



Recorder



Flow



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Datasheet

Turbine Flowmeter

LWGY-SUP

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Datasheet**Turbine Flowmeter
LWGY-SUP**

The LWGY turbine flowmeter is connected to the converter through the flow sensor, which can realize multiple functions such as pulse output, current output, and local display. The flowmeter has the characteristics of high accuracy, wide measuring range, long life, simple operation and maintenance, etc. It can be widely used in food, medicine, petrochemical, metallurgy, paper making and other industries. It is an ideal instrument for flow measurement.

The flowmeter is suitable for liquids that do not corrode stainless steel 304, 430F, corundum (Al_2O_3), cemented carbide, etc., and are free of impurities such as fibers and particles.

If the user needs a special type of flowmeter, it can be supplied by agreement.

Working Principle

When the measured liquid flows through the flowmeter sensor, its internal impeller rotates with the help of liquid kinetic energy. At this time, the impeller blade causes the magnetic resistance in the detection device to change periodically. Therefore, an electric pulse signal proportional to the flow rate is induced at both ends of the detection coil, and is amplified by the preamplifier then sent to the display unit. The single chip microcomputer system in the display unit calculates according to the number of pulses measured and the meter coefficient K of the flowmeter, and displays the instantaneous flow rate and the accumulated total amount.

**Turbine Flow Meter**

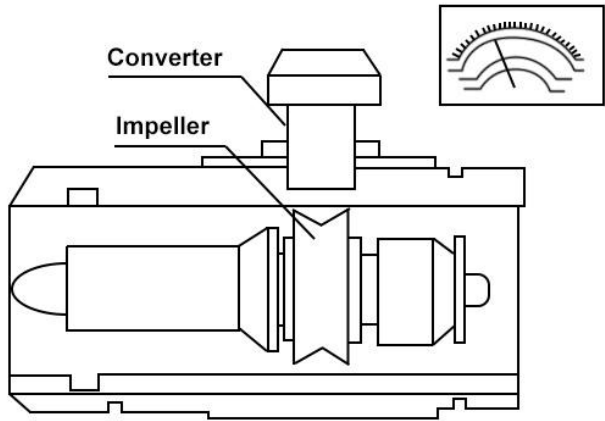


Figure 1

The relationship between the meter coefficient and instantaneous flow rate, frequency, pulse number, and the cumulative total is as follows:

$K=f/Q$ and $K=N/V$

where:

- f—flow signal frequency (Hz)
- Q—instantaneous flow rate (m³/s, or /L/s)
- N—number of pulses
- V—total volume (m³)
- K—meter coefficient (1/m³ or 1/L)

Parameters		
Input		
Measured variables	flow	
Nominal diameter	DN4 ~ DN200	
Flow range	See Table 2	
Range ratio	DN4~DN10	1:6
	DN15~DN200	1:10
Output		
Transmitter output	Output type	(4~20)mA
	Output accuracy	0.02%
	Output load	(0~750)Ω
Pulse output	Pulse width	Automatic or 10ms
	Pulse frequency	(1~2000) Hz
	Pulse coefficient	1~20000 1/L
Communication output	RS485	Modbus protocol

Power supply	
Power supply	DC: 12V, 24V Battery power supply: 3.6V lithium battery
Power consumption	12VDC power supply: maximum power consumption 0.15W 24VDC power supply: maximum power consumption 0.5 W Battery powered: Maximum current 0.8 mA
Electrical interface	M20*1.5 cable gland
Performance parameters	
Accuracy	Level 0.5/1.0
Repeatability	1/3 of the accuracy grade
Response time	20ms (5s meter head without display)
Protection level	IP65 (IP67, IP68 available upon negotiation, pulse head is IP00)
Process conditions	
Medium viscosity	Less than $5 \times 10^{-6} \text{ m}^2/\text{s}$ (For liquids with a flow rate greater than $5 \times 10^{-6} \text{ m}^2/\text{s}$, the flowmeter must be calibrated with standard solution before use)
Medium temperature	Regular model: (-20~ 80)°C High temperature: (-20~ 120)°C
Process pressure	See Table 2
Environmental conditions	
Operation	Temperature: (-20~60)°C RH: 5% to 90%
Storage	Temperature: (5-40) °C

