

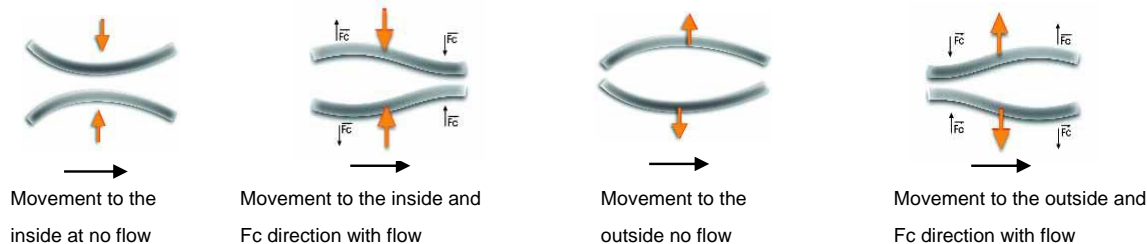


## GENERAL

### ALCM Massflowmeters

The SMC coriolis mass flowmeters uses two tubes in a parallel arrangement 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 opposite effects on the inlet and outlet side, deforming each pipe by a minor amount. The excursion of the pipes is detected by the inlet and outlet-side sensors. The phase shift between the rotational frequencies of both pipes is directly proportional to the mass flow rate and the resonant frequency of both pipes changes in accordance with the density of the fluid media. This effect allows for measurement of the density. Using only one sensor, both density and temperature measurements may be performed. The extent of deformation of the pipes is temperature-dependant. Therefore, the temperature is measured for compensation purposes. Using only one primary sensor, values including mass flow, density, and temperature may be measured. The ALCM's microprocessor-based circuitry allows for conversions such as volumetric flow and % concentration to be calculated.

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



## FEATURES

- Measurement of mass flow, density, temperature and volume flow
- Suitable for aggressive and contaminated media
- Excellent purging and sterilization qualities due to a construct
- Free of dead spots
- Up to +260°F (ALCM 00300-03000), 360°F (ALCM 06000-60000)
- Individual 8-point-calibration including NIST-traceable report
- Ex protected as per ATEX and EMC tested
- High rotation frequency and well-balanced measuring pipes

## SPECIFICATION - Flowbody

### ALCM 00300 to ALCM 03000

- Process Connections: Female threads, G $\frac{1}{2}$ " adapters for flanges (ANSI and DIN), diary or tri-clamp®.
- Operating pressure: max. 5000 psig (350 bar)
- Process temperature: up to 260 °F (125°C)
- Material: SS as per DIN 1.4571 (AISI 316 Ti)
- Housing protecton: IP 67
- Electrical connection: 9-pin flange plug - compact version with integral transmitter
- Max cable length: 100' (30 M) between transducer and transmitter
- Ex-protection: EX II 2G EEx ib IIC T2-T4
- Weight: ALCM 00300 and 03000: 11-22 lbs (5-10 kg)  
ALCM 06000 and 60000: 22-88 lbs (10-40 kg)


### ALCM 06000 to ALCM 60000

- Process Connections: Flanges acc. EN 1092, ANSI B16.5, DIN2512 adapters for flanges (ANSI and DIN)
- Nominal pressure: PN 40, ANSI 150 / 300 lbs
- Process temperature: -40°F to +356°F ( -40°C to +180°C)
- Ambient temperature: -40°F to +140°F (-40°C to +60°C)
- Enclosure protection: NEMA 4X (IP 65) (EN60529)
- Materials: Flow tubes, splitter flanges: 1.4404(316 L)/1.4571(316 Ti)
- Housing material: Cast iron
- Ex-protection: EX II 2G EEx ib IIC T2-T4



