2023-6

FLUIGENT

SMART MICROFLUIDICS™

2023

RESEARCH & INDUSTRIAL PRODUCT CATALOG

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INTRODUCTION

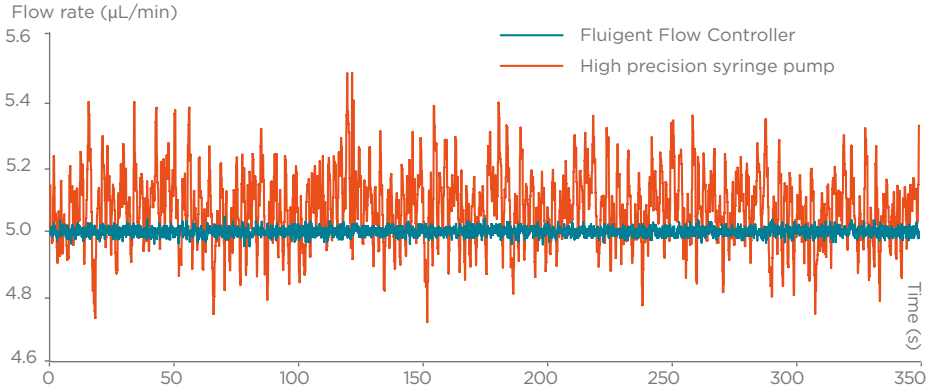
FLOW CONTROL TECHNOLOGIES

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, pulseless flow control is critical for repeatable results. Peristaltic and syringe pumps generate pulsatile and unstable flows. **Pressure-driven pumps have been shown to provide superior performance**.

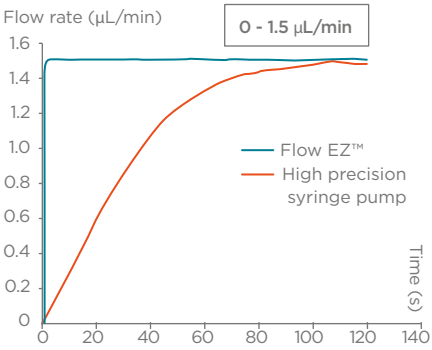
Flow rate profile over the time

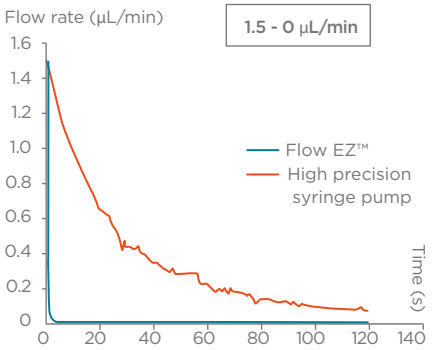


The Fluigent Flow Controller used in this experiment is our MFCS™-EX, based on the patented FASTAB™ technology. This technology is the best adapted to manipulating fluid volumes at the sub-microliter scale compared to syringe, peristaltic or piston pumps.

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 more stable flow** leading to **better experimental data**.

Flow rate response over the time





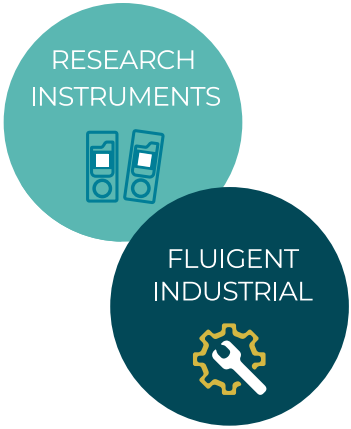
The Fluigent Flow Controller used in this experiment is our LineUp Flow EZ™. This component allows you to save experimental time, precious samples and expensive reagents with significantly shorter response times compared to syringe pumps.

Flow controller system comparaison

Features	Fluigent LineUp™ series	Fluigent MFCS™ series	Other Pressure-Based Solutions	Syringe Pumps
Free standing (no PC needed)	✓	×	×	~
Modular & stackable	✓	×	×	~
Very short response time	✓	✓	~	×
Pulseless flow	✓	✓	✓	×
Control & monitor display	✓	×	~	~
Compact	✓	✓	~	×
Integrated pressure source	×	✓	~	×

COMPANY OVERVIEW

Fluigent develops, manufactures, sells 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 **3000 Fluigent systems**. These include the MFCS™-EZ (Microfluidic Flow Control System), the LineUp™ series (Pressure-based flow controllers) and the ESS™ valves (Easy Switch Solutions™).

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

TEAM & FACILITIES

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.

HISTORY

Fluigent is the leader in microfluidic control

2023

- Introduction of the first Non-invasive flow sensor 

2022

- Flow EZ™ certified Made in France 

2021

- Introduction of RayDrop Packages 

2020

- Introduction of the most advanced flow controllers: LineUp™ series 

2019

- Introduction of the Microfluidic Flow Control System™-EX 

2017

- Opening of Fluigent Inc. USA & Fluigent Deutschland 

2015

- Introduction of new products: MFCS™-EZ & ESS™ 

2012

- Obtention of the ISO 9001 Certification 

2010

- Introduction of flow rate monitoring instruments

2008

- First MFCS™ Sales 

2006

- Fastab™ patent Technology in MFCS™

2003

- Market expansion in Asia

- First International Sales

- Creation of the SDK support

- Start OEM activity 

- Introduction of MFCS™ FLEX & MFCS™ 100 

- Expansion of the LineUp™ series 

- Introduction of ARIA 

- Introduction of PX-SERIES 

- Introduction of F-OEM modular platform 

OUR DISTRIBUTORS

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 SAS), the USA (Fluigent Inc.), Germany (Fluigent Deutschland GmbH), and our network of distributors and partners.

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**.

2

RESEARCH INSTRUMENTS

LINEUP™ SERIES

The most advanced flow control system

LineUp™ series modules

Our LineUp™ product range is the next generation of microfluidic systems. With the **Flow EZ™** or **Push-Pull** modules one can precisely regulate and control pressure & vacuum, the **LINK** and **LINK COM** modules provide communication to a computer or any external instrument using TTL ports, USB cable or Serial port communication. The **Adapt** is used to connect Flow EZ™ modules with different pressure ranges without the need of additional pressure sources. The **P-SWITCH** allows to multiply the outlets of the system and the **SWITCH EZ** controls microfluidic valves. The entire system can be controlled without a PC using local control and can also be monitored by **Fluigent Software** to extend its capabilities and benefit from automation. Select modules you need and combine them together.

Focus on your experiment with the local control dial

Easily adaptable to any setup

Start within minute: Use with or without a PC

Economical & expandable

FLOW EZ™

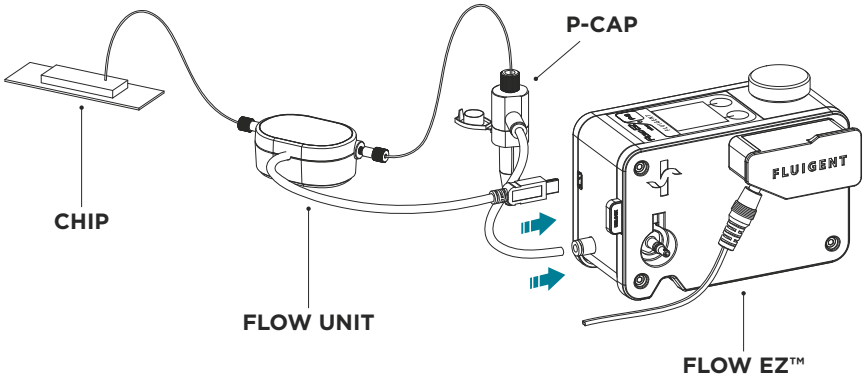
Microfluidic Flow Controller

Characteristics

LineUp Flow EZ™

Range in mbar	Product Number
0 to 25	LU-FEZ-0025
0 to 69	LU-FEZ-0069
0 to 345	LU-FEZ-0345
0 to 1000	LU-FEZ-1000
0 to 2000	LU-FEZ-2000
0 to 7000	LU-FEZ-7000
0 to -25	LU-FEZ-N025
0 to -69	LU-FEZ-N069
0 to -345	LU-FEZ-N345
0 to -800	LU-FEZ-N800

The **Flow EZ™** is the most advanced flow controller for pressure-based fluid control. It can be combined with a **FLOW UNIT** to control both pressure and flow rate. It can be used without a PC to minimize benchtop space, or connected to the **LINK** to benefit from **Fluigent Software** features such as graph view in real-time, automation and custom integration.



Microfluidic setup

Characteristics

LineUp™ Push-Pull

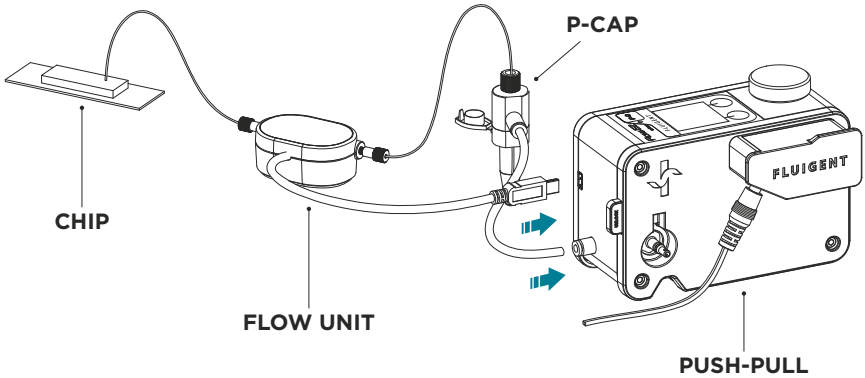
Range in mbar	Product Number
-800 to 1000	ELUPPU1000

The **Push-Pull** is the newest version of the Flow EZ™ with the ability to **regulate pressure and vacuum from one unit**. The module controls over the range of **-800 mbar to 1000 mbar**.

PUSH-PULL

Vacuum Pressure-Based Controller

The **Push-Pull** can be combined with a **FLOW UNIT** to control both pressure and flow rate. It can be used without a PC to minimize benchtop space. When connected to a PC with the **LINK** one can benefit from **Fluigent Software** features.



Microfluidic setup

P-SWITCH

Pneumatic Valve Controller

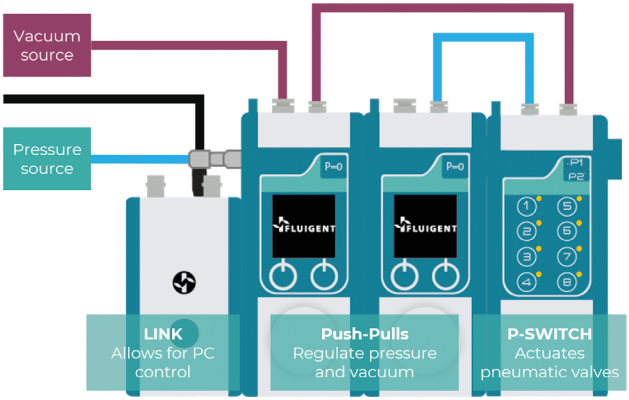
Characteristics

LineUp™ P-SWITCH

Range in mbar	Product Number
-800 to 2000	ELUPSW2000

The **P-SWITCH** is a pneumatic valve controller. By providing two regulated pressure / vacuum sources (any vacuum or pressure from **-800 mbar to +2000 mbar**), each module is able to deliver one of the two provided pressure through **8 independent outlets**.

Supplied by the **Flow EZ** modules or other external pressure system, one P-SWITCH can pressurize **up to 8 reservoirs**. With a **LINK** and **Fluigent Software**, the module allows for automation behavior and actuation timing of any pneumatic or quake valves.



To learn more about the P-SWITCH applications, see the **application note.**

Characteristics

LineUp™ SWITCH EZ

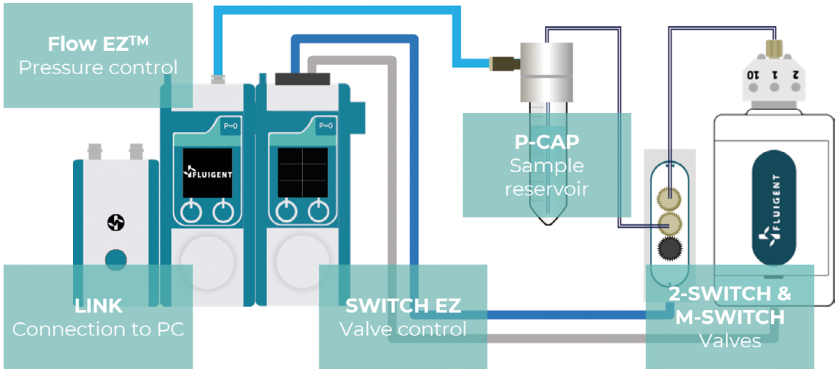
Valve compatibility	Product Number
M-SWITCH™, L-SWITCH™, 2-SWITCH™	ELUSEZ

SWITCH EZ

Microfluidic Valve Controller

The **SWITCH EZ** is a module allowing one to control **Fluigent's microfluidic valves**. The module has **6 external connections** and can be combined with other **LineUp™** products to have a complete, compact system for benchtop use.

Connected valves can be **controlled or programmed** either by using the local control directly on the device or by creating a software protocol to automate **valve actuation timing**.



ADAPT

Pressure Reducer

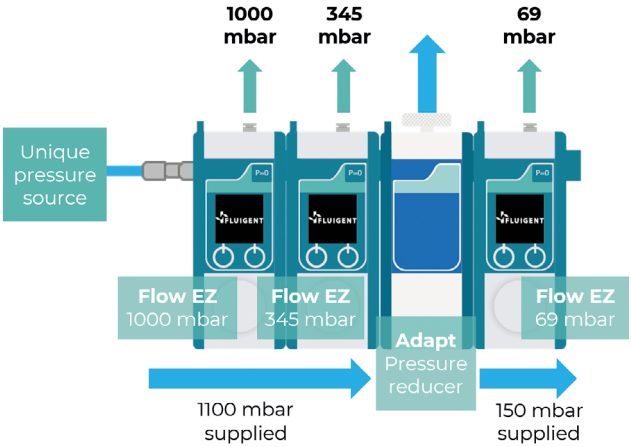
Characteristics

LineUp™ Adapt

Product Number
LU-ADP-0001

The **Adapt** is a **pressure reducer**. Placed between two pressure controllers having different input requirements, it allows one to have a system with many **different pressure channel ranges**. It reduces the outgoing pressure supply from the module to its left and provides the required pressure supply to the module on its right.

Each **LineUp™ Flow EZ** or **Push-Pull** requires a specific amount of pressure supplied. To build a single LineUp™ system with various pressure range, use the **Adapt** to reduce the pressure supply and meet exact requirements.



Pressure requirement	Product Number
150 mbar	LU-FEZ-0025
	LU-FEZ-0069
11000 mbar	LU-FEZ-0345
	LU-FEZ-1000
2100 mbar	LU-FEZ-2000
71000 mbar	LU-FEZ-7000
-800 mbar	LU-FEZ-N025
	LU-FEZ-N069
	LU-FEZ-N345
	LU-FEZ-N800
1100 mbar -800 mbar	ELUPPU1000

LINK
LINK COM

Microfluidic Software Control

Characteristics

LineUp™ LINK / LINK COM

Communication	Product Number
USB port, TTL signal	LU-LNK-0002 (LINK)
Serial port (RS-232), TTL signal	ELULNK232 (LINK COM)

LINK COM

LINK

The **LINK** provides communication for all connected **LineUp™ series** modules to a PC for **software control**. Place it at the first position of the chain and connect it to the PC to use Fluigent Software.

