F-102E

LOW-ΔP-FLOW F-102E

Mass Flow Meter for low pressure drop or corrosive gas service

- Large bore capillary (thermal bypass sensor)
- Very low pressure drop
- Less sensitivity to humidity or dirt
- Suitable of corrosive gases
- Easy to purge



Thermal Mass Flow Meters for low pressure drop or corrosive gas applications

Bronkhorst® model F-102E Mass Flow Meters (MFMs) are suited for precise measurement of flow ranges between 0,17…8,5 l_n/min and 1…50 l_n/min (N_2-equivalent). The instruments are particularly suited for corrosive gases or applications with very low differential pressure (ΔP). Compared to conventional instruments, LOW-ΔP-FLOW meters have larger flow channels to minimize the risk of clogging, facilitate cleaning and purging, and cause lower pressure drop (the sensor only requires 0,5 to 5 mbar).

The integrated digital pc-board provides signal and fieldbus conversion as well as PID controller functionality for optional mass flow control by means of a (separately mounted) control valve. 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 or FLOW-BUS protocols.

Technical specifications

Measurement / control system

Flow range (intermediate ranges available)	min. 0,17…8,5 l_n/min max. 1…50 l_n/min (based on N_2)
Accuracy (incl. linearity) (based on actual calibration)	± 1 % FS
Repeatability	< 0,2 % RD
Turndown ratio	1:50 (2…100%)
Max. operating pressure	10 bar g
Multi fluid capability	storage of max. 8 calibration curves
Response time (sensor)	1 … 2 sec.
Operating temperature	-10 … +70 °C
Mounting	horizontal
Temperature sensitivity	< 0,1% FS/°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
Warm-up time	30 min. for optimum accuracy 2 min for accuracy ± 2% FS

Mechanical parts

Material (wetted parts)	stainless steel 316L or comparable; other on request
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	0,6 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, 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	2 x RJ45 modular jack (in/out);
EtherCAT®/ PROFINET	2 x RJ45 modular jack (in/out);

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-422 RS

- 1/4" female in / male out
- 200 bar
- Average porosity 2...20 µm

Related products



LOW-ΔP-FLOW F-102D

Min. flow 0,28…14 ln/min
Max. flow 0,5…25 ln/min
Pressure rating up to 10 bar
Very low pressure drop
Suitable for corrosive gases



LOW-ΔP-FLOW F-103D

Min. flow 0,8…40 ln/min
Max. flow 3…150 ln/min
Pressure rating up to 10 bar
Very low pressure drop
Suitable for corrosive gases



LOW-ΔP-FLOW F-102EI

Min. flow 0,17…8,5 ln/min
Max. flow 1…50 ln/min
Pressure rating up to 10 bar
Low ΔP, easy to purge
Compact IP65 design



LOW-ΔP-FLOW F-202EV

Min. flow 0,17…8,5 ln/min
Max. flow 1…50 ln/min
Pressure rating up to 10 bar
Low ΔP, easy to purge
Compact design

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