



ALCM SERIES

Coriolis Mass Flowmeter



ALCM series Coriolis Mass Flowmeter



■ Micro Bend type : ALCM MB

- Line size: DN8~DN300
- Flow Range: 40~2,500,000kg/hr
- Accuracy: std $\pm 0.5\%$ of reading
opt $\pm 0.2\%$ of reading
opt $\pm 0.15\%$ of reading
- Connection: flange, sanitary
- Output: Pulse, 4-20mA, HART, RS485
- Power: AC, DC,

■ U Shape type : ALCM UT

- Line size: DN40~DN300
- Flow Range: 1,300~2,500,000kg/hr
- Accuracy: std $\pm 0.5\%$ of reading
opt $\pm 0.2\%$ of reading
opt $\pm 0.15\%$ of reading
- Connection: flange, sanitary
- Output: Pulse, 4-20mA, HART, RS485
- Power: AC, DC



■ Deltoid type : ALCM DT

- Line size: DN3~DN25
- Flow Range: 6~8,000kg/hr
- Accuracy: std $\pm 0.5\%$ of reading
opt $\pm 0.2\%$ of reading
opt $\pm 0.15\%$ of reading
- Connection: flange, sanitary
- Output: Pulse, 4-20mA, HART, RS485
- Power: AC, DC

PRODUCT PRESENTATION

Performance Specification	Standard	Optional-1	Optional-2
Mass/volume flow accuracy(1) (2)	±0.5% of reading	±0.2% of reading	±0.15% of reading
Mass/volume flow repeatability	±0.15% of reading	±0.075% of reading	±0.05% of reading
Density accuracy	±0.002 g/cm ³ (±0.5 kg/m ³)	±0.002 g/cm ³ (±0.5 kg/m ³)	±0.002 g/cm ³ (±0.5 kg/m ³)
Density repeatability	±0.001 g/cm ³ (±0.2 kg/m ³)	±0.001 g/cm ³ (±0.2 kg/m ³)	±0.001 g/cm ³ (±0.2 kg/m ³)
Temperature accuracy	≤ ±1 °C (±0.5% of reading)	≤ ±1 °C (±0.5% of reading)	≤ ±1 °C (±0.5% of reading)
Temperature repeatability	±0.2 °C	±0.2 °C	±0.2 °C

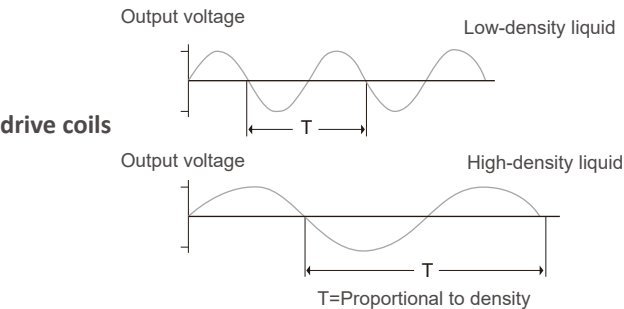
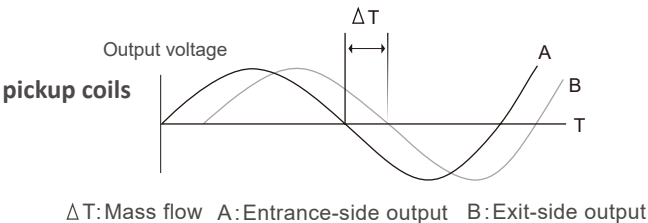
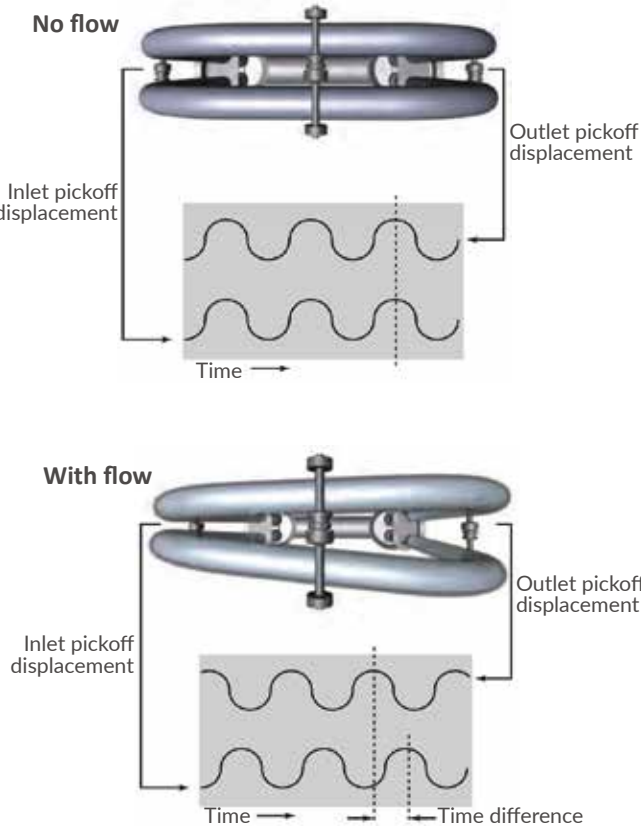
(1) Stated flow accuracy includes the combined effects of repeatability, linearity, and hysteresis.

