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INTRODUCTION
Fluigent develops, manufactures, commercializes and supports innovative fluid handling solutions for a variety of rapidly growing applications where fluid control is critical.

Since 2005 we have delivered more than 2,500 Fluigent systems. These include the MFCS™-EZ (Microfluidic Flow Control System), the FRP (Flow Rate Platform) and the ESS™ (Easy Switch Solutions™).

We strive to provide “Smart Microfluidic” solutions. Our modular system architecture enables our customers to focus on their application.

In addition to our Paris area headquarters, we have 2 local subsidiaries to be closer to our customers and provide local service and support: Fluigent Deutschland GmbH in Jena, Germany serves Northern and Eastern European customers, and Fluigent INC. near Boston, USA for our customers in the Americas.
INTRODUCTION

HISTORY
Fluigent is the leader in microfluidic control

2003
- First MFCS™ Sales

2006
- First International Sales

2008
- Introduction of flow rate monitoring instruments
- obtention of the ISO 9001 Certification

2010
- Introduction of new products: MFCS™-EZ & ESS™
- Opening of Fluigent Inc. USA & Fluigent Deutschland

2012
- Introduction of Microfluidic Flow Control System™-EX

2015
- Introduction of ARIA

2017
- Introduction of the Microfluidic Flow Control System™-EX

2019
- Introduction of the most advanced flow controller: Flow EZ™

Creation of the SDK support
Start OEM activity
Market expansion in Asia
Fastab™ patent
Technology used in MFCS™
At Fluigent, we strongly believe that local customer and technical support is essential to maintaining customer satisfaction.

**Since 2006, we have delivered our instruments to more than 40 countries worldwide** thanks to our direct offices in France (Fluigent S.A), the USA (Fluigent Inc.), Germany (Fluigent Deutschland GmbH), and our network of distributors and partners selected because of our shared values.

Through regular training and support, we help our distributors serve our customers from around the world every day. No matter where you are in the world, Fluigent will be there.

To contact your local Fluigent representative, or if you are interested in partnering with Fluigent for OEM development, distribution, or services, please send us an email at sales@fluigent.com.
MICROFLUIDIC COMPONENTS
LineUP™
The most advanced flow controller

FLOW EZ™
The Flow EZ™ is the most advanced flow controller for pressure based fluid control. It can be combined with a Flow Unit to control pressure and flow. It can be used without a PC.

Focus on your experiment with the local control dial
Easily adaptable to any setup
Start within minute: Use without a PC
Economical & expandable
**Characteristics**

**LineUP Flow EZ™**

<table>
<thead>
<tr>
<th>Range in mbar</th>
<th>Product Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 25</td>
<td>LU-FEZ-0025</td>
</tr>
<tr>
<td>0 to 69</td>
<td>LU-FEZ-0069</td>
</tr>
<tr>
<td>0 to 345</td>
<td>LU-FEZ-0345</td>
</tr>
<tr>
<td>0 to 1000</td>
<td>LU-FEZ-1000</td>
</tr>
<tr>
<td>0 to 2000</td>
<td>LU-FEZ-2000</td>
</tr>
<tr>
<td>0 to 7000</td>
<td>LU-FEZ-7000</td>
</tr>
<tr>
<td>0 to -25</td>
<td>LU-FEZ-N025</td>
</tr>
<tr>
<td>0 to -69</td>
<td>LU-FEZ-N069</td>
</tr>
<tr>
<td>0 to -345</td>
<td>LU-FEZ-N345</td>
</tr>
<tr>
<td>0 to -800</td>
<td>LU-FEZ-N800</td>
</tr>
</tbody>
</table>

**LineUP™ Series**

Our LineUP™ product range is the next generation of microfluidic systems. Alongside, the Flow EZ™ module, a Link can connect the modules to a computer or any external instrument. The Adapt is available to connect Flow EZ™ modules with different pressure ranges without the need of additional pressure sources. The entire system can be controlled and monitored by Fluigent software.

**Extended products**

**LineUP™ SUPPLY KIT**
LU-SPK-0001

The Flow EZ™ Supply Kit is designed to be used with any Flow EZ™ pressure channel.

More information page 26

Provided

**MAT**
SFT-MAT

The Microfluidic Automation Tool allows an easy design of time-based protocols for completely automated experiments.

More information page 21

Provided

**A-i-O**
SFT-AIO

The Fluigent All-in-One Software is designed for controlling and measuring pressure and flow rate in real time.

More information page 20

Provided

**SDK**
SFT-SDK-LU

The Fluigent Software Development Kit includes full integration of devices interfaces within LabVIEW, MATLAB and other IDEs.

More information page 23

Provided

**LINK**
LU-LNK-002

The LINK is designed to connect Flow EZ™ module to a PC.

More information page 25

Required for remote control

**FLOW UNIT**

The Flow Unit is a high-precision individual flow sensor used for direct flow control.

More information page 12

Required for flow rate control

**ADAPT**
LU-ADP-0001

The ADAPT is designed to combine different ranges of Flow EZ™ together.

More information page 25

Required when working with various Flow EZ™ pressure ranges

More product specifications at www.fluigent.com

More information on flow control technologies on pages 40-41
MFCS™ SERIES
Microfluidic Flow Control System

MFCS™
The MFCS™ is a modular microfluidic flow controller. 4 or 8 channels are available with different pressure ranges for high precision operations in microfluidic experiments. By using the FASTAB™ microfluidic patented technology, the MFCS™ generates a constant pressure-driven flow rate that allows for reliable and repeatable experiments.

