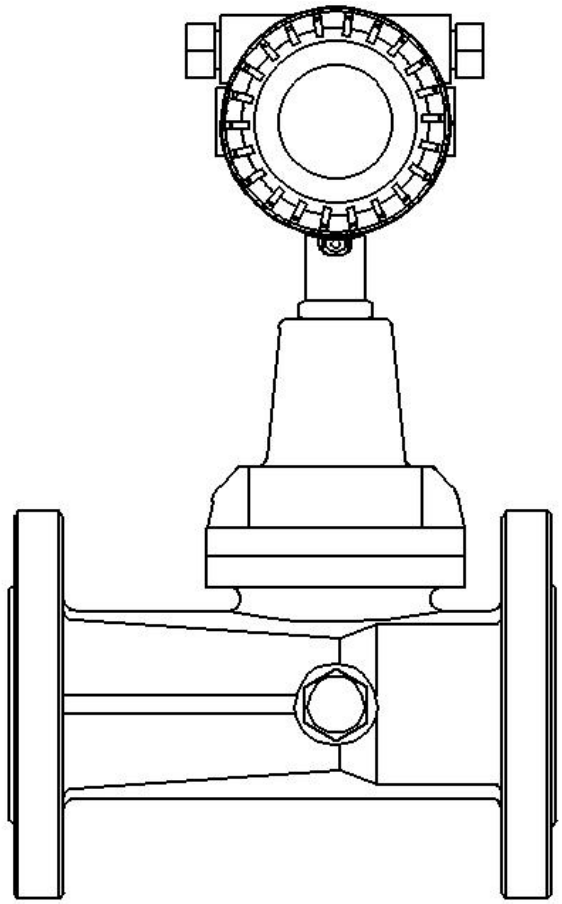
Precession vortex flow meter



Installation manual

2020-10

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Ⅰ、Product features, uses and scope of application

I am very pleased that you have purchased this intelligent precession vortex flowmeter, which is a new type of gas flow meter with leading level developed by our company through years of practice and learning foreign advanced technology. The flowmeter can integrate flow, temperature, and pressure detection functions, and can automatically compensate for temperature, pressure, and compression factor. It has strong anti-vibration and anti-interference capabilities, high precision and high repeatability, and is suitable for petroleum and chemical industries. Ideal instrument for gas metering in industries such as, electric power and metallurgy.

1.1 Product main features

1. No mechanical moving parts, not easy to corrode, stable and reliable, long life, long-term operation does not require special maintenance;
2. Using 16-bit computer chip, high integration, small size, good performance, and strong functions of the whole machine;
3. The intelligent flowmeter integrates flow probe, microprocessor, pressure and temperature sensor, and adopts a built-in combination to make the structure more compact. It can directly measure the flow, pressure and temperature of the fluid, and automatically track the compensation and compression factor in real time. Amend
4. Adopting dual-probe detection technology, new sensor processing technology, and reasonable installation methods to greatly improve the signal strength, so that the sensor can accurately detect the signal, and suppress the interference caused by pipeline vibration;
5. Adopting domestic leading intelligent anti-seismic technology, effectively suppressing interference signals caused by vibration and pressure fluctuations;
6. Adopting Chinese character dot matrix display, with many display digits, intuitive and convenient reading, which can directly display the volume flow in working state, volume flow in standard state, total volume, and parameters such as medium pressure and temperature;
7. The converter can output frequency pulses, 4-20mA analog signals, and has an RS485 interface, which can be directly networked with a computer, and the transmission distance can reach 1.2km;
8. Multi-physical parameter alarm output, users can choose one of them;
9. Pressure and temperature signals are sensor input methods, which are highly interchangeable;
10. The whole machine has low power consumption and can be powered by the built-in battery or an external power supply.

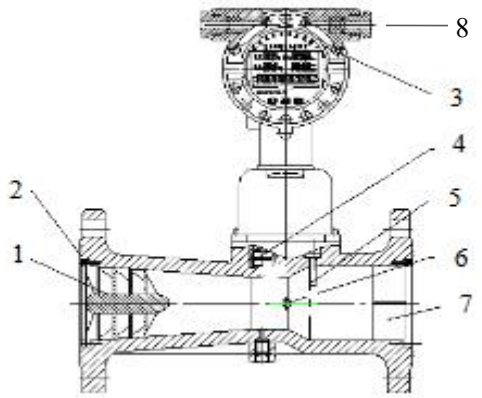
1.2 The main purpose

The intelligent precessing vortex flowmeter can be widely used in petroleum, chemical, electric power, metallurgy, urban gas supply and other industries to measure various gas flows. It is currently the first choice for oilfield and urban natural gas transmission and distribution measurement and trade measurement.

Ⅱ、Structure and working principle

2.1 Flowmeter structure

The vortex precession flowmeter has a compact structure and is mainly composed of a shell, a vortex generator, a sensor (temperature, pressure, flow), a rectifier and a totalizer.



1. Vortex generator
2. Shell
3. Intelligent flow totalizer
4. Temperature sensor
5. Pressure sensor
6. Flow sensor
7. Rectifier
8. Electrical interface: M20*1.5

Figure1 Flowmeter structure

1. Vortex generator: It is made of aluminum alloy with a certain angle of spiral blade, which is fixed at the front of the contraction section of the shell to force the fluid to produce a strong vortex.

2.Shell: It has a flange and a fluid channel of a certain shape. According to different working pressures, the shell material can be cast aluminum alloy or stainless steel.

3.Intelligent flow meter Integrator: It is composed of temperature and pressure detection analog channel, flow detection digital channel, micro-processing unit, liquid crystal drive circuit and other auxiliary circuits, and is equipped with an external signal interface.

4. Temperature sensor: Pt100/pt1000 platinum resistance is used as the temperature sensitive element, within a certain temperature range, the resistance value corresponds to the temperature.

5. Pressure sensor: The piezoresistive diffused silicon bridge is the sensitive element, and its bridge arm resistance will change as expected under the action of external pressure. Therefore, under the action of a certain excitation current, the potential difference between its two output terminals is proportional to the external pressure. Proportional.

6. Flow sensor: Installed at the throat near the expansion section of the shell, it can detect the frequency signal of the vortex precession.