(2) For cryogenic applications, liquid accuracy is standard ±0.5% of reading.

MEASUREMENT PRINCIPLES:

Principles: As a practical application of the Coriolis effect, the Coriolis mass flow meter operating principle involves inducing a vibration of the flow tube through which the fluid passes. The vibration, though it is not completely circular, provides the rotating reference frame which gives rise to the Coriolis effect. While specific methods vary according to the design of the flow meter, sensors monitor and analyze changes in frequency, phase shift, and amplitude of the vibrating flow tubes. The changes observed represent the mass flow rate and density of the fluid.

Mass Flow: The measuring tubes are forced to oscillate producing a sine wave. At zero flow, the two tubes vibrate in phase with each other. When flow is introduced, the Coriolis forces cause the tubes to twist resulting in a phase shift. The time difference between the waves is measured and is directly proportional to the mass flow rate.



Density: The measuring tubes are vibrated at their natural frequency. A change in the mass of the fluid contained inside the tubes causes a corresponding change to the tube natural frequency. The frequency change of the tube is used to calculate density.

Temperature: Temperature is a measured variable that is available as an output. The temperature is also used internal to the sensor to compensate for temperature influences on Modulus of Elasticity



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■ Zero stability:

Zero stability is used when the flow rate approaches the low end of the flow range where the meter accuracy begins to deviate from the stated accuracy rating, as depicted in the turndown section below. When operating at flow rates where meter accuracy begins to deviate from the stated accuracy rating, accuracy is governed by the formula: accuracy = (zero stability/flow rate) x 100%. Repeatability is similarly affected by low flow conditions.

Line Size (mm)	Zero stability (kg/hr)		
	ALCM MB	ALCM UT	ALCM DT
DN3	-	-	0.01
DN6	-	-	0.02
DN8	0.08	-	0.04
DN10	0.1	-	0.04
DN15	0.2	-	0.12
DN25	0.6	-	0.32
DN32	0.8	-	0.4
DN40	2.4	1.2	-
DN50	5	2	-
DN65	6	3	-
DN80	8	6	-
DN100	15	8	-
DN150	50	20	-
DN200	100	40	-
DN250	150	60	-
DN300	200	100	-

FUNCTIONAL SPECIFICATIONS:

Power Supply:

AC: 85~265V_{AC}, 45~63Hz

DC: 16~30V_{DC}, draw up to 1 amp of current steady state,
I_{max}=23mA

Power consumption: 10W (up to 15W)

Vibration resistance: 10 to 150 Hz (Acceleration up to 1g)

Damping time: 0.2 to 100s (default 6s).

Grounding Resistance: <10 Ω

Output: Pulse (0-10KHz)

4~20mA_{DC}

RS485 (up to 2km at 14400bps)

HART – opt

AMBIENT SPECIFICATIONS:

Vibration limits: Meets IEC 68.2.6, endurance sweep,
10 to 2000 Hz, 50 sweep cycles at 1.0 g.