Table 1 Flow range

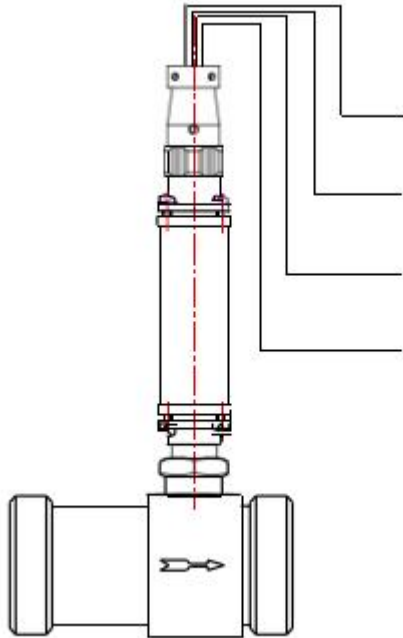
Diameter (mm)	Flow range (m^3/h)	Extended flow range (m^3/h)	Threaded connection pressure (MPa)	Flange connection pressure (MPa)	Clamp connection pressure (MPa)
4	0.04~0.24	—	6.3, 25, 32	—	
6	0.1~0.6	—			
10	0.2~1.2	—			
15	0.6~6	0.3~6	6.3, 32	—	1.6
20	0.8~8	0.4~8	6.3	—	—
25	1~10	0.5~10	6.3, 32	1.6, 2.5, 4.0	1.6
32	1.5~15	1~ 15	6.3	1.6, 2.5, 4.0	—
40	2~20	1~20	6.3	1.6, 2.5, 4.0	1.6
50	4~40	2~40	—	1.6, 2.5, 4.0	1.6
65	8~80	4~80		1.6, 2.5, 4.0	1.6
80	10~100	5~100		1.6, 2.5, 4.0	1.6
100	20~200	10~200		1.6, 2.5	1.6
150	30~300	15~300		1.6, 2.5	—
200	80~800	40~800		1.6	—

Wiring

(1) Connection of the sensor and the meter with local display

The connection between the flowmeter and the display instrument can be selected according to the power supply of the instrument.

Warning: When wiring the instrument, it must be operated after power off.



Red: power positive

Yellow: signal terminal

White: power negative

Shielding layer: ground wire

(2) Wiring Instructions for the Amplifier with Display Housing

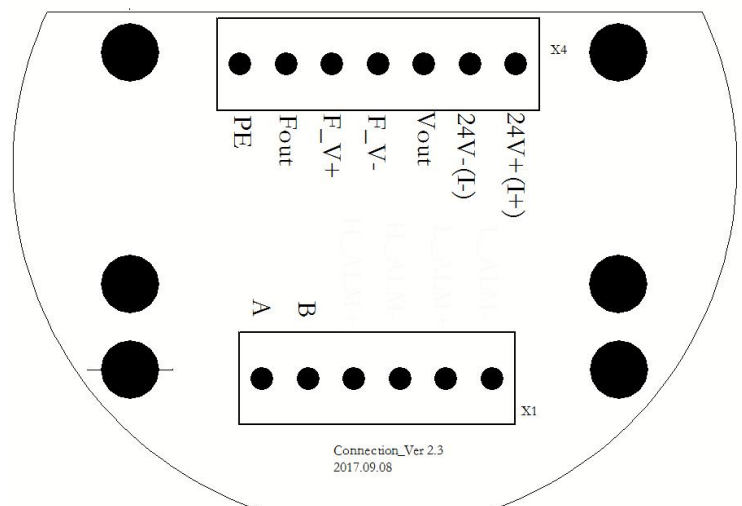
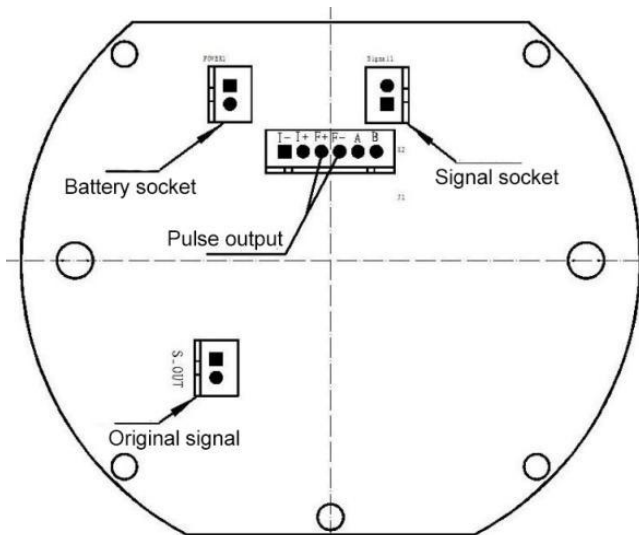
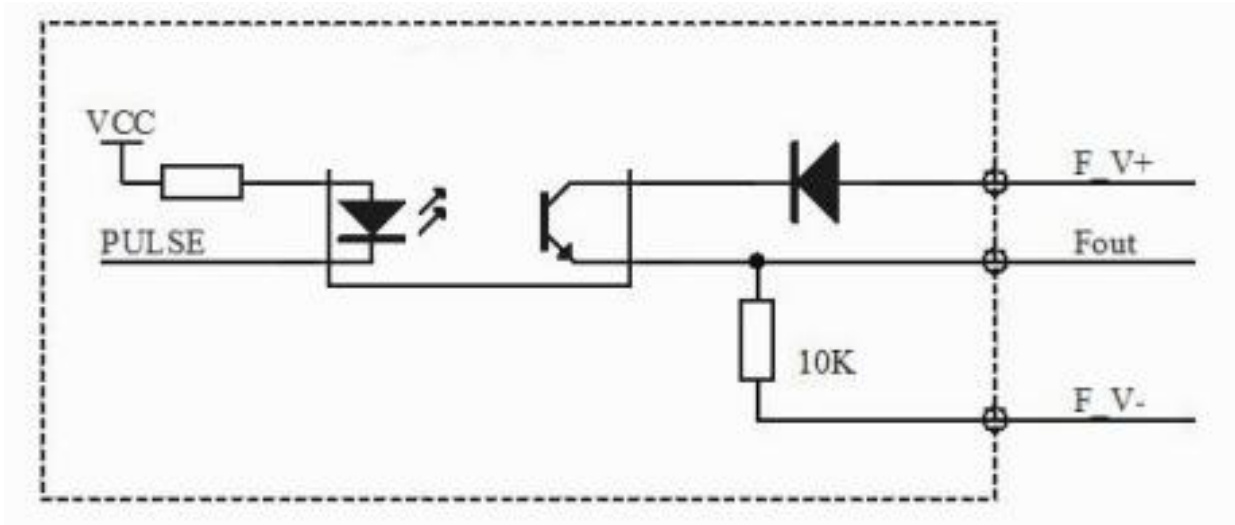


