MASS FLOWMETER

These very accurately measure the mass flowrate, density and temperature of liquids, chemicals, foods, emulsions and gases.

Excellent accuracy and repeatability ✓

- **Improve your process**
- **Reduce waste**
- **Independent of viscosity and temp changes**

Easy to use ✓

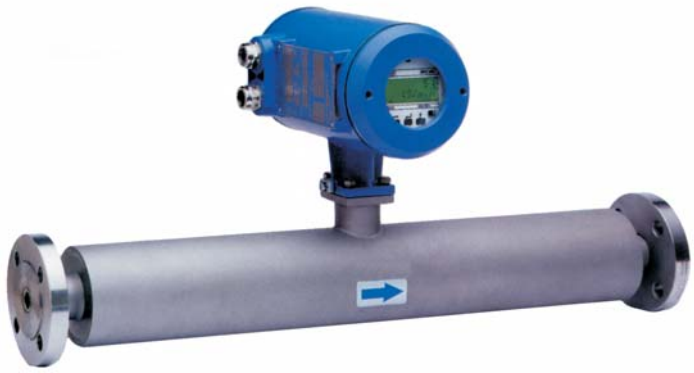
- **Displays mass flow,density and temperatur**
- **Outputs for your control systems**
- **Preset for your requirements**

Easily maintained ✓

- **No obstruction to flow**
- **Low pressure drop**

High quality manufacture ✓

- **Intrinsic safety approval**
- **Hygienic approval**



Application

These are highly accurate and are used for dosing and batching of liquids and gases. They cover the range from 0.01kg/min to 3000 kg/min. The results are accurate independent of changes in viscosity, temperature, pressure and density.

Instrumentation

The flowmeter has an LCD display. It displays the mass flow rate, total, temperature and density. It has pulse and current outputs for a wide range of control systems.

Principle of Operation

Coriolis forces are generated in an oscillating system when a mass moves away from or towards an axis of oscillation. The measuring tube is vibrated at a uniform frequency. With no flow the Coriolis force is zero. During flow the particles in the fluid are accelerated and decelerated to and from the axis of oscillation. This generates Coriolis forces that move the measuring tube by extremely small amounts and are detected by special sensors. The Coriolis force is directly proportional to the mass flowrate.

Calibration

Each flowmeter is calibrated against scales. The scales are calibrated to National Standards by the Trading Standards Calibration Service.
To ensure accuracy over the measuring range, calibrations are carried out at different flow rates.
The mass flowmeters have measuring errors of less than 0.15% of the measured value.
Each mass flowmeter is also calibrated for a density range of 0.5 to 2.0 g/cm^3.

Installation

The flowmeter is mounted in the line and should be maintained full of the line fluid prior to and throughout measurement. You are strongly advised to avoid heavily vibrating environments. The tube can be installed in a vertical or horizontal line and has a straight through bore that is self-draining and has a minimal pressure drop. A zero point calibration is done after installation when the line is full.

Construction

The range of materials of the wetted parts make it suitable for almost all applications.
The flowmeters consist of a detector and a display converter. They can be supplied integral with the display mounted directly on the detector or separately connected by a 5m cable so that the display can be mounted remotely.
There is an option for a heating jacket to be fitted to allow the line fluid to be heated up to 150 °C. For this option the converter must be mounted separately.

APOLLO

Mass Flowmeter

Flowmeter Performance

Model	Size		Flow range in kg/min:		
	ANSI	DN	Min.	Norm.	Max.
10 G	1/2"	10/15	0.25	**10**	20
100 G	3/4"/1"	15/25	2	**100**	200
300 G	1"/1 1/2"	25/40	5	**300**	600
800 G	1 1/2"/2"	40/50	15	**800**	1600
1500 G	2"/3"	50/80	25	**1500**	3000
3000 G	3"/4"	80/100	50	**3000**	6000

Flowmeter Specification

Linearity:	+/- 0.15% of reading
Repeatability:	+/- 0.04% of reading
Density range:	0.5 - 2.0 g/cm^3
Maximum pressure:	63 bar or connection rating
Flange connections:	ANSI 150/300
	DIN 2635 PN 40/63
Hygienic version:	Triclamp, IDF, ISS or RJT
Maximum line temp:	-25 to 130^{0}C (Option to 150 ^{0}C)

Materials of Construction

Wetted parts & tube:	Titanium alloy, zirconium option
Secondary housing:	304 stainless steel
	(3000 G powder coated steel)
Flanges:	304 stainless steel

Hygienic Version

The hygienic version is rated to 3A or EHEDG standards.

Dimensions and Weight

Model	a	b	c	d	kg
10 G	490	415	242	90	12.1
100 G	656	565	249	102	17.6
300 G	843	744	249	102	26.5
800 G	1110	988	269	142	59
1500 G	1242	1115	283	170	101
3000 G	1630	1400	335	274	190

For IS version dimension c is c+18mm

Converter Specification

Current output:	0-20 mA or 4-20mA
Load:	500 Ohms
Pulse Output:	Open collector
	Max. 24V
Frequency max.:	1300 Hz
Status output:	Open collector
Function	Status, flow alarm & direction
	Max. 24 V, 150mA
Control input:	Opto isolator
Function:	Reset total, zero point, status or changeover mode

Materials of Construction

Material:	Aluminium with polyurethane finish
Amb. temp.:	-25 to 60 ^{0}C
Protection:	IP67 or NEMA 6

Power Supply

Mains:	230 V ac or 120 V ac
DC:	Option for 24 V dc

Setup & Control

Settings:	The meter is preset for your application.
Adjustments:	Changes are made using the 3 keys and the LCD display.

Intrinsically Safe Version

The IS version is approved to EEx ib IIC T6 and to FM Class 1 Division 1