

# **FlowMaster**

## **SIC Flowmeter**

---

# **PRODUCTS GUIDE**



Sichuan Instrument Complex Co.,LTD.  
Flowmeter Branch

**TIB**® SIC FLOWMETER

# FlowMaster



Least velocity of flow dpi **0.3** mm/s



# INTRODUCTION

Thank you for your close attention of our SIC flowmeter series products, we'll do our utmost to provide our products and supporting services, which is what we're trying to accomplish.

All products of Sichuan Instrument Complex Co., Ltd. Flowmeter Branch are based on professional technologies, standard manufacturing systems, analog setting equipments that reach 0.1 rating of accuracy and integrated flowmeter production line of Chongqing Sichuan Instrument Complex Co., Ltd., we can support customers with overall services such as selecting inquiries, product supplies, maintenances, technical supports, user trainings, and so on.

Here we highly recommend our FlowMaster series, each of their performances reaches world advanced standard, more superior in their stabilization, responding speed, self-compatibility and self-diagnostics.

In order to make it easy for customers in selecting our recommended series products, this products guide supplies design materials of the related products, and we wish these references will be helpful when you select the diameter, the lining material, the matching flange, the installation area, the wire connection, etc. If there is anything unclear in the materials supplied, please contact us immediately, and we'll provide help and supports according to your specific requirements. Thanks again for your attentions and supports, waiting for your inquiries.



# TABLE OF CONTENTS

<b>Chapter one: Introduction</b>	01
I . Measuring principal of the electromagnetic flowmeter	01
II . Features of the electromagnetic flowmeter	01
III. Selecting requirements of the electromagnetic flowmeter	02
IV. Ordering information	02
<b>Chapter two: The FlowMaster</b>	03
I .FlowMaster sensor	03
1.Features of the FlowMaster	03
2.Technical parameters	03
3.Sensor specification	05
4.Dimensions	05
II .FlowMaster transmitter	06
1.Transmitter features and its application range	06
2.Transmitter technical performance	06
3.Transmitter specification	08
4.Dimensions	09
<b>Chapter three: Additional Information Related to Flowmeter Selection</b>	10
I .Selecting the flowmeter diameter	10
II .Selecting the flange	10
III. Selecting the lining	11
IV.Selecting the electrode	12
V . Selecting the cable	12
VI. Working environments	13
VII. Cable glands	13
VIII. Selecting the transmitter function	13

CIS



## CHAPTER ONE:INTRODUCTION

### I .Measuring principal of the electromagnetic flowmeter

The measuring principal below is based on Faraday electromagnetic induction rule, that is, when traveling vertically in the electric-liquid magnetic fields, the conductor generates inductive voltage, whose value is calculated through such formula as:

$$U=KB\bar{V}D$$

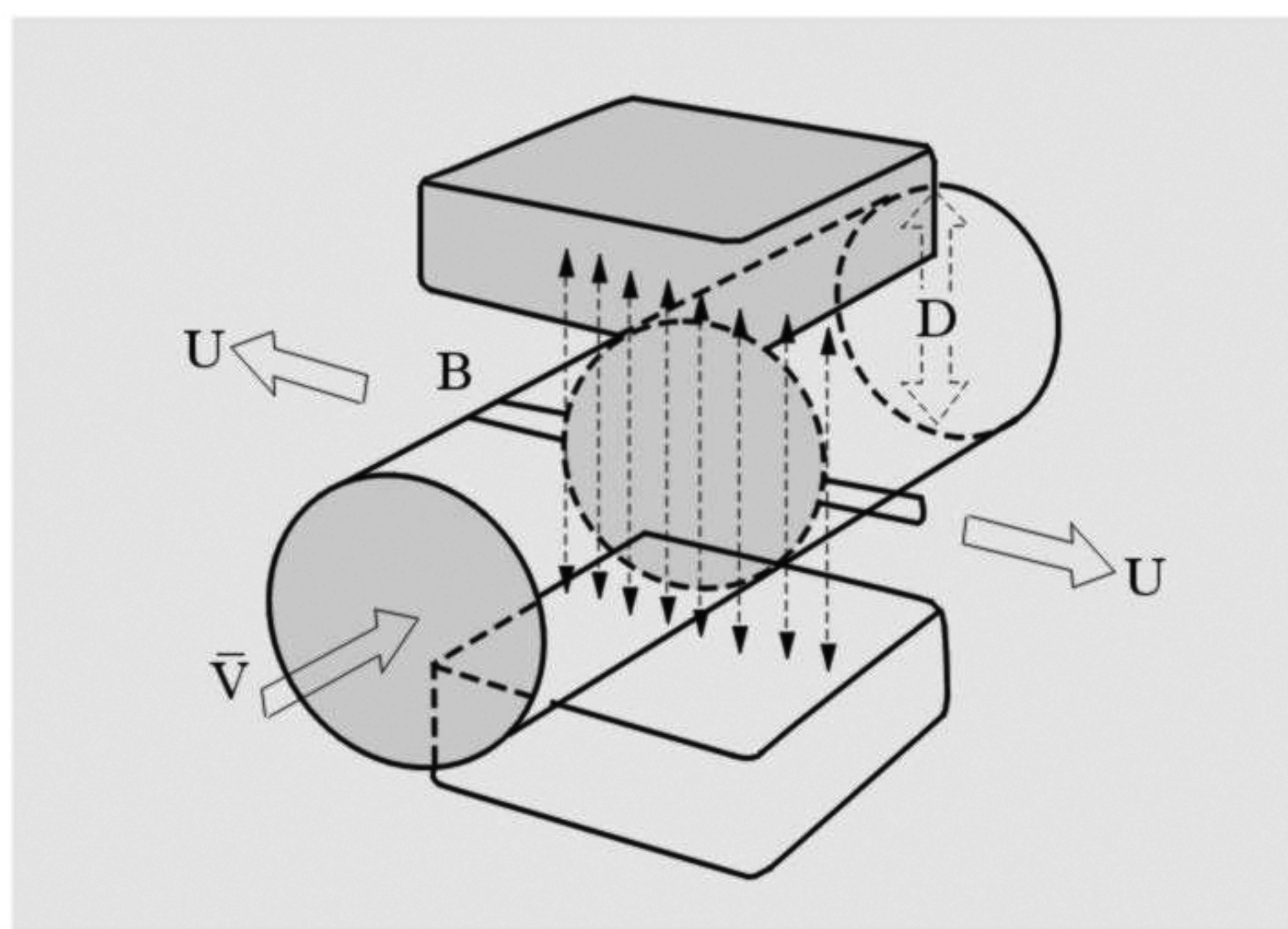
K=instrument invariable

B=magnetic induction intensity

V=average flow velocity across the section of the measuring pipe

D=inner diameter of the measuring pipe

When measuring the flow value, the liquid is flowing through the magnetic field vertical to the flowing direction, and the flowing electric liquid generates a voltage directly proportional to the average flow velocity (also called volume velocity), therefore the measured flowing liquid is demanded to have a minimum conductivity. The inductive voltage signal is conveyed through two electrodes directly contacting the flow liquid and is sent to the cable by the amplifier, and then exchange to an integrated output signal.



### II .Features of the electromagnetic flowmeter

- 1.As there are no blocking flow and active parts in the measuring pipe, no additional energy will be caused lost and no blocks will be formed. It's very effective in energy-saving, especially applied well in the two-phased flow measuring such as the wastewater, the slop, the mineral slurry, water-coal slurry, the paper slurry, etc.
- 2.As only the lining and the electrode contact the measuring medium, if their materials are properly chosen, good erosion-resistance and abrasion-resistance will be achieved. So the flowmeter can be used to measure various chemical liquids such as thick acid, alkali, and so on.



3. Mount quite easy, there needs 5D for the front straight pipe and 2D for the back straight pipe.
4. High measuring accuracy. The FlowMaster series have an accuracy of  $\pm 0.2\%$ , capable of measuring forward and reverse flow rates, which provides a good tool for accurate measuring of the flow.
5. Operable flow range: 1500:1, so the flowmeter can generally track the flow and can accurately measure the minor flow. Setting ranges of the full-scale flow velocity are very wide, you can extend or reduce the measuring ranges after calculation according to the practical requirements on the spot, re-setting is not necessary and the accuracy still remains high.
6. Consists of low frequency rectangular electromagnetic wave, not violated from the working frequency and all other electromagnetic fields, stable in performance.
7. Only consumes a very little power ( $<20\text{VA}$ ).
8. The sensor and the transmitter are exchangeable with each other, not necessary to re-set the practical flow value and it can meet the requirements of the accuracy.

As the electromagnetic flowmeter has the advantages of all the above, it became more and more popular in various industries, being the No.1 instrument in measuring flow of the liquid.

