# F-213AX

# EX-FLOW F-213AX

Ex-Proof 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 higher 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-213AX covers flow ranges from 4...200 $l_n$/min up to 25...1250 $l_n$/min ($N_2$-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. 4…200 $l_n$/min<br>max. 25…1250 $l_n$/min<br>(based on $N_2$) |
| 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 | 0,15 … 1,5 |
| Leak integrity, outboard | tested < 2 x $10^{-9}$ mbar l/s He |
| Attitude sensitivity | max. error at 90° off horizontal 0,2% FS at 1 bar, typical $N_2$ |
| Warm-up time | 30 min. for optimum accuracy<br>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®;<br>options: EPDM, Kalrez® (FFKM), FDA and USP Class VI approved compounds |
| Ingress protection | IP65 |

## Electrical properties

| | |
|---|---|
| Signal circuit | type of explosion protection: intrinsic safety Ex ib IIC, only for connection to a certified intrinsically safe circuit with the following maximum values:<br>Ui = 28 V, Ii = 98 mA, Pi = 686 mW<br>The effective internal capacitance between:<br>Terminals 1 and 3: Ci = 1 nF;<br>Effective internal inductance: Li = 0,3 mH |
| Output signal | 15 … 20 mA (linear) |
| I/O signals via PS/Readout (located in safe area) | analog: 0…5 Vdc, 0…10 Vdc, 0…20 mA, 4…20 mA;<br>digital: RS232, PROFIBUS DP, DeviceNet™, Modbus RTU or ASCII, PROFINET, EtherCAT®, FLOW- BUS |
| XB-coil | Coil voltage max. 28 V/110 mA;<br>295 Ohm at 20°C |
| XC-coil | Coil voltage max. 24 V;<br>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 |

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-423 RS

- 1/2" female in / male out
- 200 bar
- Average porosity 2...40 µm

## Related products




### EX-FLOW F-212AX

Flow ranges from 0,6…30 ln/min up to 5…250 ln/min

Pressure rating 100 bar

ATEX approval Cat.2, Zone 1

Rugged IP65 construction




### EX-FLOW F-113AX

Flow ranges from 4…200 ln/min up to 25…1250 ln/min

Pressure rating 100 bar

ATEX approval Cat.2, Zone 1

Rugged IP65 construction




### EX-FLOW F-216AX

Flow ranges from 0,4…20 m3n/h up to 4…200 m3n/h

Pressure rating 100 bar

ATEX approval Cat.2, Zone 1

Rugged IP65 construction

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