A WHOLE UNIVERSE OF MICROFLUIDIC INSTRUMENTS

Elveflow® Product Line 2016

Plug & Play systems for high level microfluidics

Developed by researchers for researchers
### FLOW CONTROL

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OB1 Mk3</td>
<td>Pressure &amp; Vacuum Flow Controller&lt;br&gt;Pressure &amp; Vacuum on up to 4 channels, 20 times more stable &amp; up to 10 times faster than other microfluidic flow controllers.</td>
</tr>
<tr>
<td>AF1 Series</td>
<td>Mobile Pressure &amp; Vacuum Pump&lt;br&gt;An autonomous pump with the advantages of the most recent piezoelectric technology for microfluidics.</td>
</tr>
<tr>
<td>MUX Series</td>
<td>Flow Switch Matrices&lt;br&gt;Switch between different samples at lightning speed. Instantaneous stop flow &amp; Quake valve control.</td>
</tr>
<tr>
<td>FPS Sensor Reader</td>
<td>Flow Sensors &amp; Pressure Sensors&lt;br&gt;Measure and control the flow-rate and pressure in your microfluidic system in real time and with the best precision.</td>
</tr>
</tbody>
</table>

### OPTICAL CONTROL

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>OPR Series</td>
<td>Microfluidic Optical Reader&lt;br&gt;Measure optical properties in your microfluidic channel. Detect and quantify flowing objects.</td>
</tr>
</tbody>
</table>

### ACCESSORIES & SPARE PARTS

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KITS Series</td>
<td>Accessories &amp; Spare Parts&lt;br&gt;Reservoirs, tubing, fittings, manifolds &amp; setup boosters. Everything you need to get started straight away.</td>
</tr>
</tbody>
</table>

### MICROFABRICATION

<table>
<thead>
<tr>
<th>Product</th>
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</thead>
<tbody>
<tr>
<td>BOX Soft Litho</td>
<td>Soft Lithography Station&lt;br&gt;3 turnkey stations that include everything to make your chips No need for a clean room.</td>
</tr>
</tbody>
</table>

Additional Products:
- Temperature Controller, Perfusion System, Fluorescence Reader, OEM Customized Products, etc...

Contact Information:
- [www.elveflow.com](http://www.elveflow.com)
- [contact@elveflow.com](mailto:contact@elveflow.com)
**OB1 Mk3**

**Pressure & Vacuum Controller**

20 X more stable & up to 10 X faster than other microfluidic flow controllers

**Stability: 0.005 % - Response Time: 9 ms**

**Pressure & vacuum within the same channel.**

Outstanding performances

- Pressure stability: 0.005 %
- Pressure Sensor Resolution 0.006 %
- Response time: 9 ms
- Settling time: 40 ms

Wide range of applications

- Digital microfluidics: micro-droplets, anisotropic particles, double emulsion generation & handling
- Bead and particle manipulation
- Fast liquid sample switching
- Cell culture experiments
1. Pressure & Vacuum Source
   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 rate profile.

3. Sample
   Depending on your choice, the liquids can be sucked into the reservoir or be ejected therefrom since the OB1 can use Pressure or Vacuum within the same fluidic channel.

4. Chip
   OB1 Pressure & Vacuum features offers precise sample handling, and provides full control over the sample injection.

Highest Flow Stability
Taking control to a new level.
The 0.005 % flow stability ensures a superior flow performance even at low flow rates, to provide you with low noise data and quality results upon first time.

Short Response & Settling Time
Responsive performance.
The piezo technology technology used on the OB1 Mk3 enable a blazing fast flow change in your microdevice and make the OB1 the flow controller of choice for the most demanding microfluidic applications.

Accurate Flow Rate Control
Master the Flow.
Our flow regulation algorithm provides a real time regulation of the flow rate inside your microchannels while keeping the stability and responsiveness of pressure driven flows.

Plug & Play Software Interface
Shorten the Path to Your Goal.
ESI - Elveflow Smart Interface - controls all Elveflow instruments, letting you automate basic functions to operate all your devices with the same intuitive interface. Seldom used expert functions are out of sight, but just a mouse click away. Save time and get faster answers to your questions!

Complex Fluidic Profiles
Make the Complex Simple.
Our profile editor will enable you to easily create and program sine, triangle, square, sawtooth and pulses flow profiles to automate the most sophisticated protocols.

High Customization Flexibility
Your Flexible Choice of Elements.
The OB1 offers a range of technical features and product versions that enable you to design your OB1 instrument the way you prefer. Get from 1 up to 4 channels, in any maximum pressure range (200 mbar, 2 bar, 8 bar or vacuum) with any type of flow sensor, on the same instrument.

Setup Synchronization
Communication Skills.
The OB1 offers a TTL trigger set for easily synchronizing your instrument with any Elveflow device, microscope or mechanical shutter. Get a complete control of all the devices involved in your experiments.

High Compliance
Ever ready.
Former electro-mechanical pressure controllers have limited gas throughput which limits their ability to quickly pressurize large tanks. The OB1 MkII technology enables fast pressurization of tanks up to 1 liter and enables you to setup long term or high flowrate microfluidic experiments.

The Elveflow* Smart Interface Makes Your Work Easier

Thanks to an ergonomic design of the fluidic functions & modules, your routine tasks and workflows will be more comfortable.

- Intuitive control interface
- Real time control using pressure or flow rate regulation
- Pressure & flow rate visualization and recording
- Programming & automation control of complex sequences
- Easy alternative instrument control through the provided Labview® and Matlab® libraries, and DLLs

National instruments is our technological partner for embedded electronics.
### OB1 TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Unit Pressure Range</th>
<th>0-200 mbar (0-2.9 psi)</th>
<th>0-2000 mbar (0-29 psi)</th>
<th>0-8000 mbar (0-116 psi)</th>
<th>-1000 to 1000 mbar (-14.5 psi to 14.5 psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Stability (1)</td>
<td>0.005 % FS (10 µbar - 0.00014 psi)</td>
<td>0.005 % FS (100 µbar - 0.0014 psi)</td>
<td>0.006 % FS (500 µbar - 0.007 psi)</td>
<td>0.05% FS (-1000 to 1000 mbar: 1 mbar - 0.014 psi)</td>
</tr>
<tr>
<td>Response Time</td>
<td>down to 9 ms (2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Settling Time</td>
<td>down to 40 ms (3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure Sensor Resolution</td>
<td>0.006 % FS (12.2 µbar - 0.00017 psi)</td>
<td>0.006 % FS (122 µbar - 0.0017 psi)</td>
<td>0.006 % FS (500 µbar - 0.007 psi)</td>
<td>0.06 % FS (-1000 to 500 mBar: 1 mBar - 0.014 psi)</td>
</tr>
<tr>
<td>Input Pressure (min - max)</td>
<td>1.5 bar - 10 bar</td>
<td>Any value from 0 to 1 bar (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquid Compatibility</td>
<td>No liquid should enter the OB1.</td>
<td>Any aqueous or organic solvent, oil or biological sample solution can be propelled.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure Source</td>
<td>Non corrosive, non explosive, dry and oil-free gases, e.g. air, argon, N₂, CO₂...</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### OB1 PRODUCTS & SERVICES