### III. Selecting requirements of the electromagnetic flowmeter

1. The subject being electric liquid or liquid and solid medium, and the conductance not lower than  $5\ \mu\text{S/cm}$  which equal to the soft water (conductance of the general tap water and the natural water is about  $100\text{--}500\ \mu\text{S/cm}$ ). Therefore, the acid, soda and salt liquid, the paper slurry, the slop, the mineral slurry, etc can all adapt electromagnetic flowmeter for measurement. Note that this product cannot measure non-electric medium such as the pure alcohol, the pure acetone, the petroleum and any other fatty substances.
2. The subject can't contain too many Fe-magnetic substances and too many bubbles.  
The mediums which meet the conditions can select the electromagnetic flowmeter for measuring purposes according to their parameters such as erosion capabilities, flow values, abrasion capabilities, working pressures, and so on.

### IV. Ordering information

Please read this sample guide to learn the product type and code regulations before you put an order of our products, and then confirm the specification you need. Attach information below if necessary:

1. Asking for the original setting parameters of the product not leaving our production factory.
2. Whether require providing the matching flanges for installation.
3. Whether require submersible requirement.
4. Other special requirements.

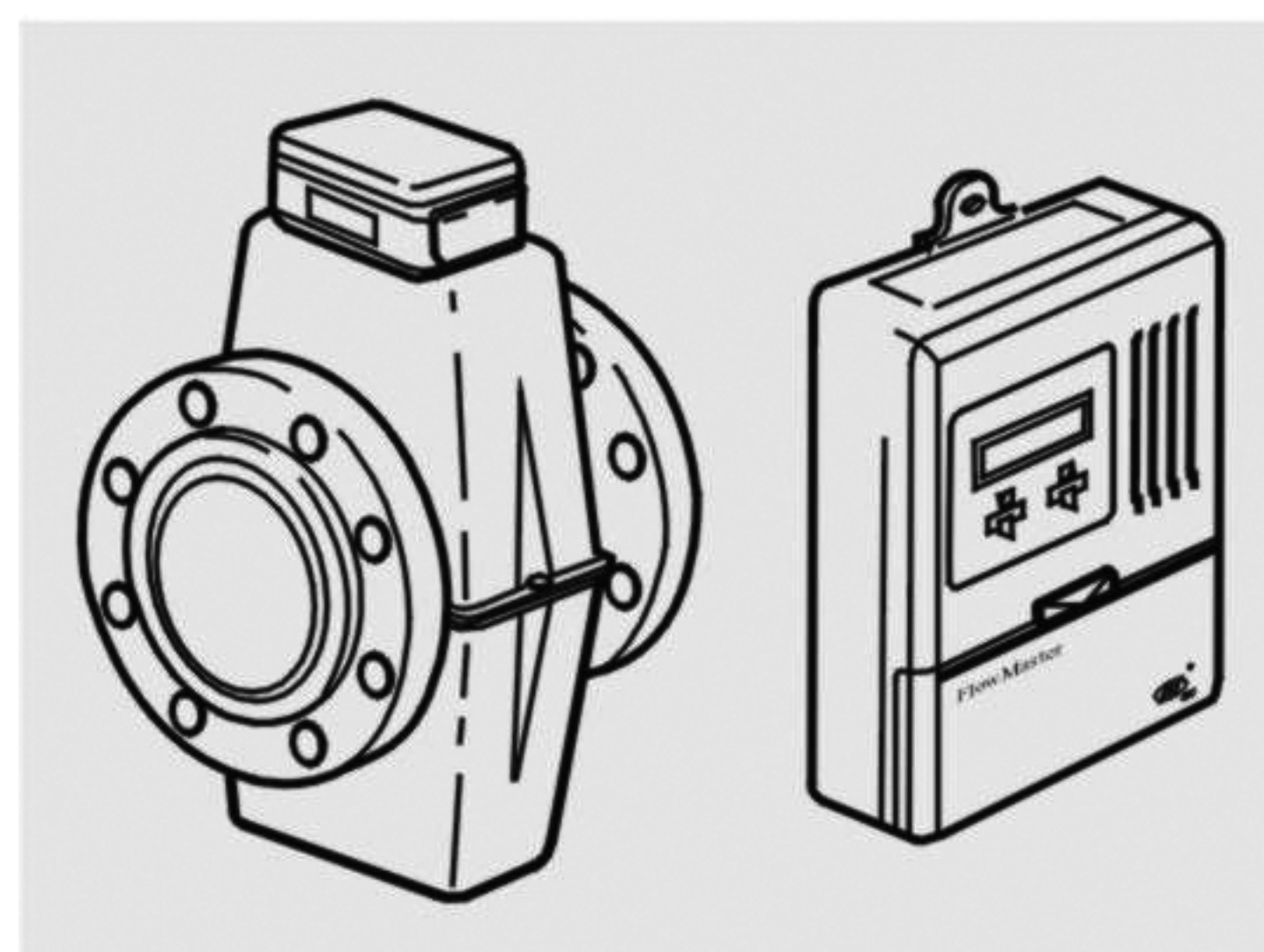


## CHAPTER TWO: THE FLOWMASTER

Capabilities of FlowMaster can meet world-class standards, especially more superior in its stabilities, responding speeds, self-adaptabilities and self-diagnostics.

The special design methods of the FlowMaster can satisfy customers with personal design requirements.

The in-built earthing (grounding) electrode less than DN500 can validly enlarge the capability against violation. The impedance that the sensor inputs can meet up to  $10^{15} \Omega$ , effectively reducing the electrode pollution.



