

# DATASHEET ML120V21

## mini CORI-FLOW™ ML120V21

(Ultra) Low Flow Coriolis Mass Flow Controller



### Low Flow Coriolis Mass Flow Controllers for Gases and Liquids

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 ML120V21 Mass Flow Controller (MFC) is suited for highly accurate measurement and control of gas or liquid flow in the range of 0...200 g/h (which corresponds with 0...2,66 l<sub>n</sub>/min when used on nitrogen) at operating pressures up to 5 bar.

The mass flow controller offers “multi-range” functionality: factory calibrated ranges can be rescaled by the user, maintaining the original accuracy specs. The instrument contains a microprocessor based pc-board with signal and fieldbus conversion and a PID controller for mass flow control by means of the integrated piezoelectric control valve.

### Technical specifications

#### Measurement / control system

Flow rates	Liquid: 0...200 g/h (nominal flow rate: 100 g/h); Gas: 0...2.66 l <sub>n</sub> /min (N <sub>2</sub> ); Full Scale (FS) value is user-configurable; advised minimum flow depends on fluid properties
Mass flow accuracy	Liquid: ±0,2% Rd; Gas: ±0,5% Rd
Repeatability	± 0,05 % of rate ± ½(ZS* x 100/actual flow)%
Turndown ratio	1:100
Zero stability (ZS)	< ± 10 mg/h (Guaranteed at constant temperature and for unchanging process and environment conditions.)
Settling time (in control, typical)	1 sec.
Temperature effect	on zero: < 3 mg/h/°C; on span: < 0,005% Rd/°C; self heating (at zero flow): < 10°C (Depends on flow rate, heat capacity fluid, T amb., T fluid and cooling capacity.)
Operating temperature	0 ... 70 °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/m³ (at full scale flow)
Leak integrity, outboard	< 2 x 10 <sup>-8</sup> mbar l/s He

## Measurement / control system

Warm-up time	> 30 min for optimum accuracy
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## Mechanical parts

Sensor	single tube, DN 0.25; frequency 170 Hz $\pm$ 20 Hz
Valve	piezoelectric valve (metal plunger)
Material (wetted parts)	stainless steel 316L or comparable
Pressure rating (PN)	5 bar g (higher on request); max. $\Delta P$ : 5 bar d
Process connections	compression type or face seal (VCR/VCO) couplings
Seals	Kalrez®
Weight	0,9 kg
Ingress protection	IP40

## Electrical properties

Power supply	+15...24 Vdc +/- 10% Max. ripple recommended: 50 mV tt
Max. power consumption	max. 3 W
Analog output	0...5 (10) Vdc, min. load impedance > 2 k $\Omega$ ; 0 (4)...20 mA (sourcing), max. load impedance < 375 $\Omega$
Analog setpoint	0...5 (10) Vdc, min. load impedance > 100 k $\Omega$ ; 0 (4)...20 mA (sourcing), max. load impedance $\sim$ 250 $\Omega$
Digital communication	standard: RS232 options: PROFIBUS DP, CANopen®, DeviceNet™, PROFINET, EtherCAT®, Modbus RTU, ASCII or TCP/IP, EtherNet/IP, POWERLINK, FLOW-BUS

## Electrical connection

Analog/RS232	9-pin D-connector (male);
PROFIBUS DP	bus: 9-pin D-connector (female); power: 9-pin D-connector (male);
CANopen® / DeviceNet™	5-pin M12-connector (male);
FLOW-BUS/Modbus-RTU/ASCII	RJ45 modular jack;
Modbus TCP / EtherNet/IP / POWERLINK	2 x RJ45 modular jack (in/out);
EtherCAT® / PROFINET	2 x RJ45 modular jack (in/out);

## Control valve options

## External actuator options to be connected to the controller

## Certification for hazardous areas

## Approvals / certificates

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™  
ML120V00**

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



**MINI CORI-FLOW™  
M12V14I**

Flow range 0...200 g/h  
Pressure rating 100 bar  
Independent of fluid  
properties  
High accuracy, fast  
control



**MINI CORI-FLOW™  
CORIOLIS WITH PUMP**

Min. flow 0,05...5 ml/h  
Max. flow 6...600 l/h  
Compact, integrated  
dosing solution  
Direct pump control