Three types of connection and communication are available:

Related products

OxyGEN SSFT-OXY	Fluigent Software extends the devices capabilities with features such as pressure / flow rate graph views, control in real time and protocol automation.	Provided
LineUp™ Supply Kit LU-SPK-0002	Power cable and pneumatic tubing to supply the LineUp series modules. Allow for local control without a PC.	Provided in package
Chain-to-Chain kit LU-C2C-0001	Cable to connect data and power transmission between two modules without combining them together. Allows for flexibility and several pressure sources.	Accessory
P-CAP series P/N on version	Air-tight metal cap for reservoir pressurization.	Required for liquids
FLOW UNIT P/N on flow rate range	The FLOW UNIT is a high-precision flow sensor used for direct flow control.	Required for flow rate control
SDK FLUIGENT-SDK	The Software Development Kit provides integration of devices over multiple programming languages	Provided

See more about LineUp™ series

See more

Dedicated webpage with additional information about the complete series. Visit https://www.fluigent.com/research/instruments/pressure-flow-controllers/lineup-series/

Tutorials

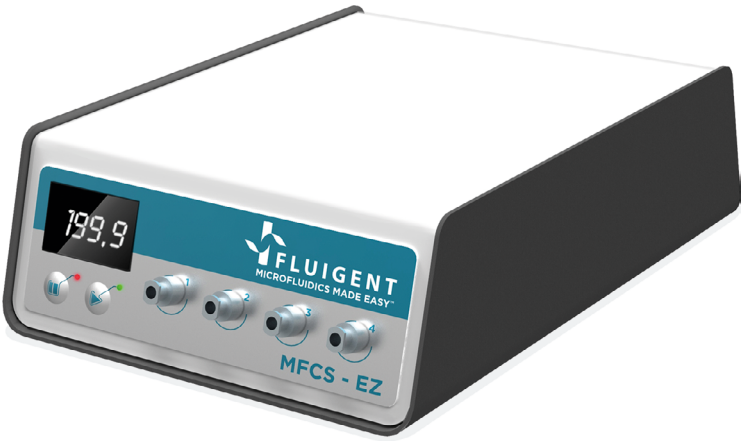
Fluigent tutorials on Flow EZ™ pressure-based flow controller. Watch us on YouTube at https://www.youtube.com/channel/UC8wJ_15yYGjbcI-DnMBPEww

Applications

Discover the use of LineUp™ series in a number of applications. Visit https://www.fluigent.com/resources-support/expertise/application-notes/

MFCS™ SERIES

Microfluidic Flow Control System



MFCS™

The **MFCS™** is a microfluidic flow controller. Either **4 or 8 channels** are available with different pressure ranges for **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

	Range in mbar	Product Number		Range in mbar	Product Number
MFCS™-EZ	0 to 345	EZ-00345001	MFCS™-EX	0 to 345	EX-00345001
	0 to 1000	EZ-01000001		0 to 1000	EX-01000001
	0 to 2000	EZ-01000002		0 to 2000	EX-01000002
	0 to 7000	EZ-07000001		0 to 7000	EX-07000001
	0 to -345	EZ-80345001		0 to -345	EX-80345001
	0 to -800	EZ-80800001		0 to -800	EX-80800001

	Unit in mbar	Product Number
MFCS™-EZ Base	Basic	EZ-11000001
	Positive Pressure Source Included	EZ-source-pos
	Negative Pressure Source Included	EZ-source-neg
MFCS™-EX Base	Basic	EX-11000008
	Positive Pressure Source Included	EX-source-pos
	Negative Pressure Source Included	EX-source-neg

MFCS™ series

Our MFCS™ series product range is the first generation of microfluidic systems. Along with the **MCFS™-EZ** or **MCFS™-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**. The MFCS™ can also have an integrated pressure source or be coupled with the **FLPG Plus**, an external pressure source (page 30). This system is controlled by **Fluigent Software Solutions**.

More product specifications at www.fluigent.com

More information on flow control technologies on pages 4-5

Related products

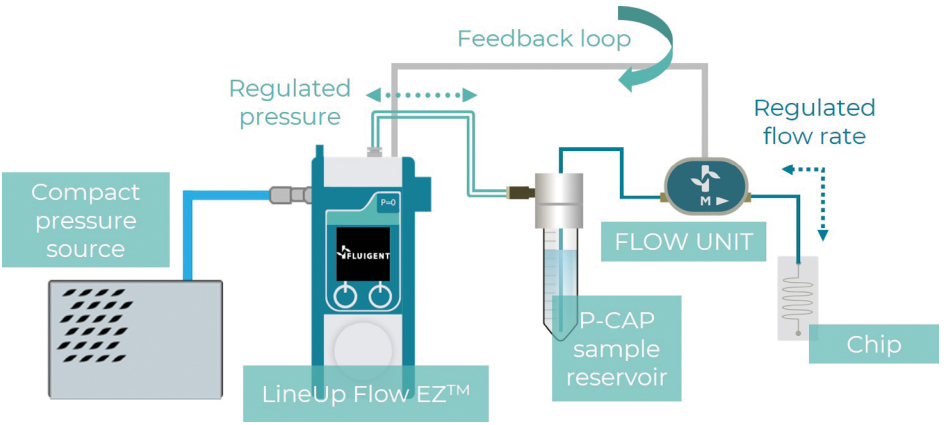
OxyGEN SSFT-OXY	Fluigent Software extends the devices capabilities with features such as pressure / flow rate graph views, control of real time and protocol automation.	Provided
SDK FLUIGENT-SDK	The Fluigent Software Development Kit includes full integration of devices interfaces within LabVIEW, MATLAB and other IDEs.	Provided
MFCS™ KITS	The MFCS™ Low or High Pressure Kits are specially designed to be used with any MFCS™ with any low or high pressure channel.	Required
FLOW UNIT	The FLOW UNIT is a high-precision individual flow sensor used for direct flow control.	Required for flow rate control
FLOWBOARD FLB	The Flowboard is a hub that communicates between Fluigent Software and up to eight FLOW UNITs.	Required for flow rate control

FLOW UNIT

Bidirectional Microfluidic Flow Sensor

The **FLOW UNIT** is a **bidirectional flow sensor** compatible with our Software Solutions, our **MFCS™ series,** our **LineUp™ series** or other external control system. The sensor extends the capabilities of Fluigent instruments and allows for **direct control of flow rate**.

High precision: get reliable results	*Adaptable: Large range of flow rates*	*Flexible: Usable with any flow control system*	*Ease of use: Plug & play and easy combination*



PC free pressure-based flow control

Characteristics

FLOW UNIT+	XS	S		M+		L+	
Product Number	FLU-XS	FLU-S-D		FLU-M+		FLU-L+	
Sensor Inner Diameter	25 µm	150 µm		400 µm		400 µm	
Maximum Pressure	200 bar	200 bar		12 bar		12 bar	
Wetted Materials	PEEK & Quartz Glass			PPS, stainless steel 316L			
Calibrated Media	Water	Water	IPA	Water	IPA	Water	IPA
Range	0±1.5 µL /min	0±7 µL /min	0±70 µL /min	0±2 mL /min	0±2 mL /min	0±40 mL /min	0±40 mL /min
Accuracy (measured value)	10% mv above 75 nL /min	5% mv above 0.42 µL /min	20% mv above 4.2 µL /min	5% mv above 10 µL /min	10% mv above 50 µL /min	5% mv above 10 µL /min	10% mv above 50 µL /min
Lowest detectable flow increment	3.7 nL/min	10 nL/min		0.25 µL/min		25 µL/min	

FLOW UNIT	XL	L		M	
Product Number	FLU-XL	FLU-L-D		FLU-M-D	
Sensor Inner Diameter	1.8 mm	1.0 mm		430 µm	
Maximum Pressure	5 bar	12 bar		100 bar	
Wetted Materials	PEEK and Borosilicate Glass				
Calibrated Media	Water	Water	IPA	Water	IPA
Range	0±5mL/min	0±1mL/min	0±10mL/min	0±80µL/min	0±500µL/min
Accuracy (measured value)	5% m.v above 0.2 mL/min	5% m.v. above 0.04 mL/min	20% m.v. above 0.5 mL/min	5% m.v. above 2.4 µL/min	20% m.v. above 25 µL/ min
Lowest detectable flow increment	3 µL/min	0.7 µL/min		0.06 µL/min	

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

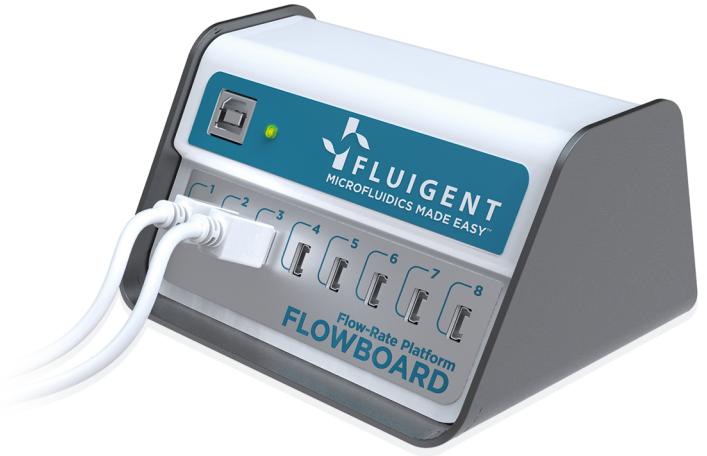
Related products

FLOWBOARD FLB	The Flowboard is a hub that manages communication between Fluigent Software and up to eight FLOW UNITs.	Required with MFCS™ or stand alone
FLOW UNIT KITS	Tubing & fitting elements dedicated for each range of FLOW UNIT, allow for fast handling and optimized performance.	Required
LineUp™ Push-Pull ELUPPU1000	Pressure & vacuum controller used to pressurize the sample reservoirs and drive fluids to a microfluidic set-up. Allows for control and monitor in flow rate if combined with a FLOW UNIT.	Required to monitor fluids bidirectionally without a PC

FLOWBOARD

Flow Sensor Hub

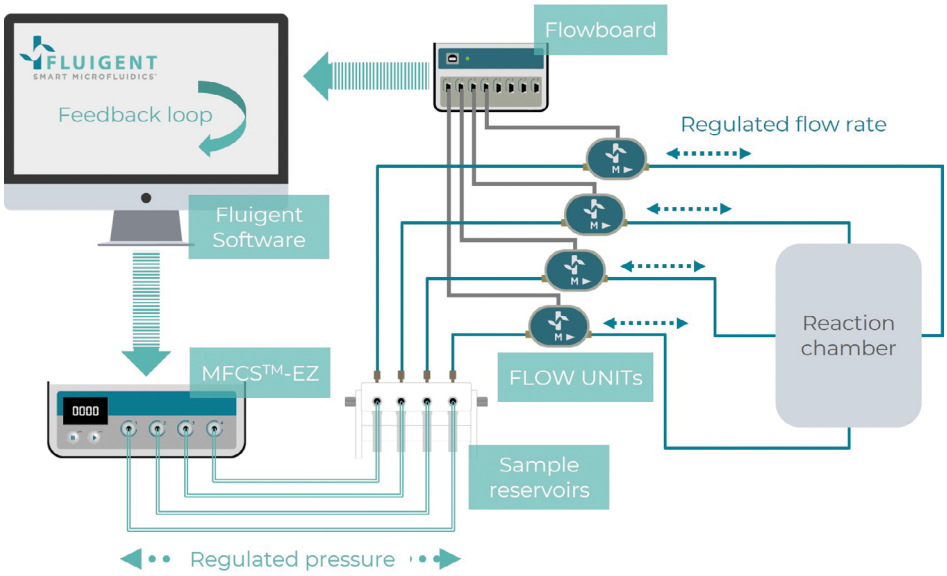
P/N : FLB



The **Flowboard** is a hub that manages communication between **Fluigent Software** and **up to eight FLOW UNITs**. The **Flow Rate Platform** is designed to be used with any flow control system.

This unique flow rate measurement system provides the **best precision for various flow rate ranges**. Used with any Fluigent pressure system, the **Direct Flow Control algorithm** and Fluigent Software allow for **accurate** and **fast regulation** of the fluids by automatically adjusting pressure to maintain the set flow rate.

Easy to set and use	*Up to 8 flow sensors*	*Mix range from nL/min to mL/min*	*Adaptable : work with any flow controller*



Direct Flow Control

Related products

FLOW UNIT	The FLOW UNIT is a bidirectional flow sensor used for direct flow control.	**Required**
MFCS™ series	The MFCS™ series products are designed to control pressure. Combined in the set-up with a Flowboard and FLOW UNIT sensors, it allows for direct flow control.	**Required for pressure-based flow control**

PRESSURE UNIT

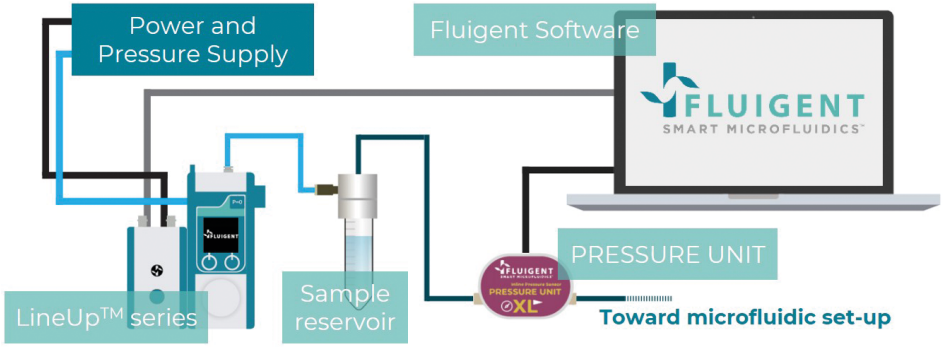
Microfluidic In-Line Pressure Sensor

The **PRESSURE UNIT** is a stand-alone sensor for **continuous, accurate measurement** of the pressure in a fluidic path. The sensors can detect values over the range of **-1000 mbar** (-15 psi) to **7000 mbar** (100 psi). They are directly connected to a PC via USB, and display measurement in real time with **Fluigent Software** interface. User's can output this value for custom software applications using the **Software Development Kit**.

Compact device: dedicated for benchtop use	*Wide range of detection: from -1000 to 7000 mbar*	*Ease of use: Operate within a minute*	*Plug & Play: No hub required, connect it directly to the PC*

Characteristics

PRESSURE UNIT	S	M	L
Product Number	EIPS345	EIPS1000	EIPS7000
Pressure range	-345 to 345 mbar	-1000 to 1000 mbar	-1000 to 7000 mbar



Microfluidic set-up with in-line pressure detection

Related products

PRESSURE UNIT KIT EIPSKIT	Tubing & fitting elements dedicated for all range of PRESSURE UNIT, allow for fast handling and optimized performance.	Required
LineUp™ Push-Pull ELUPPU1000	Pressure & vacuum controller used to pressurize the sample reservoirs and drive the fluids toward microfluidic set-up. The PRESSURE UNIT allows for pressure detection and control anywhere it is placed in the system.	Required to monitor fluids and pressure
OxyGEN SSFT-OXY	Fluigent Software allows for graphical display in real-time of the measured value by the sensor.	Required

MICROFLUIDIC VALVES

Easy Switch Solutions™

M-SWITCH™
11-port
10-position

SWITCH EZ
microfluidic valve
controller

L-SWITCH™
6-port
2-position

2-SWITCH™
3-port
2-way

The **ESS™** is a versatile **fluid handling platform** for directing fluid flow. It can be **automated** using Fluigent software or **controlled locally** without the need of a PC. The product line offers **three different valves** for a wide range of applications. One valve controller can be combined with the pressure system and Fluigent Software Solutions or used in stand alone mode.

Economical: reduce reagent consumption	*Accuracy: fast valve actuation and low internal volume*	*Versatility: Control in real-time, Automate and Integrate as needed*	*Compact: dedicated for benchtop use & useable without a PC*

2-SWITCH™

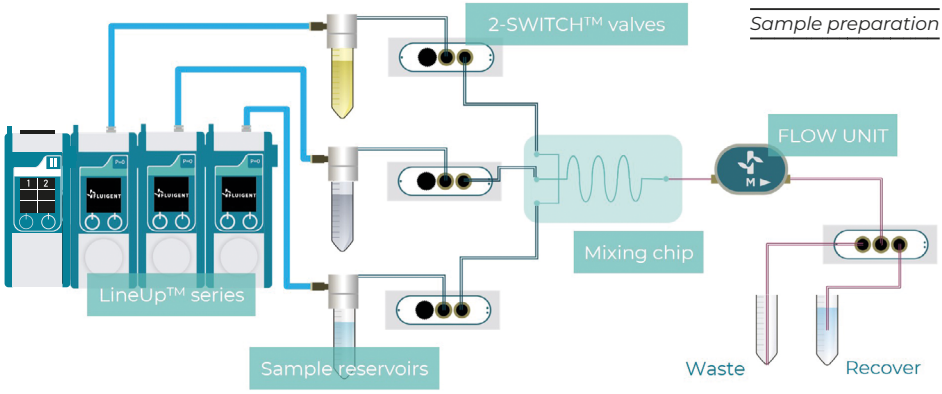
P/N : 2SW002

3-port/2-way microfluidic sampling valve

The **2-SWITCH™** is a compact **3-port/2-way bidirectional** microfluidic valve. Using standard connectors it can be integrated to any microfluidic setup. Its unique design allows the combination of multiple units together to save space on your benchtop.

