



# Model SG Series

## Product Overview

- Dedicated on the technical creation, supply the professional solutions for industries of high pressure and cryo
- Wide measurement span
- Modulized signal converter
- Optimized hardware designs, best suitable for measurement in all fields
- Design with explosion-proof and ant-corrosive, applicable in different harsh work conditions, especially in the explosive environment
- Highly accurate, realize an effective industrial control

## Work Theory and Application

The SG serials of Coriolis Mass Flowmeter is developed based on the Coriolis theory, for the measurement of mass flow, density and temperature, etc, and is widely used in fields of petroleum and chemicals, natural gas, pipe line transportation, etc, to realize the custody transference and industrial process control. Our Coriolis mass flowmeter assure a quick and accurate work, is a good assistance for you to optimize the production, raise the safety and save the cost to the ultimate level.

## Technical Features

- Measure the mass flow inside the pipe lines, without the effect by factors like temperature and pressures, etc.
- High accuracy of measurement (Batch by 0.15 grade, at maximum at 0.05 grade), good repeatability
- Wide span, up to 50:1
- Measurement for mass flow, volume flow, density and temperature available
- A table and reliable performance.
- Well anti-corrosive, measurement for any corrosive fluids available.

## Coriolis Mass and Density Flowmeter

Model PN Code	Picture	Temperature of Application	Transmitter Model	Partial Application Industries			
				Oil and gas/ New energy	Automobile/ smelting	Paper/ Environment	Cryo
CNG CNG-15		Normal Temperature	F210 (F23X)	■	■	■	□
SG SG-20		Normal Temperature	F210 (F23X)	■	■	■	□
SG SG-06		Low/High temperature	F210 (F23X)	■	■	■	■
SG SG-15		Low/High temperature	F210 (F23X)	■	■	■	■
SG SG-25		Low/High temperature	F210 (F23X)	■	■	■	■
SG SG-40		Low/High temperature	F210 (F23X)	■	■	■	■
SG SG-50		Low/High temperature	F210 (F23X)	■	■	■	■
SG SG-80		Low/High temperature	F210 (F23X)	■	■	■	■
SG SG-100		Low/High temperature	F210 (F23X)	■	■	■	■

## Remarks:

1. In the table, "■" represent it is complying, "□" represents it is not complying, the same for as followings.  
 2. Product picture does not represent the product itself, I side the table, "()" represents the transmitter models configurable, the function for display on F231 transmitter is available for customized configurations, detailed products are subject to the real production.

## Technical Parameter

### a) Generals

Accuracy Rate	0.15, 0.2, 0.3, 0.5
Repeatability	0.075%, 0.1%, 0.15%, 0.25%
Density	$\pm 0.002\text{g/cm}^3$
Temperature	$\pm 1^\circ\text{C}$
Environmental Temperature	$-40^\circ\text{C}\sim+55^\circ\text{C}$
Relative Humidity	$\leq 95\%$
Mediums Measured	Gas, liquid
Materials for Enclosures	Sensor-304 stainless steel, transmitter-cast aluminum alloy (coating with epoxy polyurethane)
Materials for Measuring Tubes	316L