Table 4

24V+ (I+)	24V Power + (current +)
24V- (I-)	24V Power-(current -)
Vout	Voltage output+
F_V-	Pulse output power supply-
F_V+	Pulse output power supply+
Fout	Pulse output
FE	Ground
B	Modbus communication line B
A	Modbus communication line A

(3) Pulse output wiring diagram:



When there is no sampling resistance inside the system, F_V+ is connected to the positive pole of the power supply, F_V- is connected to the negative pole of the power supply, and Fout is connected to the pulse signal;

When there is a sampling resistor inside the system, F_V+ is connected to the positive pole of the power supply, Fout is connected to the pulse signal, and F_V- does not need to be connected.

note! The pulse signal power supply voltage range is DC5V~24V.

Battery replacement

Accumulatively powered on for two years, unconditionally replace the battery. If the meter does not display or displays abnormally within the battery lifespan, and the measured battery voltage is lower than 2.8V, you should immediately cut off the power supply and replace the battery, otherwise the circuit unit in the meter will be damaged.

When replacing the battery, pay attention to the polarity of the battery to be consistent with the battery box label, and not reverse it. Each time the cover is opened and then assembled, the front and back covers of the instrument should be tightened.

(4) Two-Wire Turbine Flowmeter without Display (4~20 mA Current Output Type)

