

LG01-2000Axxx

Liquid Flow Switch and Bubble Detector

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



1 Introduction LG01

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 Limit and 0V below this limit or when air or bubbles are found inside the sensors 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.

2 Sensing Performance

Table 1: Model specific performance of LG01-2000Axxx
(all data for medium H₂O, 20°C, 1 bar_{abs} unless otherwise noted)

Parameter	LG01-2000A090	LG01-2000A005	
Maximum Flow Rate	50	220	ml/min
Flow Switch Limit	4.5	0.25	ml/min
Accuracy ^a of Switching Point	±10	±10	%
Switching Hysteresis	±5	±5	%
Mounting Orientation Sensitivity ^b	+2	+14	%
Flow Detection Response Time	50		ms
Response Time On Power-Up	120		ms
Operating Temperature	+10...+50		°C
Ambient storage temperature	-10...+60		°C

2.1 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 above is a good approximation.

For hydrocarbon liquids such as oil, fuel, solvents and so on the *Flow Switch Limit* is increased by the factors below.

Table 2: Increase of Flow Switch Level for LG01-2000Axxx using hydrocarbon liquids

Parameter	LG01-2000A090	LG01-2000A005	
Approximate Multiplication Factor for Flow Switch Limit	2	5.5	

A *Maximum Flow Rate* of 250 ml/min and more is possible with hydrocarbon liquids for all LG01-2000Axxx models.

^a Better available on request.

^b Shift of switching point if not mounted in normal position (which is horizontal flow channel) but with vertical flow channel.

3 Electrical and Mechanical Specifications

3.1 Electrical Specifications

An electrical voltage output indicates flow above (5 V) or below (0 V) the Flow Switch Limit 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-

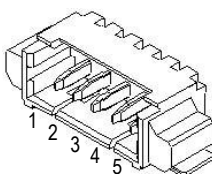
Table 3: DC Characteristics.

Parameter	Conditions	Min.	Typ.	Max.	Units
Power Supply DC, VDD		5	7	12 ^a	V
Operating Current	V _{DD} = 9 V, no load		6.8		mA
Voltage Output High	Flow>Flow Switch Limit and <u>no air</u>		5		V
Voltage Output Low	Flow<Flow Switch Limit or <u>air found</u>		0		V

3.2 Electrical Connector and Pinout

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

Pin	
1	do not connect
2	do not connect
3	VDD
4	GND
5	Voltage Output



3.3 Mechanical Specifications and Pressure Rating

Attention Fragile

Forces introduced by stiff fluid connection lines as well as connecting the fittings without suitable tools causes stress on the internal thin-walled glass capillary.
This can cause it to break! Test for leakage every time after new connections are made.



Inside the LG01 flow sensors a highly sensitive microsensor-chip is mounted on the outside of a straight glass capillary and allows to measure the flow through the wall (US Patent 6,813,944 B2) using a thermal principle.

Table 4: Mechanical Specifications and Pressure Rating

Parameter	LG01-2000
Fluid Connector Ports (Fittings)	¼-28 for 1/16" or 1/8" OD plastic tubing ^a
Wetted Materials:	
• Internal Sensor Capillary Material	Borosilicate Glass 3.3 (Duran®)
• Fitting Material	100% PEEK™ (polyetheretherketone)
• Additional Sealing Material	ETFE(Tefzel®)
Overpressure Resistance	3 bar 40 psi
Maximum Pressure Drop (at max. flow rate)	1 mbar
Internal Sensor Capillary, Inner Diameter	1.8 mm
Total Internal Volume	<90 µl
Total Mass	6 g

^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.

LG01 Liquid Flow Switch

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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7.4 RoHS and WEEE Statement

The LG01 product family complies with requirements of the following directives:

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 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (**RoHS**), OJ 13.02.2003; esp. its Article 4.

