DATASHEET F-116AI

IN-FLOW 'High-Flow' F-116AI

Industrial Style Mass Flow Meter for High Gas Flow

Industrial Style Gas Mass Flow Meters for high flow rates

Bronkhorst® model F-116AI Mass Flow Meters (MFMs) are suited for precise measurement of flow ranges between 0,3…15 m^3_n/h and 4…200 m^3_n/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. 0,3…15 m^3_n/h max. 4…200 m^3_n/h (based on N_2)
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_2; 0,01% Rd/bar typical H_2
Leak integrity, outboard	tested < 2 x 10^{-9} mbar l/s He
Attitude sensitivity	max. error at 90° off horizontal 0,2% FS at 1 bar, typical N_2
Warm-up time	30 min. for optimum accuracy 2 min for accuracy ± 2% FS

Mechanical parts

Material (wetted parts)	stainless steel 316L or comparable

Mechanical parts

Pressure rating (PN)	100 bar abs
Process connections	compression type or face seal couplings
Seals	standard: Viton®; options: EPDM, Kalrez® (FFKM)
Weight	5,0 kg
Ingress protection	IP65

Electrical properties

Power supply	+15 … 24 Vdc			
Max. power consumption meter	Supply 15 V 24 V	at voltage I/O 95 mA 65 mA	at current I/O 125 mA 85 mA	extra for fieldbus <75 mA <50 mA
Max. Power consumption controller	Supply 15 V 24 V	at voltage I/O 290 mA 200 mA	at current I/O 320 mA 215 mA	extra for fieldbus <75 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 F-113AI

- Min. flow 4…200 ln/min
  Max. flow 8…1670 ln/min
- Pressure rating 100 bar
- Compact IP65 design
- High accuracy

IN-FLOW 'HIGH-FLOW' F-116BI

- Min. flow 1 ... 50 m3n/h
  Max. flow 7,5 ... 375 m3n/h
- Pressure rating 100 bar
- Compact IP65 design
- High accuracy

IN-FLOW 'HIGH-FLOW' F-206BI

- Min. flow 1 ... 50 m3n/h
  Max. flow 7,5 ... 375 m3n/h
- Pressure rating 64 bar
- Compact IP65 design
- High accuracy and repeatability

IN-FLOW 'HIGH-FLOW' F-216AI

- Min. flow 0,3 ... 15 m3n/h
  Max. flow 4 ... 200 m3n/h
- Pressure rating 100 bar
- Compact IP65 design
- High accuracy and repeatability

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