BCMF3100-MB Series
Coriolis Mass Flowmeter

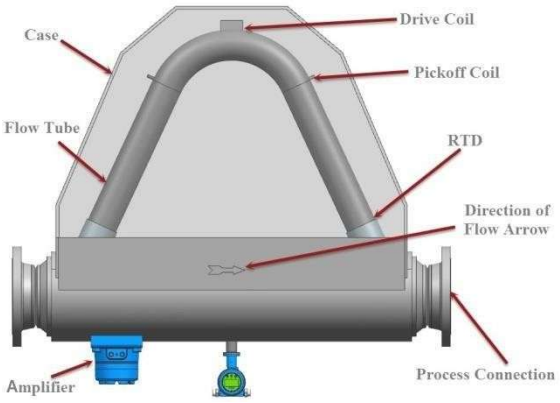
GENERAL DESCRIPTION

BCMF-MB Micro-bend Coriolis mass flowmeters are comprised of two U-Shaped tubes in a casing with a considerably smaller radius than conventional U-Shaped Coriolis flowmeters. The smaller radius ensures a more compact instrument with significantly lower pressure differential values compared to other flowmeters.

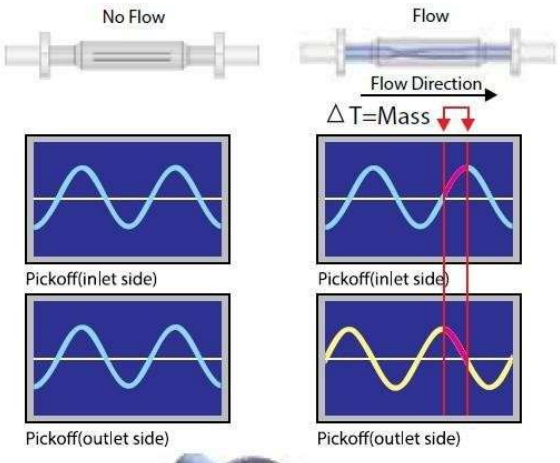
Our range of Coriolis mass flowmeters are designed to suit your need to measure almost any fluid across any application. Built on the Coriolis principle, these meters measure the mass of the fluids directly, rather than volume and hence they do not require compensations for factors such as temperature and pressure which impact volume and accuracy of measurement.

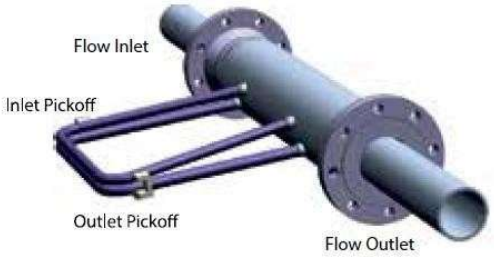
MEASURING PRINCIPLE

The Coriolis measuring principle refers to the effect that a moving mass has on a body in a rotating frame of reference. The moving mass exerts an apparent force on the body, causing a deformation. This force is called the Coriolis force. It does not act directly on the body, but on the motion of the body. This principle is used in Coriolis flowmeters.



OPERATION





A diagram showing phase shift

A Coriolis flowmeter consists of two parallel tubes that are made to oscillate using a magnet. These oscillations are recorded by sensors fitted at the inlet and outlet of each tube. In a no-flow state, the oscillations are synchronised, since there is no mass exerting any force on the tubes. On the other hand, any fluid, gas flowing through the tubes generates Coriolis forces, causing the tubes to twist in proportion to the mass flow rate of the medium.



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BCMF TRANSMITTER

The BCMF transmitter is a high-performing transmitter that uses a micro-processor and offers zero calibration, adjustable pulse outputs, an RS485, and a HART communication protocol. It is highly stable and accurate, as well as easy to install and operate. It requires low maintenance which keeps your process downtime to a minimum and covers the cost of ownership over the long term.



BENEFITS

- Suitable for aggressive and contaminated media
- Measurement and display of percent water-cut for oil or water mixtures
- High rotation frequency and well-balanced measuring tubes
- Higher Sampling and Digital Filtering
- Shorter response time
- No moving parts
- Can be used in extremely harsh conditions
- High accuracy for measuring mass flow, density, temperature, and volume flow
- OLED with 2 line indication
- Measurement of net oil
- Density accuracy now had been updated to 0.001 g/cm3

APPLICATION

- Used to measure steady uniform flow of common viscous fluid, non-Newtonian fluid, slurry containing some solid components, and liquids containing some trace of gases
- Suitable for the bulk measurement of products like syrup, molasses, and raw chemicals



