



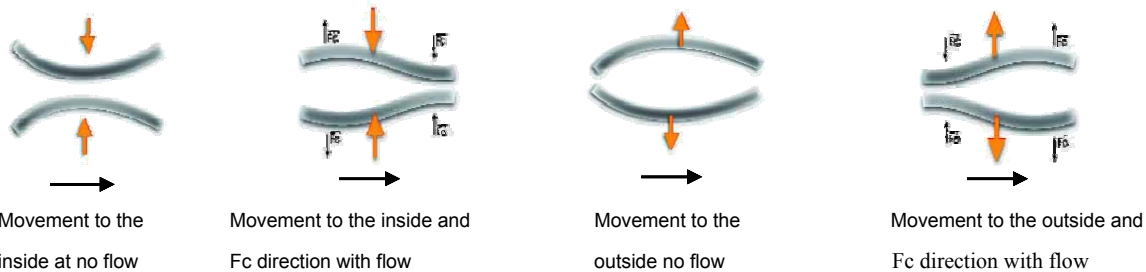
7 GENERAL

ALCM Massflowmeters

The Alia coriolis mass flowmeters, uses two parallel arranged pipes which are rotated at their resonant frequency by coils. Any mass flow passing through the tubes will generate coriolis forces which appear whenever a mass moves radially in a rotating system. The forces have opposed effects on the in- and outlet side, they do slightly deform the pipes. The excursion of the pipes is detected by sensors on the in- and outlet side. The phase shift between the rotational frequencies of both pipes is proportional to the mass flow rate. The resonant frequency of both pipes changes in accordance with the density of the medium. This effect determines the density. Using one sensor density and temperature can also be measured. The extent of deformation of the pipes depends on temperature. Therefore the temperature is measured for compensation purposes. Using only one sensor primary values as mass flow, density and temperature can be measured. Conversions allow for calculation of further values like flow volume and concentration Cycle of excursion (simplified)

Fluid measured can be more extensive, such as the steady uniform flow of common viscosity fluid, the high viscosity fluid, non-Newtonian fluid, slurry containing some solid components and the liquid containing some trace of gas.

Rotation and deformation of two parallel looped pipes by the coriolis force F_c .



7 FEATURES

- Suitable for aggressive and contaminated media
- Measurement of mass flow, density, temperature and volume flow
- Excellent purging and sterilization qualities due to a construction
- Free of dead spots
- Up to +200°C (ALCM-FR 003-200)
- Individual 8-point-calibration including report
- High rotation frequency and well-balanced measuring pipes

7 SPECIFICATION - Flowbody

ALCM-FR 003 to ALCM-FR 200

- Flow range: 9 kg/hr to 1200 ton/hr
- Process Connection: flanges (ANSI and DIN)
- Operating pressure: max. 42 Mpa
- Process temperature: up to +200°C
- Body Material: Stainless Steel 304
- Measuring Tube Material: SS as per DIN 1.4571 (AISI 316 Ti)
- Housing protection: IP 67
- Environmental Temperature: -20~+55 °C
- Working Humidity: <90% @ +25°C
- Approvals Exd (ib) II CT4
- Accuracy: ±0.15%
- Repeatability: ±0.05%
- Digital outputs RS 485, Modbus, Hart
- Pulse Output: 0~10 kHz, ±0.001% F.S/°C
- Current Output: 4-20mA, ±0.005% F.S/°C, External resistor: 250~600Ω
- Power Supply 85-265 VAC, 18-36 VDC
- Environment vibration: Frequency Range: 10~2000 Hz
Acceleration amplitude value: 2g
Circulation time: 50 times
- Density Measuring: 0.2~2.0 kg/l, repeatability: 0.001 kg/l

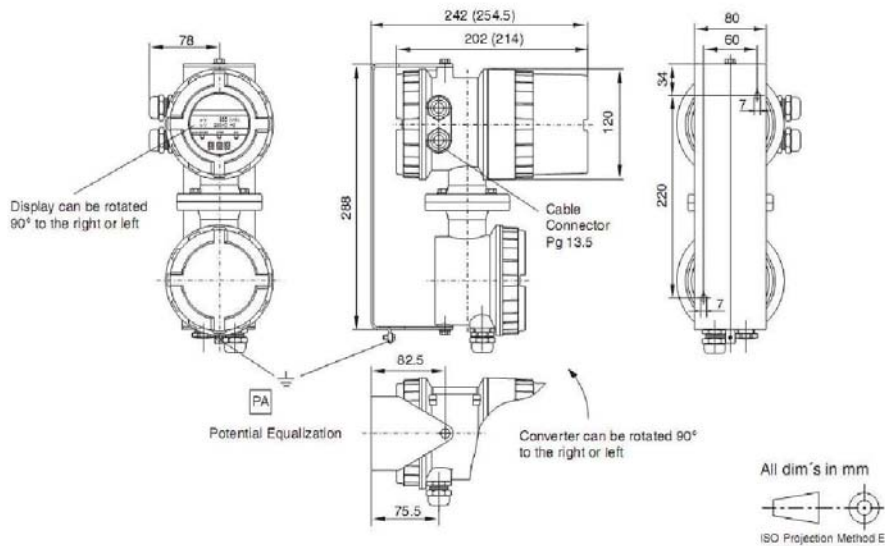


Smartmeasurement.

