

NIFS

Non-Invasive-Flow Sensor for Industrial Integration

Our NIFS is dedicated to flow rate measurement and control. When combined with Fluigent pressure controllers, it provides pressure-based flow rate control. It allows for accurate and repeatable measurements of dynamic liquid flow rates from:

100 μ L/min and to 10 mL/min



KEY FEATURES

High accuracy and precision

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

Contamination-free

As the sensor is placed in the pneumatic path, it is not in contact with the liquid, making it suitable for applications where sterility is required. No cleaning or maintenance is needed.

Calibration-free

Unlike traditional flowmeters, the NIFS functions independently of the liquid properties.

Plug & Play

The sensor is compact and is directly recognized and integrated in your microfluidic setup by Fluigent's software when connected.

KEY APPLICATIONS

Cell biology: many biological experiments require disposable or sterilized components in the fluidic path.

Microfluidic droplet generation: as there is no calibration needed to control different liquids, the NIFS saves time during this process that involves different fluids (aqueous solutions, oil, surfactants, alcohols...).

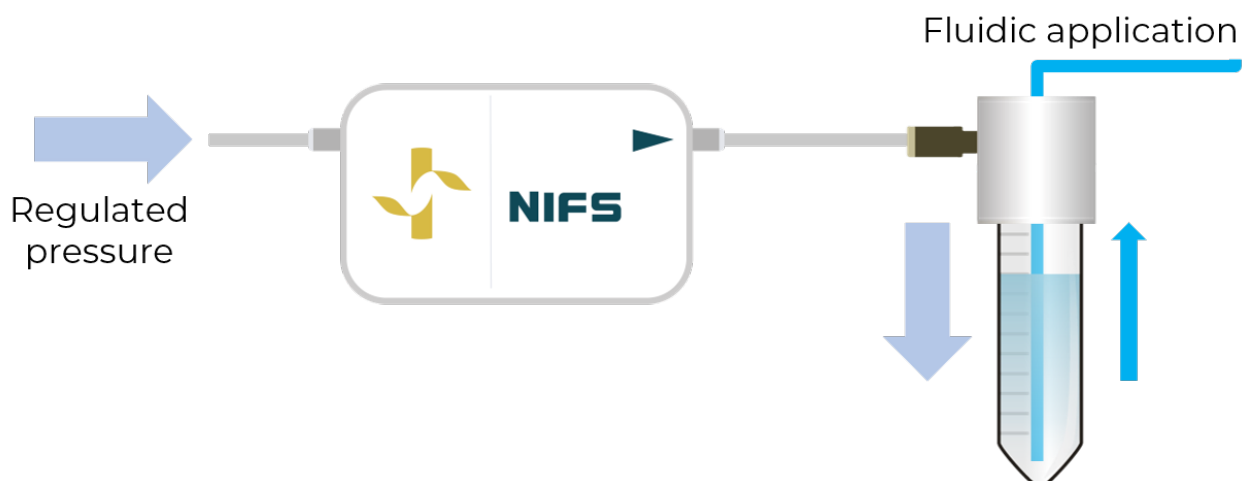
Biochemical and molecular analysis: the sterile environment and elimination of a calibration step speeds up drug, enzyme or food analysis through screening with droplet microfluidics.

EXPERTISE

An innovative solution for microfluidic flow rate sensors

Effective microfluidic flow control requires precise flow rate measurements that do not interfere with the process occurring. Flow rate sensing is even more crucial for pressure-based controllers because they need an external flow meter to be able to perform flow rate control.

The NIFS derives the fluidic flow rate from the measurement of the air flow rate in the pneumatics at the outlet of a [F-OEM](#) / [P-OEM](#) / [PX](#), thanks to a zero-leakage system. It is completely non-intrusive and thus prevents contamination or clogging.

