

DATASHEET F-201DI

LOW-ΔP-FLOW F-201DI

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



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

Bronkhorst® model F-201DI Mass Flow Controllers (MFCs) are suited for precise measurement of flow ranges between 0,42...21 ml_n/min and 0,042...2,1 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 MFCs 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 mass flow control by means of the integrated 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. 0,42...21 ml _n /min max. 0,042...2,1 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
Settling time (in control, typical)	2 ... 3 sec.
Control stability	< ± 0,1 % FS (typical)
Operating temperature	-10 ... +70 °C 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% Rd/bar typical N ₂
Max. Kv-value	6,6 x 10 ⁻²
Leak integrity, outboard	tested < 2 x 10 ⁻⁹ mbar l/s He

Measurement / control system

Warm-up time	30 min. for optimum accuracy 2 min for accuracy $\pm 2\%$ FS
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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	1,3 kg
Ingress protection	IP65

Electrical properties

Power supply	+15 ... 24 Vdc			
Max. power consumption	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: 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

Certification for hazardous areas

Approvals / certificates

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-200DI

Min. flow 0,2...10 ml/min
Max. flow 0,4...20 ml/min
Pressure rating up to 10 bar
Low ΔP, easy to purge
Compact IP65 design



LOW-ΔP-FLOW F-201EI

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-201DV

Min. flow 0,42...21 ml/min
Max. flow 0,042...2,1 l/min
Pressure rating up to 10 bar
Low ΔP, easy to purge
Compact design



LOW-ΔP-FLOW F-101DI

Min. flow 0,42...21 ml/min
Max. flow 0,042...2,1 l/min
Pressure rating up to 10 bar
Low ΔP, easy to purge
Compact IP65 design

