SENSIRION
THE SENSOR COMPANY

LG01-2000Axxx

Liquid Flow Switch and Bubble Detector

- Detection of low liquid flow in the ml/min Range
- Totally non-invasive
- Ultra-fast response time of 100 ms

Product Summary

The LG01 Liquid Flow Switch enables detection of flow of liquid in the range of ml/min. The output signal is 5V when the flow rate is higher than the specified flow switch point and 0V below this limit or when air or bubbles are found inside the sensor's flow channel instead of liquid.

Excellent chemical resistance and bio-compatibility are ensured: The flow path of the LG01 Liquid Flow Switch is formed by a simple, straight glass capillary.

For more information on communication, please refer to section 2 of this document.

1 Sensing Performance

Table 1: Model specific performance of LG01 (all data for medium **H_2O**, 23°C)

Parameter	LG01-2000A090	LG01-2000A005	Unit
H_2O flow switching point	4.5	0.25	ml/min
H_2O maximum flow rate	50	220	ml/min
Accuracy[a] of switching point	±10	±10	% of switching point
Switching hysteresis	±5	±5	% of switching point
Mounting orientation sensitivity[b]	+2	+14	% of switching point
Flow detection response time τ_{63}	50		ms
Response time on power-up	120		ms
Operating temperature	+10…+50		°C
Ambient storage temperature[c]	-10…+60		°C
Operating pressure	3		bar
Proof pressure	5		bar

[a]Better available on request
[b]Maximum shift of switching point if mounted vertically
[c]Non-condensing, flow path empty

1.1 Operation with Other Liquids than Water

Due to the measurement principle the LG01 flow switch characteristics is changing with the thermal properties of the liquid. For aqueous solutions the data for H_2O as stated above is a good approximation.
For hydrocarbon liquids such as oil, fuel, or organic solvents, the flow switch point shifts towards higher flow rates. For indicative purpose, data is provided for isopropyl alcohol (IPA) below.

Table 2: Approximate switch levels of the LG01 liquid flow switch with hydrocarbon liquids

Parameter	LG01-2000A090	LG01-2000A005	Unit
Approximate flow switching point with IPA	9	1.4	ml/min
Maximum flow rate with IPA	>250	>250	ml/min

2 Communication with the Sensor

An electrical voltage output indicates flow above (5 V) or below (0 V) the flow switch point and/or air or bubbles inside the sensors flow channel. The product comes fully calibrated for water – for volume applications flow calibration for other media is available on request.

2.1 Electrical Specifications

Table 3: DC Characteristics

Parameter	Min.	Typ.	Max.	Units
Power supply DC, VDD	5	7	12[a]	V
Operating current, VDD = 9 V, no load		6.8		mA
Voltage output high		5		V
Voltage output low		0		V

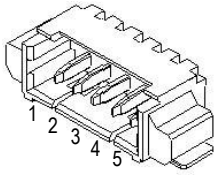
[a]Use 9 V max. for best performance

2.2 Electrical Connector and Sensor Pinout

Connector Type: 5 pin Molex PCB Header 53261-0590 Mating connector: Molex 51021-0500.

Table 4: Electrical Pinout

Pin	
1	Do not connect
2	Do not connect
3	VDD
4	GND
5	Voltage output



3 Fluidic Connection

Table 5: Fluidic Specifications and Pressure Rating

Parameter	LG01-2000Axxx
Wetted materials:	
• Internal sensor tube material	Borosilicate Glass 3.3
• Fitting material	PEEK
• Sealing material	FEP
Fluid connector ports (Fittings)	¼-28 flat-bottom for 1/16" or 1/8" OD plastic tubing (min. 2mm ID recommended)[a]
Pressure drop (at maximum flow rate, H_2O, 23°C)	1 mbar
Total internal volume	80 µl

[a] For fluid connection material use flat bottom ¼-28 standard components e.g. IDEX parts P-200/P-300. Various adapters e.g. to Barb connectors are available from company Value Plastics as well.

For more information on the fluidic connection please find: "Application Note Sensor Ports and Tubing Connections" in the Download Center on our webpage (www.sensirion.com/liquidflow-download).