Characteristics

The **2-SWITCH™** may be used as a manually-operated, stand-alone device or controlled by Fluigent Software for long-term experiments. Its versatility makes it ideal for applications where fluid sorting, switching or periodic sampling are required.



Related products

SWITCH EZ ELUSEZ	Microfluidic valve controller that can host up to six 2-SWITCH™ and allow for local actuation without a PC or time-based automation if connected to Fluigent Software with a LINK.	Required
2-SWITCH™ KIT CTQ-KIT-2SW2	Tubing & fitting elements dedicated the 2-SWITCH™, allows for fast handling and optimized performance.	Required

M-SWITCH™

P/N : ESSMSW003

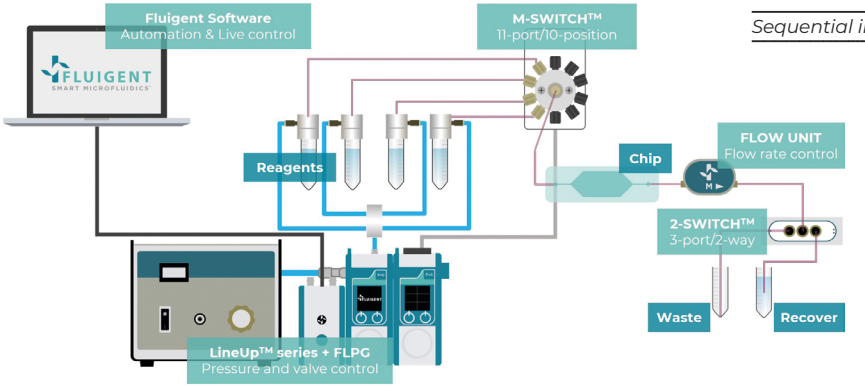
11-port/10-position microfluidic bidirectional valve

The **M-SWITCH™** is a bidirectional 11-port / 10-way microfluidic valve for injection or selection of **up to 10 different fluids or chips**. The **flow is bidirectional** in the valve, meaning that the device can be used as a **selector** and a **distributor** for either multiplexing or demultiplexing purposes.

Characteristics

The **M-SWITCH™** is compatible with Fluigent's pressure controllers **MFCS™ series** and **LineUp™ series**. It is controlled with **LineUp™ SWITCH EZ** allowing for **local control without a PC** or **automated valve actuation** using Fluigent Software.

Sequential injection



Related products

SWITCH EZ ELUSEZ	Microfluidic valve controller that can host up to three MSWITCH™ and allow for local actuation without a PC or time-based automation if connected to Fluigent Software with a LINK.	Required
M-SWITCH™ KIT CTQ-KIT-ESSMSW003	Tubing & fitting elements dedicated the M-SWITCH™, allows for fast handling and optimized performance.	Required
PRESSURE MANIFOLD CTQ-MANI	The Pressure Manifold is designed to redirect pressure flow from a single controler into up to 10 reservoirs.	Optional

L-SWITCH™

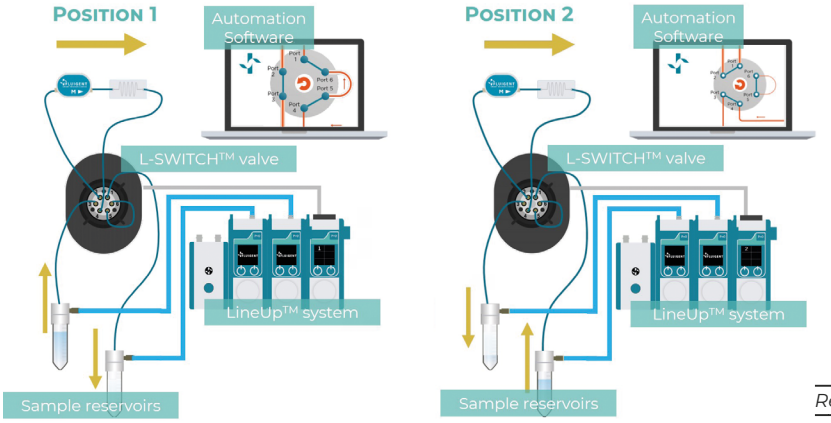
P/N : LSW001

6-port/2-position microfluidic injection / recirculation valve

The **L-SWITCH™** is a bidirectional 6-port/2-position valve for **precise sample injection** or switching between different fluids. It's configuration make it ideal for **recirculation** in cell culture.

Characteristics

The **L-SWITCH™** can be used as a useful cell culture tool: a small volume of buffer can be recirculated within a closed loop into the chip for several hours or days. Combined with our **MFCS™-EZ** or **LineUp™ series** it can provide stable flow with a minimal impact on shear stress. The valve also enables one to load and inject a precise volume of fluid. By selecting the position of the **L-SWITCH™** one will choose when to load the fluid then inject it (using a sample loop). Several sample loops are available from 5 µL to 100 µL.



Recirculation

Related products

SWITCH EZ ELUSEZ	Microfluidic valve controller that can host up to three L-SWITCH™ and allow for local actuation without a PC or time-based automation if connected to Fluigent Software with a LINK.	Required
L-SWITCH™ KIT CTO-KIT-LSW	Tubing & fitting elements dedicated the L-SWITCH™, allows for fast handling and optimized performance.	Required

FLPG+

Microfluidic Low Pressure Generator

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 the **LineUp™ series** and **MFCS™ series** or any other microfluidic pressure-based instrument.

Characteristics

The FLPG+ compressor supplies **up to plus 2 bar**. This item contains the pressure source, a manual regulator, and a pressure sensor and display. **Three FLPG models** are available depending on requirements

FLPG+ model	Product Number
FLPG+ High Pressure Supply - Up to 8 channels (2 bar) or 16 channels (1 bar)	FLPG003
FLPG+ Silent Pressure Supply - Up to 4 channels (2 bar) or 8 channels (1 bar)	FLPG005
FLPG+ with incubator aspiration option	FLPG004

Related products

MFCS™ series	The MFCS™ series products are designed to control pressure. If the device has no integrated pump, it needs to be supplied by the FLPG+ compressor.	**Required for pressure-based flow control**
LineUp™ series	The LineUp™ series products are designed to control pressure. The system requires an external pressure source to be supplied.	**Required for pressure-based flow control.**

COMPACT PRESSURE SOURCE

Product Number

E-AC-RX1-2500

The **Compact Pressure Source** is the latest addition to the Fluigent Pressure Source family of products. It also exists in an OEM version, called the **RX**. This compact compressor is designed to be used as a **standalone pressure source**. Packaged in a robust steel enclosure, it provides dried and filtered air at up to **2500 mbar** for one or pressure control systems such as the **LineUp™ series, MFCS™ series, PX-series**, or other instruments which need compressed air to operate.

Compact and versatile	*Provides condensation-proof and filtered air*	*Suited for OEM integration*

Related products

LineUp™ series	The LineUp™ series products are designed to control pressure. The system requires an external pressure source to be supplied. The Compact Pressure Source has been especially designed to supply properly the LineUp™ series and reduce global system size.	**Required for pressure-based flow control.**

VACUUM PUMP

Compact Vacuum Pump

The **Compact Vacuum Pump** generates a vacuum to **supply any negative pressure channel** or perform **aspiration**. The pump is compact and has a **regulation dial** to provide an outstanding ease of use.

Product Number

EACVACPUMP

High flow rate: up to 7L/min	*Ease of use and compactness*	*Low vibration and noise level*	*High compatibility: from 0 to -1000 mbar*

Extended products

MFCS™ series	The MFCS™ series products are designed to control pressure and vacuum. If the device has no integrated vacuum pump and negative pressure channels, it can to be supplied by the Compact Vacuum Pump	Recommended
Push-Pull	The LineUp™ Push-Pull is a pressure and vacuum controller. The system requires an external vacuum source to perform aspiration. The Compact Vacuum Pump can supply properly the LineUp™ series with negative range and Push-Pull.	Recommended

P-CAP SERIES

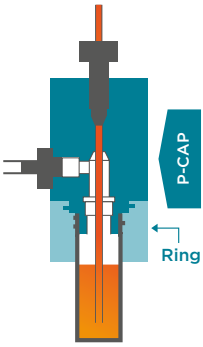
Tube metal caps

The **P-CAP** is an air-tight metal cap that allows for pressurization of standard lab tubes for microfluidic fluid delivery. The reservoirs and caps are available with different **volume sizes** and **pressurization levels**.

Autoclavable & Incubator compatibility	*No contact between the sample and the P-CAP*	*Suitable for long term experiments*	*Compatible with different tube sizes*

Characteristics

Name	Max. volume of pressurized liquid	Pressure compatibility	Product Number
P-CAP for Eppendorf plastic reservoirs	1.5 mL and 2 mL	MFCS™	P-CAP2-LP
		Flow EZ™ & MFCS™ 7 bars	P-CAP2-HP
P-CAP for Flacon Tubes	15 mL	MFCS™	P-CAP15-LP
		Flow EZ™ & MFCS™ 7 bars	P-CAP15-HP
	50 mL	MFCS™	P-CAP50-LP
		Flow EZ™ & MFCS™ 7 bars	P-CAP50-HP



Related products

FLOW EZ™	The Flow EZ™ is the most advanced flow controller.	Optional
MFCS™	The MFCS™ series products are designed to control pressure.	Optional

FLUIWELL SERIES

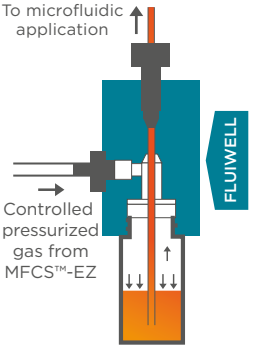
Pressurized fluid reservoirs

The **Fluiwell** is a tool for pressurizing samples inside the vials in order for the fluids to flow through the microfluidic system. The reservoirs and caps are available with different **volume sizes**, **channel numbers**, and **pressurization levels**.

Autoclavable compatibility	*Compatible with any tubing*	*Suitable for long term experiments*	*Compatible with different tube sizes*

Characteristics

Name	Max. volume of pressurized liquid	Pressure compatibility	Product Number
Fluiwell-4C	0.5 mL	MFCS™	14000501
		Flow EZ™ & MFCS™ 7 bar	24000501
	2 mL	MFCS™	14002001
		Flow EZ™ & MFCS™ 7 bar	24002001
Fluiwell-1C	15 mL	MFCS™	11015001
		Flow EZ™ & MFCS™ 7 bar	21015001
	50 mL	MFCS™	11050001
		Flow EZ™ & MFCS™ 7 bar	21050001



Consult our product guide page 92

Related products

FLUIWELL KITS

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

Required

BOTTLE-CAP SERIES

Pressurized bottle cap

The **Bottle-CAP** series are **air-tight microfluidic adapters** that allows the pressurization of **large volumes of liquid** for microfluidic applications. This cap is compatible with bottles with a **GL-45 thread**. It is compatible with Fluigent's pressure controllers: the **MFCS™ series** and the **LineUp™ series**. The number of outlets for the cap can be customized, with **up to 3 fluidic outlets**, to refill easily or to perfuse different microfluidic chips at the same time.

Precaution : Glass laboratory bottles should not be pressurized above 2 bar.

Easy to use and standardized fittings	*Incubator compatibility*	*Robust and autoclavable*	*Possibility to refill during experiment*

Characteristics

Bottle-CAP model	Tubing & Fitting kit	Number of fluidic port
RES-CAP	CTQ-KIT-BC	1 fluidic port
RES-CAP-PCK	included	1 fluidic port
RES-CAP-3P	included	2 fluidic ports
RES-CAP-4P	included	3 fluidic ports

STANDALONE ACCESSORIES

P-CAP SERIES RACK

(P-CAP-RACK)

The **P-CAP rack** is a **compact holder** compatible with any P-CAP size. The versatility of this micro-fluidic accessory allows to hold **different sizes of pressurized reservoirs**. The rack can be rotated easily if needed.

Benefits:

- ► *Autoclavable*
- ► *Incubator compatibility*
- ► *Convenient setup saving space on the bench*

Extended products :

P-CAP series: Metal air-tight cap for standard lab reservoirs (Recommended)

EDUCATIONAL MICROSCOPE

(OSEDUCMIC)

A **cost-effective microscope** for microfluidics. The LED display enables **several people to observe** at the same time. LCD microscope 50-500x, 2000 (digital) magnification transmitted and reflected light SD card reader USB port.

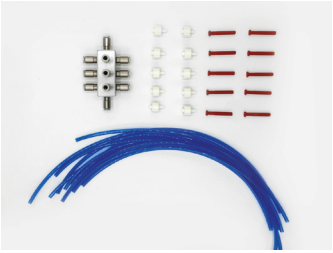
Benefits:

- ► *LCD Microscope display - live view, photo, and video*
- ► *Magnification: 50x-500x, 2000x*
- ► *Optimal LED illumination with color filters*

PRESSURE MANIFOLD

(CTQ-MANI)

10-Position Pressure Manifold



The **Pressure Manifold** is designed to redirect pressure flow into **multiple reservoirs**. It allows splitting a gas line into up to 10 lines.

Contents:

- 10 way manifold (x1)
- Luer lock HP (x11)
- Red plugs (x10)
- 30 cm high pressure tubings (4 mm OD x 2.5 mm ID) (x10)

AIR FLOW REGULATION KIT

(10000001)

A **Regulation Kit** for Pressure Sources consisting of a pressure regulator, an air dryer, and pneumatic tubing.

Contents:

- Pressure regulator (x1)
- Air drier (x1)
- 6 mm OD pneumatic tubing (5 m)
- G1/4" – 6 mm OD tube fitting (x2)
- G1/8" – 6 mm OD fitting (dryer) (x2)

BUBBLE TRAP

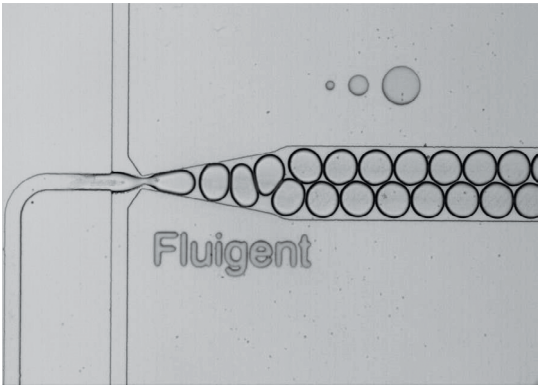
(CTQ-006BT)

The **Bubble Trap** from Fluigent is a device suitable for aqueous stream flows, to **prevent air bubbles** from entering a microfluidic system. Based on a porous membrane inside the trap, the Bubble Trap prevents high instabilities in the flow rate, high shear stress variation, and damage to the microfluidic system.

Contents:

- Bubble Trap (x1)
- Membranes (x3)
- 1/4-28 Flat-Bottom for 1/16" OD Tubing and ferrules (x2)
- FEP Tubing 1/16" OD x 0.020" (508 µm) ID (1 m)

DSURF
Quality Surfactant

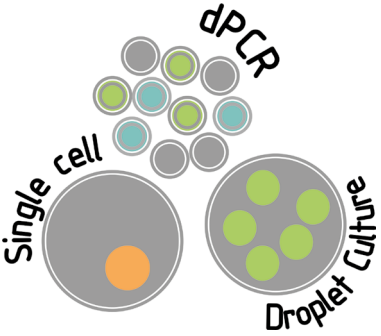


This experiment was realized by using the dSURF and the Droplet Starter Pack that contains our Fluigent microfluidic chip, the EZ Drop.

dSURF is a high-performance fluorosurfactant for microdroplet generation.

It allows for **high-quality droplet formation** and **long-term stability** in conditions such as dPCR and cell culture experiments.

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



dSURF Biological Applications

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.