Easy to use
Adaptable: Independent pressure channels
Reliable and reproducible results: Pulseless flow
Compact: Save benchtop space
**Characteristics**

<table>
<thead>
<tr>
<th>Range in mbar</th>
<th>Product Number</th>
<th>Range in mbar</th>
<th>Product Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 345</td>
<td>EZ-003450001</td>
<td>0 to 345</td>
<td>EX-003450001</td>
</tr>
<tr>
<td>0 to 1000</td>
<td>EZ-01000001</td>
<td>0 to 1000</td>
<td>EX-01000001</td>
</tr>
<tr>
<td>0 to 2000</td>
<td>EZ-01000002</td>
<td>0 to 2000</td>
<td>EX-01000002</td>
</tr>
<tr>
<td>0 to 7000</td>
<td>EZ-07000001</td>
<td>0 to 7000</td>
<td>EX-07000001</td>
</tr>
<tr>
<td>0 to -345</td>
<td>EZ-80345001</td>
<td>0 to -345</td>
<td>EX-80345001</td>
</tr>
<tr>
<td>0 to -800</td>
<td>EZ-80800001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Extended products**

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Provided or Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT</td>
<td>The Microfluidic Automation Tool allows an easy design of time-based protocols for completely automated experiments.</td>
<td>Provided</td>
</tr>
<tr>
<td>A-i-O</td>
<td>The Flugent All-in-One Software is designed for controlling and measuring pressure and flow rate in real time.</td>
<td>Provided</td>
</tr>
<tr>
<td>SDK</td>
<td>The Flugent Software Development Kit includes full integration of devices interfaces within LabVIEW, MATLAB and other IDEs.</td>
<td>Provided</td>
</tr>
<tr>
<td>FRCM</td>
<td>The FRCM is designed to simultaneously control multiple flow rate channels using the Flugent MFCS™.</td>
<td>Provided</td>
</tr>
<tr>
<td>MFCS™ KITS</td>
<td>The MFCS™ Low or High Pressure Kits are specially designed to be used with any MFCS™ with any low or high pressure channel.</td>
<td>Required</td>
</tr>
<tr>
<td>FLOW UNIT</td>
<td>The Flow Unit is a high-precision individual flow sensor used for direct flow control.</td>
<td>Required for flow rate control</td>
</tr>
<tr>
<td>FLOWBOARD</td>
<td>The Flowboard is a hub that manages communication between Flugent Software and up to eight Flow Units.</td>
<td>Required for flow rate control</td>
</tr>
</tbody>
</table>

**MFCS™ Series**

Our MFCS™ Series product range is the first generation of microfluidic systems. Along with the MFCS™-EZ or MFCS™-EX, a Manifold can be added to redirect the pressure to multiple fluid reservoirs. The flow generated can be measured with Flow Units and the Flowboard.

MFCS™ can also have an integrated pressure source or be coupled with the FLPG Plus, an external pressure source (page 24). This system is controlled and monitored by Flugent software.

**Range in mbar**

<table>
<thead>
<tr>
<th>Product Number</th>
<th>Unit in mbar</th>
</tr>
</thead>
<tbody>
<tr>
<td>EZ-11000001</td>
<td>Basic</td>
</tr>
<tr>
<td>EZ-source-pos</td>
<td>Base Positive Pressure Source Included</td>
</tr>
<tr>
<td>EZ-source-neg</td>
<td>Base Negative Pressure Source Included</td>
</tr>
<tr>
<td>EX-11000008</td>
<td>Basic</td>
</tr>
<tr>
<td>EX-source-pos</td>
<td>Base Positive Pressure Source Included</td>
</tr>
<tr>
<td>EX-source-neg</td>
<td>Base Negative Pressure Source Included</td>
</tr>
</tbody>
</table>

More product specifications at www.fluigent.com

More information on flow control technologies on pages 40-41
FLOW UNIT
High-precision individual flow sensors

The Flow Unit is a bidirectional flow sensor compatible with our software, our Flow EZ™ and our MFCS™.

<table>
<thead>
<tr>
<th>Reliable results:</th>
<th>Adaptable:</th>
<th>Flexible:</th>
<th>Easy combinasion</th>
</tr>
</thead>
<tbody>
<tr>
<td>High precision</td>
<td>Large range of flow rates</td>
<td>Usable with any flow control system</td>
<td>with other Flow Units</td>
</tr>
</tbody>
</table>

This setup is made for injecting fluid samples into a chip using a microfluidic pressure pump which generates pressure-driven flow rates. These can be measured with flow rate products such as our Flow Unit. The pressure pump is controlled by Fluigent Software such as the MAT that allows setup automation, or A-i-O, which is ideal for live pressure and flow rate control.

Any number of Flow Units with any flow rate range can be combined. A single hub, the Flowboard, can host up to 8 Flow Units and communicate with Fluigent software.
### Characteristics

<table>
<thead>
<tr>
<th>Flow Unit</th>
<th>XS</th>
<th>S</th>
<th>M</th>
<th>L</th>
<th>XL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Number</td>
<td>FLU-XS</td>
<td>FLU-S-D</td>
<td>FLU-M-D</td>
<td>FLU-L-D</td>
<td>FLU-XL</td>
</tr>
<tr>
<td>Sensor Inner Diameter</td>
<td>25 μm</td>
<td>150 μm</td>
<td>430 μm</td>
<td>1 mm</td>
<td>1.8 mm</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>200 bar</td>
<td>200 bar</td>
<td>100 bar</td>
<td>15 bar</td>
<td>15 bar</td>
</tr>
<tr>
<td>Wetted Materials</td>
<td>PEEK &amp; Quartz Glass</td>
<td>PEEK &amp; Borosilicate Glassz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calibrated Media</td>
<td>Water</td>
<td>Water</td>
<td>IPA</td>
<td>Water</td>
<td>IPA</td>
</tr>
<tr>
<td>Range</td>
<td>0±1.5 μL/min</td>
<td>0±7 μL/min</td>
<td>0±70 μL/min</td>
<td>0±80 μL/min</td>
<td>0±500 μL/min</td>
</tr>
<tr>
<td>Accuracy (measured value)</td>
<td>10% mv above 75 nL/min</td>
<td>5% mv above 0.42 μL/min</td>
<td>20% mv above 4.2 μL/min</td>
<td>5% mv above 2.4 μL/min</td>
<td>20% mv above 25 μL/min</td>
</tr>
<tr>
<td>Repeatability (measured value)</td>
<td>&lt;1% mv above 90 nL/min</td>
<td>0.5% mv above 0.7 μL/min</td>
<td>1% mv above 0.7 μL/min</td>
<td>0.5% mv above 1.4 μL/min</td>
<td>1% mv above 25 μL/min</td>
</tr>
</tbody>
</table>