**SPECIFICATION - Transmitters - Part numbers TRM5000R & F**

**Basic Features**

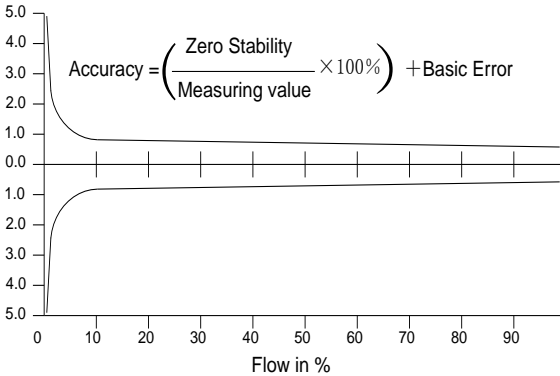
- LCD Display(illuminated): 2-line alpha numerical, measured values & parameter settings, 2x 20 characters (2.4X 4.7 mm)
- Programming: Via front keypad.
- Supply voltage: 24 V<sub>DC</sub>, ±15%.
- Power Comspition: Max. 2 W
- Interface: RS485
- Weights: 3.3 lbs (1.5 kg) wall mount, 2.2 lbs (1 kg) panel mount.
- Housing Wall & Panel: Plastic with transparent cover.
- Operating temperature: 32 to 122 °F (0 to 50 °C)
- Ex protection:  II (2) G (Eex ib) IIC
- Temperature drift: 0.05% per 10 K load (Load>10 k).

**Analog Outputs**

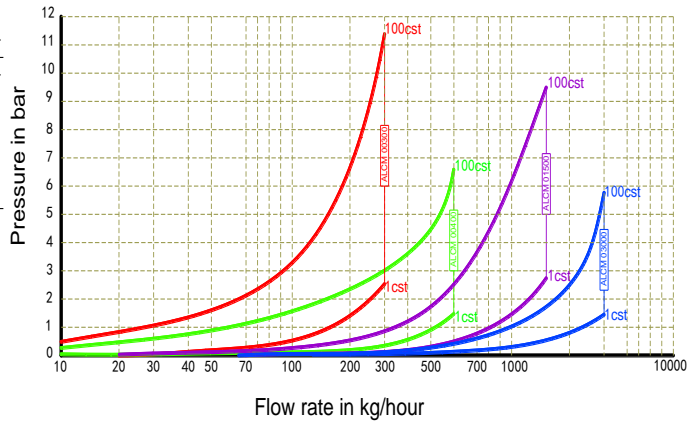
- Voltage outputs: two 0-5V<sub>DC</sub>, resolution: 12 bits, linearity ±0.05% final value scaled output of flow rate.
- Current: 1 off 0/4-20mA, active, galvanically free, resolution 12 bits with linearity: ±0.05% of final value, Load ≤ 800 Ω scaled output of flow rate, or job total, density or temperature.
- Pulse: Of flow rate, 8-5 kHz, adjustable via jumper, push/pull: I<sub>max</sub>\* 20mA open collector: V<sub>ce</sub> ≤ 30V, I<sub>ce</sub> ≤ 50 mA.
- Switch outputs: adjustable via jumper: push/pull: I<sub>max</sub> 20mA. Open Collector: V<sub>ce</sub> ≤ 30V, I<sub>ce</sub> ≤ 50 mA, 1 or 2 job total, fault or rate or cycle.
- Switch inputs: passive "on" >4V<sub>DC</sub>, "off" <1V<sub>DC</sub>; total, reset,& offset.

Accuracy

Type	ALCM00300	ALCM00600	ALCM01500	ALCM03000	ALCM06000	ALCM20000	ALCM40000	ALCM60000
No.of measuring tubes (arrangement)	2(serial)	2(parallel)	2(serial)	2(parallel)	2(parallel)	2(parallel)	2(parallel)	2(parallel)
Basic error (referring to instant.flow)	±0. 25%	±0. 25%	±0. 25%	±0. 25%	±0. 15%	±0. 15%	±0. 15%	±0. 15%
Zero stability	0. 05kg/h	0. 12kg/h	0. 3kg/h	0. 5kg/h	0. 6kg/h	2. 0kg/h	4kg/h	6kg/h