<table>
<thead>
<tr>
<th>Elements provided by Elveflow</th>
<th>Included</th>
<th>Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software &amp; libraries</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Control all Elveflow® instruments with the same smart interface.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OB1 Connection kit</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>A complete set of accessories fitted for the OB1 pressure controller.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kits</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Connect any pressure source/syringe pump to your device.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reservoirs</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Gas tight reservoirs with ergonomic fluidic connection.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow Sensors</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>A line of sensors to monitor very low liquid flow rates.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressor</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>A safe &amp; secure pressure source for the OB1 pressure controller.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Related Products & Services

- **Eppendorf® Microfluidic Tank**
  - 100% gas tight connection caps.
  - 1.5 - 2 mL Eppendorf® tubes
  - 15 mL BD Falcon® tubes
  - 100 mL - 2 L Upchurch® bottle

- **Connection Kits**
  - Bored of microplumbing issues? Our kits enable to easily connect your microfluidic device to any pressure or flow control equipment.

- **Broad Product Line**
  - Elveflow instruments are designed to work together on your microfluidic setup. Switch valve system, flow rate monitoring,

- **Service**
  - Benefit from our microfluidics PhD team’s expertise. Take advantage of our support for specific developments on your setup.

- **OEM Solutions**
  - All our instruments are highly customizable and available in end user or OEM version and designed to be easily integrated.

**Performance cannot just be told, it must be experienced.**

**Responsiveness**

![Output pressure response to a 1 bar step with an output volume of 300 mL](image)

Experimental condition: pressure response to a 1 bar step with an output volume of 300 mL.

**Stability**

![Real output pressure stability (%)](image)

Experimental condition: pressure stability at 150 mbar with an output volume of 2 mL.

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(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 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.
AF1

Pressure Generator

An autonomous pump designed to match all mobile workers' needs

Exceptional performances

- Pressure resolution: 100 µbar
- Pressure stability: 100 µbar
- Response time: 50 ms
- Settling time: 100 ms

Wide application range

- Digital microfluidics: micro-droplets, anisotropic particles, double emulsions generation & handling
- Beads and particles manipulation
- Fast liquid sample switching
- Cell culture experiments under medium perfusion
AF1

**FEATURES & BENEFITS**

- **Short Response & Settling Time**
  - Get the Highest Responsiveness.
  - The piezo technology used for the AF1 enables a blazing fast flow change in your microdevice (100 ms response time, 100 ms settling time) to perform amazingly dynamic experiments.

- **Highest Flow Stability**
  - Enjoy a Smooth & Pulsless Flow.
  - The 100 µbar flow stability (i.e. 0.05 % F. S.) ensures a superior flow performance even at low flow rates, to provide you with low-noise data and quality experimental results upon first time.

- **Accurate Flow Rate Control**
  - Master the Flow.
  - Our flow regulation algorithm provides a real time regulation of the flow rate inside your microchannels while keeping the stability and responsiveness of pressure driven flows.

- **Complex Fluidic Profiles**
  - Make the Complex Simple.
  - Our profile editor will allow you to easily create and program sine, square, sawtooth and pulses profiles to automate the most sophisticated protocols.

- **Plug & Play Software Interface**
  - Shorten the Path to Your Goal.
  - ESI - Elveflow Smart Interface - controls all Elveflow instruments, letting you automate basic functions to operate all your devices with the same intuitive interface. Seldom used expert functions are out of sight, but just a mouse click away. Save time and get faster answers to your questions!

- **Compactness**
  - Small, yet Mighty.
  - Subtle experiments sometimes require a rather significant space. Fortunately, the AF1 is shaped to deliver impressive performances while saving valuable lab bench space (220 x 130 x 130 mm LxWxH).

---

**The Elveflow® Smart Interface Makes Your Work Easier**

Thanks to an ergonomic design of the fluidic functions & modules, your routine tasks and workflows will be more comfortable.

- Intuitive control interface
- Real time control using pressure or flow rate regulation
- Pressure & flow rate visualization and recording
- Programming & automation of complex sequences
- Alternative instrument control through the provided Labview® and Matlab® libraries, and DLLs

---

*flow sensor required*
Vacuum & Pressure Generator
Generate vacuum & pressure wherever an electric plug is available.

This instrument has been designed to ensure a perfect teamwork with the AF1 Dual Vacuum & Pressure Controller, that would bring the control and accuracy you need. This instrument can also be used independently.

Vacuum & Pressure Controller
Regulate negative & positive pressure on the same channel.

This instrument covers a pressure control range from -700 mbar to 1000 mbar. It has to be linked to an external pressure/vacuum source such as the AF1 Dual Vacuum & Pressure Generator to supply regulated vacuum and pressure.
AF1 Dual

**FEATURES & BENEFITS**

- **Highest Flow Stability**
  Enjoy a Smooth & Pulseless Flow.
  The 1 mbar flow stability provided by the AF1 Dual ensures a superior flow performance even at low flow rates, to provide you with low-noise data and quality experimental results upon first time.

- **Short Response & Settling Time**
  Get the Highest Responsiveness.
  The piezo technology used for the AF1 enable a blazing fast flow change in your microdevice (100 ms response time, 100 ms settling time) to performamazingly dynamic experiments.

- **Bi-directional Flow Control**
  Master the Flow.
  The -700 mbar to 1000 mbar pressure control range allows you to precisely manage positive and negative flow rates on the same channel with the same instrument.

- **Plug & Play Software Interface**
  Shorten the Path to Your Goal.
  ESI - Elveflow Smart Interface - controls all Elveflow instruments, letting you automate basic functions to operate all your devices with the same intuitive interface. Seldom used expert functions are out of sight, but just a mouse click away.

- **Complex Fluidic Profiles**
  Make the Complex Simple.
  Our profile editor will allow you to easily create and program sine, triangle, square, sawtooth and pulses flow profiles to automate the most sophisticated protocols.

- **Portability**
  Performance Anywhere.
  The AF1 provides superior portability while keeping performances at high level, to deliver a stable and pulseless fluid flow for the most demanding experiments, anytime, anywhere.

- **Setup Synchronization**
  Communication Skills.
  The AF1 offers a TTL triggers set for easilysynchronizingyourinstrument with any Elveflow® device, microscopes or mechanical shutter. That way you can have a full control of all the devices involved in your microfluidic experiment.

