

DATASHEET FG-111AC

EL-FLOW Prestige FG-111AC

High Performance Mass Flow Meter for Gases



Gas Mass Flow Meters for low flow rates

Bronkhorst® model FG-111AC High Performance Mass Flow Meters (MFM) are suited for precise measurement of flow ranges between 0,4...20 I_n/min and 2...100 I_n/min at operating pressures between vacuum and 100 bar. The MFM consists of a thermal mass flow sensor and a microprocessor based pc-board with signal and fieldbus conversion and a PID controller for optional mass flow control by means of a separately mounted control valve.

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 I _n /min max. 2...100 I _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.
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 2 min. for accuracy ± 1% FS

Mechanical parts

Material (wetted parts)	Stainless steel 316L or comparable, degreased for use on oxygen (O ₂)
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
Weight	0,7 kg
Ingress protection	IP40

Electrical properties

Power supply	+15 ... 24 Vdc			
Max. power consumption meter	Supply	at voltage I/O	at current I/O	extra for fieldbus
	15 V	69 mA	92 mA	<75 mA
	24 V	45 mA	63 mA	<50 mA
Max. Power consumption controller	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-111B

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-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-211AV

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



Bronkhorst High-Tech designs and manufactures innovative instruments and subsystems for low-flow measurement and control for use in laboratories, machinery and industry. Driven by a strong sense of sustainability and with many years of experience, we offer an extensive range of (mass) flow meters and controllers for gases and liquids, based on thermal, Coriolis and ultrasonic measuring principles. Our global sales and service network provides local support in more than 40 countries. Discover Bronkhorst[®]!