

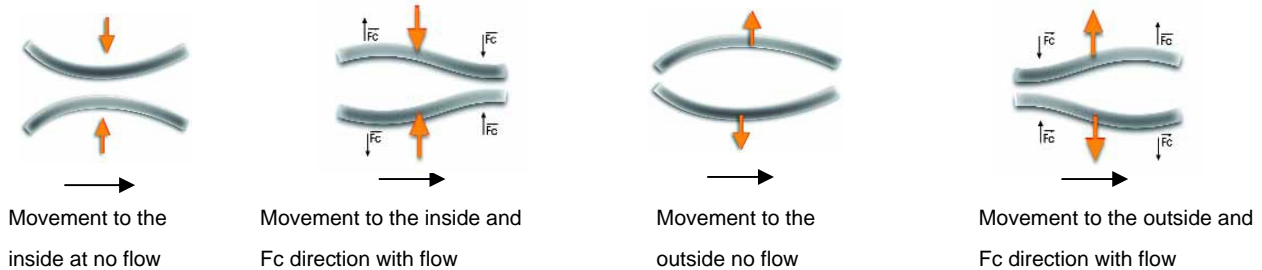


## GENERAL

### ALCM Massflowmeters

The SMC 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)

#### 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 construction
- Free of dead spots
- Up to +125°C (ALCM 00300-03000), 180°C (ALCM 06000-60000)
- Individual 8-point-calibration including 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 Connection: Female threads G1/2" adapters for flanges (ANSI and DIN), diary or tri-clamp.
- Operating pressure: max. 350 bar
- Process temperature: up to +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: 30 M between transducer and transmitter
- Ex-protection: EX II 2G EEx ib IIC T2-T4
- Weight: ALCM 00300 and 03000: 5-10 kg  
ALCM 06000 and 60000: 10-40 Kg


### ALCM 06000 to ALCM 60000

- Process Connection: 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°C to +180°C (-40°F to +356°F)
- Ambient temperature: -40°C to +60°C (-40°F to +140°F)
- Enclosure protection: IP 65 (EN60529) (NEMA 4X)
- 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**

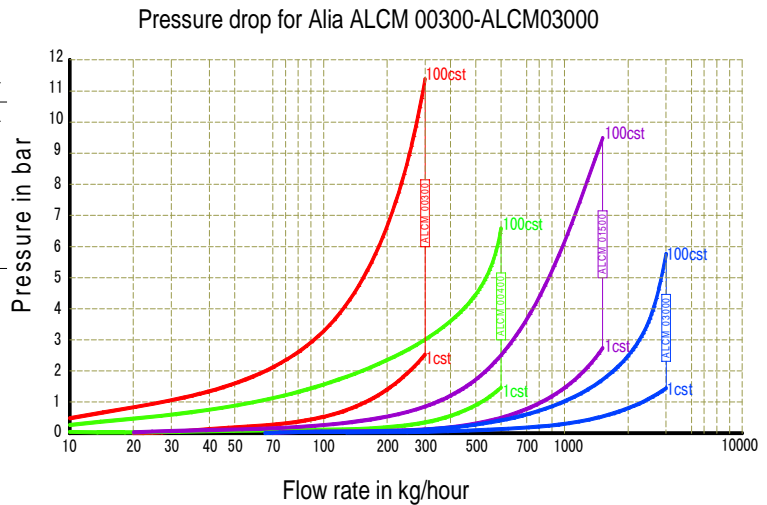
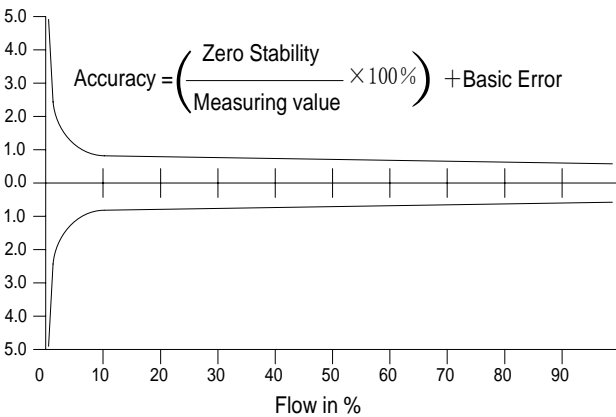
- LCD Display(illuminated): 2-line alpha numerical, measured values & parameter settings, 2x 20 characters (2.4X 4.7 mm)
- Programming: Via front keyboard.
- Supply voltage: 24 V/DC, 15%.
- Power Comspotion: Max. 2 W
- Interface: RS485
- Weights: 1.5 kg wall mount, 1 kg panel mount.
- Housing Wall & Panel: Plastic with transparent cover.
- Operating temperature: 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, 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 ohms scaled output of flow rate, or job total, density or temperature.
- Pulse: Of flow rate, 8-5K Hz, adjustable via jumper, push/pull: I<sub>max</sub>-20mA open collector: U<sub>ce</sub> < 30V, I<sub>ce</sub> < 50 mA.
- Switch outputs: adjustable via jumper: push/pull: I<sub>max</sub> 20mA. Open Collector: U<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, "off" <1V, 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