- **Compactness**
  Small, yet Mighty.
  Subtleexperimentssometimes require rather significant space. Fortunately, the AF1 is shaped to deliver impressive performances while saving valuable lab bench space (220 x 130 x 130 mm LxLxH).

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**AF1 Dual Pressure Source**

The AF1 Dual Controller has to be connected to an external pressure source that can be, for instance, the AF1 Dual Generator.

**Monitoring**

Control the outlet pressure (or the flow rate*) of the AF1 Dual Vacuum & Pressure Controller through the Elveflow Smart Interface on your PC.

**Sample 1**

The liquid stored into this reservoir can be injected into your chip using pressure.

**Sample 2**

The liquid stored into this reservoir can be sent into your chip using vacuum.

---

* flow sensor required

---

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- Real time control using pressure or flow rate regulation
- Pressure & flow rate visualization and recording
- Programming & automation of complex sequences
- Alternativeinstrumentcontrosthrough the provided Labview® and Matlab® libraries, and DLLs

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National instruments is our technological partner for embedded electronics.
## Technical Specifications

<table>
<thead>
<tr>
<th>AF1 Unit Pressure range</th>
<th>0 to 200 mbar (0 to 2.9 psi)</th>
<th>0 to 1600 mbar (0 to 23 psi)</th>
<th>Dual Pressure &amp; Vacuum Controller -700 to 1000 mbar (-10 to 14 psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of pressure</strong></td>
<td>Positive</td>
<td>Positive</td>
<td>Negative &amp; Positive</td>
</tr>
<tr>
<td><strong>Pressure Sensor Resolution</strong></td>
<td>0.006 % FS 12.2 µbar - 0.00017 psi</td>
<td>0.006 % FS 122 µbar - 0.0017 psi</td>
<td>0.006 % FS 122 µbar - 0.0017 psi</td>
</tr>
<tr>
<td><strong>Pressure stability</strong></td>
<td>100 µbar (0.0014 psi) i.e. 0.05 % Full Scale</td>
<td>1 mbar (0.014 psi) i.e. 0.05 % Full Scale</td>
<td>-700 to 500 mbar: 1 mBar 500 to 1000 mBar: 5 mBar</td>
</tr>
<tr>
<td><strong>Response time</strong></td>
<td>50 ms</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Settling time</strong></td>
<td>down to 40 ms (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Supply pressure (min - max)</strong></td>
<td>Integrated pump No pressure source needed</td>
<td>Pressuresupplyneeded (1.5barmin,2.5barmax)</td>
<td></td>
</tr>
<tr>
<td><strong>Liquid compatibility</strong></td>
<td>Any aqueous or organic solvent, oil, or biological sample solution can be propelled</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>15 W (100 V to 240 V - 50 Hz to 60 Hz)</td>
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<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>1.7 kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Case dimensions L x l x h (mm)</strong></td>
<td>220 x 130 x 130</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output connectors</strong></td>
<td>Stainless steel female luer lock</td>
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</tr>
</tbody>
</table>

(1) Volume dependent – Measurement done on 12 mL reservoir for a set point from 0 to 200 mbar

## AF1 Products & Services

<table>
<thead>
<tr>
<th>Elements provided by Elveflow</th>
<th>Included</th>
<th>Optional</th>
</tr>
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<tbody>
<tr>
<td>Software &amp; Libraries</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>Control all Elveflow® Instruments with the same smart interface.</td>
<td></td>
<td></td>
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<tr>
<td>AF1 Connection kit</td>
<td></td>
<td>•</td>
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<tr>
<td>A complete set of accessories fitted for the AF1 pressure generator.</td>
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<td>Kits</td>
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<td>A line of sensors to monitor very low liquid flow rates.</td>
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<tr>
<td>Compressor</td>
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<td>•</td>
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<td>A safe &amp; secure pressure source for the OB1 pressure controller.</td>
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</tbody>
</table>

It is no coincidence that the most prestigious names trust in us
High-accuracy for very low flow rate monitoring

Exceptional performances
- Calibrated flows from 0.07 µL/min to 5000 µL/min
- Sensor response time: 40 ms
- Resolution down to 1.5 pL/s

Features that matter
- Chemical and biological compatibility
- Low internal volume (1 µL)
- Bi-directional flow rate measurement (positive & negative)

AF1 & OB1 become the most performant syringe pumps!
**PRINCIPLE**

**MFS**

**FEATURES & BENEFITS**

1. **Monitoring**
   Set a desired flow rate profile and control it using the Elveflow Smart Interface on your computer.

2. **Sample**
   Pressurize the liquid samples into the reservoirs with your Elveflow instrument (OB1 or AF1).

3. **Flow Sensor**
   The sensor output signal is sent to the Elveflow Smart Interface that automatically adjusts the pressure to reach the set flow rate value in your channels.

4. **Microfluidic Chip**
   The pressurized liquid is smoothly and precisely injected into the microfluidic chip at the desired flow rate.

---

The Elveflow® Smart Interface Makes Your Work Easier

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- Intuitive control interface
- Real time control using pressure or flow rate regulation
- Pressure & flow rate visualization and recording
- Programming & automation of complex sequences
- Alternative instrument control through the provided Labview® and Matlab® libraries, and DLLs

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**FEATURES & BENEFITS**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MFS</strong></td>
<td>Fits your needs</td>
</tr>
<tr>
<td><strong>Plug and Play flow control</strong></td>
<td>Let it Flow</td>
</tr>
<tr>
<td><strong>Complex Flow Rate Pattern Control</strong></td>
<td>Make the Complex Simple</td>
</tr>
<tr>
<td><strong>Chemical &amp; biological compatibility</strong></td>
<td>Complete Confidence</td>
</tr>
<tr>
<td><strong>Broad Line of Products</strong></td>
<td>A Sensor for Every Need</td>
</tr>
</tbody>
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---

**The Elveflow® Smart Interface Makes Your Work Easier**

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- Intuitive control interface
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- Alternative instrument control through the provided Labview® and Matlab® libraries, and DLLs
The recommended storage temperature ranges from -10 °C to +60 °C.
The operating temperature range is -20 C to +50 C.
Liquid Flow Sensor enables fast, and non invasive measurements of very low liquid flow rates below 5 mL/min.
Excellent chemical resistance and bio-compatibility are ensured.
The sensor shows bi-directional and linear transfer characteristics.
The product comes fully calibrated for water. For volume applications, flow calibration for methanol or other media is available on request (all data for medium H2O, 20°C, 1 bar unless otherwise noted).

Non-contractual information may be changed without notice.