Characteristics

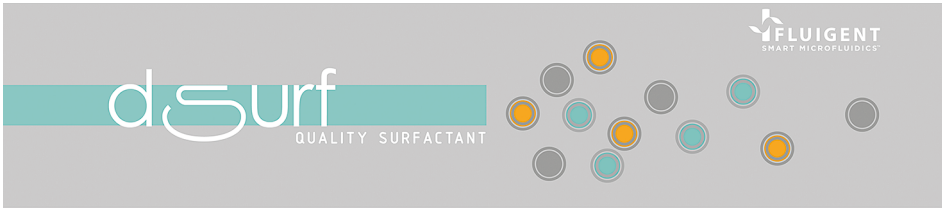
Name	Characteristics	Product Number
dSurf 3x4 mL	2% formula	DR-RE-SU-12
dSurf 30 mL	2% formula	DR-RE-SU-30
Honey dSurf 5 g	100% formula	ODSURF5G

dOIL

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

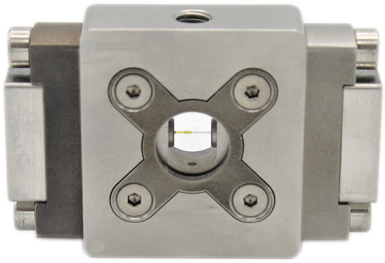


Reagents

dOIL DR-RE-SU-A1	dOIL is pure Novec™ fluorinated oil in which our dSURF emulsion stabilizer is diluted.	Optional
DROPLET STARTER PACKAGE DROPPACK-01	The Droplet Starter Pack is designed for microfluidic droplet experiments.	Optional
EZ DROP DROPKIT01	The Droplet Kit is designed to be used with the droplet starter pack.	Optional

MICROFLUIDIC CHIPS

RAYDROP SINGLE EMULSION DEVICE



Characteristics

RayDrop Single Emulsion

Capillary size	Product Number
30 µm - 150 µm	1DPRD01
60 µm - 300 µm	ORDRPSE-60-300
90 µm - 450 µm	ORDRPSE-90-450

The **RayDrop** developed and manufactured by Secoya is a microfluidic **droplet generator** composed of three main fully removable parts: two inserts on each side and a center section containing a nozzle and an outlet capillary. There are four standard microfluidic connections, two on the box for the continuous phase, and one on each insert for the dispersed phase entry and the collecting emulsion outlet.

The RayDrop's design allows for **multiple liquid emulsification**, in the same device **without the need for special coatings**.

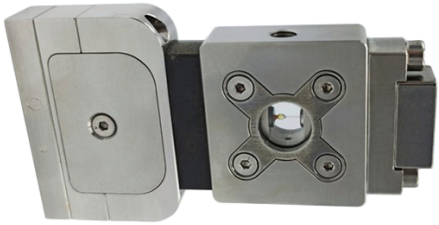
One device for multiple applications	*Easy cleaning*	*No coating needed*	*High monodispersity*

Applications

- PLGA microparticle
- Polymer microcapsule
- Alginate microbeads
- Liposome Nanoparticle
- Oil-in-Water droplets
- Water-in-Oil droplets

Secoya
FLUIDIFY PHARMA

RAYDROP DOUBLE EMULSION DEVICE



Characteristics

RayDrop Double Emulsion

Capillary size	Product Number
30µm - 70µm - 150µm	ORDRPDE-30-70-150
60µm - 120µm - 300µm	O-DE-RDRPC03-EUP
90µm - 160µm - 450µm	O-DE-RDRPC02-EUP

The **RayDrop** droplet generator developed and manufactured by Secoya is a patented device for **droplet generation** with most of the **advantages of glass chips** such as resistance to strong chemicals and **compatibility with high pressures** (> 2 bar). Glass chips are a very expensive disposable, are prone to leakage issues and have limited lifetimes as they are very difficult to recover once clogged. The RayDrop device uses **standard fittings** leading to **sealed connections** and its design allows for **easy recovery and cleaning** if clogging occurs.

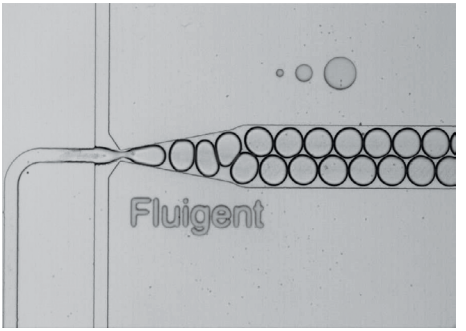
Perform double emulsions in one single device	*Droplet size from 70 µm to 150 µm diameter*	*Easy-to-clean exchangeable nozzle*	*High flexibility (w/o/w) o/w/o)*	*Surface coating-free: No need any surfactant*

Applications

- **Double emulsions** can be produced in only one step in a single device
- Produce **water-oil-water** and **oil-water-oil** droplets **without any surface coatings** needed.
- The system does **not need any surfactant** for droplet formation

EZ DROP

Droplet generation chip



Characteristics

Microfluidic Chips	Product Number
EZ Drop	DROPKIT01

The **EZ Drop** is a PDMS chip dedicated for water-in-oil droplet generation. It comes with the tubing and fittings needed for an experiment. It works with any **LineUp™** pressure channel and **FLOW UNITs** models.

Up to 10 000 Hz	*From 20 µm to 100 µm droplets*	*20 µm, 50 µm, and 100 µm markers on the PDMS Droplet Chip*	*Microscope slide dimensions. Easy connections.*	*Quality monitoring with a QR code*

Contents

- **EZ Drop chip**, with 3 designs each (x3 chips, 9 designs)
- **Tubing** (250 ID ; 1/32"OD) (2 m)
- **Sleeves** (x2)

DROP-SEQ

Drop-seq chip

FlowJEM
Polymer Microfluidic Technology

Characteristics

Microfluidic Chips	Product Number
FlowJEM Drop-Seq	ODROPSEQCHIP

Fluigent has worked with FlowJEM to provide the best microfluidic chips for **Drop-seq**. Drop-sequencing (Drop-seq) developed by the McCarroll lab at Harvard Medical School, is a method designed for the **parallel analysis of mRNA expression** in thousands of individual cells following their **encapsulation in tiny droplets**. These droplets (nanolitre scale) are formed by **precisely combining** aqueous and oil flows in a specially designed microfluidic device (Drop-seq chip). Expression profiling can then be carried out in **tens of thousands of cells in a matter of hours**.

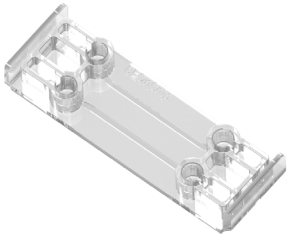
Benefits

- **Latest Design:** Each Droplet Generation Device is based on the design recommended in the latest McCarroll lab Drop-seq protocol.
- **Precision Engineered:** Robust Devices durable over a wide range of pressures, temperatures, and flow rates.
- **26 Droplet Generation Devices Per Chip:** Provides value for money in a chip which lasts. When the life of one device is depleted, simply move onto the next one.
- **Produces Highly Mono-Dispersed Droplets:** Reliable and consistent generation of droplets of optimal size for Drop-sequencing.
- **Efficient Production Of Transcript Libraries:** Superior design promotes optimal mixing of component fluids, minimizing bead shearing or premature lysis of cells and mRNA release.

CELL CULTURE CHIPS

BE-FLOW (OOC-FLOW-01)

Most easy-to-use device dedicated to cell culture under flow

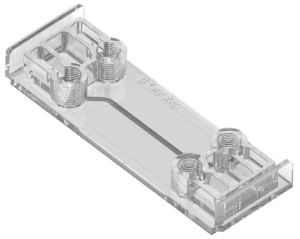


BE-Flow is Beonchip's simplest device dedicated to **cell culture under flow**. It allows the performance of long-term **2D or 3D culture** in two independent channels. BE-Flow is compatible with any microfluidic pump system and can be used with a rocker as its fluid reservoirs are situated by the inlets/outlets. This is an optimal device for **vascular research** where shear stress plays a major role in gene expression.

Easy to use	*Easy to connect*	*No unspecific absorption*	*Impermeability*	*Cell recovery option*

BE-DOUBLE FLOW (OOC-DBLE-08)

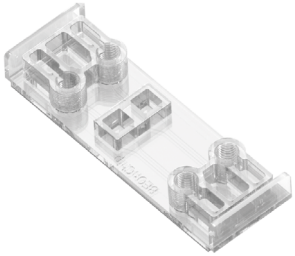
Explore the interaction between different 2D and 3D cultures



BE-Doubleflow is Beonchip's most advanced device. It consists of two perfusable channels connected via a **porous membrane**. It allows for the investigation of different 2D and 3D cultures in a **biomimetic environment** and controls the efficiency of the interaction by selecting the optimal pore size for your application. This is the optimal device when a **hypoxic environment** is needed for studying the **effect of circulating particles** (bacteria, immune system, circulating tumor cells) and for **endothelium/epithelium barrier** when no ALI is needed or when flux plays a role in both sides of the coculture.

Easy to use	*Easy to connect*	*No unspecific absorption*	*Cell recovery option*

BEOnChip
Biomimetic Environment On Chip

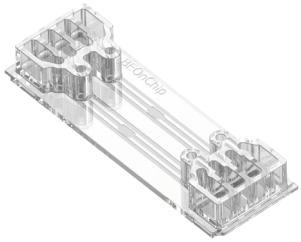


BE-TRANSFLOW (OOC-TRNS-07)

The most versatile cell culture platform

Be-Transflow is Beonchip's most **versatile cell culture platform**. It allows the study of **complex culture configurations** by joining a culture well with a microfluidic channel via a porous membrane. This is the optimal device for **Air Liquid Interface** (ALI) culture, **endothelium/epithelium barrier**, and **crosstalk studies**.

Easy to use	*Easy to connect*	*No unspecific absorption*	*Impermeability*	*Cell recovery option*



BE-GRADIENT (OOC-GRAD-05)

Designed for the application of electrochemical gradients to 3D cell cultures

BE-Gradient is Beonchip's device for the application of **chemical gradients to 3D cell cultures**. BE-Gradient is compatible with any type of optical microscopy (inverted phase contrast, confocal, fluorescence..). Be-Gradient consists of a central chamber for cell culture and two lateral channels connecting to the central chamber through 3 small microchannels. The lateral channels are meant to **simulate blood vessels**. 2D culture is also possible for adherent cells not only in the central chamber but also in the lateral channels.

Easy to use	*Easy to connect*	*No unspecific absorption*	*Cell recovery option*

OXYGEN

P/N : SSFT-OXY

Control in real time, Automate protocols and Record experimental data

The new way to get full control of your microfluidic setup.

OxyGEN is a **single interface**, with **plug and play capabilities**, available for **common desktop OS (windows, MacOS, Linux)**, that allows you to **control**, **monitor** and **automate** all Fluigent products. It combines in one program all the functions and capabilities of our traditional software: A-i-O, MAT, ESS control and much more.

Through its **intuitive dashboard**, OxyGEN is our new reference tool for **real-time control** and for developing **time based protocols** focusing on **pressures**, **flow rates**, **volumes**, and **valve control** in microfluidic experiments.

Control in real time pressures, flow rates, valves and volumes	*Edit and automate long time protocols*	*Record and export data*	*Plug & Play connection & Simulated instruments*

SOFTWARE DEVELOPMENT KIT

P/N : FLUIGENT-SDK

Custom Software Development

Custom your own software application using the SDK to automate and monitor Fluigent devices

Fluigent Software Development Kit (SDK) allows one to fully **integrate Fluigent devices** in a customized application. It has been designed in **several languages**, among the most popular ones in the instrumentation field (LabVIEW, C++, C#.NET, Python, and MATLAB).

The SDK controls all Fluigent pressure and sensor instruments as well as microfluidic valves and advanced regulation loops. One can still use independent SDK for **basic hardware set-ups** or for **specific software requirements**.

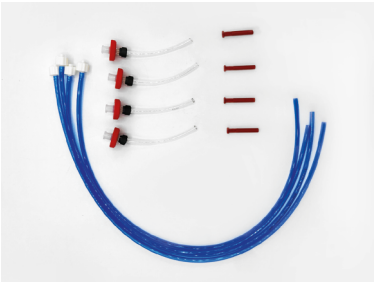
Languages

- **Python** (ver. 3.1+ minimum)
- **LabVIEW** (ver. 2016+ minimum)
- **MATLAB** (ver. R2015a+ minimum)
- **C++** (ver. 11+ minimum)
- **C#** (ver. .NET Core 3.1 minimum)

Operating system

- **Windows 10, 8 and 7** (32 Bits, 64 Bits)
- **MacOS**
- **Linux**

PRESSURE SYSTEM KITS



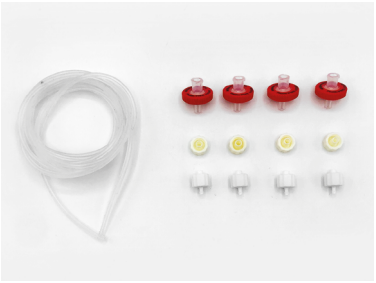
MFCS™ HIGH PRESSURE KIT

(CTQ-KIT-HP-MFCS)

Tubing and connecting kit designed to be used with **MFCS™-EZ** for the 7 bar pressure range.

Kit contents:

- Transparent pneumatic tubing 4 mm (0.2 m)
- Backflow filters (x4)
- Blue pneumatic tubings 4 mm (x4)
- Male luer black tubings (x4)



MFCS™ LOW PRESSURE KIT

(CTQ-KIT-LP-MFCS)

Tubing & Fitting Kit compatible with low pressure **MFCS™-EZ** – channels from 25 mbar to 2000 mbar ranges and from -800 mbar to -25 mbar ranges.

Kit contents:

- Male white luer fittings, 1.6 mm (x4)
- Luer caps (x4)
- Backflow filters (x4)
- 1×3 mm tubing (2 m)

LineUp™ SUPPLY KIT

(LU-SPK-0002)

The **LineUp™ Supply Kit** contains all the components to provide power and pressure supply to any LineUp™ series module.

Supply kit contents:

- Power supply 24 V 1,75 A (x1)
- Blue pneumatic tubing 6 mm (x1)
- Female Staubli tubing fitting (x1)
- Power cable – EUR – Little (x1)

LineUp™ CHAIN-TO-CHAIN KIT

(LU-C2C-0001)

LineUp™ series connection cable

The **Chain-2-Chain Kit** allows to connect **LineUp™ series** modules together without combining them. The cable allows for data and power transmission while the tubing allows pressure to flow from one module to the next. Both the cable and the tubing are approximatively 1.8 m. One can use different gases to pressurize the reservoirs and use **negative and positive modules at the same time**.

LineUp™ P-SWITCH KIT

(ELUPSWKIT1)

Tubing & fitting kit for the **LineUp™ P-SWITCH**.

Kit contents:

- Pneumatic tubing 3 mm OD (2 m)
- Transparent tubing 4 mm OD (1 m)
- Red plugs 4 mm (x2)
- Red plugs 3 mm (x8)

SENSOR KITS

PRESSURE UNIT KIT

(EIPSKIT)

Tubing & Fitting Kit dedicated to the **PRESSURE UNIT** product line.

Kit contents:

- Flangeless fittings 1/4-28 (x2)
- Ferrules (x4)
- 1 m x FEP tubing 1/16" OD 0.020" ID (1 m)

FLOW UNIT XS KIT

(CTQ-KIT-LQ-XS)

A kit containing all the tubing and fittings for our **FLOW UNIT XS**.

Kit contents:

- Adapters 10/32'' (x2)
- Blue PEEK tubing 1/32x0.010x100ft (LQ) (1 m)
- Sleeves 1/16" –> 1/32" (x2)
- Flowmeter fittings (x2)
- 1/16" –> 1/32" tubing fittings (x1)
- PEEK filter XS (x1)

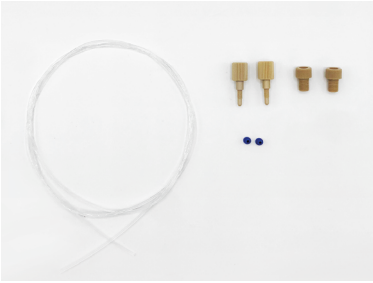
FLOW UNIT S AND M 1/32” KIT

(CTQ-KIT-LQ)

A kit containing all the tubing & fitting elements for the **FLOW UNIT S and M** with **1/32" outer diameter (OD) tubing**.

Kit contents:

- Flowmeter fittings (x2)
- Sleeves 1/16" –> 1/32" (x1)
- Blue PEEK Tubing 1/32x0.010x100ft (1 m)
- Red tubing reducer 1/16" –> 1/32" (x1)



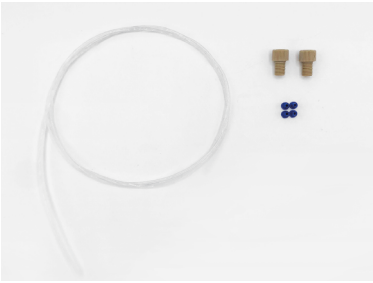
FLOW UNIT S AND M 1/16” KIT

(CTQ-KIT-FU2)

The most recent kit containing all the tubing & fittings for the **FLOW UNIT S and M**. These new fittings allow using **1/16" outer diameter (OD) tubing** with fewer connecting elements, making it the best option for 1/16" tubing.