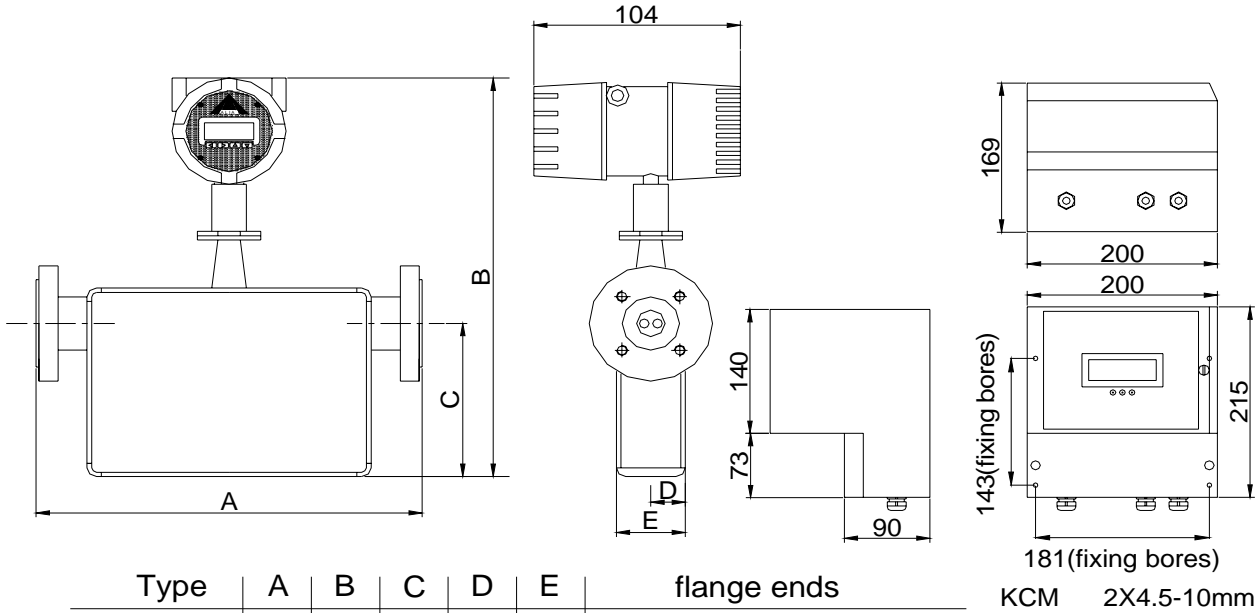
**Pressure drop for ALCM6000-60000**

[water (20°C), 1 mPas]

