

# F-240MI

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## IN-FLOW F-240MI

Industrial Style High-Pressure Mass Flow Controller for Gases

- High accuracy, excellent repeatability
- Fast response
- Pressure rating up to 700 bar (delta-P max. 400 bar)
- Compact, rugged design (IP65, dust and waterproof)
- Virtually pressure and temperature independent



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### Industrial Style Gas Mass Flow Controllers for High Pressure / High Delta-P

Bronkhorst® model F-240MI Mass Flow Controllers (MFCs) are suited for accurate measurement and control of flow ranges between 0,2...10 ml<sub>n</sub>/min and 10...500 ml<sub>n</sub>/min with an operating pressure up to 700 bar and max. 400 bar pressure difference ( $\Delta P$ ). 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 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™, PROFIBUS DP, PROFINET, Modbus RTU/ASCII or FLOW-BUS protocols.

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### Technical specifications

## Measurement / control system

Flow range (intermediate ranges available) min. 0,2...10 ml<sub>n</sub>/min  
max. 10...500 ml<sub>n</sub>/min  
(based on N<sub>2</sub>)

Accuracy (incl. linearity) (based on actual calibration) ±0,5% Rd plus ±0,1% FS

Repeatability < 0,2 % RD

Turndown ratio 1:50

Multi fluid capability storage of max. 8 calibration curves

Settling time (in control, typical) 2 ... 4 sec.

Control stability < ± 0,1 % FS

Operating temperature -10 ... +70 °C  
for ATEX cat. 3 : 0...50°C

Temperature sensitivity zero: < 0,05% FS/°C; span: < 0,05% Rd/°C

Pressure sensitivity 0,1% Rd/bar typical N<sub>2</sub>; 0,01% Rd/bar typical H<sub>2</sub>

Leak integrity, outboard tested < 2 x 10<sup>-9</sup> mbar l/s He

Attitude sensitivity max. error at 90° off horizontal 0,2% at 1 bar, typical N<sub>2</sub>

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) 700 bar abs

Min. ΔP 6 bar dif.

Max. ΔP up to 400 bar dif.

Process connections none, female thread;  
special high-pressure adapters on request

Seals standard: Viton®; option: EPDM

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™, PROFIBUS DP, PROFINET, Modbus RTU/ASCII 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)
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)

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 SERIE

#### Digital Readout / Control Systems

Bright, wide angle, 1.8" display (TFT technology)  
User friendly operation, menu driven with 4 push buttons



### BRIGHT SERIE

#### Compact Local R/C Module

Bright, wide angle, 1.8" display  
User friendly operation  
Indication/operation/configuration



### PIPS SERIE

#### Plug-in Power Supply

For lab-style or industrial devices  
Interchangeable plugs (Euro, UK, USA, Australian, IEC) for mains connection

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## Related products



**IN-FLOW F-241MI**

Min. flow 10 ... 500 mln/min  
Max. flow 0,2 ... 10 ln/min  
P max. 700 bar /  $\Delta P$  max. 400 bar  
Compact IP65 design  
High accuracy



**IN-FLOW F-141MI**

Min. flow 0,3 ... 15 mln/min  
Max. flow 2 ... 100 ln/min  
Pressure rating 700 bar  
Compact IP65 design  
High accuracy



**BRONKHORST USA INC.**

57 South Commerce Way

Suite 120

USA - Bethlehem, PA 18017

Tel. [+1-610-866-6750](tel:+1-610-866-6750)

[sales@bronkhorstusa.com](mailto:sales@bronkhorstusa.com)