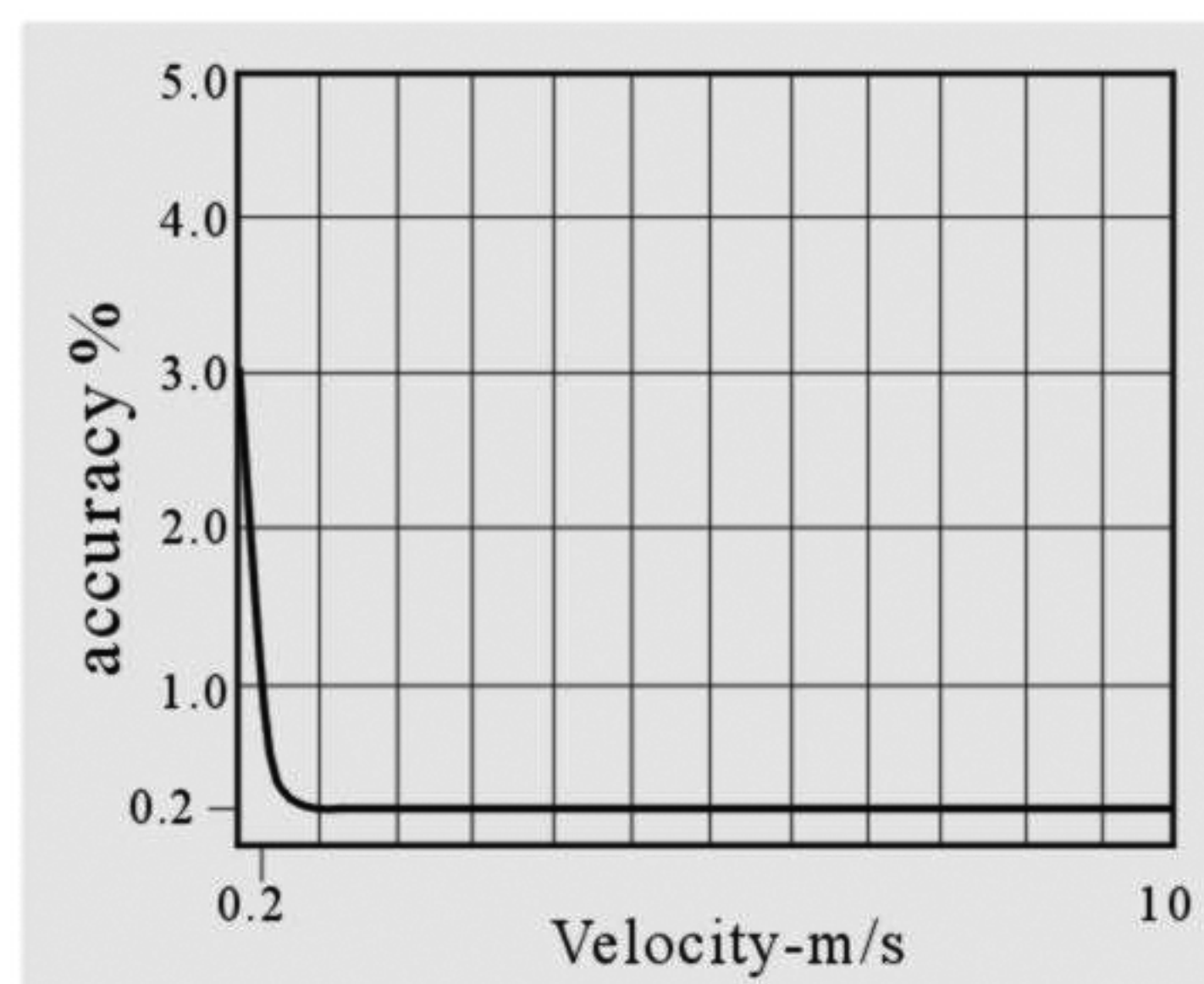
### 1. FlowMaster sensor

#### 1. Features of the FlowMaster :

- ▲ Submersible and buriable
- ▲ Eliminates chambers and promotes very low installation costs
- ▲ Three internal totalizers: forward, reverse, net; forward and reverse flowrates and comprehensive range of outputs: current, pulse, data and HART, ensuring compatibility with user's control system requirements.
- ▲ The standard cover can meet customers with different display requirements
- ▲ Two-way measurement (forward/reverse)
- ▲ In-Built earthing (grounding) electrode eliminates requirement for earthing (grounding) flanges.
- ▲ Liquid sensing
- ▲ Comprehensive test mode, matched with measuring software
- ▲ Universal switch mode power supply, available for usual power supply (AC95-265V/50Hz)
- ▲ Self-diagnostics
- ▲ Programmable multiple alarm capability

#### 2. Technical parameters

- ▲ Medium conductance:  $\geq 5 \mu / \text{cm}$
- ▲ Transmitter/Sensor
  - Separation type: DN15~DN1600
  - Integral type: DN15~DN400
- ▲ Accuracy:  $\pm 0.2\%$  or  $\pm 0.5\%$  (under forward flow reference conditions, please see the right diagram.)
- ▲ Analog outputs: Deviation  $< \pm 0.02 \text{mA}$





- ▲Temperature effect: Transmitter:  $< \pm 0.1\%10^{\circ}\text{C}$  Analog output:  $< \pm 0.1\%10^{\circ}\text{C}$  Sensor:  $< \pm 0.03\%10^{\circ}\text{C}$
- ▲Repeatability and Reproductivity:  $< \pm 0.05\%$  or  $< \pm 0.25\%$ , whichever is the greater.
- ▲Operable flow range: 1500:1, flowrate  $< 15\text{m/s}$
- ▲Installation environment (sensor)
  - Protection rating: IP68/NEMAL 6P(10meters, please attach a remark when ordering.)
  - Buriable:  $(\leq 600\text{mm}) \leq 5\text{m}$
- ▲Electrode: 316 stainless steel, Hastelloy, Ti, Ta, Pt-Ir alloy.
- ▲Lining: PTFE, PFA, Neoprene, Elastomer, Polyurethane
- ▲Medium temperature: Separation type:  $-10^{\circ}\text{C} \sim 140^{\circ}\text{C}$  Integral type:  $-10^{\circ}\text{C} \sim 80^{\circ}\text{C}$
- ▲Environment temperature:  $-25^{\circ}\text{C} \sim 70^{\circ}\text{C}$
- ▲Dimension and flow range: see diagram 2-1
- ▲Medium pressure:
  - DN15~DN50      PN $\leq 4.0$
  - DN50~DN600    PN $\leq 1.6\text{MPa}$
  - DN600~DN1600 PN $\leq 0.6\text{MPa}$
- ▲Flange: conform to China GB9119 standard, Carbon steel
- ▲Grounding electrode: DN15~DN200(not incl. DN200)
- ▲Electric connector: 20mm plastic sealing sleeve
- ▲Sensor Cable: Supplied by SIC, 5 times as large as the conductance in maximum length, not to exceed 100m

Diagram 2-1

Code	Size		Flow range	
	(mm)	(in)	Minimum ( $\text{m}^3/\text{h}$ )	Maximum ( $\text{m}^3/\text{h}$ )
030	3	0.12	0.0127	0.254
060	6	0.24	0.0509	1.02
080	8	0.31	0.0905	1.809
090	9	0.35	0.115	2.29
100	10	0.39	0.141	2.827
120	12	0.4	0.204	4.07
150	15	0.5	0.005	6
200	20	0.75	0.008	11
250	25	1	0.014	17
320	32	1.3	0.022	29
400	40	1.5	0.035	45
500	50	2	0.053	71
650	65	2.5	0.089	119
800	80	3	0.136	181
101	100	4	0.212	283
121	125	4.9	0.331	442
151	150	6	0.477	640
201	200	8	0.848	1130

Code	Size		Flow range	
	(mm)	(in)	Minimum ( $\text{m}^3/\text{h}$ )	Maximum ( $\text{m}^3/\text{h}$ )
251	250	10	1.32	1770
301	300	12	1.91	2540
351	350	14	2.6	3460
401	400	16	3.39	4520
451	450	18	4.29	5730
501	500	20	5.3	7070
601	600	24	7.63	10180
701	700	27	10.4	13850
751	750	30	11.9	15900
801	800	31	13.6	18100
901	900	36	16.6	22900
102	1000	39	21.2	28300
112	1050	41	25.7	34200
122	1200	48	30.5	40700
142	1400	54	41.6	55400
152	1500	58	47.7	63600
162	1600	66	54.3	72400

※Based on  $10\text{ms}^{-1}$ (33 $\text{fts}^{-1}$ ), but instrument capability in excess of  $15\text{ms}^{-1}$ (50 $\text{fts}^{-1}$ )



