DATASHEET F-113AC

EL-FLOW Select F-113AC

Digital Thermal Mass Flow Meter for Gases



Gas Mass Flow Meters for higher flow rates

Bronkhorst® model F-113AC Mass Flow Meters (MFMs) are suited for precise measurement of flow ranges between 4…200 l_n/min and 8…1600 l_n/min at operating pressures between vacuum and 100 bar. The MFM 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.

EL-FLOW® Select 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. The EL-FLOW® Select design features optional Multi Gas / Multi Range functionality, providing (OEM-) customers with optimal flexibility and process efficiency.

Technical specifications

Measurement / control system

Flow range (intermediate ranges available)	min. 4…200 l_n/min max. 8…1600 l_n/min (based on N_2)
Accuracy (incl. linearity) (based on actual calibration)	± 0,5 % RD plus ±0,1% FS
Repeatability	< 0.2 % RD
Turndown ratio	up to 1:187,5 (1:50 in analog mode)
Multi fluid capability	storage of max. 8 calibration curves; optional Multi Gas / Multi Range functionality up to 10 bar abs
Response time (sensor)	typical 0,5 sec.
Operating temperature	-10 … +70 °C
Temperature sensitivity	zero: < 0,05% FS/°C; span: < 0,05% Rd/°C
Pressure sensitivity	< 0,1% Rd/bar typical N_2; 0,01% Rd/bar typical H_2
Leak integrity, outboard	tested < 2 x 10^{-9} mbar l/s He
Attitude sensitivity	max. error at 90° off horizontal 0,2% at 1 bar, typical N_2
Warm-up time	30 min. for optimum accuracy 2 min. for accuracy ± 2% FS

Mechanical parts

Material (wetted parts)	Stainless steel 316L or comparable

Mechanical parts

Pressure rating (PN)	100 bar abs
Process connections	compression type or face seal (VCR/VCO) couplings
Seals	standard: Viton®; options: EPDM, Kalrez® (FFKM), FDA and USP Class VI approved compounds
Weight	3,0 kg
Ingress protection	IP40

Electrical properties

Power supply	+15 … 24 Vdc			
Max. power consumption meter	Supply 15 V 24 V	at voltage I/O 95 mA 65 mA	at current I/O 125 mA 85 mA	extra for fieldbus <75 mA <50 mA
Max. Power consumption controller	Supply 15 V 24 V	at voltage I/O 290 mA 200 mA	at current I/O 320 mA 215 mA	extra for fieldbus <75 mA <50 mA
Analog output	0...5 (10) Vdc or 0 (4)…20 mA (sourcing output)			
Digital communication	standard: RS232; options: PROFIBUS DP, CANopen®, DeviceNet™, PROFINET, EtherCAT®, Modbus RTU, ASCII or TCP/IP, EtherNet/IP, POWERLINK, 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



IN-LINE FILTER SERIE M-423 RS

- 1/2" female in / male out
- 200 bar
- Average porosity 2...40 µm

Related products



EL-FLOW SELECT F-112AC

- Min. flow 0,8…40 ln/min
  Max. flow 1,4…250 ln/min
- Pressure rating 100 bar
- Compact design
- High accuracy



EL-FLOW SELECT F-203AV

- Min. flow 4…200 ln/min
  Max. flow 33…1670 ln/min
- Pressure rating 64 bar
- Compact design
- High accuracy and repeatability



EL-FLOW SELECT F-123M

- Min. flow 4…200 ln/min
  Max. flow 25…1250 ln/min
- Pressure rating 200 bar
- Compact design
- High accuracy

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