■ TECHNICAL SPECIFICATION

Line size	3, 8, 10, 15, 25, 40, 50, 80, 100, 150, 200, 250
Process connections	Flanged (ANSI, DIN, JIS), Thread, Tri-clamp
Flow measurement	Accuracy: 0.1% for liquid, Repeatability: ±0.05% Accuracy: 0.2% for liquid, Repeatability:±0.1% Accuracy: 0.5% for both of liquid and gas, Repeatability: ±0.25% (Accuracy is calculated based on the water measurement under the condition of +20°C～25°C and 0.1MPa～0.2MPa.)
Density measurement	Density range: (0.2～2.0) g/cm^3 Basic error:±0.002g/cm^3 (Affected by the sensor) Repeatability: 0.001g/cm^3
Temperature measurement	Integrated type: (-50～+125)°C Remote type: (-50～+200)°C High temperature remote type: (-50～+350)°C Low temperature remote type: (-200~+125)□
Circuit loop output	Output Range: 4~20mA Resolving power: 0.000244mA Basic error: 0.2%F.S Temperature impact: ±0.005%F.S/□ External resistor should be 250～600Ω
Frequency output	Output range: （0～10）kHz Resolving power: 0.152Hz Basic error: ±0.075% Temperature impact: ±0.001%F.S/□ Capability of Outrange is 12kHz
Low flow cutoff	When the flow value measured is lower than the value of Low Flow Cutoff, the TCMF-MB will output zero flow and the totalizer will stop to accumulate. The value of Low Flow Cutoff is usually sets to be 1% of the maximum flow rate.
Environment vibration	Frequency range: (10～2000)Hz Acceleration amplitude value: 2g Circulation time: 50 times
Environment temperature	Ambient temperature: (-20～+55)°C Storage temperature: (-20～+70)°C
Environment humidity	Ambient humidity: ＜90% Storage humidity: ＜95% +25□ No condensation
Material	Measuring tube: SS316L, Housing: SS304
Power supply	(18~36)VDC or (85~260)VAC
Communication	RS485 or HART
Nominal pressure	1.6MPa, 2.5MPa, 4.0MPa, 6.4MPa, 10MPa, 16MPa, 25MPa
Protection	IP67
Explosion-proof	Standard type is explosion-proof

■ ENGINEERING UNITS

Program	Units
Mass flow rate	Lb/m, lb/h, kg/m, kg/h, t/h, t/D
Total mass flow	Lb, Kg, T
Volume flow rate	GPM, GPH, M3/m, M3/h, M3/d, Bl/D
Total volume flow	Gal, M3, Bbl
Density	G/ml, Kg/l, Kg/M3, Lb/Gal, g/cm3, Lb/f
Temperature	°C, °F
Low flow cut off	Lb/h

■ FLOW RANGE (for liquid)

DN	Max. Flow range (kg/h)	Normal flow range for 0.1% accuracy(Kg/h)	Normal flow range for 0.2% accuracy(Kg/h)	Normal flow range for 0.5% accuracy(Kg/h)	Stability of Zero point (Kg/h)
3	1.2~120	10~120	8~120	6~120	0.004
8	8~800	80~800	55~800	40~800	0.035
10	10~1000	100~1000	70~1000	50~1000	0.045
15	20~3000	300~3000	200~3000	150~3000	0.09
25	80~8000	600~8000	400~8000	300~8000	0.25
40	240~24000	2400~24000	1200~24000	1000~24000	1
50	500~45000	5000~45000	2500~45000	2000~45000	2
80	800~120000	10000~120000	8000~120000	6000~120000	3.5
100	1500~200000	20000~200000	15000~200000	10000~200000	7
150	5000~500000	50000~500000	35000~500000	30000~500000	23
200	10000~1000000	100000~1000000	70000~1000000	50000~1000000	45
250	15000~1500000	150000~1500000	120000~1500000	75000~1500000	70

Note: Conversion of Basic Error for Mass flow

0.1%

$$\pm 0.1\% \pm \left(\frac{StabilityofZeroPo\ \text{int}}{Ins\ \text{tan tan}\ eousFlow} \times 100\% \right)$$