### b) Technical Parameter

Model	PN Code	Applicable Temperature	Medium Temperature	Work Pressure	Structure Type	Connection Mode (Customized Available)
CNG	CNG-15	Normal Temp	$-40^\circ\text{C}\sim+80^\circ\text{C}$	$\leq 25\text{ MPa}$	Separate type	M32*1.5 nuts
SG	SG -20	Normal Temp	$-40^\circ\text{C}\sim+80^\circ\text{C}$	$\leq 25\text{ MPa}$	Separate type	M42*2 nuts
SG	SG -06	Low/High temp	$-196^\circ\text{C}\sim+200^\circ\text{C}$	$\leq 4\text{ MPa}$	Separate type	flanges
SG	SG -15	Low/High temp	$-196^\circ\text{C}\sim+200^\circ\text{C}$	$\leq 4\text{ MPa}$	Separate type	M32*1.5 nuts
SG	SG -25	Low/High temp	$-196^\circ\text{C}\sim+200^\circ\text{C}$	$\leq 4\text{ MPa}$	Separate type	flanges
SG	SG -40	Low/High temp	$-196^\circ\text{C}\sim+200^\circ\text{C}$	$\leq 4\text{ MPa}$	Separate type	flanges
SG	SG -50	Low/High temp	$-196^\circ\text{C}\sim+200^\circ\text{C}$	$\leq 4\text{ MPa}$	Separate type	flanges
SG	SG -80	Low/High temp	$-196^\circ\text{C}\sim+200^\circ\text{C}$	$\leq 4\text{ MPa}$	Separate type	flanges
SG	SG -100	Low/High temp	$-196^\circ\text{C}\sim+200^\circ\text{C}$	$\leq 4\text{ MPa}$	Separate type	flanges



Remarks: If the pressure is more than the "work pressure", customization is available

## Transmitter and Sensor

### a) Generals

Power	85~265VAC / 12~24VDC ( $\pm 5\%$ )
Communication and Signal Output	RS485, HART, Circulating (4~20mA), Frequency (0Hz~10kHz)
Output Variables	Mass flow, volume flow, Mass accumulation, volume accumulation, temperature, density, standard flow, standard flow accumulation
Environmental Temp	$-40^\circ\text{C} \sim +55^\circ\text{C}$
Electrical Connection	Cable Plug of M20×1.5

### b) Technical Parameter

Model	Picture	Functions of Display		Signal of Output		
		With display	Without display	Modbus/RS-485	Pulse	4-20mA/HART
F210		■	□	■	■	□
F23X		■	■	■	■	■

## Size and Flow Range

Model	Calibre Size		PN Code	Max Flow Rate				
	inch	mm		kg/min	Lb/min	gal/min	kg/h	l/h
CNG	1/2	DN15	CNG-15	50	110	13	3000	3000
SG	1/4	DN06	SG -06	20	44	5	1200	1200
SG	1/2	DN15	SG -15	50	110	13	3000	3000
SG	3/4	DN20	SG -20	120	264	30	7200	7200
SG	1	DN25	SG -25	200	440	50	12000	12000
SG	1.5	DN40	SG -32	500	1100	130	30000	30000
SG	2	DN50	SG -50	1000	2200	260	60000	60000
SG	3	DN80	SG -80	2500	5500	652	150000	150000
SG	4	DN100	SG -100	4000	8800	1043	240000	240000

## Test Performance

Mass Flow Error	Inside span of 20:1	±0.15%
	Outside span of 20:1	±0.15%±[ (zero stability=instant flow)×100]%
Volume Flow Error	Inside span of 20:1	±0.15%
	Outside span of 20:1	±0.15%±[ (zero stability=instant flow)×100]%
Repeatability Error	Inside span of 20:1	±0.075%

## Zero Stability

Model	CNG-15	SG-06	SG-15	SG-20	SG-25	SG-40	SG-50	SG-80	SG-100
kg/h	0.10	0.05	0.10	0.30	0.63	1.7	5	8	15

Note: The Zero Stability is derived from test in lab, for the accuracy of sensor estimated. Under lab condition of zero flow, the average flow should be reached within the range that the stable value of zero ( $0 \pm \text{Zero Stability}$ ) defines. For each type and model of sensor, they have their only Zero Stability Value. In terms of statistics, 95% of the data points used should be reached within the range of the zero stability value defines.

## The typical Error, Span, Pressure Loss Configured with the Transmitter of SG-50

Span Ratio (from max flow rate)	20:1	15:1	10:1	1.5:1	1:1
Tolerance±%	0.14	0.10	0.10	0.10	0.10
Pressure Loss MPa	0.00	0.00	0.02	0.10	0.23

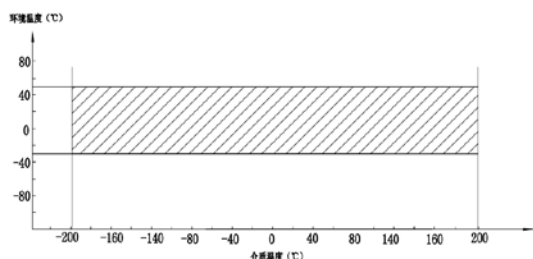
Notes: When the max flow is over the given flow span, the aboriginal noise of the pipe lines will affect the accuracy of the measurement.

