



**2024
PRODUCT
INTRODUCTION**

Liquid Turbine Flowmeter

Company Profile

Weifang AOBO Instrument Technology Development Co., Ltd., founded in 2002, with registration capital of 10 million RMB, is a "High-Tech" and "Double-Software Certification" enterprise specialized in "flow measurement and intelligent measurement & control" industry, integrating R&D, production, sales and service.

The company has a core R&D team for computer software and technology, automatic intelligent control, HVAC engineering design and flow measurement. It has the ability to provide customers with specific solutions and complete sets of products according to their different needs, based on years of practical experience. Especially in the heating industry, by the customer's recognition, has a high reputation in the industry.

The products are mainly used in the measurement and control of "steam, liquid, gas, sewage and tap water"; and especially suitable for energy monitoring and energy-saving control in many industries, such as thermal power plants, thermal companies, residential heating, petroleum, chemical industry, papermaking, food, coating, printing & dyeing and HVAC.

Since its foundation, based on self-developed and leading technology, reliable quality, high-quality service and good reputation, our company has been warmly accepted by customers, and become a designated supplier for many central enterprises and listed companies.

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I. Product Overview

The liquid turbine flowmeter is a speed-type instrument, which has the advantages of simple structure, small volume, high accuracy, sensitive reaction and convenient installation and maintenance. It is used for measuring volume flow and accumulation of low

viscosity, non-corrosive and clean liquids in closed pipes. If it is matched with the display instrument with special functions, it can also carry out quantitative control, over-limit alarm and so on. It is an ideal instrument for flow measurement and energy saving.

It can be widely used in petroleum, chemical industry, metallurgy, organic liquid, inorganic liquid, liquefied gas, urban gas pipe network, pharmaceutical, food, paper making and other industries.



A model

B model

II. Product Characteristics

(1) High precision, generally up to $\pm 1\%R$, $\pm 0.5\%R$, and high precision type up to $\pm 0.2\%R$;

(2) It has good repeatability and short-term repeatability can reach 0.05% -0.2%. It is due to good repeatability, normal calibration or online calibration can get extremely high accuracy, which is the preferred flowmeter in trade settlement;

(3) It outputs a 4-20mA signal and it can be connected with DCS to achieve intelligent control;

(4) It outputs pulse frequency signal, and it is suitable for total measurement and connection with the computer, without zero drift and strong anti-interference ability;

(5) Original pulse frequency range (10Hz-1.5KHz), with strong signal resolution;

(6) The range ratio is wide and the maximum range ratio reaches 1:20;

(7) Compact and light structure, convenient installation and maintenance and large circulation capacity;

(8) It is applicable to high pressure measurement and we do not have to open a hole on the sensor meter body. It is easy to make high pressure type instruments.

III. Operational Principle

Fig.1 shows a brief diagram of the liquid turbine flowsensor structure. It is shown from the figure, when the measured liquid flows through the sensor, the impeller is rotated by the liquid. Its rotational speed is proportional to the pipeline average flow speed and the rotation of the impeller periodically changes the magnetoresistance value of the magnetoelectric converter. The magnetic flux in the detection coil changes periodically, producing a periodic induction potential, that is, the electric pulse signal and it is sent to the display instrument after amplification.

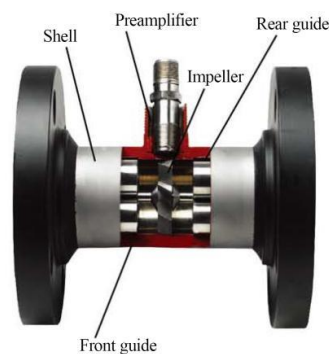


Figure 1

IV. Technical Parameter(s)

Measured medium	No impurities, low viscosity, no strong corrosive liquid		
Instrument caliber and connection mode	Thread connection for 4, 6, 10, 15, 20, 25, 32 and 40 Integrated flange or clamping flange connection for (15, 20, 25, 32, 40) 50, 65, 80, 100, 125, 150, 200		
Accuracy grade	Pipe-segment type: 1.5%, 1%, 0.5%, 0.2% (specially made)		
Range ratio	1:10-1:20		
Verification conditions	Verification device	Liquid flow verification device based on master meter method	
		Liquid flow verification device based on static mass method	
	Ambient conditions	Ambient temperature	20