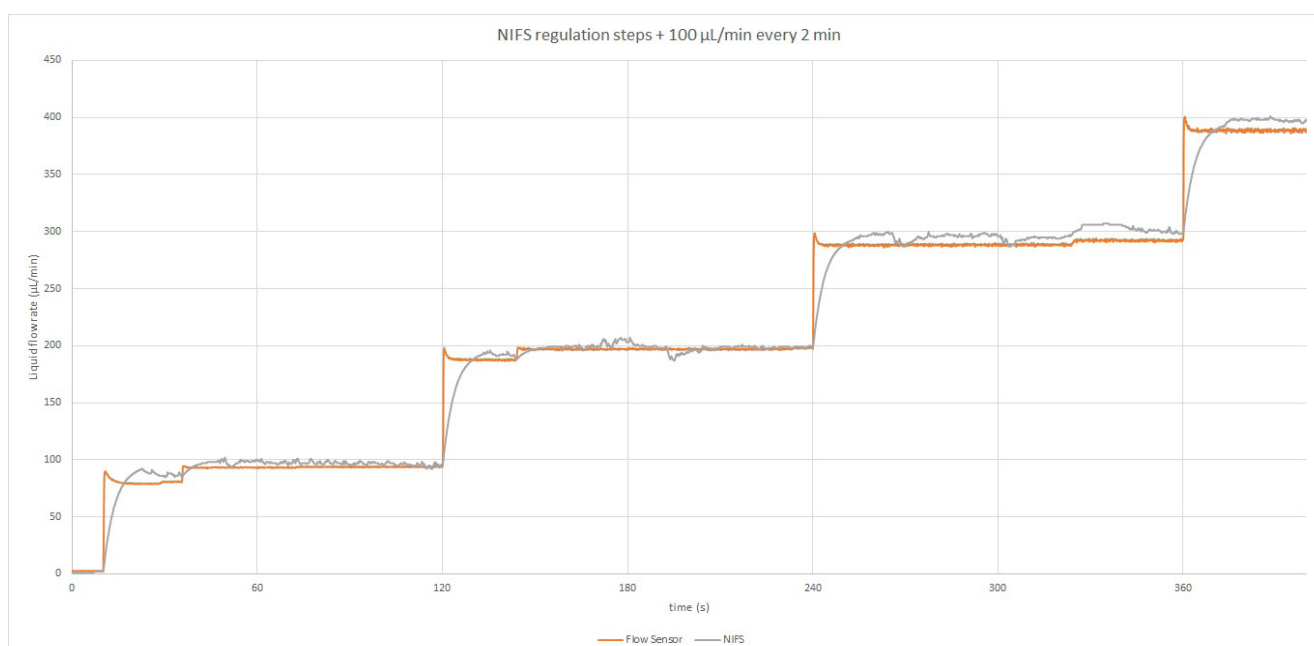


schematic NIFS setup

Fluigent expertise for durable and highly stable flow rate control

By connecting a NIFS to Fluigent pressure controllers, one may monitor or control the flow rate in real time. The algorithm continuously optimizes the parameters, allowing it to adapt to the interactions between fluidic channels in complex geometries.

- No overshoot/undershoot - allowing for a responsive, accurate, and stable flow rate
- Adaptable to three reservoir sizes
- Compatible with wide pressure and vacuum ranges



Result graph using DFC algorithm

One reference for a wide range of flow rates

For applications that require a contamination-free or sterile environment, working with several types of fluids, continuous operation with slow flow response time and flow rates ranging from $100 \mu\text{L}/\text{min}$ to $10 \text{ mL}/\text{min}$, we recommend our latest flow sensor, the NIFS.

It consists of sensing elements and electronics integrated into a compact case. Standard M3 sized screws can be used for fixing the device.