Power supply: +24V DC

Output signal: 4~20mA current output

● Usage

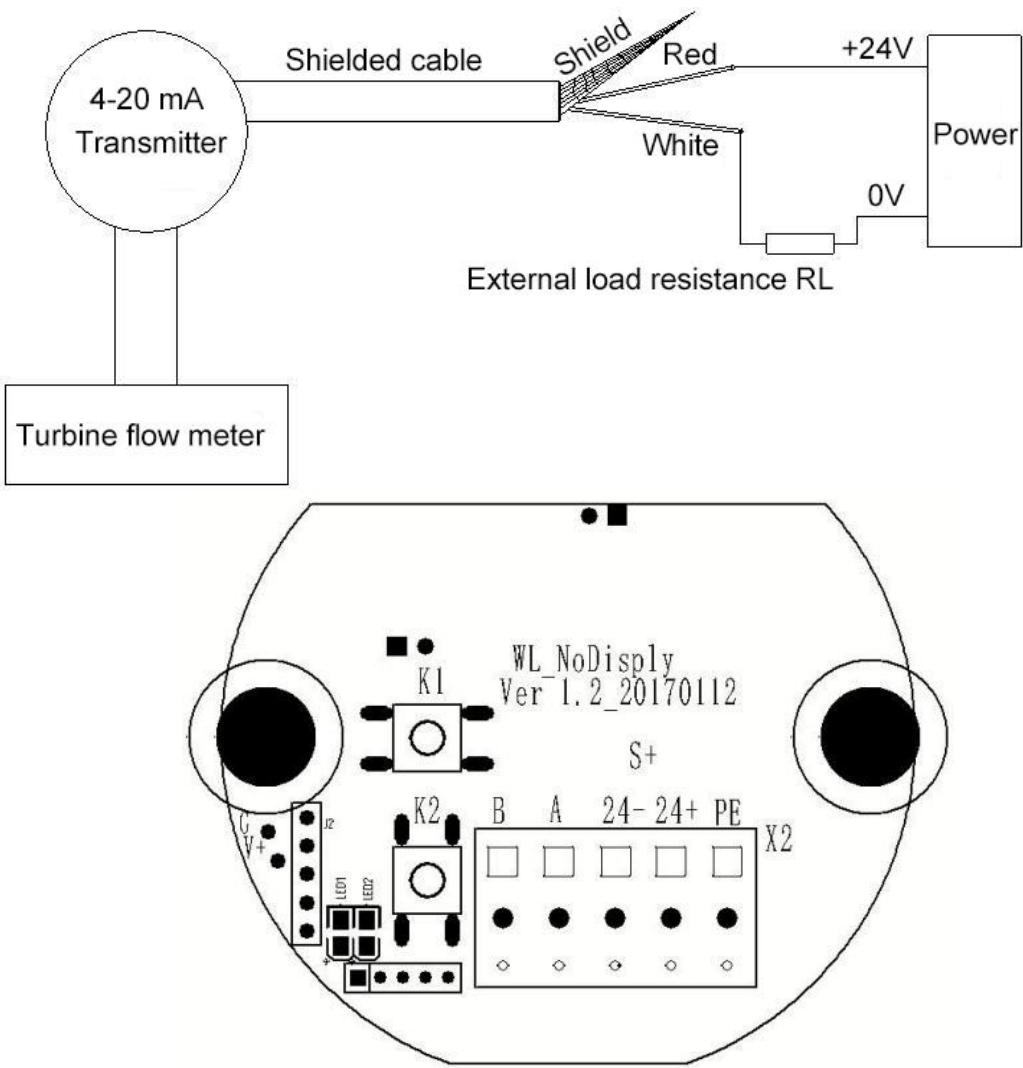
(1) The complete connection method of the flowmeter (see Figure 16).

(2) Schematic diagram of internal wiring (see Figure 17)

(3) Schematic diagram of fine adjustment of full-scale flow (see Figure 17)

Full scale fine-tuning button: press K1 and K2 at the same time, LED2 lights up to enter the adjustment mode and release the button, press K1 to increase the current, and press K2 to decrease the current. It will automatically exit the adjustment mode if there is no operation for 1 minute.

*Note: The current has been adjusted before the product is sold, please do not adjust it at will;



Schematic diagram of internal wiring diagram

PE	Ground
24+	24V power supply+
24-	24V power supply
A	485 Communication A
B	485 communication B

Dimension

(1) Pulse type structure and size

The flowmeter structure is divided into thread, flange and clamp connection according to the different connection modes of the sensor part. The specific structure is shown in Figure 1 to Figure 5.

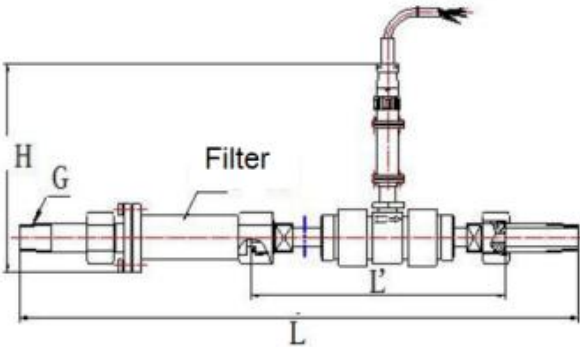


Fig.1 DN4~DN10 threaded connection flowmeter structure and installation dimensions

