SENSORS COMPARISON MFS VS BFS

FLOW SENSORS COMPARISON	**BFS** (1 & 1+)	**MFS**
Accuracy	0.2 % of measured value [1]	5 % of measured value
Range	One sensor for 1.6 µL/min to 3 mL/min	Five sensors from 10 nL/min to 5 mL/min
Negative flow measurement	Yes	Yes
Supported fluid types	All without calibration	All with calibration
Response time	35 ms [2]	From 1 to 70 ms [3]
Flow sensor size	65 x 32 x 144 mm	58 x 53 x 23 mm
Internal diameter	250 µm	From 25 µm to 1.8 mm [4]
Weight	3 kg	100 g
Connectors	1/16" OD tubing	1/16" OD tubing
Internal volume	13 µL	From 1 µL to 80 µL[4]
Wetted material	Stainless steel 316L or comparable	Glass or Quartz
Principle	Coriolis	Thermal
Computer connection	Directly via USB to the computer	Directly on the OB1 and the AF1 or with the Sensor reader MSR
Additional features	Temperature and density measurement	

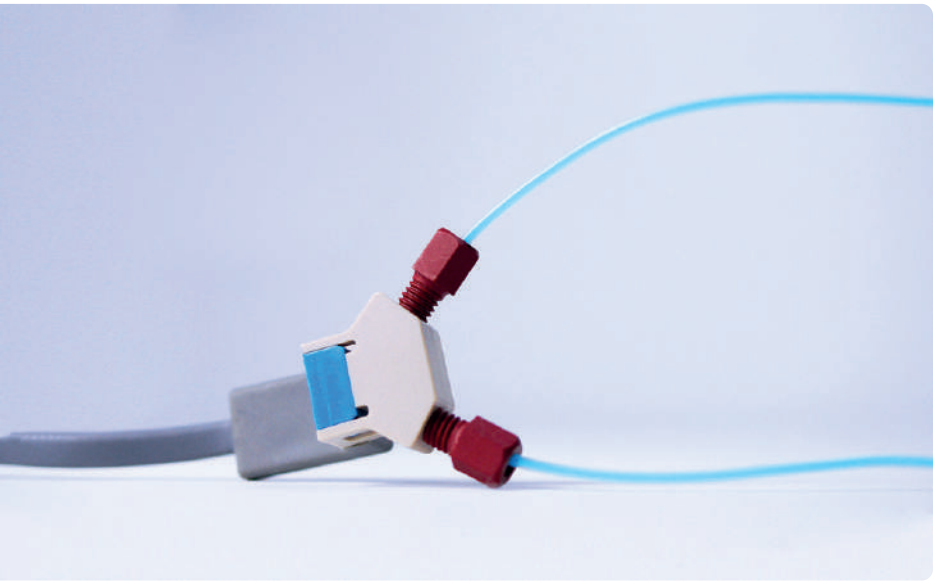
Non-contractual information, may be changed without notice.

(1) Available upon request. 2 % accuracy for the regular model
(2) 0.2 s at 98 % (spec) to fill the tubing then 35 ms with temperature measurement
(3) Depending on chosen digital resolution
(4) Depending of the sensor range

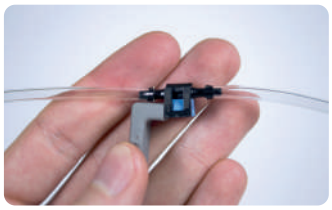
MPS

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 liquid and gas and compatible with 3/32" ID tubing or 10-32 fittings for 1/16" OD tubing. Ideal for monitoring **low pressure flow rate** in your microfluidic setup.

✔ **PRESSURE FEEDBACK OPTION**

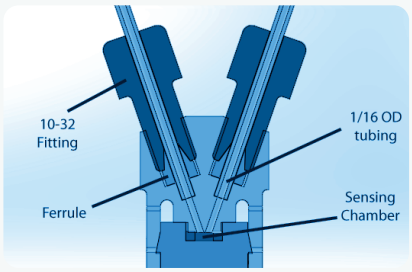
✔ **MEASUREMENT & DETECTION**

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**
> Works with both **liquid & gas**

APPLICATIONS

> By plugging our pressure sensor anywhere in your microfluidic setup, you can record the pressure on your computer and adjust it accordingly using our pressure pumps



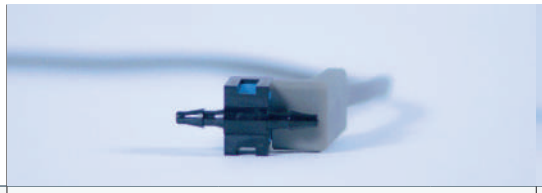
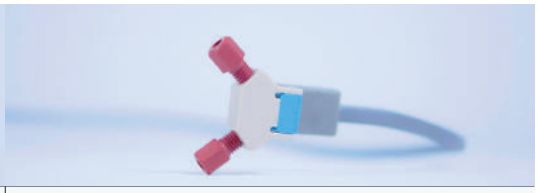
OUR PRESSURE SENSORS WORK AS GAUGE PRESSURE SENSORS,

measuring positive and negative pressure relatively to atmospheric pressure.

TECHNICAL SPECIFICATIONS

MICROFLUIDIC PRESSURE SENSOR		MPS 0	MPS 1	MPS 2	MPS 3	MPS 4
Pressure range		-70 to 70 mbar (-1 to 1 psi)	-340 to 340 mbar (-5 to 5 psi)	-1 to 1 bar (-15 to 15 psi)	-1 to 2 bar (-15 to 30 psi)	-1 to 7 bar (-15 to 100 psi)
Maximum overpressure		1.4 bar (20 psi)	1.4 bar (20 psi)	3 bar (45 psi)	3 bar (60 psi)	14 bar (200 psi)
Pressure accuracy liquids		up to ± 0.5 % of max range	up to ± 2 % of max range	up to ± 0.2 % of max range		
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				

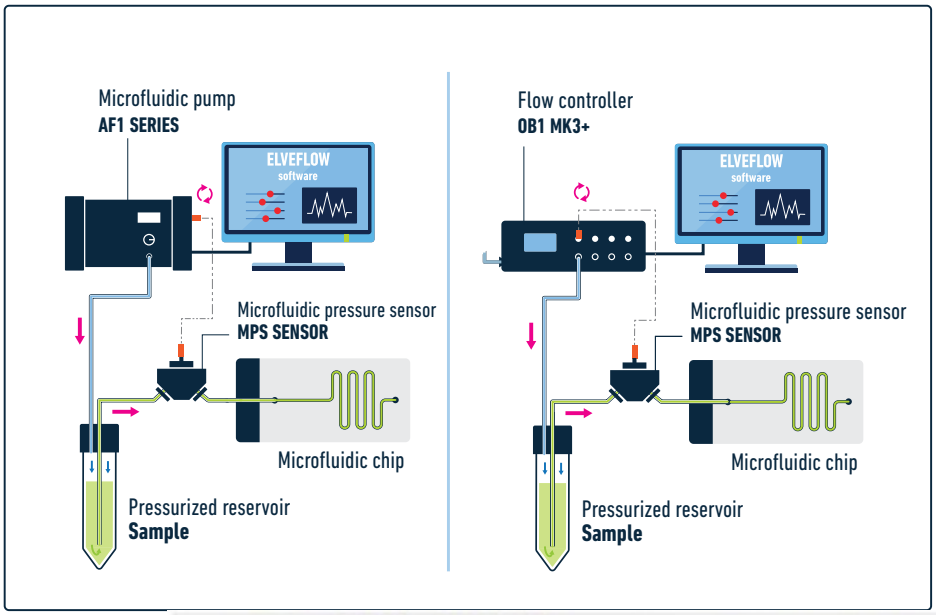
Non-contractual information, may be changed without notice.

