



instrument

**2024
PRODUCT
INTRODUCTION**

Portable Ultrasonic Flowmeter



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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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All of the catalogue and company information can be found at:

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I. Product Overview

ABDT-LCT-B series ultrasonic flowmeter is a general time difference ultrasonic liquid flowmeter designed by using VLSI and low-voltage wide pulse emission technology. It is suitable for continuous measurement of homogeneous liquid without high concentration suspended particles or gas in industrial environment.



II. Function Characteristics

- 1) Hardware modular design, easy production and maintenance operation;
- 2) Built in 4M byte data recorder and record 200000 lines of timing output or real-time printing data;
- 3) Electrical isolation RS485 interface, including more than 10 kinds of communication protocols such as MODBUS, M-BUS and FUJI;
- 4) Electrical isolation 0~20mA or 4~20mA current loop output, optional loop power supply mode (two-wire system);
- 5) Optional HART Protocol;
- 6) Heat measurement function in accordance with CJ128 national heat meter standard;
- 7) 8~36VDC, 8-30VAC, 85-264VAC power supply mode is optional;
- 8) It has the functions of manual accumulator and batch controller;
- 9) The cumulative recording function of month, year and day; and record the cumulative flow, cumulative heat and other data in the first 512 days (every day) and the first 128 months (every month);
- 10) Record and review the power-off time and other data of the previous 32 times;
- 11) The interval can be set from 1 second to 24 hours. There are up to 22 outputs;
- 12) Three analog inputs with accuracy of 0.1%.

Please know the working power supply and model of the product before use to prevent

abnormal operation or damage caused by misconnection.

III. Technical Parameters

Suitable for online calibration and inspection measurement of liquid flow in industrial sites. It has the characteristics of simple operation, high measurement accuracy, good consistency, online printing, and long battery power supply time.

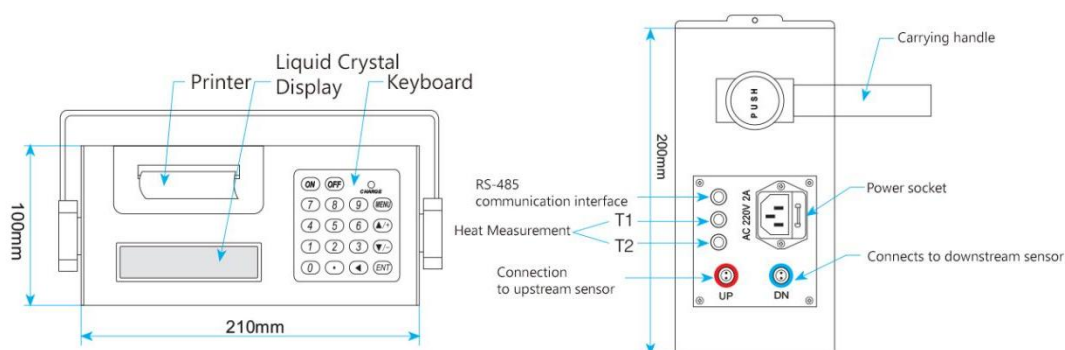
- Accuracy: better than 1%
- Repeatability: better than 0.2%.
- Power supply: AC220V(Standard), AC110V(Optional)
- Measurement cycle: 500ms (2 times/second, collecting 128 sets of data/cycle)
- Battery: Built-in nickel hydrogen rechargeable battery can work continuously for 24 hours;
- Installation method: external installation
- Display: 2×10 Chinese/English character backlight display (instantaneous flow, cumulative flow, signal status, etc.)
- Signal output: isolated RS485
- Communication protocol: MODBUS protocol, FUJI extension protocol, compatible with communication protocols of similar products from other domestic manufacturers
- Print output: Built in thermal integrated printer for real-time or timed printing
- Other functions: self diagnosis, indicating whether the current working state is normal
- Optional sensors: external sensors with plug and play interfaces

IV. Outline Dimensions and Wiring Diagram

Physical image



Outline dimensions and wiring diagram



V. Clamp on Type Transducer

Before installation, choose density pipe to install transducers, and clean the installation area, clear away rust, paint, anti-rust layer, it is the best to use angle grinder to polish, use cleaning cloth with alcohol or acetone to clear oil and dust, coat enough couplant around the center of installation area, attach the transducers on the pipe and fix it without air bubbles or sand between transducers and pipe wall.



S2-type transducer M2-type transducer L2-type transducer

Transducer	S2 type	M2 type	L2 type
Work frequency	1MHz		
Suitable pipe diameter(mm)	DN15-DN100	DN50-DN700	DN300-DN6000
Outer size	50*30*29mm	100*40*35mm	120*55*45mm
quality	175g	259g	535g

VI. Installation Condition

The following steps are generally followed for installing the flow sensor:

1.choosing measurement point;

2.Select the appropriate installation method according to the site conditions or the type of sensor purchased;

- Type selection of insertion type flow sensor: insertion type B; Installation method: Z method

- External clamp flow sensor: the sensor type has been set before delivery, and other parameters such as "outer diameter, wall thickness and installation mode" are set according to the site conditions.

3.Enter the pipe parameters and calculate the installation distance between the two flow sensors;

4.Field mounted sensors;

5.Signal check.

