

In-Flow

Termisk massflödesmätare för gaser från Bronkhorst High-Tech

Mäter och reglerar från 0,014 ml/min till 11000 m³/h

Enkel

- Mäter alltid rätt flöde oavsett tryck och temperatur
- Snabb respons, 1-2 s.
- Inga krav på raksträckor för flöden upp till 500 m³/h
- Okänslig för vibrationer
- Temperaturer från -10 till +70°C
- Analogt bör- och ärvärde, samt RS232-kommunikation
- Industriell version, IP65

Ekonomisk

- Enkelt montage med Swagelok-kopplingar, wafer, eller flänsanslutning, därmed låg installationskostnad
- Medieberörda delar i 316L
- Klarar tryck upp till 400 bar
- Low-delta-P version för låga tryck eller aggressiva gaser
- Upp till 8 kalibreringskurvor
- Profibus, DeviceNet, Modbus
- Ex-godkänd för zon 2

Noggrann

- +/- 0,5% av avläst värde +/- 0,1% full skala



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> Technical specifications

Measurement / control system

Accuracy (incl. linearity) (based on actual calibration)	: standard: $\pm 0,8\%$ Rd plus $\pm 0,2\%$ FS; on request: $\pm 0,5\%$ Rd plus $\pm 0,1\%$ FS; ($\pm 1\%$ FS for ranges < 0-10 ml/min; for flow > 1000 m ³ /h contact factory)
Turndown	: 1 : 50 (in digital mode up to 1:187,5)
Repeatability	: < 0,2% Rd
Settling time (controller)	: standard: 1...2 seconds option: down to 200 msec
Operating temperature	: -10...+70°C; for ATEX Cat.3 max. 50°C
Temperature sensitivity	: zero: < 0,05% FS/°C; span: < 0,05% Rd/°C
Leak integrity	: tested < 2×10^{-9} mbar l/s He
Attitude sensitivity	: max. error at 90° off horizontal 0,2% at 1 bar, typical N2
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
Surface quality (wetted parts)	: Ra = 0,8 μ m typical
Process connections	: compression type or face seal couplings; wafer type on series F-106; DIN or ANSI flanges on series F-107
Seals	: standard: Viton options: EPDM, FFKM (Kalrez)
Ingress protection (housing)	: IP65

Electrical properties

Power supply	: +15...24 Vdc
Power consumption	: meter: 70 mA; controller: max. 320 mA; add 50 mA for Profibus, if applicable
Analog output/command	: 0...5 (10) Vdc or 0 (4)...20 mA (sourcing output)
Digital communication	: standard: RS232 options: Profibus-DP [®] , DeviceNet [™] , Modbus-RTU, FLOW-BUS
Electrical connection	
Analog/RS232	: 8 DIN male;
Profibus-DP [®]	: bus: 5-pin M12 female; power: 8 DIN male
DeviceNet [™]	: 5-pin M12 male
Modbus-RTU/FLOW-BUS	: 5-pin M12 male

Technical specifications subject to change without notice.



F-201CI Compact IP65 Mass Flow Controller for low flow ranges

> Models and flow ranges

Mass Flow Meters (MFM); PN100 (pressure rating 100 bar)

Model	min. flow	max. flow
F-110CI	0,014...0,7 ml _v /min	0,06...9 ml _v /min
F-111BI	0,16...8 ml _v /min	0,16...25 l _v /min
F-111AI	0,4...20 l _v /min	0,6...100 l _v /min
F-112AI	0,8...40 l _v /min	1,4...250 l _v /min
F-113AI	4...200 l _v /min	8...1670 l _v /min
F-116AI	0,4...20 m ³ /h	4...200 m ³ /h
F-116BI	1...50 m ³ /h	10...500 m ³ /h

For ranges of 200, 400 or 700 bar rated MFMs please contact factory

High-Flow MFMs; PN10 / PN16 / PN25 / PN40 / PN100

Model	min. flow	max. flow
F-106AI/F-107AI/F-117AI	0,4...20 m ³ /h	4...200 m ³ /h
F-106BI/F-107BI/F-117BI	1...50 m ³ /h	10...500 m ³ /h
F-106CI/F-107CI/F-117CI	2...100 m ³ /h	20...1000 m ³ /h
F-106DI/F-107DI/F-117DI	3,6...180 m ³ /h	36...1800 m ³ /h
F-106EI	8...400 m ³ /h	80...4000 m ³ /h
F-106FI	14...700 m ³ /h	140...7000 m ³ /h
F-106GI	22...1100 m ³ /h	220...11000 m ³ /h

Mass Flow Controllers (MFC); PN64 / PN100

Model	min. flow	max. flow
F-200CI/F-210CI ¹⁾	0,2...10 ml _v /min	0,24...12 ml _v /min
F-201CI/F-211CI ¹⁾	0,24...12 ml _v /min	0,16...25 l _v /min
F-201AI/F-211AI ¹⁾	0,4...20 l _v /min	0,6...100 l _v /min
F-202AI/F-212AI ²⁾	0,8...40 l _v /min	1,4...250 l _v /min
F-203AI/F-213AI ³⁾	4...200 l _v /min	8...1670 l _v /min
F-206AI/F-216AI ³⁾	0,4...20 m ³ /h	4...200 m ³ /h
F-206BI/F-216BI ⁴⁾	1...50 m ³ /h	10...500 m ³ /h

¹⁾ K_v-max = 6,6x10⁻² ²⁾ K_v-max = 0,4 ³⁾ K_v-max = 1,5 ⁴⁾ K_v-max = 6,0

MFCs for high-pressure / high-ΔP applications; PN400

Model	min. flow	max. flow
F-230MI	0,2...10 ml _v /min	10...500 ml _v /min
F-231MI	10...500 ml _v /min	0,2...10 l _v /min
F-232MI	0,2...10 l _v /min	2...100 l _v /min

For ranges of 700 bar rated MFCs please contact factory.



F-107BI Mass Flow Meter for high flow ranges