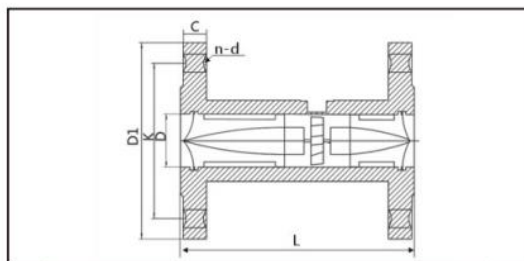
		Relative humidity	65%	
Verification conditions	Medium temperature	T1(General, standard)	-20℃ ~ +80℃	
		T2(high-temperature type, custom-made)	-20℃ ~ +120℃	
		T2(high-temperature type, custom-made)	-20℃ ~ +150℃	
	Ambient temperature	-20℃ ~ +60℃	Relative humidity	5%-90%
	Atmospheric pressure	86KPa~106KPa		

V. Caliber-Flow Comparison Table

Caliber (mm)	Regular flow range (m ³ /h)	Extended flow range (m ³ /h)
	Pipe-segment type	Pipe-segment type
DN4	0.04-0.25	0.04-0.4
DN6	0.1-0.6	0.06-0.6
DN8	0.15-0.9	0.1-1
DN10	0.2-1.2	0.15-1.5
DN15	0.6-6	0.4-8
DN20	0.8-8	0.45-9
DN25	1-10	0.5-10
DN32	1.5-15	0.8-15
DN40	2-20	1-20
DN50	4-40	2-40
DN65	7-70	4-70
DN80	10-100	5-100
DN100	20-200	10-200
DN125	25-250	13-250
DN150	30-300	15-300
DN200	80-800	40-800

VI. Installation

6.1 Installation mode



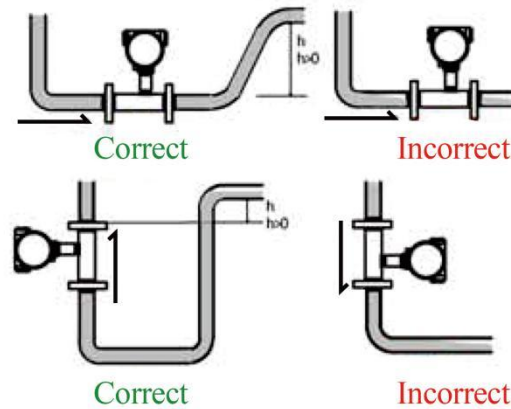
6.2 Overall dimensions

Nominal diameter DN(mm)	1.6MPa, Flange outer diameter D1	Flange connection				Body length L
		Centre distance K	Hole diameter d	Number of holes n	Thickness C	
4						225
6						225
8						345
10						345
15	95	65	14	4	14	75
20	105	75	14	4	16	85
25	115	85	14	4	16	100
32	140	100	18	4	18	120
40	150	110	18	4	18	140
50	165	125	18	4	20	150
65	185	145	18	4	20	175
80	200	160	18	8	20	200
100	220	180	18	8	22	220
125	250	210	18	8	22	250
150	285	240	22	8	24	300
200	340	295	22	12	26	360

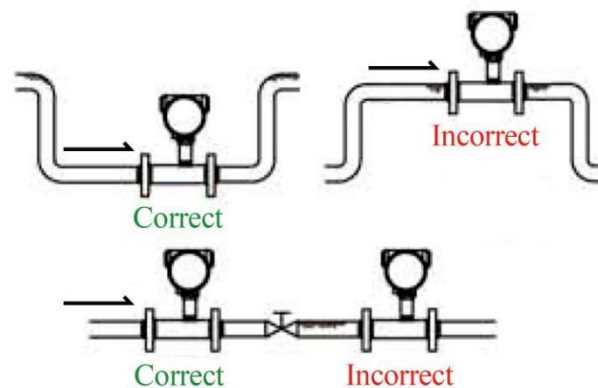
6.3 Installation Precautions

1. Installation conditions and location

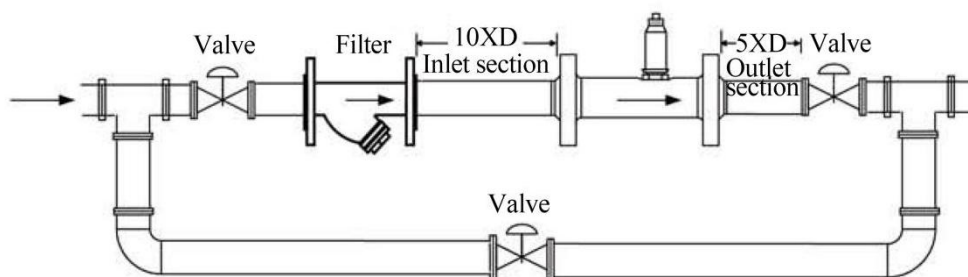
(1) The pipe must be fully filled with liquid. It is important to keep the pipe completely full of liquid at any time, otherwise the flow display will be affected and it may cause measurement errors.



