

# DATASHEET F-117CI

## IN-FLOW 'High-Flow' F-117CI

Industrial Style Mass Flow Meter for High Gas Flow



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

Bronkhorst® model F-117CI Mass Flow Meters (MFM) are suited for precise measurement of flow ranges between 2...100 m<sup>3</sup><sub>n</sub>/h and 20...1000 m<sup>3</sup><sub>n</sub>/h at operating pressures up to 100 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. 2...100 m <sup>3</sup> <sub>n</sub> /h max. 20...1000 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
Pressure rating (PN)	up to 100 bar abs
Process connections	Flanged type, according to DIN DN80 or ANSI 3"
Seals	standard: FKM/Viton®; options: EPDM, FFKM/Kalrez®
Weight	26,7 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-117BI

Min. flow 1 ... 50 m<sup>3</sup>n/h  
Max. flow 10 ... 500 m<sup>3</sup>n/h  
Pressure rating up to 100 bar  
Flanged connection (DIN/ANSI)  
Rugged IP65 housing



### IN-FLOW 'HIGH-FLOW' F-117DI

Min. flow 3,6 ... 180 m<sup>3</sup>n/h  
Max. flow 36 ... 1800 m<sup>3</sup>n/h  
Pressure rating up to 100 bar  
Flanged connection (DIN/ANSI)  
Rugged IP65 housing



### IN-FLOW 'HIGH-FLOW' F-107CI

Min. flow 2 ... 100 m<sup>3</sup>n/h  
Max. flow 20 ... 1000 m<sup>3</sup>n/h  
Pressure rating up to 40 bar  
Flanged connection (DIN/ANSI)  
Rugged IP65 housing



### IN-FLOW 'HIGH-FLOW' F-106CI

Min. flow 2 ... 100 m<sup>3</sup>n/h  
Max. flow 20 ... 1000 m<sup>3</sup>n/h  
Pressure rating up to 40 bar  
Wafer type connection (DIN/ANSI)  
Rugged IP65 housing