

DATASHEET FG-211AV

EL-FLOW Prestige FG-211AV

High Performance Mass Flow Controller for Gases



Gas Mass Flow Controllers for low flow rates

Bronkhorst® model FG-211AV High Performance Mass Flow Controllers (MFCs) are suited for accurate measurement and control of flow ranges between 0,4...20 l_n/min and 2...100 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 CANopen®, DeviceNet™, EtherCAT®, PROFIBUS DP, PROFINET, Modbus RTU, ASCII or TCP/IP, EtherNet/IP, POWERLINK 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 (intermediate ranges available)	min. 0,4...20 l _n /min max. 2...100 l _n /min (based on N ₂)
Accuracy (incl. linearity) (based on actual calibration)	± 0,5 % RD plus ±0,1%FS
Repeatability	< 0,2 % RD
Turndown ratio	1:150 (1:50 in analog mode)
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)
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)
Max. Kv-value	6,6 x 10 ⁻²
Leak integrity, outboard	tested < 2 x 10 ⁻⁹ mbar l/s He

Measurement / control system

Attitude sensitivity max. error at 90° off horizontal 0,07% FS at 1 bar, typical N₂

Warm-up time 30 min. for optimum accuracy
2 min. for accuracy ± 1% FS

Mechanical parts

Material (wetted parts) Stainless steel 316L or comparable, degreased for use on oxygen (O₂)

Pressure rating (PN) 100 bar g

Process connections compression type or face seal (VCR/VCO) couplings

Seals standard: FKM/Viton®
options: EPDM, FFKM/Kalrez®, FDA and USP Class VI approved compounds
valve seat: FFKM with PI film

Weight 0,9 kg

Ingress protection IP40

Electrical properties

Power supply +15 ... 24 Vdc

Max. power consumption	Supply	at voltage I/O	at current I/O	extra for fieldbus
	15 V	202 mA	225 mA	<75 mA
	24 V	128 mA	146 mA	<50 mA

(based on normally closed valve, pin 5 not used)

Analog output 0...5 (10) Vdc or 0 (4)...20 mA (sourcing output)

Digital communication standard: RS232;
options: PROFIBUS DP, CANopen®, DeviceNet™, PROFINET, EtherCAT®, Modbus RTU, ASCII or TCP/IP, EtherNet/IP, POWERLINK, FLOW-BUS

Certification CE / UKCA

Electrical connection

Analog/RS232 9-pin D-connector (male);

PROFIBUS DP bus: 9-pin D-connector (female);
power: 9-pin D-connector (male);

CANopen® / DeviceNet™ 5-pin M12-connector (male);

FLOW-BUS/Modbus-RTU/ASCII RJ45 modular jack

Modbus TCP / EtherNet/IP /
POWERLINK 2 x RJ45 modular jack (in/out);

EtherCAT®/ PROFINET 2 x RJ45 modular jack (in/out)

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



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 PRESTIGE FG-201AV

Min. flow 0,4...20 l/min
Max. flow 2...100 l/min
Pressure rating 64 bar
100 selectable gases
Customized I/O configurations



EL-FLOW PRESTIGE FG-211CV

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



EL-FLOW PRESTIGE FG-111AC

Min. flow 0,4...20 l/min
Max. flow 2...100 l/min
Pressure rating 100 bar
100 selectable gases
Customized I/O configurations