

DATASHEET F-201CM

EL-FLOW Metal Sealed F-201CM

Metal Sealed Mass Flow Controller for Gases



Metal Sealed Gas Mass Flow Controllers

Bronkhorst® model F-201CM Mass Flow Controllers (MFCs) designed especially to meet the requirements of the semicon market as well as other high purity gas applications. The instruments feature high surface quality and are of modular construction with metal-to-metal seals that ensure long-term leak tightness. The F-201CM is suited for precise measurement and control of flow ranges between 0.12...6 sccm up to 1...50 slm (based on N₂) at operating pressures between vacuum and 1000 psig (64 bar).

EL-FLOW® Metal Sealed 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® Metal Sealed design features optional 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. 0.12...6 ml _n /min max. 1...50 l _n /min
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)
Max. operating pressure	1000 psig (64 bar)
Multi fluid capability	storage of max. 8 calibration curves; optional Multi Gas / Multi Range functionality up to 10 bar abs
Settling time (in control, typical)	1 second typical above 5% FS; option: down to 600 msec
Control stability	± 0.05% FS (typical for 1 slm N ₂)
Operating temperature	-10...+70°C (Viton or EPDM valve seat); 0...70°C (NC valve with Kalrez 6375 seat); 0...50°C (NO valve with Kalrez 6375 seat)
Mounting	any position, attitude sensitivity negligible
Temperature sensitivity	zero: < 0.05% FS/°C; span: < 0.05% Rd/°C
Pressure sensitivity	< 0,1% Rd/bar typical N ₂ ; < 0,01% Rd/bar H ₂

Measurement / control system

Leak integrity, outboard	$< 2 \times 10^{-11} \text{ Pa.m}^3/\text{s He}$
Leak-by through closed valve	$< 10^{-5} \text{ Pa.m}^3/\text{s He}$ (metal sealed)
Warm-up time	30 min. for optimum accuracy 2 min. for accuracy $\pm 2\%$ FS

Mechanical parts

Material (wetted parts)	stainless steel 316L or comparable
Process connections	1/4" face seal male
Seals	Outer seals: metal-to-metal (no rings); Inner seal / valve seat: Kalrez® (FFKM); option: Viton®
Weight	0,7 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	290 mA	320 mA	<75 mA
	24 V	200 mA	215 mA	<50 mA
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			

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)

Control valve options

External actuator options to be connected to the controller

Certification for hazardous areas

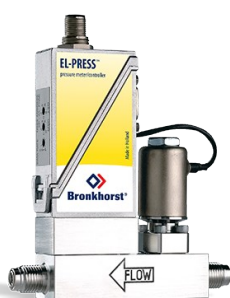
Approvals / certificates

Related products



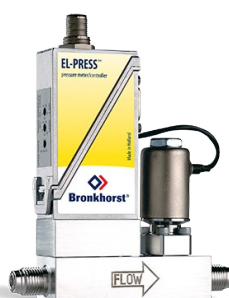
EL-FLOW METAL SEALED F-111CM

Min. flow 0,12...6
mln/min
Max. flow 1... 50 lln/min
Pressure rating 100 bar
Metal-to-metal outer
seals
Cleanroom assembled



EL-PRESS METAL SEALED P-602CM (P2-CONTROL)

Min. pressure 2...100
mbar
Max. pressure 1,28...64
bar
Metal-to-metal outer
seals
Cleanroom assembled



EL-PRESS METAL SEALED P-702CM (P1-CONTROL)

Min. pressure 2...100
mbar
Max. pressure 1,28...64
bar
Metal-to-metal outer
seals
Cleanroom assembled