### TECHNICAL SPECIFICATIONS

**MFS**

<table>
<thead>
<tr>
<th>Related Products &amp; Services</th>
<th>Microfluidic Tank</th>
<th>Grants &amp; Partnerships</th>
<th>Connection Kits</th>
<th>Broad Product Line</th>
<th>Flow Reader</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eppendorf® Microfluidic Tank</td>
<td>100% gas tight connection caps. 1.5 - 2 mL Eppendorf® tubes 15 mL BD Falcon® tubes 100 mL - 2 L Upchurch® bottle caps.</td>
<td>Elveflow invests in co-development and cooperative projects with academic, SME and industrial partners to take an active part in the development of microfluidics.</td>
<td>Bored of microplumbing issues? Our kits enable to easily connect your microfluidic device to any pressure or flow control equipment.</td>
<td>Elveflow instruments are designed to work together on your microfluidic setup. Switch valve system, flow rate monitoring, temperature control...</td>
<td>A device specifically designed to be used with a flow sensor for flow rate measurements inside your microchannels</td>
</tr>
<tr>
<td>Connection Kits</td>
<td>Borosilicate Glass</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow Reader</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Microfluidic Flow Sensor**

**OUTSTANDING PERFORMANCES**
- Precision, stability, response time, repeatability, reliability...

**ONE SENSOR SUITED TO A LARGE RANGE OF FLOW RATES**
- Adaptive ranges from 1.6 µL/min to 3.3 mL/min

**LARGE LIQUID COMPATIBILITY**
- Water, oil, alcohol, mixture, ... work with several liquids without requesting calibration.

---

**Measure your flow rates with unmatched precision**

- Direct mass flow measurement, independent of fluid properties
- Additional density and temperature outputs
- Compatible with all liquids
- No periodical recalibration required
- Excellent repeatability and long-term stability
- Excellent accuracy (0.2% of measured value)

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**Specifications**

<table>
<thead>
<tr>
<th>PROPERTIES</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ranges</strong></td>
<td></td>
</tr>
<tr>
<td>Minimum Flow Rate</td>
<td>1.6 µL/min</td>
</tr>
<tr>
<td>Maximum Flow Rate</td>
<td>3.3 mL/min</td>
</tr>
<tr>
<td><strong>Performance</strong></td>
<td></td>
</tr>
<tr>
<td>Mass flow accuracy liquids</td>
<td>± 0.2% of rate</td>
</tr>
<tr>
<td>Mass flow accuracy gases</td>
<td>± 0.5% of rate</td>
</tr>
<tr>
<td>Repeatability</td>
<td>± 0.05% of rate</td>
</tr>
<tr>
<td>Zero stability (25°C)*</td>
<td>&lt; ±0.02 g/h</td>
</tr>
<tr>
<td>Density accuracy</td>
<td>&lt; 5 kg/m³</td>
</tr>
<tr>
<td>Temperature accuracy</td>
<td>±0.5 °C</td>
</tr>
<tr>
<td>Temperature effect**</td>
<td>Zero drift: ±0.01 g/h/°C</td>
</tr>
<tr>
<td>Mounting***</td>
<td>Any position, attitude sensitivity negligible</td>
</tr>
<tr>
<td>Device temperature</td>
<td>0…70°C</td>
</tr>
<tr>
<td>Response time, meter (t98%)</td>
<td>0.2 s to fill the tubing then 35 ms</td>
</tr>
</tbody>
</table>

**Mechanical parts**

<table>
<thead>
<tr>
<th>Material (wetted parts)</th>
<th>Stainless steel 316L or comparable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure rating</td>
<td>200 bar</td>
</tr>
<tr>
<td>Sensor Inner Diameter</td>
<td>250µm</td>
</tr>
<tr>
<td>Microfluidic fitting type</td>
<td>UNF 1/4-28&quot;</td>
</tr>
<tr>
<td>Analog output</td>
<td>0-10V</td>
</tr>
<tr>
<td>Sensor size</td>
<td>65<em>32</em>144 mm³</td>
</tr>
<tr>
<td>Weight</td>
<td>3 kg</td>
</tr>
</tbody>
</table>
Using Flow Resistances

Using flow resistances in a microfluidic setup can be very useful in a number of experiments. It enables to reach and work at low flow rates, even with chips of low fluidic resistance. It also greatly stabilizes the flow rate when flow rate responsiveness really matters or when working with different fluids - e.g. when making droplets.

Elveflow offers a broad range of flow resistances kits that are easy and quick to connect and offer excellent chemical compatibility:

- KFR 1: Kit Flow Resistance 1 - 25 µm ID PEEK Capillary
- KFR 2: Kit Flow Resistance 2 - 50 µm ID PEEK Capillary
- KFR 3: Kit Flow Resistance 3 - 65 µm ID PEEK Capillary
- KFR 4: Kit Flow Resistance 4 - 100 µm ID PEEK Capillary
- KFR 5: Kit Flow Resistance 5 - 150 µm ID PEEK Capillary
- KFR 6: Kit Flow Resistance 6 - 250 µm ID PEEK Capillary
- KFR 7: Kit Flow Resistance 7 - 500 µm ID PTFE Capillary

Installation could not be easier, since these kits contain enough tubing to make about three to fifteen flow resistances, along with all necessary fittings, and a microfluidic tubing cutter.

The following table indicates the tubing length and flow resistance kit reference to be used based on the typical working pressure and the Elveflow flow sensor used:

<table>
<thead>
<tr>
<th>Microfluidic Flow Sensor</th>
<th>Working Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200 mbar</td>
</tr>
<tr>
<td>MFS 1</td>
<td>KFR 3: 30 cm</td>
</tr>
<tr>
<td>MFS 2</td>
<td>KFR 3: 8 cm</td>
</tr>
<tr>
<td>MFS 3</td>
<td>KFR 5: 15 cm</td>
</tr>
<tr>
<td>MFS 4</td>
<td>KFR 6: 10 cm</td>
</tr>
<tr>
<td>MFS 5</td>
<td>KFR 7: 30 cm</td>
</tr>
</tbody>
</table>

Important Note: This table is not intended to provide absolute values for a particular setup and should only be seen as a beginners guide. The microfluidic resistance should be refined based on each setup characteristics. The particular conditions of your use and application of our products are beyond our control. Only a test in the specific conditions of your application will determine the appropriateness of a flow resistance size, which remains a hypothesis among other parameters (e.g. biophysical model chosen, length of fluidic channel, pressure source, chip height, etc.).