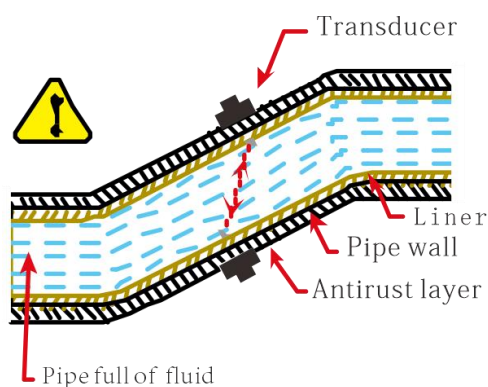
Choosing measurement point:

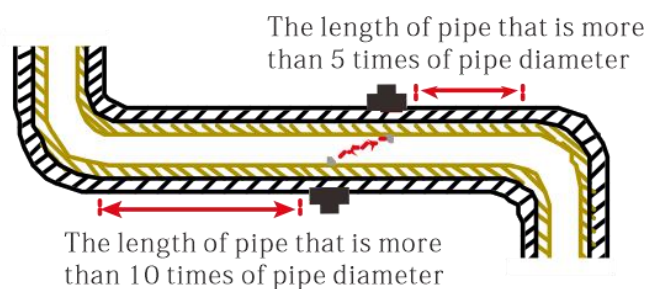
To ensure measurement accuracy and stability,the installation point of transducers should be on the straight pipe full of well distributed fluid(when installing,the pipe must be full of liquid).

Following principle:

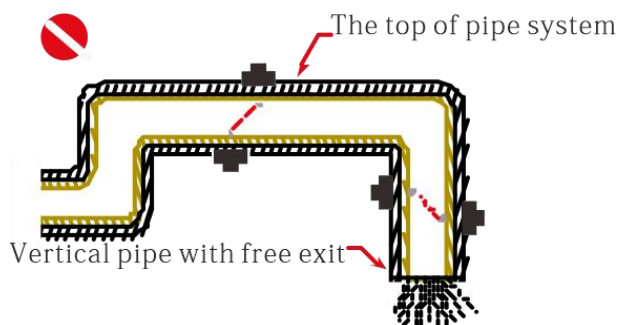
1.Pipe must be full of liquid that is uniform and easy to travel the ultrasonic beam(vertical pipe or horizontal pipe)

2.Upstream transducer should be installed at the place where the upstream length of the straight pipe is at least $10D$ and the downstream length is at least $5D$ where install the downstream transducer,so the pipe length should be straight without any valve,pump,angle head, D stands for pipe outside diameter. The installation point should stay away from valves,pump,high pressure current,transformers interference source etc.

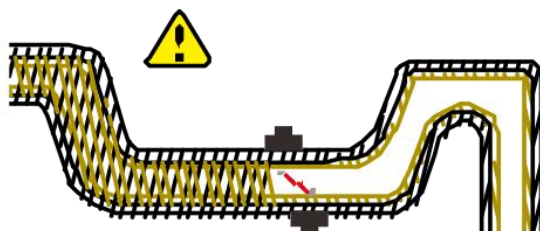




3. Avoid to install on the highest point of pipe system or vertical pipe with free exit (flow down)



4. For the opened pipe or half full pipe, the transducers should be installed on U type pipe.



5. The two transducers must be installed in horizontal direction to pipe axis plane, within $\pm 45^\circ$ of axis line horizontal plane, to prevent bubbles or not full in upper pipe or sediment in down side of pipe to influence transducer measurement normally. If there is space limit of installation that could not install horizontal symmetry, then install the transducers vertically or dip angle under the condition of no bubbles in upper parts of pipe.

Clamp on type transducer installation method

Before installation, choose density pipe to install transducers, and clean the installation area, clear away rust, paint, anti-rust layer, it is the best to use angle grinder to polish, use cleaning cloth with alcohol or acetone to clear oil and dust, coat enough couplant around the center of installation area, attach the transducers on the pipe and fix it without air bubbles or sand between transducers and pipe wall.



Remarks: users input transducers parameters by yourself.

1. Installation space

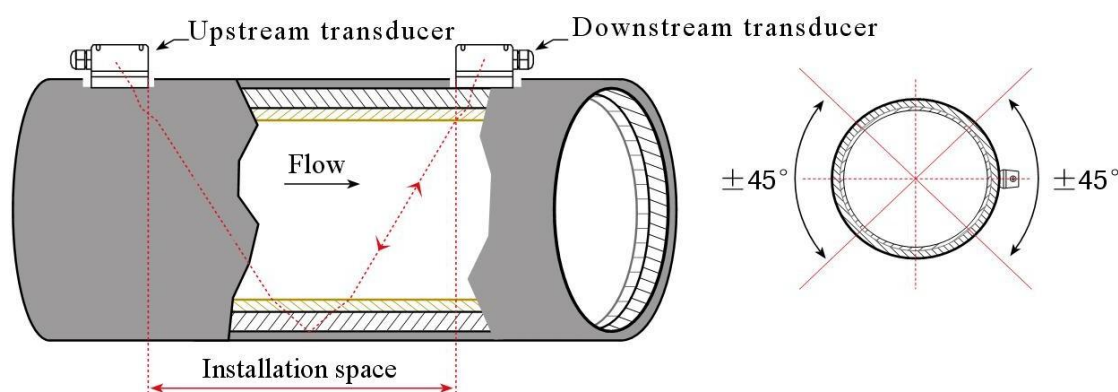
Installation space of clamp on type transducer is inner edge distance of the two transducers(face to face),after inputting the required parameters in Menu,check the display on M25,that is the installation space.

2. Installation method

The method has 4 kinds: V method,Z method, N method and W methods.

V method(suitable to the pipe diameters within the range DN15-DN200mm)

Normally, V method is standard installation method, convenient to use with precise measurement,when installation,the two transducers horizontally align,its centre line is horizontal with pipe axis line.



Z method (the most commonly used method)

When the pipe diameter is wide,or there are suspended matters in fluid,too thick scaling or liner inside pipe inner wall,that can make the flow meter can not work normally and signal poor by using V method installation,so need to use Z method to install,its features are direct transferring without reflection(called single sound path),little signal attenuation.

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