7. Rectifier: fixed at the outlet section of the shell, its function is to eliminate vortex flow

to reduce the impact on the performance of downstream instruments.

2.2 Working principle

The flow profile of the flow sensor is similar to the type of venturi (see Figure 2). A set of spiral guide vanes are placed on the inlet side. When the fluid enters the flow sensor, the guide vanes force the fluid to produce a violent vortex flow. When the fluid enters the diffusion section, the vortex flow is affected by the backflow and starts to rotate twice, forming a gyroscopic vortex precession phenomenon. The precession frequency is proportional to the flow rate and is not affected by the physical properties and density of the fluid. The second rotation precession frequency of the fluid measured by the detection element can obtain good linearity in a wide flow rate range.The signal is amplified, filtered and shaped by the preamplifier and converted into a pulse signal proportional to the flow rate, and then sent to the microprocessor together with the temperature, pressure and other detection signals for integration processing, and finally the measurement is displayed on the LCD screen Results (instantaneous flow rate, cumulative flow rate and temperature and pressure data). The principle block diagram of the totalizer is shown in Figure 3.

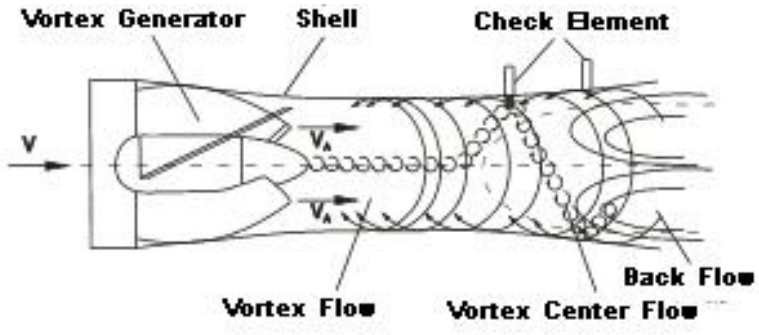


Figure2 Working principle

2.3 Working principle of flow totalizer

The flow totalizer is composed of temperature and pressure detection analog channels, flow sensor channels and a microprocessor unit, and is equipped with an external output signal interface to output various signals. The microprocessor in the flowmeter performs temperature and pressure compensation according to the gaseous equation, and automatically corrects the compressibility factor. The gaseous equation is as follows:

$$Q_N = \frac{Pa + P}{P_N} \bullet \frac{T_N}{T} \bullet \frac{Z_N}{Z} Q_V \quad \cdots\cdots\cdots\cdots\cdots\cdots \quad (1)$$

In the formula:

Q_N——Volume flow under standard conditions(Nm3/h);

Q_V——Volume flow under working conditions(m3/h);

Pa ——Local atmospheric pressure（kPa）;

P ——Gauge pressure measured by the pressure port of the flowmeter（kPa）;

P_N ——Atmospheric pressure under standard conditions（101.325 kPa）;

T_N —Absolute temperature under standard conditions（293.15K）；

T ——The absolute temperature of the measured fluid（K）；

Z_N ——Compression coefficient of gas under standard conditions；

Z ——Compression coefficient of gas under working conditions；

Note: When using bell jar or negative pressure calibration, take ZN/Z=1, for natural gas (ZN/Z) 1/2=FZ is the super compressibility factor. Calculated according to the formula in China National Petroleum Corporation's standard SY/T6143-1996.

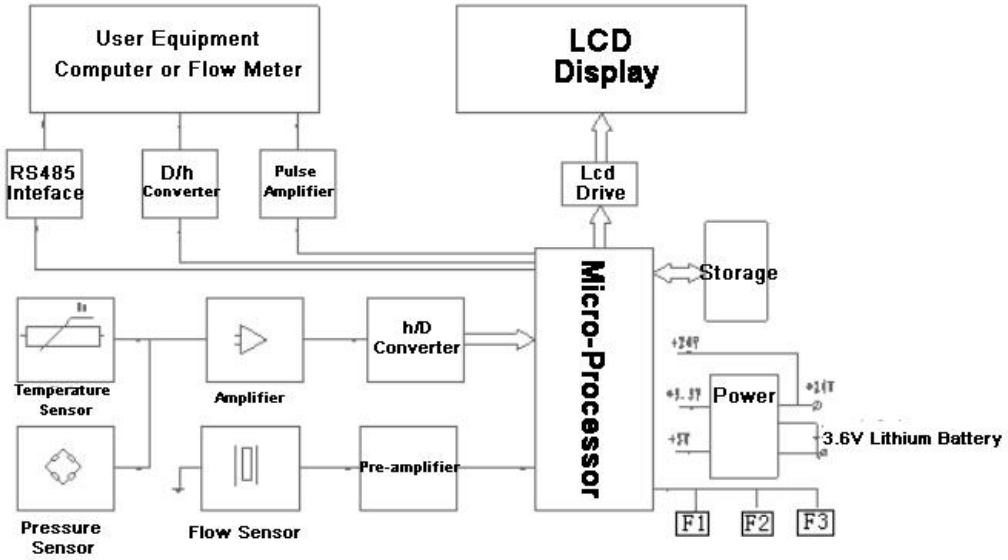


Figure 3 Block diagram of the integrator

Ⅲ、Technical performance and selection guide

3.1 Executive standard

JJG198-1994 ≤Velocity Flowmeter≥ Metrological Verification Regulation

3.2 Accuracy level

The accuracy levels of the flowmeter are 1.0 and 1.5 within the specified flow range and working conditions.