To go even further in understanding the hydraulic resistance in microchannels, we highly recommend the following article:

Microfluidic Pressure Sensor

Liquid flow-through pressure sensor - 7.5 µL internal volume

- Accuracy down to 0.2 % Full Scale
- 4 ranges from 5 psi (340 mBar) to 100 psi (7 bar)
- Ultra small internal volume of 7.5 µL on small package version
- 20 ms Settling time
- Compatible with gas and liquids*
- Interactivity with other Elveflow instruments

Measure and control pressure anywhere in your setup

- Our pressure sensors work as Gauge pressure sensors, measuring positive and negative pressure relatively to atmospheric pressure.
- Several pressure ranges are available from 5 psi (340 mBar) to 100 psi (7 bar).
- You can plug our liquid pressure anywhere within your microfluidic setup, record the pressure on your computer and adjust the flow accordingly using our pressure pumps. The pressure sensors are fitted for Elveflow pressure pumps.

Specifications

<table>
<thead>
<tr>
<th>MICROFLUIDIC PRESSURE SENSOR</th>
<th>MPS 1</th>
<th>MPS 2</th>
<th>MPS 3</th>
<th>MPS 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor Range:</td>
<td>5 psi (340 mBar)</td>
<td>15 psi (1 bar)</td>
<td>30 psi (2 bar)</td>
<td>100 psi (7 bar)</td>
</tr>
<tr>
<td>Minimum pressure (psi)</td>
<td>-5</td>
<td>-15</td>
<td>-15</td>
<td>-15</td>
</tr>
<tr>
<td>Maximum pressure (psi)</td>
<td>5</td>
<td>15</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>Max overpressure (psi)</td>
<td>20</td>
<td>45</td>
<td>60</td>
<td>200</td>
</tr>
<tr>
<td>Linearity (%span)</td>
<td>Typ. 0.4</td>
<td>0.25</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Max   0.5</td>
<td>0.5</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Repeatability &amp; Hysteresis (%span)</td>
<td>+/- 0.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stability over 1 year (%span)</td>
<td>+/- 0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40° to +85°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specified temperature range</td>
<td>+0 to +50°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Package model</th>
<th>Large</th>
<th>Small</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection type</td>
<td>Arrow for 3/32 ID tubing</td>
<td>10-32 thread with ferrule</td>
</tr>
<tr>
<td>Internal volume (µL)</td>
<td>70</td>
<td>7.5</td>
</tr>
<tr>
<td>Recommended tubing diameter (inch)</td>
<td>3/32 ID</td>
<td>1/16 OD</td>
</tr>
<tr>
<td>Material in contact</td>
<td>polyetherimide, silicon and fluorosilicone seal</td>
<td>PEEK, silicon and fluorosilicone seal</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>4 point measurement M8 connector compatible with Elveflow Flow Reader and a Flow Reader 4 point sensor adaptor</td>
<td></td>
</tr>
</tbody>
</table>
**Microfluidic Inline Pressure Sensors**

Pressure measurement with no dead volume and FDA certified

- Accuracy down to 0.2 % Full Scale
- Flow rate up to 100 ml / min **
- 1 range: 0 – 16 bar* / overload 25 bar
- Compatible with gas and liquids
- No dead volume
- Interactivity with other Elveflow instruments

* limited to 10 bar when used with the Flow Reader
** depending on the viscosity and primary pressure of the medium

**Measure and control pressure anywhere in your setup**

The Flowplus is a sensor for measuring the pressure of fluids and primarily impresses through its special design featuring extremely small dimensions and a fluid area with no dead space. These pressure sensors are no problem to re-integrated because they are easy to clean and maintenance-free. The compact dimensions of the sensor also makes them easy to install or integrate in existing plants.

**Specifications**

<table>
<thead>
<tr>
<th>MICROFLUIDIC FLOWPLUS PRESSURE SENSOR</th>
<th>MFP Inline Pressure Sensor FlowPlus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flowrate :</td>
<td>up to 100 ml / min.**</td>
</tr>
<tr>
<td>Measurement Parameters :</td>
<td>0 to 16 bar*</td>
</tr>
<tr>
<td>Feed :</td>
<td>12 to 30 VDC</td>
</tr>
<tr>
<td>Material :</td>
<td>Housing – coated aluminum</td>
</tr>
<tr>
<td></td>
<td>Interior flow channel – FFKM</td>
</tr>
<tr>
<td></td>
<td>Modded – PU</td>
</tr>
<tr>
<td>Signal :</td>
<td>0,1 bis 10 V</td>
</tr>
<tr>
<td>Electrical Connection :</td>
<td>“push-pull” connector /</td>
</tr>
<tr>
<td></td>
<td>M8 sensor plug</td>
</tr>
<tr>
<td>Mechanical Connection :</td>
<td>LUER-LOCK DIN EN 1707</td>
</tr>
<tr>
<td>Operating temperature :</td>
<td>15 to 45°C</td>
</tr>
</tbody>
</table>

* limited to 10 bar when used with the Flow Reader
** depending on the viscosity and primary pressure of the medium
MSR
Microfluidic Sensor Reader

- An acquisition interface for all your sensors inside your setup

**Monitoring and feedback control**
- Read simultaneously up to 4 sensors
- Compatible with Elveflow Pressure & Flow Sensor
- Fast and precise, 10 kHz and a 11 bit resolution,
- Real-time control & Feedback loops
**PRINCIPLE**

1. **Pressure Supply**
   Pressurize your reservoir using an OB1 Pressure & Flow Controller.

2. **Monitoring**
   Set a desired flow rate profile and control it using the Elveflow Smart Interface on your computer.

3. **Sample**
   Pressurize the liquids samples into the reservoirs with your Elveflow instrument (OB1 or AF1).

4. **Microfluidic Chip**
   The pressurized liquid is smoothly and precisely injected into the microfluidic chip at the desired flow rate.

---

**FEATURES & BENEFITS**

- **Fast and Precise**
  **Feated for microfluidic**
  With an acquisition sampling rate of up to 10 kHz and a 11 bit resolution, the Sensor Reader enables you to easily conduct experiments involving monitoring or controlling a physical parameter with analog sensors in real time.

- **Noise Reduction**
  **Cleaner data**
  An embedded analog 60 Hz low pass filter function can be activated on each channel independently to reduce sensor noise.

- **Plug and Play flow control**
  **Let it Flow.**
  "Plug & Play Microfluidics" is not just a motto to us. Users will benefit from a control algorithm that ensures an extremely sensitive and responsive flow rate regulation, while being very simple to operate.

- **Complex Flow Rate Pattern Control**
  **Make the Complex Simple.**
  Sensor measurements can be monitored in real time simultaneously with measurements of other Elveflow® apparatuses. Data can be logged and measurements can be used in interaction with other apparatuses to make feedback loops.

- **Wide sensor compatibility**
  **Complete Confidence.**
  Sensor Reader embed two independent power supplies ranging from 5 to 25 V (one for the channels 1-2, one for the channels 3-4). This allows the use of a wide variety of sensors functioning with different voltages for their power supply. Thus, up to four sensors working with 2 different voltages for their power supply can be monitored simultaneously.