PACKAGE MODEL	LARGE	SMALL
Sensor design		
Connection type	3/32 barb	10-32 thread with ferrule
Internal 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	

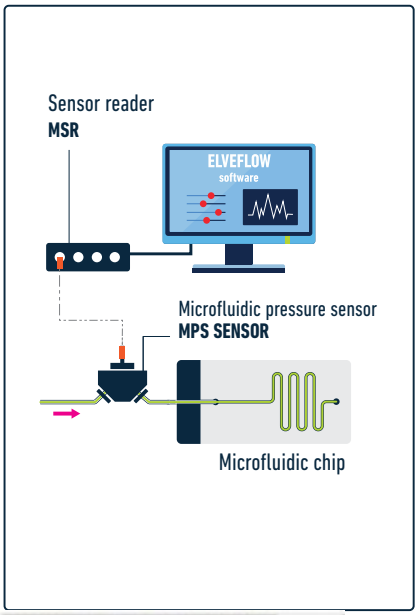
Non-contractual information, may be changed without notice.

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

WITH ELVEFLOW PRESSURE CONTROLLERS: MONITORING + CONTROL



WITH SENSOR READER: MONITORING



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.

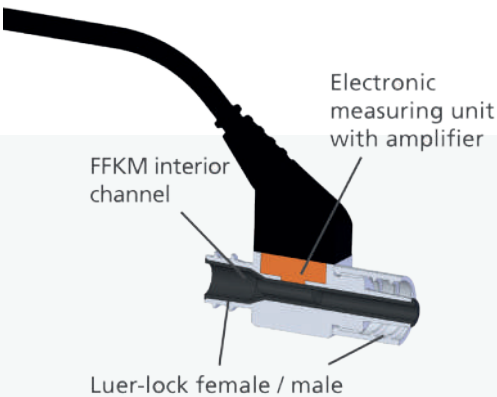
- ✔ **HIGH CHEMICAL COMPATIBILITY**
- ✔ **UP TO 16 BAR**

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**
- > Versatile: works with **gas & liquid**

APPLICATIONS

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



WIDE MEDIA COMPATIBILITY

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

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	interior flow channel: FFKM
Housing	coated aluminum
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

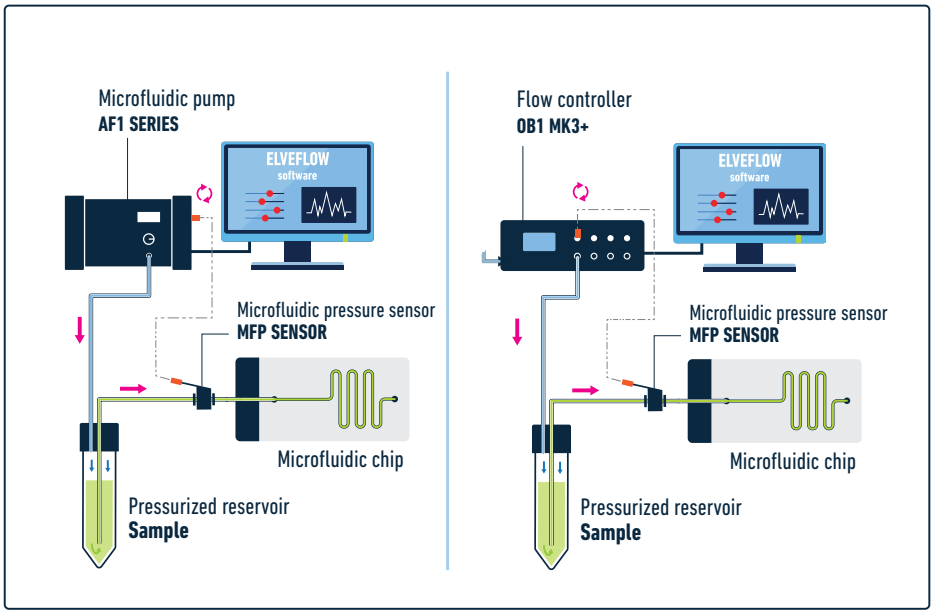
Non-contractual information, may be changed without notice.

SENSOR SIZE (length): 31.2 mm

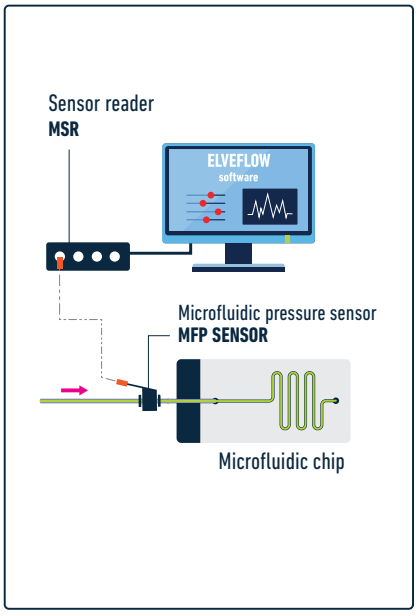
OUR PRESSURE SENSORS WORK AS GAUGE PRESSURE SENSORS,

measuring pressure relatively to atmospheric pressure.

WITH ELVEFLOW FLOW CONTROLLERS: MONITORING + CONTROL



WITH SENSOR READER: MONITORING



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

This sensor detects **the presence of fluids inside clear tubing, triggers a signal to another instrument**, and acts as needed - stop, wait, 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 casings suited to the use with 1/16" or 1/4" outside diameter tubes

