



# Mass Flow Meters for Gases

Experts for Smart Sensor Solutions

**SENSIRION**  
THE SENSOR COMPANY

# High Performance Gas Flow Measurement

With our long history of designing mass flow solutions for medical technology and industrial automation, we are your ideal partner to support you in the development of new products. Sensirion offers mass flow meters for diverse applications thanks to these key characteristics:

- Excellent repeatability
- Fast response time
- High sensitivity at low flows
- Wide dynamic range
- Reliability and robustness
- Bidirectionality

For more information, please visit: [www.sensirion.com/massflowmeter](http://www.sensirion.com/massflowmeter)

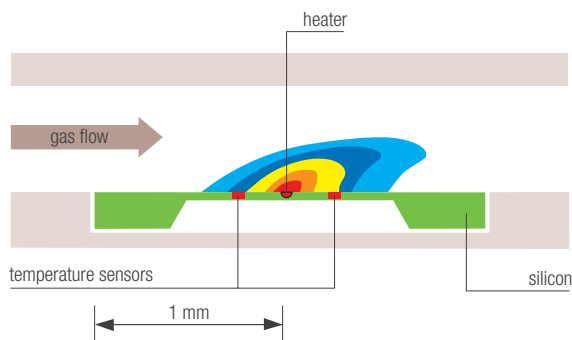
Process  
Automation

Respiratory  
Applications

Burner Control

## UNIQUE MEASUREMENT PRINCIPLE

Sensirion's mass flow meters ensure fast, accurate and economical measurements of gas flow over a wide dynamic range. At the heart of every Sensirion mass flow sensor is a MEMS-based calorimetric microsensor, which measures the gas flow using the thermal measurement principle (see illustration). The sensor element is integrated with the signal conditioning electronics on a single chip. This unique technological approach – provided by innovative CMOSens® Technology – results in excellent performance and robustness at a very attractive cost. That is why today leading manufacturers rely on Sensirion's highly sensitive flow meters.



Gas Metering

# What we offer

Expert first contact

Fast and easy  
product evaluation

Customized solutions

Design-in support

Lifetime support

## 1. EXPERT FIRST CONTACT

- Specialized and experienced sales force
- Worldwide presence with a global distribution network

## 2. FAST AND EASY PRODUCT EVALUATION

- Comprehensive product portfolio
- Easy-to-use evaluation kits for effortless measurement during sensor evaluation
- Technical documents – datasheets, sample code, application notes

## 3. CUSTOMIZED SOLUTIONS

- Various flow rates
- A variety of gases (multigas option)
- Special form factor requirements

## 4. DESIGN-IN SUPPORT

- Assistance in the integration of Sensirion's sensors into your application
- Proven best practices to ensure that your production concept accommodates the requirements of our mass flow meters

## 5. LIFETIME SUPPORT

- Reliable and flexible production
- Sustainable product innovation roadmap to meet your future needs

# Fuel Cells

## EVALUATION KITS FOR FAST AND EASY TESTING

The EK-F3X and EK-F4X evaluation kits are test sets for Sensirion's SFM3000 and SFM4100 mass flow meters. Precise test measurements can be made quickly and inexpensively with these ready-to-use kits. Both evaluation kits consist of a USB stick with an adapter cable and are easy to connect to your computer via a USB port. The viewer software can be downloaded from our website. The software allows measurements at various resolutions and displays mass flow in standard liters per minute (slm). Data can be logged and exported to Excel.



# Analytical Instruments

# Selection of Sensirion Mass Flow Meters

## SFM3000 SERIES

### SFM3000

- Versatile digital flow meter
- Fully bidirectional
- Low pressure drop



### SFM3300-AW / SFM3300-D

- Fully calibrated proximal flow sensor for respiratory applications
- Small dead space and low pressure drop
- Single-use and autoclavable/ washable version



### SFM3100

- Versatile analog flow meter
- Additional temperature sensor
- Small form factor



### SFM3400-AW / SFM3400-D

- Neonatal proximal flow meter, fully calibrated
- Small dead space and low pressure drop
- Single-use and autoclavable/ washable version



### SFM3200 / SFM3200-AW

- SFM3200 for inspiratory use in respiratory applications
- SFM3200-AW for expiratory use in respiratory applications
- Extremely good low-flow performance



