

DATASHEET F-201CI

IN-FLOW F-201CI

Industrial Style Thermal Mass Flow Controller for Gases



Industrial Style Gas Mass Flow Controllers for low flow rates

Bronkhorst® model F-201CI Mass Flow Controllers (MFCs) are suited for accurate measurement and control of flow ranges between 0,16...8 ml_n/min and 0,5...25 l_n/min with pressure rating between vacuum and 64 bar. The MFC consists of a thermal mass flow sensor, a precise control valve and a microprocessor based pc-board with signal and fieldbus conversion. As a function of a setpoint value, the flow controller swiftly adjusts the desired flow rate. The IN-FLOW 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.

IN-FLOW series are equipped with a digital pc-board, offering high accuracy, excellent temperature stability and fast response. The main digital pc-board contains all of the general functions needed for measurement and control. 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. The IN-FLOW model features optional Multi Gas / Multi Range functionality, providing (OEM-) customers with optimal flexibility and process efficiency.

Technical specifications

Measurement / control system

Flow range (intermediate ranges available)	min. 0,16...8 ml _n /min max. 0,5...25 l _n /min (based on N ₂)
Accuracy (incl. linearity) (based on actual calibration)	±0,5% Rd plus ±0,1% FS
Repeatability	< 0,2 % RD
Turndown ratio	up to 1:187,5 (1:50 in analog mode)
Multi fluid capability	storage of max. 8 calibration curves; optional Multi Gas / Multi Range functionality up to 10 bar abs
Settling time (in control, typical)	standard: 1...2 seconds option: down to 500 msec
Control stability	< ± 0,1 % FS
Operating temperature	-10 ... +70 °C for ATEX cat. 3 and FM Class 1 Div 2 : 0...50°C
Temperature sensitivity	zero: < 0,05% FS/°C; span: < 0,05% Rd/°C
Pressure sensitivity	0,1% Rd/bar typical N ₂ ; 0,01% Rd/bar typical H ₂
Max. Kv-value	6,6 x 10 ⁻²
Leak integrity, outboard	tested < 2 x 10 ⁻⁹ mbar l/s He

Measurement / control system

Attitude sensitivity max. error at 90° off horizontal 0,2% at 1 bar, typical N₂

Warm-up time 30 min. for optimum accuracy
2 min for accuracy ± 2% FS

Mechanical parts

Material (wetted parts) stainless steel 316L or comparable

Pressure rating (PN) 64 bar abs

Process connections compression type or face seal couplings

Seals standard: FKM/Viton®;
options: EPDM, FFKM/Kalrez®, FDA and USP Class VI approved compounds

Weight 1,4 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

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



IN-FLOW F-200CI

Min. flow 0,014...0,7 mln/min
Max. flow 0,18...9 mln/min
Pressure rating 64 bar
Compact IP65 design
High accuracy and repeatability



IN-FLOW F-201AI

Min. flow 0,4...20 ln/min
Max. flow 0,6...100 ln/min
Pressure rating 64 bar
Compact IP65 design
High accuracy and repeatability



IN-FLOW F-111BI

Min. flow 0,16...8 mln/min
Max. flow 0,16...25 ln/min
Pressure rating 100 bar
Compact IP65 design
High accuracy