3.3 Parameters

Chart1 parameters

Nominal diameter（mm）	Flow range（m^3/h）	Nominal pressure（MPa）	Pressure loss（kPa）	Accuracy	Repeatability	Shell material
15	1～7	1.6 2.5 4.0 6.3 10.0 16.0 25.0	△P=ρ/1.2 05×ＰN	1.0 1.5	Less than 1/3 of the absolute value of the basic error limit	Aluminum alloy shell/ 304ss
20	1～18					
25	2～30					
32	4.5～60					
40	6～80					
50	10～150					
65	18～220					
80	28～400					
100	50～800					
125	80～1000					
150	150～2200					
200	360～3600					

Note: Accuracy: system accuracy after temperature and pressure correction

3.4 Standard status condition

P=101.325KPa, T=293.15K

3.5 Environmental conditions

Ambient temperature：-30℃～+65℃
Relative humidity：5%～95%
Medium temperature：-20℃～+80℃
Atmospheric pressure：86KPa～106KPa

3.6 Working power and signal output

3.6.1 Power supply

A. External power supply: +24VDC±15%, ripple <5%, suitable for 4～20mA output, pulse output, alarm output, RS-485, etc.

B. Internal power supply: 1 set of 3.6V lithium battery.

3.6.2 Whole machine power consumption

A. External power supply：<2W;

B. Internal power supply：The average power consumption is 1mW, which can be used continuously for more than one year.

3.6.3 Pulse output method

Working condition pulse signal, directly output the working condition pulse signal detected by the flow sensor through optocoupler isolation and amplification, high level ≥ 20V, low level ≤ 1V;

3.6.4 RS-485 communication (photoelectric isolation), can realize the following functions:

Using RS-485 interface, it can be directly connected to the host computer or secondary meter, remotely display the temperature, pressure of the medium and the standard volume flow and total standard volume after temperature and pressure compensation;

3.6.5 4～20mA standard current signal (photoelectric isolation)

It is proportional to the standard volume flow, 4mA corresponds to 0 m3/h, 20 mA corresponds to the maximum standard volume flow (this value can be set in the first level menu), system: two-wire or three-wire, the flowmeter can be based on the inserted current The module automatically recognizes and outputs correctly.

3.6.6 Control signal output

A. Lower limit alarm signal (LP): photoelectric isolation, high and low level alarm, alarm level can be set, working voltage +12V~+24V, maximum load current 50mA;

B. Upper limit alarm signal (UP): photoelectric isolation, high and low level alarm, alarm level can be set, working voltage +12V~+24V, maximum load current 50mA;

3.7 Live display function

A. Real-time display of temperature, pressure, instantaneous flow, and accumulated flow under working conditions (or standard conditions) on the display panel of the totalizer;

B. Alarm function: flow upper and lower limits, temperature upper and lower limits

3.8 Explosion-proof type and grade

Intrinsically safe type: its explosion-proof mark is ExibIIBT4

3.9 Protection level

IP65

3.10 Pressure loss

The calculation formula for the actual pressure loss of the flowmeter is as follows：

$$\Delta P_1 = \frac{\rho}{1.205}\Delta P \quad \text{.....(2)}$$

In the formula：

ΔP_1 —— Actual pressure loss of flowmeter（kPa）；

ρ —— Density of measured medium (kg/m3)；

ΔP —— The pressure loss of the flowmeter when the medium is dry air (kPa). The characteristic curve is shown in Figure 4.

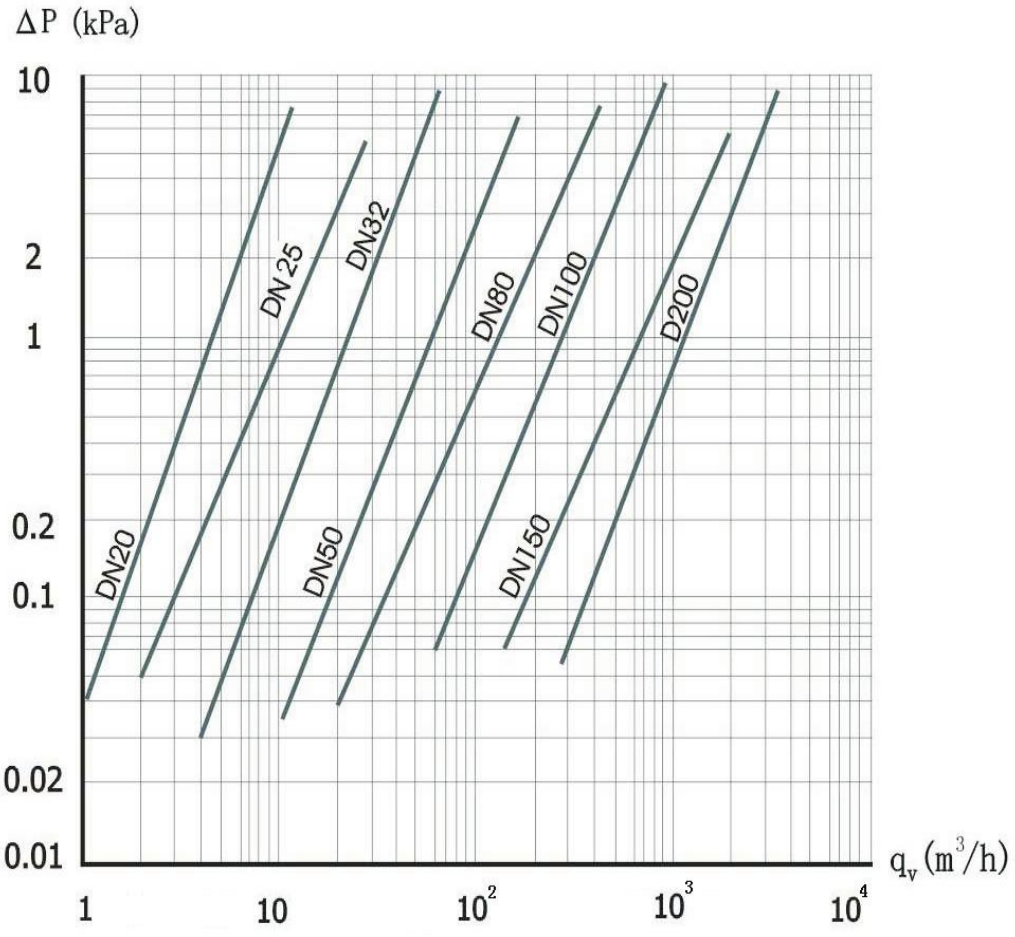


Figure 4 Pressure loss curve

3.11 Electrical interface

Internal thread M20*1.5

3.12 Selection Guide

3.12.1 Selection conditions

When placing an order, the user should select the appropriate flowmeter model and specification according to the nominal pipeline pressure, maximum working pressure, working temperature, flow range, environmental conditions, etc.

3.12.2 Reasonable selection

A. When the measured flow rate provided by the user is the working condition flow rate, the flowmeter of the corresponding diameter can be selected directly according to Table 2;

B. When the measured flow rate provided by the user is the standard condition flow rate, the standard condition flow rate should be converted to the working condition flow rate, and the flowmeter of the corresponding diameter should be selected.

