

# DATASHEET MI130

## mini CORI-FLOW™ MI130

Low Flow Coriolis Mass Flow Meter / Controller



### Low Flow Coriolis Mass Flow Meters / Controllers for Liquid and Gases

mini CORI-FLOW™ MI-series Mass Flow Meters and Controllers are precise, versatile and compact instruments, based on the [Coriolis measuring principle](#), featuring fast response and designed to cover the needs of the low flow market. Bronkhorst® model MI130 Mass Flow Meter (MFM) is suited for highly accurate measurement of gas or liquid flow ranges up to 2000 g/h (which corresponds 26,6 l<sub>n</sub>/min when used on nitrogen) at operating pressures up to 200 bar. The instruments are equipped with a robust IP66/IP67 weatherproof housing with screw terminal connections. The MI-series MkII are suitable for an industrial area up to pollution degree 3 with additional gas or dust (Ex) atmosphere (zone 2/22 or EPL Gc/Dc).

The instrument contains smart electronics, featuring alarm and counter functions, and a PID controller for optional mass flow control by means of a separately mounted control valve or pump. With regard to connectivity, the instruments can be equipped with a wide range of fieldbus options, beside their standard analog and RS232 I/O communication.

### Technical specifications

#### Measurement / control system

|                         |  |
|-------------------------|--|
| Flow rates              | Liquid: 0...2000 g/h (nominal flow rate: 1000 g/h);<br>Gas: 0...26,6 l <sub>n</sub> /min (N <sub>2</sub> );<br>Full Scale (FS) value user-configurable                   |
| Mass flow accuracy      | Liquid: ≤±0,2% Rd (of Reading);<br>Gas: ≤±0,5% Rd  |
| Volume flow accuracy    | Liquid: ≤ ±0,2% Rd, at fixed density value;<br>Gas: ≤ ±0,5% Rd   |
| Repeatability           | Liquid mass flow: ≤ ±0,05% Rd ± ½ZS (Zero Stability);<br>Gas mass flow: ≤ ±0,25% Rd ± ½ZS;<br>Density: ≤ ±1 kg/m <sup>3</sup> (at calibration conditions at stable flow) |
| Turndown ratio          | up to 1:2000 (in digital mode)   |
| Zero stability (ZS)     | < ± 0,2 g/h<br>(Guaranteed at constant temperature and for unchanging process and environment conditions.)   |
| Response time (sensor)  | ≤ 200 msec   |
| Fluid temperature       | -20 ... +70 °C   |
| Ambient temperature     | -20 ... +70 °C   |
| Mounting                | any position, attitude sensitivity negligible.<br>External shocks or vibrations should be avoided.   |
| Temperature sensitivity | ≤ 0,02 g/h/°C  |
| Temperature accuracy    | ± 0,5 °C   |

## Measurement / control system

|                          |  |
|--------------------------|--|
| Density accuracy         | < ± 1 kg/m <sup>3</sup> (at calibration conditions at stable flow), up to 2500 kg/m <sup>3</sup> |
| Max. fluid viscosity     | 5000 cP  |
| Leak integrity, outboard | tested < 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, Ra ≤ 0,8 µm (typical)   |
| Material (wetted parts) | stainless steel 316L / 1.4404  |
| Housing                 | stainless steel 316L / 1.4404 (body);<br>high-grade anodised aluminium alloy (EN AW-6082-T6, AISI1MgMn, housing and lid); FKM (sealings) |
| Pressure rating (PN)    | 200 bar abs  |
| Process connections     | compression type or face seal (VCR/VCO) couplings, or Tri-Clamp flanges (welded)   |
| Seals                   | none (in fluid path)   |
| Weight                  | 5 kg   |
| Ingress protection      | IP66/IP67  |

## Electrical properties

|                        |   |
|------------------------|---|
| Power supply           | +15...24 Vdc +/- 10%<br>Max. ripple recommended: 50 mV tt   |
| Max. power consumption | meter: max. 3 W;<br>controller: max 7 W   |
| Analog output          | 0...5 (10) Vdc, min. load impedance > 2 kΩ;<br>0 (4)...20 mA (sourcing),<br>regular, max. load impedance < 375 Ω;<br>with HART, load impedance 250...600 Ω    |
| Analog setpoint        | (for MFM + pump or control valve)<br>0...5 (10) Vdc, min. load impedance > 100 kΩ<br>0 (4)...20 mA (sourcing), max. load impedance ~ 250 Ω                    |
| Digital communication  | standard: RS232;<br>options: CANopen®, DeviceNet™, EtherCAT®, PROFIBUS DP, PROFINET, Modbus RTU, ASCII or TCP/IP,<br>EtherNet/IP, POWERLINK, FLOW-BUS or HART |
| Valve control signal   | M12 cable gland, screw terminals <2,5 mm <sup>2</sup>   |
| Bus termination        | dipswitch integrated on pc-board  |
| Support interface      | micro USB on pc-board   |

## Electrical connection

|   |  |
|---|--|
| Analog/RS232                            | M20 gland : I/O signals and Power<br>M12 gland : Actuator output<br>M12 gland : Bronkhorst valve out |
| PROFIBUS DP                             | M20 gland  |
| CANopen® / DeviceNet™                   | M20 gland  |
| FLOW-BUS/Modbus-RTU/ASCII               | M20 gland  |
| Modbus TCP / EtherNet/IP /<br>POWERLINK | M20 gland  |

Electrical connection

|                     |           |
|---------------------|-----------|
| EtherCAT®/ PROFINET | M20 gland |
|---------------------|-----------|

Control valve options

External actuator options to be connected to the controller

Certification for hazardous areas

Approvals / certificates

|                 |  |
|-----------------|--|
| Hazardous areas | ATEX / IECEx / UKEx category 3, zone 2/22 hazardous areas (only for MkII)<br>Ex II 3G Ex ec IIC T4 Gc (gas)<br>Ex II 3D Ex tc IIIC T100 °C Dc (dust) |
|-----------------|--|

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

## Related products



**MINI CORI-FLOW™ M13**

Flow range 0...2000 g/h  
Pressure rating 200 bar  
Independent of fluid properties  
High accuracy, fast response



**MINI CORI-FLOW™ MI140**

Flow range 0...30 kg/h  
Pressure rating 200 bar  
Independent of fluid properties  
IP66/IP67 housing, terminal strip conn.