APPLICATIONS

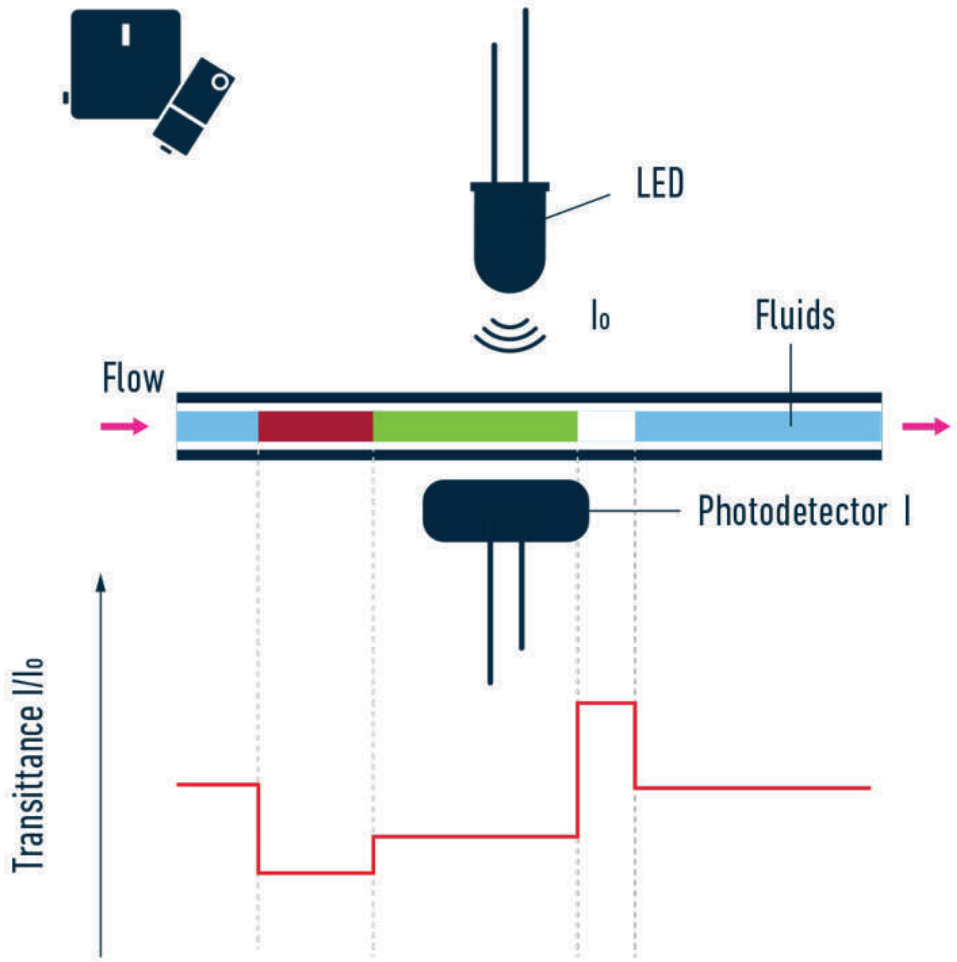
- > Bubble detection
- > Liquid level sensing
- > Blood processing equipment
- > Patient connected medical devices
- > Perform bilateral recirculation based on air detection

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.

WAVELENGTH = 890 nm



MSR

SENSOR READING UNIT

ELVEFLOW.COM/MICROFLUIDIC-PRODUCTS/MICROFLUIDICS-FLOW-MEASUREMENT-SENSORS/MICROFLUIDIC-SENSOR-READER/

AN ACQUISITION **INTERFACE** FOR ALL SENSORS

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

- ✔ **MONITOR UP TO 4 SENSORS**
- ✔ **REAL-TIME CONTROL & FEEDBACK**

UNIQUE PERFORMANCES

- > Fast acquisition frequency **1 kHz**
- > From **9 to 16 bits 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	200 mA - 800 mA
Sensor power supplies voltage (2 power supplies tunable independently each of which feeding 2 sensors)	5 - 24 V
Total power on the 4 channels	0.9 W

SENSOR INPUTS

Impedance	1 MΩ
Acquisition frequency	200 Hz
Acquisition resolution	from 9 to 16 bits
Input range	0 - 10 V
Resolution (1 bit)	5 mV
Noise (full band)	5 mV rms
Compatible sensors	MFS flow sensor, MPS pressure sensor, MFP FlowPlus pressure sensor, MBD bubble detector

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

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

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**

ACCESSORIES

ELVEFLOW ACCESSORIES

ELVEFLOW.COM/MICROFLUIDIC-PRODUCTS/MICROFLUIDICS-ACCESSORIES/

You can contact us anytime to order **Elveflow Accessories** or request tech support. The Elveflow accessories team is always ready to **make your experience fast and easy.** Alternatively, you can browse the Elveflow Accessories product line on Darwin Microfluidics and order online. Darwin Microfluidics is our official online reseller. Check it out!

MICROFLUIDIC ACCESSORIES

MICROFLUIDIC RESERVOIRS
BUBBLE REMOVER
RESERVOIR XXS ON CHIP
4 TUBES HOLDER
PRESSURIZED AIR SOURCE
VACUUM GENERATOR
KIT FITTINGS STARTER PACK LUER
KIT FITTINGS STARTER PACK PUSH IN
MANIFOLD 9 PORTS
PTFE TUBING 1/16" OD X 1/32" ID, 50M
REMOTE FLOW CONTROL
PRESSURE SOURCE
VACUUM SOURCE

NEW AND IMPROVED PEEK BUBBLE TRAP

- ✔ AUTOCLAVABLE & LEAK-RESISTANT
- ✔ EASILY REPLACEABLE MEMBRANE

This improved version of Elveflow's bubble trap is now autoclavable, thanks to the use of PEEK (Polyetheretherketone). Three internal volume versions are available: 23 µL (S), 95 µL (M), 362 µL (L).

RESERVOIRS TECHNICAL SPECIFICATIONS

RESERVOIRS	Volume	2 ports	4 ports
XXS	800 µL	NA	NA
XS	1.5 - 2 mL	available	not available
S	15 mL	available	available
M	50 mL	available	available
L	100 mL	available	available
HP	150 mL	available	not available

Non-contractual information, may be changed without notice.

RESERVOIRS SPECIFICATIONS DEDICATED TO THE OB1 PRESSURE CONTROLLER

PRESSURIZED TANK VERSION	OB1 PRESSURE CHANNEL RANGES				
	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)
XXS	✓	*	*	*	*
XS	✓	✓	✓	✓	✓
S	✓	✓	✓	✓	✓
M	✓	✓	✓	✓	✓
L	✓	✓	**	✓	**
HP	✓	✓	✓	✓	✓

*not tested in these conditions

** The reservoir passed the pressure resistance tests in these conditions; nevertheless, Elveflow doesn't recommend using it as they are sensitive to mechanical damage

EPS

PRESSURE SOURCE

ELVEFLOW.COM/MICROFLUIDIC-PRODUCTS/MICROFLUIDICS-ACCESSORIES/LABORATORY-PRESSURE-SOURCE/

A **COMPACT** AND **LIGHT** PRESSURE SOURCE

An **oil-free** pressure source to ease the integration in a laboratory environment thanks to its small footprint and integrated tank.

- ✔ **PORTABLE**
- ✔ **EASY-TO-USE**

UNIQUE PERFORMANCES

- > Positive pressure **2 bar**
- > Low noise level **<53 dB**
- > Small footprint **2kg**

APPLICATIONS

- > This pressurized air source is ideal to supply compressed air to a pressure regulator such as the OB1.
- > The steady pressure over 2000 mbar makes it the perfect complementary pressure supply for up to 2 channels 2 bar or 200 mbar OB1 pressure regulators.

OTHER PRESSURE GENERATOR: PRESSURIZED AIR SOURCE (KCP-230/120)

ELVEFLOW.COM/MICROFLUIDIC-PRODUCTS/MICROFLUIDICS-ACCESSORIES/AIR-PRESSURE-GENERATOR/

A **CLEAN PRESSURIZED AIR** SOURCE

This **lubricated air compressor** is a powerful alternative to laboratory gas line supplies. The in-built 5 µm oil filter prevents microdroplets from entering into the instruments. In addition, anti-corrosion treatments of the receiver and long-life synthetic oil utilization makes this pressurized air source the most robust companion for **pressure-driven control** in laboratories.