SPECIFICATIONS

Sensor performance

Part Number	[INIFS]
Calibrated media	Air
Range	100 μ L/min to 10 mL/min
Accuracy	5% reading
Lowest detectable flow increment	5 μ L/min
Response time	10 s for reading 10 to 30 seconds for regulation (depends on the volume to control and the setup)

Compatibility

Products	FOEM: via micro-USB or via USB-A connected to computer POEM/PX: via USB-A connected to computer NOT COMPATIBLE WITH Flowboard OEM
Accessories	2 mL reservoir + P-CAP lock 15 mL reservoir + P-CAP screw 50 mL reservoir + P-CAP screw
Software	SDK (Software Development Kit)

Mechanical specifications

Dimensions	99.85 x 45.00 x 33.50 mm
Length of the electrical cable	1 m
Maximum pressure	2 bar
Weight	117 g
Pneumatic connector ports	4 mm OD

COMPARISON

Between FS series and NIFS

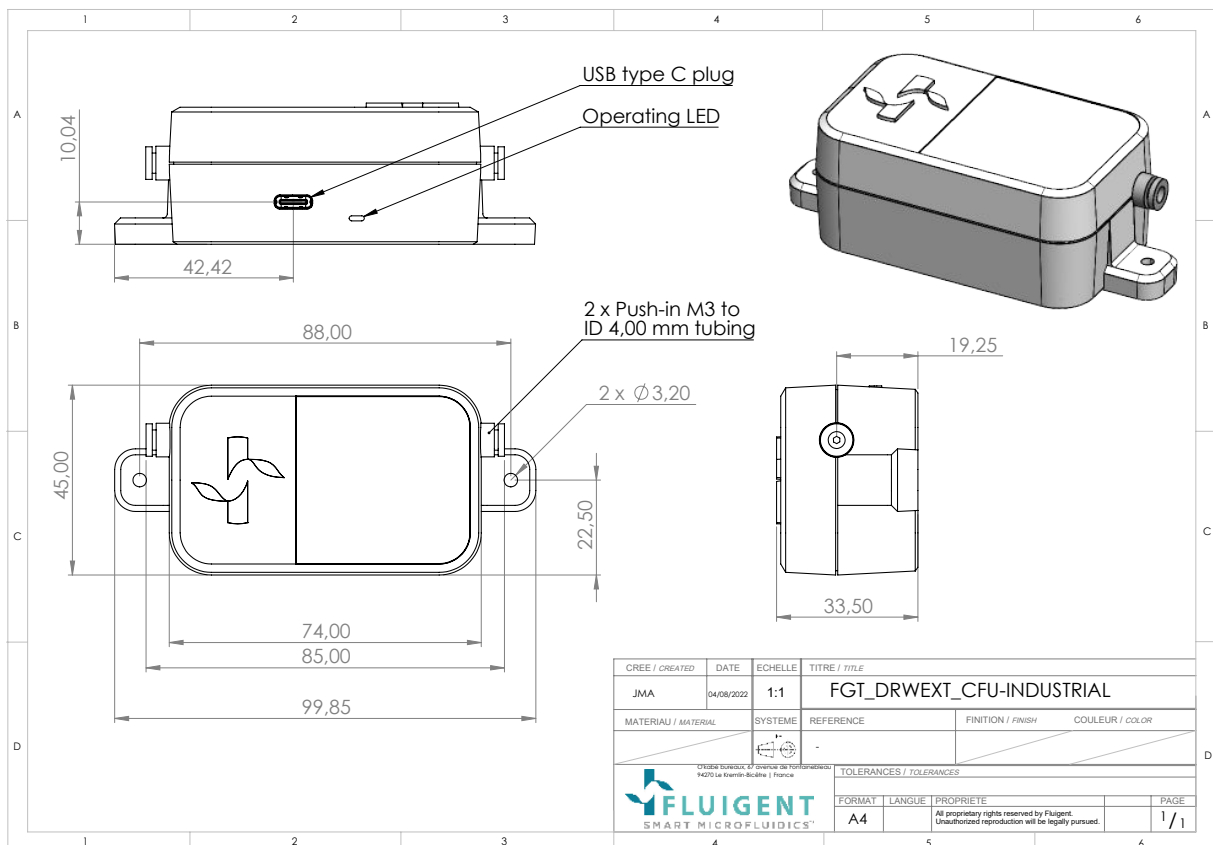
Product	NIFS	FS series
Invasiveness	Noninvasive: connected to the pneumatic path	Invasive: connected to the fluidic path
Calibration	Not required	Required for fluids with different viscosity than water, IPA, HFE or oil
Flow rate range	100 µL/min to 10 mL/min	75 nL/min to 10 mL/min
Maximum operating pressure	2 bar	15 bar
Response time (regulation)	10 to 30 sec*	< 1 sec
Accuracy	Excellent	Excellent
Recommended use cases	<ul style="list-style-type: none"> - Manipulation of several liquids (no calibration/cleaning steps) - Long-term processes that risk contamination or clogging (non-intrusive) 	<ul style="list-style-type: none"> - Manipulation of aqueous fluids only (no calibration step) - Processes with many flow rate changes (excellent response time and stability at low flow rates)