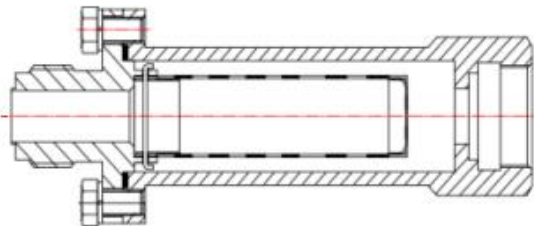


Fig.2 DN4~10 threaded connection turbine flowmeter filter

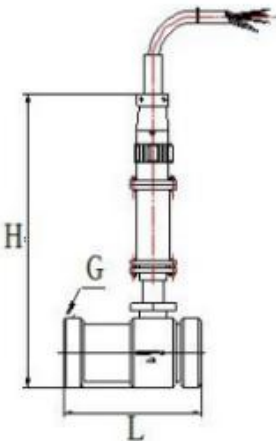


Fig.3 Threaded-connected flowmeter diagram

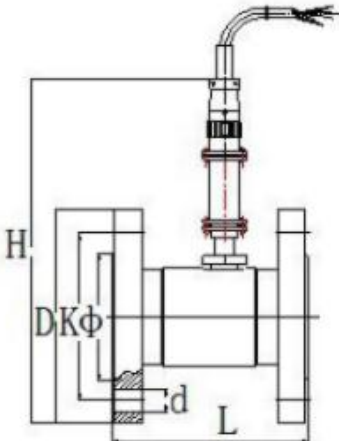


Fig.4 Flange-connected flowmeter diagram

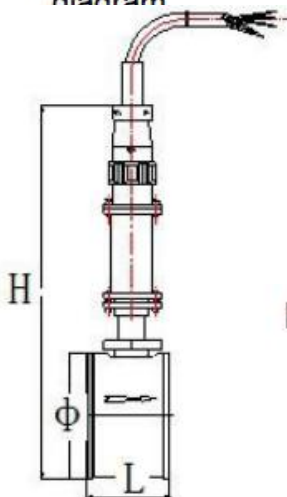


Fig.5 Clamp-connected flowmeter diagram

Table 2 Dimensions of pulse turbine flowmeter

Diameter (mm)	Connect Type	L (mm)	H (mm)	G	L' (mm)	D (mm)	K (mm)	n -d (mm)
4	thread	4 25	140	R3/8	225			
	flange	225	168			Φ90	Φ60	4- Φ14
	clamp	225	149			Φ50.5		
6	thread	425	141	R3/8	225			
	flange	225	169			Φ90	Φ60	4- Φ14
	clamp	225	150			Φ50.5		
10	thread	5 45	142	R3/8	345			
	flange	345	17 3			Φ90	Φ60	4- Φ14
	clamp	345	151			Φ50.5		
15	thread	75	14 5	G1				
	flange	75	175			Φ95	Φ65	4- Φ14
	clamp	75	153			Φ50.5		
20	thread	85	149	G1				
	flange	85	183			Φ105	Φ75	4- Φ14
	clamp	85	155			Φ50.5		
25	thread	100	15 5	G1 1/4				
	flange	100	190			Φ115	Φ85	4- Φ14
	clamp	100	159			Φ50.5		
32	thread	120	162	G1 1/2				
	flange	120	206			Φ140	Φ100	4- Φ18
	clamp	120	1 6 3			Φ50.5		
40	thread	140	170	G2				
	flange	140	215			Φ150	Φ110	4- Φ18
	clamp	140	173			Φ64		
50	thread	150	18 4	G2 1/2				
	flange	150	227			Φ 165	Φ125	4- Φ18
	clamp	150	18 4			Φ77.5		
65	thread	175	201	G3				
	flange	175	24 5			Φ185	Φ145	8- Φ18
	clamp	175	19 8			Φ91		
8 0	thread	200	211	G3 1/2				
	flange	200	261			Φ200	Φ160	8- Φ18
	clamp	200	215			Φ106		
100	flange	220	280			Φ220	Φ180	8- Φ18
	clamp	220	230			Φ 119		
150	flange	300	337			Φ285	Φ240	8- Φ22
200	flange	360	391			Φ340	Φ295	12-Φ22

