

# DATASHEET L13

## LIQUI-FLOW™ L13

Digital Thermal Liquid Mass Flow Meter



### Liquid Mass Flow Meters for low flow rates

Bronkhorst® model L13 Liquid Flow Meters (LFMs) are suited for precise measurement of flow ranges between 0,25...5 g/h and 5...100 g/h at operating pressures up to 100 bar. The LFM consists of a thermal mass flow sensor and a microprocessor based pc-board with signal and fieldbus conversion and a PID controller for optional mass flow control by means of a separately mounted control valve.

LIQUI-FLOW™ series are equipped with a digital pc-board, offering high accuracy, excellent temperature stability and fast response. The main digital pc-board contains all of the general functions needed for measurement and control. In addition to the standard RS232 output the instruments also offer analog I/O. As an option, an on-board interface can be mounted to provide CANopen®, DeviceNet™, EtherCAT®, PROFIBUS DP, PROFINET, Modbus RTU, ASCII or TCP/IP, EtherNet/IP, POWERLINK or FLOW-BUS protocols.

### Technical specifications

#### Measurement / control system

Flow range (intermediate ranges available)	min. 0,25...5 g/h max. 5...100 g/h (based on H <sub>2</sub> O)
Accuracy (incl. linearity) (based on actual calibration)	± 1 % FS
Repeatability	< 0,2 % FS (typical H <sub>2</sub> O)
Turndown ratio	FS < 50 g/h : 1:20 (5...100%); FS > 50 g/h : 1:50 (2...100%)
Operating temperature	5 ... 50 °C
Temperature sensitivity	± 0,1% FS/°C
Attitude sensitivity	negligible
Warm-up time	30 min. for optimum accuracy; 2 min for accuracy ± 2% FS

#### Mechanical parts

Material (wetted parts)	stainless steel 316L/320; other on request
Pressure rating (PN)	100 bar abs
Process connections	compression type or face seal (VCR/VCO) couplings
Seals	Kalrez® (FFKM); other on request
Ingress protection	IP40

## Electrical properties

Power supply	+15 ... 24 Vdc +/-10%			
Max. power consumption meter	Supply	at voltage I/O	at current I/O	extra for fieldbus
	15 V	100 mA	120 mA	<75 mA
	24 V	65 mA	85 mA	<50 mA
Analog output	0...5 (10) Vdc or 0 (4)...20 mA (sourcing output)			
Digital communication	standard: RS232; options: CANopen®, DeviceNet™, EtherCAT®, PROFIBUS DP, PROFINET, Modbus RTU, ASCII or TCP/IP, EtherNet/IP, POWERLINK or FLOW-BUS			

## Electrical connection

Analog/RS232	9-pin D-connector (male)
PROFIBUS DP	bus: 9-pin D-connector (female); power: 9-pin D-connector (male)
CANopen® / DeviceNet™	5-pin M12-connector (male)
FLOW-BUS/Modbus-RTU/ASCII	RJ45 modular jack
Modbus TCP / EtherNet/IP / POWERLINK	2 x RJ45 modular jack (in/out);
EtherCAT® / PROFINET	2 x RJ45 modular jack (in/out)

## Control valve options

External actuator options to be connected to the controller

## Ex-proof specifications

## Approvals / certificates

Technical specifications subject to change without notice.

For dimensional drawings and hook-up diagrams please visit the [product page](#) on our [website](#)

## Recommended accessories



**E-8000 SERIES**

**Digital Readout / Control Systems**

Bright, wide angle, 1.8" display (TFT technology)  
User friendly operation, menu driven with 4 push buttons



**BRIGHT SERIES**

**Compact Local R/C Module**

Bright, wide angle, 1.8" display  
User friendly operation  
Indication/operation/configuration



**PIPS SERIES**

**Plug-in Power Supply**

For lab-style or industrial devices  
Interchangeable plugs (Euro, UK, USA, Australian, IEC) for mains connection

## Related products



**LIQUI-FLOW™ L13V12**

Min. flow 0,25 ... 5 g/h  
Max. flow 5 ... 100 g/h  
Pressure rating 100 bar  
Compact, IP40 design  
Analog, RS232 or fieldbus I/O



**LIQUI-FLOW™ 'INDUSTRIAL STYLE' L13I**

Min. flow 0,25 ... 5 g/h  
Max. flow 5 ... 100 g/h  
Pressure rating 100 bar  
Compact, IP65 design  
Analog, RS232 or fieldbus I/O



**LIQUI-FLOW™ L23**

Min. flow 2 ... 100 g/h  
Max. flow 20 ... 1000 g/h  
Pressure rating 100 bar  
Compact, IP40 design  
Analog, RS232 or fieldbus I/O



**μ-FLOW L01**

Min. flow 5 ... 100 mg/h  
Max. flow 0,1 ... 2 g/h  
Pressure rating 400 bar  
Small internal volume  
Analog, RS232 or fieldbus I/O



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