Kit contents:

- FLOW UNIT S and M adapters (x2)
- FEP tubing 1/16" OD 0.020" ID (1 m)
- Flangeless fittings 1/4-28 (x2)
- Blue ferrules (x2)



FLOW UNIT L KIT

(CTQ-KIT-HQ)

A kit containing all the tubing and fittings for the **FLOW UNIT L**.

Kit contents:

- FEP tubing 1/16" OD 0.020" ID (1.00 m)
- Flangeless fittings 1/4-28 (x2)
- Blue ferrules (x4)

FLOW UNIT XL KIT

(CTQ-KIT-XL)

Kits containing the tubing and fittings to use the **FLOW UNIT XL**.

Kit contents:

- FEP tubing 1/16" OD 0.020" ID (1 m)
- Flangeless fittings 1/4-28 (x2)
- Low-pressure union (x1)
- Tube PEEK (x0.1 m)
- Blue ferrules (x4)

MICROFLUIDIC VALVE KITS

2-SWITCH™ KIT

(CTQ-KIT-2SW2)

Tubing & fitting kit for the **2-SWITCH™** microfluidic valve.

Kit contents:

- FEP tubing 1/16" OD 0.010" ID (3 m)
- PEEK plugs 1/4-28 black (x2)
- Flangeless fittings 1/4-28 (x6)
- Blue ferrules (x12)
- Fittings 4 mm (x1)
- P-Y tube (x1)

M-SWITCH™ KIT

(CTQ-KIT-ESSMSW003)

Kit consisting of tubing & fitting elements for the **M-SWITCH™** microfluidic valve.

Kit contents:

- FEP tubing 1/16" OD 0.10" ID (2.5 m)
- Sleeves 1/16" to 1/32" (x6)
- PEEK plugs 1/4-28 black (x11)
- Flangeless fittings 1/4-28 (x11)
- Blue ferrules (x22)

L-SWITCH™ KIT

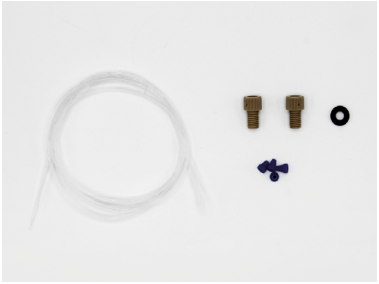
(CTQ-KIT-LSW)

Tubing & fitting kit for the **L-SWITCH™** microfluidic valve.

Kit contents:

- 10/32" adapters (x7)
- FEP tubing 1/16" OD 0.020" ID (1 m)
- Acetal blue plugs 10/32" (x2)
- 10-32 female – female luer adapter (x1)

SAMPLE RESERVOIRS KITS



P-CAP 2 ML KIT

(CTQ-KIT-PCAP2)

Tubing & Fitting Kit for **2mL P-CAP** reservoirs.

Kit contents:

- FEP tubing 1/16" OD 0.020" ID (0.5 m)
- Flangeless fittings 1/4-28 (x2)
- Blue ferrules (x4)
- O-ring P-CAP 2 mL (x1)

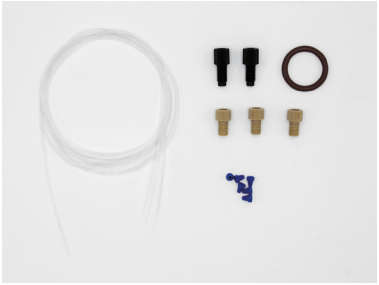
P-CAP 15 ML KIT

(CTQ-KIT-PC15)

Tubing & fitting kit for **15 mL P-CAP** reservoirs.

Kit contents:

- Tubing FEP 1/16" OD 0.020" ID (1 m)
- Flangeless fittings 1/4-28 (x4)
- Blue ferrules (x4)
- O-ring P-CAP15 (x1)



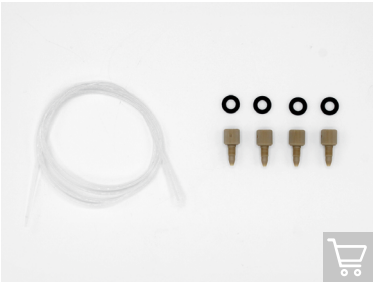
P-CAP 50 ML KIT

(CTQ-KIT-PC50)

Tubing & fitting kit for **50 ml P-CAP** reservoirs.

Kit contents:

- Tube FEP 1/16" OD 0.020" ID (1.50 m)
- Flangeless fittings 1/4-28 (x3)
- Blue ferrules (x6)
- O-ring P-CAP50 (x1)
- Black caps PEEK 1/4-28 (x2)



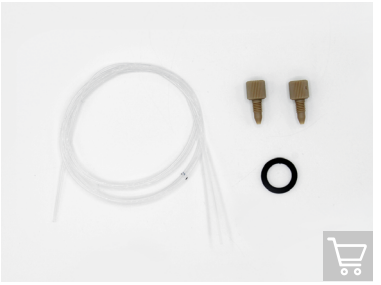
FLUIWELL 4C KIT

(CTQ-KIT-F4C)

Tubing & fitting kit for **Fluiwell 4-Channels** (0.5 or 2 mL reservoirs).

Kit contents:

- Adaptors 10/32" (x4)
- FEP tubing 1/16" OD 0.020" ID (m) (2 m)
- Fluiwell 4-Channels O-rings (x4)



FLUIWELL 15 ML KIT

(CTQ-KIT-F1C15)

Tubing & fitting kit for **Fluiwell-1C 15 mL** reservoir.

Kit contents:

- Adaptors 10/32" (x2)
- Tubing FEP 1/16" OD 0.020" ID (1 m)
- O-ring Fluiwell 1C-15 mL (x1)

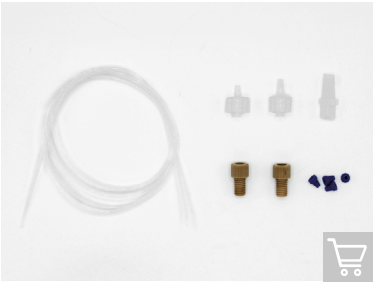
FLUIWELL 50 ML KIT

(CTQ-KIT-F1C50)

Tubing & fitting kit for **Fluiwell 1C-50 mL** reservoirs.

Kit contents:

- Adaptors 10/32" (x2)
- Tubing FEP 1/16" OD 0.020" ID (1 m)
- O-ring Fluiwell 1C-50 mL (x1)



BOTTLE-CAP KIT

(CTQ-KIT-BC)

A kit containing tubing and fittings for the **Bottle-CAP 2 ports**.

Kit contents:

- FEP tubing 1/16" OD 0.020" ID (1 m)
- Flangeless fitting 1/4-28 + blue ferrules (x2)
- Male luer locks (white) to barb 1.6 mm (x1)
- Blue ferrules (x2)
- Black Male Luer tubing (x1)

3

SYSTEMS & PLATFORMS

OMI

Automated Organ-on-chip Platform

Product Number

O-OMISC-PTF

Omi is an automated platform that helps reproduce the microphysiological behavior of organs inside microfluidic chips. It is compatible any type of chips to sustain different cell culture types or organ on chip models (Gut , Skin...)

Omi, automated organ-on-chip platform, can perform any perfusion protocol. It has the ability to customize and automate any protocol that includes simple perfusion, recirculation, sampling and injection. It meets the needs of both beginners in cell culture research and advanced Organ-on-Chip researchers who seek automation and reproducibility.

Cell culture under sterile conditions	*Versatile Fits any chip*	*Automated and fully integrated*	*Intuitive interface and technology*

Protocols

Perfusion
Perfuse up to 4 mL of many types of liquids such as cell culture media for a long period of time in a controlled and reproducible way.

Recirculation
Unidirectional recirculation of medium while maintaining a constant flow rate for a long period of time.

Sampling
Sample up to 4 mL of soluble factors secreted in the culture medium for analysis or imagery.

Injection
Inject up to 4 mL of fresh medium during the experiments.

Characteristics

Performance	
Flow rate control	From 1 µL/min to 1 mL/min
Maximum pressure	600 mbar at maximum
Fluid reservoir volume	4 mL
Perfusion volume	From 1.5 mL to 4 mL
Min volume recirculated	2.5 mL

Applications

Single channel
Blood vessel on chip

Dual channel
Blood/brain barrier
Gut-on-a-chip

Features

Fully integrated platform
Omi can perform user customized protocol including perfusion, drug delivery, sampling and recirculation.

Compact and transportable
The device is designed to fit in incubators and can be easily transported to a microscope for imaging or cell analysis while maintaining perfusion.

Remote control
Set up and monitor your protocols on Omi's application's user friendly interface with WIFI.

Contamination-free
Inject cell or fresh medium, deliver test compounds, collect samples without disconnecting the microfluidic chip and disturbing the shear stress conditions of the experiments.

Completely autonomous platform
2-hour battery allows for transport from incubator to imaging system

Platform contents

- Omi device (x1)
- Power supply kit (x1)
- Tablet (x1)
- Cartridges (x3)
- Pneumatic connector kit (x1)
- Fluidic connector kit (x1)
- Low resistance adaptors (x3)
- High resistance adaptors (x3)

ARIA, AUTOMATED SEQUENTIAL INJECTION SYSTEM

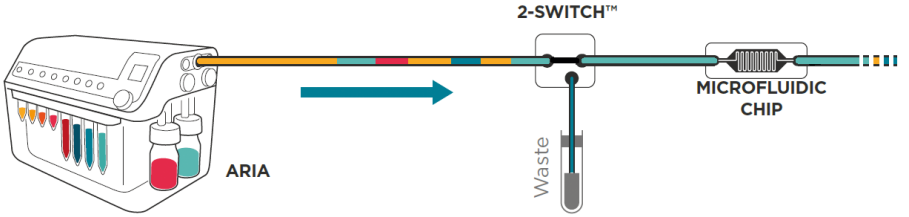
Unique solution for automating perfusion imaging studies.
You do the science, Aria does the rest

ARIA is a compact instrument to **automate multiple fluid perfusions**. It allows the user to set up a **custom time schedule** for exposing cells, nucleic acids, etc. to antibodies, chromophores, test compounds, or other liquids.

Reagents can be delivered to a perfusion chamber, microfluidic device, or other system for imaging or analysis. **Up to 10 unique solutions** can be delivered at precise times for **faster** and more **reproducible results**.

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

ARIA Technology



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

Characteristics

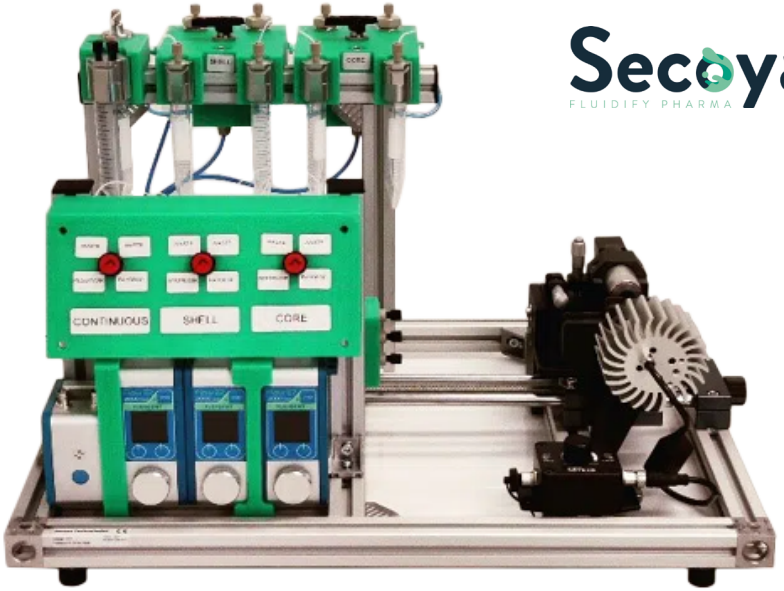
Product & Service	Product Number	Contents
Aria L (40 µL – 1 mL/min) single output	OAR-L-02-2SW	Aria 2-SWITCH™ + FLOW UNIT L
Aria L (40 µL – 1 mL/min) single output + Installation + 1 Year extra warranty	OAR-L-02-2SW-W	Aria 2-SWITCH™ + FLOW UNIT L + Installation + 1 year Warranty
Aria M (3.2 µL – 80 µL) single output	OAR-M-02-2SW	Aria 2-SWITCH™ + FLOW UNIT M
Aria M (3.2 µL – 80 µL) single output + Installation + 1 Year extra warranty	OAR-M-02-2SW-W	Aria 2-SWITCH™ + FLOW UNIT M + Installation + 1 year Warranty
Aria L (40µL – 1 mL/min) serial output	OAR-L-02-MSW	Aria M-SWITCH™ + FLOW UNIT L
Aria L (40 µL – 1 mL/min) serial output + Installation + 1 Year extra warranty	OAR-L-02-MSW-W	Aria M-SWITCH™ + FLOW UNIT L + Installation + 1 year Warranty
Aria M (3.2 µL – 80 µL) serial output	OAR-M-02-MSW	Aria M-SWITCH™ + FLOW UNIT M
Aria M (3.2 µL – 80 µL) serial output + Installation + 1 Year extra warranty	OAR-M-02-MSW-W	Aria M-SWITCH™ + FLOW UNIT M + Installation + 1 year Warranty
Aria Single Output Kit	2SW-KIT-AR	Flangeless fittings ¼-28 (x6) + Ferrules blue (x12) + Tube FEP (2 m) + F 120 x2
Aria Serial Output Kit	MSW-KIT-AR	Flangeless fittings ¼-28 (x15) + Ferrules blue (x30) + Tube FEP (4 m) + Plug black ¼-28 ref P309 (x15) + F 120 (x2)
Aria Replacement Tubbing Kit	CTQ-KIT-AR	Aria internal replacement tubing kit

Focus on the science, not on the setup

Aria Automation Software provides quick and easy navigation to control the experiment and walk away while the experiment is running.

Create custom injection/ perfusion sequences	*Set injection parameters based on time or volume*	*Set the desired flow rate value for each injection*	*Program stops flow and incubation*

MICROFLUIDIC COMPLEX EMULSION PLATFORM



Secoya
FLUIDIFY PHARMA

The emulsion platform, develop by Secoya, with our flow control equipment, is a fast and easy screening system perform emulsification processes such as simple emulsions and double emulsions.

Save time with integrated, organized, ready to use platform and get monodispersed complex emulsions rapidly.

Applications

- w/o and o/w droplets
- w/o/w and o/w/o emulsions
- UV polymerised resin microparticles
- UV polymerised resin microcapsules
- PLGA microparticles
- PLGA microcapsules
- Alginate microparticles
- Chitosan microcapsules

Product Number

O-DE-STD-PTF

Platform composition

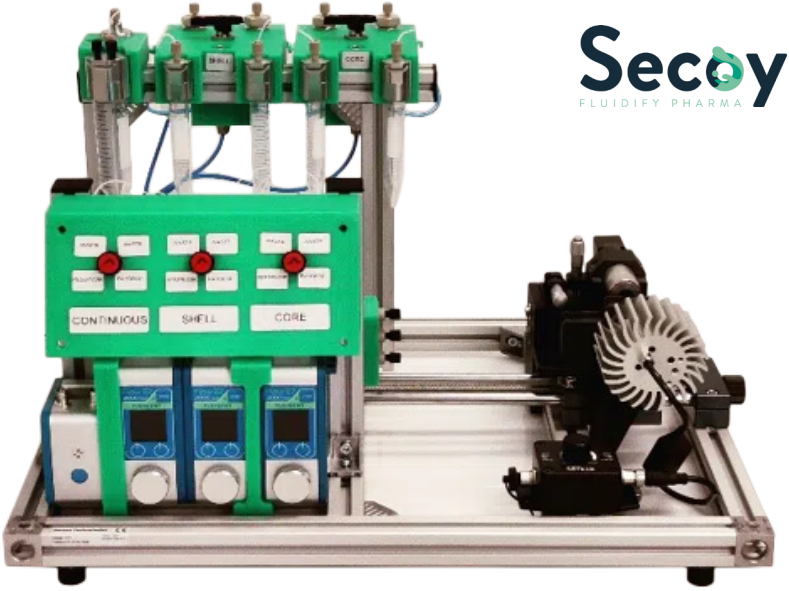
- LineUp Flow EZ™ 7 bar (x3)
- Power supply kit & USB cable (x1)
- LineUp™ LINK (x1)
- FLOW UNIT M (x2)
- FLOW UNIT L (x1)
- 15 mL P-CAP (x4)
- 50 mL P-CAP (x1)
- RayDrop Double Emulsion (x1)
- Fluidic tubing & fitting kit (x1)
- Pneumatic tubing kit (x1)
- Optical system (x1)
- (Optional) protective hood (x1)

High monodispersity (2%)	*Double emulsion size: 25 µm – 500 µm*	*High Frequency: 5 000 Hz*
Adjustable shell thickness	*No surface coating*	*w/o/w and o/w/o double emulsion*
Ready-to-use robust platform	*Single & Double emulsion available*	*Adaptable for various microcapsules*

Performance

Feature	Batch method	Fluigent microfluidic method
Process	Multiple step process	Direct double emulsion production
Homogeneity	Random distribution of single and double emulsion	High homogeneity
Particle size distribution	More than 50%	~2%
Reproducibility	Low	High
Live particle size control	No	Precise
Continuous / In-line production	No	Yes

CELL ENCAPSULATION PLATFORM



Secoya
FLUIDIFY PHARMA

The cell encapsulation platform, developed and manufactured by Secoya and constituted by Fluigent's flow control equipment and Secoya's Emulsion Technology, complete system for high throughput encapsulation of complex and individual cells within highly monodisperse double emulsion droplets small enough (<90 µm) for further analysis.