Conversion formula：

$$Q = Q_0 \times \frac{P_0}{P} \times \frac{T}{T_0} \quad \text{.....(3)}$$

In the formula:

Q —Volume flow under standard conditions（Nm^3/h）;

Q_0—Volume flow under working condition(m^3/h);

$P=P_a+P_g$ —Working pressure (absolute pressure)(kPa);

P_a—Local atmospheric pressure(kPa);

P_g—Gauge pressure at the pressure detection point of the flowmeter(kPa);

P_0—Standard atmosphere(101.325kPa);

T_0—Absolute pressure under standard conditions(293.15K);

T —Absolute pressure of the measured medium(273.115+t)K;

t —The temperature of the measured medium;

Ⅳ、Instrument dimensions and installation

4.1 Flowmeter dimensions

The external dimensions of the flowmeter are shown in Figure 5. The dimensions not marked in the figure are listed in Table 2. The flowmeter adopts flange connection. The flange size is in accordance with GB/T9119-2010 flange standard.

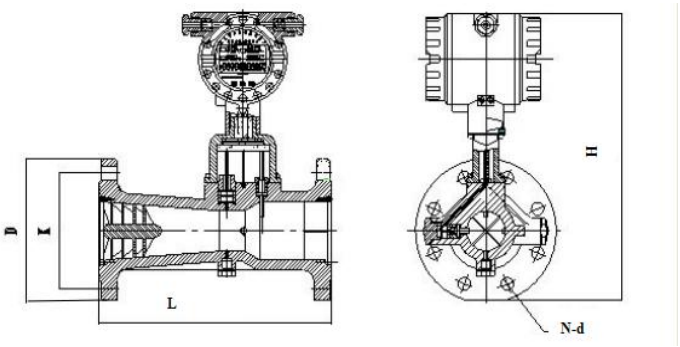


Figure 5 Outline drawing of flow meter

Table 2 Dimensions

Nominal diameter (mm)	Pressure level (MPa)	L	H	D	K	N-d
15	4.0	162	320	95	65	4-φ12
20	4.0	162	325	105	75	4-φ14
25	4.0	182	335	115	85	4-φ14
32	4.0	200	350	140	100	4-φ18
40	4.0	234	360	150	110	4-φ18
50	4.0	234	365	165	125	4-φ18
65	1.6	286	390	185	145	8-φ18
80	1.6	330	405	200	160	8-φ18
100	1.6	410	425	220	180	8-φ18
125	1.6	516	450	250	210	8-φ18
150	1.6	585	470	285	240	8-φ22
200	1.6	690	525	340	295	12-φ22

Note: Aluminum alloy

4.2 Flowmeter installation

4.2.1 Flowmeter installation

1.When installing the flowmeter, it is strictly forbidden to conduct electric welding directly at the inlet and outlet flanges to avoid burning the internal parts of the flowmeter.

2.The newly installed or overhauled pipeline must be cleaned, and the flowmeter can be installed after removing the debris in the pipeline.

3.The flowmeter should be installed in a place that is convenient for maintenance, without strong electromagnetic field interference, strong mechanical vibration and thermal radiation.

4.Flow meters should not be used in occasions where the flow is frequently interrupted and there is a strong pulsating flow or pressure pulsation.

5.When the flowmeter is installed outdoors, there should be a covering on the upper part to prevent rainwater and hot sun from affecting the life of the flowmeter.

6.The flowmeter can be installed at any angle, and the flow direction of the fluid should be consistent with the flow direction marked on the flowmeter.

7.In the pipeline construction, the installation of expansion pipes or bellows should be considered to avoid serious stretching or breaking of the flowmete.

8.The flowmeter should be installed coaxially with the pipeline, and prevent the sealing sheet and grease from entering the inner cavity of the pipeline.

9.When using an external power source, the flowmeter must be reliably grounded, and the ground wire must not be shared with the strong current system. During pipeline installation or maintenance, the ground wire of the electric welding system must not be overlapped with the flowmeter.

10.In order not to affect the normal flow of fluid and facilitate maintenance, it is required to install the bypass pipeline as shown in Figure 6, and ensure that the front is ⩾3DN and the rear is ⩾1DN straight pipe section.

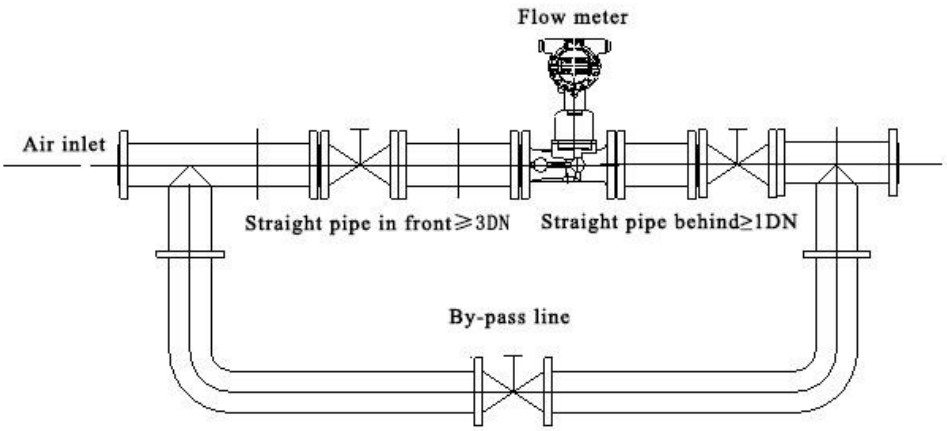


Figure 6 Installation diagram of bypass pipeline

4.2.2 Straight pipe requirements

According to the working principle of the precession vortex flowmeter and the flowmeter's requirements for upstream and downstream straight pipe sections, for various upstream resistance parts, it is recommended to use the front and rear straight pipe lengths as shown in Figure 7 and keep the inner wall of the straight pipe section smooth and straight.

