

DATASHEET F-101E

LOW-ΔP-FLOW F-101E

Mass Flow Meter for low pressure drop or corrosive gas service



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

Bronkhorst® model F-101E Mass Flow Meters (MFMs) are suited for precise measurement of flow ranges between 0,028...1,4 l_n/min and 0,24...12 l_n/min (N₂-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, POWERLINK or FLOW-BUS protocols.

Technical specifications

Measurement / control system

| | |
|--|--|
| Flow range (intermediate ranges available) | min. 0,028...1,4 l _n /min max. 0,24...12 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: FKM/Viton®; options: EPDM, FFKM/Kalrez®, FDA and USP Class VI approved compounds |
| Weight | 0,5 kg |
| Ingress protection | IP40 |

Electrical properties

| | | | | |
|-----------------------------------|--|----------------|----------------|--------------------|
| Power supply | +15 ... 24 Vdc | | | |
| Max. power consumption meter | Supply | at voltage I/O | at current I/O | extra for fieldbus |
| | 15 V | 95 mA | 125 mA | <75 mA |
| | 24 V | 65 mA | 85 mA | <50 mA |
| Max. Power consumption controller | Supply | at voltage I/O | at current I/O | extra for fieldbus |
| | 15 V | 290 mA | 320 mA | <75 mA |
| | 24 V | 200 mA | 215 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 | power: 9-pin D-connector (male); bus: 9-pin D-connector (female); |
| 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

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](#)

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 LOW FLOW SERIE M-411

1/4" female in / male out
100 bar
Average porosity 0.5...15 μm

Related products



LOW-ΔP-FLOW F-101D

Min. flow 0,42...21
mln/min
Max. flow 0,042...2,1
l/min
Pressure rating up to 10
bar
Very low pressure drop
Suitable for corrosive
gases



LOW-ΔP-FLOW F-102D

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



LOW-ΔP-FLOW F-101EI

Min. flow 0,028...1,4
l/min
Max. flow 0,24...12
l/min
Pressure rating up to 10
bar
Low ΔP , easy to purge
Compact IP65 design



LOW-ΔP-FLOW F-201EV

Min. flow 0,028...1,4
l/min
Max. flow 0,24...12
l/min
Pressure rating up to 10
bar
Low ΔP , easy to purge
Compact design