

S-MASS SMART LINE Series

Coriolis flowmeters for mass and density



Applications

- Chemical and petrochemical industry
- Paper mills
- Pharmaceutical industry
- Food and Beverage industry
- Textiles, paints

Features and Benefits

- Unchallengeable HTCMF performance on liquid mass flow, volume flow, and density measurement
- Unique design delivers unparalleled measurement sensitivity and stability
- Guarantees consistent, reliable performance over the widest flow range
- Designed to minimize process, mounting, and environmental effects



S-MASS

EXTREMELY CONVENIENT FLOW MEASURE FOR PROCESS AND SERVICE APPLICATIONS

The **S-MASS flowmeters of the Smart Line series** are based on the Coriolis principle and measure the mass flow and density of liquids and sludge products with extreme accuracy and repeatability.

They are the solution for almost all process fluids and guarantee low pressure drop.

This Coriolis flowmeter has one measuring tube which oscillate by means of an exciter. When the fluid starts to flow in the measuring tube, additional twisting is imposed on this oscillation due to the fluid inertia. This change of the tube oscillation is detected by two sensors. This difference is a direct measure of the mass flow.

From the oscillation frequency of the measuring tube also the fluid density can be determined.

Petroleum: moisture content analysis

Lipids: including vegetable oils, animal fats and other oils

Fuel: crude oil, heavy oil, coal slurry, lubricant and other fuels

Food: gas dissolving beverage, health drink and other liquids

Low temperature fluid, like liquid oxygen and liquid nitrogen, low temperature up to -200 °C

High temperature fluid, the maximum temperature up to 300 °C

High pressure fluid, like slurry flow control

APPLICATION PRECISION

Low flow precision measurement	Precision measurement Process control	High capacity precision measurement
2 - 330 kg/h	Kg/min – ton/h	Up to 1.200 ton/h
Starting at 2 kg/h to 330 kg/h	Truck loading	Custody transfer
Flavouring	Internal allocation	Ship loading
Vials	Leak detection	Railcar loading
Chemical injection	Produced fluids with chlorides	Pipeline measurement
		Marine bunkering
		Feedstock and fuel blending

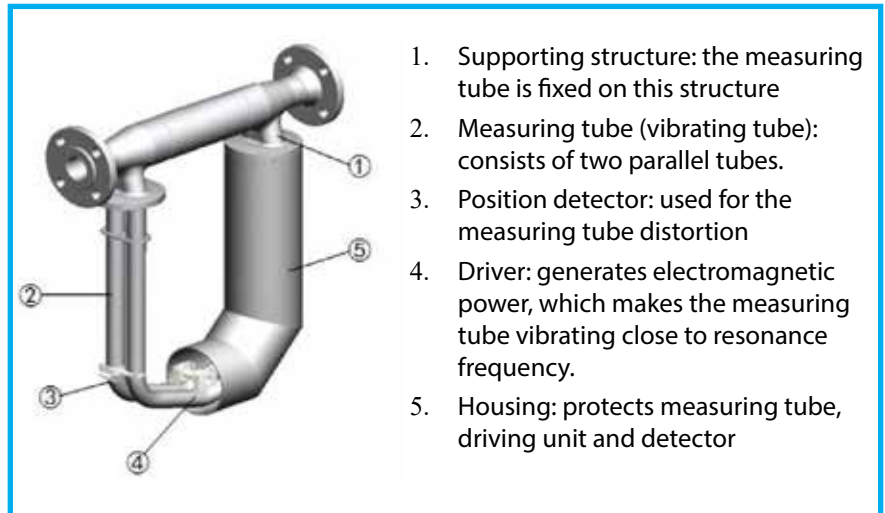


SENSOR STRUCTURE

The sensor of the mass flowmeter S-MASS consists of :
measurement tube, driving device, position detector, support structure, temperature sensor, housing.