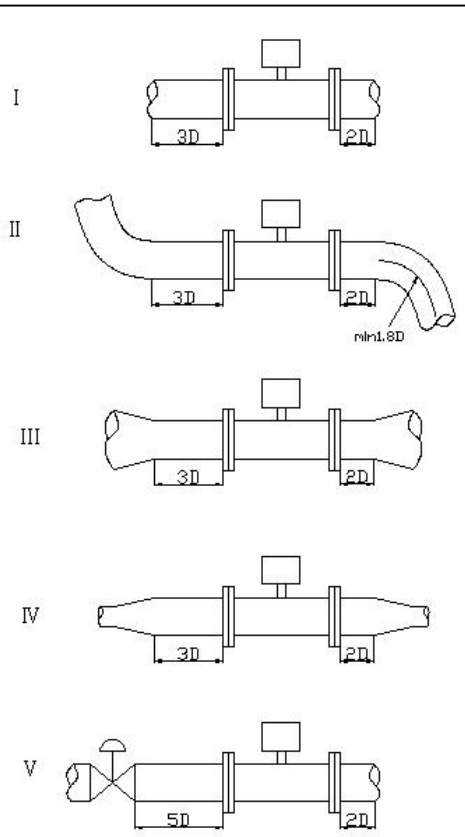
Explain	Icon
Ensure that the length of the straight pipe on the upstream side is at least 3D, and the length of the straight pipe on the downstream side is at least 2D. See I for schematic diagram. (D: Nominal diameter of precession vortex flowmeter)	
Elbow: For bent pipes, ensure that the length of the straight pipe on the upstream side is at least 3D, and the length of the straight pipe on the downstream side is at least 2D. The schematic diagram is shown in II.	
Shrink tube: For shrinking pipes, ensure that the length of the straight pipe on the upstream side is at least 3D, and the length of the straight pipe on the downstream side is at least 2D. See III for the schematic diagram.	
Pipe expanding: For expanded pipelines,, ensure that the length of the straight pipe on the upstream side is at least 3D, and the length of the straight pipe on the downstream side is at least 2D. The schematic diagram is shown in IV.	
Valve: If there is a valve on the upstream side, ensure that the length of the straight pipe on the upstream side is at least 5D, and the length of the straight pipe on the downstream side is at least 2D. See V for the schematic diagram.	

Figure 7 Requirements for installing straight pipes

4.2.3 Installation Precautions

1. The sensor can be installed in a vertical, horizontal or any inclined position according to the flow direction mark;

2. When the pipeline is relatively long or is close to the vibration source, supports should be installed upstream and downstream of the flowmeter to eliminate the influence of pipeline vibration;

3.The installation location of the sensor should have enough space to facilitate the inspection and maintenance of the flowmeter, and should meet the environmental requirements of the flowmeter;

4. The interference of strong external magnetic fields should be avoided;

5. When installing and using outdoors, there should be a cover to avoid sun exposure and rain erosion, which will affect the service life of the instrument;

6. When testing pipeline pressure, pay attention to the pressure measurement range of the pressure sensor equipped with the intelligent flowmeter to avoid damage to the pressure sensor due to overpressure;

7. Pay attention to the influence of installation stress. The upstream and downstream pipelines of the flowmeter should be installed coaxially, otherwise shear stress will occur. The location of the flowmeter should consider the thickness of the sealing gasket, or install an elastic expansion joint downstream;

8. Before installing the flowmeter, remove the welding slag and other sundries in the pipeline;

9. When it is put into operation, the upstream and downstream valves of the flow meter should be opened slowly, so as not to destroy the spinner due to the sudden air flow;

10. When the flowmeter requires remote signal transmission, it should be connected to an external power supply (8～24) VDC strictly according to the requirements of "working power supply", and it is strictly forbidden to connect 220VAC or 380VAC power supply directly to the signal output port;

11. The user is not allowed to change the wiring method of the explosion-proof system and arbitrarily twist each output lead connector;

12. When the flow meter is running, it is not allowed to open the back cover to change the meter parameters, otherwise it will affect the normal operation of the flow meter;

13. Regularly check the leakage at the flange of the flowmeter.

4.2.4 Replacement of built-in battery

Open the back cover of the intelligent flow totalizer, loosen the three screws on the battery cover, unplug the battery socket, take out the battery, replace with a new battery and reinstall it.

4.2.5Installation requirements for explosion-proof locations

1. The flowmeter should have reliable grounding, and the explosion-proof grounding should not be shared with the protective grounding of the strong current system;

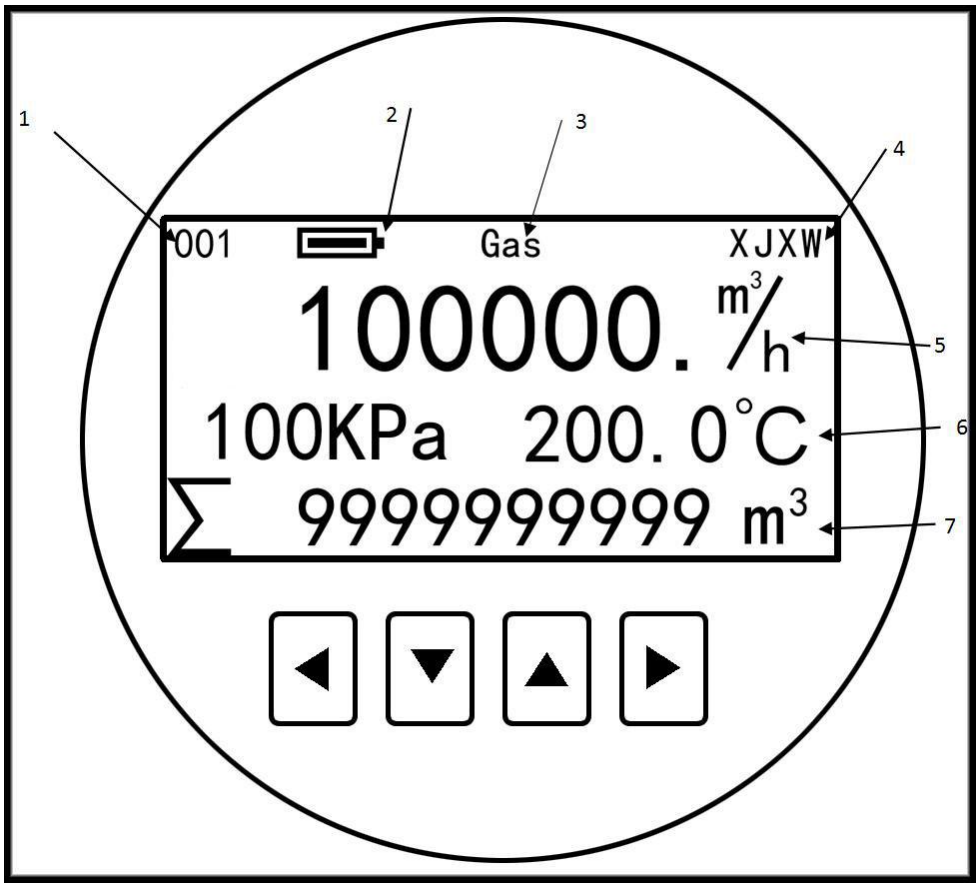
2. When testing the power supply on site, it is not allowed to use AC power to ground;