---

**The Elveflow® Smart Interface Makes Your Work Easier**

Thanks to an ergonomic design of the fluidic functions & modules, your routine tasks and workflows will be more comfortable.

- Intuitive control interface
- Real time control using pressure or flow rate regulation
- Pressure & flow rate visualization and recording
- Programming & automation of complex sequences
- Alternative instrument control through the provided Labview® and Matlab® libraries, and DLLs

---

National Instruments is our technological partner for embedded electronics.
<table>
<thead>
<tr>
<th>General</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of sensors</td>
<td>4</td>
</tr>
<tr>
<td>Physical characteristics</td>
<td></td>
</tr>
<tr>
<td>Sensor connectors</td>
<td>M8 female (4 pins)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>91x69x29 mm (without connectors)</td>
</tr>
<tr>
<td>Weight</td>
<td>320 g</td>
</tr>
<tr>
<td>Power</td>
<td></td>
</tr>
<tr>
<td>USB feeding current</td>
<td>100 mA min, 500 mA max</td>
</tr>
<tr>
<td>Sensor power supplies</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>5 - 25 V</td>
</tr>
<tr>
<td>(2 power supplies tunable independently each of which feeding 2 sensors)</td>
<td></td>
</tr>
<tr>
<td>Total power (On the 4 channels)</td>
<td>0.9 W</td>
</tr>
<tr>
<td>Sensor inputs</td>
<td></td>
</tr>
<tr>
<td>Impedance</td>
<td>1 MΩ</td>
</tr>
<tr>
<td>Max acquisition frequency</td>
<td>0-10 kHz</td>
</tr>
<tr>
<td>Acquisition resolution</td>
<td>11 bits (2048 cts)</td>
</tr>
<tr>
<td>Input range</td>
<td>0-10 V 0-5 V 0-1 V</td>
</tr>
<tr>
<td>Resolution (1 bit)</td>
<td>5 mV 2.5 mV 0.5 mV</td>
</tr>
<tr>
<td>Noise (Full band)</td>
<td>5 mVrms 2.5 mVrms 0.5 mVrms</td>
</tr>
<tr>
<td>Analog Low-pass filter function characteristics</td>
<td></td>
</tr>
<tr>
<td>cutoff frequency</td>
<td>60 Hz</td>
</tr>
<tr>
<td>filter order</td>
<td>3</td>
</tr>
</tbody>
</table>

**Related Products & Services**

- **Microfluidic Sensor Reader**
  The Sensor Reader is an interface allowing the acquisition of many kinds of analog sensors, including Elveflow pressure and flow sensors.

- **Broad Product Line**
  Elveflow instruments are designed to work together on your microfluidic setup. Switch valve system, flow rate monitoring, temperature control…

- **Grants & Partnerships**
  Elveflow invests in co-development and cooperative projects with academic, SME and industrial partners to take an active part in the development of microfluidics.

- **Service**
  Benefit from our microfluidics PhD team’s expertise. Take advantage of our support for specific developments on your setup.
4 unique microfluidic flow switch matrices

Skilful instruments...
› Fast flow switch: 25 ms
› 2-way or 3-way valves
› Clean fluids injection: no backflow
› Complete flow stop
› No residual flow
› Low volume injection

...with extended capabilities
› Fast medium switching - Drug Testing
› On-chip peristaltic pumping
› Sequential sample injection
› Cell/particle sample screening
› Medium perfusion switch for cell biology
› Diffusion studies
4 unique microfluidic flow switch matrices

ROCKER valve technology >> No waves created when opening & closing valves (flow displacement < 10nL).

**MUX Cross Chip The Zero Flow Virtuoso**
A flow switch matrix designed to stop the flow in microfluidic devices in 100 ms

**Applications:**
- Instantaneous Flow Stop, Small Sample Injection & Sample Premixing
- Rocker Peek Valves
- Plug & Play Programmable Flow Stop
- Complete Equilibrium & Stop Flow In 100 ms
- Ultra Low Volume Injection
- Internal/External Trigger

**MUX Flow switch Matrix The Medium Switch Specialist**
A flow switch matrix designed for fast drug switch into microdevices in less than 300ms

**Applications:**
- Drug, Reagent & Cell Medium Switch For Cell Biology and Flow Chemistry
- Rocker Peek Valves & PEEK Manifold
- Plug & Play Software
- No Samples Cross-Contamination & No Backflow
- Flexible: From 4 To 256 Valves
- Internal/External Trigger

**MUX Quake Valve The PDMS Valves Expert**
A flow switch matrix designed to open & close bilayer PDMS valves in less than 50ms

**Applications:**
- PDMS Microvalves & Micropumps and Cell Confinement Device Control
- Plug & Play Programmable Valve Sequence
- Fast Valve Switch
- Fine Valve Position Tuning
- Flexible: From 16 To 256 Peek Valves
- Internal/External Trigger

**MUX Distributor The Sample Injection Artist**
A rotative valve designed to easily execute fast medium switches in less than 1s.

**Applications:**
- Drug, Reagent & Cell Medium Switch For Cell Biology
- Fast medium switch in less than 1s
- Inject up to 6 different solutions into the same inlet
- Clean sample injection - No back flow
- Automate your experiment and increase reproducibility
- Automate your sample collection
Short Flow Switch Time
Lightning-fast.
The technology used in the Elveflow® MUX makes it possible to achieve a 25 ms flow switch into your microfluidic system. This level of performance pushes the conventional experimental limits and offers you new possibilities.

Plug and Play Flow Control
Let it Flow.
ESI - Elveflow Smart Interface - enables you to control simultaneously up to 16 Elveflow® instruments involved in your microfluidic experiment, while being very simple to operate.

Complex Flow Patterns
Loop it. Mix it. Send it.
Our profile editor will allow you to easily program subtle valves patterns and repeat a set of steps in a loop to automate the most sophisticated protocols.

Setup Synchronization
Perfect Timing.
The MUX offers a TTL triggers set for easily synchronizing your instrument with any Elveflow® device, microscopes or mechanical shutter. That way you can have a full control of all the devices involved in your microfluidic experiment.

Compactness
Small, yet Mighty.
Choose the number of valves you need from 4 to 16 (up to 256 on special request) and the type of valves, unidirectional valves (2/2) for fast sample injection or bi-directional valves (3/2) for quake valves control.

The Elveflow® Smart Interface Makes Your Work Easier
Thanks to an ergonomic design of the fluidic functions & modules, your routine tasks and workflows will be more comfortable.

Intuitive control interface
Real time control using pressure or flow rate regulation
Pressure & flow rate visualization and recording
Programing & automation of complex sequences
Alternative instrument control through the provided Labview® and Matlab® libraries, and DLLs

Chemical & Biological Compatibility
Complete Confidence.
Wetted materials include borosilicate glass, quartz glass, or inert PEEK plastic to ensure a full chemical and biological compatibility, so you can work in complete confidence.