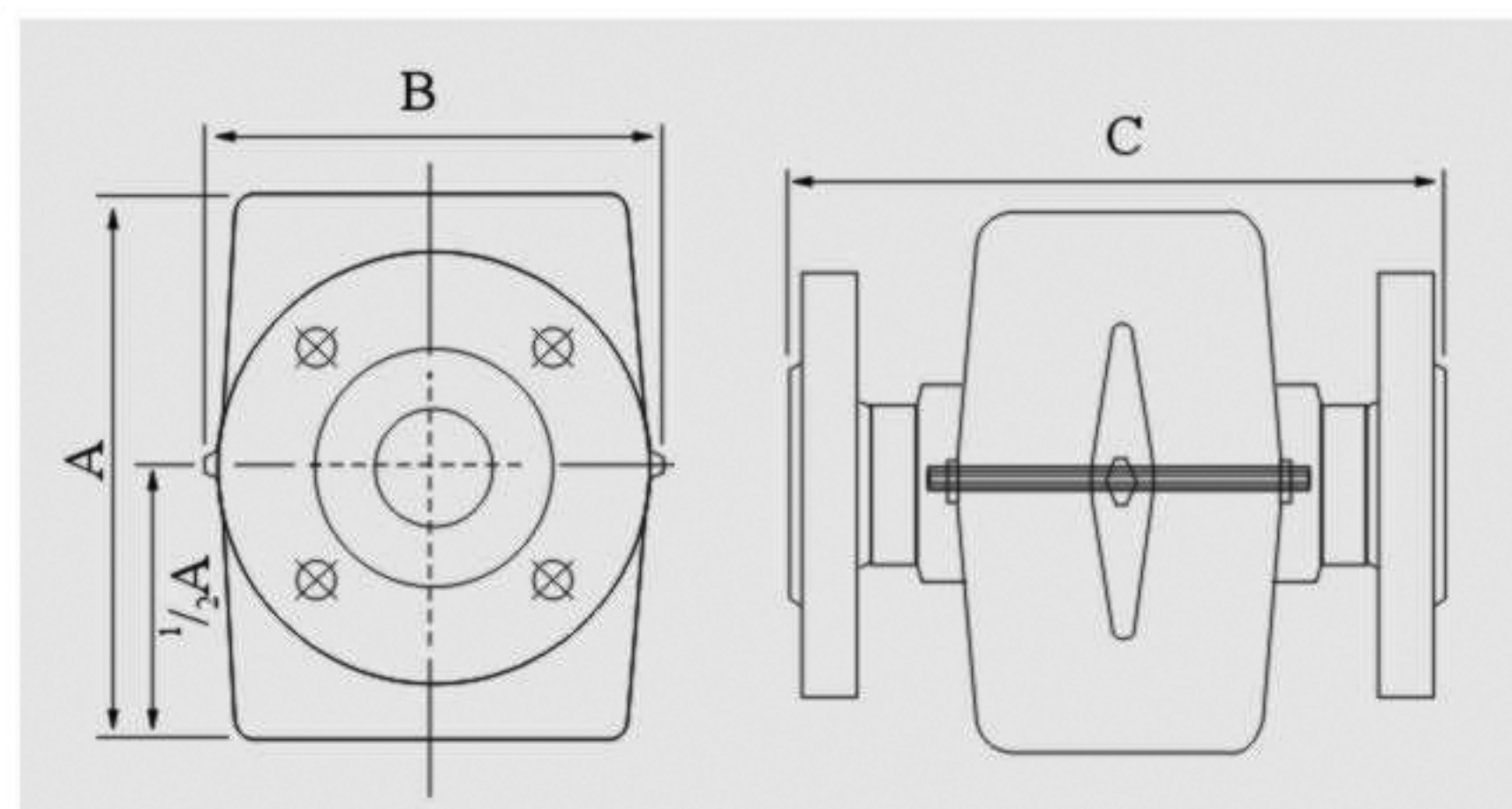
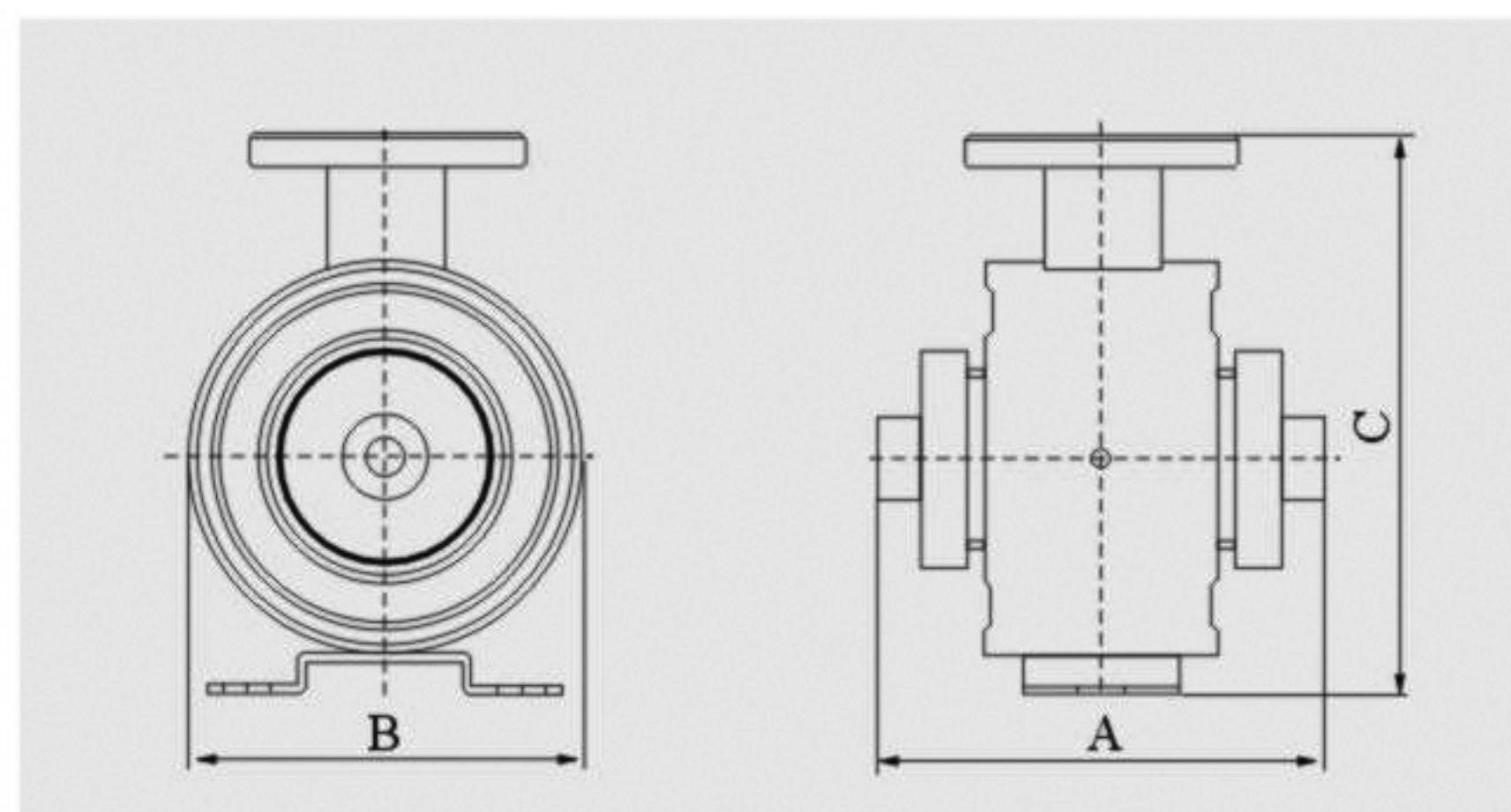
### 3. Sensor Specification

MFC	XXX	X	X	X	X	0	X	XX	X
Main Title	Diameter DN3-DN1600 Represented with 3-digit figure, the former 2 represents 1st and 2nd figure of the Diameter, the 3rd digit represents the quantity of zeros after the former 2 digit figure. Unit: mm For the sizes please see diagram 2-1	Standard Pressure (flanges)  1:1.6MPa DN3~DN600 2:4MPa DN3~DN250 5:1.0MPa DN3~DN600 6:0.6MPa DN700~DN1600 S:Special	Lining material  4: Elastomer DN3~DN1600 6:Polyurethane DN25~DN600 7:Teflon PFA DN3~DN600 8: Neoprene DN3~DN1600 A: Unbonded PTFE DN200~DN400	Electrode material  1: stainless steel below 316 only supplies to flange type 2: Hastelloy C 3: Ti DN3~DN600 4:Ta DN3~DN600 5:pt-Ir alloy	Working environment See diagram below		Setting the analog  A: Standard 3 point test without pressure	Cable  Adds every 10m, maximum 90m	Gland sealing  5:20mm plastic sealing (user to fit cable or integral type)
					Code	Working environment	Environment temperature	Medium temperature	
					1	Normal area	≤60℃	≤80℃	
					4	Normal area	≤60℃	≤140℃	

### 4. Dimensions

Size:3 to 150mm(0.12 to 6 in)

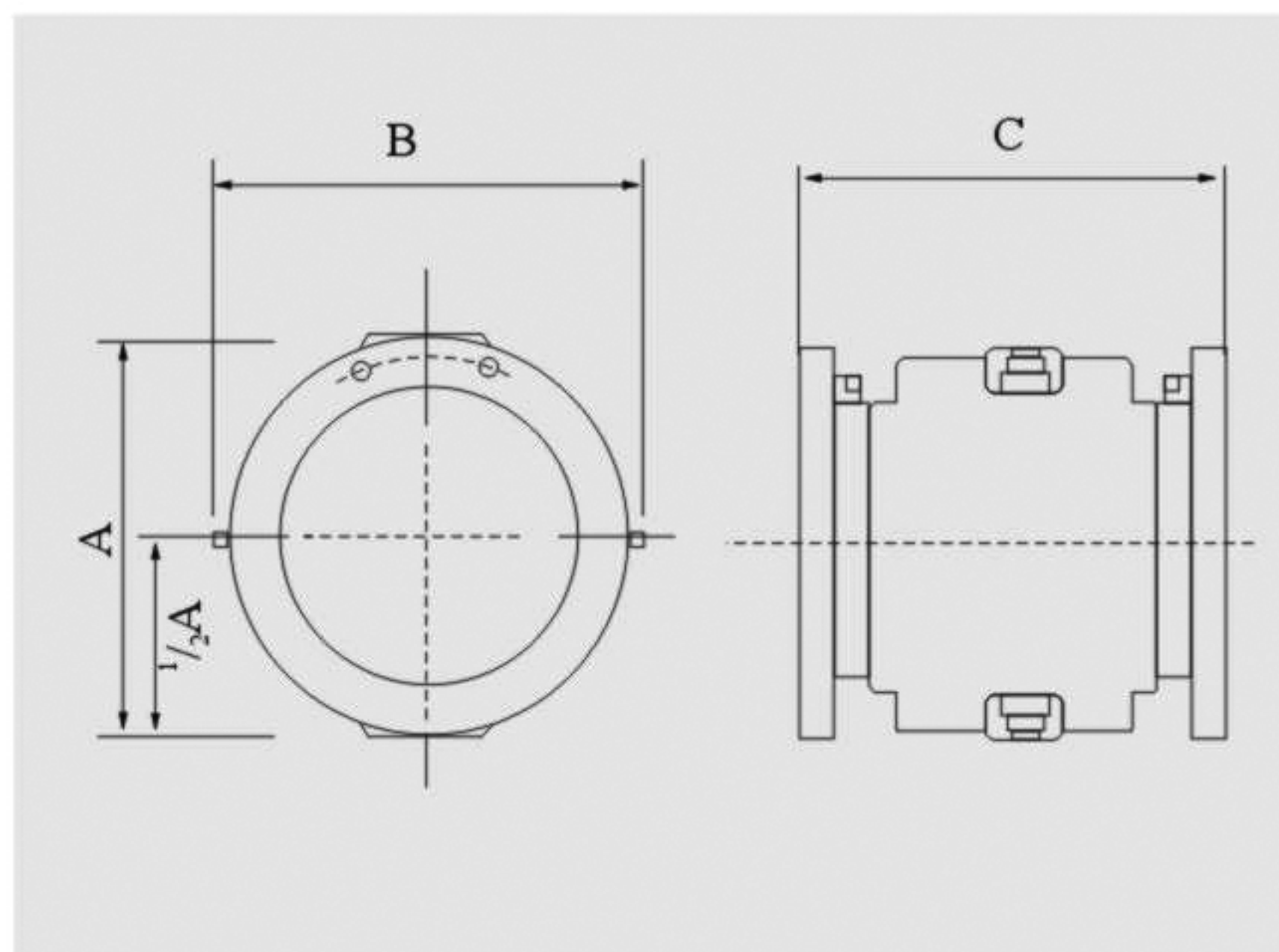
Meter Size		Dimension						Approx Weight (kg)
		A		B		C		
(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	
3	0.12	114	4.4	99	3.9	135	5.3	2
6	0.24	114	4.4	99	3.9	135	5.3	2
8	0.31	114	4.4	99	3.9	135	5.3	2
9	0.5	114	4.4	99	3.9	135	5.3	2
10	0.39	114	4.4	99	3.9	135	5.3	2
12	0.4	114	4.4	99	3.9	135	5.3	2
15	0.5	174	6.8	140	5.5	200	7.9	7
20	0.8	174	6.8	140	5.5	200	7.9	7
25	1	210	8.3	176	6.9	200	7.9	7
32	1.3	210	8.3	176	6.9	200	7.9	8
40	1.5	210	8.3	176	6.9	200	7.9	9
50	2	210	8.3	176	6.9	200	7.9	10
65	2.5	280	11.0	219	8.6	200	7.9	18
80	3	280	11.0	219	8.6	200	7.9	18
100	4	312	12.3	230.5	9.8	250	9.8	24
125	4.9	312	12.3	230.5	9.8	250	9.8	28
150	6	370	14.6	281	11.8	300	11.8	38