0.2%

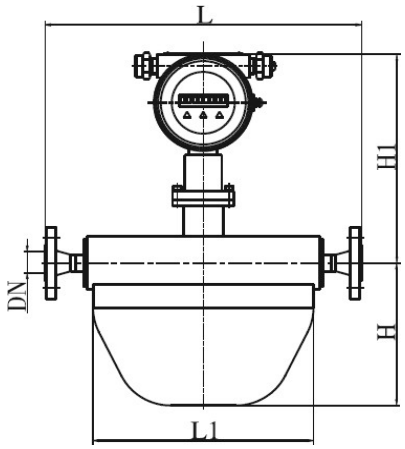
$$\pm 0.2\% \pm \left(\frac{StabilityofZeroPo\ \text{int}}{Ins\ \text{tan tan}\ eousFlow} \times 100\% \right)$$

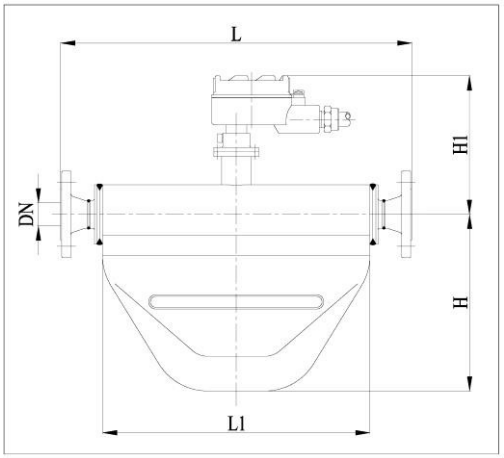
0.5%

$$\pm 0.5\% \pm \left(\frac{StabilityofZeroPo\ \text{int}}{Ins\ \text{tan tan}\ eousFlow} \times 100\% \right)$$

Accuracy is calculated based on the water measurement under the condition of +20°C～25°Cand 0.1MPa～0.2MPa.

■ OUTLINE DIMENSION

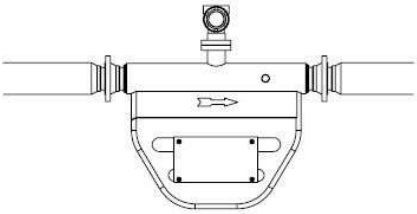




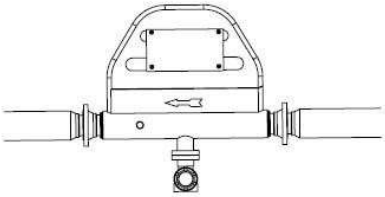
BCMF-MB	DN	L			L1	H	H1	
		MPa		±△ L(mm)			Integrated	Separated
		≤4.0	≥6.3					
003W	3	321	345	3	260	115	250	170
008W	8	424	484		302	154	270	185
010W	10	424	484		302	154	270	185
015W	15	400	414		280	191	298	213
025W	25	500	536	4	360	258	302	218
040W	40	600	634		460	306	315	230
050W	50	800	828		640	410	325	240
080W	80	900	928		700	495	350	265
100W	100	1130	1156	5	860	665	370	285
150W	150	1450	1490		1200	905	400	316
200W	200	1800	1845		1450	1175	426	342
250W	250	1966	2006		1530	1300	426	342

■ INSTALLATION

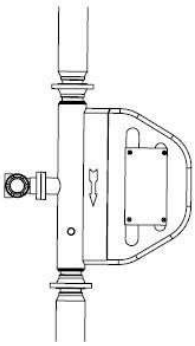
For Liquid or Slurry



For Gas



For Liquid, Slurry, or Gas



■ Model selection

Example: BCMF-MB-LI015RA112EF													
BCMF-MB	- X	X	XXX	X	X	X	X	X	X	X	X		
Medium	L												For liquid
	G												For gas
Structure	I												Integral type
	R												Remote type
Size		003~250mm											DN3-DN250mm
Output signal			R										Pulse & 4-20mA & RS485
			H										Pulse & 4-20mA & HART
Power supply				A									(85~260)VAC
				D									(18~36)VDC
Medium temperature					1								-50…+125☐
					2								-50…+200☐
					3								-50…+300☐
					4								-150…+125☐
Pressure rating						1							1.6MPa
						2							2.5MPa
						3							4.0MPa
						4							6.3MPa
						5							10MPa
						6							16MPa
						7							26MPa
						Z							Customized
Accuracy							1						±0.1%
							2						±0.2%
							5						±0.5%
Explosion type								N					None
								E					Explosion (see note1)
Process connection									F				Flange (ANSI, DIN, JIS...)
									C				Tri-clamp
									T				Thread
									Z				Others

Structure and Size		Explosion-proof Grade
Integrate Type	003～250	Exdib II CT4～T6）
Remote Type	003～080	Ex ib II CT3～T6
	100～250	Exdib II CT3～T6
	Transmitter	Exd[ib]IICT6