Measured Values from 5% to 100% of product range in normal conditions.

### Flow Rate Platform

The Flow Rate Platform (FRP) is designed to be used with any flow control system or stand alone. This unique flow rate measurement system provides the best precision for various flow rate ranges. This platform includes the Flow Unit(s) and its communication hub, the Flowboard.

More product specifications at www.fluigent.com

### Extended products

**FLOWBOARD**

FLB

The Flowboard is a hub that manages communication between Fluigent Software and up to eight Flow Units.

More information page 25

**Required with MFCS™**

**FRP KITS**

The FRP Low or High Flow Rate Kit is especially designed to be used with low or high flow rate Flow Units.

More information page 27

**Required**

**A-i-O**

SFT-AIO

The Fluigent All-in-One Software is designed for controlling and measuring pressure and flow rate in real time.

More information page 20

**Required**

**MAT**

SFT-MAT

The Microfluidic Automation Tool allows an easy design of time-based protocols for completely automated experiments.

More information page 21

**Required for automation**

---

13
The P-Cap is an air-tight metal cap that allows for pressurization of standard lab tubes for microfluidic fluid delivery.

### Characteristics

<table>
<thead>
<tr>
<th>Name</th>
<th>Max. volume of pressurized liquid</th>
<th>Pressure compatibility</th>
<th>Product Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-CAP for Eppendorf plastic reservoirs</td>
<td>1.5 mL and 2 mL</td>
<td>MFCS™</td>
<td>P-CAP2-LP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flow EZ™ &amp; MFCS™ 7 bars</td>
<td>P-CAP2-HP</td>
</tr>
<tr>
<td>P-CAP for Flacon Tubes</td>
<td>15 mL</td>
<td>MFCS™</td>
<td>P-CAP15-LP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flow EZ™ &amp; MFCS™ 7 bars</td>
<td>P-CAP15-HP</td>
</tr>
<tr>
<td></td>
<td>50 mL</td>
<td>MFCS™</td>
<td>P-CAP50-LP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flow EZ™ &amp; MFCS™ 7 bars</td>
<td>P-CAP50-HP</td>
</tr>
<tr>
<td>Bottle-Cap</td>
<td>GL45 thread bottles</td>
<td>Flow EZ™ &amp; MFCS™</td>
<td>CTQ-KIT-BC</td>
</tr>
</tbody>
</table>

### For use with

- **FLOW EZ™**
  - The Flow EZ™ is the most advanced flow controller.
  - More information page 8
  - Optional

- **MFCS™**
  - The MFCS™ Series products are designed to control pressure.
  - More information page 10
  - Optional
FLUIWELL SERIES
Sample Reservoirs

The Fluiwell is an air-tight plastic cap that allows for pressurization of standard lab tubes for microfluidic fluid delivery.

### Characteristics

<table>
<thead>
<tr>
<th>Name</th>
<th>Max. volume of pressurized liquid</th>
<th>Pressure compatibility</th>
<th>Product Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluiwell-4C</td>
<td>0.5 mL</td>
<td>MFCS™</td>
<td>14000501</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flow EZ™ &amp; MFCS™ 7 bar</td>
<td>24000501</td>
</tr>
<tr>
<td></td>
<td>2 mL</td>
<td>MFCS™</td>
<td>14002001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flow EZ™ &amp; MFCS™ 7 bar</td>
<td>24002001</td>
</tr>
<tr>
<td>Fluiwell-1C</td>
<td>15 mL</td>
<td>MFCS™</td>
<td>11015001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flow EZ™ &amp; MFCS™ 7 bar</td>
<td>21015001</td>
</tr>
<tr>
<td></td>
<td>50 mL</td>
<td>MFCS™</td>
<td>11050001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flow EZ™ &amp; MFCS™ 7 bar</td>
<td>21050001</td>
</tr>
</tbody>
</table>

Consult our product guide page 46

### Accessories

**FLUIWELL KITS**

The Fluiwell Kits ensure the air-tightness of the fluid reservoirs.

More information page 28
The ESS™ is a versatile fluid handling platform for directing fluid flow that can be automated using Fluigent software.

This diagram shows how to use a M-SWITCH™ to perform a sequential injection of up to 10 different reagents inside an on-chip reactor. The reagent flow is controlled by Fluigent control devices (Flow EZ™, Flow Rate platform and manifold), and injected into the chip as selected by the M-SWITCH™. The M-SWITCH™ is controlled by Fluigent Software such as the MAT (for protocol automation) or the ESS™ Control (for live control of valve position). On the diagram, the reagent #5 is being injected.