## Parameter of Density (Liquid)

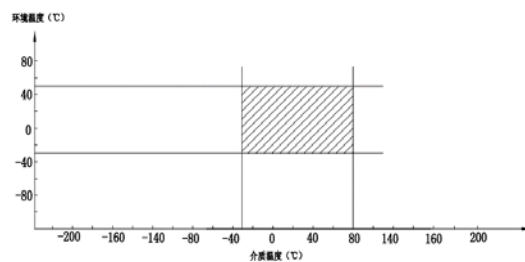
Unit	g/cm <sup>3</sup>	kg/m <sup>3</sup>
Tolerance	±0.002	±1
Repeatability	±0.0005	±0.5
Measured Span	0.2~3	200~3000

## Parameter of Temperature

Accuracy	For all models	±1°C
Temperature Limitation Range	For all models	As followings pictures



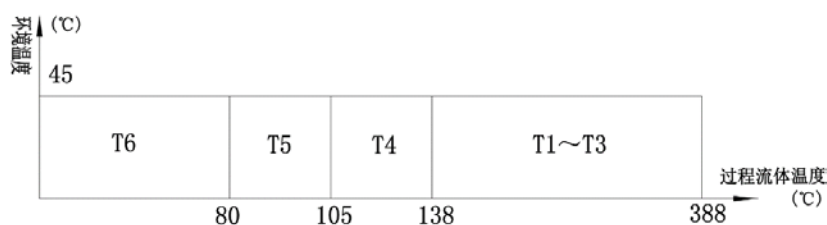
SG Flowmeter Temperature Range



CNG Flowmeter Temperature Range

Temperature Range of Medium	CNG Model	-30°C~+80°C
	SG Model	-196°C~+200°C
Temperature Range of Environment	Storage	-50°C~+65°C
	In Use	-40°C~+55°C

“T”temperature group means the highest nominal temperature for the sensor works at the environment of 45°C, as shown in the following picture.



Exd complies with GB 3836.1-2010, GB 3836.2-2010, GB 3836.4-2010, GB/T 4208-2010.

IP Grade complies with GB 4208-2008.

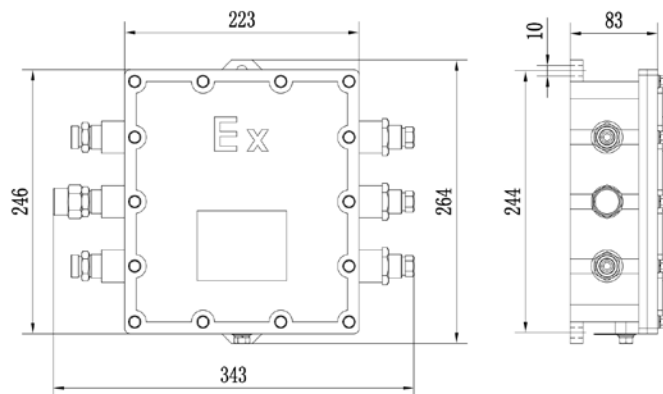
Application: Explosive and hazardous Zone 1, Zone 2, Equipment Category IIC, Compatible IIA, IIB, Temperature Group Category T1...T6 Gb

