

# EL-FLOW® *Classic*

## Thermal 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 experience in designing and manufacturing precise and reliable measurement and control devices. With a wide range of instruments, Bronkhorst offers innovative solutions for many different applications in many different markets. EL-FLOW®*Classic* instruments are highly standardized and can therefore cost-efficiently be produced in larger quantities. This enables us to pass on this advantage to our customers.

### > EL-FLOW® *Classic* series for laboratory and machinery applications

EL-FLOW®*Classic* series Mass Flow Controllers for gas applications have a housing designed for laboratory and clean processing conditions. The instruments are designed to measure and control gas flow ranges between 0.16...8 sccm and 0.4...20 slm at an operating pressure between atmospheric pressure and 30 bar(g).

The integrated control valve ensures extremely fast and smooth control. EL-FLOW®*Classic* combines the advanced technology and high quality of Bronkhorst's most popular product line with a very attractive price level.

### > Fields of applications

The EL-FLOW®*Classic* series are suited for application in a wide variety of both OEM and laboratory applications in the following markets (typically):

- ◆ Analysis and environmental measurements
- ◆ Burner control
- ◆ Vacuum technology
- ◆ Surface treatment installations
- ◆ Process control in food, pharmaceutical and (petro-) chemical industries



EL-FLOW®*Classic* model F-201CL

### > EL-FLOW® *Classic* features

- ◆ Accurate mass flow control
- ◆ Fast response, excellent repeatability
- ◆ Virtually pressure and temperature independent
- ◆ Cost effective solution
- ◆ Analog I/O-signals: 0...5 Vdc or 4...20 mA (sourcing)



## > Technical specifications

### Measurement / control system

Flow ranges	: from 0.16...8 sccm up to 0.4...20 slm; intermediate flow ranges available
Accuracy (incl. linearity)	: $\pm 1\%$ FS (based on actual calibration)
Turndown	: 1 : 50
Repeatability	: < 0,2% Rd
Settling time	: 1...2 seconds
Operating pressure	: 0...30 bar(g)
Operating temperature	: 0...50°C
Temperature sensitivity	: zero: < 0.1% FS/°C; span: < 0.1% Rd/°C
Warm-up time	: 30 min. for optimum accuracy
Leak integrity, outboard	: < $2 \times 10^{-9}$ mbar l/s He
Control valve	: normally closed solenoid valve

### Mechanical parts

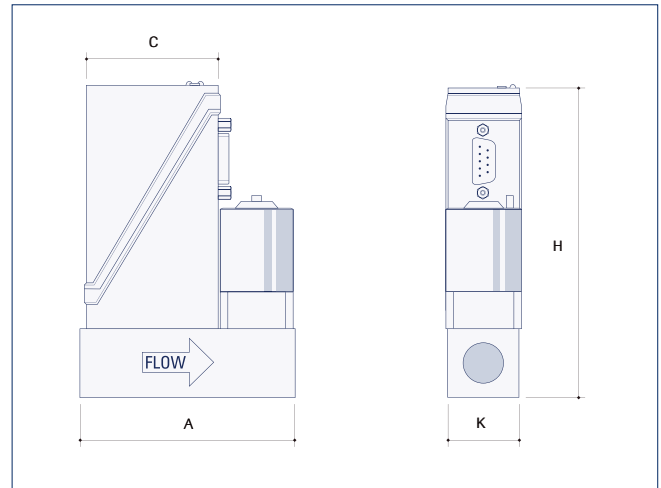
Material (wetted parts)	: stainless steel 316L or comparable
Seals	: Viton®
Process connections	: 1/4" BSPP female thread; optional accessories: compression type or face seal couplings in various inch or metric sizes

### Electrical properties

Power supply	: +15...24 Vdc
Power consumption	: max. 320 mA
Analog output/command	: 0...5 Vdc or 4...20 mA (sourcing output)
Electrical connection	: 9-pin D-connector (male) (power + I/O signals)
EMC	: EU declaration
RoHS	: EU declaration
Ingress protection (housing)	: IP40

Technical specifications and dimensions subject to change without notice.

## > Dimensions and weights



Model	A	C	H	K	Weight (kg)
F-201CL	77	47	111	25	0,5

Dimensions in mm

## > Warranty

All instruments and accessories are warranted for a period of 1 year from delivery date.

## > Round the clock support

Bronkhorst High-Tech is a worldwide organization with its Head Office located in Ruurlo, The Netherlands. Our Customer Service Department offers 'seven days a week' support to customers in every part of the world. Our specialist teams are available to you to fulfill the needs of pre- and aftersales support, on-site inspection & calibration and start-up assistance.

## > Model number identification

F-201CL - NNN - NNN - A

Gas	Nominal Range (FS)	Output
001 He	020 20 sccm	A 0...5 Vdc
004 Ar	050 50 sccm	G 4...20 mA sourcing
007 H <sub>2</sub>	100 100 sccm	
008 Air	200 200 sccm	
009 CO	500 500 sccm	
013 N <sub>2</sub>	1K0 1 slm	
015 O <sub>2</sub>	2K0 2 slm	
025 CO <sub>2</sub>	5K0 5 slm	
027 N <sub>2</sub> O	10K 10 slm	
028 CH <sub>4</sub>	20K 20 slm	



## > Related documents

For technical documentation related to the EL-FLOW® Classic Series, e.g. instruction manual, dimensional drawing, hook-up diagram etc. please visit following landing page on our website:  
[www.bronkhorst.com/en/qrclassic](http://www.bronkhorst.com/en/qrclassic)