This type of microfluidic path can be very useful for sample preparation, cell analysis, fluorescent labelling and drug screening.
**Characteristics**

<table>
<thead>
<tr>
<th>Name</th>
<th>Characteristics</th>
<th>Product Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-SWITCH™</td>
<td>3 port / 2-way bidirectional valve</td>
<td>2SW001</td>
</tr>
<tr>
<td>L-SWITCH™</td>
<td>6 port / 2-positions bidirectional valve</td>
<td>LSW001</td>
</tr>
<tr>
<td>M-SWITCH™</td>
<td>11 port / 10-way bidirectional valve</td>
<td>MSW002</td>
</tr>
</tbody>
</table>

**ESS™ Platform**

Our ESS™ Platform includes three complementary types of bidirectional valves (the 2-SWITCH™, the L-SWITCH™, and the M-SWITCH™), as well as a unique communication hub, the SWITCHBOARD.

This system can be controlled by Fluigent software or using the SDK.

The different valves can be used for many different protocols. For **sorting**, the 2-SWITCH™ is recommended whereas for **recirculation**, it is better to use a L-SWITCH™. However, for **sequential injections**, the M-SWITCH™ is the most suitable product.

Discover all applications at [www.fluigent.com](http://www.fluigent.com)

Consult our product guide page 46

**Accessories**

<table>
<thead>
<tr>
<th>ESS™ CONTROL SFT-ESS</th>
<th>The ESS™ Control Software enables live monitoring of valve positions. More information page 22 Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWITCHBOARD SWB002</td>
<td>The SwitchBoard is a communication hub between the connected valves and the PC. It also powers the valves. More information page 25 Required</td>
</tr>
<tr>
<td>MAT SFT-MAT</td>
<td>The Microfluidic Automation Tool allows an easy design of time-based protocols for completely automated experiments. More information page 21 Required for automation</td>
</tr>
<tr>
<td>PRESSURE MANIFOLD CTQ-MANI</td>
<td>The Pressure Manifold is designed to redirect pressure flow into multiple reservoirs. Optional</td>
</tr>
</tbody>
</table>
dSURF is a high-performance fluorosurfactant dedicated to microdroplet generation. It allows high-quality droplet formation and long-term stability in conditions such as dPCR and cell culture experiments.

This experiment was realized by using the dSURF and the Droplet Starter Pack that contains our Fluigent microfluidic chip, the EZ Drop.

| Biocompatible with mammal cell, yeast and bacteria | High-performance fluorosurfactant | Reliable Results: high droplet stability | Broad range of dye compatibility |

**dSURF** is a high-performance fluorosurfactant dedicated to microdroplet generation. Be sure to get reliable results! dSURF being a non-ionic fluorosurfactant, it reduces droplet cross-talk and fits properly with any biological application such as dPCR and cell culture.

dSURF is adaptable to most droplet microfluidic applications. It comes in a 2% formula that can be diluted with our fluorinated oil, dOIL, to suit all application requirements. For dPCR experiments, dSURF has demonstrated excellent compatibility with FAM™, HEX™, VIC® and EvaGreen® dyes.
**dOIL**

*dOIL* is a pure fluorinated oil (3M™ Novec™ 7500 Engineered Fluid) in which our dSURF emulsion stabilizer is diluted.

Fluorinated oils have shown several advantages compared to other carrier fluids such as mineral oils. They show **better PDMS compatibility** due to minimum swelling. They are also more **adapted to biochemical experiments** due to low organic compound transfer drop to drop, and they have shown better biocompatibility in **long term in droplet cell culture experiments**.

dSURF is a new generation of fluorosurfactant providing highly **reliable droplet production** and stability even under PCR amplification conditions. Combined with the **droplet pack**, our **biocompatible** emulsion stabilizer also enables the generation of monodispersed droplet of any size.

### Characteristics

<table>
<thead>
<tr>
<th>Name</th>
<th>Characteristics</th>
<th>Product Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>dSurf 3x4mL</td>
<td>2% formula</td>
<td>DR-RE-SU-12</td>
</tr>
<tr>
<td>dSurf 30mL</td>
<td>2% formula</td>
<td>DR-RE-SU-30</td>
</tr>
</tbody>
</table>

### Reagents

<table>
<thead>
<tr>
<th>Reagent</th>
<th>Description</th>
<th>Required/Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>dOIL DR-RE-SU-A1</td>
<td>dOIL is pure Novec™ fluorinated oil in which our dSURF emulsion stabilizer is diluted.</td>
<td>Required</td>
</tr>
<tr>
<td>DROPLET PACK Droppack</td>
<td>The Droplet Starter Pack is designed for microfluidic droplet experiments.</td>
<td>Optional</td>
</tr>
<tr>
<td>DROPLET KIT Dropkit01</td>
<td>The Droplet Kit is designed to be used with the droplet starter pack.</td>
<td>Optional</td>
</tr>
</tbody>
</table>

More information page 25

More information page 38

More information page 26
The Fluigent All-in-One Software is designed for controlling and measuring pressure and flow rate in real time.

Compatible Products

**FLOW EZ™**
The Flow EZ™ is the most advanced flow controller.
More information page 8

**MFCS™**
The MFCS™ series products are designed to control pressure.
More information page 10

**FLOW UNIT**
The Flow Unit is a high-precision individual flow sensor used for direct flow control.
More information page 12

More product specifications & videos at www.fluigent.com
The Fluigent Microfluidic Automation Tool is a unique program for developing and running time-based experiments. It allows one to easily create protocols for completely automated experiments.