Flow Body Dimensions

Pressure Rating	Diameter mm	Dimensions (mm)				Process Connections	Weight kg
		A	B	C	D		
4MPa	3		190	180	50	M14X1.5	3
	6		222	165	50	M22X1.5	3.7
	10		305	200	60	M22X1.5	5.6
	15	326	370	300	84	Flange Connection standards: JB/T82.1-94	14
	25	446	440	385	104		21
	32	460	490	420	94		28
	40	566	562	444	124		36
	50	646	760	525	144		60
	80	776	943	592	206		116
	100	864	1350	748	276		175
	150	1092	1830	1100	412		360
200	1320	2136	1214	530	520		
25MPa	10		305	200	60		M22X1.5
16MPa	25	480	440	385	104	Flange Connection	22
10MPa	40	610	562	444	124	Flange standards: JB/T82.1-94	37

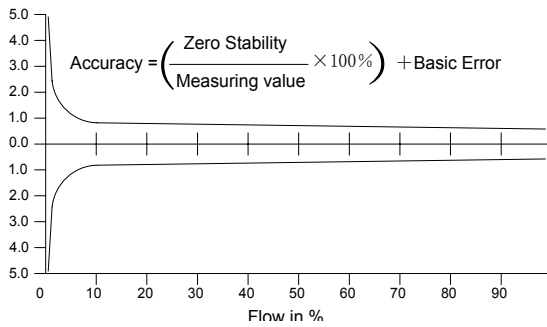
Signal Processor Dimensions



Flow Range in Kg/hr

DN (mm)	Allowable Flow Range	Normal Flow Range for Accuracy 0.15%	Normal Flow Range for Accuracy 0.2% & 0.5%	ΔP Pressure Drop (Mpa) (water at 20°C)	Stability of Zero Point (Kg/Hr)
3	1.8~180	12 ~ 180	9 ~ 180	0.332	0.066
6	9 ~ 900	60 ~ 600	45 ~ 800	0.191	0.24
10	18 ~ 1800	120~1200	90~1,600	0.143	0.36
20	42~4,200	300~3,600	210~4,000	0.265	0.84
25	120~12,000	96~9,600	600~12,000	0.262	2.4
32	216~21,600	1800 ~ 18,000	1080 ~ 20,000	0.183	4.2
40	600~30,000	2400~24,000	1,500~30,000	0.148	6
50	1,000~50,000	8,000~45,000	2,500~50,000	0.132	14.4
80	2,400~120,000	16,000~90,000	6,000~120,000	0.092	31.2
100	4,000~200,000	32,000~180,000	10,000~200,000	0.092	42.6
150	10,000~660,000	80,000~440,000	33,000~660,000	0.63	72
200	20,000~1,200,000	180,000~900,000	60,000~1,200,000	0.098	114

Accuracy:



The diagram shows typical values. Individual values may be taken from the calibration records supplied with each meter.

Notes: ΔP for other fluids:

$$\Delta P = \Delta P_s \times \left(\frac{\mu}{\mu_s} \right)^{0.5} \times \left(\frac{\rho_s}{\rho} \right)$$

Where μ_s viscosity and ρ_s density of water at 20C

Where μ viscosity and ρ density of your fluid

For Exact ΔP at max flow contact your SMC Engineer

Repeatability:

Accuracy	0.15%	0.20%	0.50%
Repeatability	±0.05%	±0.1%	±0.25%

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

Density Measuring

Density Range	(0.2~2.0) g/cm ³
Basic Error	±0.002g/cm ³ (Affected by the transducer)
Repeatability	0.001g/cm ³

**** Please contact your local SMC application engineer**

You also need to provide the following information:

Type of liquid	We need the name of your liquid, including operating density and viscosity
Full Scale Flow	We need your maximum and minimum flow rates, units must be Kg/hr, Lb/hr, LPM or gpm, etc..
Line Size	we need to know your pipe size as well connection type (flange, threaded, etc..)
Process Pressure and Temperature	We calibration your mass Flowmeter as close to your application as possible
Pressure drop	Please indicated the maximum pressure drop (see graph below) that your process can withstand
Type of Electronics	Indicate if you want integral, remote panel or remote wall mounted
Power Requirements	Specify your power requirements such as 24 VDC or 220 VAC

Model Selection Guide

ALCM-FR Series										
Example ALCM-FR-150-ANSI 150-1-1-COM-XD-5										
ALCM-FR	**	**	**	**	**	**	**	**	Description	
3 mm (9-180 kg/h)	003								Sizes and flow rates	
6 mm (45-800 Kg/h)	006									
10 mm (90-1600 Kg/h)	010									
20 mm (210-4000 Kg/h)	020									
25 mm (120-6,000 kg/h)	025									
32mm (1010-20,000 Kg/h)	032									
40 mm (1500-30,000 Kg/h)	040									
50 mm (2,500-50,000 Kg/h)	050									
80 mm (6,000-120,000 Kg/h)	80									
100 mm (10,000-200,000 Kg/h)	100									
150 mm (33,000-660,000 Kg/h)	150									
200 mm (60,000-1,200,000 Kg/h)	200									
ANSI 150#	ANSI 150									Connections options
ANSI 300#	ANSI 300									
ANSI 600#	ANSI 600									
-50°C ~ +200°C			1							Temperature
1.6 Mpa			1							Pressure
2.5 Mpa			2							
4.0 Mpa			3							
6.4 Mpa			4							
Compact Version					COM					Housing
Remote Mounted					REM					
Non-Explosion					NX					Approval
Ex protection EExi for transducer					XI					
Ex protection EEx d Explosion proof					XD					
±0.15%						1				Accuracy
±0.2%						2				
±0.5%						5				