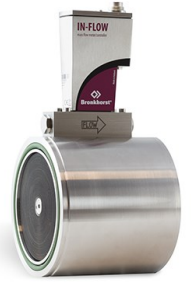


# DATASHEET F-106EI

## IN-FLOW 'High-Flow' F-106EI

Industrial Style Mass Flow Meter for High Gas Flow



### Industrial Style Gas Mass Flow Meters for high flow rates

Bronkhorst® model F-106EI Mass Flow Meters (MFMs) are suited for precise measurement of flow ranges between 8...400 m<sup>3</sup><sub>n</sub>/h and 80...4000 m<sup>3</sup><sub>n</sub>/h at operating pressures up to 40 bar. The MFM consists of a thermal mass flow sensor and a microprocessor based pc-board with signal and fieldbus conversion and a PID controller for optional mass flow control by means of a separately mounted control valve. 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.

### Technical specifications

#### Measurement / control system

Flow range (intermediate ranges available)	min. 8...400 m <sup>3</sup> <sub>n</sub> /h max. 80...4000 m <sup>3</sup> <sub>n</sub> /h (based on N <sub>2</sub> )
Accuracy (incl. linearity) (based on actual calibration)	± 1 % FS
Repeatability	< 0,2 % RD
Turndown ratio	1:50
Multi fluid capability	Storage of max. 8 calibration curves
Response time (sensor)	typical: 0,5 sec.
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 <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% FS 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
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## Mechanical parts

Pressure rating (PN)	up to 40 bar abs (PN10, 16, 40); for hazardous gases such as O <sub>2</sub> , H <sub>2</sub> , etc. do not exceed operating pressure of 10 bar; for higher pressure select a flanged type MFM, series F-107/F-117.
Process connections	Wafer type, for mounting between flanges according to DIN DN150 or ANSI 6"
Seals	standard: Viton®; options: EPDM, Kalrez® (FFKM)
Weight	13,3 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	95 mA	125 mA	<75 mA
	24 V	65 mA	85 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

## Ex-proof specifications

## 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

## Related products



**IN-FLOW 'HIGH-FLOW' F-106DI**

Min. flow 3,6 ... 180 m<sup>3</sup>/h  
Max. flow 36 ... 1800 m<sup>3</sup>/h  
Pressure rating up to 40 bar  
Wafer type connection (DIN/ANSI)  
Rugged IP65 housing



**IN-FLOW 'HIGH-FLOW' F-106FI**

Min. flow 14 ... 700 m<sup>3</sup>/h  
Max. flow 140 ... 7000 m<sup>3</sup>/h  
Pressure rating up to 40 bar  
Wafer type connection (DIN/ANSI)  
Rugged IP65 housing



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