**Compatibles Products**

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOW EZ™</td>
<td>The Flow EZ™ is the most advanced flow controller. More information page 8</td>
<td></td>
</tr>
<tr>
<td>MFCS™</td>
<td>The MFCS™ series products are designed to control pressure. More information page 10</td>
<td></td>
</tr>
<tr>
<td>FLOW UNIT</td>
<td>The Flow Unit is a high-precision individual flow sensor used for direct flow control. More information page 12</td>
<td></td>
</tr>
<tr>
<td>ESS™ PLATFORM</td>
<td>Our ESS™ Platform includes three complementary types of bidirectional valves as well as a unique communication hub. More information page 16</td>
<td></td>
</tr>
<tr>
<td>ARIA</td>
<td>ARIA is an automated instrument which is able to sequentially inject up to 10 solutions into a microfluidic device. More information page 35</td>
<td></td>
</tr>
</tbody>
</table>
ESS™ Control allows to visualize and control ESS™ valve position in real time.

ESS™ Control Software

Compatible Products

Our ESS™ Platform includes three complementary types of bidirectional valves as well as a unique communication hub. More information page 16
SDK
Software Development Kit

The Fluigent Software Development Kit includes full integration of devices interfaces within LabVIEW, MATLAB and other IDEs.

Compatible Products

FLOW EZ™
The Flow EZ™ is the most advanced flow controller.
More information page 8

ESS™ PLATFORM
Our ESS™ Platform includes three complementary types of bidirectional valves as well as a unique communication hub.
More information page 16

MFCS™
The MFCS™ Series products are designed to control pressure.
More information page 10
BUBBLE TRAP KIT (CTQ-006BT)

The Bubble Trap Kit is designed to remove gas bubbles present in a liquid sample at a flow rate up to 5mL/min. The Bubble Trap Kit contains:
- Fluigent Bubble Trap
- 2 disposable membranes
- 2 Fitting 1/4-28 Flat Bottom for 1/16” OD Tubing
- 2 Ferrules
- FEP Tubing 1/16” OD x 0.020 ID
- Compatible with 1/32” OD with sleeves on demand

► Cost effective solution
► No vacuum line needed

FLPG PLUS (FLPG003)

The Fluigent Low Pressure Generator is the perfect tool for those who need a pressure source with all accessories included and integrated. This tool is adapted to Flow EZ™ and MFCS™ or any other microfluidic pressure based instrument.

Specifications:
- Dimensions: 25cm x 26cm x 15cm
- Power supply: 24V
- Maximum outlet pressure: 2.3bar

► No vibration
► No maintenance

FOOT SWITCH (FSW001)

The Foot Switch is designed to allow hands-free operations such as starting/stoping the flow or switching configurations of the MFCS™. This device is directly connected to a computer by a USB port.

► Ideal for working under a microscope
► Hands-free operations
**LINK** (LU-LNK-0002)
The LINK is designed to connect the Flow EZ™ module to a PC and is compatible with Fluigent Software.
- Connection between Flow EZ™ and PC
- TTL connectors

**ADAPT** (LU-ADP-0001)
The ADAPT module is designed to allow one to combined different pressure ranges of the Flow EZ™ together.
- Connection between multiple Flow EZ™
- Compact

**SWITCHBOARD** (SWB002)
The SwitchBoard is a communication hub between the connected valves and the PC. It also powers the valves.
- Single USB connection to the PC
- TTL connectors

**FLOWBOARD** (FLB)
The Flowboard is a hub managing the communication between Fluigent Software and up to eight Flow Units and provides them power. This product is only required for flow rate control with MFCS™.
- Single USB connexion to the PC
- Compatible with Fluigent Software

**dOIL** (DR-RE-SU-A1)
dOIL is a pure Novec™ fluorinated oil in which our dSurf emulsion stabilizer is diluted.
- Low viscosity
- Reduced drop to drop transfer of organic compounds
TUBING & FITTING KITS

**DROPLET KIT** *(Dropkit01)*
The Droplet Kit is designed to be used with the droplet starter pack, with any flow control system and Flow Unit models.
- 3 x EZ Drop chips with 3 patterns each
- 2 m Tubing (250 ID; 1/32” OD)
- 2 x Sleeves

**LineUp™ SUPPLY KIT** *(LU-SPK-0001)*
The LineUp™ Supply Kit is required powering one, or up to 16 Flow EZ™ pressure channels.
- Power supply (24VDC)
- Power supply to Sub-D adaptor
- Pneumatic inlet tubing
- Pneumatic inlet smart connector
- B9 Power stand alone adaptor

**MFCS™ KITS**

**MFCS™-EZ Low Pressure Kit** *(CTQ-KIT-LP-MFCS)*
The MFCS™-EZ Low Pressure Kit is especially designed to be used with any MFCS™-EZ with low-pressure channel from 25 mbar to 2000 mbar ranges and from -800mbar to -25 mbar ranges.
- MFCS-LP Male Luer Connector, 1.6mm (x4)
- MFCS-LP White Cap (x4)
- MFCS-LP Black flow Filters (x4)
- Tygon Tubing (2 m) OD: 3 mm, ID: 1 mm

**MFCS™-EZ High Pressure Kit** *(CTQ-KIT-HP-MFCS)*
The MFCS™-EZ High Pressure Kit is especially designed to be used with any MFCS™-EZ with high-pressure channels, especially the 7 bar pressure range.
- MFCS-HP Red Plug (x4)
- MFCS-HP Black flow Filters (x4)
- High Pressure Tubing (4x40 cm) OD: 4 mm , ID: 2.5 mm
FRP KITS

FRP Low Flow Rate Kit (CTQ-KIT-LQ)
The FRP Low Flow Rate Kit is for use with low flow rate Flow Units, XS, S, and M.
• Adaptor PEEK 1/16” to 1/32” OD Tubing (x1)
• LQ Flow Unit Connector for 1/32” OD Tubing (x2)
• Green sleeve 1/16” OD , 0.33” ID x 1.6” (x1)
• Blue PEEK Tubing 1/32” OD x 0.010” ID (1 m)