4 Connectivity Kit

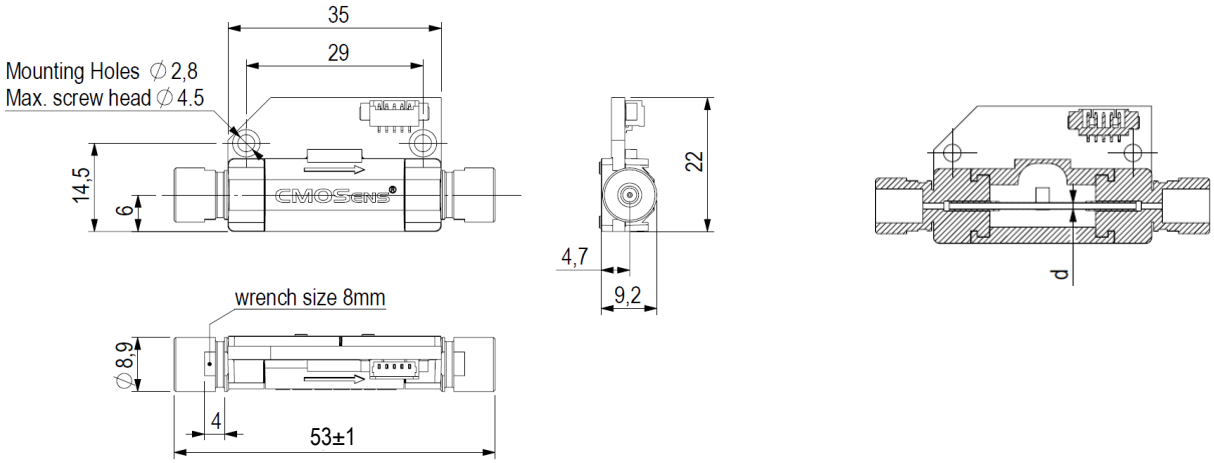
The optional LG01 connectivity kit contains material for electrical and fluidic connections

- Assembled flat ribbon cable, 30cm (1-100482-01)
- 2x barb adapter to connect ID 1.6 mm (1/16") tubing (Value Plastics ABR004-J1A-2)
- 2x barb adapter to connect ID 3.2 mm (1/8") tubing (Value Plastics ABR013-J1A-1)

5 Mechanical Specifications

Table 6: Mechanical Specifications

Parameter	LG01-2000Axxx
Largest dimensions	53 x 22 x 9 mm
Total mass	6 g
Inner diameter d	1.8 mm



All dimensions in mm

Attention Fragile	
Mechanical shocks, forces induced by stiff fluid connection lines as well as connecting to the fittings without suitable tools lead to stress on the internal thin-walled glass capillary and can cause it to break. • While tightening the fittings, fix the fluidic ports position with a wrench. • Test for leakage after every time new connections are made.	!

6 Ordering Information

For OEM applications the sensor can be purchased in larger quantities without any additional parts.

Product	Article Number
LG01-2000A090	1-100796-01
LG01-2000A005	1-100797-01
LG01 Connectivity Kit	1-100814-01

Important Notices

Warning, personal injury

Do not use this product as safety or emergency stop devices or in any other application where failure of the product could result in personal injury (including death). Do not use this product for applications other than its intended and authorized use. Before installing, handling, using or servicing this product, please consult the datasheet and application notes. Failure to comply with these instructions could result in death or serious injury.

If the Buyer shall purchase or use SENSIRION products for any unintended or unauthorized application, Buyer shall defend, indemnify and hold harmless SENSIRION and its officers, employees, subsidiaries, affiliates and distributors against all claims, costs, damages and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if SENSIRION shall be allegedly negligent with respect to the design or the manufacture of the product.

ESD Precautions

The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation, take customary and statutory ESD precautions when handling this product.

Warranty

SENSIRION warrants solely to the original purchaser of this product for a period of 12 months (one year) from the date of delivery that this product shall be of the quality, material and workmanship defined in SENSIRION's published specifications of the product. Within such period, if proven to be defective, SENSIRION shall repair and/or replace this product, in SENSIRION's discretion, free of charge to the Buyer, provided that:

- notice in writing describing the defects shall be given to SENSIRION within fourteen (14) days after their appearance;
- such defects shall be found, to SENSIRION's reasonable satisfaction, to have arisen from SENSIRION's faulty design, material, or workmanship;
- the defective product shall be returned to SENSIRION's factory at the Buyer's expense; and
- the warranty period for any repaired or replaced product shall be limited to the unexpired portion of the original period.

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REACH, RoHS and WEEE Statement

The LG01 flow switch complies with requirements of the following directives:

- EU Directive 1907/2006/EC concerning Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
- EU Directive 2002/96/EC on waste electrical and electronic equipment (WEEE), OJ13.02.2003; esp. its Article 6 (1) with Annex II.
- EU Directive 2002/65/EC on the restriction of certain hazardous substances in electric and electronic equipment (RoHS), OJ01.01.2011

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