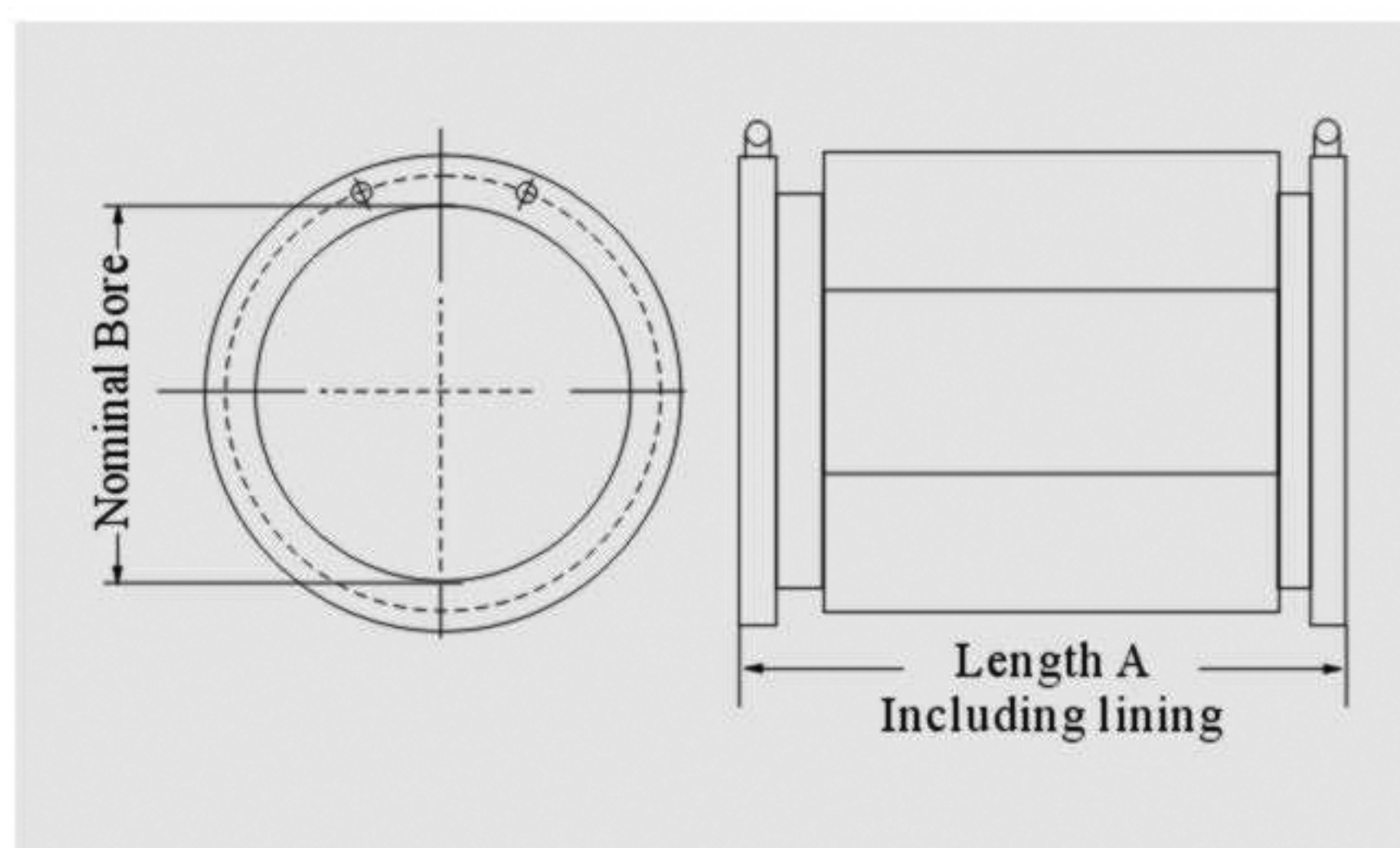
Size: 200 to 600mm(8 to 24in)

Meter Size		Dimension						Approx Weight (kg)
		A		B		C		
(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	
200	8	396	15.6	402	15.8	350	13.8	53
250	10	430	16.9	440	17.3	450	17.7	60
300	12	461	18.1	480	18.9	500	19.7	70
350	14	513	20.2	520	20.5	550	21.7	100
400	16	570	22.4	576	22.7	600	23.6	115
450	18	632	24.9	627	24.7	600	27.6	160
500	20	686	27.0	679	26.7	600	30.2	217
600	24	772	30.4	770	30.3	600	36.1	315



Size: 700 to 1600mm(27 to 78 in)

Meter Size		Length		Approx Weight (kg)
(mm)	(in)	(mm)	(in)	
700	27	700	27	430
800	31	800	31	430
900	36	900	36	540
1000	39	1000	39	720
1200	48	1200	48	1000
1400	54	1400	54	1450
1600	66	1600	66	2000



## II. FlowMaster transmitter

### 1. Transmitter features and its application range

For general flow measurements, FlowMaster that uses high-tech and microprocessor is a supreme product among the flow measurement instruments for the users. It's high in reference with its performance and has most competitive price advantage.

### 2. Transmitter technical performance

#### ▲Display (optional)

32-character high temperature super twisted LCD, displays flow value, total value, alarm terms in letters and digits, using magnetic switch to enable the rolling and return to original condition

#### ▲Internal totalizer

Enables 15-digit totalisation for forward flow total value, reverse flow total value and net flow total value.

#### ▲Programming

Supply data before users put an order, as the internal transmitter programs have already been set before leaving our factory. Local hand-held terminals can be used to easily enable the reprogramming of the transmitter if necessary, not effecting the technical performance of the transmitter. Optional units can be selected to flexibly execute programming of the transmitter. Samples as using different units to display flow value and flow total value.

Programming options:

Local hand-held configurator    Integral keypad    HART communication    RS485 communication



▲Power Supply A.C 25~265V, D.C 11~40V 47~440Hz, Maximum power 20 VA

▲Output

A. Analog outputs

For the zero scale, the full scale actively programmable, maximum output 21mA, flow direction optional, outputs completely separated; Output capacity greater than 15V, loaded resistance 750Ω.

B. Dual-analog outputs (optional)

The same with A, but the forward flow and reverse flow both have a separate output.

C. And D. Dual-pulse

Forward and reverse flow, 0~1000Hz square wave and fixed width pulse signal; Parameters such as pulse repeat frequency, cut-off frequency and pulse width, etc. are safely programmable. Frequency ranges can be set between 1Hz and 1000Hz, 1Hz for 1 rating; When the insulating-protected output transistor switch is electrified, the current should below 150mA, contact voltage below 35V.