Product Number
O-FACS1-PTF
O-FACS2-PTF
O-FACS3-PTF
O-FACS4-PTF

This fast and easy system allows the encapsulation of cells in aqueous core (such as medium, PBS) and oil shell (such as HFE 7500) double emulsions, providing a powerful tool for biochemical and cellular assays, as it enables the isolation of each cell within microreactors, highlighting its characteristics and concentrating the signals to measurable levels to obtain meaningful biological data.

4

MICROFLUIDIC PACKS

MICROFLUIDIC APPLICATION PACKS

Packages for cell biology, droplet & particle generation applications

We built **microfluidic application packages** with pressure/flow controllers, microfluidic chips, and valves fit for your application. In this section, you will find packages to create a mechanical stimulation of your cells, generate a unidirectional and stable flow rate in your cell culture chamber, create highly monodisperse simple or double emulsions, and sort your cells and particles according to their size.

Easy to use with simple connections	*Flexible packages and instruments*	*Contamination-free and designed for biology*

MECHANICAL STIMULATION PACK

A versatile package for mechanical stimulation of cells

This package is the perfect setup to create mechanical stimulation in your experiments with your own microfluidic chip.

Package contents:

- LineUp™ LINK
- Flow EZ 1000 mbar
- PCAP 15 mL (x2)
- LineUp™ Push-Pull (x3)
- FLOW UNIT M
- LineUp™ supply kit
- Tubing & fitting kits

IMMUNOSTAINING PACK

(O-MULTILABEL-PCK)

A ready-to-use package for sequential injection of multiple fluids for cell or tissue staining. The Immunostaining Package provides stable and automated delivery of up to 10 different fluids to a single cell culture chamber.

Package contents:

- LineUp™ supply kit
- LineUp™ LINK
- Flow EZ 1000 mbar
- PCAP 15 mL (x12)
- FLOW UNIT M
- Tubing & fitting kits
- SWITCH EZ
- M-SWITCH™
- 2-SWITCH™
- 10 position pressure manifold

RECIRCULATION PACK

(O-RECIR-PCK)

A ready-to-use package for unidirectional and stable fluid recirculation. The Recirculation Package allows continuous flow between two reservoirs while maintaining a unidirectional flow-rate in the cell culture chamber.

Package contents:

- LineUp™ supply kit
- LineUp™ LINK
- Flow EZ 345 mbar (x3)
- PCAP 15 mL (x2)
- FLOW UNIT M
- Tubing & fitting kits
- SWITCH EZ
- 2-SWITCH™ (x2)

CELL PERFUSION PACK

The science of flow control for Organ-On-A-Chip applications

Organ on chip study is an emerging field that brings substantial benefits compared to conventional cell culture. In many labs, considerable effort is put in choosing the right chip design, but the impact of flow control is still undetermined. It is our intent to create awareness on **the importance of flow** and its effects on one's studies.

1. LineUp™ – Flow Controller
2. FLOW UNIT – Flow Rate Sensor
3. P-CAPs – Sample Reservoirs
4. BE-FLOW – Microfluidic Chip

Characteristics

Perfusion Pack	Product Number
Starter Pack	OOC-ST-001
High Throughput Pack	OOC-HT-001

MICROFLUIDIC CELL SORTING PACK

Microfluidic size cell sorting

The microfluidic **cell sorting package** allows sorting cells or particles according to their size using inertial and Dean drag forces. Fluigent has joined with microfluidic ChipShop to provide a solution with **well-designed microfluidic devices** and **excellent flow control** for sorting experiments.

1. FLOW UNIT – Flow rate sensor
2. LINK – Connect to the PC
3. Flow EZ (2 bar) – Flow controller
4. P-CAP – Sample reservoir
5. ChipShop sorting chip

Product Number

ESORT-PCK01

microfluidic ChipShop

Label-free	*High throughput: up to 3 mL/min*	*Passive sorting: does not require additional external source*	*Up to 8 cells/ particles sizes sorted per experiment*

DROP-SEQ PACK

The **Drop-Seq protocol**, is a high throughput method that enables the **sequencing of the mRNA** from a large number of cells. With this method it is possible to create a **gene expression map of the cell**, or even distinguish cell populations within a tissue. For optimized Drop-Seq experiments in Next-Generation Sequencing. The Fluigent **Drop-Seq Package** allows better **reproducibility** and control of both single cell and bead **encapsulation**.

1. LINK – PC control
2. Flow EZ – Flow controllers
3. P-CAP – Sample reservoirs
4. FLOW UNITs – flow rate sensors
5. Drop-Seq - microfluidic chip

Product Number

ODROPSEQFPCK

Package contents

- LineUp FLOW EZ™ (x3)
- LineUp™ LINK (x1)
- FLOW UNIT M (x2)
- FLOW UNIT L (x1)
- P-CAP 15 mL (x1)
- P-CAP 2 mL (x2)
- Drop-Seq device FlowJEM PDMS Microfluidic Devices (x1)
- Fluigent Software
- LineUp™ Supply Kit (x1)
- Tubing & Fitting Kits

Gain time: less than 1 minute to obtain droplets	*Avoid losing cells or beads during transition time*	*Better control: avoid problems such as the backflow*

Drop-Seq chip

Chip allowing for parallel analysis of mRNA expression in thousands of individual cells following their encapsulation in tiny droplets. These nanodroplets are formed by precisely combining aqueous and oil flows in a specially designed microfluidic device. Expression profiling can then be carried out in tens of thousands of cells in a matter of hours.

ALGINATE BEADS GENERATION PACK

The Fluigent **Alginate beads production station** is a complete system for producing **outstanding monodispersed** Alginates beads with the flexibility to change **particle sizes** production in hundreds of milliseconds without interrupting the production. Its performance results from the combination of Fluigent's **LineUp™** microfluidic pumps and the **RayDrop** droplet generator, a breakthrough technology for **high-quality particles and beads production**.

1. Flow EZ™ pressure controllers
2. SWITCH EZ valve controller
3. LINK for software control
4. FLOW UNITs flow sensors
5. RayDrop droplet generator
6. 2-SWITCH™ microfluidic valves
7. P-CAP sample reservoirs
8. Digital High-Speed Microscope

Product Number
O-SE-ALG-PCK

Package contents

- LineUp Flow EZ™ 2 bar (x2)
- LineUp™ supply kit (x1)
- LineUp™ LINK (x1)
- FLOW UNIT M (x2)
- P-CAP 15 mL (x3)
- 2-SWITCH™ (x2)
- LineUp™ SWITCH EZ (x1)
- RayDrop Single Emulsion (x1)
- Tubing & fitting kit (x1)

Continuous production	*High Monodispersity (2%)*	*High flexibility on alginate beads size*	*Ease of use*	*High reproducibility*

Performance

Feature	Extrusion Method	Fluigent Microfluidic Method
Particle size distribution	Up to 50%	~2%
Reproducibility	Low	High
Live particle size control	No	Precise
Continuous (in-line) production	No	Yes

NANOPARTICLE PRODUCTION PACK

The Fluigent **Liposome Nanoparticle Production Station** is a complete system for **precise and long-term production of liposomes** with high flexibility in terms of the liposome size range. Its performance results from the combination of Fluigent's **LineUp™** microfluidic pumps and the **RayDrop** device, a breakthrough technology for high-quality particles production.

1. Flow EZ™ pressure controllers
2. SWITCH EZ valve controller
3. LINK for software control
4. FLOW UNITs flow sensors
5. RayDrop droplet generator
6. 2-SWITCH™ microfluidic valves
7. P-CAP sample reservoirs
8. Digital High-Speed Microscope

Product Number

O-MIX-LIPO-PCK

Package contents

- LineUp Flow EZ™ 2 bar (x2)
- LineUp™ supply kit (x1)
- LineUp™ LINK (x1)
- FLOW UNIT M (x1)
- FLOW UNIT L (x1)
- P-CAP 15 mL (x3)
- 2-SWITCH™ (x2)
- LineUp™ SWITCH EZ (x1)
- RayDrop Single Emulsion (x1)
- Tubing & fitting kit (x1)

Continuous / In-line production	*High flexibility in liposome nanoparticle size*	*High reproducibility*	*Full control on liposome nanoparticle size*

Performance

Feature	Extrusion Method	Fluigent Microfluidic Method
Particle size distribution	Up to 50%	~2%
Reproducibility	Low	High
Live particle size control	No	Precise
Continuous (in-line) production	No	Yes

PLGA MICROPARTICLE PRODUCTION PACK

1. Flow EZ™ pressure controllers
2. SWITCH EZ valve controller
3. LINK for software control
4. FLOW UNITs flow sensors
5. RayDrop droplet generator
6. 2-SWITCH™ microfluidic valves
7. P-CAP sample reservoirs
8. Digital High-Speed Microscope

The PLGA microparticle production station is a **robust, high-performance** solution to **generate polymer microparticles** in a **homogenous** and **fully controlled manner**. The performance brought by the **RayDrop droplet generator**, with the combination of polylactic-co-glycolic acid as an encapsulation polymer and ethyl acetate as a solvent provides a **biocompatible solution** lowering both hazard risk and precipitation time. Suitable for **biological applications**, the RayDrop, and its station offer a **semi-automated** solution for one of the most successful drug delivery systems in laboratories and clinics. To solve the current problems of the PLGA microparticles synthesis, droplet-based microfluidics appears to be a powerful tool. Droplet control and generation allow **highly monodispersed** and **continuous production** as compared to batch emulsion methods.

Characteristics

Package	Description
Standard package	1DPPL01
Automation package	O-SE-PLGAAP-PCK

Package contents

Content	Description	Package
Flow EZ™	Two 2 bar pressure-based flow controllers	Standard Package Automation Package
LINK	Monitor and automate the setup with Fluigent Software	Standard Package Automation Package
FLOW UNITs	Two high precision flow sensors (M and L range)	Standard Package Automation Package
P-CAPs	Air-tight caps for sample reservoirs (one of 50 mL, two of 15 mL)	Standard Package Automation Package
RayDrop	Single emulsion droplet generator	Standard Package Automation Package
Fluigent Software	Software to control in real time and automate instruments	Standard Package Automation Package
2-SWITCH™	Two bidirectional valves	Automation Package
SWITCH EZ	Microfluidic valves controller	Automation Package
Tubing & Fitting Kit	Dedicated tubing & fitting elements to set up the system	Standard Package Automation Package
Digital High-Speed Camera	Observe and record results with high resolution and rates up to 7092 fps	Optional

Particle monodispersity ~2%	*Particle size control and encapsulation performance*	*System recovery and cleaning*
Biocompatibility: Ethyl acetate as solvent	*Continuous / In-line production*	*Semi-automated priming protocol*

DOUBLE EMULSION GENERATION PACK

The **Fluigent Double Emulsion Production Station** is a complete system for producing outstanding **monodispersed double emulsions in one single device**. Its performance results from the combination of Fluigent's **LineUp™** microfluidic pumps and the **RayDrop** device, a breakthrough technology for **high monodispersed** and **stable double emulsion**.

1. Flow EZ™ pressure controllers
2. SWITCH EZ valve controller
3. LINK for software control
4. FLOW UNITs flow sensors
5. RayDrop droplet generator
6. 2-SWITCH™ microfluidic valves
7. P-CAP sample reservoirs
8. Digital High-Speed Microscope

Product Number

O-DE-STD-PCK

Package contents

- LineUp Flow EZ™ 2 bar (x3)
- LineUp™ supply kit (x1)
- LineUp™ LINK (x1)
- FLOW UNIT M (x2)
- FLOW UNIT L (x1)
- 15 mL P-CAP (x1)
- 50 mL P-CAP (x2)
- 2-SWITCH™ (x2)
- LineUp™ SWITCH EZ (x1)
- RayDrop Double Emulsion (x1)
- Tubing & Fitting kit (x1)

High monodispersity (2%)	*Double emulsion size: 70 µm – 150 µm*	*High Frequency: 5 000 Hz*
Adjustable shell thickness	*No surface coating*	*w/o/w and o/w/o double emulsion*

Performance

Feature	Batch method	Fluigent microfluidic method
Process	Multiple step process	Direct double emulsion production
Homogeneity	Random distribution of single and double emulsion	High homogeneity
Particle size distribution	More than 50%	~2%
Reproducibility	Low	High
Live particle size control	No	Precise
Continuous / In-line production	No	Yes

MICROFLUIDIC DROPLET PACK

Ideal for biologists and chemists

The **Droplet Package** is designed for all who want to start with **microfluidic droplets experiments**. It includes the **EZ Drop** chips and fully adapted liquid handling solution and accessories.

1. LineUp™ pressure-based flow controllers
2. LINK for Software control
3. High precision flow sensors
4. Sample reservoirs
5. Droplet generation chips

Highly monodisperse droplets	*Most simple droplet generation kit*	*Cost-effective solution*

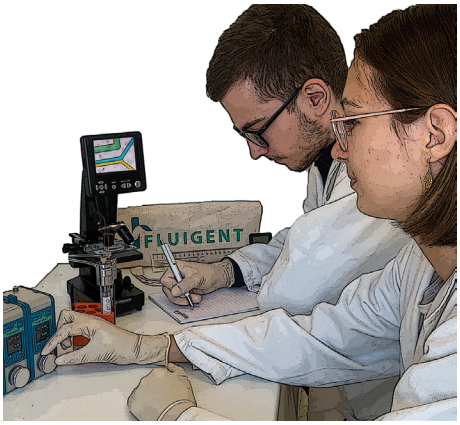
Package contents

- Flow EZ™ 2 or 1 bar (x2)
- LineUp™ supply kit (x1)
- LINK (x1)
- FLOW UNIT S (x2)
- P-CAP 2 mL (x2)
- EZ Drop chip (x1)
- Tubing & fitting kits

Product Number
DROPPACK-01
DROPPACK-02

EDUCATIONAL PACK

Complete microfluidic setup for starting experiment



The **Fluigent Educational Packages** provide a **broad introduction to microfluidics** and its applications by familiarizing the user with general **microfluidic principles** and microfluidic systems. These **ready-to-teach packages** are specifically handy for professors and teachers.

Flexible offer with 4 packages available	*Up to 4 hours of practical work with solutions*	*A handbook for an overview on microfluidics*

FIRST LEVEL: CO-FLOW

(SEDUC-COFLOW)

A beginner package to discover microfluidics by experimenting visually a pillar concept of microfluidics: laminar flows.

1 hour guided experiments. Suited for: biologists, (bio)engineers, chemists, but also for high schools with scientific programs.

Package contents:

- LineUp™ supply kit
- Flow EZ 1000 mbar (x2)
- PCAP 15 mL (x2)
- Co-Flow chip (x3)
- Tubing & fitting kit
- Microscope with SD memory card
- Dye solutions
- Printed Handbook
- Exp. Leaflet Co-Flow
- Accessories bag (tubing cutter, pen, notebook, counter, ruler ...)

FIRST LEVEL: RESISTANCE

(SEDUC-RESIST)

Master and take advantage of one powerful tool for optimizing your microfluidic experiments: hydrodynamic resistance. 1 hour guided experiments:

- Perform resistance measurements on the microfluidics system
- Theoretical calculations related to the experiments

Package contents:

- LineUp™ supply kit
- Flow EZ 1000 mbar
- PCAP 15 mL
- FLOW UNIT M
- Tubing & fitting kit
- Dye solutions
- Printed Handbook
- Exp. Leaflet Resistance
- Accessories bag (tubing cutter, pen, notebook, counter, ruler ...)

