FLOW UNIT+

P/N [FLU-XS]
P/N [FLU-S-D]
P/N [FLU-M+]
P/N [FLU-L+]

Microfluidic flow sensor

Fluigent's FLOW UNIT is a unique tool to easily monitor all the flow-rates in any microfluific system with the best precision and accuracy:

- **A micro heater provides a minimal amount of heat to the medium monitored (around 1°C)**
- **Two temperature sensors, located on both sides of the heater, detect any temperature variation. The flow-rate is then calculated based on the spread of heat, which is directly related to the flow- rate.**

KEY FEATURES

High accuracy for various flow rate ranges

Highly precise flow measurement with an accuracy of less than 5% of the measured value

Plug and play

Thanks to internally developed electronics and algorithms, the sensors are directly recognized by Fluigent systems and OxyGEN/SDK for starting experiments right away.

Compact & intuitive

The sensors were developed to minimize benchtop space and provide intuitive use.

Air bubble detection*

In addition to liquid monitoring, it is possible to detect bubbles during an experiment

*Bubble detection is only available for the FLOW UNIT+ series (M+ and L+)

KEY APPLICATIONS

Next-generation sequencing (NGS) applications using for instance microfluidic Digital PCR to quantify ctDNA in liquid biopsies for oncology

Microscopy for cell biology research, DNA-PAINT imaging, genomics research, live cell imaging

Drug discovery using microphysiological systems such as 3D-(co)-cultures, organoids, organ-on-chip models

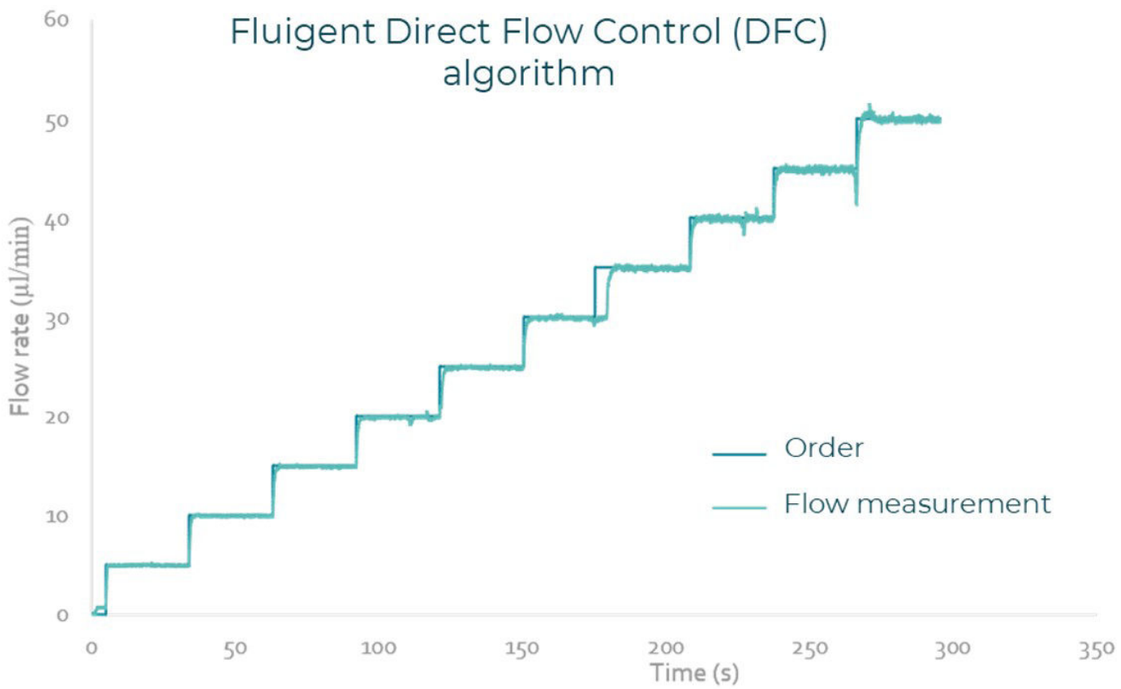
Molecular analysis using including microfluidic modulation spectroscopy or mass photometry

EXPERTISE

Highly stable, and responsive real-time flow rate control

By connecting a flow rate sensor to Fluigent pressure controllers, it is possible to monitor or control the flow rate in real time. The algorithm includes a continuous optimization of the parameters, allowing it to adapt to the interactions between fluidic channels in complex situations.

- No overshoot/undershoot, allowing for an immediate response
- Adapts to any reservoir size
- Useful over a wide pressure or vacuum range



FLOW UNIT+ | TECHNICAL DATASHEET
https://www.fluigent.com/resources-support/support-tools/downloads/technical-datasheets/flow-unit-plus-datasheet/

FLOW UNIT+ SERIES

Mid to high flow rate ranges (7µL/min – 40 mL/min)

For applications that require flow rates ranging from 7 µL/min to 40 mL/min, we recommend our latest flow sensor series. It consists of a sensor and electronics integrated into a compact casing. Using these flow sensors, one can also monitor the liquid temperature and detect air bubbles that pass through the sensor.