Pressure drop for Alia ALCM 00300-ALCM03000



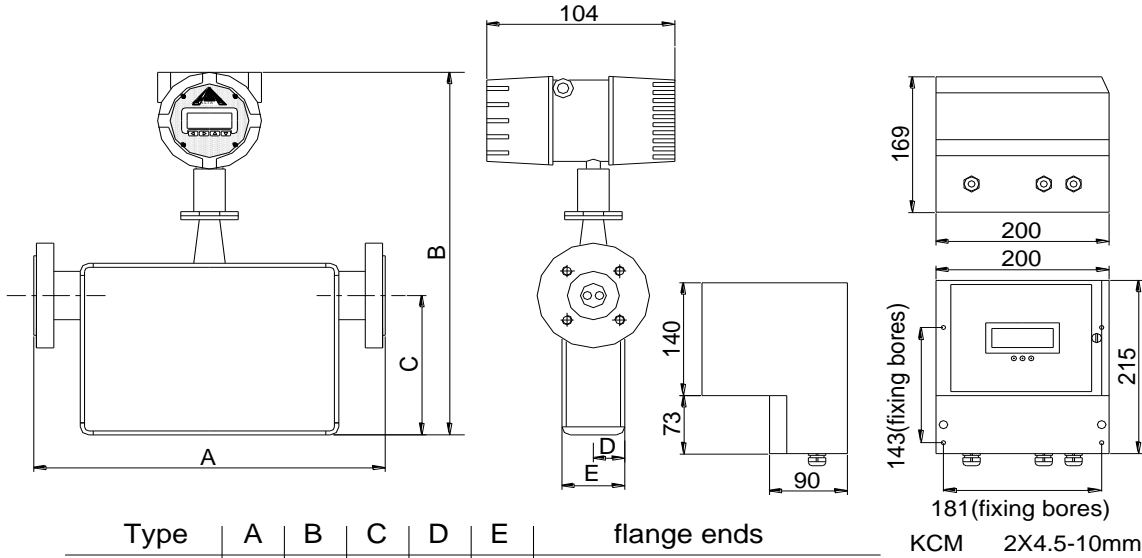
Pressure drop for ALCM6000-60000

[water (70°F), 1 cSt]

Model	measuring (in kg/hour)	flow range (in kg/hour)	Pressure loss psig (bar)	Model	measuring (in kg/hour)	flow range (in kg/hour)	Pressure loss psig (bar)
ALCM-6000	600-6000	600 kg/h	0.3 (0.02)	ALCM-40000	4000-40000	4000 kg/h	0.3 (0.02)
		1950 kg/h	2.2 (0.15)			13000 kg/h	2.8 (0.19)
		3300 kg/h	5.5 (0.38)			22000 kg/h	6.7 (0.46)
		4650 kg/h	10 (0.69)			31000 kg/h	12.3 (0.85)
		6000 kg/h	15.7 (1.08)			40000 kg/h	19.1 (1.32)
ALCM-20000	2000-20000	2000 kg/h	0.6 (0.04)	ALCM-60000	6000-60000	6000 kg/h	0.3 (0.02)
		6500 kg/h	4.4 (0.30)			19500 kg/h	2.2 (0.15)
		11000 kg/h	11 (0.76)			33000 kg/h	5.5 (0.38)
		15500 kg/h	20 (1.38)			46500 kg/h	10.2 (0.70)
		20000 kg/h	31.3 (2.16)			60000 kg/h	15.8 (1.09)

ALCM 06000 to ALCM 60000 Deminsions

TRM5000R&F-WLM Dimenstional drawings



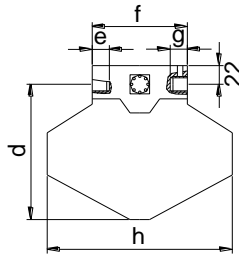
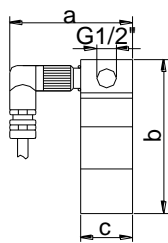
Type	A	B	C	D	E	flange ends
ALCM06000	400	450	173	65	113	DN25 PN40,ANSI 1" 150/300lb
ALCM20000	500	491	206	65	113	DN50 PN40,ANSI 2" 150/300lb
ALCM40000	600	577	290	77	137	DN80 PN40,ANSI 3" 150/300lb
ALCM60000	600	577	290	77	137	DN80 PN40,ANSI 3" 150/300lb

181 (fixing bores)  
KCM 2X4.5-10mm

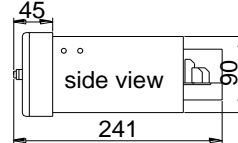
ALCM 00300 to ALCM 03000 Deminsions

TRM5000R&F-PNM Dimenstional drawings

standard housing

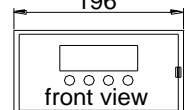


(without cover 9mm)



