

FG-211CV

EL-FLOW PRESTIGE FG-211CV

High Performance Mass Flow Controller for Gases

- On-board gas conversion model (Multi-Fluid / Multi-Range)
- 100 unique gases embedded
- User configurable I/O functions
- Significantly reduced power consumption
- Further advances in flow-signal processing
- Highly stable flow control regime virtually impervious to process fluctuations
- Advanced control valve design



Gas Mass Flow Controllers for low flow rates

Bronkhorst® model FG-211CV High Performance Mass Flow Controllers (MFCs) are suited for accurate measurement and control of flow ranges between 0,14...7 ml_n/min and 0,4...20 l_n/min at operating pressures up to 100 bar. The MFC consists of a thermal mass flow sensor, a precise control valve and a microprocessor based pc-board with signal and fieldbus conversion. As a function of a setpoint value, the flow controller swiftly adjusts the desired flow rate.

EL-FLOW® Prestige 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 DeviceNet™, PROFIBUS DP, Modbus, EtherCAT®, PROFINET or FLOW-BUS protocols. The EL-FLOW® Prestige design features standard Multi Gas / Multi Range functionality, providing (OEM-) customers with optimal flexibility and process efficiency.

Technical specifications

Measurement / control system

Flow range, based on N ₂ (intermediate ranges available)	min. 0,14...7 ml _n /min max. 0,4...20 l _n /min
Accuracy (incl. linearity) (based on actual calibration)	±0,5% Rd plus ±0,1%FS
Repeatability	< 0,2% Rd
Turndown	1 : 150; in analog mode 1 : 50
Multi Gas/Multi Range	embedded gas data for <u>100 unique gases</u> , plus any mixture of maximum 5 of these gases. MG/MR functionality available up to 100 bar.
Settling time (in control, typical)	fast: < 500 msec standard: < 1 sec slow: < 2 sec
Control stability	≤ ± 0,1% FS (typical for 1 l _n /min N ₂)
Max. Kv-value	6,6 x 10 ⁻²
Operating temperature	-10...70°C
Temperature sensitivity	zero: < 0,02% FS/°C; span: < 0,025% Rd/°C
Pressure sensitivity	< 0,15% Rd/bar typical N ₂ ; < 0,02% Rd/bar N ₂ (incl. pressure correction option)
Leak integrity, outboard	tested < 2 x 10 ⁻⁹ mbar l/s He
Attitude sensitivity	max. error at 90° off horizontal 0,07% FS at 1 bar, typical N ₂
Warm-up time	30 min. for optimum accuracy

Mechanical parts

Material (wetted parts)	stainless steel 316L or comparable, degreased for use on oxygen (O ₂)
Pressure rating	100 bar (g)
Process connections	compression type or face seal couplings
Seals	standard: Viton® options: EPDM, Kalrez® (FFKM), FDA and USP Class VI approved compounds
Weight	0,7 kg
Ingress protection (housing)	IP40

Electrical properties

Power supply	+15...24 Vdc		
Max. power consumption (based on normally closed valve, pin 5 not used)	Supply	at voltage I/O	at current I/O
	15 V	202 mA	225 mA
	24 V	128 mA	146 mA
If applicable: PROFIBUS DP	add 53 mA (15 V supply) or 30 mA (24 V supply)		
PROFINET	add 76 mA (15 V supply) or 48 mA (24 V supply)		
EtherCAT®	add 66 mA (15 V supply) or 41 mA (24 V supply)		
DeviceNet™	add 48 mA (24 V supply)		
Analog output/command	0...5 (10) Vdc or 0 (4)...20 mA (sourcing output)		
Digital communication	standard: RS232; options: PROFIBUS DP, DeviceNet™, PROFINET, EtherCAT®, Modbus RTU or ASCII, FLOW-BUS		

Electrical connection

Analog/RS232	9-pin D-connector (male);
PROFIBUS DP	bus: 9-pin D-connector (female); power: 9-pin D-connector (male);
Devicenet™	5-pin M12-connector (male);
EtherCAT®/PROFINET	2 x RJ45 modular jack (in/out)
Modbus/FLOW-BUS	RJ45 modular jack
CE	EMC 2014/30/EU, RoHS 2011/65/EU,
IEC 61010-1	2010

Technical specifications subject to change without notice.

For dimensional drawings and hook-up diagrams please visit the [productpage](#) on our [website](#)

Recommended accessories



E-8000 - DIGITAL READOUT / CONTROL SYSTEMS

Bright, wide angle, 1.8" display (TFT technology)

User friendly operation, menu driven with 4 push buttons



BRIGHT - COMPACT LOCAL READOUT/CONTROL MODULE

Bright, wide angle, 1.8" display

User friendly operation

Indication/operation/configuration



PIPS - PLUG-IN POWER SUPPLY

For lab-style or industrial devices

Interchangeable plugs (Euro, UK, USA, Australian, IEC) for mains connection



IN-LINE FILTER SERIES M-411 RS

1/4" female in / male out

100 bar

Average porosity 0.5...15 µm

Related products



EL-FLOW PRESTIGE FG-211CVP (P-INSENSITIVE)

Min. flow 0,14...7 mln/min
Max. flow 0,4...20 lln/min
Pressure rating 100 bar
On-board pressure correction
100 selectable gases



EL-FLOW PRESTIGE FG-201CV

Min. flow 0,14...7 mln/min
Max. flow 0,4...20 lln/min
Pressure rating 64 bar
100 selectable gases
Customized I/O configurations



EL-FLOW PRESTIGE FG-211AV

Min. flow 0,2...10 lln/min
Max. flow 2...100 lln/min
Pressure rating 100 bar
100 selectable gases
Customized I/O configurations



EL-FLOW PRESTIGE FG-210CV

Min. flow 0,014...0,7 mln/min
Max. flow 0,18...9 mln/min
Pressure rating 100 bar
100 selectable gases
Customized I/O configurations



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