(2) The dimension and structure of the Flowmeter with local display

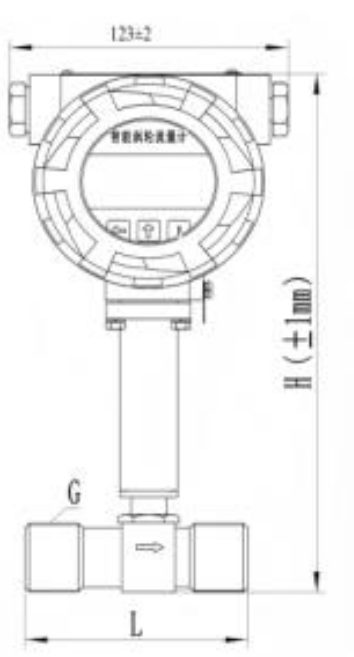


Fig.6 Threaded-connected flowmeter diagram

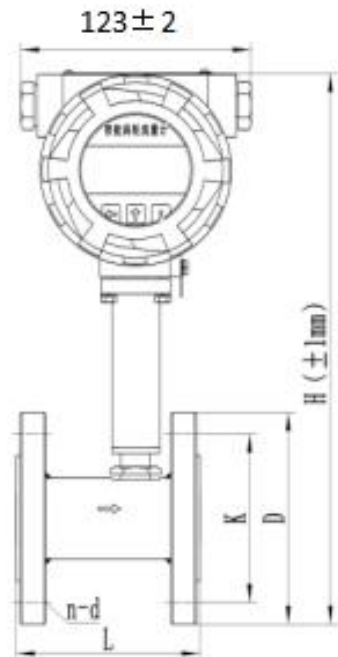


Fig.7 Flange-connected flowmeter diagram

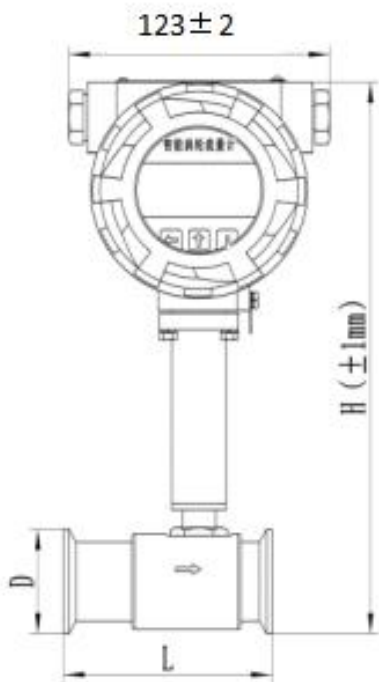


Fig.8 Clamp-connected flowmeter

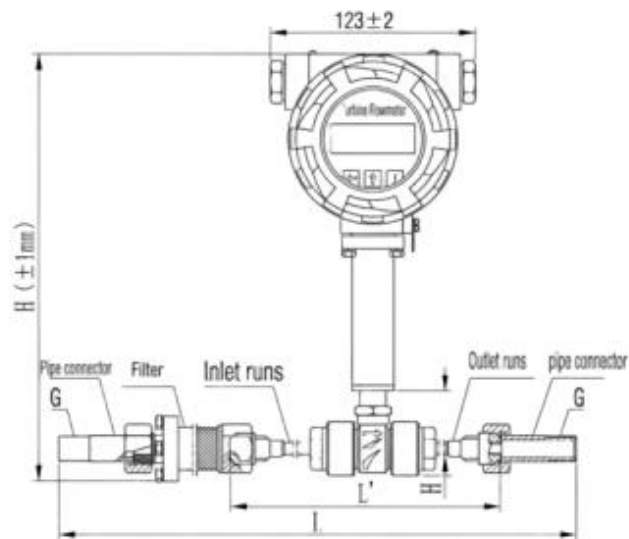


Fig.10 Diagram of DN4~DN10 threaded connection turbine flowmeter

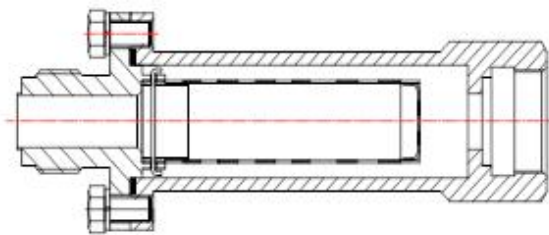


Fig.9 Diagram of DN4~ DN10 threaded connection flowmeter filter

Table 3 Dimensions of turbine flowmeter with display

Diameter (mm)	Connect Type	L (mm)	H (mm)	G	L' (mm)	D (mm)	K (mm)	n -d (mm)
4	thread	4 25	208	R3/8	225			
	flange	225	236			Φ90	Φ60	4- Φ14
	clamp	225	217			Φ50.5		
6	thread	4 25	209	R3/8	225			
	flange	225	237			Φ90	Φ60	4- Φ14
	clamp	225	218			Φ50.5		
10	thread	5 45	210	R3/8	345			
	flange	345	238			Φ90	Φ60	4- Φ14
	clamp	345	219			Φ50.5		
15	thread	75	214	G1				
	flange	75	243			Φ95	Φ65	4- Φ14
	clamp	75	221			Φ50.5		
20	thread	85	217	G1				
	flange	85	251			Φ105	Φ75	4- Φ14
	clamp	85	223			Φ50.5		
25	thread	100	222	G1 1/4				
	flange	100	258			Φ115	Φ85	4- Φ14
	clamp	100	22 6			Φ50.5		
32	thread	120	230	G1 1/2				
	flange	120	274			Φ140	Φ100	4- Φ18
	clamp	120	231			Φ50.5		
40	thread	140	238	G2				
	flange	140	283			Φ150	Φ110	4- Φ18
	clamp	140	241			Φ64		

