DATASHEET ES-112C

ES-FLOW ES-112C

Low-Flow Ultrasonic Flow Meter for liquids



Low-Flow Ultrasonic Flow Meters for Liquids

The innovative ES-FLOW® ES-112C Ultrasonic Liquid Flow Meter/Controller is designed for measuring volume flow ranges between 0,4 and 200 ml/min with high precision, high linearity and low pressure drop using Ultrasonic Wave Technology in a small bore tube. Liquids can be measured independent of fluid density, temperature and viscosity, therefore recalibration per fluid is unnecessary. The flow meter has a straight sensor tube design with the actuators positioned at the outer surface. Therefore, the instrument is easy to clean. All wetted parts are made of stainless steel and PEEK, build in an aluminium housing. The on-board PID controller can be used to drive a control valve or pump, enabling users to establish a complete, compact control loop.

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 CANopen®, DeviceNet™, EtherCAT®, PROFIBUS DP, PROFINET, Modbus RTU, ASCII or TCP/IP, EtherNet/IP, POWERLINK or FLOW-BUS protocols.

Technical specifications

Measurement / control system

Maximum full scale flow	200 ml/min
Minimum flow	0,4 ml/min
Volume flow accuracy	≤ ±0,8% Rd
Repeatability	≤ 0,1% Rd ± 0,02 ml/min
Turndown ratio	digital up to 1:500 (full scale value scalable by the user); analog: 1:50 (2...100%), also applicable for controller
Zero stability (ZS)	≤ 0,06 ml/min
Fluids	Speed of sound 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
Fluid temperature	-10...60 °C
Ambient temperature	0...60 °C
Mounting	any position, attitude sensitivity negligible
Temperature accuracy	±1 °C

Mechanical parts

Sensor	straight 1/32" tube, 0,6 mm ID
Material (wetted parts)	stainless steel 316L (1.4404) and PEEK
Housing	aluminium
Pressure rating (PN)	100 bar g
Process connections	3 mm, 6 mm, 1/8", 1/4" OD compression type; other on request
Seals	metal
Ingress protection	IP66 and IP67

Electrical properties

Power supply	+15…24 Vdc ±10%
Max. power consumption	2,8 W
Analog output	0…5 (10) Vdc; 0 (4)…20 mA (sourcing)
Analog setpoint	0…5 (10) Vdc, impedance > 100 kΩ; 0 (4)…20 mA, impedance ~250 Ω
Customised I/O	Analog control signal output (option): 0...10 Vdc or 4...20 mA Pulse output (option)
Digital communication	Standard: RS232; Options: PROFIBUS DP, DeviceNet™, EtherCAT®, Modbus RTU/ASCII, CANopen®, FLOW-BUS, PROFINET, Modbus/TCP, EtherNet/IP, POWERLINK

Electrical connection

Analog/RS232	M12 8-pin connector male
Actuator/Remote display	M8 4-pin connector male
PROFIBUS DP	M12 5-pin connector male
CANopen® / DeviceNet™	M12 5-pin connector male
FLOW-BUS/Modbus-RTU/ASCII	M12 5-pin 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)

Control valve options

External actuator options to be connected to the controller

Certification for hazardous areas

Approvals / certificates

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-113C

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

Pressure rating 100 bar

Compact and robust; IP66/IP67



ES-FLOW ES-103I

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-113I

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

Pressure rating 100 bar

IP66/IP67 display; touchscreen

Bronkhorst®

www.bronkhorst.com

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®!