FRP High Flow Rate Kit (CTQ-KIT-HQ)
The FRP High Flow Rate Kit is for use with high flow rate Flow Unit L.
• HQ Flow Unit Connector 1/4-28 Flat-Bottom for 1/16” OD Tubing (x2)
• Ferrule for HQ Flow Unit (x4)
• FEP Tubing 1/16” OD x 0.020” ID (1m)

FRP High Flow Rate XL Kit (CTQ-KIT-XL)
The FRP High Flow Rate Kit XL is for use with high flow rate Flow Unit XL.
• HQ Flow Unit Connector 1/4-28 Flat-Bottom for 1/16” OD Tubing (x2)
• Ferule for HQ Flow Unit (x4)
• FEP Tubing 1/16” OD x 0.020” ID (1m)
• Union Tezfel™ with 0.030 thru hole (x1)
• PEEK Tubing Natural 1/16” OD x 0.055” ID (10cm)

ESS™ KITS

ESS™ 2-SWITCH™ Kit (CTQ-KIT-2SW)
The ESS™ 2-SWITCH™ Kit is a replacement tubing and fitting kit.
• 2-SWITCH™ Plug Delrin®-10-32 Coned Blue (x2)
• 2-SWITCH™ Ferrule 1/16” (x12)
• 2-SWITCH™ Teflon Connector (x6)
• FEP Tubing 1/16” OD x 0.010” ID (1m)
**ESS™ M-SWITCH™ Kit** (CTQ-KIT-MSW)
The ESS™ M-SWITCH™ Kit is a replacement tubing and fitting kit.
- M-SWITCH™ Plug (x10)
- M-SWITCH™ Ferrule 1/16” (x20)
- FEP Tubing 1/16” OD x 0.10” ID (1m)

**ESS™ L-SWITCH™ Kit** (CTQ-KIT-LSW)
The ESS™ L-SWITCH™ Kit is a replacement tubing and fitting kit.
- L-SWITCH™ Plug Delrin®-10-32 Coned Blue (x2)
- L-SWITCH™ 10-32 to Female Luer Connector (x2)
- FEP Tubing 1/16” OD x 0.020” ID (1m)
- L-SWITCH™ Fitting 10-32 Coned, for 1/16” OD Tubing

**FLUIWELL KITS**

**Fluiwell-1C15 Kit** (CTQ-KIT-F1C15)
The Fluiwell-1C15 Kit is designed for use with the Fluiwell-1C, with 15mL Grenier Tube.
- Fluiwell Fitting 10-32 Coned, for 1/16” OD Tubing (x2)
- Fluiwell-4C Seals (x1)
- FEP Tubing 1/16” OD x 0.020” ID (1m)

**Fluiwell-1C50 Kit** (CTQ-KIT-F1C50)
The Fluiwell-1C50 Kit is designed for use with the Fluiwell-1C, with 50mL Falcon Tubes.
- Fluiwell Fitting 10-32 Coned, for 1/16” OD Tubing (x2)
- Fluiwell-4C Seals (x1)
- FEP Tubing 1/16” OD x 0.020” ID (1m)

**Fluiwell-4C Kit** (CTQ-KIT-F4C)
The Fluiwell-4C Kit is designed for use with the Fluiwell-4C.
- Fluiwell Fitting 10-32 Coned, for 1/16” OD Tubing (x4)
- Fluiwell-4C Seals (x4)
- FEP Tubing 1/16” OD x 0.020” ID (1m)
3

FLUIGENT INDUSTRIAL
For integration into manufactured systems, Fluigent has developed a wide range of OEM products for flow control and flow handling in microfluidic and nanofluidic applications.

In house design and assembly | Easy to use and to integrate | Economical | Modular

OEM PRODUCT LINE

All microfluidic instruments developed by Fluigent are available as OEM components. They can easily be integrated in more complex instruments. All our OEM products and solutions come with a Software Development Kit (SDK) for system control interface.

We offer a complete OEM product line with our standard OEM to best suit industrial needs:

- Pressure controllers with the P-OEM and the PRC100
- Flow rate sensing
- Fluid switching solutions
- Accessories
- Interfaces, Software and Integration tools
PX-SERIES

The newest member of our industrial line, the PX-Series, is the most versatile industrial pressure controller. It is available for three pressure ranges including positive or negative. It also has RS232 and a USB ports ensuring its compatibility with any system.

<table>
<thead>
<tr>
<th>Range in mbar</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>PX-1</td>
</tr>
<tr>
<td>2000</td>
<td>PX-2</td>
</tr>
<tr>
<td>-800</td>
<td>PX-V</td>
</tr>
</tbody>
</table>

Adapted to industrial uses  | High-quality pressure control  | Unmatched price for the best performance

P-OEM

The P-OEM is able to host up to 8 independent channels of controlled pressure and thus, makes it a very compact solution for multiplexed fluid management. Its patented technology has been field-proven for more than 12 years.

► Same pressure ranges available as the Flow EZ™

Adapted to industrial uses  | High-qualitied pressure control  | Compact solution
**CUSTOM SOLUTIONS**

Customized products using Fluigent proprietary technologies

Fluigent can assist with the design and manufacture customized platforms for specific applications and needs, thanks to detailed product design and application engineering capabilities.

<table>
<thead>
<tr>
<th>In house design and assembly</th>
<th>Easy to use and to integrate</th>
<th>Fits your needs</th>
<th>Modular</th>
</tr>
</thead>
</table>

**Development Process**

- **User functional specification**
  - Definition of final specification requirement

- **Feasibility studies**
  - Proof of concept
  - Workbench testing
  - Estimation cost

- **Manufacturing**
  - Associated documentation
  - Certifications
  - Customization
  - Software

- **Support services**
  - Maintenance
  - Expertise
  - Reactivity

- **Development & prototyping**
  - Development & prototyping
Example

Fluigent has a strong expertise in instrument integration. We combine microfluidic components in one final instrument that includes all the fluidic functions required for any specific application.