FEATURES & BENEFITS

TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>MUX Elveflow® flow switches</th>
<th>Cross Chip</th>
<th>Flow Switch Matrix</th>
<th>Quake valve</th>
<th>Distributor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply</td>
<td></td>
<td>100 V to 240 V</td>
<td>35 W</td>
<td>disconnectAC/DCadapter</td>
</tr>
<tr>
<td></td>
<td>Input voltage range, AC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AC supply frequency</td>
<td>50 Hz to 60 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Input current, AC</td>
<td>1 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Power consumption</td>
<td>35 W</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Safety</td>
<td>IEC/EN 61010-1: 2001</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shutting down power supply</td>
<td>button switch or disconnect the AC/DC adapter</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Performances

<table>
<thead>
<tr>
<th>Valves response time</th>
<th>20 ms</th>
<th>300 ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. supported pressure</td>
<td>2 bar (29 PSI)</td>
<td>9 bar (125 PSI)</td>
</tr>
</tbody>
</table>

Mechanical Specifications

<table>
<thead>
<tr>
<th>Valve type</th>
<th>2/2-way Solenoid Valve</th>
<th>3/2-way Solenoid Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input/Output connectors</td>
<td>10-32 UNF (PEEK tube to port fittings adapters provided)</td>
<td>1/16 or 1/8 fitting-less tubingconnection system</td>
</tr>
<tr>
<td>Dimensions L x l x h (mm)</td>
<td>220 x 130 x 130</td>
<td>160 x 76 x 117</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>10°C to 40°C</td>
<td></td>
</tr>
<tr>
<td>Operating humidity</td>
<td>20 to 80%</td>
<td></td>
</tr>
</tbody>
</table>

Software

<table>
<thead>
<tr>
<th>Computer specifications</th>
<th>USB2.0port,IntelPentiumIII500MHz,1GoHardDiskspace,2GoRAMWindowsXP/Vista/7/8,32/64bit. Labview® 2011 is required when using Labview® libraries.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection type</td>
<td>USB</td>
</tr>
<tr>
<td>Provided elements</td>
<td>Labview® library, Matlab® library, C DLLs</td>
</tr>
</tbody>
</table>
Microfluidic Valves Controller
Plug your valves anywhere in your microfluidic setup

**PLUG FROM 1 TO 16 VALVES**
Control 1 to 16 valves independently

**MIX ALL KIND OF VALVES**
Use our microfluidic valves (3:2, 2:2, …) or plug your own valves

**SOFTWARE & SDK**
A simple USB connection and easily control your valves with your computer

* Limited only to media compatible with polyetherimide, silicon, and fluorosilicone seals

Plug your valves **wherever** you want in your **microfluidic** setup

Our selection of valves: Choose the one for you

- Low internal volume: 20 µL
- Compatible with gas or liquid
- Low power consumption: 1.5 W
- Convenient ¼-28UNF connection
- ROCKER® valve technology (flow displacement < 10nL)
- Afford a wide range of pressure: -0.75 bar to 2.5 bar (-11 psi to 37 psi)

Specifications

<table>
<thead>
<tr>
<th>Properties</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Number of controlled valves</td>
<td>16</td>
</tr>
<tr>
<td>Bus interface</td>
<td>USB 2.0</td>
</tr>
<tr>
<td>Power supply</td>
<td>24 VDC, 1.5 A</td>
</tr>
<tr>
<td>Max valve power</td>
<td>10 W</td>
</tr>
<tr>
<td>Max total power (sum of the power of all connected valves)</td>
<td>35 W</td>
</tr>
<tr>
<td>Physical characteristics</td>
<td></td>
</tr>
<tr>
<td>Valve connectors</td>
<td>WR-MPC 3.2.2</td>
</tr>
<tr>
<td>Dimmensions</td>
<td>128x81.5x31 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>251 g</td>
</tr>
</tbody>
</table>
It is no coincidence that the most prestigious names trust in us

Related Products & Services

- **Eppendorf® Microfluidic Tank**
  100% gas tight connection caps.
  1.5 - 2 mL Eppendorf® tubes
  15 mL BD Falcon® tubes
  100 mL - 2 L Upchurch® bottle caps.

- **Connection Kits**
  Bored of microplumbing issues? Our kits enable to easily connect your microfluidic device to any pressure or flow control equipment.

- **Chip Holder**
  A device specifically designed for sample screening, small sample injection, and Zero Flow applications

- **Grants & Partnerships**
  Elveflow invests in co-development and cooperative projects with academic, SME and industrial partners to take an active part in the development of microfluidics.

- **Broad Product Line**
  Elveflow instruments are designed to work together on your microfluidic setup. Switch valve system, flow rate monitoring, temperature control...

- **Service**
  Benefit from our microfluidics PhD team's expertise. Take advantage of our support for specific developments on your setup.

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- 100 mL - 2 L Upchurch® bottle caps.

**Connection Kits**
Bored of microplumbing issues? Our kits enable to easily connect your microfluidic device to any pressure or flow control equipment.

**Chip Holder**
A device specifically designed for sample screening, small sample injection, and Zero Flow applications

**Grants & Partnerships**
Elveflow invests in co-development and cooperative projects with academic, SME and industrial partners to take an active part in the development of microfluidics.

**Broad Product Line**
Elveflow instruments are designed to work together on your microfluidic setup. Switch valve system, flow rate monitoring, temperature control...

**Service**
Benefit from our microfluidics PhD team's expertise. Take advantage of our support for specific developments on your setup.
OPTOREADER - OPTICAL DETECTION FOR MICROFLUIDICS

OptoReader uses one optical fiber to both illuminate and capture light emitted by the sample. In function of your needs, there are different available versions:

- **OptoReader Basic**: Measurement of fluorescence.
- **OptoReader Fluo**: Simultaneous measurement of reflection & fluorescence.

**MAIN FEATURES**

- Inspection camera: x10 to x90
- Alignment Module: sensitivity 50 µm/rotation
- Custom filter set: 9 types of fluorophore
- Custom lens: magnification 0.5x to 5x
- Custom excitation wavelength: from 365 nm to 625 nm

**BENEFITS**

- Fast acquisition
- High sensitivity: detection limit down to 1 nM FITC
- Tiny detection spot with high aperture
- Simultaneous measurement of fluorescence and reflection
- Versatile integration
Our software Makes Your Work Easier

A user-friendly software that allows easily integrating Optoreader into your existing flow control system.

- **Optical Detection Interface**
  Records the variation of the reflection and fluorescence signals due to the passing of the fluorescent objects.