3. Under any circumstances, users are not allowed to change the explosion-proof circuit, components and explosion-proof type by themselves;

4. The external power supply must be cut off before opening the converter cover.

Ⅴ、Instructions

5.1 Main interface



The main interface of the software is shown in the figure above, and its meaning is:

1- The device address of the instrument in RS-485 communication.

2-Battery power supply and external power supply working mode display.

3-The internal algorithm of the integrator, used in the precession vortex mainly uses two algorithms:

(1) Gas Flow algorithm for gas working conditions, measurement working conditions.

(2) Gas TP Gas standard condition algorithm, calculate standard condition flow (default).

4-Instrument type, XJXW stands for precession vortex flowmeter.

5-Instantaneous flow display area, the maximum display is 100000。

6-Temperature and pressure display, used to display temperature and pressure.

(3) When displaying temperature and pressure, press any up and down keys to switch to flow rate and frequency display.

7-Cumulative flow display area, the maximum cumulative flow is 9999999999。

The meter has four buttons, which are used to：

◀: Move left, confirm key for parameter setting, and exit submenu

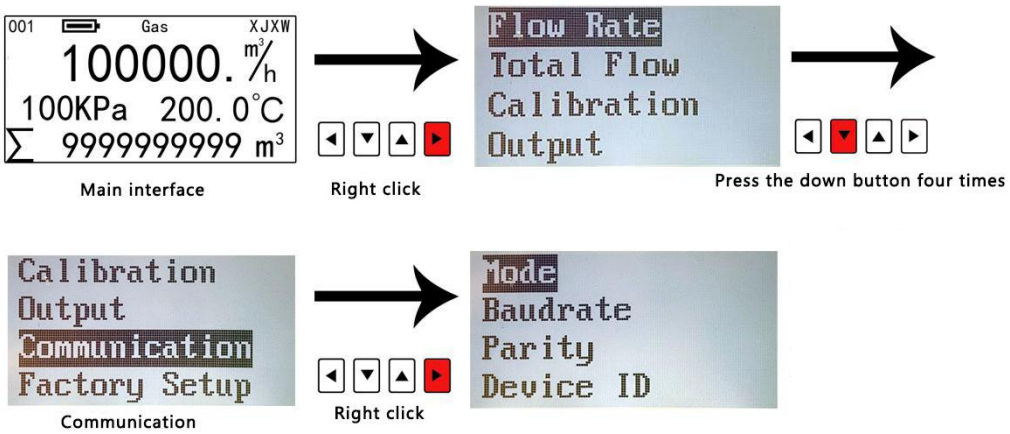
▲: Move up, number plus 1 key

▼: Move down, number minus 1 key

►: Move right, enter parameter

5.2 Common operations

(1) Set 485 information



Introduction:

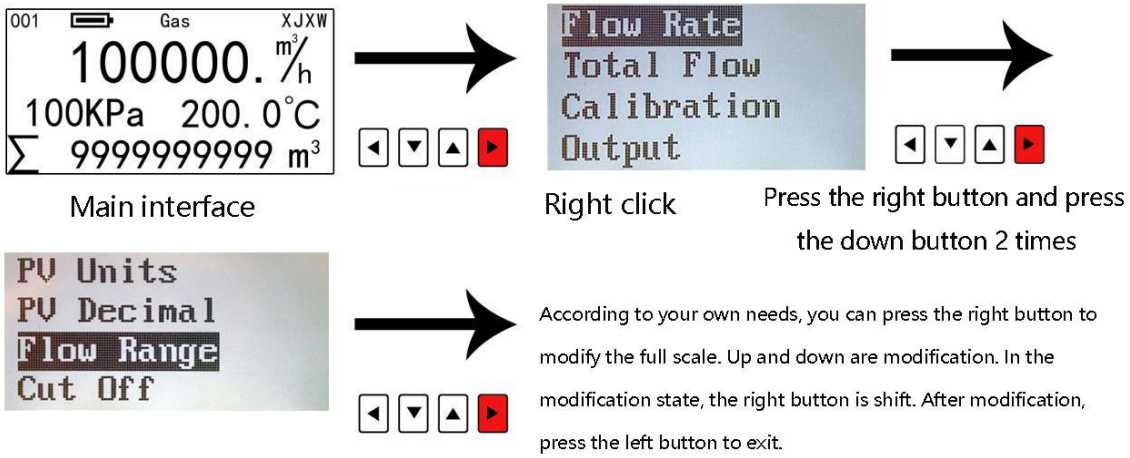
Mode: Default RTU, optional ASCII, RTU

Baud rate: default 9600, optional 9600, 19200, 38400, 57600

Check mode: Default NONE (no check), optional NONE, EVEN (even check), ODD (odd check)

Device address: The default factory random (1-3), you can set 1~247

(2) Set full-scale output (4-20mA output)