## Power and Consumption

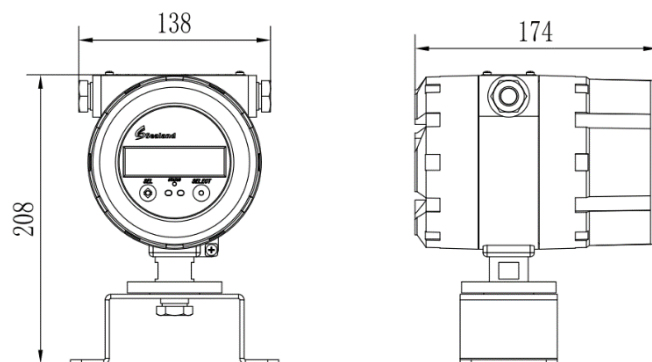
Voltage Input Range	85VAC~265VAC / 12VDC~24VDC (±5%)
Max Consumption	10W

## Installation Size

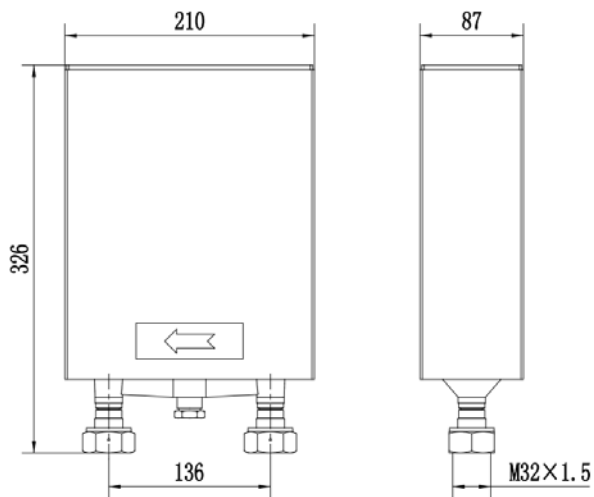
Size Unit: millimeter (mm) \* Tolerance: ±2mm



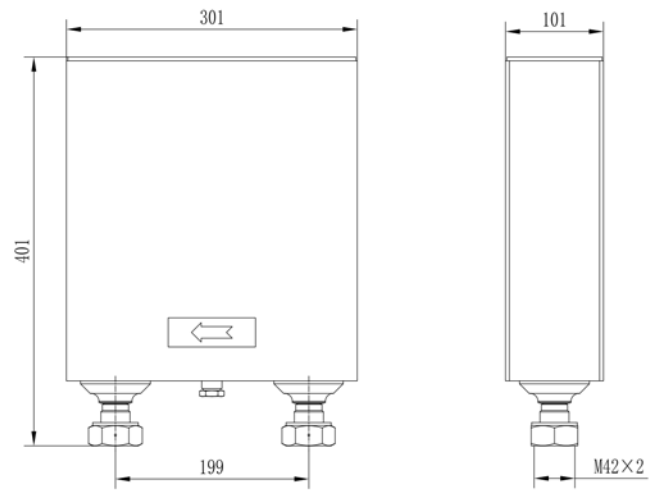
Drawing 1: Installation Size for Transmitter F210



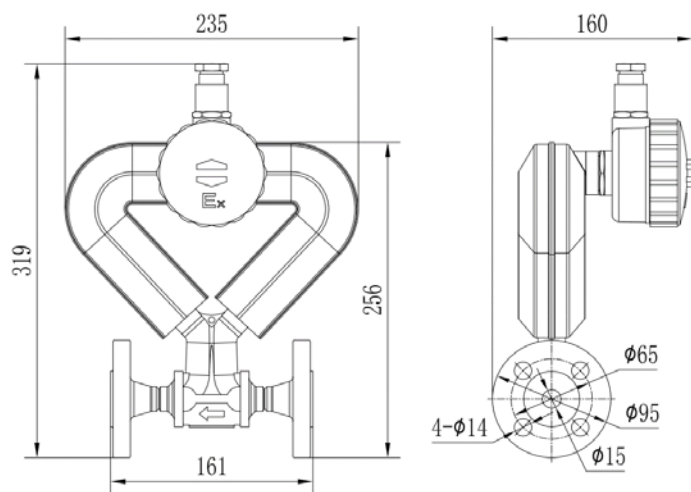
Drawing 2: Installation Size for Transmitter F23X