Diameter (mm)	Connect Type	L (mm)	H (mm)	G	L' (mm)	D (mm)	K (mm)	n -d (mm)
50	thread	150	252	G2 1/2				
	flange	150	295			Φ 165	Φ125	4- Φ18
	clamp	150	251			Φ77.5		
65	thread	175	269	G3				
	flange	175	312			Φ185	Φ145	8- Φ18
	clamp	175	26 6			Φ91		
80	thread	200	279	G3 1/2				
	flange	200	329			Φ200	Φ160	8- Φ18
	clamp	200	282			Φ106		
100	flange	220	350			Φ220	Φ180	8- Φ18
	clamp	220	298			Φ 119		
150	flange	300	405			Φ285	Φ240	8- Φ22
200	flange	360	458			Φ340	Φ295	12- Φ22

(3) Structure and size of the flowmeter without display

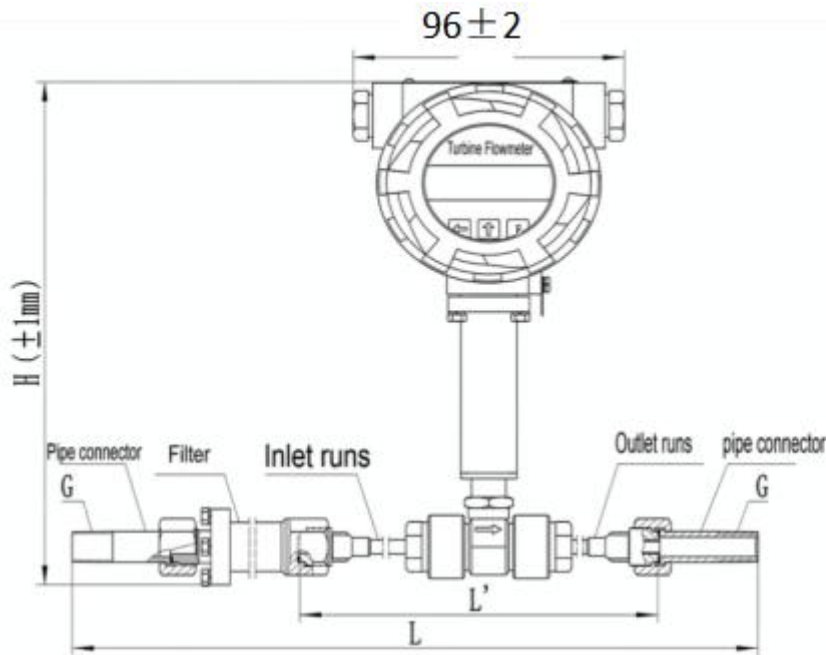


Fig. 11 Diagram of DN4~DN10 threaded connection turbine flowmeter

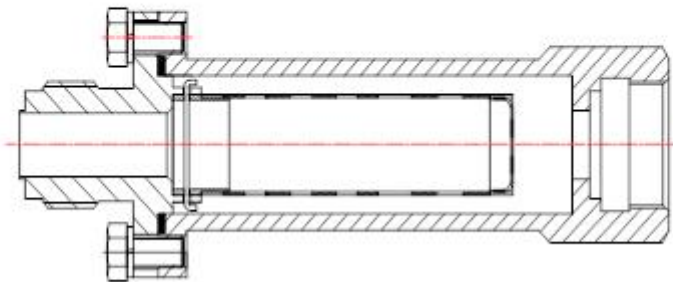


Fig. 12 Diagram of DN4~10 threaded connection turbine flowmeter filter

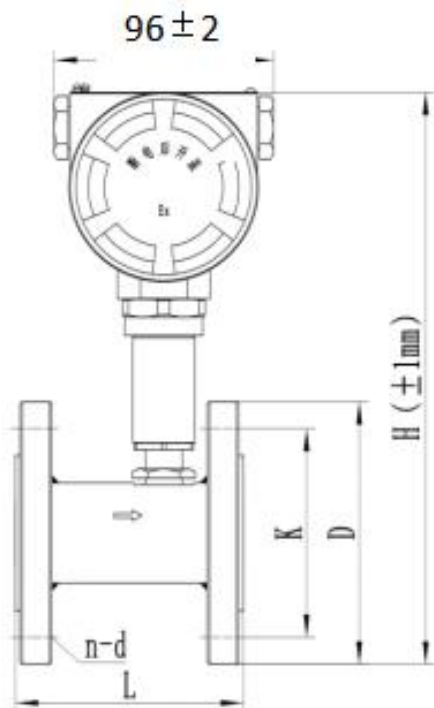


Fig. 13 Flange-connected flowmeter diagram



Fig. 14 Threaded-connected flowmeter diagram

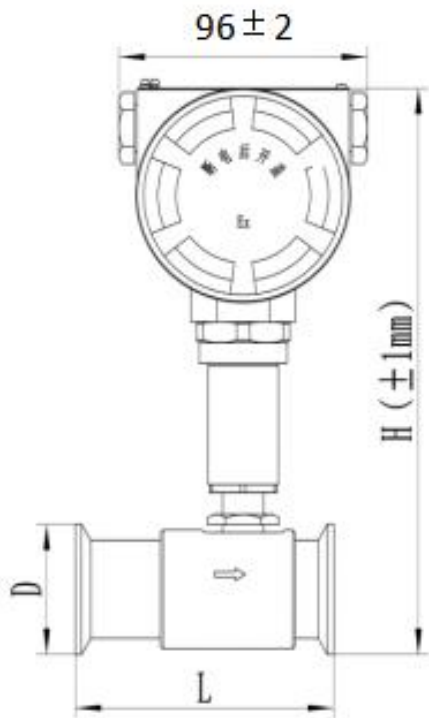


Figure 14 Diagram of clamp-connected turbine flowmeter

Table 4 Dimensions of turbine flowmeter without display

Diameter (mm)	Connect Type	L (mm)	H (mm)	G	L' (mm)	D (mm)	K (mm)	n -d (mm)
4	thread	425	203	R3/8	225			
	flange	225	231			Φ90	Φ60	4- Φ14
	clamp	225	212			Φ50.5		
6	thread	4 25	204	R3/8	225			
	flange	225	232			Φ90	Φ60	4- Φ14
	clamp	225	213			Φ50.5		
10	thread	5 45	205	R3/8	345			
	flange	345	233			Φ90	Φ60	4- Φ14
	clamp	345	21 2			Φ50.5		
15	thread	75	20 6	G1				
	flange	75	238			Φ95	Φ65	4- Φ14
	clamp	75	216			Φ50.5		
20	thread	85	21 0	G1				
	flange	85	24 4			Φ105	Φ75	4- Φ14
	clamp	85	218			Φ50.5		
25	thread	100	217	G1 1/4				
	flange	100	253			Φ115	Φ85	4- Φ14
	clamp	100	222			Φ50.5		
32	thread	120	225	G1 1/2				
	flange	120	269			Φ140	Φ100	4- Φ18
	clamp	120	2 25			Φ50.5		
40	thread	140	23 1	G2				
	flange	140	275			Φ150	Φ110	4- Φ18
	clamp	140	23 4			Φ64		
50	thread	150	244	G2 1/2				
	flange	150	290			Φ 165	Φ125	4- Φ18