SECOND LEVEL: CO-FLOW & RESISTANCE

(SEDUC-RESITCOFL)

Co-flow and Resistance in one package for a first overview on microfluidics.

2 hours guided experiments. Suited for: (bio)engineers, physicists, chemists.

Package contents:

- LineUp™ supply kit
- Flow EZ 1000 mbar (x2)
- FLOW UNIT M
- PCAP 15 mL (x2)
- Co-Flow chip (x3)
- Tubing & fitting kit
- Microscope with SD memory card
- Dye solutions
- Printed Handbook
- Exp. Leaflet Co-Flow
- Exp. Leaflet Resistance
- Accessories bag (tubing cutter, pen, notebook, counter, ruler ...)

FULL COURSE: CO-FLOW, RESISTANCE & DROPLETS

(SEDUC-DROPLET)

Get the most complete overview, with experiments pushed to real-world applications: droplet generation.

4 hours guided experiments. Suited for: (bio)engineers, chemical engineering, physicists, biologists and researchers.

Package contents:

- LineUp™ supply kit
- Flow EZ 1000 mbar (x2)
- LINK
- FLOW UNIT M (x2)
- PCAP 15 mL (x2)
- Co-Flow chip (x3)
- EZ Drop chip (x3)
- dSurf 2% 12mL
- dOil 120mL
- Microbeads bottle
- Fluigent Software
- Tubing & fitting kit
- Microscope with SD memory card
- Dye solutions
- Printed Handbook
- Exp. Leaflet Co-Flow
- Exp. Leaflet Resistance
- Exp. Leaflet Droplet
- Accessories bag (tubing cutter, pen, notebook, counter, ruler ...)

SYSTEMS & PACKS TUBING & FITTING KITS

ARIA SINGLE OUTPUT KIT

(2SW-KIT-AR)

Tubing Kit for external **2-SWITCH™** addition for the **Aria** device.

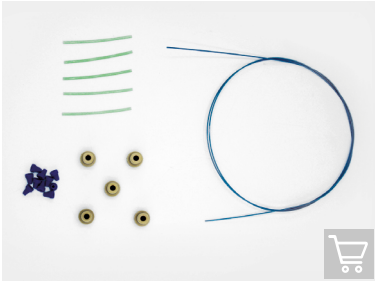
Kit contents:

- Flangeless fittings 1/4-28 (x6)
- FEP tubing 1/16" OD 0.010" ID (2 m)
- Blue ferrules (x12)
- Adapters 10-32 (x2)
- RJ45 female coupler (x1)
- Flat RJ45 flat cable (x1)

ARIA REPLACEMENT TUBING KIT

(CTQ-KIT-AR)

Pre-cut set of tubings to replace internal tubings of **Aria** device.



DROP-SEQ KIT

(ODROPSEQCTQ)

Tubing & fitting kit for the **Drop-Seq microfluidic chip**.

Kit contents:

- Sleeves 1/16" –> 1/32" (x5)
- Flangeless fittings 1/4-28 (x5)
- 1/32"x0.010x100ft (LQ) PEEK tubing (2 m)
- Blue ferrules (x10)

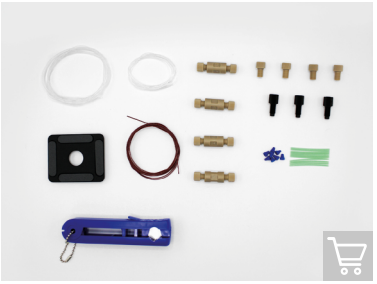
DOUBLE EMULSION GENERATION KIT

(O-DE-STD-CTK)

A kit containing tubing, fitting, plug, and ferrule elements required for the **Double Emulsion Generation**.

Kit contents:

- 1/32'' PEEK tubing with 250 µm inner diameter (ID) (1 m)
- 1/32'' PEEK tubing with 150 µm inner diameter (ID) (2 m)
- FEP tubing 1/16" OD 0.010" ID (1 m)
- FEP tubing 1/16" OD 0.020" ID (1 m)
- Sleeves 1/16" –> 1/32" (x16)
- PEEK plugs 1/4-28 Black (x4)
- Flangeless fittings 1/4-28 (x5)
- Blue ferrules (x10)
- Inline filters (x3)
- 1/16" unions (x4)
- 10-32 adapters (x10)
- Tube cutter (x1)
- RayDrop support (x1)
- Lateral rails (x4)



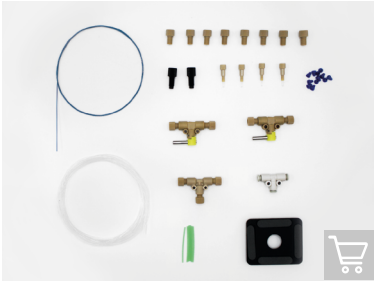
NANOPARTICLE PRODUCTION KIT

(O-MIX-LIPO-CTK)

A kit containing tubing, fitting, plug, and ferrule elements required for the **Nanoparticle Production pack**.

Kit contents:

- 1/32'' PEEK tubing with 250 µm inner diameter (ID) (1 m)
- 1/32'' PEEK tubing with 150 µm inner diameter (ID) (2 m)
- FEP tubing 1/16" OD 0.010" ID (1 m)
- FEP tubing 1/16" OD 0.020" ID (1 m)
- Sleeves 1/16" –> 1/32" (x16)
- PEEK plugs 1/4-28 Black (x4)
- Flangeless fittings 1/4-28 (x5)
- Blue ferrules (x10)
- Inline filters (x3)
- 1/16" unions (x4)
- 10-32 adapters (x10)
- Tube cutter (x1)
- RayDrop support (x1)
- Lateral rails (x4)



PLGA MICROPARTICLE PRODUCTION KITS: STANDARD PACK

(1DPPLC1)

A kit containing tubing, fitting, plug, and ferrule elements required for the **PLGA Microparticle Production pack**.

Kit contents:

- RayDrop tubing & fitting kit (x1)
- 1/32" PEEK tubing with 250 µm inner diameter (ID) (1 m)
- FEP tubing 1/16" OD 0.010" ID (3 m)
- transparent tube 4 mm (1 m)
- Sleeves 1/16" –> 1/32" (x6)
- PEEK plugs 1/4-28 Black (x2)
- Flangeless fittings 1/4-28 (x8)
- Blue ferrules (x12)
- Fluidic T (x1)
- T fitting 4 mm (x1)
- Flowmeter fittings (x 4)
- Tube cutter (x1)
- RayDrop support (x1)
- Lateral rails (x4)

PLGA MICROPARTICLE PRODUCTION KIT: AUTOMATION PACK

(1DPPLC2)

A kit containing tubing, fitting, plug, and ferrule elements required for the **PLGA Microparticle Production pack**.

Kit contents:

- RayDrop tubing and fitting kit (x1)
- 1/32'' PEEK tubing with 250 µm inner diameter (ID) (1 m)
- FEP tubing 1/16" OD 0.010" ID (3 m)
- Transparent tube 4 mm (1 m)
- Sleeves 1/16" –> 1/32" (x6)
- PEEK plugs 1/4-28 black (x2)
- Flangeless fittings 1/4-28 (x15)
- Blue ferrules alone (x20)
- T fitting 4mm (x1)
- Flowmeter fittings (x4)
- Tube cutter (x1)
- RayDrop support (x1)
- Lateral rails (x4)

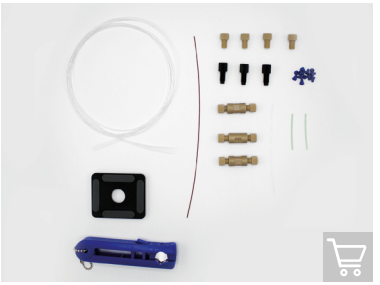
ALGINATE BEADS GENERATION KIT

(O-SE-ALG-CTK)

A kit containing tubing, fitting, plug, and ferrule elements required for the **Alginate bead generation pack.**

Kit contents:

- 1/32'' PEEK tubing with 250 µm inner diameter (ID) (0.5 m)
- 1/32'' PEEK tubing with 150 µm inner diameter (ID) (1 m)
- FEP tubing 1/16"OD 0.010"ID (0.5 m)
- FEP tubing 1/16"OD 0.020"ID (0.4 m)
- Sleeves 1/16" –> 1/32" (x6)
- 1/16" unions (x3)
- PEEK plugs 1/4-28 Black (x3)
- Flangeless fittings 1/4-28 (x4)
- Blue ferrules (x8)
- Tube cutter (x1)
- RayDrop support (x1)
- Lateral rails (x4)



RAYDROP SINGLE EMULSION DEVICE KIT

(1DPRDC1)

A kit containing tubing, fitting, plug, and ferrule elements required for using the **RayDrop Single Emulsion Device**.

Kit contents:

- 1/32'' PEEK tubing with 150 µm inner diameter (ID) (0.2 m)
- FEP tubing 1/16" OD 0.010" ID (2 m)
- FEP tubing 1/16" OD 0.020" ID (0.1 m)
- Sleeves 1/16" –> 1/32" (x2)
- 1/16'' unions (x3)
- PEEK plugs 1/4-28 Black (x3)
- Flangeless fittings 1/4-28 (x4)
- Blue ferrules (x8)
- Tube cutter (x1)
- RayDrop support (x1)
- Lateral rails (x4)

4

FLUIGENT INDUSTRIAL

INTRODUCTION

For **integration** into **manufactured systems**, Fluigent has developed a wide range of **OEM products & services**. These are dedicated for **flow control** and **fluid handling** in microfluidic and nanofluidic applications. Equipments can easily be integrated into more complex instruments due to their compact design and **Software Development Kit**.

Fluigent complete OEM product & service line offers :

MICROFLUIDIC OEM EQUIPMENTS

(fluid management solutions, pressure control and generation, switching solutions, flow-rate measurement, ...)

CUSTOMIZABLE OEM FLOW CONTROL MODULES

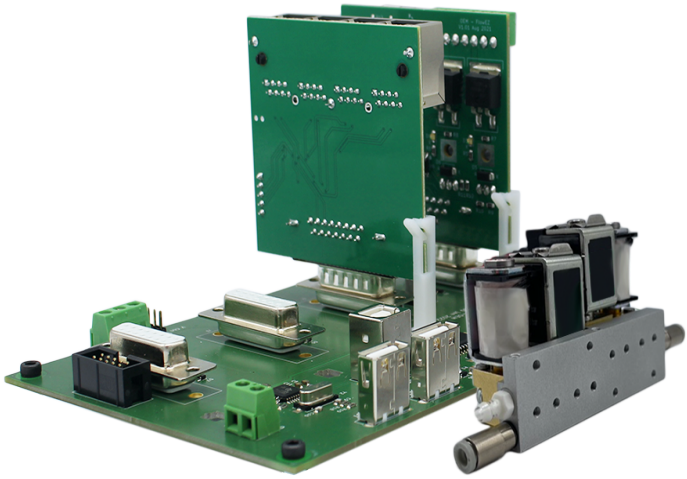
from Fluigent proprietary technologies (specific development from mechanical to fluidic, electronic and software, component integration, specific settings, ...)

FULLY CUSTOM MICROFLUIDIC DEVICE

(Any pressure / flow rate configuration, dedicated PCB, software integration)

F-OEM

Modular OEM microfluidic flow controller

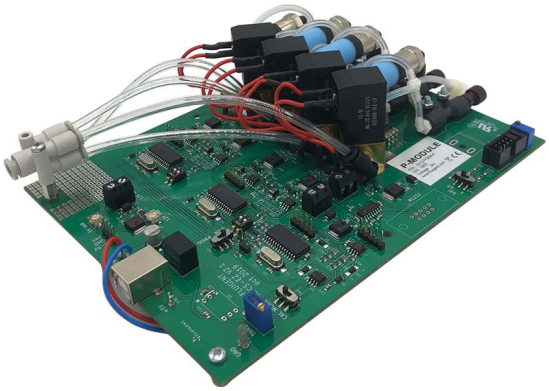


Our **F-OEM** offers our highest performance, efficiency, and widest pressure and flow rate ranges to support the most demanding industrial applications, including microfluidic and nanofluidic applications (microchannels, nanochannels, capillaries, lab on a chip...). It is a standalone, modular platform that will perform complex fluidic operations.

Compact standalone platform for industrial uses	*Flexible and configurable with pressure & switch*	*Contamination-free Not in contact with liquids*

P-OEM

Microfluidic flow management unit



The **OEM Microfluidic modules** are a range of products for **flow control** and **fluid handling** in microfluidic and nanofluidic applications. Dedicated for industrial microfluidic applications they can economically replace conventional syringe pumps or peristaltic pumps.

The multi-channel design is **highly compact**, ranging from **1 to 8 channels** for the OEM microfluidic modules. As fluids are not in contact with the instrument, there is no routine cleaning and cross-contamination is drastically reduced. **Positive or Negative pressure ranges** can be applied independently on different channels of the same module.

The optional advanced multi-channel **Flow-Rate Control Module Software** combined with the Flow Sensor Unit device makes it possible to have **full control of flow rates** in any coupled multi-channel configuration, while keeping the benefits of pressure actuation. Switching solutions can also be integrated to extend the **fluid management capabilities**. OEM versions of the **2-SWITCH** (3-port/2-way) and **M-SWITCH** (11-port/10-position) are **available for integration**.

Highly customizable through numerous options	*Adapted to industrial usage*	*Quality and application expertise*	*Compact solution*

PX SERIES

OEM microfluidic pressure controller

The **PX-series**, is the most versatile industrial pressure controller.
It is **fast and stable** thanks to our field proven, patented FASTAB™ technology.

The PX-series is **designed for OEM integration in industrial environments**. Its RS232 and USB ports ensure its communication with any system. The series presents **5 versions** regarding pressure range requirements.

High-Quality Pressure Control	*Unmatched Price-Performance Ratio*	*Designed for OEM Integration*	*Patented technology*

Characteristics

PX model	Range in mbar	P/N
PX-345	0 to 345	ICPX3451
PX-1	0 to 1000	ICPX11
PX-2	0 to 2000	ICPX21
PX-V1	0 to -600	ICPXV1
PX-V2	0 to -750	ICPXV2

NIFS

P/N : INIFS

Non-Invasive Flow Sensor for Industrial Integration

Our OEM non-invasive flow sensor (NIFS) is dedicated to flow rate monitoring and control.

When combined with Fluigent pressure controllers, it allows pressure-based flow rate control without fluid contact, no liquid calibration is needed. It allows for accurate and repeatable measurements of liquid flow rates from 100 µL/min and to 10 mL/min bi-directionally.

High performance	*Versatile*	*Reliable*
Industry-proven technology	*use for all liquids, wide flow rate range*	*No liquid contact*

Key applications

Including cell culture under flow, blood/plasma perfusion, organ-on-a-chip, single/double emulsions, microparticles or cell-encapsulation.

- **Cell biology**
  Many biological experiments require disposable or sterilized components in the fluidic path. The use of NIFS is ideal for these applications.
- **Microfluidic droplet generation**
  As there is no calibration needed to manipulate several liquids, the NIFS saves time when users want to generate droplets, a process that involves different fluids (aqueous solutions, oil, surfactants, alcohols...).
- **Biochemical and molecular analysis**
  A sterile environment and lack of need for a calibration step are beneficial for drug, enzyme or food analysis through screening with droplet microfluidics.

Key features

High accuracy and precision: With Fluigent's regulation control technology, the NIFS can measure flow rate with 5% accuracy.

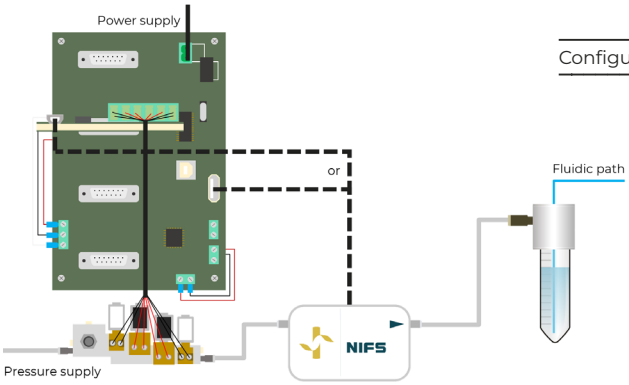
Liquid contamination-free: As the non-invasive flow sensor is placed in the pneumatic path, it does not touch the liquid. It is suitable for applications where sterility is required. No cleaning is necessary.

Fluid calibration-free: Unlike traditional flowmeters, the NIFS functions independently of the liquid properties.

