



Handbook

ABDT-LI120A

Portable Velocity Meter

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Manual of ABDT-LI120A portable velocity meter

The ABDT-LI120A-type portable flow velocity meter (portable velocity meter for short) is specially developed for open channel velocity and flow measurement in the field by hydrological stations, factories and mines, environmental protection monitoring stations, farmland drainage and irrigation, rivers, currents, channels, lakes, hydrogeological surveys and other departments.

Portable velocity meter is mainly composed of LI120A-type propeller flow speed sensor and LS-A flow rate meter and measuring rod. The full set of instruments is placed in the advanced aluminum alloy password box. When using, assemble the assembly as shown in Figure 1, connect the signal line, and measure the flow rate in each open channel, and automatically display the flow rate.

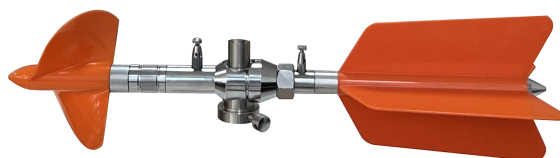


Fig.1 The installation diagram of the portable velocity meter

The instrument has simple structure, light and convenient, low power consumption, complete functions, high degree of automation, stability and reliability. It meets the national open channel flow measurement standard and is equipped with 60 degree high temperature propeller. It is a new portable flow velocity measurement instrument in China.

I. Technical Requirements

Formula: $V = \frac{KN}{T} + C$ (m/s) (automatically calculate)

No.: _____, K: _____, C: _____

Paddle structure: spiral curved double blade, left spin, PC plastic;

Rotating diameter of propeller D: 120mm

Propeller hydraulic pitch B: 200-250mm

Starting speed of instrument $V_0: \leq 0.03\text{m/s}$

Critical speed of verification curve V_k : about 0.13m/s (starting point of linear formula)

Flow rate measurement range V: 0.03 ~ 10m/s

Signal component structure: magnetic steel reed electronic switch

Each signal Revolution: 20 revolutions

Relative error of verification curve E: when $V \geq V_k$, $E < 1.5$; When $V < V_k$, $E < \pm 3\%$

Switch contact capacity: current $\leq 50\text{mA}$, voltage $\leq 6\text{V}$

Dry reed working life: 70million times

Instrument continuous working time: 40 hours (suspended sediment concentration $\leq 50\text{kg/m}^3$, flow rate $\leq 5\text{m/s}$, water depth $\leq 10\text{m}$)

Instrument working flow conditions water depth range: 0.2~50m

Water temperature: 0~40 °C

Suspended sediment concentration: $\leq 100\text{kg/m}^3$ salinity: $\leq 2\text{g/l}$

Display screen: 4 × 16 bit LCD

Measurement mode: pole positioning measurement (also cable suspension positioning measurement).

Power supply: DC8.4V (rechargeable battery), which can work continuously for more than 40 hours after full charge.

II. Measuring Principle

This instrument is designed according to the principle of velocity area method of open channel flow measurement. The measured velocity can obtain the flow $Q = V \cdot S$ (S is the cross-sectional area)

2.1 Flow rate measurement

When measuring the flow rate, the propeller rotor current meter is driven by water to rotate, and the built-in signal device generates the revolution signal. The flow rate is calculated by the following formula:

$$V = \frac{KN}{T} + C \text{ (m/s)}$$

Where:

V: Average flow rate during flow measurement period (m/s)

K: Hydraulic pitch of blade

C: Current meter constant

T: Flow measurement duration (unit: s)

N: Number of signals in T period

When this instrument is used, K and C are constants. When measuring flow, as long as T and N are measured, the flow rate can be calculated.

2.2 Calculation of flow

Flow measurement according to the velocity area method of open channel flow measurement, the flow is obtained by measuring the velocity and multiplying it by the cross-sectional area.

III. Operation

When using, plug in the plug and turn it on, unplug it and turn it off. The power supply of the instrument can be powered on to display the parameters of the current meter selected during the last shutdown. The parameter setting is shown in the figure: if the parameters are the same, you can enter the flow measurement.

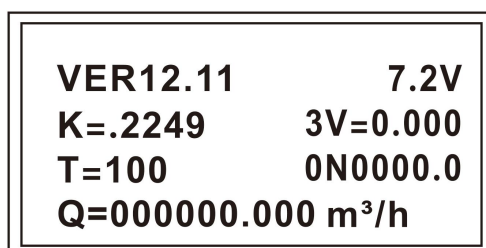


Fig.2 Measuring display

VER -- Version number

7.2V --Battery voltage

K -- Certificate b value

3 --Automatic measurement interval

T -- Automatic measurement time

V --Display flow rate

Q --Instantaneous flow

0 automatic 1 manual

N --Number of pulses

There are 3 keys in total, such as following:



3.1 Parameter setting operation

1. Check whether the display screen is consistent with the parameters of the current meter used. If not, press "menu" key to enter setting 1, and modify the display screen through "  " key and "  " key. For example, if the value of C is 0.0150, first operate the "  " key to shift the cursor to C = . 0150, press "  " key, add 1 for each press, and press repeatedly until the value of the number of digits where the cursor is located is consistent with the required value, that is, C = 0.0150.

