

# F-111BX

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## EX-FLOW F-111BX

Ex-Protected Mass Flow Meter for Gases

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



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### Intrinsically Safe Gas Mass Flow Meters for low flow rates

Bronkhorst® EX-FLOW Mass Flow Meters (MFM) are suited for precise gas flow measurement in ATEX Zone 1 hazardous areas. The MFM should be connected to a power supply with galvanic isolation / preamplifier / readout system (located in the safe zone). See Bronkhorst® [E-8000 Series](#).

EX-FLOW model F-111BX covers flow ranges from 0,3...15 ml<sub>n</sub>/min up to 0,4...20 l<sub>n</sub>/min (N<sub>2</sub>-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.

Other certifications: IECEx (IECEx DEK14.0060), TIIS (検・第TC21584号) and KCs = Ex ib IIC T4.

# Technical specifications

## Measurement / control system

Flow range (intermediate ranges available)	min. 0,3...15 ml <sub>n</sub> /min max. to 0,4...20 l <sub>n</sub> /min (based on N <sub>2</sub> )
Accuracy (incl. linearity) (based on actual calibration)	± 1 % FS
Repeatability	< 0,2 % RD
Turndown ratio	1:50 (2...100%)
Time constant	5 sec.
Operating temperature	-10 ... +70 °C
Temperature sensitivity	zero: < 0,05% FS/°C; span: < 0,05% Rd/°C
Leak integrity, outboard	tested < 2 x 10 <sup>-9</sup> mbar l/s He
Attitude sensitivity	max. error at 90° off horizontal 0,2% FS at 1 bar, typical N <sub>2</sub>
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	1,0 kg
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: Ui = 28 V, Ii = 98 mA, Pi = 686 mW The effective internal capacitance between: Terminals 1 and 3: Ci = 1 nF; 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; digital: RS232, PROFIBUS DP, DeviceNet™, Modbus RTU or ASCII, PROFINET, EtherCAT®, FLOW- BUS

## Electrical connection

Ex-proof measuring head	Terminal connection, cable gland M16x1,5
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Technical specifications subject to change without notice.

For dimensional drawings and hook-up diagrams please visit the [product page](#) on our [website](#)

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## 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  $\mu\text{m}$

## Related products



**EX-FLOW F-110CX**

Min. flow 0,15...7,5 mln/min  
Max. flow 0,18...9,5 mln/min  
Pressure rating 100 bar  
ATEX approval Cat.2, Zone 1  
Rugged IP65 construction



**EX-FLOW F-111AX**

Flow ranges from 0,1...5 lln/min up to 2...  
100 lln/min  
Pressure rating 100 bar  
ATEX approval Cat.2, Zone 1  
Rugged IP65 construction



**EX-FLOW F-201CX**

Flow ranges from 0,3...15 mln/min up to  
0,4...20 lln/min  
Pressure rating 64 bar  
ATEX approval Cat.2, Zone 1  
Rugged IP65 construction



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