Ambient Temperature Limits

Operating: -20°C ~ +55°C

Storage: -40°C ~ +70°C

≤-40°C is not recommended for long-term storage

Humidity Limits: 0~90% RH to 150°F (65°C)

Protection: IP65 – std

IP67 – opt (only for remote type)

Shock resistance: up to 2g, conforms to IEC60068-2-6

Interference-resistant: conforms to EN61326/A1



Micro-Bend Coriolis Mass Flowmeter: ALCM MB

ALCM MB-				
Internal Dia.		0.5%	0.2%	0.15%
DN8	008	40 - 800 kg/hr	55 - 800 kg/hr	80 - 800 kg/hr
DN10	010	50 - 1,000 kg/hr	70 - 1,000 kg/hr	100 - 1,000 kg/hr
DN15	015	100 - 3,000 kg/hr	150 - 3,000 kg/hr	200 - 3,000 kg/hr
DN25	025	300 - 8,000 kg/hr	400 - 8,000 kg/hr	600 - 8,000 kg/hr
DN40	040	1,000 - 24,000 kg/hr	1,200 - 24,000 kg/hr	2,400 - 24,000 kg/hr
DN50	050	2,000 - 50,000 kg/hr	2,500 - 40,000 kg/hr	5,000 - 40,000 kg/hr
DN80	080	6,000 - 120,000 kg/hr	7,000 - 120,000 kg/hr	8,000 - 120,000 kg/hr
DN100	100	10,000 - 200,000 kg/hr	12,000 - 200,000 kg/hr	15,000 - 200,000 kg/hr
DN150	150	25,000 - 500,000 kg/hr	30,000 - 500,000 kg/hr	50,000 - 500,000 kg/hr
DN200	200	50,000 - 1,000,000 kg/hr	70,000 - 1,000,000 kg/hr	100,000 - 1,000,000 kg/hr
DN250	250	75,000 - 1,500,000 kg/hr	120,000 - 1,500,000 kg/hr	150,000 - 1,500,000 kg/hr
DN300	300	100,000 - 2,500,000 kg/hr	150,000 - 2,500,000 kg/hr	200,000 - 2,500,000 kg/hr
Process Connection				
ANSI 150#	F1			
ANSI 300#	F3			
Other connection	0			
Accuracy				
±0.15%	1			
±0.2%	2			
±0.5%	5			
Temperature				
-50°C~+125°C standard	1			
-50°C~+200°C(only for remote)	2			
-50°C~+350°C (only for remote)	3			
Pressure				
1.6 Mpa	1			
2.5 Mpa	2			
4.0 Mpa	3			
6.4 Mpa	4			
Transmitter				
TSY Compact Version - surface touch control, display, 4 - 20mA, RS485		CYS		
TSY Compact Version - surface touch control, display, 4 - 20mA, RS485, HART		CYH		
TSY Remote Version - surface touch control, display, 4 - 20mA, RS485		RYS		
TSY Remote Version - surface touch control, display, 4 - 20mA, RS485, HART		RYH		
Approval				
Non-Explosion		NX		
Exdib II CT3~T6 for transducer, Exd[ib] II CT6 transmitter (for remote)		XI		
Exdib II CT4~T6 (for compact)		XD		
Power supply				
24V _{DC}		DC		
85-260 V _{AC} , 50 Hz		AC		
Options				
Standard 316L measuring tube		NN		
Signal cable for remote type - \$10/m		CABL		
Hot jacket		HJ		