The method of modifying K value and measuring time T is the same as above. First press "  " key to shift, and then press "  " key to add until it is correct. If press the wrong button, Please repeat the above operation.

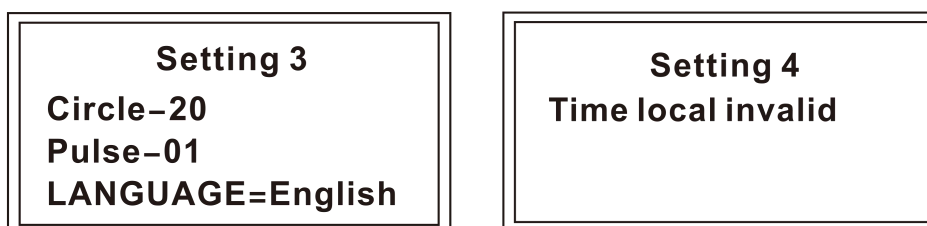
Setting 1 Thread pitch-K=.1972 Constant-C=.00094 Time-T=100.00	Setting 2 Automatic-1 Time delaye-1 Section-01.005 m²
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In the display screen, please input the K and C coefficients according to the parameters of the identification certificate: T represents the measurement time unit of automatic measurement seconds.

2. Press the menu key to enter the setting 2 display screen the automatic "0" symbol represents automatic measurement, and the setting of "0" is automatic measurement. If manual measurement is required, this symbol should be set to "1". In the display screen, the time delay is 3 seconds, which means that the measurement interface is entered after setting, and the automatic measurement can be processed only after 3 seconds. If it is automatic measurement, the instrument will automatically repeat the measurement times (the interval time is the delay time). For manual measurement, press the start / stop key to

measure and stop when measurement is needed. After reading the number, press the start / stop key once to carry out the next measurement. Section area output: the unit is square meter. After setting, the flow of the section area can be obtained. The formula $q = V \cdot S$ (S is the section area).

3.Setting 3 Circle--20 Pulse--01 LANGUAGE=English



Setting 3 and setting 4 is default setting.

3.2 Measuring data

After setting the parameters correctly, press "  " and "  " at the same time to save the parameters and return to the measurement state; Enter the measurement state, and the display is as shown in the figure: if it is automatic measurement, the instrument will automatically calculate the flow rate value according to the formula after each measurement and display $3V=0.000\text{m/s}$. After the fixed display for 3-5 seconds, the measurement will be repeated automatically, but the flow rate value will remain displayed until the end of the next measurement. If it is manual measurement, after each measurement, press the start and stop key once after reading the number, and then the next measurement can be carried out. During measurement, when the first signal arrives, it can be seen from the display that the time T starts counting and N starts counting. When the time T reaches the set time, the instrument automatically closes T and N and automatically calculates the flow rate v. after the display delay of 3-5 seconds, the instrument automatically starts the next flow measurement and repeats the above process. In this measurement, the value of V on the display is the last flow rate value, Convenient for reference and record.

3.3 Shutdown operation

After each use of the instrument, as long as the plug is unplugged, the instrument can automatically shut down, and save the model and parameters of the current meter selected

before shutdown. In the next use, just plug in the plug, connect the current meter, and press the screen change key once to measure the flow.

IV. Instrument Maintenance

For the maintenance of the measuring instrument, when it is not used for a short time, the plug must be unplugged (the power supply must be disconnected) for storage. When it is not used for a long time, it must be recharged once every three months. After each use, rinse the flow meter and measuring rod with clean water, dry them with a towel and store them. For the maintenance, disassembly and cleaning of the current meter, see the instructions of the current meter.

V. The Complete Set of Instrument

No.	Product name	Quantity
1	ABDT-LI120A speed measuring instrument	1pcs
2	Measuring rod	1pair
3	ABDT-LI120A instrument propeller	1pcs
4	Signal connection line	1pair
5	Communication cable (optional)	1pair
6	Tail wings	1pcs
7	Charger	1pcs
8	Accessory: operation manual of LI120A portable velocity meter	1pcs

Special warning:

The first charge of the instrument should be more than 3 hours. Please set the test time for more than 20 seconds. Please recharge the battery after using up each time. (this machine has over discharge and over charging protection)

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