Fluigent collaborates with its customers through the custom and development process in order to define specifications and products to best fit customer needs.
ARIA
You do the science, Aria does the rest

Aria is a perfusion automation tool which is able to sequentially inject 10 different solutions into a microfluidic chip perfusion chamber, or a petri dish.

Easy to use: protocol automation
Easy to handle: intuitive user interface
Intelligent software adapted to any application
Compatible with biological applications

Characteristics

Stop flow, stable perfusion and sequential pulseless injections are all functions controlled by ARIA. These functions can be combined using the MAT software to automate protocols such as live cell based assays, micro dosing, cell perfusion, immunolabeling, periodic injections or calcium imaging.
5

APPLICATION PACKAGES & PLATFORMS
Fluigent has partnered with Micronit to offer a versatile fully integrated organ-on-a-chip kit which reproduces numerous characteristics of the *in vivo* environment cells.

### Characteristics

The Fluigent/Micronit **organ-on-a-chip kit** focuses on modeling the main biochemical and biophysical features of the **native environment of cells** in order to induce their growth and differentiation as functional tissues. Air-liquid interface, flow induced shear stress, mechanical stimulation, biochemical gradient, cell-cell coculture have been reported to significantly **improve the functionality of *in vitro* models**. All these parameters are controlled by the system.

The Organ-on-a-chip kit is composed of multiple microfluidic components:
- Flow EZ™ (page 8)
- Fluiwell (page 15)
- Flow Units (page 12)

A Micronit chip is included.
The Droplet Starter Pack is designed for microfluidic droplets experiments. It includes the EZ Drop chips, and liquid handling solution accessories.

**Characteristics**

The Droplet Starter Pack includes:
- 2 Flow EZ™ for pressure-driven injection (page 8)
- 2 Flow Units for flow rate control (page 12)
- 2 P-Cap 2 mL (page 14)
- 1 Droplet Kit (page 26)
- All tubing fitting and accessories (page 26)

---

**Extended Products**

<table>
<thead>
<tr>
<th><strong>DROPLET KIT</strong></th>
<th>Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dropkit01</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>dSURF</strong></th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dSURF is a high-performance fluorosurfactant dedicated to microdroplet generation. More information page 18</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>dOIL</strong></th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>dOIL is a fluorinated oil in which our dSurf emulsion stabilizer is diluted. More information page 25</td>
<td></td>
</tr>
</tbody>
</table>
Fluigent was the first company to introduce pressure-driven flow control to research in microfluidics.

Pressure-driven flow control has multiple advantages compared to conventional syringe and peristaltic pumps for many applications.

Depending on the field of application, shear stress-related flow requirements can be different. Some studies exclude this parameter and other researchers are trying to reproduce in-vivo shear stress conditions. In both cases, precise and pulseless flow control is critical for repeatable results. While peristaltic pumps and syringe pumps generate pulsatile and unstable flows, pressure-driven pumps have been shown to perform the best.

Flow rate representation over the time

The Fluigent Flow Controller used in this experiment is our MFCS™-EX, based on the patented FASTAB™ technology. This technology is the best adapted to manipulating fluid volumes at the sub-microliter scale compared to syringe, peristaltic or piston pumps.

Moreover, in microdroplet generation, droplet size and frequency are directly linked to the flow rates of the continuous and dispersed phases. Flow rate stability is critical for having repeatable and monodispersed droplets. Pressure pumps provide a more stable flow profile leading to better experimental data.
Flow rate response over the time

The Fluigent Flow Controller used in this experiment is our LineUp Flow EZ™. This component allows you to save experimental time, precious samples and expensive reagents with significantly shorter response times compared to syringe pumps.

Flow controller system comparison

<table>
<thead>
<tr>
<th>Features</th>
<th>Fluigent Flow EZ™</th>
<th>Fluigent MFCS™</th>
<th>Other Pressure-Based Solutions</th>
<th>Syringe Pumps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free standing (no PC needed)</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>~</td>
</tr>
<tr>
<td>Modular &amp; stackable</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>~</td>
</tr>
<tr>
<td>Very short response time</td>
<td>✓</td>
<td>✓</td>
<td>~</td>
<td>x</td>
</tr>
<tr>
<td>Pulseless flow</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>Control &amp; monitor display</td>
<td>✓</td>
<td>x</td>
<td>~</td>
<td>~</td>
</tr>
<tr>
<td>Compact</td>
<td>x</td>
<td>✓</td>
<td>~</td>
<td>x</td>
</tr>
<tr>
<td>Integrated pressure source</td>
<td>x</td>
<td>✓</td>
<td>~</td>
<td>x</td>
</tr>
</tbody>
</table>
Working in a microfluidic environment almost automatically means using fittings and tubing to connect your microfluidic device or your Lab-on-a-chip to the various elements of your microfluidic circuit.

- Tubing enables you to connect the various elements of your microfluidic circuit.
- Fittings enable you to attach, adapt or adjust the tubing to these elements, ensuring tight connections.

Tubing and sleeves are defined by their diameter, length and material.

**Diameter**

Inner diameter (often abbreviated as “ID”) is diameter through which the fluid flows. The inner section times the length of the tubing gives you the internal volume of the tubing. The inner diameter plays a significant role in the fluidic resistance to flow brought by the tubing. The smaller the diameter is, the more resistant the tubing will be.

**Length**

Usually the tubing is made as short as possible to have smaller internal volumes. It is also a parameter that contributes to the resistance of the tubing.