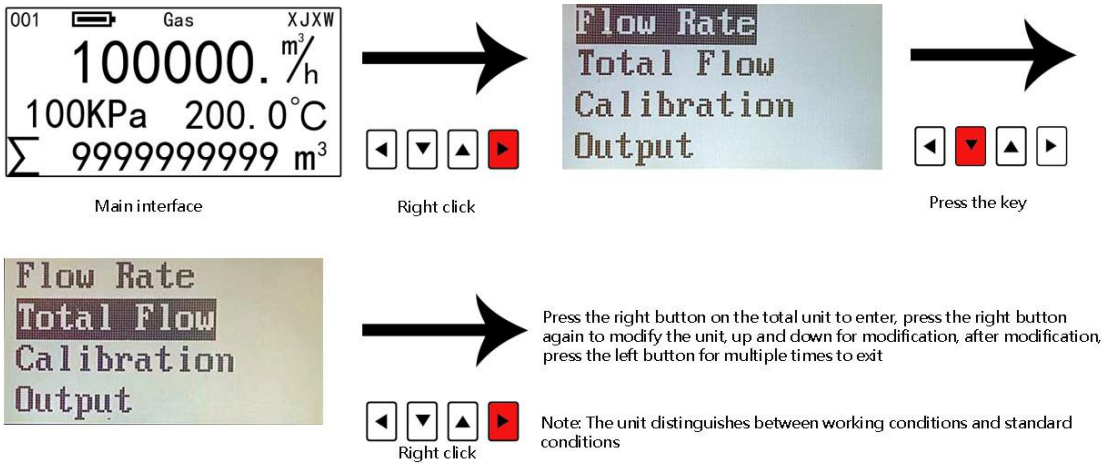
Introduction:

The meaning of range is the maximum flow rate corresponding to 20mA by default when outputting 4-20mA.

Another meaning of this range is the original value of the percentage of small signal removal.

Except for these two uses, it does not affect the actual measurement.

(3)Modify the cumulative unit

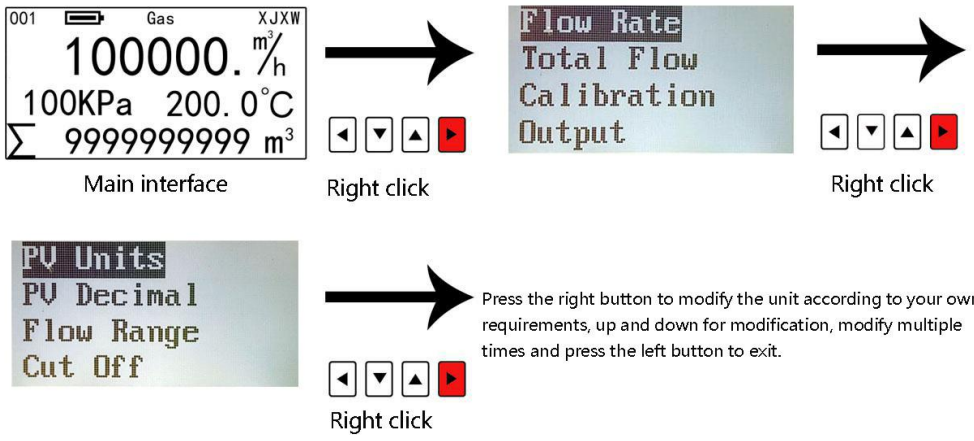


Introduction:

1. Modifying the cumulative flow The original cumulative flow will not change and will not be cleared, so it is recommended to clear it once or record the original value after modifying the unit, and then subtract the original value later.

2. The cumulative flow unit needs to be consistent with the instantaneous algorithm. For example, when the instantaneous value is L, the cumulative flow can be set to m^3 and L, but cannot be set to T, kg and Nm^3.

(4) Modify the instantaneous unit

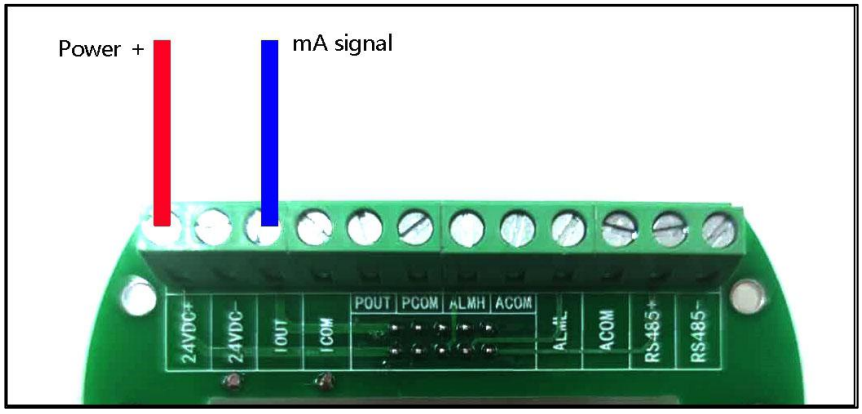


Introduction:

The instantaneous flow unit should be consistent with the algorithm. If you are unclear, it is recommended to contact the manufacturer.

