

DATASHEET FG-201CS

EL-FLOW Prestige FG-201CS

High Performance Mass Flow Controller with
Integrated Shut-Off Valve



Gas Mass Flow Controllers with Electrical Shut-Off Valves

Bronkhorst® model FG-201CS 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 between vacuum and 10 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. For extra efficiency or safety, the FG-201CS features an integrated, electrically operated shut-off 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. 0,14...7 ml _n /min max. 0,4...20 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. |
| 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 | 6,5 x 10 ⁻² |
| 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 |

Measurement / control system

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| Warm-up time | 30 min. for optimum accuracy 2 min. for accuracy \pm 1% FS |
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Mechanical parts

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|-------------------------|--|
| Material (wetted parts) | Stainless steel 316L or comparable, degreased for use on oxygen (O ₂) |
| Pressure rating (PN) | 10 bar g |
| Max. Δ P | 5 bar dif. |
| Process connections | compression type or face seal (VCR/VCO) couplings |
| Seals | standard: Viton® options: EPDM, Kalrez® (FFKM) (N/C shut-off only) valve seat: FFKM with PI film |
| Weight | 1,3 kg |
| Ingress protection | IP40 |

Electrical properties

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|------------------------|----------------|----------------|----------------|--------------------|
| 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)

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|----------------------|---|
| Shut-off valve (N/C) | +24 Vdc 3 W; using a shut-off control adapter reduces the power consumption |
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| Analog output | 0...5 (10) Vdc or 0 (4)...20 mA (sourcing output) |
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| Digital communication | standard: RS232; options: PROFIBUS DP, CANopen®, DeviceNet™, PROFINET, EtherCAT®, Modbus RTU, ASCII or TCP/IP, EtherNet/IP, POWERLINK, FLOW-BUS |
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|---------------|-----------|
| Certification | CE / UKCA |
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Electrical connection

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|--------------|---------------------------|
| Analog/RS232 | 9-pin D-connector (male); |
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|-------------|--|
| PROFIBUS DP | bus: 9-pin D-connector (female); power: 9-pin D-connector (male); |
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|-----------------------|-----------------------------|
| CANopen® / DeviceNet™ | 5-pin M12-connector (male); |
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|---------------------------|-------------------|
| FLOW-BUS/Modbus-RTU/ASCII | RJ45 modular jack |
|---------------------------|-------------------|

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

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|----------------------|--------------------------------|
| 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-201CV

Min. flow 0,14...7
mln/min
Max. flow 0,4...20 ln/min
Pressure rating 64 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®!