

MI-series mini CORI-FLOW™

Industrial low-flow Coriolis mass flow meter with PID controller



Mass Flow Meter model MI130

> Introduction

As the world's most compact heavy-duty Coriolis mass flow meters with integrated PID controller, the MI-series from Bronkhorst, fit perfectly in any industrial application where high precision mass low-flow metering for low flow rates is required. It's the key to accurate dosing (batch and continuous).

The MI-series consist of two models and cover a flow rate range up to 30 kg/h, suitable for liquid and gas, independent of the fluid properties. This industrial version of the mini CORI-FLOW has a robust and weatherproof metal housing. The versatile electronics support a wide range of valves and pumps and offers extensive connectivity.

> Technical specifications

Models and mass flow range

MI130	0...2,000 g/h*
MI140	0...30 kg/h*

**) advised minimal flow: $\geq 5 \times ZS$*

Measurement / control system

Features include	mass flow, density, temperature, PID controller, ratio & batch dosing, diagnostic parameters
Mass flow accuracy	$\leq 0.2\% \text{ Rd}$ ($\leq 0.5\% \text{ Rd}$ for gas) $\pm ZS$
Repeatability	$\leq 0.05\% \text{ Rd} \pm ZS$
Zero stability (ZS)	0.2 g/h (MI130), 6 g/h (MI140)
Fluid temperature range	-20...+70 °C
Ambient temperature range	-20...+70 °C
Tube temperature accuracy	± 0.5 °C
Density accuracy	$\leq \pm 0.02 \text{ g/cm}^3$
Refresh (cycle) time	≤ 5 msec
Temperature sensitivity	$\leq 20 \text{ mg/h/}^\circ\text{C}$ (MI130), $\leq 500 \text{ mg/h/}^\circ\text{C}$ (MI140)
Noise flow value	$\leq 0.8 \text{ g/h RMS}$ (MI130), $\leq 8 \text{ g/h RMS}$ (MI140)

Electrical properties

Power supply	15...24 Vdc $\pm 10\%$
Max. power consumption	2.5 W (up to 7 W, depends on I/O options)
Analog setpoint (input)	0...5 (10) Vdc or 0 (4)...20 mA
Customised I/O (2x)	current (accuracy $\leq 1.7 \mu\text{A}$), frequency, pulse, digital, voltage (accuracy $\leq 0.7 \text{ mV}$)
Analog output	0...5(10) Vdc (accuracy $\leq 2.9 \text{ mV}$), 0(4)...20 mA (accuracy $\leq 7 \mu\text{A}$)

Digital communication (optional)

◆ RS232/RS485	Modbus RTU/ASCII, FLOW-BUS, PROFIBUS DP
◆ Ethernet	PROFINET, EtherCAT
◆ Other	HART 7.6
Mains supply	M20 cable gland, screw terminals 2.5 mm ²
Digital communication	M20 cable gland, screw terminals 2.5 mm ² , 2x
Customised I/O	M12 cable gland, screw terminals 2.5 mm ²
Valve control signal	M12 cable gland, screw terminals 2.5 mm ²
Bus termination	dipswitch integrated
Service port	micro USB connector