*Depends on the volume to control and the setup

SCHEMATICS

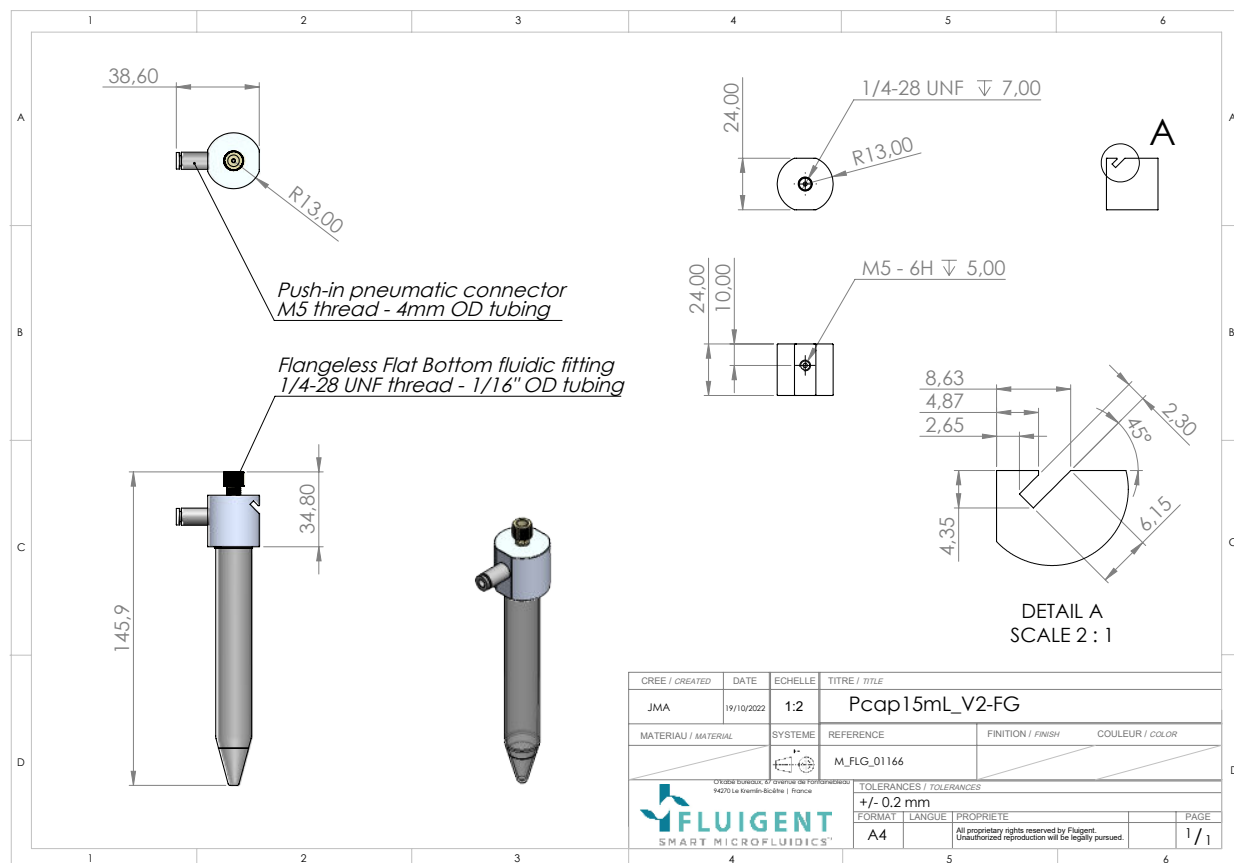
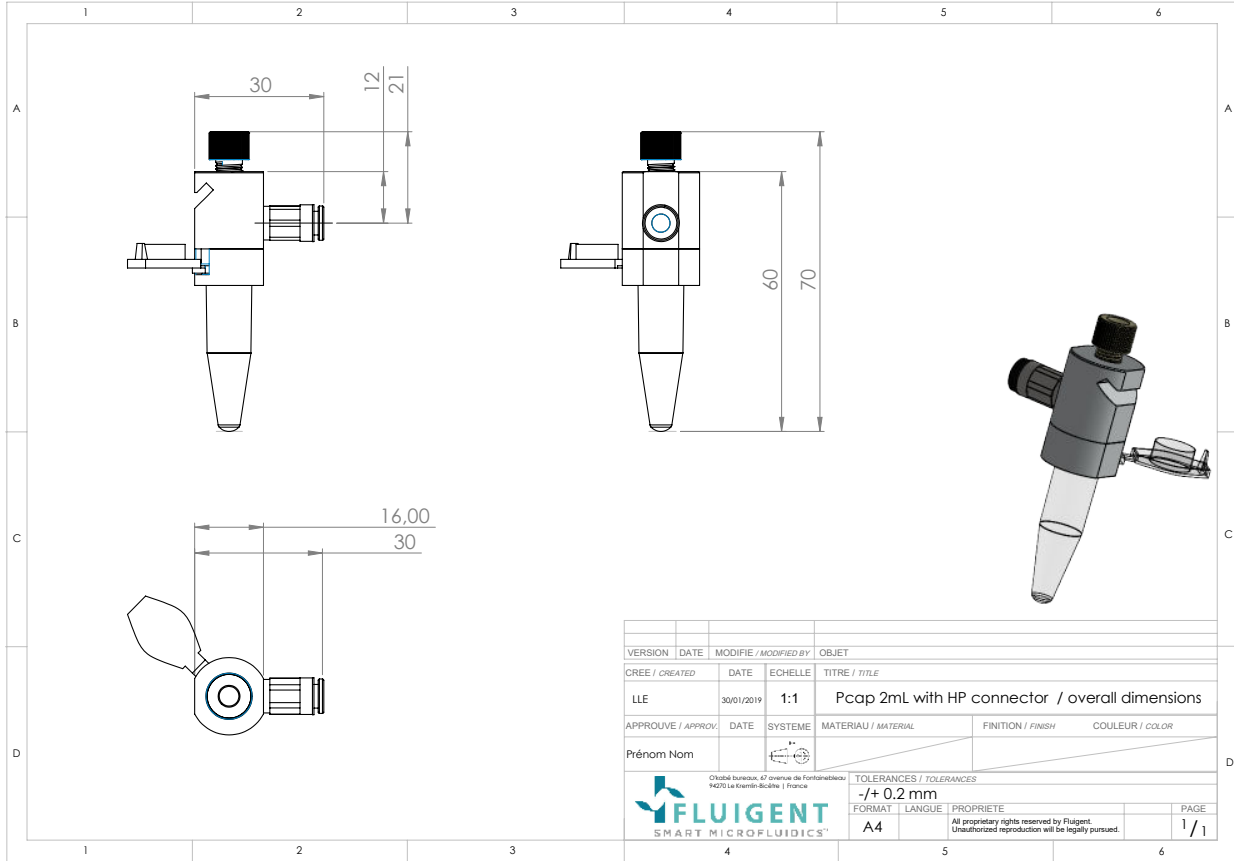
FS series

