DATASHEET F-103DI

LOW-ΔP-FLOW F-103DI

Mass Flow Meter for low pressure drop or corrosive gas service, industrial style



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

Bronkhorst® model F-103DI Mass Flow Meters (MFMs) are suited for precise measurement of flow ranges between 0,8…40 l_n/min and 3…150 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). This model is of rugged design (IP65) for use in industrial environments or even Zone 2 hazardous areas, with optional ATEX Cat. 3 or FM Class I, Div. 2 approval.

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, POWERLINK or FLOW-BUS protocols.

Technical specifications

Measurement / control system

Flow range (intermediate ranges available)	min. 0,8…40 l_n/min max. 3…150 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 for ATEX cat. 3 and FM Class 1 Div 2 : 0…50°C
Mounting	horizontal
Temperature sensitivity	< 0,1% FS/°C
Pressure sensitivity	0,1 % 0,1% Rd/bar typical N_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	4,4 kg
Ingress protection	IP65

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

Electrical connection

Analog/RS232	8 DIN (male);
PROFIBUS DP	bus: 5-pin M12 (female); power: 8 DIN (male);
CANopen® / DeviceNet™	5-pin M12 (male);
FLOW-BUS/Modbus-RTU/ASCII	5-pin M12 (male)
Modbus TCP / EtherNet/IP / POWERLINK	bus: 2 x 5-pin M12 (female) (in/out); power: 8 DIN (male);
EtherCAT®/ PROFINET	bus: 2 x 5-pin M12 (female) (in/out); power: 8 DIN (male)
IEC 61010-1	IEC-61010-1:2010 including national deviations for UL (61010-1:2012) and CSA (C22.2 No. 61010-1-12)

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



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-103EI

- Min. flow 0,9…45 ln/min
  Max. flow 4…200 ln/min
- Pressure rating up to 10 bar
- Low ΔP, easy to purge
- Compact IP65 design



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

BRONKHORST USA LLC

57 South Commerce Way

Suite 120

USA - Bethlehem, PA 18017

Tel. +1-610-866-6750

sales@bronkhorstusa.com