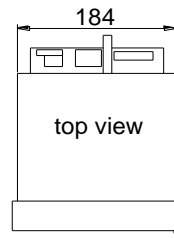
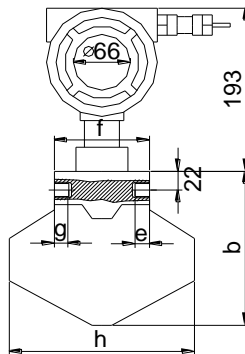
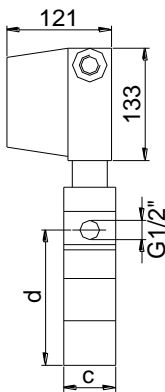
(without cover 205mm)

(without cover 193mm)



(without cover 96mm)

compact housing



panel board

cut of:

width=186mm+1.1

height=92mm+0.8

Type	a	b	c	d	e	f	g	h
ALCM00300	120	182	60	160	19	110	15	214
ALCM00600	120	182	60	160	19	87	15	214
ALCM01500	119	280	60	258	21	140	18	350
ALCM03000	119	280	60	258	21	140	18	350

Note:all dimensions are mm unless stated

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

**You also need to provide the following information:**

<b>Type of liquid</b>	Please provide the name of your liquid, including operating density and viscosity
<b>Full Scale Flow</b>	Please provide your maximum and minimum flow rates in units of Kg/hr, Lb/hr, LPM or gpm, etc..
<b>Line Size</b>	Please specify your nominal pipe size and desired process connection type (flange, threaded, etc..)
<b>Process Pressure &amp; Temperature</b>	We will calibrate your mass flowmeter as close to your operating conditions as possible
<b>Pressure drop</b>	Please indicate the maximum pressure drop (see graph on page 2) that your process can withstand
<b>Type of Electronics</b>	Please specify either integral, remote, panel, or remote wall-mounted electronics
<b>Power Requirements</b>	Please specify your power requirements such as 24 V <sub>DC</sub> or 115 V <sub>AC</sub> or 230 V <sub>AC</sub>

**Model Selection Guide**

ALCM Series								
Example ALCM-03000-25P040-TRM4000R-WLM-CABL-TREX								
ALCM	XXXXXXX	XXXXXX	XXXXXXXX	XXX	XXXX		<b>Description</b>	
<b>Small Size ( Models ALCM 00300-03000)</b>							Sizes and flow rates	
Internal Dia.								
4 mm (4.5-300 kg/h)	00300							
4 mm (9.0-600 Kg/h)	00600							
8 mm (25-1500 Kg/h)	01500							
8 mm (50-3000 Kg/h)	03000							
½" FNPT	05FNPT	Connections options (1/2" FNPT Standard)						
Male NPT	10MNPT							
Tri-clamp - ½" (15mm)	TRCL15							
Tri-clamp - 1" (25mm)	TRCL25							
DN 25 PN40	25P040							
DN 25 PN100	25P100							
DN 25 PN 160	25P160							
DN 25 PN 250	25P250							
1" ANSI 150	AN0150							
1" ANSI 300	AN0300							
1" ANSI 600	AN0600							
1" ANSI 900	AN0900							
1" ANSI 1500	AN1500							
<b>Medium Size ( Models ALCM 06000-60000)</b>							Flow rates and connection (DN flanges standard, equivalent ANSI flanges also available)	
DN 25 PN 40 (60-6000 Kg/h)	06000	DN25P040						
DN 50 PN 40 (200-20,000 Kg/h)	20000	DN50P040						
DN 80 PN 40 (400-40000 Kg/h)	40000	DN80P040						
DN 80 PN 40 (600-60,000 Kg/h)	60000	DN80P040						
Standard Transmitter			ACE5000				Transmitter	
Compact Version			COM				Housing	
Wall Mounted			WLM					
Panel-Mounted			PNM					
Ex protection EExi for transducer				XI				Options
Ex protection EEx d Explosion proof				XD				
Cable, 10' (3 meters) -(Only for WLM or PNM mounting)				CABL				