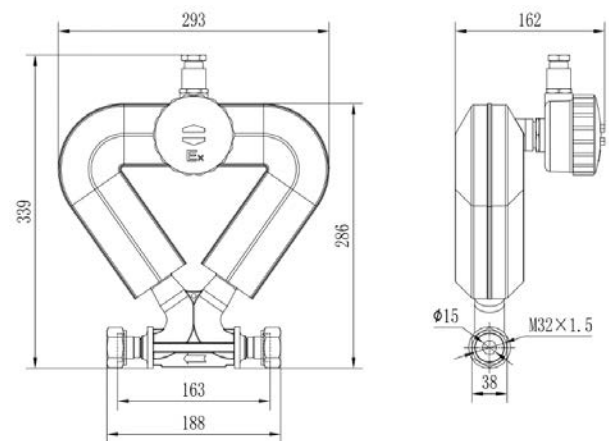
Drawing 3: Installation Size of CNG-15



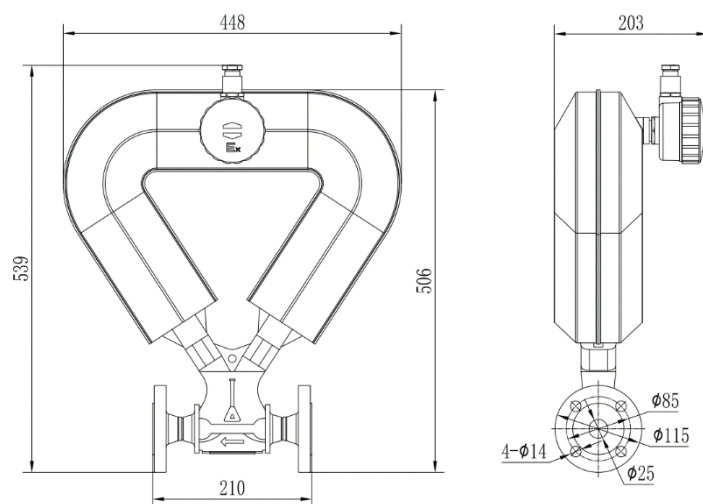
Drawing 4: Installation Size of SG-20



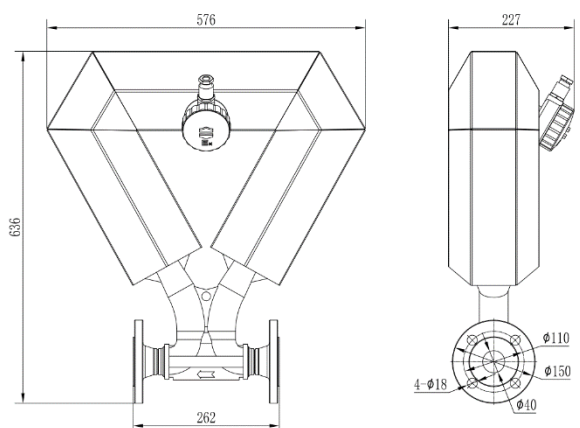
Drawing 5: Installation Size of SG-06



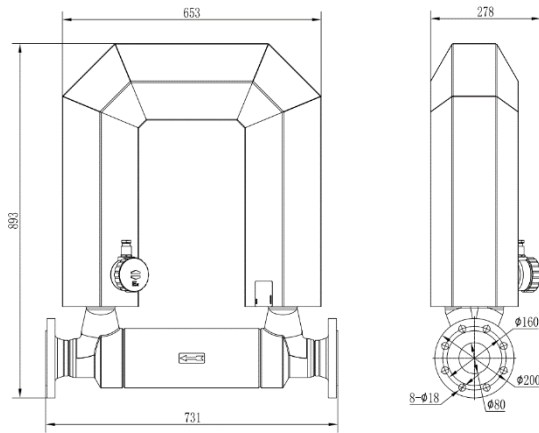
Drawing 6: Installation Size of SG-15



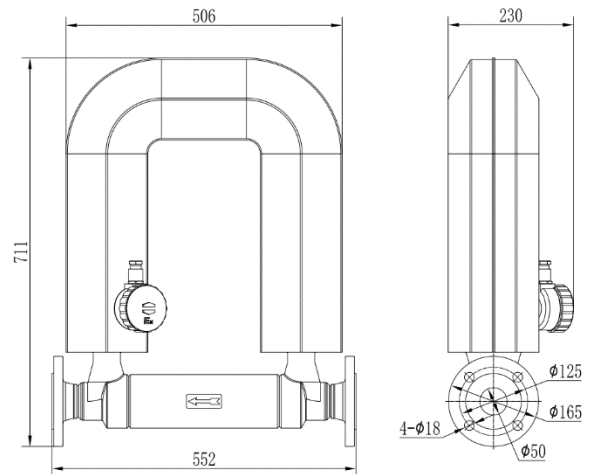
Drawing 7: Installation Size of SG-25



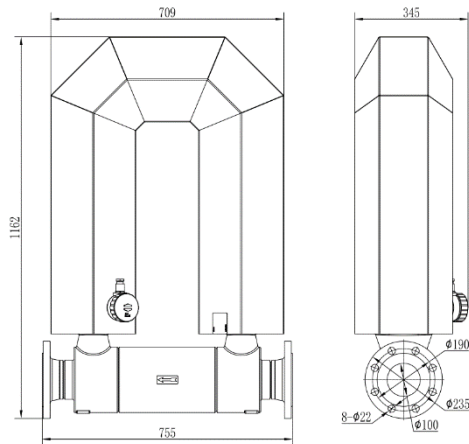
Drawing 8: Installation Size of SG-40



Drawing 9: Installation Size of SG-80 (U Type)

