

DATASHEET F-201ES

LOW-ΔP-FLOW F-201ES

Mass Flow Controller for low pressure drop or corrosive gas service, with integrated shut-off valve



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

Bronkhorst® model F-201ES Mass Flow Controllers (MFCs) 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 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). For extra efficiency or safety, the F-201ES features an integrated, electrically operated shut-off valve.

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. 0,028...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
Settling time (in control, typical)	2 ... 3 sec.
Control stability	< ± 0,1 % FS (typical)
Operating temperature	-10 ... +70 °C
Mounting	horizontal
Temperature sensitivity	< 0,1% FS/°C
Pressure sensitivity	0,1% Rd/bar typical N ₂
Max. Kv-value	6,5 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
Pressure rating (PN)	10 bar abs
Max. ΔP	3 bar dif
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	1,1 kg
Ingress protection	IP40

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
Shut-off valve (N/C)	+24 Vdc, 3 W; using a shut-off control adapter reduces the power consumption			
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

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-201DS

Min. flow 0,42...21 ml/min
Max. flow 0,042...2,1 l/min
Pressure rating 10 bar
Low ΔP , easy to purge
Integrated electrical shut-off



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