Related products

F-OEM

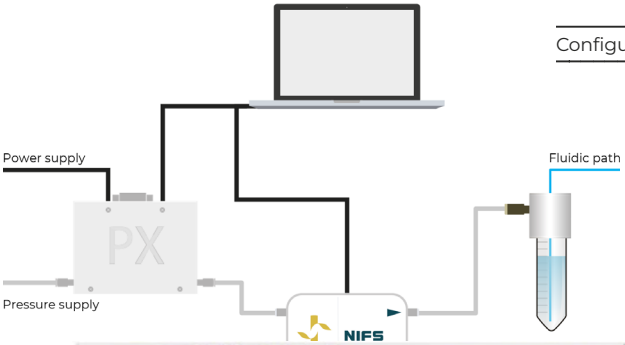
The F-OEM offers our highest performance, efficiency, and widest pressure and flow rate ranges to support the most demanding industrial applications



Configuration with F-OEM

PX-SERIES

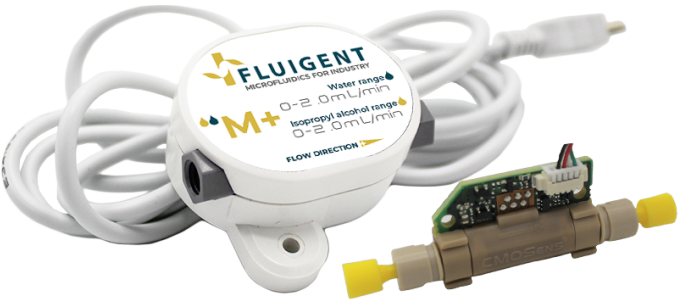
The PX-series, is the most versatile industrial pressure controller. It is fast and stable thanks to our field proven, patented FASTAB™ technology.



Configuration with PX-series

FS+ SERIES

Microfluidic OEM flow sensor



Our FS series is dedicated to flow-rate control and monitoring. When combined with Fluigent pressure controllers, it permits pressure-based flow control. It enables precise and accurate measurements of dynamic liquid flow rates from 0 – 1.5 µL/min and up to 40 mL/min bi-directionally.

FS+ series model	**XS**	**S**		**M+**		**L+**	
Part number	IFSXS1	IFSS1		FLU-M+-OEM		FLU-L+-OEM	
Sensor Inner Diameter	25 µm	150 µm		400 µm		400 µm	
Maximum Pressure	200 bar	200 bar		12 bar		12 bar	
Wetted Materials	PEEK & Quartz Glass			PPS, stainless steel 316L			
Calibrated Media	Water	Water	IPA	Water	IPA	Water	IPA
Range	0±1.5 µL /min	0±7 µL /min	0±70 µL /min	0±2 mL /min	0±2 mL /min	0±40 mL /min	0±40 mL /min
Accuracy (measured value)	10% mv above 75 nL /min	5% mv above 0.42 µL /min	20% mv above 4.2 µL /min	5% mv above 10 µL /min	10% mv above 50 µL /min	5% mv above 10 µL /min	10% mv above 50 µL /min
Lowest detectable flow increment	3.7 nL/min	10 nL/min		0.25 µL/min		25 µL/min	

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

Short response time pressure-based direct flow control | *High reliability* and long-term stability | *Reliable* industry-proven technology | *Intuitive* and easy-to-use systems

FS series model	XL	L		M	
Product Number	IFSXL1	IFSL1		IFSM1	
Sensor Inner Diameter	1.8 mm	1.0 mm		430 µm	
Maximum Pressure	5 bar	12 bar		100 bar	
Wetted Materials	PEEK and Borosilicate Glass				
Calibrated Media	Water	Water	IPA	Water	IPA
Range	0±5mL/min	0±1mL/min	0±10mL/min	0±80µL/min	0±500µL/min
Accuracy (measured value)	5% m.v above 0.2 mL/min	5% m.v. above 0.04 mL/min	20% m.v. above 0.5 mL/min	5% m.v. above 2.4 µL/min	20% m.v. above 25 µL/min
Lowest detectable flow increment	3 µL/min	0.7 µL/min		0.06 µL/min	

RX

OEM microfluidic pressure source

Model	**P/N**
RX	ISRX21

The **RX** is designed to be seamlessly integrated into OEM systems or used as a **standalone pressure source**. Packaged in a robust steel enclosure, it provides dried and filtered air at **up to 2500 mbar** for one or multiple pressure control module(s) such as the **PX-series** or other instruments which need compressed air to operate.

Compact & versatile | *Condensation-proof and filtered air* | *Designed for OEM Integration*

FULLY CUSTOM MICROFLUIDIC DEVICE

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

- Pioneers in innovative flow control solutions
- From product customization to specific solution development
- High Performance and Robustness
- Flexibility and compactness
- In house design and assembly
- Quality standard certification
- Broad range of applications
- Customer needs focused
- Highly experienced customer service

Whether you're a start-up or a larger organization, Fluigent can drive your microfluidic project from conception to design and manufacturing.

By partnering with us, customers benefit from Fluigent's portfolio of products, technologies, patents, and 15 years of experience with microfluidic technology.

We combine our expertise and knowledge to design and manufacture the highest quality custom microfluidic devices. Partner with Fluigent to accelerate your product time to market.

Fluigent expertise	*Flexible*	*Cost-efficient*
Microfluidic knowledge	*We adapt to your specifications needs*	*Device and development*

Fluigent's unique portfolio of technologies

- **DFC Flow Rate Control Algorithm**
  Self-learning algorithm allowing live pressure/flow-rate monitoring and control
- **Micropumps algorithm**
  Fluigent algorithm in micropumps for compact pressure supply and control
- **Fluid mixer & Temperature management**
  Biological vortex mixer. Orbital motion, mass compensated vibration, temperature modules for heating and cooling
- **Robotic pipetting**
  x-y-z robotic stage for fluid sampling into microwells
- **Non-intrusive flow sensing**
  Contact-free, no calibration needed, high presicion and accuracy

Custom software development

We provide custom software based on our well-known end-user software OxyGEN as well as on our SDK library for your custom microfluidic device.

Development Process

Fluigent discusses all users, business models, and technical specifications.

Business consulting & systems requirements

Technical feasibility & technology review

- *Identifying needs and specifications*
- *R&D propose the most cost-efficient solution*

- *Prototyping*
- *Continuous update on overall progress*
- *Send for test*

Solution development & prototyping

- *Start production*
- *Production files,*
- *Bench tests*
- *Training*

Industrialization and quality management

Your product on the market

- *First-class support*
- *Team training*
- *Spare part orders.*

FOCUS ON THE SCIENCE WITH FLUIGENT

Continuous support & service

5

SUPPORT & TOOLS

TIPS

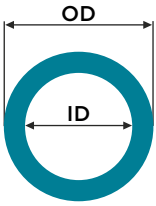
Working in a microfluidic environment almost automatically means using fittings and tubing to connect your microfluidic device or your Lab-on-a-chip to the various elements of your microfluidic circuit.

- *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.

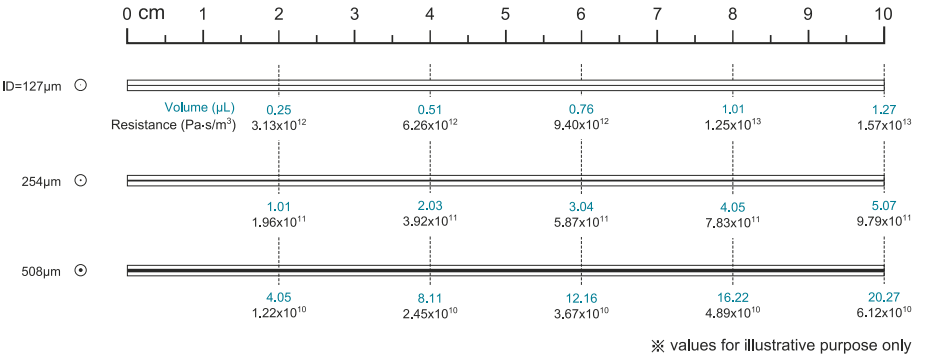
In order to get a clean interface and prevent any clogging or collapsing of the fluidic path, all tubing should be cut with specifically designed cutters.

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



※ values for illustrative purpose only

OD (OUTER DIAMETER) IDENTIFICATION

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

UNIT CONVERSIONS

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

CUSTOMER SUPPORT & SERVICE

Service & Technical Support from Fluigent-certified experts

At Fluigent, we understand that a non-functioning system means time lost in the lab. **Our 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.

Dedicated Fluigent-certified team & trained partners	*Diagnosis through remote session or on-site visit*	*Customer satisfaction oriented*

REFERENCE GUIDE

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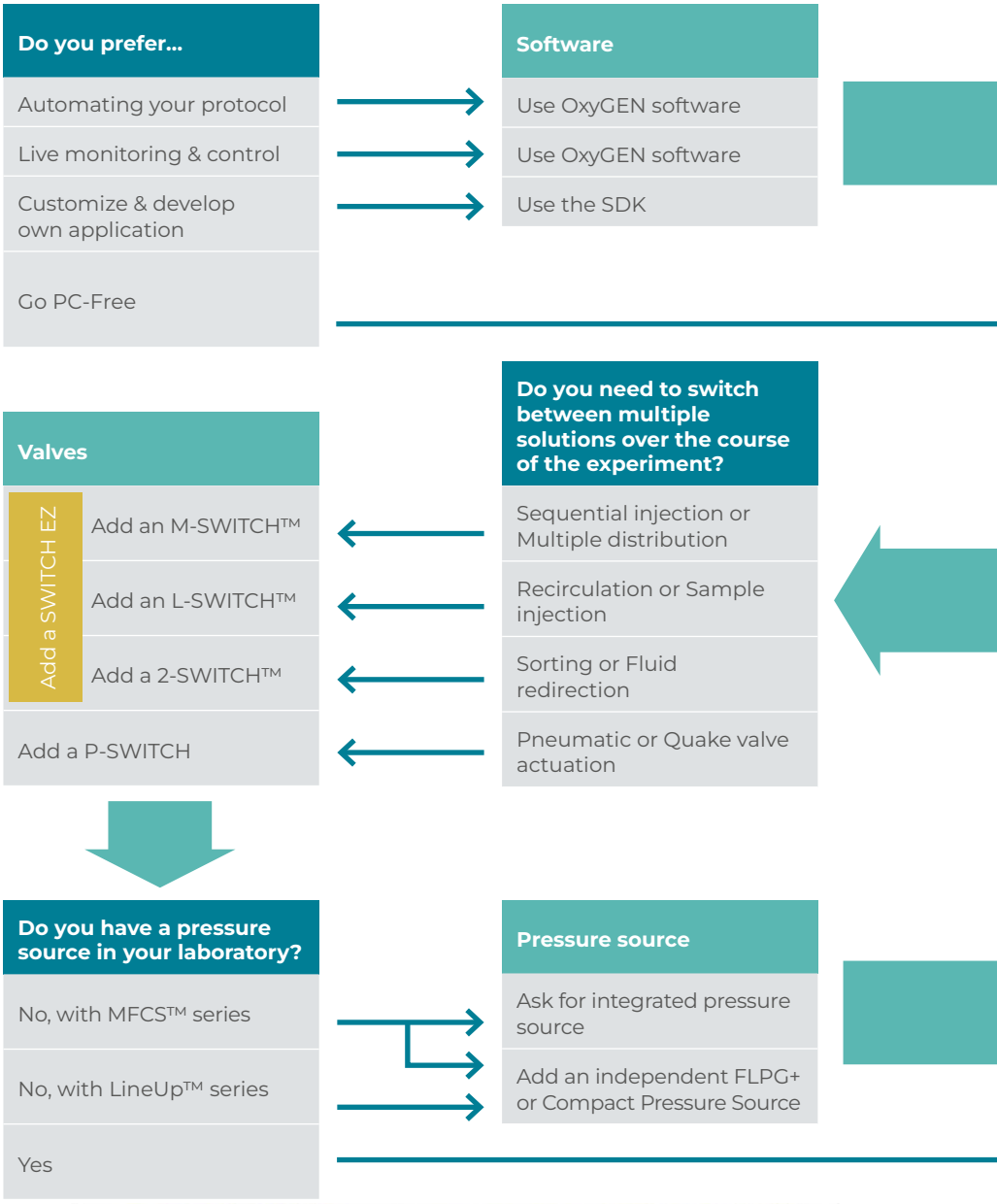
PRODUCT GUIDE



How many solutions/ liquids/fluids do you want to handle in your system?	Pressure system
5 to 8	Go with MFCS™-EX
4	Go with MFCS™-EZ
1 to 3	Go with LineUp™ series
I want to extend freely	Go with LineUp™ series
9 to 32	(Use LineUp™ P-SWITCH)

Do you work with:	Sensors
Flow rate	Add FLOW UNIT
Pressure only	No additional sensor
Extended pressure detection	Add PRESSURE UNIT

REQUEST A QUOTE

or

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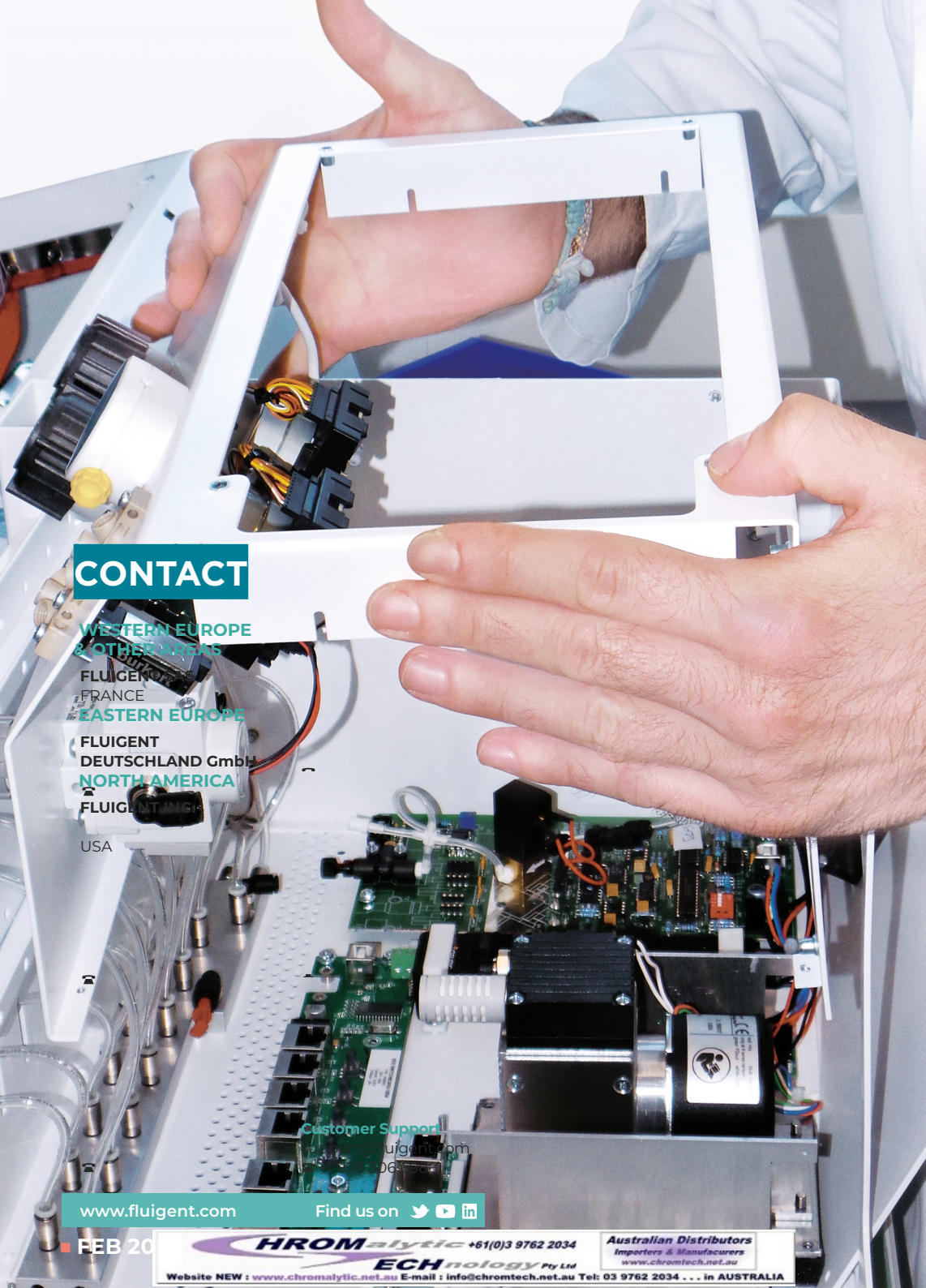
NOTES



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