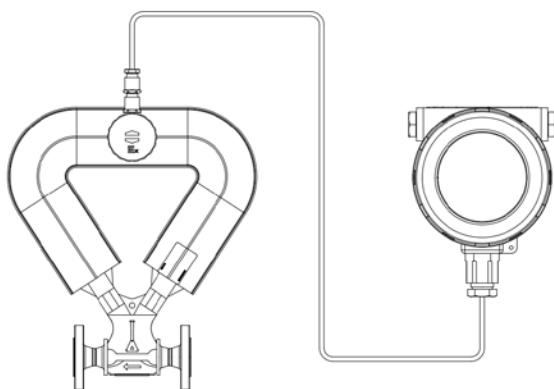


Drawing 10: Installation Size of SG-50 (U Type)

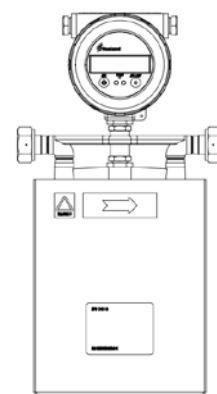


Drawing 11: Installation Size of SG-100 (U Type)

## Structure Type



Separate



Integral

## Installation Mode

**Attention!** When install horizontally or vertically, the direction of medium flow need to be the same as the direction arrow on the flowmeter body.

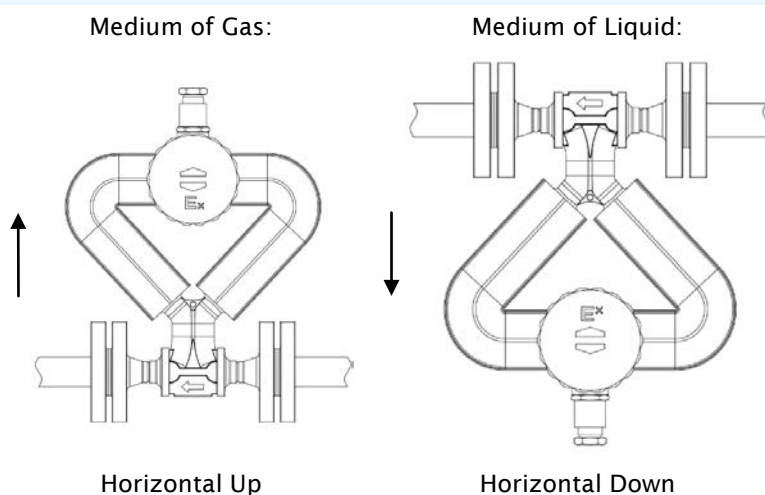
**Attention!** If the flowmeter need to be installed vertically, the flow direction should be from down to up.