- **Statistic Interface**
  Get real-time statistical information on the studied objects: frequency, amplitude, width.

**OPR FEATURES & BENEFITS**

- **Compact optical fiber-based design**
  for an easy and versatile integration with your microfluidic device.

- **Bidirectional Optical fiber output**
  the optical fiber can perform simultaneous reflection and fluorescence measurement.

- **High throughput detection**
  100 kHz acquisition, capable of detecting thousands of events per seconds.

- **High sensitivity**
  Fluorescence detection limit: < 20 pW full bandwidth.

- **Monitoring**
  The OptoReader allows detection and quantification of flowing particles in a given point during microfluidic experiments.

- **Plug-and-Play**
  Control your experiments through C, Python, Matlab®, Labview® or the Elveflow® Smart Interface.

- **Technical support**
  A team of experts in microfluidics will provide you individual customer care, specialist advice and technical support: the guarantee for a solution tailored to your specific research.

- **Many available options**
  - Higher sensitivity (25x)
  - Alignment platform
  - Focalization optics
  - Multi band fluorescence detection (up to 3 colors)
  - Lock in detection

- **Compact**
  Offers great advantage over conventional microscopes thanks to its compact design, real-time processing capacity, high detection sensitivity and cost effectiveness.

**Features & Benefits**

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### Technical Specifications

<table>
<thead>
<tr>
<th>Properties</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Excitation</strong></td>
<td></td>
</tr>
<tr>
<td>Excitation wavelength</td>
<td>365 nm, 470 nm, 530 nm, 590 nm, 625 nm</td>
</tr>
<tr>
<td>Fluorescence filter set</td>
<td>DAPI, FITC, TRITC, Texas Red, Cy5</td>
</tr>
<tr>
<td>Power</td>
<td>0-1.5 mW (470 nm LED)</td>
</tr>
<tr>
<td>Pulse duration (pulse mode)</td>
<td>10 μs-10 s</td>
</tr>
<tr>
<td>Frequency (Lock-in mode)</td>
<td>50 Hz-10 kHz</td>
</tr>
<tr>
<td><strong>Acquisition</strong></td>
<td></td>
</tr>
<tr>
<td>Acquisition frequency</td>
<td>0-100 kHz</td>
</tr>
<tr>
<td>Acquisition resolution</td>
<td>16 bits</td>
</tr>
<tr>
<td>Lyp. acquisition dynamic</td>
<td>84 db</td>
</tr>
<tr>
<td>Reflection off resolution</td>
<td>100 pW</td>
</tr>
<tr>
<td><strong>Optics</strong></td>
<td></td>
</tr>
<tr>
<td>Optical fiber diameter</td>
<td>50 μm, 200 μm, 400 μm</td>
</tr>
<tr>
<td>Optical fiber numerical aperture</td>
<td>0.50</td>
</tr>
<tr>
<td>Focalized spot diameter</td>
<td>36 μm, 143 μm, 296 μm</td>
</tr>
<tr>
<td>Focalized spot numerical aperture</td>
<td>0.6</td>
</tr>
</tbody>
</table>

| Bandwidth                   |                                |
| REFLECTION                  |                                 |
| FLUORESCENCE                |                                 |
| 0-12 μW                     | 0-120 nW                       |
| 0-3.6 μW                    | 0-36 nW                        |
| 0-1.2 μW                    | 0-12 nW                        |
| 0-360 nW                    | 100 Hz                        |
| 0-120 nW                    | 10 Hz                         |
| 0-36 nW                     | 1 Hz                          |
| REFLECTION                  | 4 pW/Hz 1/2                   |
| FLUORESCENCE                | 40 nW/Hz 1/2                  |

| Noise equivalent power (NEP) | 6 pW (0-360 pW range)          |
| Refraction min. noise       | -60 nW (0-360 pW range), or 5 x 10^19 photons/s² |
| Fluorescence sensitivity    | (available option with 2 x 10^19 photons/s sensitivity) |
| Minimal equivalent fluorescence background (specified on normal mode, virtually zero in lock-in mode) | 0.1 μm FITC in 400 μm spot (0-300 pW range, 200 μV power) |

**Eppendorf® Microfluidic Tank**

- 100% gas tight connection caps.
- 1.5 - 2 mL Eppendorf® tubes
- 15 mL BD Falcon® tubes
- 100 mL - 2 L Upchurch® bottle caps.

**Grants & Partnerships**

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*It is no coincidence that the most prestigious names trust in us*
Ready To Use Soft Lithography Station for Fast & Easy PDMS Devices Production

A Turnkey System that Includes Everything

>_ We provide equipment, chemicals, protocols, training & assistance

**Major strengths of SoftLithoBox**

>_ Save Time: Do not waste time trying to set up a microfabrication facility on your own, we are here!
>_ Easy to Use: Our reliable protocols will help you to quickly become self-sufficient.
>_ Save Space: The equivalent of a conventional clean room in 3 m².
>_ Highly Efficient: Get a direct access to high quality microfabrication tools - resolution down to 1 µm.
**SU-8 PHOTOLITHOGRAPHY PACK**

Quickly create your own master molds out of the clean room.

Our benchtop SU-8 photolithography facility includes everything you need to fabricate molds for microfluidics in your lab and test new experiments fast:

- Programmable hot plates
- Programmable spin coater
- Programmable UV lamp
- Pressurized air gun...

All chemicals for photolithography (MicroChem Corp. SU-8, SU-8 developer, TCMS, Isopropanol, etc.) and all associated accessories (Silicon wafers, wafer tweezers, timers …) are also included.

**PDMS MOLDING PACK**

Replicate easily your PDMS devices out of the clean room.

With our benchtop PDMS molding facility, just take your master molds and duplicate PDMS devices directly in your lab. Our PDMS molding facility includes all equipment so that you can start your fabrication immediately:

- Complete air plasma system
- Oven for fast PDMS curing
- Desiccator for PDMS degassing
- Spin-coater for multilayer PDMS devices

All chemicals for photolithography (MicroChem Corp. SU-8, SU-8 developer, TCMS, Isopropanol, etc.) and all associated accessories (Silicon wafers, wafer tweezers, timers …) are also included.

**FULL SOFT LITHOGRAPHY PACK**

Quickly create your own molds & replicate your devices out of the clean room.

The full softlithography pack, includes everything you need to fabricate molds and replicate PDMS devices directly in your lab. Our pack includes all equipment and support to produce chips autonomously:

- Oven for fast PDMS curing
- Desiccator for PDMS degassing
- Spin-coater for multilayer PDMS devices

All chemicals for photolithography (MicroChem Corp. SU-8, SU-8 developer, TCMS, Isopropanol, etc.) and all associated accessories (Silicon wafers, wafer tweezers, timers …) are also included.

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