Model	measuring (in kg/hour)	flow range (in kg/hour)	Pressure loss (in bar)	Model	measuring (in kg/hour)	flow range (in kg/hour)	Pressure loss (in bar)
ALCM-6000	600-6000	600 kg/h	0.02 bar	ALCM-40000	4000-40000	4000 kg/h	0.02 bar
		1950 kg/h	0.15 bar			13000 kg/h	0.19 bar
		3300 kg/h	0.38 bar			22000 kg/h	0.46 bar
		4650 kg/h	0.69 bar			31000 kg/h	0.85 bar
ALCM-20000	2000-20000	6000 kg/h	1.08 bar	ALCM-60000	6000-60000	40000 kg/h	1.32 bar
		6500 kg/h	0.30 bar			6000 kg/h	0.02 bar
		11000 kg/h	0.76 bar			19500 kg/h	0.15 bar
		15500 kg/h	1.38 bar			33000 kg/h	0.38 bar
		20000 kg/h	2.16 bar			46500 kg/h	0.70 bar
						60000 kg/h	1.09 bar

ALCM 06000 to ALCM 60000 Deminsions

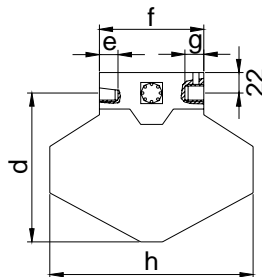
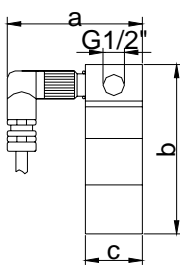
TRM5000R&F-WLM Dimensional drawings



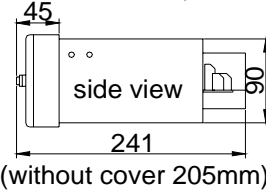
ALCM 00300 to ALCM 03000 Deminsions

TRM5000R&F-PNM Dimensional drawings

standard housing

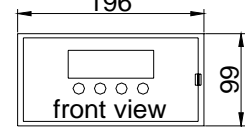


(without cover 9mm)

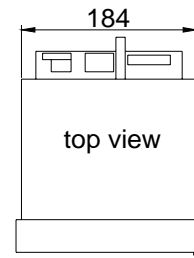


(without cover 205mm)

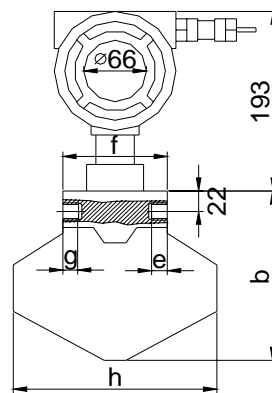
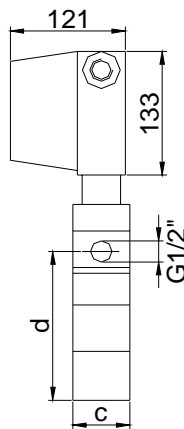
(without cover 193mm)



(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>	We need the name of your liquid, including operating density and viscosity
<b>Full Scale Flow</b>	We need your maximum and minimum flow rates, units must be Kg/hr, Lb/hr, LPM or gpm, etc..
<b>Line Size</b>	we need to know your pipe size as well connection type (flange, threaded, etc..)
<b>Process Pressure and Temperature</b>	We calibration your mass Flowmeter as close to your application as possible
<b>Pressure drop</b>	Please indicated the maximum pressure drop (see graph below) that your process can withstand
<b>Type of Electronics</b>	Indicate if you want integral, remote panel or remote wall mounted
<b>Power Requirements</b>	Specify your power requirements such as 24 VDC or 115 VAC or 230 VAC

**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									
1/2" FNPT	05FNPT	Connections options (1/2" FNPT Standard)								
Male NPT	10MNPT									
Tri-clam 15mm	TRCL15									
Tri-clam 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 (3 meters) -(Only for WLM or PNM mounting)					CABL					