U Shape Coriolis Mass Flowmeter: ALCM UT

ALCM UT-					
Internal Dia.		0.5%	0.2%	0.15%	
DN40	040	1,300 - 32,000 kg/hr	1,500 - 32,000 kg/hr	2,000 - 32,000 kg/hr	
DN50	050	2,000 - 50,000 kg/hr	2,500 - 50,000 kg/hr	3,500 - 50,000 kg/hr	
DN80	080	6,000 - 140,000 kg/hr	7,000 - 140,000 kg/hr	8,000 - 140,000 kg/hr	
DN100	100	10,000 - 200,000 kg/hr	12,000 - 200,000 kg/hr	15,000 - 200,000 kg/hr	
DN150	150	25,000 - 500,000 kg/hr	30,000 - 500,000 kg/hr	35,000 - 500,000 kg/hr	
DN200	200	50,000 - 1,000,000 kg/hr	70,000 - 1,000,000 kg/hr	100,000 - 1,000,000 kg/hr	
DN250	250	70,000 - 1,500,000 kg/hr	75,000 - 1,500,000 kg/hr	100,000 - 1,500,000 kg/hr	
DN300	300	120,000 - 2,500,000 kg/hr	125,000 - 2,500,000 kg/hr	170,000 - 2,500,000 kg/hr	
Process Connection					
ANSI 150#	F1				
ANSI 300#	F3				
Other connection	0				
Accuracy					
±0.1%	1				
±0.2%	2				
±0.5%	5				
Temperature					
-50 ℃~+125 ℃ standard	1				
-50 ℃~+200 ℃ (only for remote)	2				
-50 ℃~+350 ℃ (only for remote)	3				
Pressure					
1.6 Mpa	1				
2.5 Mpa	2				
4.0 Mpa	3				
6.4 Mpa	4				
Transmitter					
TSY Compact Version - surface touch control, display, 4 - 20mA, RS485	CYS				
TSY Compact Version - surface touch control, display, 4 - 20mA, RS485, HART	CYH				
TSY Remote Version - surface touch control, display, 4 - 20mA, RS485, 10m cable	RYS				
TSY Remote Version - surface touch control, display, 4 - 20mA, RS485, HART, 10m cable	RYH				
Approval					
Non-Explosion	NX				
Exdib II CT3~T6 for transducer, Exd[ib] II CT6 transmitter (for remote)	XI				
Exdib II CT4~T6 (for compact)	XD				
Power supply					
24V _{DC}	DC				
85 -260 V _{AC} , 50 Hz	AC				
Options					
Standard 316L measuring tube				NN	
Signal cable for remote type - \$10/m				CABL	
Hot jacket				HJ	

Deltoid Coriolis Mass Flowmeter: ALCM DT

ALCM DT-				
Internal Dia.		0.5%	0.2%	0.15%
DN3	003	6 - 120 kg/hr	8 - 120 kg/hr	10 - 120 kg/hr
DN8	008	40 - 800 kg/hr	50 - 800 kg/hr	60 - 800 kg/hr
DN10	010	50 - 1,000 kg/hr	60 - 1,000 kg/hr	70 - 1,000 kg/hr
DN15	015	80 - 3,000 kg/hr	100 - 3,000 kg/hr	150 - 3,000 kg/hr
DN25	025	280 - 8,000 kg/hr	300 - 8,000 kg/hr	400 - 8,000 kg/hr
Process Connection				
ANSI 150# flange	F			
ANSI 300# flange	F3			
Other connection	0			
Accuracy				
0.15% - For DN6 to DN100	1			
0.2% - For DN6 to DN100	2			
0.5% - standard	5			
Working Pressure				
1.6 Mpa - standard	1			
2.5 Mpa	2			
4.0 Mpa	3			
Working Temperature				
Up to 80 deg C - standard	N			
Up to 150 deg C	M			
Up to 250 deg C	H			
Transmitter				
CB03 Compact Version - local display, 4 - 20mA, RS485	CBS			
CB03 Compact Version - local display, 4 - 20mA, RS485 and HART	CBH			
CB03 Remote Version - display, 4 - 20mA, RS485	RBS			
CB03 Remote Version - display, 4 - 20mA, RS485 and HART	RBH			
TRO Remote Version - surface touch control, display, 4 - 20mA, RS485	TRO			
Other transmitter	RE			
Approval				
Non - Explosion	NX			
Ex protection EEx d Explosion proof	XD			
Power supply				
24V _{DC}	DC			
85-260 V _{AC} , 50 Hz	AC			
Options				
Standard - with 316L measuring pipe	NN			
Signal cable for remote type - \$10/m	CABL			
Hot jacket	HJ			

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