E. And F. Double-Alarm

When the insulating-protected output transistor switch is electrified, the current should below 150mA, so as to generate 0V; contact voltage below 35V. (Note: not insulated from frequency output)

All parameters below programmable:

High/low flow, fluid measurement; error condition; forward/reverse flow; polarity (always on/always off); simulation value within the limited measuring ranges; pulse (frequency within the limited measuring ranges); pulse cut-off frequency;

G.RS232C data inserting hole(plug)/9-pin D type inserting hole(plug) connecting to the hand-held configurator

H.RS485S clustered communication connector, with matched data connection.

▲Input

CLS of insulated juncture totalizer (not insulated from pulse and alarm)

▲Between simulation value and pulse/alarm signal and earth, D.C 500V for the insulated voltage

▲Environmental temperature

Working temperature: -20℃ ~+70℃      Storage temperature: -25℃ ~+85℃

▲External environmental protection

Ip65/NEMA 4X separate terminal box and electric part;      Ip65/NEMA 4X already insulated

▲Configuration

Configuration is registered in a register difficult to loose data (usually 10 years for remaining); pre-set value users set changeable.

▲Self-diagnostics

The transmitter can configure whether the hardware is working well and can execute error analog such as wire driving error.

▲Flowrate setting

Almost equal to the flow measurement range of maximum velocity( $\leq 15\text{m/s}$ ), this range can be changed.

▲Interchangeability

Transmitter completely changeable with various diameter FlowMaster sensor, configurable in the working field; Transmitter exchange not effecting system performance.

▲Gland sealing

20mm plastic gland or Cu sealing pressure gland, or 0.5in NPT

▲Time invariable 1~120 seconds all programmable

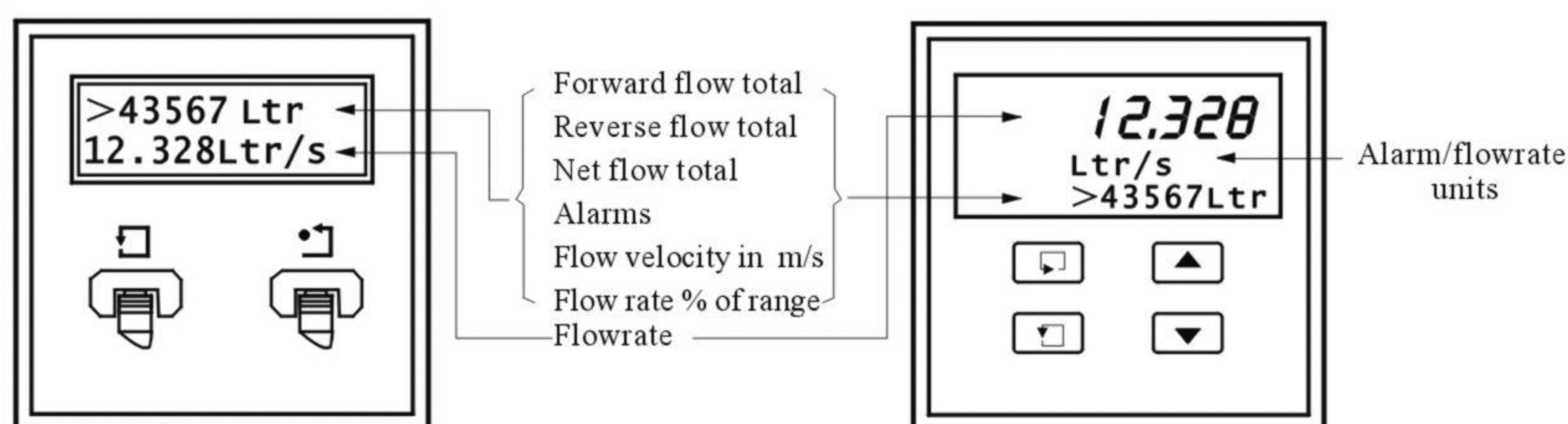
Display direction of integral type: when selecting integral type flowmeter, the pipe position makes the display direction of the transmitter not easy to watch, in this case, you can select display direction to suit (linear or vertical).



### ▲ Functions

Fully configurable	A choice of engineering parameters in engineering units, e.g. flowrate, flowunits, all outputs, etc.
Liquid sensing	Ensures units read zero on empty pipe.
Interchangeability	Transmitter/sensor can be changed without affecting performance
Self-diagnostics	Ensures transmitter and sensor integrity.
Test mode	Powerful commissioning aid. Exercises all outputs and displays, even without a connected sensor.

