

ES-113I

ES-FLOW™ ES-113I

Low-Flow Ultrasonic Flow Meter for liquids

- Fast and accurate measuring signal
- Low pressure loss due to straight sensor tube
- Medium independent and temperature insensitive
- Local display with capacitive touchscreen
- IP66/IP67 rating
- Pressure rating 100 bar



Low-Flow Ultrasonic Flow Meters for Liquids

ES-FLOW™ model ES-113I Liquid Flow Meters (LFMs) are suited for precise measurement of volume flow ranges between 2 and 1500 ml/min. The LFM consists of an innovative ultrasonic flow sensor and an IP66/IP67 protected measuring head with bright LCD display and capacitive touchscreen for adjustment of the settings e.g. for flow indication, alarm, totalisation and control (if applicable). The electronics include a PID controller for optional flow control by means of a separately mounted control valve or pump. ES-FLOW™ model ES-113I has orbitally welded compression type connections, making this instrument suitable for operating pressures up to 100 bar.

Bronkhorst® ES-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 PROFIBUS DP, PROFINET, CANopen®, DeviceNet™, Modbus RTU/ASCII or FLOW-BUS protocols.

November 2020, launch of ES-FLOW MkII generation

With the introduction of the second generation of our ES-FLOW series, indicated by suffix MkII, Bronkhorst realised some important improvements and new options. Here are the main MkII-highlights:

- **Hygienic Standards 3-A**
The ES-103I MkII with Tri-Clamp flanges is authorized by 3-A, meeting the highest hygienic standards.
- **Hygienic Flow Controller**
Combining the ES-FLOW flow meter with a GEMÜ 650 pneumatic diaphragm valve makes an excellent hygienic flow controller for a wide range of applications within the Food & Beverage market. The GEMÜ valve is also 3-A authorized.
- **EC Regulation Nos. 1935/2004 and 2023/2006 (Food Contact Materials)**
By meeting the requirements, Bronkhorst can provide a Manufacturer Declaration for these regulations.
- **Improved accuracy and rangeability**
- **Additional functionalities and EtherNet fieldbus options**

Technical specifications

Measurement / control system

Minimum full scale flow	100 ml/min
Maximum full scale flow	1500 ml/min
Minimum flow	2 ml/min
Volume flow accuracy	Mkl: $\leq \pm 1\% \text{ Rd} \pm 1 \text{ ml/min}$; Mkll: $\leq \pm 0,8\% \text{ Rd} \pm \leq 0,4 \text{ ml/min}$
Repeatability	$\leq 0,1\% \text{ Rd} \pm 0,05 \text{ ml/min}$
Turndown ratio	digital 4:200 up to 4:1500 ml/min (full scale value scalable by the user); analog: 1:50 (2...100%);
Fluids	liquids with sound speed between 1000 and 2000 m/s; fluid independent measurement; also suitable for non-conductive fluids
Response time (sensor)	200 msec (meter, t98%)
Refresh (cycle) time	$\leq 10 \text{ msec}$
Fluid temperature max	-10 ... 90 °C Mkll: steam cleaning (SIP) max 140°C
Ambient temperature max	10 ... 60 °C
Mounting	Any position, attitude sensitivity negligible.
Temperature accuracy	$\pm 1 \text{ °C}$
Warm-up time	approx. 1/2 hour after power up for optimum performance

Mechanical parts

Sensor	Straight tube
Material (wetted parts)	stainless steel 316L
Surface quality	$Ra < 0,8 \mu\text{m}$
Pressure rating (PN)	10 bara at $T_{AMB} = 15...35\text{°C}$, $ T_{AMB} - T_{MED} \leq 25\text{°C}$; for elevated temperatures please consult factory
Process connections	3 mm, 6 mm, 1/8", 1/4" OD compression type or 1/4" face seal male (welded)
Seals	none
Weight	Meter: 1,3 kg; Controller: on request
Ingress protection	IP66 and IP67

Electrical properties

Power supply	+15...24 Vdc $\pm 10\%$; max. ripple recommended: 50 mV tt
Max. power consumption	2.8 W
Analog output	0...5 (10) Vdc, min. load impedance $> 2 \text{ k}\Omega$; 0 (4)...20 mA (sourcing), max. load impedance $< 375 \Omega$
Analog setpoint	0...5 (10) Vdc, min. load impedance $> 100 \text{ k}\Omega$; 0 (4)...20 mA, load impedance $\sim 100 \Omega$
Customised I/O	Analog control signal output: 0...10 Vdc or 4...20 mA; Pulse output
Digital communication	Standard RS232; Options: PROFIBUS DP, PROFINET, CANopen®, DeviceNet™, Modbus RTU/ASCII or FLOW-BUS

Electrical connection

Analog/RS232	8-pin M12 connector (male)
Configured I/O / Actuator output	8-pin M12 Connector (male)
Actuator/Remote display	4-pin M8 connector (female)
PROFIBUS DP	bus: 5-pin M12 connector (female); 8-pin power: M12 connector (male)
CANopen® / DeviceNet™	5-pin M12 connector (male)
FLOW-BUS/Modbus-RTU/ASCII	5-pin M12 connector (male)
PROFINET	8-pin M12 connector (male)

Approvals / certificates

Food contact	EC 1935/2004
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Technical specifications subject to change without notice.

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

Related products



ES-FLOW™ ES-1031

Min. flow 2 ... 100 ml/min
Max. flow approx. 1500 ml/min
Pressure rating 10 bar
IP66/IP67 display; touchscreen
Hygienic, flanged type design



ES-FLOW™ ES-1131

Min. flow 2 ... 100 ml/min
Max. flow approx. 1500 ml/min
Pressure rating 100 bar
Compact, integrated dosing solution
Direct pump control



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