DATASHEET ES-113I

ES-FLOW ES-113I

Low-Flow Ultrasonic Flow Meter for liquids

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 a 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 advanced electronics, 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.

The second generation of the ES-FLOW series, is indicated by suffix MkII.

ES-FLOW model ES-103I liquid flow meters with Tri-Clamps can be delivered with 3-A certificate. Bronkhorst can also supply the Manufacturer Declaration for EC Regulation Nos. 1935/2004 and 2023/2006 (Food Contact Materials). ES-103I can be combined with a GEMÜ 650 pneumatic diaphragm valve to make it an excellent hygienic flow controller for a wide range of applications within the Food & Beverage market. The GEMÜ valve is also 3-A authorised.

Technical specifications

Measurement / control system

Maximum full scale flow	1500 ml/min
Minimum flow	2 ml/min
Volume flow accuracy	MkI: ≤ ±1% Rd; MkII: ≤ ±0,8% Rd
Repeatability	≤ 0,1% Rd ± 0,05 ml/min
Turndown ratio	digital 2:100 up to 2:1500 ml/min (full scale value scalable by the user); analog: 1:50 (2…100%);
Zero stability (ZS)	MkI: ≤ 1 ml/min; MkII: ≤ 0,4 ml/min
Fluids	liquids with sound speed between 1000 and 2000 m/s; fluid independent measurement; also suitable for non-conductive fluids
Response time (sensor)	≤ 50 msec (t98%)
Refresh (cycle) time	≤ 10 msec

Measurement / control system

Fluid temperature	-10 … 90 ℃
Ambient temperature	0 … 60 ℃
Mounting	Any position, attitude sensitivity negligible.
Temperature accuracy	± 1 ℃

Mechanical parts

Sensor	Straight tube, 1,3 mm ID
Material (wetted parts)	stainless steel 316L
Surface quality	Ra < 0,8 µm
Pressure rating (PN)	100 bar g
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
Max. power consumption	2.8 W
Analog output	0…5 (10) Vdc, min. load impedance > 2 kΩ; 0 (4)…20 mA (sourcing), max. load impedance < 375 Ω
Analog setpoint	0…5 (10) Vdc, impedance > 100 kΩ; 0 (4)…20 mA, impedance ~100 Ω
Customised I/O	Analog control signal output: 0…10 Vdc or 4…20 mA; Pulse output; for more options, see Model number identification in our ES-FLOW brochure
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	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)
Modbus TCP / EtherNet/IP / POWERLINK	2 x 4-pin M12 connector female (in/out)
EtherCAT®/ PROFINET	2 x 4-pin M12 connector female (in/out)
PROFINET	8-pin M12 connector (male)

Control valve options

External actuator options to be connected to the controller

Ex-proof specifications

Approvals / certificates

Food contact	EC 1935/2004

Technical specifications subject to change without notice.

For dimensional drawings and hook-up diagrams please visit the product page on our website

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Related products

ES-FLOW ES-103I

Flow rate 2 ... 1500 ml/min

Pressure rating 10 bar

IP66/IP67 display; touchscreen

Hygienic, flanged type design

ES-FLOW ES-113C

Flow rate 2 ... 1500 ml/min

Pressure rating 100 bar

Compact and robust; IP66/IP67

ES-FLOW™ ES-FLOW METER WITH PUMP

Min. flow 2 ... 100 ml/min
Max. flow approx. 1500 ml/min

Compact, integrated dosing solution

Direct pump control

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Bronkhorst High-Tech designs and manufactures innovative instruments and subsystems for low-flow measurement and control for use in laboratories, machinery and industry. Driven by a strong sense of sustainability and with many years of experience, we offer an extensive range of (mass) flow meters and controllers for gases and liquids, based on thermal, Coriolis and ultrasonic measuring principles. Our global sales and service network provides local support in more than 40 countries. Discover Bronkhorst®!