Liquid flow sensors

Precise measurements, even at lowest flow rates

SENSIRION

Inspiring technology

Sensirion's liquid flow meters establish new standards wherever monitoring of low liquid flow rates, liquid handling and liquid dispensing is important. Our unique CMOS® Technology allows bidirectional liquid flow measurement through the wall of the sensor's flow channel from hundreds of milliliters per minute down to single-digit nanoliters per minute. Applications in fields like medical devices, diagnostics and process and automation technology benefit daily from our safe and reliable sensor solutions.

For more information, please visit: www.sensirion.com/liquidflow

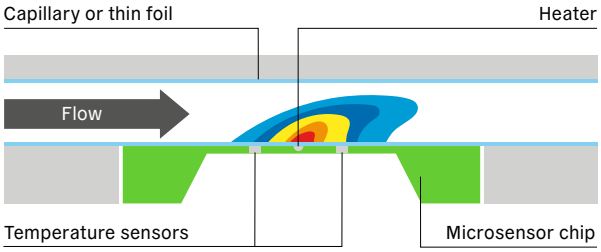
Patented technology

Sensirion's CMOS® flow sensor technology is based on a thermal microsensor, and is most effective at flow rates up to 1 l/min. The key element in our products is an integrated digital CMOS® microchip bonded to the outside of the sensor's flow channel for precise measurement through the wall of the flow channel. Our liquid flow meters offer completely media-isolated flow sensing with no moving parts or obstacles in the flow path. We offer our customers the world's smallest and most precise liquid flow meters, and inspire new designs and applications throughout all industries. High reliability and perfect media compatibility make our sensors ideal for use in medical and life sciences, diagnostics, semiconductor, factory automation and energy management applications.

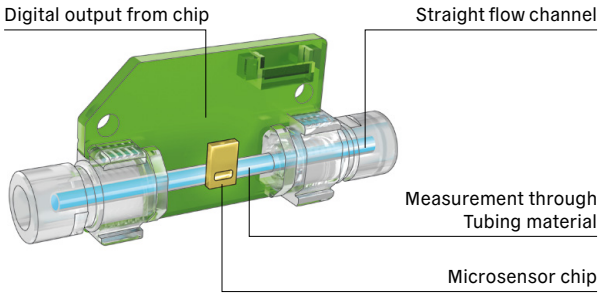
Fast, small, reliable

Sensirion's standard liquid flow meters provide exceptional value for money and eliminate the need for investment in application-specific OEM sensor development. Inert wetted materials ensure excellent process compatibility, industry-standard fluidic fittings enable quick assembly on the fluidic line and downmount fittings allow compact installation in manifold systems. Through the use of capillaries with different diameters, Sensirion's liquid flow meters cover flow rates over eight orders of magnitude, from single-digit nanoliters up to a liter per minute.

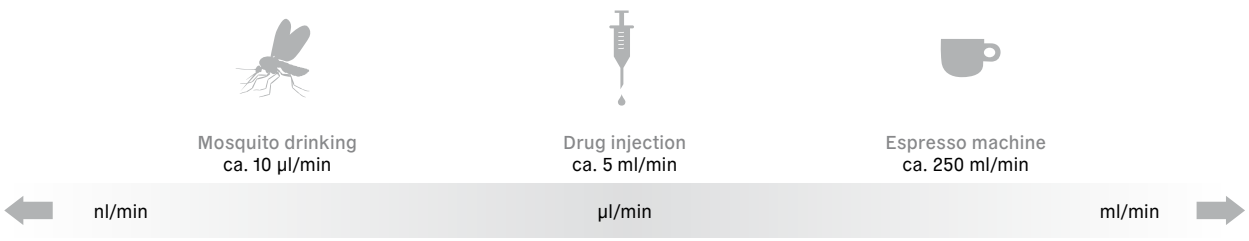
In addition to the sensor element, the CMOS® chip integrates the complete digital intelligence and memory for signal linearization, temperature compensation and self-test algorithms. Various digital (I²C, RS485, USB) or analog output options are available for easy testing and seamless integration. Please contact our experts to discuss possible options for customized solutions: info@sensirion.com