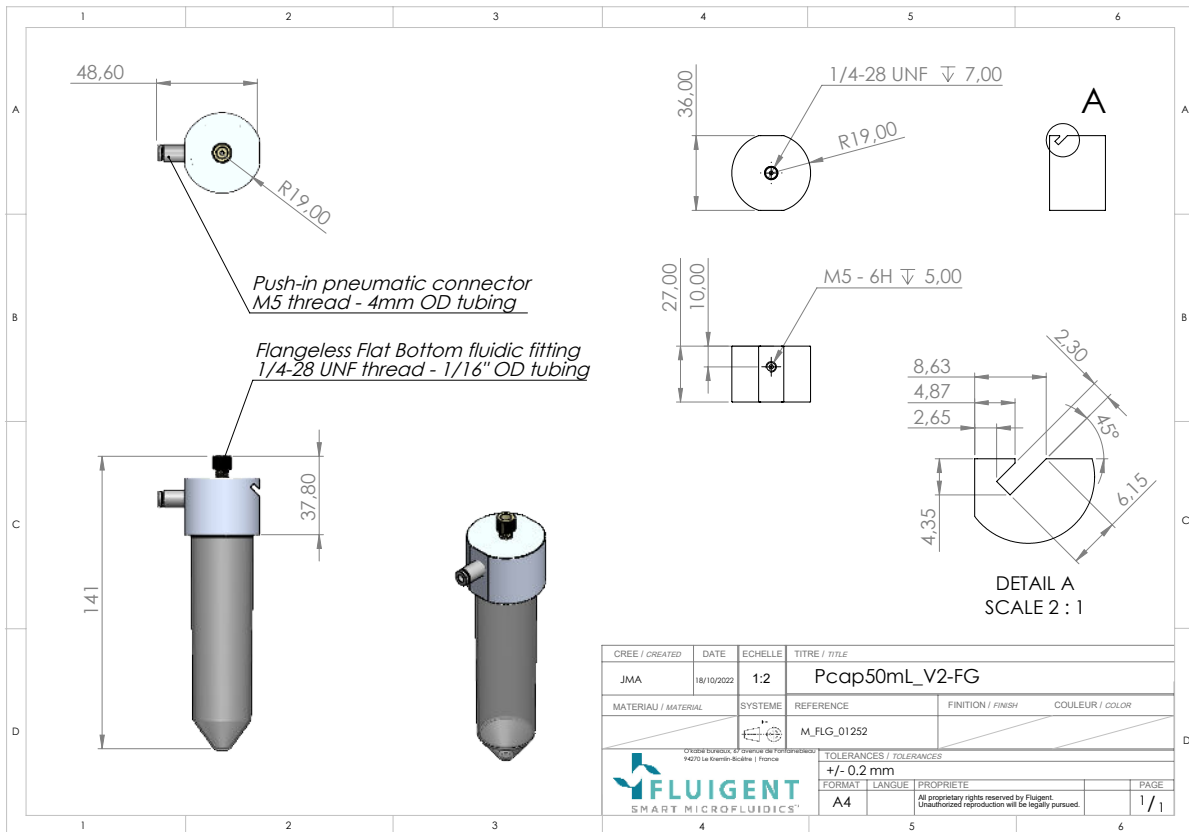
All dimensions in mm



SCHEMATICS

P-CAP series





CERTIFICATION

The FS Series are CE and RoHS compliant
 FLUIGENT SA is ISO 9001 certified since 2010



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