### ▲ Three display modes optional (see below): none, two line display, three line display

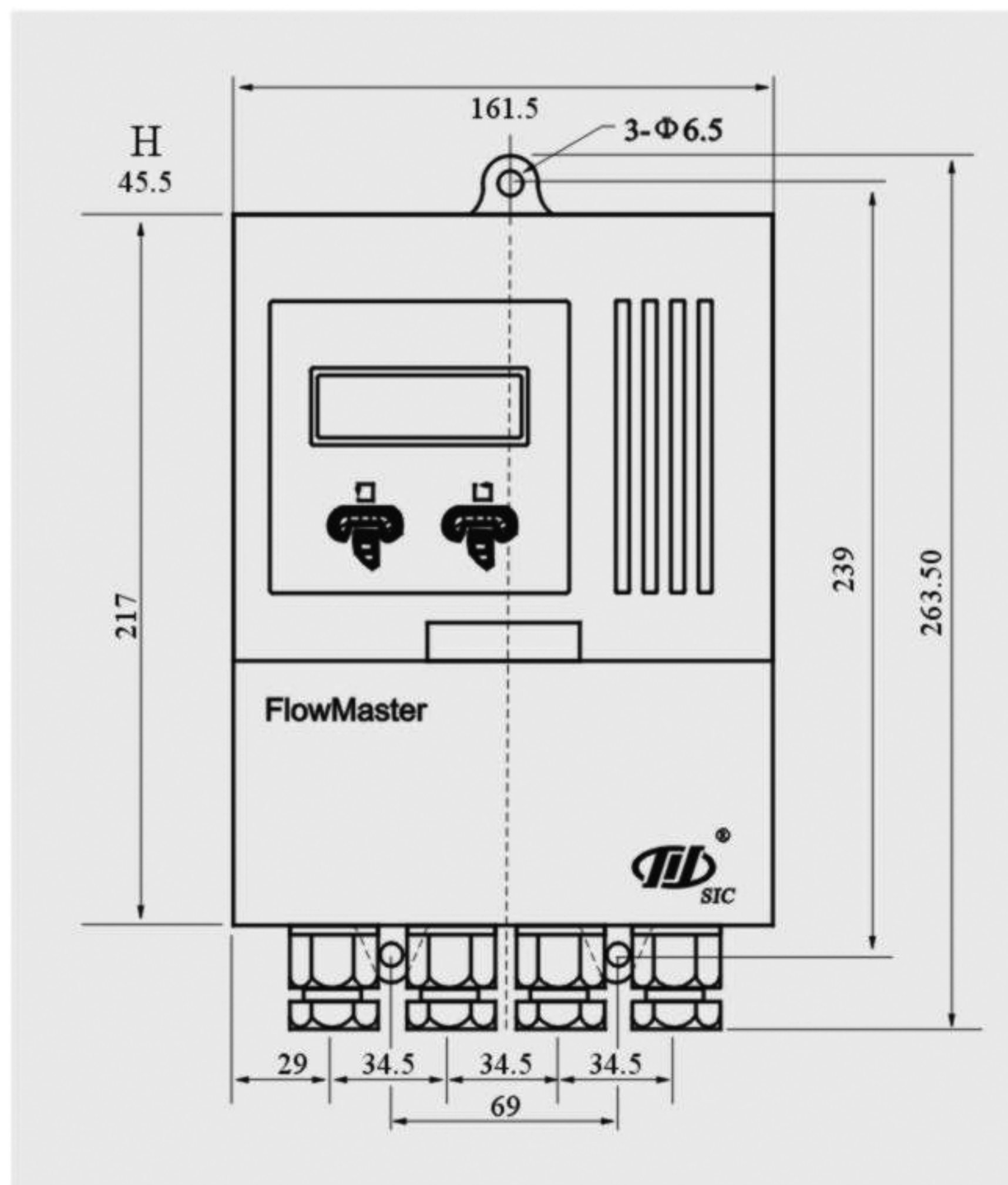


### 3. Transmitter specification

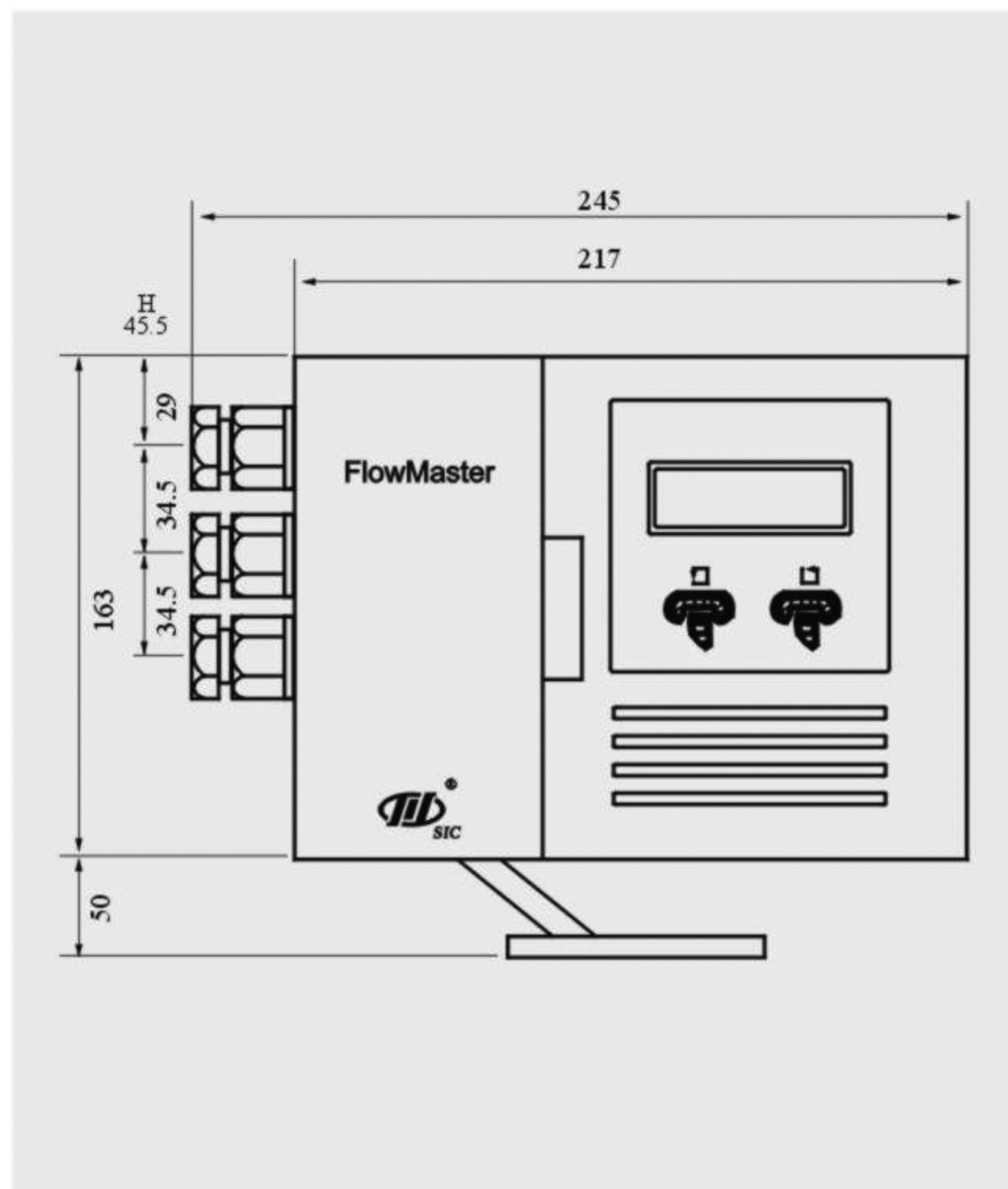
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Gland sealing 5:20mm plastic sealing (user to fit cable or integral type)	Type EH: Integral ER: Separation	Power supply 1: 95-265V A.C 47-440Hz 3: 11-40V D.C	Display 0: None 3: High protected two line display 4: Three line keypad display	Drive Connection 0: Standard output 1: Dual current output 2: HART 4: RS485 5: RS485+dual current output 6: RS485(local RS232 not acceptable) 7: RS485+dual current output (local RS232 not acceptable)	Working environment 1: Normal working area	Display direction 1: Standard direction 2: +90° 3: +180 4: 270°	Language 1: English	Label 1: Factory matched



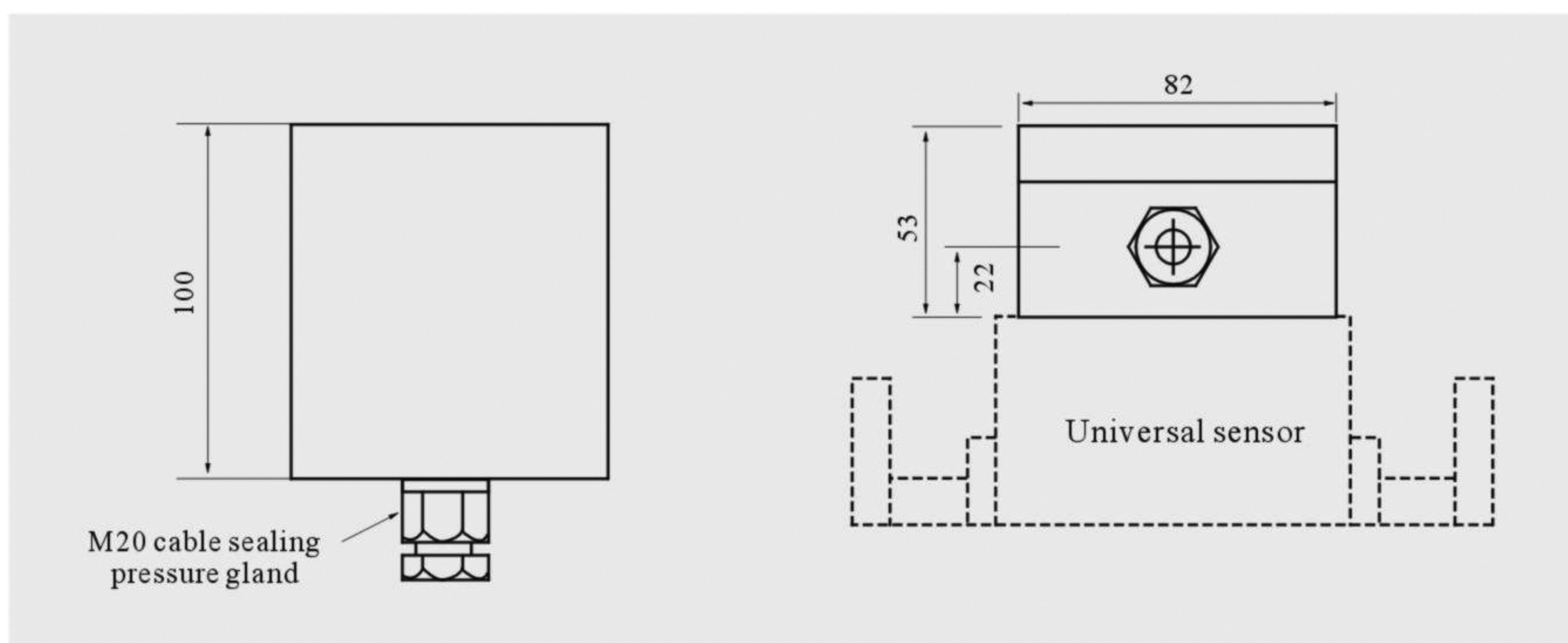
#### 4. Dimensions



Separation type  
transmitter



Integral type transmitter  
(mounted on sensor)



Standard terminal box dimension (mounted on sensor)



## **CHAPTER THREE: ADDITIONAL INFORMATION RELATED TO FLOWMETER SELECTION**

### **I .Selecting the flowmeter diameter**

#### **1.Flowmeter diameter equal to the connecting process pipe**

This selection is easy for the mount, with the curl pipe not needed. It's required that the using flow be between 0.1~15m/s. This selection usually suits the very new project, and the flow rate is quite slow, when the late following projects are in place, the inside pipe flow becomes very fast, adjusting locally the full-calibration range is all the solution to get it compatible, changing other instruments is not need.

#### **2.Flowmeter diameter not equal to the connecting process pipe**

This selection suits the conditions below:

- A.The flow inside the pipe is rather slow and the process flow is quite stable. To satisfy the requirements of the instrument upon the flow ranges, locally improving the flow rate is done upon the instruments, selecting that the sens or diameter is less than process pipe diameter and adding curl pipes to connect the two ends of the sensor.
- B.Considering by the price, for the big diameter electromagnetic flowmeter, the bigger the diameter, the higher the price; For the slow flow inside the pipe and the stable process parameters, smaller diameter sensor is preferable which can not only keep the instrument in the very good working conditions but also reduce the investment costs upon the instruments.