TECHNICAL SPECIFICATIONS COMPARISON

KCP & EPS

		KCP-230 / KCP-120	PRESSURE SOURCE (EPS)
Performances	Max pressure	8 bar (120 psi)	3 bar (44 psi)
	Air flow rate (at operating pressure)	11 L/min	1.5 L/min (at 2 bar)
	Noise level	<35 dB	<53 dB
Mechanical specifications	Dimensions (without connectors, cm)	38.4 x 33.3 x 34.2	16.1 x 19.4 x 19.5
	Weight	18 Kg	2 Kg
	Pneumatic connection	6mm push-in	
	Internal receiver volume	4 L	350 mL
	Operating temperature	-	5-40 °C
	Operating humidity	-	Up to 80%
Electrical specifications	Input voltage range	-	24 V
	AC supply frequency	50-60 Hz	
	Power supply voltage	100-240 VAC	
	Max current consumption	0.9 A	1.5 A (typical: 0.8 A)
	Max power consumption	-	36 W

Non-contractual information, may be changed without notice.

EVS
VACUUM SOURCE

ELVEFLOW.COM/MICROFLUIDIC-PRODUCTS/MICROFLUIDICS-ACCESSORIES/NOISELESS-VACUUM-SOURCE/

A **COMPACT** AND **LIGHT** VACUUM SOURCE

An **oil-free** vacuum source to ease the integration in a laboratory environment thanks to its small footprint and integrated tank.

- ✔ **PLUG&PLAY**
- ✔ **SMALL FOOTPRINT**

UNIQUE PERFORMANCES

- > Negative pressure **-850 mbar**
- > Low noise level **<51 dB**
- > Small footprint **1.4 Kg**

APPLICATIONS

- > This pressurized air source is ideal to supply vacuum to a pressure regulator such as the OB1.
- > The steady pressure of 2000 mbar makes it the perfect completementary vacuum supply for -900/1000 and -900/6000 mbar OB1 pressure regulators.

OTHER VACUUM SOURCE: VACUUM GENERATOR (KVP-230)

A **HIGH EFFICIENCY** VACUUM PUMP

This **high accuracy** microfluidic vacuum source generates negative pressure for microfluidic flow control without installation/connection of any instrument. The **anticorrosive coating** of the receiver ensures a long lifespan of the instruments.

ELVEFLOW.COM/MICROFLUIDIC-PRODUCTS/MICROFLUIDICS-ACCESSORIES/VACUUM-GENERATOR/

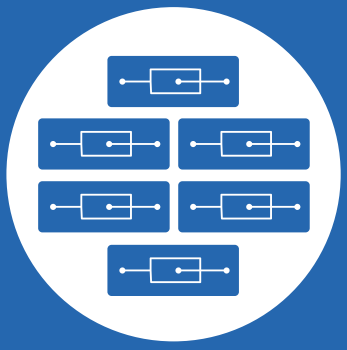
TECHNICAL SPECIFICATIONS COMPARISON

KVP & EVS

		KVP-230 / KVP-110	VACUUM SOURCE (EVS)
Performances	Vacuum pressure (relative)	-980 mbar (-15 psi)	-850 mbar (-13 psi)
	Vacuum pressure (absolute)	20 mbar (0.1 psi)	150 mbar (2.3 psi)
	Pumping speed	18 L/min	8 L/min at 0 bar
	Noise level	<42 dB	<53 dB
Mechanical specifications	Dimensions (without connectors, cm)	30 x 17 x 24	14 x 18 x 14
	Weight	3 Kg	1.4 Kg
	Pneumatic connection	6mm push-in	
	Internal receiver volume	-	250 mL
	Operating temperature	-	5-40 °C
	Operating humidity	-	Up to 80%
Electrical specifications	Input voltage range	-	24 V
	AC supply frequency	-	50-60 Hz
	Power supply voltage	100-240 vac	
	Max current consumption	-	1.5 A (typical: 0.8 A)
	Max power consumption	140 W	36 W

Non-contractual information, may be changed without notice.

ELVE FLOW
PLUG & PLAY MICROFLUIDICS



PRODUCTS

MICROFABRICATION STATIONS

STATION

SU-8 MOLD STATION

ELVEFLOW.COM/MICROFLUIDICS-APPLICATION-PACKS/MICROFABRICATION-STATIONS/SOFT-LITHOGRAPHY-SU8-PHOTOLITHOGRAPHY-STATION-MICROFABRICATION-TOOL/

A COMPLETE STATION TO **FABRICATE YOUR SU-8 MOLD**

- ✓ **HIGH RESOLUTION WITHOUT CLEANROOM**
- ✓ **ACCESSIBLE WITHOUT EXPERIENCE**
- ✓ **FLEXIBLE AND UPGRADABLE PLATFORM**

The benchtop SU-8 photolithography station includes everything you need to make high-resolution master molds in a reproducible manner.

Whether you are an experienced user or a beginner, our station provides robust and tabletop equipment to allow you to fabricate your mold & chip independently after only a week of training with one of our experts.

INCLUDED IN THE STATION

- > High-quality and robust spin-coater
- > Programmable hot plate for photoresist baking
- > High-collimated UV lamp with LEDs
- > All the accessories and chemicals needed to develop a quality process
- > One week installation and training

Each pack can be adapted to your laboratory and technical requirements.

CUSTOMIZE YOUR STATION

We offer a wide range of adaptable and upgradable alternatives to obtain a super-fast process with mid-resolution or to produce multilayer devices with a very high-performance direct laser process.

Talk to our experts and find the right offer for your experimental needs and lab infrastructure.

We ensure a clean installation of the station in your lab and will train your team to fabricate your microfluidic chips straight away.

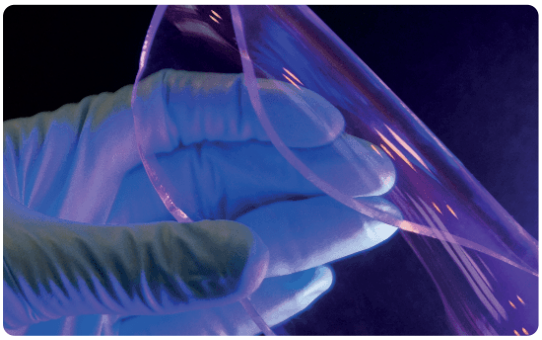
STATION

PDMS CHIPS STATION

ELVEFLOW.COM/MICROFLUIDICS-APPLICATION-PACKS/MICROFABRICATION-STATIONS/PDMS-STATION-SOFT-LITHOGRAPHY-MICROFABRICATION-TOOLS/

ALL YOU NEED TO **PRODUCE YOUR PDMS CHIPS**

- ✔ **ALL-IN-ONE PLATFORM**
- ✔ **REPRODUCIBLE PROCESS**
- ✔ **FAST FABRICATION PROCESS**



Our **PDMS molding station** comprises all the equipment needed to replicate PDMS chips from premade molds in an optimized manner.

Our plug & play system, detailed tutorials, and technical support will make you skilled in the softlithography process so you can manufacture high-quality PDMS chips.

INCLUDED IN THE STATION

Each pack can be adapted to your laboratory and technical requirements.