SENSOR SPECIFICATIONS

- Accuracy $\pm 0.1 \dots 0.5\%$
- Repeatability $\pm 0.1 \dots 0.25\%$
- Density range $0.5 \dots 2 \text{ g/cm}^3$, accuracy $\pm 0.002 \text{ g/cm}^3$
- Operating temperature $-50 \dots + 200 \text{ }^\circ\text{C}$
- Measuring tube material 316L stainless steel
- Housing material 304 stainless steel
- Nominal pressure 4.0 MPa



1. Supporting structure: the measuring tube is fixed on this structure
2. Measuring tube (vibrating tube): consists of two parallel tubes.
3. Position detector: used for the measuring tube distortion
4. Driver: generates electromagnetic power, which makes the measuring tube vibrating close to resonance frequency.
5. Housing: protects measuring tube, driving unit and detector

TRANSMITTER SPECIFICATION

MODEL	FT-521 LED	FT-522 LCD	FT-523 digital LCD
Principle	Analog signal processing	Analog signal processing	Digital signal processing 1. MVD technology 2. Higher sampling 3. Digital filtering
Ambient temperature	$-40 \dots 60 \text{ }^\circ\text{C}$	$-20 \dots 60 \text{ }^\circ\text{C}$	$-20 \dots 60 \text{ }^\circ\text{C}$
Display mode	LED	LCD	LCD
Indication	Mass flow, volume flow, density	Mass flow, volume flow, density, temperature	Mass flow, volume flow, density, temperature
Power supply	24 VDC / 220 VAC	24 VDC / 220 VAC	24 VDC
Output	Pulse, 4-20 mA	Pulse, 4-20 mA	Pulse, 4-20 mA
Communication	Modbus	Modbus, HART	Modbus

LIQUID FLOW RATES

Model	Nominal Size (mm)	Flow rate (t/hr)
S-MASS HTCMF-006	6	0~0.56~0.7
S-MASS HTCMF-008	8	0~0.96~1.2
S-MASS HTCMF-010	10	0~1.8~2.1
S-MASS HTCMF-015	15	0~3.6~4.5
S-MASS HTCMF-020	20	0~6~7.2
S-MASS HTCMF-025	25	0~9.6~12
S-MASS HTCMF-032	32	0~18~21
S-MASS HTCMF-040	40	0~30~36
S-MASS HTCMF-050	50	0~48~60
S-MASS HTCMF-080	80	0~150~180
S-MASS HTCMF-100	100	0~240~280
S-MASS HTCMF-150	150	0~480~600

DIMENSIONS AND MEASURING RANGES

DN (mm)	Flow range (kg/h)	Zero stability, kg/h			Rated pressure (MPa)	NW (kg)	GW (kg)
		0.2%	0.15%	0.1%			
3	0~96~120	0.018	0.012	0.012	40	8	19
6	0~540~660	0.099	0.066	0.066	20	12	22
8	0~960~1200	0.18	0.12	0.12	20	12	23
10	0~1500~1800	0.27	0.18	0.18	20	11	24
15	0~3000~4200	0.63	0.42	0.42	20	12	25
20	0~6000~7800	1.17	0.78	0.78	16	20	34
25	0~10200~13500	2.025	1.35	1.35	16	21	35
32	0~18 000~24 000	3.6	2.4	2.4	16	27	45
40	0~30 000~36 000	5.4	3.6	3.6	12	35	55
50	0~48 000~60 000	9	6	6	12	40	60
80	0~120 000~160 000	24	16	16	8	90	150
100	0~222 000~270 000	40.5	27	27	8	170	245
150	0~480 000~600 000	90	60	60	6	255	350

DISPLAY AND OPERATING ELEMENTS

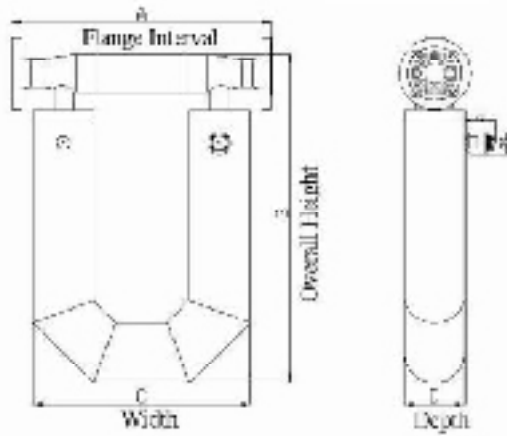
128x64 LCD display

Window size: 54x40 mm (WxH), Ø 80 mm

- Mass flow rate: g/h, kg/h, t/h, g/m, kg/m, t/m
- Total flow: g, kg, t
- Volume flow rate: cm³/h, dm³/h, m³/h, cm³/m, dm³/m, m³/m
- Total volume: cm³, dm³, m³
- Density: kg/m³, g/cm³
- Temperature: °C, °F, °K