In order to get a clean interface and prevent any clogging or collapsing of the fluidic path, all tubing should be cut with specifically designed cutters.

**Materials**

A wide range of materials are available for the same ID/OD combination. The material should be selected according to the nature of the reagents flowing through the tubing. Be careful to check the chemical compatibility of the tubing before installing it in your application. Some of the most common materials for microfluidic tubing include:

- **PEEK (Polyetheretherketone)**: very good chemical resistance and biocompatibility, low non-specific adsorption. Rigid and opaque. For low and high pressure applications. Very small internal diameters available.
- **FEP (Fluorinated ethylene-propylene)**: does not react with most chemicals and is biocompatible. Flexible and transparent. Mostly for low-pressure applications (no higher than 7 bar).
Place your tubing on the page for a quick reference

**OD (OUTER DIAMETER) IDENTIFICATION**

- **1/16”** (1.6mm)
- **1/32”** (0.8mm)

**UNIT CONVERSIONS**

- 1 bar = 14.5psi
- 1 mbar = 1.45 X 10⁻²psi
- 1 inch = 2.54cm
- 1 psi = 6.90 X 10⁻²bar
- 1 psi = 68.95mbar
- 1 cm = 0.39inch

**CUSTOMER SUPPORT & SERVICES**

Service & Technical Support from Fluigent-certified experts

At Fluigent, we understand that a non-functioning system means time lost in the lab. The Fluigent customer support team is dedicated to performing timely, cost effective repairs. Our application experts are available to advise you on any questions you may have on the use of our products and how to adapt them to different experimental designs.
### Microfluidic Components – Pressure Pumps

<table>
<thead>
<tr>
<th>Product Number</th>
<th>Product Name</th>
<th>Page</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU-FEZ-0025</td>
<td>LineUp Flow EZ™ 25 mbar</td>
<td>8-9</td>
<td></td>
</tr>
<tr>
<td>LU-FEZ-0069</td>
<td>LineUp Flow EZ™ 69 mbar</td>
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<td></td>
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<tr>
<td>LU-FEZ-0345</td>
<td>LineUp Flow EZ™ 345 mbar</td>
<td>8-9</td>
<td></td>
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<tr>
<td>LU-FEZ-1000</td>
<td>LineUp Flow EZ™ 1000 mbar</td>
<td>8-9</td>
<td></td>
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<tr>
<td>LU-FEZ-7000</td>
<td>LineUp Flow EZ™ 7000 mbar</td>
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<td>LU-FEZ-N025</td>
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### Microfluidic Components – Flow Rate Products

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<tr>
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<td>FLU-S-D</td>
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<tr>
<td>FLU-M-D</td>
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<td>FLU-L-D</td>
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<td>FLU-XL</td>
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### Microfluidic Components – Sample Reservoirs

<table>
<thead>
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<th>Page</th>
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<tr>
<td>P-CAP2-HP</td>
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<td>P-CAP15-LP</td>
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<td>P-CAP15-HP</td>
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<td>P-CAP50-LP</td>
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<td>P-CAP50-HP</td>
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<td>Res-CAP</td>
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<td>Product Number</td>
<td>Product Name</td>
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<tr>
<td>14000501</td>
<td>Fluiwell-4C 0.5 mL MFCS™</td>
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<tr>
<td>24000501</td>
<td>Fluiwell-4C 0.5 mL Flow EZ™ &amp; MFCS™ 7bar</td>
<td>15</td>
</tr>
<tr>
<td>14002001</td>
<td>Fluiwell-4C 2 mL MFCS™</td>
<td>15</td>
</tr>
<tr>
<td>24002001</td>
<td>Fluiwell-4C 2 mL Flow EZ™ &amp; MFCS™ 7bar</td>
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</tr>
<tr>
<td>11015001</td>
<td>Fluiwell-1C 15 mL MFCS™</td>
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<td>21015001</td>
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<td>LSW001</td>
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<td>16-17</td>
</tr>
<tr>
<td>MSW002</td>
<td>M-SWITCH</td>
<td>16-17</td>
</tr>
<tr>
<td>DR-RE-SU-12</td>
<td>dSURF 3x4 mL</td>
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<td>CTQ-006BT</td>
<td>Bubble Trap Kit</td>
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<td>FLPG003</td>
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<td>FSW001</td>
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<td>LineUp™ Supply Kit</td>
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<td>Droppack01</td>
<td>Droplet Starter Pack</td>
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Do you prefer...

Automating your protocol → Use MAT software
Live monitoring & control → Use A-i-O software

Go PC-Free → How many solutions/liquids/fluids do you want to handle in your system?

1 to 3
Start with Flow EZ™ (1 per channel pressure)

Do you work with...
Flow Rate → Add Flow Unit to your setup
Pressure only → Add Flow Unit and Flowboard to your setup

Go with MFCS™-EZ
Do you need to inject multiple solutions over the course of the experiment?

Sequential injection → Add an M-Switch
Recirculation → Add an L-Switch
Sorting → Add a 2-Switch
No → Get a Switchboard with ESS Software

Finally, do you have a pressure source in your lab?

Yes → Ask for a MFCS™ with an integrated pressure source
No, with MCFS™ → Add an FLPG Plus to your setup (other pumps are available on request)
No, with Flow EZ™ → Contact us for a quote!

How many solutions/liquids/fluids do you want to handle in your system?
4
Go with MFCS™-EX

5 to 8
Do you work with...
Pressure only → Add Flow Unit and Flowboard to your setup
Flow Rate → Add Flow Unit and Flowboard to your setup

Get a Switchboard with ESS Software

Software
Pressure control
Flow Rate or Pressure
Valves/Switches
Pressure source

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