- > Fitted desiccator to prepare your PDMS mix
- > Oven and soundwave bath for clean chips generation
- > Robust Air plasma for strong bonding
- > Fitted pump and pressure controller for an easy and reproducible process
- > All the accessories and chemicals needed to develop a quality process

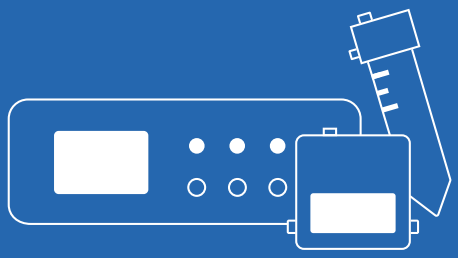
CUSTOMIZE YOUR STATION

Our offers are versatile and customizable. We can suggest options to fabricate more complex stacks (with PDMS membranes, for example) or ways to reduce the station footprint.

Talk to our experts and find the right offer for your experimental needs and lab infrastructure.

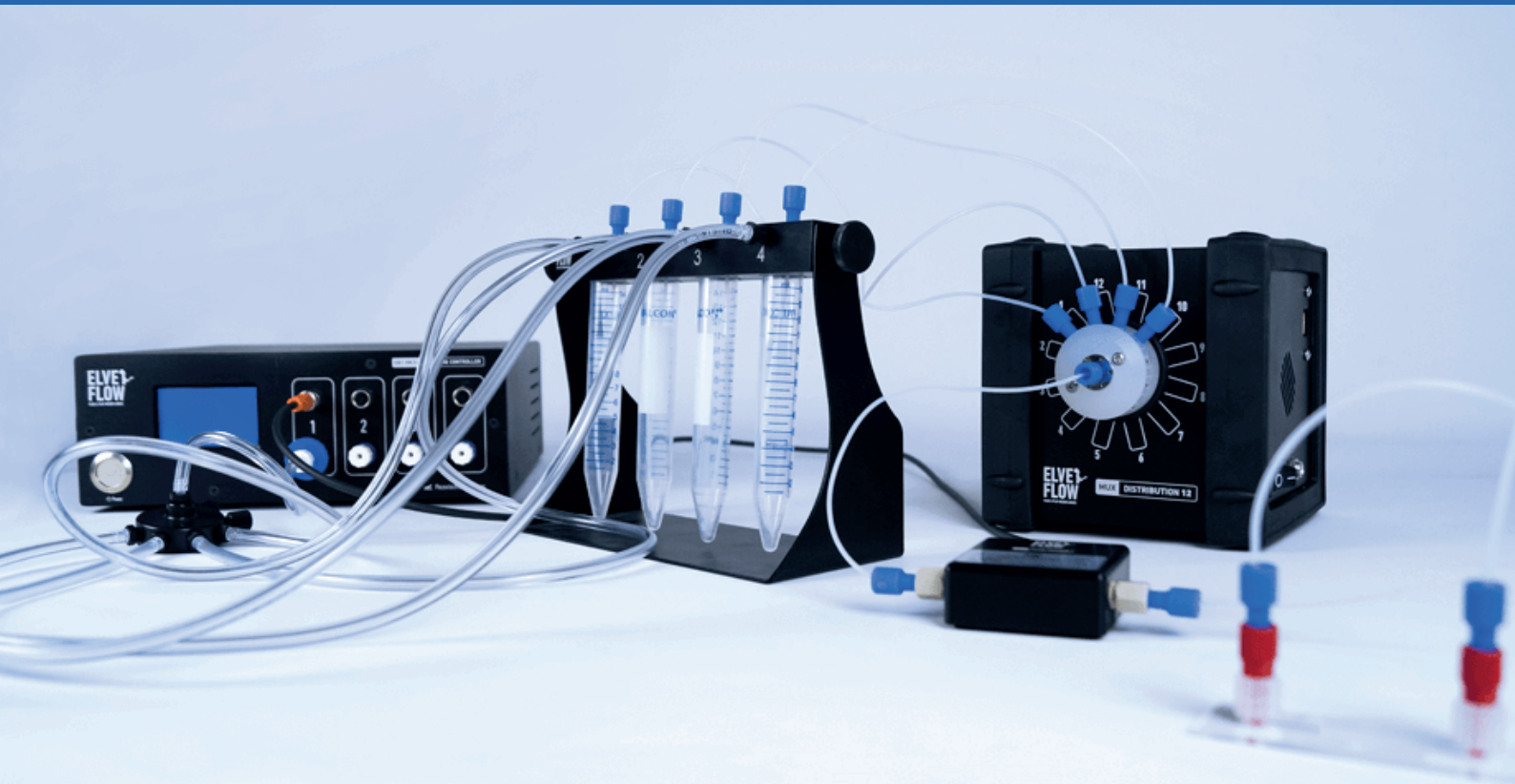
We provide detailed tutorials and technical support for you to fabricate your microfluidic chips straight away.

ELVE FLOW
PLUG & PLAY MICROFLUIDICS



PRODUCTS

APPLICATION PACKS



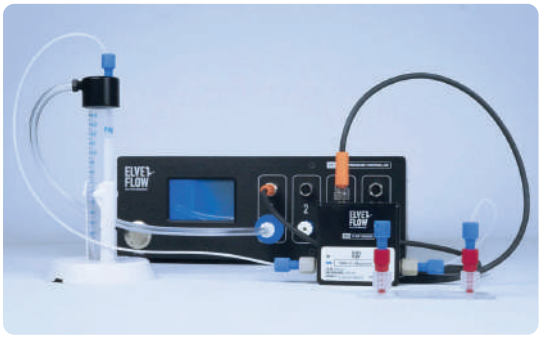
MICROFLUIDICS PACK

MICROFLUIDIC STARTER

ELVEFLOW.COM/MICROFLUIDICS-APPLICATION-PACKS/MICROFLUIDICS-PACKS/STARTER-PACK/

ALL YOU NEED TO **DISCOVER MICROFLUIDICS**

- ✔ **GET STARTED NOW**
- ✔ **GREAT FOR MANY APPLICATIONS**
- ✔ **EASY UPGRADE**



Elveflow's Starter Pack is customized according to your needs so that you will benefit from highly-accurate pressure-driven control in your microfluidic applications.

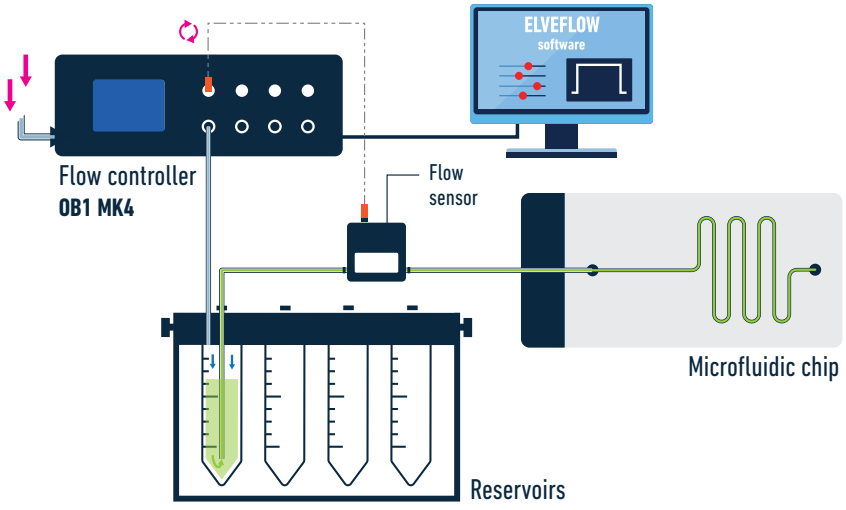
The powerful ESI software controls your entire setup, allowing you to fully control pressure, monitor your experiment, or try advanced functions such as full automation and running scripts.