FLOW UNIT M+

H2O full-scale flow rate: 0 - ± 2 mL/min

Accuracy : ±5 % of measured value if flow rate > 10 µL/min, 0.5 µL/min if flow rate < 10 µL/min

*Additional specifications available on the specification table

FLOW UNIT L+

H2O full-scale flow rate: 0 - ± 40 mL/min

Accuracy : ±5 % of measured value if flow rate > 1 mL/min, 50 µL/min if flow rate < 1 mL/min

*Additional specifications available on the specification table

WARNING: Avoid voltage difference between sensor and medium as there is no electrical isolation from the flow channel.

For additional information, please contact us : contact@fluigent.com | visit : www.fluigent.com |

FLOW UNIT SERIES

Low volumes applications (<10µL/min)

For applications that require flow rates ranging lower than 10 µL/min, we recommend our original flow sensor series.

FLOW UNIT XS

H2O full-scale flow rate: 0 - ± 1.5 µL/min

Accuracy : ±10 % of measured value if flow rate > 75 nL/min, 7.5 nL/min if flow rate > 75 nL/min

*Additional specifications available on the specification table

FLOW UNIT S

H2O full-scale flow rate: 0 - ± 7 µL/min

Accuracy : ±5 % of measured value if flow rate > 0.42 µL/min, 21 nL/min if flow rate < 0.42 µL/min

*Additional specifications available on the specification table

Note: FLOW UNIT M (H2O full-scale flow rate: 0 - ± 80 µL/min), L (H2O full-scale flow rate: 0 - ± 1000 µL/min) and FLOW UNIT XL (H2O full-scale flow rate: 0 - ± 5000 µL/min) are also available for specific usage. For more information, please contact us.

FLOW UNIT+ | TECHNICAL DATASHEET
https://www.fluigent.com/resources-support/support-tools/downloads/technical-datasheets/flow-unit-plus-datasheet/

SPECIFICATIONS

	FLOW UNIT series		FLOW UNIT+ series	
Sensor model	**XS**	**S**	**M+**	**L+**
Performance				
Calibrated media / Liquid compatibility	Water	Water Isopropyl Alcohol (IPA)	Water Isopropyl Alcohol (IPA) FCA 40 Mineral oil HFE 7500* *Warning: The sensor chip is not electrically isolated from the flow channel and the medium passing through it. Therefore, a voltage difference between sensor and medium should be avoided at all times. Not compatible with pluronic fluids.*	Water Isopropyl Alcohol (IPA) FCA 40 Mineral oil HFE 7500* *Warning: The sensor chip is not electrically isolated from the flow channel and the medium passing through it. Therefore, a voltage difference between sensor and medium should be avoided at all times. Not compatible with pluronic fluids.*
Range	Water: 0±1.5 µL/min	Water: 0±7 µL/min IPA: 0±70 µL/min	Water and IPA: 0 to +/-2ml/min	Water and IPA: 0 to +/- 40ml/min
Accuracy at 23°C (m.v = measured value)	Water: 10% m.v. above 75 nL/min 7.5 nL/min below 75 nL/min	Water: 5% m.v.above 0.42 µL/min 21 nL/min below 0.42 µL/min IPA: 20% m.v. above 4.2 µL/min 210 nL/min below 4.2 µL/min	Water: 5% mv above 10µL/min 0.5µl/min below 10 µL/min IPA: 10% mv above 50 µL/min 5 µL/min below 50 µL/min	Water: 5% mv above 1mL/min 50µl/min below 1mL/min IPA: 10% mv above 2mL/min 200 µL/min below 2mL/min
Lowest detectable flow increment	3.7 nL/min	10 nL/min	0.25 µL/min	25 µL/min
Repeatability	Water <1% m.v. above 90 nL/min 0.9 nL/min below 90 nL/min	Water 0.5% m.v. above 0.7 µL/min 3.5 nL/min below 0.7 µL/min IPA 1% m.v. above 0.7 µL/min 7 nL/min below 0.7 µL/min	At 23°C Water & IPA 0.5% mv above 100µL-min 0.5µL/min below 100µL/min	At 23°C Water & IPA 0.5% mv above 2mL/min 10µL/min below 2mL/min
Mechanical specifications				
Dimensions	80 x 35 x 22 mm	80 x 35 x 22 mm	48 x 36 x 26 mm	48 x 36 x 26 mm
Length of the electrical cable	1,5m	1,5m	1,5m	1,5m
Maximum pressure	200 bar	200 bar	12 bar	12 bar
Operating temperature	+10°C ... +50°C	+10°C ... +50°C	+5°C ... +50°C	+5°C ... +50°C
Autoclavable	No	No	No	No
Wetted materials	PEEK and Quartz Glass	PEEK and Quartz Glass	PPS, stainless steel 316L Fittings :PEEK/ETFE	PPS, stainless steel 316L Fittings :PEEK/ETFE
Total mass	97 g	97 g	97 g	97 g
Inner volume	1 µL	1.5 µL	~ 28 µL	~ 58 µL
Sensor inner diameter	25 µm	150 µm	400 µm	1.4 mm
Fluid connector ports	UNF 6-40 for 1/32" OD tubing	UNF 6-40 for 1/32" OD tubing	UNF ¼"-28 flat bottom for 1/16" OD tubing	UNF ¼"-28 flat bottom for 1/16" OD tubing

* By default calibration water, but can change using OxyGEN software or FEZ on local mode.

For additional information, please contact us : contact@fluigent.com | visit : www.fluigent.com |

CERTIFICATION

The FLOW UNIT series are CE and RoHS compliantFLUIGENT SA is ISO 9001 certified since 2010

SUPPORT & CONTACT

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