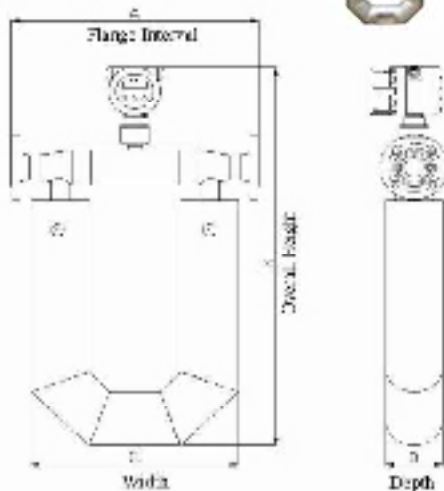
SPLIT TYPE



Unit: mm

Model	A	B	C	D
S-MASS HTC MF015	455	500	500	89
S-MASS HTC MF020	540	540	445	108
S-MASS HTC MF025	540	560	445	108
S-MASS HTC MF032	550	570	445	108
S-MASS HTC MF040	600	840	500	140
S-MASS HTC MF050	600	840	500	140
S-MASS HTC MF080	870	1150	780	220
S-MASS HTC MF100	950	1200	840	295
S-MASS HTC MF150	1300	1350	950	320

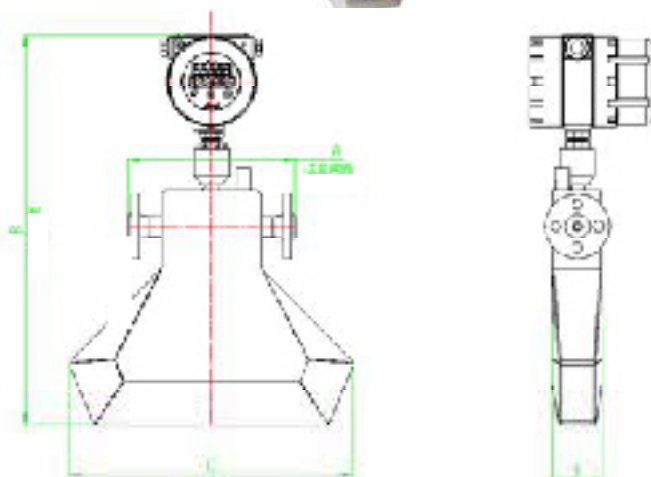
INTEGRATED TYPE



Unit: mm

Model	A	B	C	D
S-MASS HTC MF015	455	540	500	89
S-MASS HTC MF020	540	740	470	108
S-MASS HTC MF025	540	740	445	108
S-MASS HTC MF032	550	740	445	108
S-MASS HTC MF040	600	1010	500	140
S-MASS HTC MF050	600	1010	500	140
S-MASS HTC MF080	870	1365	780	220
S-MASS HTC MF100	950	1440	840	295
S-MASS HTC MF150	1300	1540	950	320

SMALL SIZE TYPE



Unit: mm

Model	A	B	C	D
S-MASS HTC MF006	232	521	380	70.5
S-MASS HTC MF008	232	535	395	70.5

INSTALLATION

Flow direction should be in accordance with the arrow in order to ensure the reliability of the measurement.

For the installation the operator should consider the following factors.

INSTALLATION

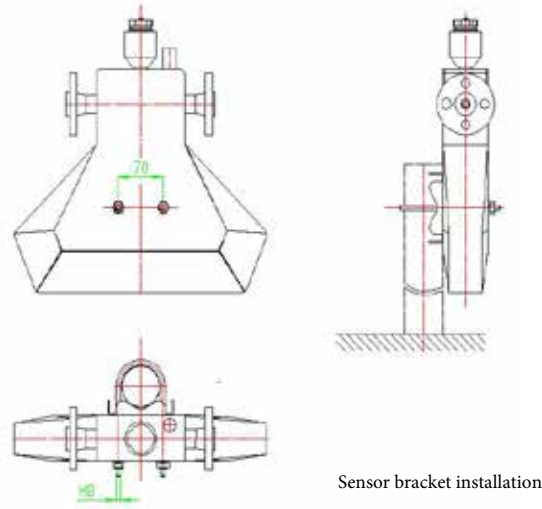
Basic requirements for the installation

- Flow direction should be in accordance with the arrow on the sensor
- Properly supporting is required for preventing tubes vibrating
- If a strong pipeline vibration is unavoidable, it is recommended to use a flexible tube to isolate the sensor from the pipe
- Flanges should be kept parallel and their centre points should be located on the same axis to avoid an additional force generation

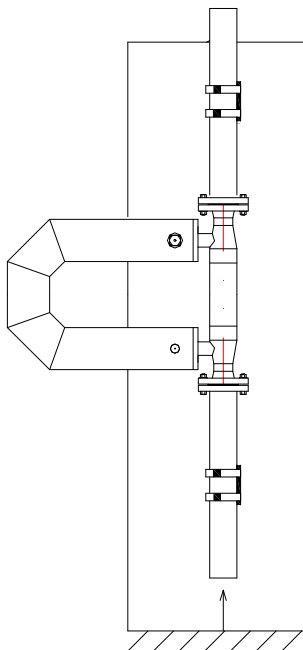
Coriolis mass flowmeter is a vibrating instrument. The measuring tubes are always in a state of vibration. Therefore, external or pipeline vibrations may have effect on the normal operation.