	clamp	150	246			Φ77.5		
65	thread	175	264	G3				
	flange	175	3 07			Φ185	Φ145	8- Φ18
	clamp	175	2 60			Φ91		
80	thread	200	274	G3 1/2				
	flange	200	324			Φ200	Φ160	8- Φ18
	clamp	200	275			Φ106		
100	flange	220	340			Φ220	Φ180	8- Φ18
	clamp	220	293			Φ 119		
150	flange	300	398			Φ285	Φ240	8- Φ22
200	flange	360	450			Φ340	Φ295	12-Φ22

(4) Process connection

Flange connection: GB/T9124.1-2019

Threaded connection: British G thread

Clamp connection: ISO 2852-1993

(5) Material

Sensor and process connection: 304SS / 316LSS

Impeller: 430F stainless steel / Duplex steel 2205

Ordering code

SUP-FLC240 -04-B0-TG-M7-1-K0-WG-T1-PC										Description
Nominal diameter	04									DN4(1/16")
	06									DN6(1/8")
	10									DN10(3/8")
	15									DN15(1/2")
	20									DN20(3/4")
	25									DN25 (1 ")
	32									DN32(1.25")
	40									DN40(1.5")
	50									DN50 (2 ")
	65									DN65(2.5")
	80									DN80 (3 ")
	1C									DN100 (4 ")
	1E									DN125 (5 ")
	1G									DN150 (6 ")
	2C									DN200 (8 ")
Process connection	B0									G thread
	G2									GB/T9119 PN40
	G1									GB/T9119 PN16
	I0									ISO2852 Clamp
	XX									Others

Process connection material and body material	M1						304SS
Heat resistance temperature	TH						-20-120℃
	X						Others
Impeller material		NT					430FSS
		MD					Duplex steel 2205
Measurement range and accuracy			3				Standard range, Class 0.5
			2				Extended range, Class 1.0
Output, display and power supply					K0		Pulse, no display, 24VDC
					A0		Two-wire 4-20mA, no display
					S1		No output, display, battery powered
					K1		Pulse, Display, 24VDC
					A1		Two-wire 4-20mA, display
					R1		RS485, Display, 24VDC
					XX		Others
Electrical interface, shell material and protection level					WG		M20 × 1.5 cable gland, aluminum, IP65
					WF		Aviation Plug, IP00
Accessories						PC	Paired flange 304SS