#### **3.Question that should be noted regarding adding curling pipes**

Curling pipes can be regarded as part of the linear pipe, in order not to violate too much the flow rate field, the gradual shrinking sharp angle should not be above 15° , and the less this angle, the better.

#### **4.Regarding the diameter size**

The FlowMaster series represents their diameters in 3-digit figures, the former 2 represents 1st and 2nd figure of the diameter, and the 3rd digit represents the quantity of zeros after the former 2-digit figure.

For examples:

Size 150 presents 15mm diameter; Size 151 presents 150mm diameter; Size 152 represents 1500mm diameter.

### **II .Selecting the flange**

Select metric flanges (exception not included), and the matching flange should be made in accordance with the metric standard. China GB9119 flange standard usually reach the pressure-resistance standard.

Additional: Special flanges and those exceeding the instrument pressure-resistance ratings can be specially ordered.

Wafer Type (DN3DN12mm, DN25DN150) nearly can be matched to any standard flange.



### III. Selecting the lining material

1. Lining material is selected according to the erosion capability, abrasion capacity and temperature of the measured mediums. Usual lining material capabilities are listed in diagram 5-1:

Diagram 5-1

Lining materials	Main capabilities	Application range
Unbonded PTFE	The best stable chemical plastic material, resistant to boiled hydrochloric acid, vitriol, nitric acid, aqua regia, thick alkali, various organic solvents, not resistant to $\text{ClF}_3$ , high temperature $\text{OF}_3$ , high flow velocity liquid state fluorin, lox, ozone, etc.	1. $-80^\circ \sim 180^\circ\text{C}$ 2. Mediums such as thick acid, thick alkali, etc. 3. Hygiene type mediums
Bonded PTFE	1. Erosion resistance capability equivalent to Unbonded PTFE 2. Weak in abrasion resistance 3. Strong in negative voltage resistance	1. The same to unbonded PTFE 2. Available to negative voltage state
Polypropylene	After FEP as referred to erosion resistance	$< 100^\circ\text{C}$
Teflon FEP	After PTFE, PFA as referred to erosion resistance, not resistant to smoked nitric acid, butyl- lithium, $\text{ClF}_3$ , high temperature $\text{OF}_3$ , high flow velocity liquid state fluorin, lox, ozone, etc.	$< 120^\circ\text{C}$
Teflon PFA	1. Erosion resistance capability same to Unbonded PTFE 2. Have low abrasion resistance capability 3. Strong in negative voltage resistance	1. The same to bonded PTFE 2. Available for low abrasion medium
Neoprene	1. Have good elasticity, high pull-breaking force and good abrasion capability 2. Resistant to normal low acid, alkali and salt erosion, not resistant to oxidative medium erosion	1. $< 80^\circ\text{C}$ 2. Usual water, wastewater, slop, mineral slurry
Polyurethane	1. Have good abrasion resistance capability (about 10 times of the natural rubber) 2. Weak in acid and alkali resistance	1. $< 70^\circ\text{C}$ 2. Neutral high abrasion mineral slurry, coal slurry and slop
Acid-resistant rubber (Vulcanite)	Resistant to hydrochloric acid	1. $< 25^\circ\text{C} \sim 90^\circ\text{C}$ 2. Usual acid, alkali and salt liquor



## 2. Maximum temperature of the flow liquid (see diagram 5-2):

diagram 5-2

Manufacturing standard	Environmental temperature (°C)	Process flow liquid temperature(°C)						
		Polypropylene	Teflon FEP	Elastomer	Vulcanite	Polyurethane	Teflon PFA,PTFE	Neoprene
Non-hazardous area of the standard structure	60	80	80	80	80	70	80	80
The approved standard temperature of the non-hazardous area	60	60	60	60	60	60	60	60
High temperature of the approved hazardous area	60	100	120	120	95	70	140	110
High temperature of the non-hazardous area	60	100	120	120	95	70	140	110
Special temperature of the non-hazardous area	120	100	120	120	95	70	140	110
Integral type of the standard structure	60	80	80	80	80	70	80	80

## IV. Selecting the electrode

The electrode material should accord with the erosion performance of the tested medium, the erosion-resistance of the electrode material please see diagram 5-3.

More details can be looked up in the related erosion resistance manual.

Diagram 5-3

Material	Erosion-resistant performance
316 stainless steel	Used for the measurement of water, wastewater, slight erosion-resistant mediums such as inorganic or organic acid, widely applied in industries such as petrochemical, carbamide, terylene, electric power, etc.
Hastelloy 'C'	Resistant to nitric acid, mixed acid, mixed mediums (chromate and vitriol), Fe <sup>+++</sup> , Cu <sup>++</sup> and other oxidants (hypochlorite above normal temperature, seawater, etc.)
Ti	Resistant to seawater, every chloride, organic acid and alkali, not resistant to vitriol and hydrochloric acid. If oxidants (nitric acid, Fe <sup>+++</sup> , Cu <sup>++</sup> , etc.) included in the acid and the erosion will be greatly reduced.
Ta	Excellent erosion-resistant performance like the glass, resistant to almost all chemical mediums (including boiled hydrochloric acid, nitric acid and vitriol below 175°C) except for hydrofluoric acid, fuming nitric acid, and alkali; not resistant in the salt liquid.
Pt	Good erosion-resistant performance to acid, alkali and salt, not resistant to aqua regia.
Carbon tungsten covered stainless steel	Suitable to high abrasion medium without erosion performance

## V. Selecting the cable

The connecting cable between the sensor and the transmitter is for special purposes, and the cable length in the specifications means this cable. As the length is correlated with the conductance, the maximum length is 5 times as large as the conductance and should not exceed 100m.

There are two types of connecting cables between the sensor and the transmitter, that's the standard type and the armoured type. The on-the-spot mount tends to require metal pipes to protect the cables, thus selecting the standard type. If metal pipes not needed for protection, the armoured type is preferred. As to the connecting cables between the transmitter and other mechanisms, no special requirements are requested, users can select proper ones according to the practical conditions.



## VI. Working environments

Working environments refer to the environments around the instrument, including general working area and dangerous working area.

General working area should not be placed flammable gases and explosive substances. Working temperature range includes temperature above 60°C and temperature below 60°C, integral type and separation type optional, but for the transmitter, the working temperature should not be more than 60°C.

Dangerous working area refers to area placed flammable gases and explosive substances. Working temperature range includes temperature above 60°C and temperature below 60°C. Integral transmitter can only select FH explosion-proof transmitter; Separation transmitter can select non-explosion-proof transmitter.

## VII. Cable glands

Cable glands include two types, one is 20mm plastic seal and 20mm Cu seal, and the former applies to standard cables, the latter armoured cables; another is 0.5 inch NTP.

20mm plastic seals are universal, among which code 1 and code 5 is the same, the difference is that code 1 requires the cable accomplish connection and sealant is gelatinized before product leaving the factory, while code 5 requires users to finish these tasks, therefore if not exceptions please select code 5. But for the inserted type, please note that the code 1 means user installation.

## VIII. Selecting the transmitter function

### 1. Transmitter output and connector selection

Various transmitter outputs can satisfy usual requirements as following:

- A. 0/4~20mAD.C signal corresponding to the flow rate
- B. Forward/reverse pulse signal corresponding to the flow rate
- C. Selecting 2 alarm outputs among 9 alarms, also configurable such as and, or, etc.
- D. RS 232 connector programmer, PC, etc.
- E. Contact inputs can execute cumulative restoration and double range selection.

Output optional:

- A. 0/4~20mAD.C signal corresponding to the reverse flow rate
- B. RS422/423, RS485 communication connector
- C. HART

### 2. Display mode

- A. If on-the-spot display not used, select no display
- B. When selecting 2 line display style, programming can only be executed through the programmer or PC computer connecting RS232 connector, or RS422/423, RS485 connector.  
When selecting 3 line display mode, programs programmable on the keypad.

### 3. Display direction

When the integral electromagnetic flowmeter is selected, the display direction of the transmitter doesn't be convenient for reading because of the pipe location, in this case, display directions (linear or vertical) are available for selection to get accommodated.





Beautiful factory site



Comfortable office



Analog setting equipments that reach 0.1 rating of accuracy



Advanced flowmeters



DN1400 flowmeter applied in yellow river Irrigation Station



Sichuan Instrument Complex Co.,LTD. Flowmeter Branch

Add: No.1Jinzicun Sixiaoqu Nanping Chongqing, China

Sales TEL: 86-23-62802924 62910242 FAX: 86-23-62817794

Technical support number: 86-23-62807086 P.C.: 400060

Http: [Sicflow.Sicc.com.cn](http://Sicflow.Sicc.com.cn) E-mail: [flowmaster@sicc.com.cn](mailto:flowmaster@sicc.com.cn)