

# DATASHEET F-202BB

## EL-FLOW Base F-202BB

Mass Flow Controller for Gases, Standard & Straightforward



### Gas Mass Flow Controllers for OEM Applications

Bronkhorst® EL-FLOW® Base model F-202BB Mass Flow Controllers (MFCs) are standard and straightforward instruments suited for precise measurement and control of flow ranges between 1,4...70 l<sub>n</sub>/min and 4...200 l<sub>n</sub>/min at operating pressures between vacuum and 10 bar(g). EL-FLOW® Base instruments are equipped with a digital pc-board, offering high accuracy, excellent temperature stability and fast response. In addition to the standard analog I/O the MFCs also offer RS232 or Modbus-RTU or -ASCII communication.

EL-FLOW® Base is an economical solution for installation in (OEM) systems e.g. in coating or welding applications.

### Technical specifications

#### Measurement / control system

Flow range (intermediate ranges available)	min. 1,4...70 l <sub>n</sub> /min max. 4...200 l <sub>n</sub> /min (based on N <sub>2</sub> )
Accuracy (incl. linearity) (based on actual calibration)	± 1 % FS
Repeatability	< 0,2 % RD
Turndown ratio	1:50 (2...100%)
Operating pressure	0...10 bar g
Settling time (in control, typical)	approx. 1 sec.
Control stability	< ± 0,1 % FS (typical for 1 l <sub>n</sub> /min N <sub>2</sub> )
Operating temperature	10 ... 50 °C
Temperature sensitivity	zero: < 0,1% FS/°C; span: < 0,1% Rd/°C
Pressure sensitivity	< 0,15% Rd/bar at 4...10 bar(g); < 0,25% Rd/bar at 1...4 bar(g); < 0,5% Rd/bar at 0...1 bar(g)
Max. Kv-value	3,5 x 10 <sup>-1</sup>
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
Process connections	compression type or face seal couplings
Seals	standard: Viton®; option: Kalrez® (FFKM)
Weight	2,3 kg
Ingress protection	IP40

## Electrical properties

Power supply	+ 15 ... 24 Vdc		
Max. power consumption	Supply	at voltage I/O	at current I/O
	15 V	290 mA	320 mA
	24 V	200 mA	215 mA
Analog output	0...5 (10) Vdc or 0 (4)...20 mA (sourcing output)		
Digital communication	RS232 or Modbus-RTU or -ASCII (RS485)		

## Electrical connection

Power/Analog/RS232/RS485	9-pin D-connector (male)
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## 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](#)

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## 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



### EL-FLOW BASE F-201AB

Min. flow 0,4...20 l/min  
Max. flow 1,4...70 l/min  
Pressure rating 10 bar  
Standard & straightforward  
Cost effective solution



### EL-FLOW BASE F-201CB

Min. flow 0,16...8 ml/min  
Max. flow 0,4...20 l/min  
Pressure rating 10 bar  
Standard & straightforward  
Cost effective solution