	SFM3000	SFM3100	SFM3200 / SFM3200-AW	SFM3300-AW / SFM3300-D
<b>Autoclavable / Washable</b>	No	No	Yes (SFM3200-AW) / No (SFM3200)	Yes (SFM3300-AW) / No (SFM3300-D)
<b>Flow range<sup>1</sup></b>	–200 to 200 slm	–24 to 240 slm	–100 to 250 slm	–250 to 250 slm
<b>Accuracy, offset</b>	0.05 slm	0.1 slm	0.05 slm	0.1 slm
<b>Accuracy, % of MV</b>	2.50 %	2.5% (< 60 slm) 4% (< 150 slm) 5% (< 240 slm)	2% (–40 to 80 slm) 3% (–60 to 100 slm) 7% (–100 to 250 slm)	3 % (–100 to 100 slm) 7 % (–250 to 250 slm)
<b>Repeatability / Noise</b>				
Low flow range	++	+++	+++	++
High flow range	++	+	+	+
<b>Pressure drop</b>	< 1 mbar @ 60 slm	< 3 mbar @ 60 slm	< 1 mbar @ 60 slm	< 1.8 mbar @ 60 slm
<b>Fluidic interface</b>	Medical Cone (22 mm) & O-ring	O-ring	Medical Cone (22 mm) & O-ring	Medical Cone (22 mm) & O-ring
<b>Interface</b>	digital, I <sup>2</sup> C	analog	digital, I <sup>2</sup> C	digital, I <sup>2</sup> C
<b>Sampling time</b>	0.5 ms	N/A	0.5 ms	0.5 ms
<b>Calibrated for</b>	Air, N <sub>2</sub> , O <sub>2</sub>	Air, N <sub>2</sub> , O <sub>2</sub>	Air, N <sub>2</sub> , O <sub>2</sub>	Air, N <sub>2</sub> , O <sub>2</sub>
<b>Power supply</b>	5V	5V	5V	5V
<b>Max working pressure</b>	1.3 bar	1.3 bar	1.07 bar	1.1 bar

<sup>1</sup> slm = standard liters per minute

## SFM4000 SERIES

### SFM4100

- Versatile digital flow meter
- Pressure stable up to 6 bar
- For gas mixing applications (e.g. anaesthesia)



### SFM4200

- Versatile digital flow meter
- Pressure stable up to 8 bar
- Downmount connector for manifold integration



## SFM5000 SERIES

### SFM5300 / SFM5400

- Versatile high-precision flow meters
- Metal body, pressure stable up to 10 bar
- Wide range of gas calibrations and flow ranges



# Medical

	SFM3400-AW / SFM3400-D	SFM4100	SFM4200	SFM5300 / SFM5400
<b>Autoclavable / washable</b>	Yes (SFM3400-AW) / No (SFM3400-D)	No	No	No
<b>Flow range<sup>1</sup></b>	–33 to 33 slm	0 to 20 slm	0 to 160 slm	various flow ranges 0 to 50 sccm to 0 to 100 slm
<b>Accuracy, offset</b>	0.02 slm	0.03 slm	0.04 slm	0.1% FS
<b>Accuracy, % of mv</b>	3 %	3 %	2.5 % (< 80 slm) 5 % (> 80 slm)	1 %
<b>Repeatability / noise</b>				
Low flow range	+++	++	+++	+++
High flow range	++	++	++	+++
<b>Pressure drop</b>	< 1 mbar @ 5 slm	< 25 mbar @ 20 slm	< 20 mbar @ 60 slm	depending on flow range
<b>Fluidic interface</b>	Medical Cone (15 mm)	Downmount & Legris connector	Downmount	Downmount, Swagelok, VCR, VCO, Legris, UNF thread
<b>Interface</b>	digital, I <sup>2</sup> C	digital, I <sup>2</sup> C	digital, I <sup>2</sup> C	digital (RS485, IO-Link, DeviceNet), analog
<b>Sampling time</b>	0.5 ms	4.6 ms	0.5 ms	1 ms
<b>Calibrated for</b>	Air, N <sub>2</sub> , O <sub>2</sub>	Air, N <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> O, Ar, CO <sub>2</sub>	Air, N <sub>2</sub> , O <sub>2</sub>	Air, N <sub>2</sub> , O <sub>2</sub> , Ar, CO <sub>2</sub> , He, H <sub>2</sub> other gases on request
<b>Power supply</b>	5V	3.5 to 9V	5V	14 to 26V
<b>Max working pressure</b>	1.1 bar	6 bar	8 bar	10 bar

<sup>1</sup> slm = standard liters per minute

# Sensing. Anytime. Anywhere.

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