CONTENT OF THE PACK

Microfluidics can be applied to several different applications. Thus, the Starter Pack is adjusted to suit your specific experimental needs.

Generally included:

- > 4 x Pressure channels
- > 4 x 50 mL Reservoirs
- > All necessary accessories: tubing, connectors, etc...



Additional Options:

- > *Flow rate sensors*
- > *Microfluidic chips*
- > *Microscope and camera*

Talk to our experts and build the pack perfectly fitted to your needs.

MICROFLUIDICS PACK

DROPLET GENERATION

ELVEFLOW.COM/MICROFLUIDICS-APPLICATION-PACKS/MICROFLUIDICS-PACKS/STARTER-PACK/

TURNKEY SYSTEM TO **EASILY GENERATE DROPLETS**

- ✓ **REPRODUCIBLE & EASY GENERATION**
- ✓ **PERFECT FOR MANY APPLICATIONS**
- ✓ **PLUG & PLAY**

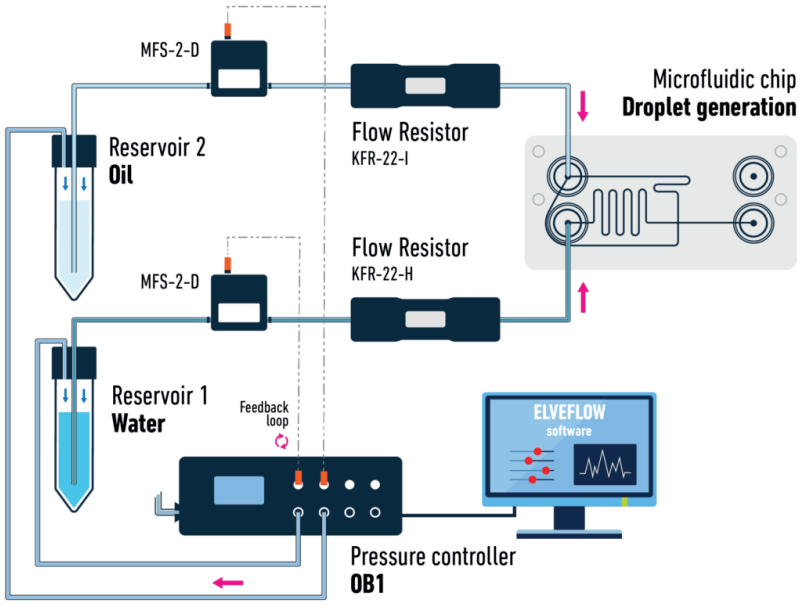
This Dropet Pack is based on the premium Elveflow instrument range and our best-seller - the OB1 flow controller.

Thanks to the OB1's high performance and accuracy, you will be able to generate highly monodisperse droplets (CV<3%) ranging from 10 to 80 µm diameter (and more using alternative microchips).

CONTENT OF THE PACK

Two versions of this pack are available:

- the **small version** (droplets ranging from 10 to 40 µm diameter)
- the **large version** (droplets ranging from 50 to 80 µm diameter).



Generally included:

- 2 x Pressure channels
- 2 x Flow rate sensors
- 2 x Microchips
- 2 x Flow resistors
- A complete user guide
- All necessary accessories: tubing, reservoirs, etc...

INTERESTED IN DROPLET?

Talk to our experts and build the pack perfectly fitted to your needs.

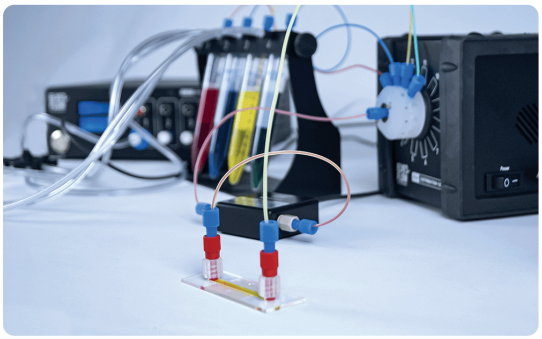
MICROFLUIDICS PACK

SEQUENTIAL INJECTION

ELVEFLOW.COM/MICROFLUIDICS-APPLICATION-PACKS/MICROFLUIDICS-PACKS/SEQUENTIAL-FLUID-INJECTION-PACK

QUICKLY SWAP BETWEEN **UP TO 12 FLUIDS** (GAS OR LIQUIDS)

- ✔ **HIGH STABILITY AND PRECISION**
- ✔ **WORKFLOW AUTOMATION**
- ✔ **HIGH VERSATILITY**



The Sequential Injection Pack includes all the necessary elements to sequentially inject up to 12 (or more) solutions in a fully automated fashion using our computer-controlled 12 to 1 MUX Distribution bidirectional valve.

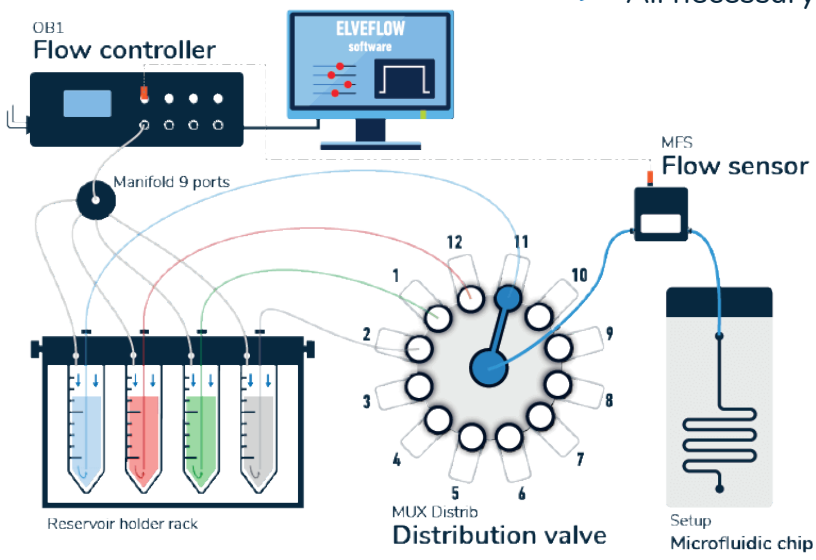
An extensive flow rate range (from 7 nL/min to 30+ mL/min) and volumes (100 µL to up to several Liters) are accessible with this system.

CONTENT OF THE PACK

This pack can be adapted for more complex and advanced experiments such as using 20 or more solutions, removing bubbles, integration into larger systems or testing multiple chip/devices simultaneously.