Flow measurement principle



Schematic layout of a liquid flow meter



Sensirion is able to measure flow rates from single-digit nl/min up to several hundred l/min.
Contact us if you require higher flow rates: info@sensirion.com

Liquid flow sensors

SLF3x series: The SLF3x series takes its well-established functionality to the next level in the price-performance ratio. In addition to an unprecedented turndown ratio reaching up to 1 l/min, the series maximizes safety, stability and long-term reliability in a vast range of high-volume OEM applications. Tube and downmount fluidic interfaces are available.

LD20 series: The LD20 sensors measure liquid flow rates of up to 1,000 ml/h at the point of interest, enabling a more direct and effective patient treatment. It combines Sensirion's proven sensing technology with a single-use design for high-volume applications in the biomedical, life sciences and food industry sectors.

SLG series: SLG liquid flow meters for ultra-low flow rates (down to single-digit nanoliters per minute) are the perfect solution for dynamic liquid flow monitoring at high pressures and/or low flow rates, such as cutting-edge UHPLC applications. The fused silica flow channel withstands pressures of up to 1,200 bar.

SLI/SLS series: With Sensirion's flow meter technology in a protective housing, SLI/SLS liquid flow meters are ideal for laboratory work and for use in the automation industry. In combination with the SCC1 sensor cables, they provide RS485, analog or USB output for reliable communication in harsh environments.

LG16 series/LG01: Inert wetted materials and ultra-low flow capabilities make the LG16 series a versatile addition to demanding OEM applications. The LG01 liquid flow switch enables straightforward event detection of flow, bubbles and leakages.

LS32-1500: The LS32-1500 comes in a compact housing with high mechanical robustness. The wetted materials provide exceptional chemical resistance. In addition to its suitability for the biomedical market, it is a compact and reliable solution for many applications with flow rates up to 40 ml/min.

Model	Full Scale Flow Rates	Typ. Accuracy of Measured Value (H_2O)	Bidirectional Operation	Output			Maximum Cable Length	Fluidic Connector Ports	Maximum Pressure
				Analog	RS485	I²C			
SLF3S-0600F	2000 µl/min H_2O 2000 µl/min HC	5 % 10 %	Yes		✓	✓	30 cm for I²C	1/4"-28 flat-bottom port for 1/16" or 1/8" OD tubing	12 bar
SLF3S-1300F/ SLF3C-1300F	40 ml/min H_2O 40 ml/min HC							1/4"-28 flat-bottom port for 1/8" OD tubing	
SLF3S-4000B	600 ml/min H_2O 600 ml/min HC	10%						6 mm OD Barb	3 bar
SLF3S-0600D	2000 µl/min H_2O 2000 µl/min HC	5 % 10 %						Downmount	10 bar
SLF3S-1300D	40 ml/min H_2O 40 ml/min HC								
LD20-2600B	1,000 ml/h H_2O	5 %	Yes		✓	✓	30 cm for I²C	Barbed fittings	3 bar
LD20-0600L	20 ml/h H_2O							Luer lock	
SLG-0025	1.5 µl/min H_2O	10 %	Yes	0 to 10 V 4 to 20 mA	✓	✓	> 100 m for RS485, 30 cm for I²C	Stainless steel 0-32 coned port for 1/16" OD tubing	1200 bar
SLG-0075	5 µl/min H_2O								
SLG-0150	8 µl/min H_2O	5 %							500 bar
SLI-0430	80 µl/min H_2O 500 µl/min HC	5 %	Yes	0 to 10 V 4 to 20 mA	✓	✓	> 100 m for RS485, 30 cm for I²C	1/4"-28 flat-bottom port for 1/16" or 1/8" OD tubing	50 bar
SLI-1000	1000 µl/min H_2O 10 ml/min HC								12 bar
SLI-2000	5 ml/min H_2O 80 ml/min HC								
LG16-0025	1.5 µl/min H_2O	10 %	Yes		✓	✓	30 cm for I²C	UNF 6-40 coned port for 1/32" OD tubing	200 bar
LG16-0150	7 µl/min H_2O 70 µl/min HC	5 %							
LG16-0430	80 µl/min H_2O 500 µl/min HC								100 bar
LG16-1000	1 ml/min H_2O 10 ml/min HC							1/4"-28 flat-bottom port for 1/16" or 1/8" OD tubing	15 bar
LG16-2000	5 ml/min H_2O								
LG01-2000	Switch level: 0.25 ml/min or 4.5 ml/min	10 %	No	0V: no flow or bubble 5V: flow above switch level			3 m		3 bar
SLS-1500	40 ml/min H_2O	5 %	Yes	0 to 10 V 4 to 20 mA	✓	✓	> 100 m for RS485, 30 cm for I²C	1/4"-28 flat-bottom port for 1/8" OD tubing	12 bar
LS32-1500	40 ml/min H_2O	5 %	Yes	0 to 10 V 4 to 20 mA	✓	✓	30 cm for I²C	1/4"-28 flat-bottom port for 1/8" OD tubing	12 bar
SLQ-QT105	120 ml/min HC	10 %	Yes	0 to 10 V 4 to 20 mA	✓	✓	> 100 m for RS485, 30 cm for I²C	Super 300 type pillar fitting 4 × 3 mm	12 bar
SLQ-QT500	120 ml/min H_2O 120 ml/min HC	5 %						PFA tube with 6.35 mm (1/4") OD, 4.35 mm ID	

