

SH-CMF Coriolis Mass Flow Meters

1. Introduction

Coriolis Mass Flow Meters patented and developed by our company (Chinese Patent No. 03119685.3, 03149996.1) are the leading meters for precision flow measurement. And with good reason, the meters offer the most accurate measurement available for virtually any process fluid, while exhibiting exceptionally low pressure drop. The meters offer direct mass flow, volume flow, density, and temperature measurement of liquids and slurries — without the need for additional equipment, manual calculations, or estimations.

The meters are designed for unsurpassed performance in even the harshest operating environments. They have no moving parts, and any special mounting or flow conditioning requirements. Every meter is available with stainless steel wetted parts and a wide variety of process connections to meet your every need.

The meters carry hazardous area approval for P. R. China.

2. Principles of Measurement

The structure of Coriolis Mass Flow Meters was consisted of a pair of bended tubes. The principle is to detect Coriolis force forced a pair of tubes from inner mass flow by fluid.

A new force-Coriolis force would be appear while two conditions met: (1) vibrating with normal frequency in a pair of bended tubes, (2) fluid flowing in tubes. This force was produced upon synthesis from vibrating force and flowing force by fluid in tubes. And tubes would be wresting symmetric the center line because the force forced. Two displacement sensors on sides of tubes detect the force and output electric signals. The signals regulated, mass flow directly produced.

3. Technical Specifications of Products

3.1 Technical Specifications

Table 1

Titles	Technical Specifications
Mass flow accuracy	$\pm[0.2\% + (\text{zero stability} / \text{flow rate} \times 100\%)]$
Mass flow repeatability	$\pm(1/2) \times [0.2\% + (\text{zero stability} / \text{flow rate} \times 100\%)]$
Density range	0.2 g/cm ³ ~3.5g/cm ³
Density accuracy	$\pm 0.002\text{g/cm}^3$
Temperature range	-60°C~+200°C
Temperature accuracy	$\pm 1^\circ\text{C}$
Output of current loop	4mA~20mA
Output of frequency/pulse	0Hz~10kHz
Contact capacity of a Batch Control relay	24V/0.1A
Contact form	normal open

3.2 Other Specifications

Environmental Specifications

Table 2

Titles	Specifications
Temperature range of fluid	-40°C~+200°C
Environmental temperature range	0°C~+40°C
Environmental humidity	≤90% RH, non condensation
Atmospheric pressure range	86kPa~106kPa
Power supply of transmitters	Essential safety Voltage: AC(220±10%)V,(50±5%)Hz Composite Voltage: DC (24±10%) V
Power consumed	<15W

Flow Range

Table 3

Specs	Line Sizes (mm)	Flow Range (t/h)	Calibration Range (t/h)	Max. Tube Pressure (MPa)	Zero Stability (t/hr)	Velocity Parameter (h m/t s)
DN1	1	0~0.04	0.004~0.04	30.0	0.000008	353.7
DN3	3	0~0.35	0.035~0.35	30.0	0.000067	39.3
DN6	6	0~0.7	0.07~0.7	30.0	0.00016	19.65
DN10	10	0~1.2	0.12~1.2	30.0	0.0002	4.912
DN15	15	0~6.4	0.64~6.4	4.0	0.0011	2.183
DN25	25	0~16	1.6~16	4.0	0.002	0.902
DN40	40	0~40	4~40	4.0	0.003	0.334
DN50	50	0~65	6.5~65	4.0	0.006	0.197
DN80	80	0~160	16~160	2.5	0.01	0.0873
DN100	100	0~250	25~250	2.5	0.015	0.0544
DN150	150	0~550	55~550	2.5	0.03	0.0239

3.3 Explosion-proof Identification Code**Explosion-proof identification code**

Table 4

Form of Explosion-proof	Identification Code
Intrinsically safe	Exib[ib]IIBT4
Flame-proof	Exdib[ib]IIBT4

4.1 Model Selection

SH-CMF		Silver Coriolis Mass Flow Meters			
Model	Nominal Diameter	Flow range (t/h)	Model	Nominal Diameter	Flow range (t/h)
1	DN1	0~0.04	40	DN40	0~40
3	DN3	0~0.35	50	DN50	0~65