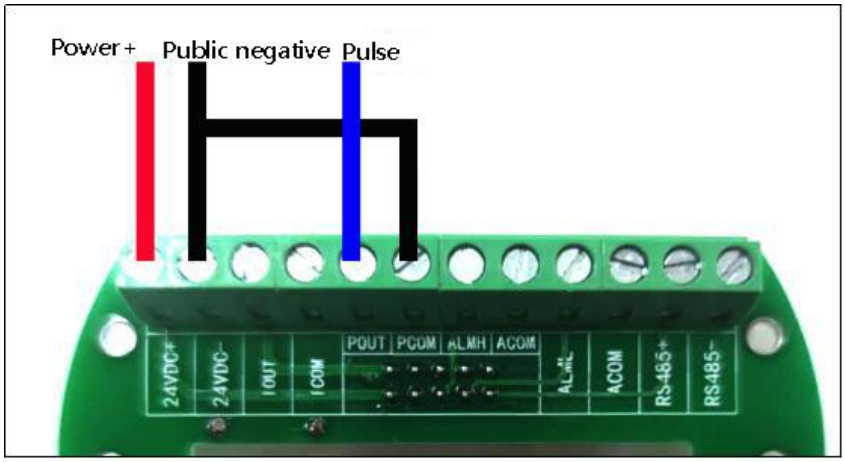
5.3 Wiring settings

5.3.1 Two-wire system 4-20mA



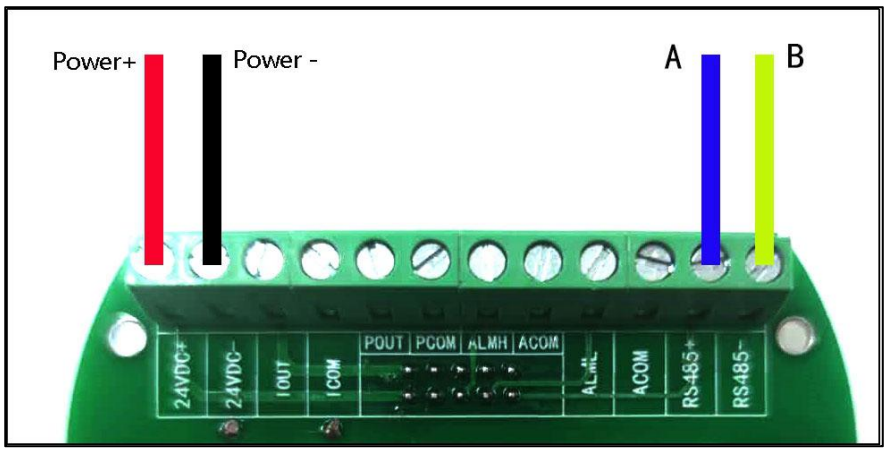
The above is the common way for customers to connect to the 2-wire 4-20mA.

5.3.2 Pulse output



The above is a common connection method for three-wire pulses. Pulses are usually only used during calibration.

5.3.3 RS485 communication wiring



The above is the common connection method of RS-485.

Ⅵ、Common malfunctions

Failure phenomenon	Possible Causes	Method of exclusion
No output signal after power on	1.There is no medium flow in the pipeline or the flow is lower than the starting flow; 2.The power supply and the output line are not connected correctly; 3.The preamplifier is damaged (the totalizer does not count, the instantaneous value is "0"); 4.The drive amplifier circuit is damaged (the totalizer display is normal).	1.Increase the flow rate of the medium or switch to a flow meter with a smaller diameter to meet the requirements of the flow range; 2.Correct wiring; 3.Replace the preamplifier; 4.Replace damaged components in the drive amplifier
The flowmeter has a signal output when there is no flow	1. Poor grounding of the flowmeter and interference with strong current and other ground wires; 2. The amplifier sensitivity is too high or self-excited; 3. Unstable power supply, poor filtering and other electrical interference.	1. Connect the ground wire correctly to eliminate interference; 2. Replace the preamplifier; 3. Repair and replace the power supply to eliminate interference.
The instantaneous flow rate display is unstable	11. The medium flow is unstable; 2. The amplifier sensitivity is too high or too low, there are too many counting, missing counting pulse phenomenon; 3. There are sundries in the shell; 4. Poor grounding; 5. The flow is lower than the lower limit; 6. The rear sealing ring extends into the pipe to cause disturbance.	1. Test after the flow is stable; 2. Replace the preamplifier; 3. Remove dirt; 4. Check the grounding circuit to make it normal
The cumulative flow displayed value does not match the actual cumulative amount	1. The meter coefficient of the flow meter is incorrectly entered; 2. The user's normal flow is lower or higher than the normal flow range of the selected flowmeter;	1. Enter the correct meter coefficient after recalibration; 2. Adjust the pipeline flow rate to make it normal or select a flow meter of appropriate specifications; 3. Recalibrate.
Display abnormal	The converter keys are in poor contact or the keys are locked.	Replace the display board.
After replacing the battery Crash	The power-on reset circuit is abnormal or the oscillation circuit does not vibrate.	Reinstall the battery (reinstall after 5 seconds of discharging).

Ⅶ、Packaging, transportation and storage

7.1 package

The flowmeter should be packed in a solid wooden box (medium and small caliber flowmeters can be packed in a carton when they are protected by foam). They should not move freely in the box. They should be handled with care.

7.2 transport

The transportation and storage conditions of the flowmeter should meet the requirements of GB/T 9329-1999《Basic Environmental Conditions and Test Methods for Transportation and Storage of Instruments and Meters》.

7.3 Store

The storage of the flowmeter should meet the following conditions:

1. Rain and moisture
2. Not subject to mechanical vibration or shock
3. Temperature range: 5℃～40℃
4. Relative humidity: not more than 90%
5. The environment does not contain corrosive gas

Appendix: RS485 communication protocol

Variable name	Register address	Register length	Instruction code	Data type
Instantaneous flow	0X01-0X02	0X02	0X04	Floating point
Instantaneous flow Unit	0X03	0X01	0X04	Integer
Total	0X04-0X07	0X04	0X04	Double precision
Total unit	0X08	0X01	0X04	Integer
Temperature	0X09-0X0a	0X02	0X04	Floating point
Pressure	0X0b-0X0c	0X02	0X04	Floating point
Total amount (the unit is m3 to allow writing, write 0 to clear the total amount)	0X0d-0X0e	0X02	0X03,0X04	Floating point
Continuous reading of floating-point numbers (32-bit floating-point numbers, low-order 16 bits first)				
Instantaneous flow	0X14-0X15	0X02	0X04	Floating point
Total flow	0X16-0X17	0X02	0X04	Floating point
Temperature	0X18-0X19	0X02	0X04	Floating point
Pressure	0X1a-0X1b	0X02	0X04	Floating point
Continuous reading of floating-point numbers (32-bit floating-point numbers,high-order 16 bits first)				
Instantaneous flow (40031-40032)	0X1e-0X1f	0X02	0X04	Inverted floating point
Total flow (40033-40034)	0X20-0X21	0X02	0X04	Inverted floating point
Temperature (40035-40036)	0X22-0X23	0X02	0X04	Inverted floating point
Pressure (40037-40038)	0X24-0X25	0X02	0X04	Inverted floating point

One of the above definitions can be selected, the latter two are continuous reading of multiple parameters, the first group can read all parameters

Unit definition

	Unit	Code	Unit	Code
Instantaneous flow	Nm^3/h	0X00	usg/h	0X09
	Nm^3/m	0X01	usg/m	0X0a
	Nm^3/s	0X02	usg/s	0X0b
	m^3/h	0X03	Kg/h	0X0c
	m^3/m	0X04	Kg/m	0X0d
	m^3/s	0X05	Kg/s	0X0e
	L/h	0X06	t/h	0X0f
	L/m	0X07	t/m	0X10
	L/s	0X08	t/s	0X11
Total flow	Nm^3	0X00		
	m^3	0X01		
	L	0X02		
	usg	0X03		
	kg	0X04		
Tempreture	t	0X05		