For small diameter Coriolis mass flowmeter, it is not easy to avoid vibrations because of the small measuring tube.

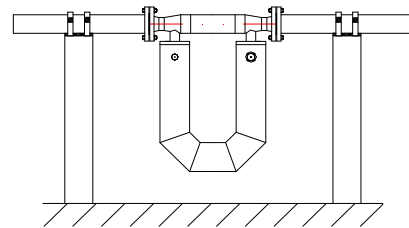
In this case, we provide installation brackets to fix the flowmeter.



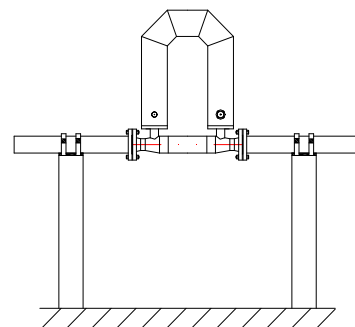
The meter should be installed sideward to avoid the accumulation of particulate matter in the measuring tube. The flow direction of medium goes from the bottom up through the sensor.



The meter should be installed downward, so that air cannot get trapped inside the tubes.



The meter should be installed upward, so that liquid cannot get trapped inside the tubes.



SELECTION GUIDE

The order code consists of the root of the product (S-MASS-HTCMF-) followed by the 10 positions based on the selected options.

S-MASS-HTCMF-				
1	SIZE		Flow range	Flow range (Kg/h)
	DN3	003		9.6...96
	DN6	006		54...540
	DN8	008		96...960
	DN10	010		150...1500
	DN15	015		300...3000
	DN20	020		600...6000
	DN25	025		960...9600
	DN32	032		1800...18000
	DN40	040		3000...30000
	DN50	050		4800...48000
	DN80	080		12000...120000
	DN100	100		19200...192000
DN150	150		36000...360000	
2	ACCURACY			
	0.2%	A2		
	0.1%	A1		
3	TEMPERATURE			
	-50...200 °C	2		
	Over 200 °C	X		
4	HEATING COIL			
	HIGH-VISCOSITY APPLICATION	HJ		

ATEX Ex ia certification pending.

5	NOMINAL PRESSURE	
	0...4,0 MPas	4
6	MATERIAL	
	Measuring tube SS316L Housing: SS304	SS
7	PROCESS CONNECTION	
	FLANGE DIN/ANSI	F
	TRI-CLAMP	CL
	THREAD	TH
8	POWER SUPPLY	
	24V DC±5%	DC
	220V AC ± 10%	AC
9	OUTPUT	
	Pulse output+4-20mA+RS485 (standard)	RS
	Pulse output+4-20mA+ Hart	HA
10	ELECTRIC CONNECTION	
	M 20 x 1,5	M
	24 Vdc	



We are a company with more than 50 years of experience in the field of industrial measurement and control instrumentation.

Specifically, we look at the internalization of some measuring systems that, due to shipping speed, performance, and low costs, can be offered in multiple industrial branches, from food to petrochemicals, from pharmaceuticals to energy production, from naval to water treatment.

Each process has specific requirements, which depend on the characteristics of the system, the environment, and the fluid to be treated.

SMERI International offers tailor-made instrumentation for liquids and gases, from the most common to the most critical ones.

We have the luck and the merit to benefit from a young and highly dynamic team of experts, who can recommend ad-hoc solutions for each application to optimize customers' processes in terms of economic efficiency and safety.

The motto is *Finding solutions together* and summarizes the spirit of SMERI: **a close collaboration with the customer and according to an ethical behavior of respect, fairness, and confidentiality.**

In the European market, SMERI is represented and distributed by companies well-known in the industrial world for their seriousness and experience.

SMERI s.r.l.

Via Mario Idiomi, 3/13

I - 20090 Assago (MI)

Tel. +39 02 539 8941

E-mail smeri@smeri.com

www.smeri-international.com