**Attention!** Need to be installed on the stable rigid base boards/ flanges

**Attention!** The transmitter is available to revolve horizontally.

- If measure gas: horizontally upward / vertical, horizontally upward means the measurement tube (inside the enclosure)upward, do not be upside down.
- If measure liquid: horizontally downward /vertical, horizontally downward means the measurement tube (inside the enclosure)upward, do not be upside down.

Diagram for Horizontal Installation:



## Order Information

Parameter Code of Sensor		
Notes on Selection	Code	Notes on code
Product Serials	SG	Serials of Mass Flowmeter of High Accuracy
	CNG	Specially used Mass Flowmeter for CNG
Sensor Model	06	Bore DN06, Max flow: 20kg/min (water)
	10	Bore DN10, Max flow: 30kg/min (water)
	15	Bore DN15, Max flow: 50kg/min (water), 30 kg/min (CNG)
	20	Bore DN20, Max flow: 120kg/min (water), 70 kg/min (CNG)
	25	Bore DN25, Max flow: 200kg/min (water), 80 kg/min (LNG)
	40	Bore DN40, Max flow: 500kg/min (water)
	50	Bore DN50, Max flow: 1000kg/min (water)
	80	Bore DN80, Max flow: 3000kg/min (water)
	100	Bore DN100, Max flow: 4000kg/min (water)
Feature of the Sensor	L	316L
	T	Special customized production
Nominal Pressure	04	4MPa
	25	25MPa
	D	Special customized production
Accuracy Grade	1	0.15
	2	0.2
	3	0.3
	4	0.5
Connection Mode	C1	Screws
	C2	Flanges
	C3	Special customized production
Warm Keep Mode	0	No
	1	Steam Heat Tracing
	2	Electrical Heat Tracing
Accessories	0	No
	1	3m Cables
	2	Stainless flanges, nuts and bolts, 3m cables
	3	Special customized production

For Example: Order code for sensor

SG - 15 L 25 2 C1 1 1  
 i.e: Bore 15mm, material of measurement tube is 316L, the work pressure of High Pressure Mass Flowmeter is  $\leq 25\text{MPa}$ , Accuracy is 0.2, inner thread connection, connection size is G3/4 inch, warm keeping mode is steam heat tracing, accessories include 3m cables.

Parameter Code of Transmitter		
Notes on Selection	Code	Notes on code
Transmitter Model	F21	Hexa-way square meter, IP65, Ex d [ib] IIB/ IIC T1~T6 Gb (T6 temperature covers T1...T6)
	F23	Round shape meter, IP67, Ex d[ib] IIB/IIC T6...T1 Gb (T6 temperature covers T1...T6)
Display Mode	0	No display interface
	1	Chinese-English switch interface ( only for F23 serials)
Power Supply	A	85VAC~265VAC
	D	12VDC~24VDC (±5%)
Communication and Output	B	RS485
	N	Frequency (0Hz~10kHz), RS485
	I	Circulating (4~20mA), RS485
	H	HART, Circulating (4~20mA), frequency (0Hz~10kHz)
	T	Customized production
Electrical Connection	W	No
	M	M20*1.5
	T	Cable inlets approved by ATEX/IECEX
Physical Connection between sensor and transmitter	0	Separate Type
	1	Integral types, fix the holder of transmitter tight on the sensor (For F23 serials only)

For example: Order code of transmitter

F23                      1                      A                      I                      M                      0  
 I.e.: transmitter is F23 type, with display, input voltage is 85VAC~265VAC, communication and signal output is 4~20mA circulation, electrical connection.  
 The connection between sensor and transmitter is separate type.