

mini CORI-FLOW™ Ex d

Coriolis Mass Flow Meters for small flow rates in flameproof enclosure

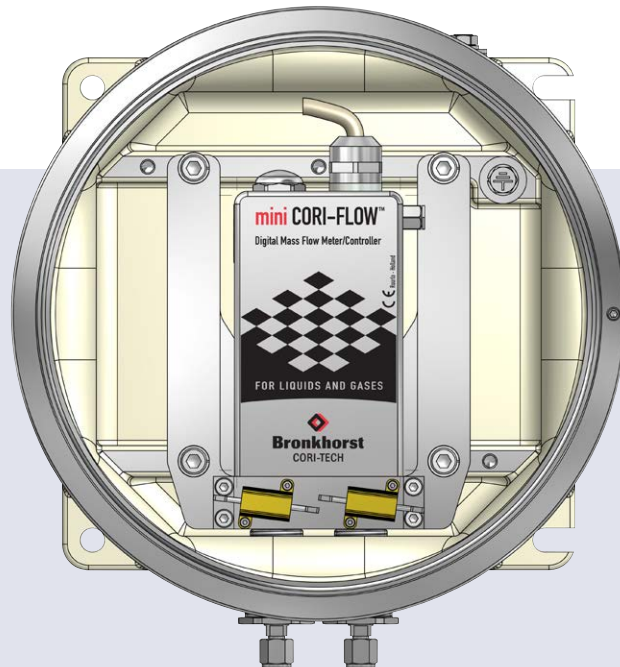


Introduction

Bronkhorst Cori-Tech B.V. manufactures Coriolis Mass Flow Meters and Controllers for gases and liquids. The product range offers true mass flow in a range from 5 g/h up to 600 kg/h (Full Scale values). The **mini CORI-FLOW™** Series are designed for capacities from 100 mg/h up to 30 kg/h. This compact mass flow instrument can be built in an explosion proof housing for use in IECEx and ATEX Zone 1 areas. All electrical instrument connections are available on screw terminals in an electrical housing connected to the **Ex d box**. External actuators can be connected to the integrated flow controller.

IECEx and ATEX approval

The mass flow meters, operating via the Coriolis principle, are now available with IECEx and ATEX approval II 2 G Ex d e IIB T6 Gb for use in hazardous areas. Hereto the instrument is built into a rugged enclosure with separated compartment for the electronics. The flow meters, suitable for both liquid and gas flow applications, cover flow rates from 0.1 g/h to 30 kg/h and can be used in systems with pipeline pressures up to 140 bar (2000 psi).



mini CORI-FLOW™ build in an Ex d housing for use in hazardous areas.

The unique design of the miniature Coriolis sensor features superior response time and high accuracy, irrespective of changing operating conditions with regard to pressure, temperature, density, conductivity and viscosity.

Features

- > direct mass flow measurement, independent of fluid properties
- > fast and stable control
- > high accuracy, excellent repeatability
- > multi-range: easy on site re-ranging via digital interface (effective turndown 2000:1, typical M13)
- > additional density and temperature outputs
- > bi-directional measurement
- > optional: instrument temperature control
- > optional: display module
- > IECEx and ATEX approval II 2 G Ex d e IIB T6 Gb for use in Zone 1 hazardous areas

Technical specifications

Flow ranges

	Unit	XM12	XM13	XM14
Minimum full scale	[g/h]	5	50	1000
Nominal scale	[g/h]	100	1000	10000
Maximum full scale	[g/h]	200	2000	30000
Minimum flow	[g/h]	0,1	1	30
Rangeability meter		1:100	1:100	1:100
Rangeability controller		≥ 1:50	≥ 1:50	≥ 1:50

Mechanical parts

Material (wetted parts)	Stainless steel AISI 316 or equivalent Optional: Hastelloy-C22
Process connection (welded)	Compression type or face seal couplings
Outer seals	Metal
Valve seat (controllers)	Kalrez-6375, other on request
Ingress protection	IP65 (weatherproof)
Leak integrity	Outboard < 2 x 10 ⁻⁹ mbar l/s He
Maximum pressure	XM12: 140 bara XM13: 140 bara XM14: 100 bara
Temperature range	0...70 °C ambient and fluid temperature
Optional	Temperature control on mini CORI-FLOW body : <i>All signals can be connected to external PID-controller for temperature control</i>
Dimensions	420x260x175 mm
Weight	12,5 kg

ATEX specifications

Safety zone	IECEx Zone 1 and ATEX Zone 1
Specially to be mentioned	compact instrument for use in Ex d housing to meet IECEx Zone 1 international standard (all fluid connections welded)
External actuator options to be connected to the controller	- C2I valve with XC coil or XB coil through barrier - Badger Meter RC200 valve with Ex d TEIP11 I/P converter - Pumps with ATEX zone 1 U/f converters

Electrical properties

Electrical signals	- All instrument connections are wired to screw terminals - valve/pump controller output Optional: - Fieldbus communication: MODBUS, Profibus-DP, DeviceNet, FLOW-BUS - PT-100 sensor connection (3 wires) - Heater connection (2 wires)
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Performance

Mass flow accuracy liquids	±0,2% of rate
Mass flow accuracy gases	±0,5% of rate
Repeatability	±0,05% of rate ±1/2 [ZS x 100/flow]%
(based on digital output)	(ZS = Zero Stability)
<i>Note: optimal accuracy will be reached after approx. 30 minutes after instrument power-up.</i>	
	Unit XM12 XM13 XM14
Zero stability (ZS)*	[g/h] < ±0,02 < ±0,2 < ±6
Density accuracy	[kg/m ³] < ±5 < ±5 < ±5
Temperature accuracy	[°C] ±0,5 ±0,5 ±0,5
Temperature effects	
Zero drift	[g/h/°C] ±0,01 ±0,02 ±0,5
Span drift	[%Rd./°C] ±0,001 ±0,001 ±0,001
Initial heating at zero flow	[°C] ≤ 15 ** ≤ 15 ** ≤ 15 **
* The zero stability is guaranteed at constant temperature and for unchanging process and environment conditions.	
** Total heating up of instrument depends on flow rate, heat capacity fluid, T _{amb} , T _{fluid} and cooling capacity.	
Mounting	In any position (attitude sensitivity negligible)***
Typical meter response time (t98%)	0,2 s
Typical settling time controller (<2% of setpoint)	1 s
*** External shocks or vibrations should be avoided.	

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