

# EL-FLOW<sup>®</sup> *Base*

## Mass Flow Controllers for Gases

### > Introduction

Bronkhorst High-Tech B.V., the European market leader in thermal Mass Flow Meters/Controllers and Electronic Pressure Controllers, has many years of experience in designing and manufacturing precise and reliable measurement and control devices. With a wide range of instruments, Bronkhorst High-Tech offers innovative solutions for many different applications in a variety of different markets.

### > EL-FLOW<sup>®</sup> *Base* fast response Mass Flow Controllers for OEM applications

The Mass Flow Controllers of the EL-FLOW<sup>®</sup> *Base* series are standard and straightforward instruments. They provide accurate measurement, fast response and stable control in common gas flow applications. EL-FLOW<sup>®</sup> *Base* is an economical solution for installation in (OEM) systems e.g. in coating or welding applications. The instruments operate on the principle of thermal mass flow measurement in ranges starting from 0,2...10 ml<sub>r</sub>/min up to 4...200 l<sub>r</sub>/min air-equivalent. They offer analog I/O-signals as well as digital RS232 communication and/or Modbus-RTU as a standard feature. EL-FLOW<sup>®</sup> *Base* is a member of Bronkhorst's most popular and field proven EL-FLOW<sup>®</sup> series.

### > Fields of applications

- ◆ Process gas measurement and control in food, pharmaceutical and (petro-) chemical industries and fermentation installations
- ◆ Burner control (welding)
- ◆ Surface treatment (CVD, coating, hardening)
- ◆ Solar cell fabrication
- ◆ Analytical instrumentation



### > Models and flow ranges

Model	min. flow	max. flow
F-201CB	0,2...10 ml <sub>r</sub> /min	0,4...20 l <sub>r</sub> /min
F-201AB	0,4...20 l <sub>r</sub> /min	1,4...70 l <sub>r</sub> /min
F-201BB	1,4...70 l <sub>r</sub> /min	4...200 l <sub>r</sub> /min

*Ranges based on Air, intermediate ranges available.*

### > EL-FLOW<sup>®</sup> *Base* features

- ◆ Accurate mass flow control
- ◆ Fast response, excellent repeatability
- ◆ Virtually pressure and temperature independent
- ◆ Cost effective solution
- ◆ Analog I/O-signals: 0...5 (10) Vdc or 0(4)...20 mA
- ◆ RS232 communication
- ◆ Modbus-RTU
- ◆ Control characteristics digitally configurable by user



## > Technical specifications

### Performance

Accuracy (incl. linearity) (based on actual calibration)	: ±1% FS
Repeatability	: < 0,2% Rd
Settling time (controller)	: approx. 1 second
Control stability	: < ±0,1% FS (typical for 1 l <sub>v</sub> /min N <sub>2</sub> )
Turndown	: 1 : 50 (2...100%)
Operating pressure	: 0...10 bar(a)
Operating temperature	: 0...50°C;
Temperature sensitivity	: zero: < 0,1% FS/°C; span: < 0,1% Rd/°C
Warm-up time	: 30min. for optimum accuracy
Leak integrity, outboard	: tested < 2 x 10 <sup>-9</sup> mbar l/s He
Control valve	: normally closed solenoid valve, F-201CB/F-201AB: Kv-max = 6,6 x 10 <sup>-2</sup> F-201BB: Kv-max = 1,7 x 10 <sup>-1</sup>

### Mechanical parts

Material (wetted parts)	: Stainless Steel
Seals	: standard: Viton (FPM), option: Kalrez (FFKM), on F-201CB/F-201AB only
Process connections	: 1/4" BSPP female thread; optional accessories: compression type or face seal couplings in various inch or metric sizes

### Electrical properties

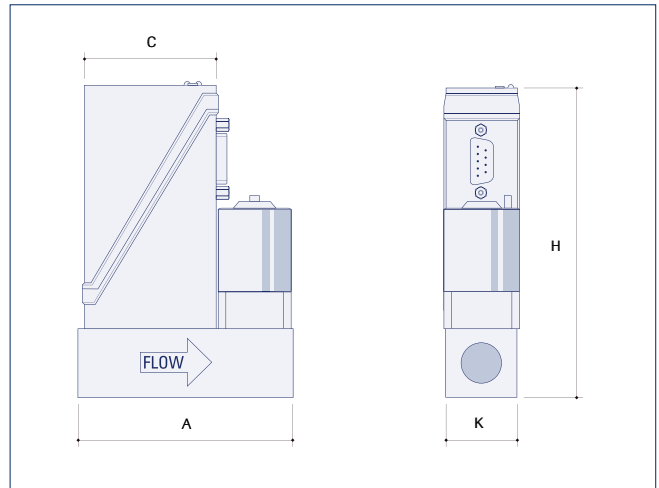
Power supply	: +15...24 Vdc
Power consumption	: max. 320 mA
Analog output/command	: 0...5 (10) Vdc or 0 (4)...20 mA (sourcing output)
Digital communication	: RS-232 or Modbus-RTU (RS-485)
Electrical connection	: 9-pin D-connector (male)
EMC	: CE declaration
Ingress protection (housing)	: IP40

Technical specifications subject to change without notice.



EL-FLOW® Base model F-201AB Mass Flow Controller

## > Dimensions and weights



Model	A	C	K	H	Weight (kg)
F-201CB	77	47	25	111	0,5
F-201AB	78	47	26	123	0,6
F-201BB	95	47	26	123	0,7

Dimensions in mm

## > Model number identification

F-NNNAA	-	NNNA	-	A	A	A	-	NN	-	A
<b>Base model</b>										
F-201CB 0...10 ml <sub>v</sub> /min / 0...20 l <sub>v</sub> /min										
F-201AB 0...20 / 0...70 l <sub>v</sub> /min										
F-201BB 0...70 / 0...200 l <sub>v</sub> /min										
<b>Nominal range</b>										
Factory selected										
<b>Communication</b>										
A Analog + RS-232 or Modbus										
<b>Analog output</b>										
A 0...5 Vdc										
B 0...10 Vdc										
F 0...20 mA sourcing										
G 4...20 mA sourcing										
<b>Supply voltage</b>										
D +15...24 Vdc										
<b>Connections (in/out)</b>										
0 none (factory standard)										
<b>Seals</b>										
V Viton (factory standard)										
K Kalrez										

## > Warranty

All instruments and accessories are warranted for a period of 3 years from delivery date.