Calibrated flow rates for
- water (H_2O)
- hydrocarbons (HC)

SLQ: Calibrated for flow rates up to 120 ml/min with the exclusive use of high-purity wetted materials (quartz glass, PFA), this sensor is ideal for demanding dispensing processes in the semiconductor industry and for the measurement of liquids with high viscosity or containing particles.

SLD3P series: The SLD3P series is our new generation of digital liquid flow sensors for measurements up to 5 ml/min. It combines accuracy, miniature size, and compatibility with various therapies. These features make it the ideal solution for medical devices manufactured in large quantities, such as drug delivery patches and insulin pumps.

Evaluation kits

In order to conduct initial measurements quickly and easily, all our liquid flow sensors can be ordered as part of a liquid flow evaluation kit. The evaluation kits contain everything that is needed to start evaluation, including cabling, fluidic and electrical connectors as well as components to mount it.

For more information please visit: www.sensirion.com/lf-ek

SLF3x Evaluation Kit

Customized solutions

Innovative ideas sometimes demand new solutions and Sensirion's sensor experts are always keen to finding ways to make interesting applications happen through our technology. Customized solutions can be designed for special requirements, such as flow rates, limited space constraints, resistance to aggressive chemicals, dedicated low-price and even disposable sensor designs for high-volume applications.

Our cutting-edge sensor technology and unique expertise in liquid flow sensing has led to many successful customer projects. The essential goal is to understand the requirements of our customers and to implement the key benefits of our technology skillfully to their advantage: modification of the packaging, the wetted materials, the fluidic or electrical interface and improvement of the dead volume or pressure resistance of the sensor.

Various flow rates

Years of experience and expertise, combined with the high sensitivity of our sensors, enable flow measurements at various flow ranges, from nanoliters to liters per minute.

High speed

The MEMS sensor integrated on a CMOS chip permits ultra-fast response times – as fast as 20 ms – due to its small thermal mass.

Flexibility and cost efficiency

With our advanced technology, we have the flexibility to address customer requirements to ensure a customized sensor solution that is both high-performance and cost-effective.


Technology at heart,
future in mind.