Generally included:

- 4 x Pressure channels
- 1 x Mux Distribution rotary valve
- 1 x Flow sensor
- 1 x Pressure splitter manifold
- All necessary accessories: reservoirs, tubing, etc...



INTERESTED IN LIQUID INJECTION?

This is only a suggestion of what could be included in this pack

Talk to our experts and build the pack perfectly fitted to your needs.

MICROFLUIDICS PACK

LIPID NANOPARTICLE SYNTHESIS

ELVEFLOW.COM/MICROFLUIDICS-APPLICATION-PACKS/MICROFLUIDICS-PACKS/STARTER-PACK/

HIGHLY REPRODUCIBLE NANOPARTICLES

- ✔ VERSATILE NANOPARTICLE SYNTHESIS
- ✔ PERFECT FOR MANY APPLICATIONS
- ✔ PLUG & PLAY

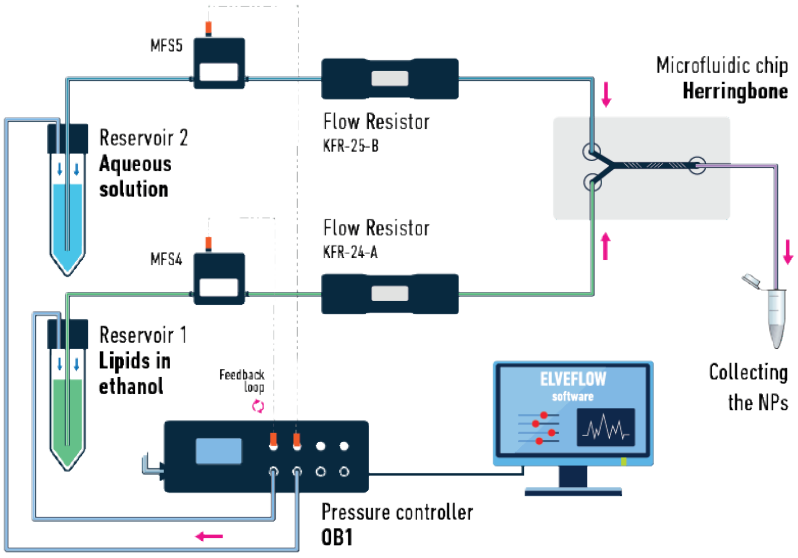
This Lipid Nanoparticle Pack is designed for researchers without prior microfluidics experience or lipid nanoparticle generation aiming to easily synthesize lipid nanoparticles (LNP).

Lipid nanoparticles (LNP), solid lipid nanoparticles (SLN), and nanoliposomes produced by microfluidics are used to encapsulate all types of drugs or organic compounds.

CONTENT OF THE PACK

The kit comes in two versions to perfectly fit your requirements.

- > Herringbone Mixer
- > Flow Focusing



It includes:

- > 2 x Pressure channels
- > 2 x Flow rate sensors
- > 1 x Microchips
- > 2 x Flow resistors
- > A complete user guide
- > All necessary accessories: tubing, reservoirs, etc...

INTERESTED IN NANOPARTICLE?

Talk to our experts and build the pack perfectly fitted to your needs.

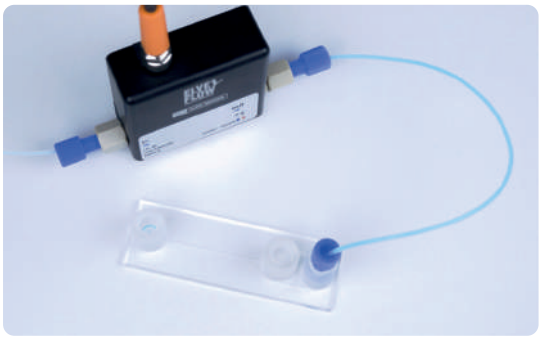
BIOLOGY PACK

RECIRCULATION

ELVEFLOW.COM/MICROFLUIDICS-APPLICATION-PACKS/BIOLOGY-PACKS/ONE-WAY-RECIRCULATION/

AUTOMATE YOUR EXPERIMENTS FOR SEVERAL DAYS

- ✔ UNIDIRECTIONAL LIQUID FLOW
- ✔ NO MORE MEDIA DEPLETION
- ✔ UNIFORM SHEAR STRESS



The Recirculation Pack uses two pressure channels to flow medium through your microfluidic device unidirectionally and continuously.

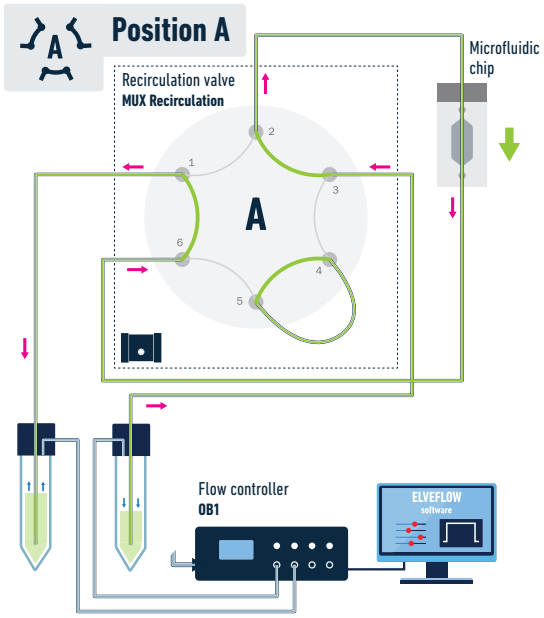
The recirculation valve allows switching between two reservoirs, ensuring the medium always flows from the most filled one. The injection loop consists of a network of inputs/outputs that can connect in two configurations.

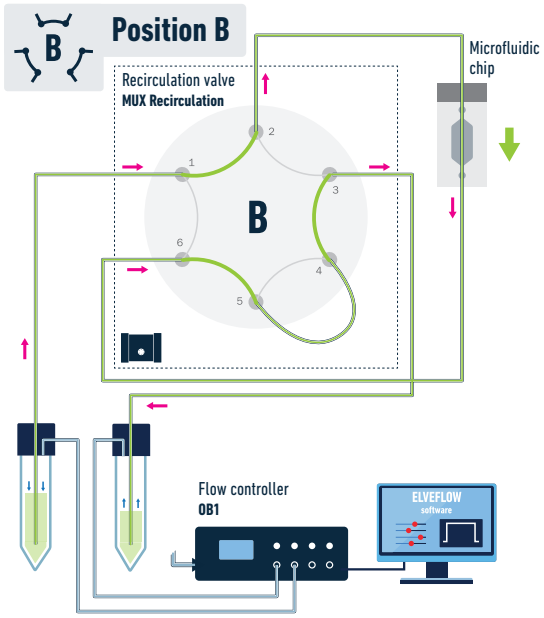
CONTENT OF THE PACK

Additional features, such as medium switch, on-off sample injection, etc. are also possible by adding other Elveflow equipment to your Recirculation Pack.

