

# M13V10I

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## mini CORI-FLOW™ M13V10I

### Low Flow Coriolis Mass Flow Controller for Gases

- High accuracy, excellent repeatability
- Fast response
- Independent of fluid properties
- Additional density and temperature output
- Compact, rugged (IP65) design
- Optional ATEX approval Cat.3, Zone 2
- Valve function: Normally Closed



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### Low Flow Coriolis Mass Flow Controllers for Gases

mini CORI-FLOW™ Mass Flow Meters and Controllers are precise and compact instruments, based on the [Coriolis measuring principle](#), designed to cover the needs of the low flow market. Bronkhorst® model M13V10I Mass Flow Controller (MFC) is suited for highly accurate control of gas flow in the range of 0...2000 g/h (which corresponds with 0...26,6 l<sub>n</sub>/min when used on nitrogen) at operating pressures up to 100 bar (higher on request). The instruments are equipped with a robust IP65 weatherproof housing and are optionally available with ATEX approval for use in Zone 2 hazardous areas.

The instrument contains a microprocessor based pc-board with signal and fieldbus conversion and a PID controller for mass flow control by means of an integrated control valve (normally closed).

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### Technical specifications

## Measurement / control system

Flow rates	0...2000 g/h (nominal flow rate: 1000 g/h); Full Scale (FS) value is user-configurable
Mass flow accuracy	± 0,5 % of rate
Repeatability	±0,05% of rate ± ½(ZS* x 100/actual flow)%
Turndown ratio	1:50
Zero stability (ZS)	≤ ± 0,2 g/h (Guaranteed at constant temperature and for unchanging process and environment conditions.)
Settling time (in control, typical)	1 sec. (typical)
Temperature effect	on zero: < 0,02 g/h/°C; on span: < 0,001% Rd/°C; self heating (at zero flow): < 15°C (Depends on flow rate, heat capacity fluid, T amb., T fluid and cooling capacity.)
Operating temperature	0 ... 70 °C ; for ATEX Cat.3, Zone 2 max. 50°C
Mounting	Any position, attitude sensitivity negligible. Instrument to be rigidly bolted to a stiff and heavy mass or construction for guaranteed zero stability. External shocks or vibrations should be avoided.
Temperature accuracy	± 0,5 °C
Density accuracy	≤ ± 5 kg/m <sup>3</sup>
Max. Kv-value	2,4 x 10 <sup>-3</sup>
Leak integrity, outboard	< 2 x 10 <sup>-9</sup> mbar l/s He
Warm-up time	> 30 min. for optimum accuracy

## Mechanical parts

Sensor	single tube, DN 0,5
Valve seat	Kalrez®-6375, other on request
Material (wetted parts)	stainless steel 316L or comparable
Housing	stainless steel 430F
Pressure rating (PN)	100 bar abs
Process connections	compression type or face seal (VCR/VCO) couplings, or Tri-Clamp flanges (welded)
Seals	metal
Weight	1,5 kg
Ingress protection	IP65 (weatherproof)

## Electrical properties

Power supply	+15...24 Vdc +/- 10%; Max. ripple recommended: 50 mV tt
Max. power consumption	max. 7 W
Analog output	0...5 (10) Vdc, min. load impedance > 2 kΩ; 0 (4)...20 mA (sourcing), max. load impedance < 375 Ω
Analog setpoint	0...5 (10) Vdc, min. load impedance > 100 kΩ; 0 (4)...20 mA (sourcing), max. load impedance ~ 250 Ω
Digital communication	standard: RS232; options: PROFIBUS DP, DeviceNet™, Modbus RTU or FLOW-BUS

**Electrical connection**

Analog/RS232	8-pin DIN (male);
PROFIBUS DP	bus: 5-pin M12 (female); power: 8-pin DIN (male);
CANopen® / DeviceNet™	5-pin M12 (male);
FLOW-BUS/Modbus-RTU/ASCII	5-pin M12 (male);

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



## MOUNTING PARTS

### Mass blocks and vibration dampeners

- To guarantee zero stability of low flow Coriolis instruments

## Related products



### MINI CORI-FLOW™ M13

Flow range 0...2000 g/h  
(0...26,6 lN/min N<sub>2</sub>)  
Pressure rating 200 bar  
Independent of fluid properties  
High accuracy, fast response



### MINI CORI-FLOW™ M13V11

Flow range 0...2000 g/h  
(0...26,6 lN/min N<sub>2</sub>)  
Pressure rating 100 bar  
Independent of fluid properties  
High accuracy, fast control (N/O)



### MINI CORI-FLOW™ M12V10I

Flow range 0...200 g/h  
(0...2666 mlN/min N<sub>2</sub>)  
Pressure rating 100 bar  
Independent of fluid properties  
High accuracy, fast control (N/C)



### MINI CORI-FLOW™ M14V10I

Flow range 0...30 kg/h  
(0...400 lN/min N<sub>2</sub>)  
Pressure rating 100 bar  
Independent of fluid properties  
High accuracy, fast control (N/C)



**BRONKHORST (UK) LTD**

1 Kings Court

Willie Snaith Road

Newmarket Suffolk CB8 7TG

Tel. +44 1223 833222

[sales@bronkhorst.co.uk](mailto:sales@bronkhorst.co.uk)