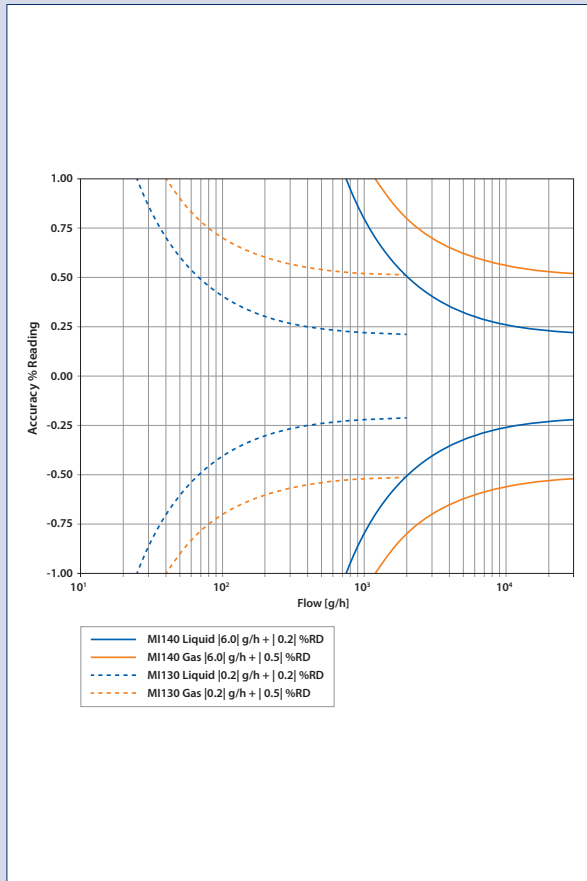
Mechanical parts

Material housing	metal with silicon and NBR seals
Material wetted parts	stainless steel 316L / 1.4404, Ra $\leq 0.8 \mu\text{m}$ Hastelloy C22 (optional, pending)
Sensor	single tube (fluidic flow path without dead zones or obstacles)
Sensor tube ID (mm)	0.5 (MI130), 1.14 (MI140)
Pressure rating (PN)	200 bar
Ingress protection (housing)	IP66 (high pressure jets) and IP67 (full immersion)
Attitude sensitivity	negligible, mounting in any position
Environment	unconditioned and hazardous

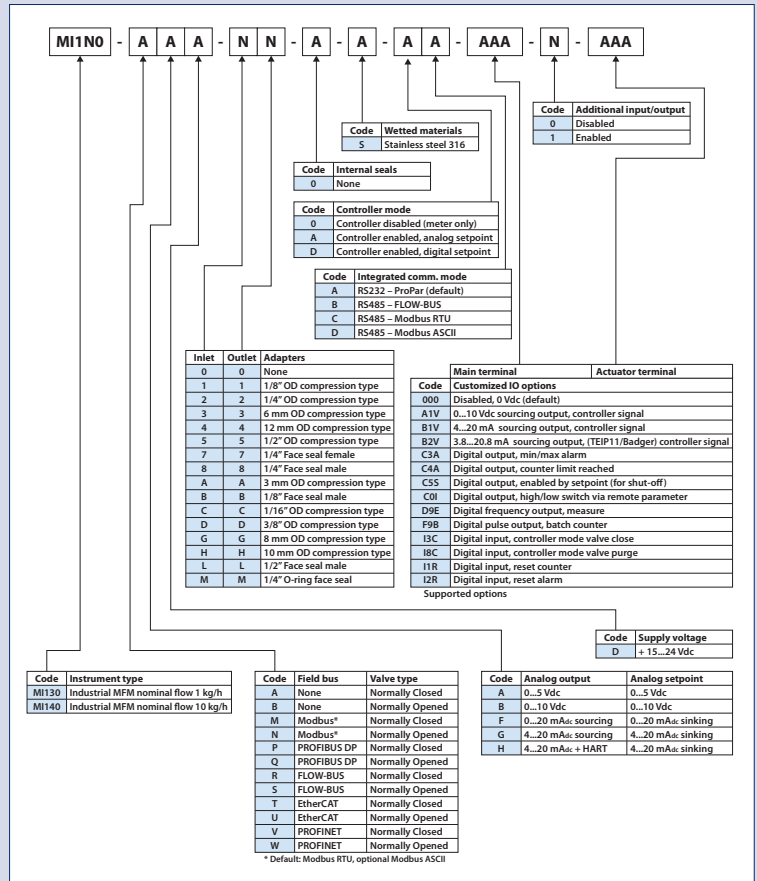
Explosion safety (pending)

IECEX (EN-IEC 60079)	Ex ec IIC T1...T6 Gc, Ex tc IIIC T70°C Dc
ATEX (EN-IEC 60079)	II 3 G Ex ec IIC T1...T6 Gc, II 3 D Ex tc IIIC T70°C Dc
Class Div (ANSI/ISA 12.12.01-2013)	Class 1, Division 2, Groups A, B, C & D, T4

> Mass flow accuracy



> Model key



> Dimensions (mm) and weight (kg)

Weight: 6 kg

Dimensions weld adapters

Compression type	3/8" tube	
		A
3mm OD	18.0mm	
6mm OD	19.2mm	
8mm OD	26.6mm	
10mm OD	39.7mm	
12mm OD	42.4mm	
1/16" OD	15.6mm	
1/8" OD	18.1mm	
1/4" OD	19.6mm	
3/8" OD	26.6mm	
1/2" OD	42.2mm	

Face seal male	3/8" tube	
		A
1/8" inlet	13.7 mm	
1/4" inlet	17.6 mm	
1/2" inlet	37.6 mm	

> Digital data communication

*) HART based signal, beta version

> Typical applications

Injection of chemical additives and odourisation of fluids



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