6	DN6	0~0.7	80	DN80	0~160
10	DN10	0~1.2	100	DN100	0~250
15	DN15	0~6.4	150	DN150	0~550
25	DN25	0~16			
P	Pressure				
P1	2.5MPa(DN80~DN150)				
P2	4.0MPa(DN15~DN50)				
P3	30MPa (DN1~DN10)				
P4	Special demand				
H	Structure Form				
H1	Compact				
H2	Remote				
T	Temperature				
T1	(-60~150°C)				
T2	(-60~200°C)				
T3	(-60~350°C)				
O	Output				
O1	4~20mA				
O2	Pulse:0-10KHz				
O3	0~5V				
C	Communication				
C1	None				
C2	RS485/Modbus				
C3	Hart				
E	Hazardous Area				
E1	Intrinsically safe, Exib[ib]IIBT4				
E2	Explosive-proof, Exdib[ib]IIBT4				
A	Accuracy				
A1	0.15%				
A2	0.2%				
B	Batch Control				
B1	None				
B2	With Batch Control				
P	Power supply				
P1	24V DC				
P2	220V AC				

* Please provide density, temperature of the medium, also cable length (if needed) when ordering

4.2 Configurations



Figure 1 Sensors (primary meter)

Figure 2 Essential Safety Transmitter

Figure 3 Composite Transmitter and Sensor

Every meter consists of two parts: the sensor (primary meter) and the transmitter (secondary meter).

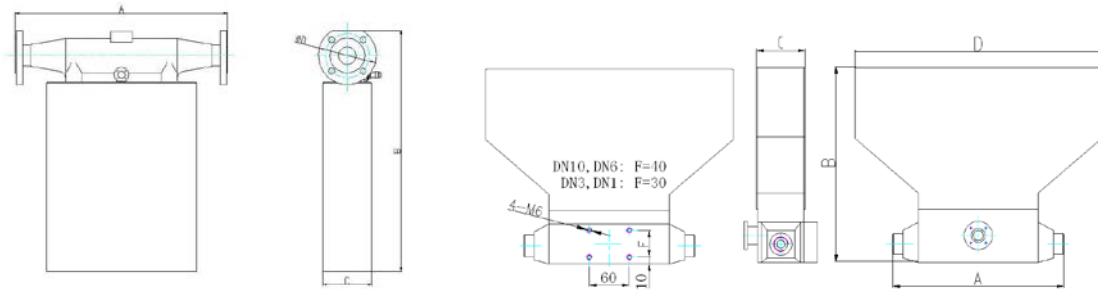
The sensor (primary meter) is machinery part of mass flow meter. There are a vibrator, two displacement sensors and a temperature sensor in it.

The transmitter (secondary meter) is display part of the meter, also is electrical part. There are power supply, analog circuits, digital circuits, displayer, and output circuits and so on in it. Its foundational functions are receiving and regulating the electrical signal from sensors, directly getting mass flow, temperature and density after regulating, and calculating volume flow and other need parameters from known parameters. It can display, output, store and long distance transmit, and you can modify the parameters of flow meter. There is a diode safety barrier in transmitters; the function of the diode safety barrier is safeguard to isolating explosion.

As the composite explosion-proof flow meter, the sensor (primary meter) is essential safety; the transmitter (secondary meter) is explosion isolated. The sensor and the transmitter may all operate under hazardous area.

As the essential safety flow meter, the sensor (primary meter) can operate under hazardous area, the transmitter (secondary meter) must only operate under prescriptive safety area (see section 3.2), forbidden to operate under hazardous area.

Dimensions



Dimensions

Spec	Line sizes(mm)	Fitting Options (mm)				Number and Hole Diameter of Flange join or Screw join (mm)	Weight (kg)
		A	B	C	D		
DN1	13	193	200	75	(234)	M12×1.5 Screw join	4
DN3	3	193	225	75	(288)	M12×1.5 Screw join	4.5
DN6	6	214	234	69	(328)	M16×1.5 Screw join	7.5
DN10	10	256	291	73	(370)	M18×1.5 Screw join	9
DN15	15	413	503	90	φ65	4-φ14	15
DN25	25	473	548	96	φ85	4-φ14	18.5
DN40	40	522	613	116	φ110	4-φ18	25.5
DN50	50	597	676	137	φ125	4-φ18	35
DN80	80	650	837	175	φ160	8-φ18	53.5
DN100	100	714	934	198	φ190	8-φ22	70
DN150	150	815	1123	265	φ250	8-φ26	85