

F-211CX

EX-FLOW F-211CX

Ex-Protected Mass Flow Controller for Gases

- ATEX approval Cat.2, Zone 1
- High accuracy, excellent repeatability
- Virtually pressure and temperature independent
- Compact design



Intrinsically Safe Gas Mass Flow Controllers for low flow rates

Bronkhorst® EX-FLOW Mass Flow Controllers (MFCs) are suited for precise gas flow control in ATEX Zone 1 hazardous areas. The flow meter part and the control valve of the MFC should be connected (via separate cables) to a power supply with galvanic isolation / preamplifier / readout system (located in the safe zone) which contains a controller board to complete the control loop. See Bronkhorst® [E-8000 Series](#).

EX-FLOW model F-211CX covers flow ranges from 0,3...15 ml_n/min up to 0,4...20 l_n/min (N₂-equivalent) at operating pressures up to 100 bar.

The intrinsically safe measuring head of the flow meter is tested according to ATEX 114 Directive 2014/34/EU and approved under EC-Type Examination Number: KEMA 01ATEX1172, protection II 2 G Ex ib IIC T4 Gb.

The intrinsically safe valve coils are explosion proof certified and available in two options (ATEX certification only):

Coil XB: protection II 1 G Ex ia IIC T6 / protection II 1 D Ex ta IIIC T80°C

Coil XC: protection II 2 G Ex eb IIC T4 / protection II 2 D Ex tb IIIC T130°C

Technical specifications

Measurement / control system

Flow range (intermediate ranges available) min. 0,3...15 ml_n/min
max. 0,4...20 I_n/min
(based on N₂)

Accuracy (incl. linearity) (based on actual calibration) ± 1 % FS

Repeatability < 0,2 % RD

Turndown ratio 1:50 (2...100%)

Time constant 5 sec.

Control stability ≤ ± 0,1 % FS typical

Operating temperature -10 ... +65 °C

Temperature sensitivity zero: < 0,05% FS/°C; span: < 0,05% Rd/°C

Max. Kv-value Valve with XB-coil: $4,3 \times 10^{-3}$ /
Valve with XC-coil: $6,6 \times 10^{-2}$

Leak integrity, outboard tested < 2×10^{-9} mbar l/s He

Attitude sensitivity max. error at 90° off horizontal 0,2% FS at 1 bar, typical N₂

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

Mechanical parts

Material (wetted parts) Stainless steel 316L or comparable

Pressure rating (PN) 100 bar abs

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

Seals standard: Viton®;
options: EPDM, Kalrez® (FFKM), FDA and USP Class VI approved compounds

Weight 1,7 kg

Ingress protection IP65

Electrical properties

Output signal 15 ... 20 mA (linear)
Terminal connection, cable gland M16x1,5

I/O signals via PS/Readout (located in safe area) analog: 0...5 Vdc, 0...10 Vdc, 0...20 mA, 4...20 mA;
digital: RS232, PROFIBUS DP, DeviceNet™, Modbus RTU or ASCII, PROFINET, EtherCAT®, FLOW-BUS

XB-coil Coil voltage max. 28 V/110 mA;
295 Ohm at 20°C

XC-coil Coil voltage max. 24 V;
65 Ohm at 20°C, Pmax = 9 W at 20°C

Electrical connection

Ex-proof measuring head Terminal connection, cable gland M16x1,5

Control valve coil cable gland M20x1,5

Control valve options

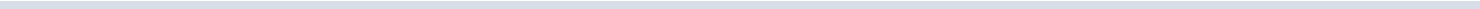
External actuator options to be connected to the controller

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

IN-LINE FILTER SERIE M-411 RS

1/4" female in / male out

100 bar

Average porosity 0.5...15 µm

Related products



EX-FLOW F-210CX

Lowest flow rates, from 0,18...9,5 mln/min up to 0,18...9,5 mln/min

Pressure rating 100 bar

ATEX approval Cat.2, Zone 1

Rugged IP65 construction



EX-FLOW F-111BX

Flow ranges from 0,3...15 mln/min up to 0,4...20 l/min

Pressure rating 100 bar

ATEX approval Cat.2, Zone 1

Rugged IP65 construction



EX-FLOW F-211AX

Flow ranges from 0,1...5 l/min up to 2...100 l/min

Pressure rating 100 bar

ATEX approval Cat.2, Zone 1

Rugged IP65 construction



BRONKHORST HIGH-TECH B.V.

Nijverheidsstraat 1A

NL-7261 AK Ruurlo (NL)

Tel. +31 573 45 88 00

info@bronkhorst.com