Generally included:

- > 2 x Pressure channels
- > 1 x Recirculation valve
- > 2 x Reservoirs
- > All necessary accessories





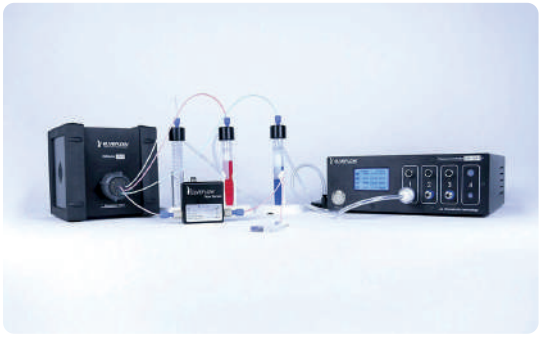
BIOLOGY PACK

ORGAN-ON-A-CHIP

ELVEFLOW.COM/MICROFLUIDICS-APPLICATION-PACKS/BIOLOGY-PACKS/ORGAN-ON-A-CHIP-PACK/

FLOW MEDIUM THROUGH ONE OR SEVERAL **PARALLEL CHIPS**

- ✓ **MIMIC PHYSIOLOGICAL CONDITIONS**
- ✓ **REPRODUCIBLE AND SCALABLE**
- ✓ **EFFORTLESS LONG-TERM EXPERIMENTS**

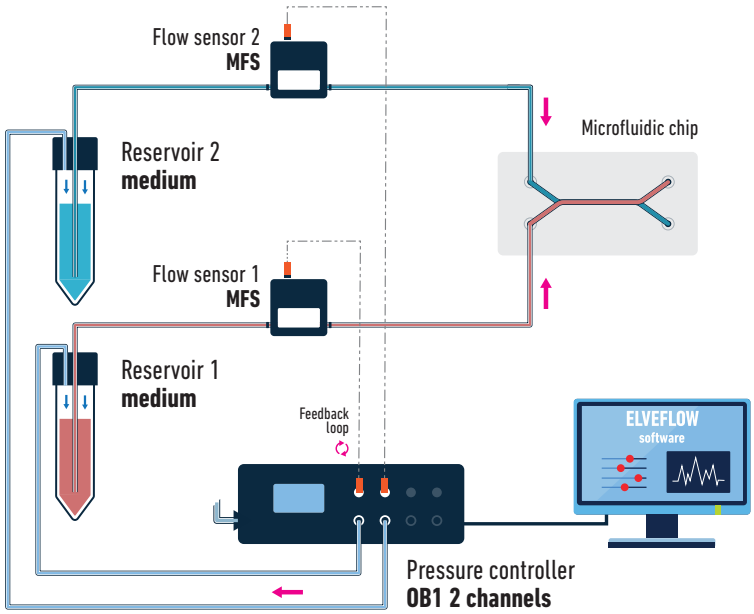


The Organ-On-Chip Pack allows you to perfuse media through a chip containing living cells to mimic in vivo physiology better.

The setup includes one flow controller that allows accurate control of multiple parameters, such as chemical concentration gradient, fluid shear stress, cell patterning, tissue-tissue interface, organ-organ interaction, and physiological responses.

CONTENT OF THE PACK

Several chip designs are available for organ-on-chip experiments, depending on the type of organ you want to mimic and your experimental protocol.



Generally included:

- > 2 x Pressure channels
- > 2 x Flow rate sensors
- > 2 x Reservoirs
- > All necessary accessories: tubing, connectors, etc...

Additional Options:

- > *Microfluidic chip advices*
- > *MUX Distribution*

INTERESTED IN ORGAN-ON-CHIP?

Talk to our experts and build the pack perfectly fitted to your needs.

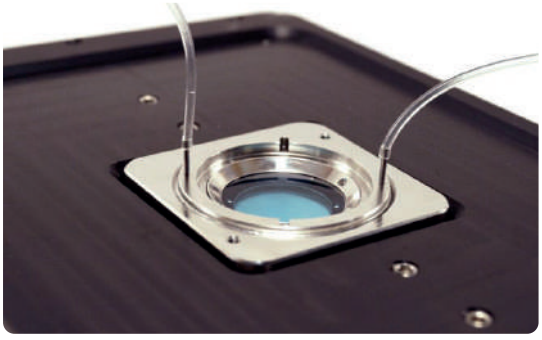
BIOLOGY PACK

LIVE CELL PERFUSION

ELVEFLOW.COM/MICROFLUIDICS-APPLICATION-PACKS/BIOLOGY-PACKS/PERFUSION-FOR-CELLS-AND-BIOLOGY/

LIQUID HANDLING FOR **CELL-BASED EXPERIMENTS**

- ✓ **MULTIPLE MEDIA PERFUSION**
- ✓ **CONTROLLED SHEAR STRESS**
- ✓ **WORKFLOWS AUTOMATION**

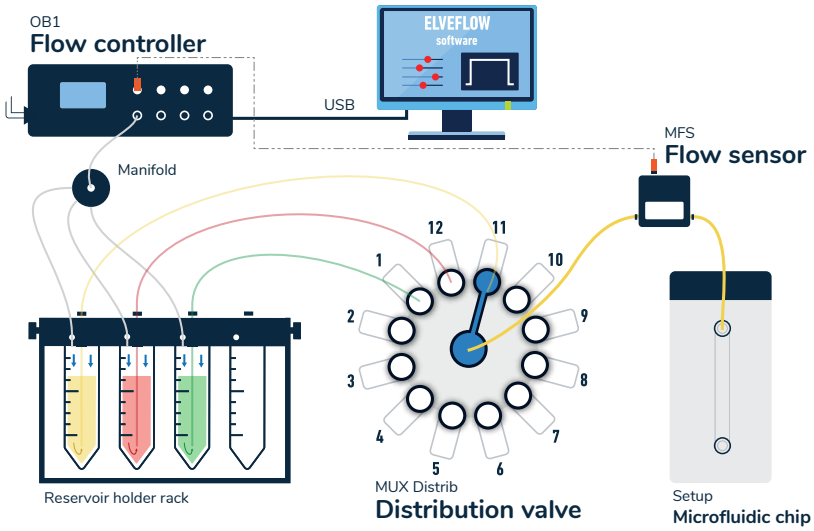


The Cell & Biology Pack uses one pressure channel to flow multiple solutions into the microfluidic chip. It is ideal for shear stress assays and imaging cell response to various media or drugs.

You will be able to design flow injection sequences and create complex patterns, such as oscillating flow to mimic physiological conditions.

CONTENT OF THE PACK

This pack is ideal for complex and advanced Cell & Biology experiments and can be adapted to your needs. For example, you may choose a suitable microfluidic chip, use more than 20 solutions, remove bubbles, or have multiple chip/inlet perfusion.



Generally included:

- > 1 x Pressure channel
- > 1 x Flow rate sensor
- > 1 x MUX Distribution valve
- > 3 x Reservoirs
- > 1 x Bubble remover
- > All necessary accessories: tubing, connectors, etc...

Additional Options:

- > *Microfluidic chips advices*
- > *Microscope and camera*

INTERESTED IN PERFUSION?

Feel free to **contact our experts.**

ART DIRECTOR JULIEN RIDOUARD

MICROFLUIDIC POETRY,
an uncommon, conceptual and sensitive vision of the
microfluidic field, on the blurring border between art & science.
https://www.elveflow.com/microfluidic-tutorials/microfluidic-reviews-and-tutorials/microfluidic-poetry-unique-imaginative-sensitive-vision-microfluidics-field/