(2) Avoid air bubbles. If there are air bubbles entering the measurement pipe, the flow display may be affected and it may lead to the measurement errors.



2. Installation site and requirements



(1) Sensors shall be installed in a place for easy maintenance, no vibration, strong electromagnetic interference and thermal radiation.

(2) Horizontal sensor installation requires that the pipeline shall not be visually tilted (generally within 5°), and the vertical deviation of vertical installation sensor pipeline shall be less than 5° . In places that cannot stop flow, bypass pipe and reliable stop valve should be

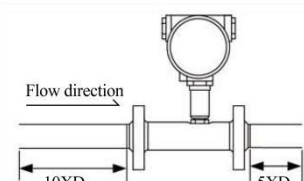
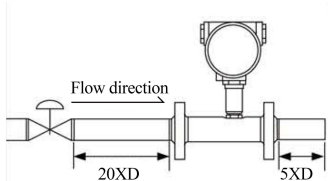
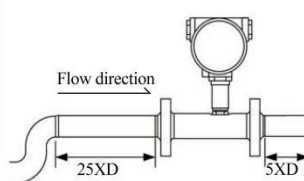
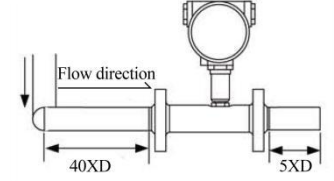
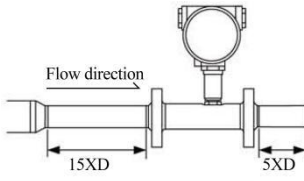
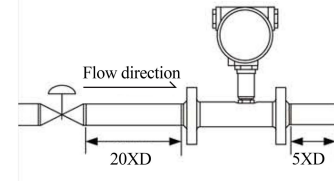
installed (see above) to ensure no leakage.

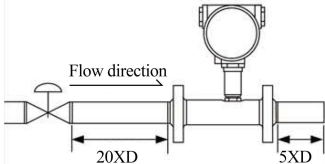
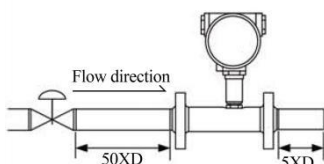
(3) Connect a section of short pipe to replace the sensor at the position of the newly laid pipe to install the sensor. After the "pigging" is completed, confirm that the pipeline is cleaned and then formally connect the sensor.

(4) If the fluid contains impurities, the filter shall be installed upstream of the sensor and the pipe shall be regularly cleaned up; if the measured liquid contains gas, the silencer shall be installed on the upstream side of the sensor. The drain outlets and air outlets of filters and silencers shall lead to safe places.

(5) When the sensor is installed outdoors, measures should be taken to prevent direct sunlight and prevent rain.

3. Intelligent liquid turbine flowmeter for straight pipe section length is sensitive to flow velocity distribution distortion and rotation flow in the pipeline, and the liquid flowing into the sensor shall be the fully developed turbulence. Therefore, it is required to provide the necessary straight pipe section or rectifier according to the baffle type in the upstream side of sensor, and the straight pipe section lengths for inlet and outlet sections are required.

Baffle type for inlet section	Installation conditions		Baffle type for inlet section	Installation conditions	
	Inlet section	Outlet section		Inlet section	Outlet section
Ordinary circumstances			90-degree bend		
Two 90-degree bends in the same plane			Two 90-degree bends in different planes		
Pipe-contracting			Pipe-expanding		

Full-open valve		Semi-open valve	
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4. Examples for installation dimensions

The dimension shown is the minimum required straight pipe section installation length for accuracy, and it is improved if the length of the straight pipe section is doubled.

Upstream: the allowable minimum straight pipe section length is at least 10 times of the pipe diameter.

For example, the ABDT-LWGY-50, upstream straight pipe section length is at least 500mm and the desired upstream straight section length shall be 1,000mm.

Downstream: the minimum allowable straight pipe segment length is at least 5 times of the pipe diameter.

For example, the ABDT-LWGY-50, downstream straight pipe segment length is at least 250mm. The desired length of the downstream straight pipe segment shall be 500mm.

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