



Handbook

ABDT-LS20B Portable Velocity Meter

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ABDT-LS20B Portable Velocity Meter

ABDT-LS20B portable velocity meter is developed for the specific measurement of the flow rate for the hydrometric station, factories and mines, environment-protection monitoring station, irrigation and drainage on the farmland and hydrogeology survey, etc.

ABDT-LS20B intelligent velocity meter is mainly composed of LS20B propeller type velocity sensor, LS-A velocity measuring instrument and measuring rod. The complete set of instruments is placed in the high-grade aluminum alloy password box. When in use, assemble as shown in Figure 1, connect the signal line, and then enter to measure the flow rate in each open channel and display the flow rate automatically.

The device is simple and convenient, energy saving, stable and reliable. It possesses complete functions and a high automaticity in accordance with the national measurement standard of open channel. Equipped with a rotating propeller which can endure 80 °C, it is a new portable velocity meter in the international market.

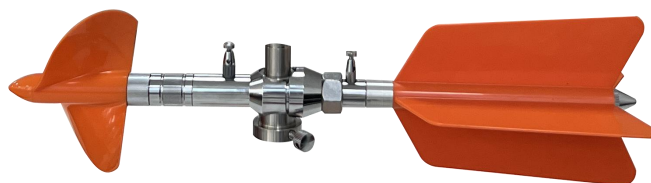


Figure 1

I. Technical Requirement of the Device

Velocity measurement formula:

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

Serial number: _____, K _____, C _____

Propeller structure: spiral curved double-blade, left-handed, PC plastic

Rotary diameter of propeller D: 125mm; Propeller hydraulic pitch b: 200mm

Instrument starting speed: $V_0 \leq 0.04\text{m/s}$; Critical speed of calibration curve V_k : about 0.13m/s (starting point of linear formula)

Flow measurement range V: 0.03~15m/s Signal component structure: magnetic steel - reed electronic switch

Revolutions per signal: 2

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

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

Working life of reed: 70 million times

Continuous working time of the instrument: 2 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 water flow conditions Water depth range: 0.02~50m Water temperature: 0~40 °C

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

Display screen: 4 × 16-bit LCD display

Measurement method: positioning measurement with measuring rod (or cable suspension positioning measurement)

Power supply: DC8.4V Li-ion rechargeable battery, continuous operation of above 40 hours after complete charge.

II. Measurement Principal

The device was developed with the flow velocity-area method in the open channel measurement. After obtaining the flow velocity, the flow quantity can be obtained through the formula $Q=V \cdot S$ (S is the cross-sectional area)

1. The measurement of the flow velocity

In the measurement, the rotor current meter was rotated by the water power, the signal device generates the revolution signal, and the flow velocity can be calculated by the following formula:

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

In it :

V: The mean flow velocity during the measurement (m/s).

K: Screw pitch.

C: Constant of the current meter.

T: The amount of time of the measurement (unit: s).

N: The number of signals during T.

During the use of the device, K and C both are constants. The flow velocity can be calculated once the value of T and N are obtained.

2. The calculation of volume of flow

By the flow velocity-area method, the volume of flow can be obtained by multiplying the flow velocity and section area which were obtained in the measurement.

III. Operation of the Device

Normally, plug in to start up and unplug to shut down. The moment the device is plugged in, the screen will display the current meter parameter used last time. The parameter setting is illustrated as follows: Measurement can be conducted once the parameter coincides with the certificate.

ZMLSY-1.0	7.2V
K=.0288	1V=0.000
T=100	0N0000.0
Q=000000.000 m³/h	

Table 1 the display of measurement parameter used last time

There are 3 buttons on the device:



3.1 The Operation of the Setting of Parameter

3.1.1 The setting of parameter

Check whether the parameter displayed on the screen is the same with the current meter parameter. If not, press "Menu" to setting 1 of parameter. Make modifications on the screen by the " $\triangleright$ " button and " $\triangle$ " button. For instance, If c is 0.0150, press the " $\triangleright$ " button to move the cursor to the position of "5" where C=0.0100. Then press the " $\triangle$ " button, one press will add 1 to this digit, and press the button for several times until the digit which cursor stays turns into the required value that is C= 0.0150.

Modification of the K and T is the same. First press " $\triangleright$ " button and then press " $\triangle$ " button until it turns into the right value. Correction can also be made with the procedure above.

Please input K and C by the parameters given on the certificate. T represents the amount of time during the measurement.

3.1.2 Press menu to enter setting of parameter 2

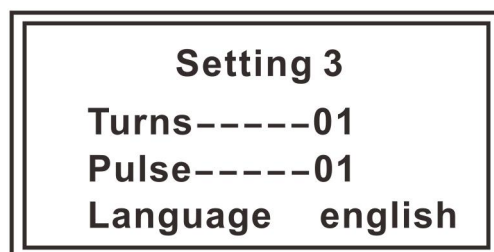
Setting 1 Thread pitch-K=.0288 Constant-C=.0100 Time- T=000.00	Setting 2 Automatic-1 Time delayed-1 Section-01.005 m²
--	---

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.

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).

3.1.3 Setting 3 turns 01 Pulse 02(LS20B default) language English



3.2 Data of the measurement

After setting the right parameter, press "  " and "  " button, the parameter can be kept down and the device will be back to the measuring status.

Back to the measuring status:

Enter the measuring status. The screen will come as portrayed: If it is automatic operation, the device will automatically calculate the flow velocity by the formula and display $3V=0.000M/S$ at the end of the measurement. After keeping the display for 3-5 seconds, the automatic measurement will be repeated but the value of flow velocity will be preserved until the end of next measurement. If it is manual operation, the value will be recorded at the end of measurement. After recording the values, press "start/stop" button and you can proceed with your next measurement. During the measurement, it can be perceived that T and N start to count on the screen when the first signal comes. When T reaches the set time, the device will automatically turn off the T and N when another signal comes and automatically calculate the velocity of the flow. After displaying for 3-5 seconds, the device will automatically conduct the next measurement and repeat the procedure above. In this measurement, the value of V displayed in this measurement is actually the value of last time, which is made for the convenience of reference and record.

3.3 Shut down

The device will be shut down automatically after unplugging. Save the model and parameters you used this time. Next time you can conduct the measurement of current

again by just plugging in and connecting the device with the target.

IV. Online Operation with Computer(Optional)

(No such function if not specified when ordering)

First, connect the device with computer with a communication cable for exclusive use. Turn on the computer and get into the WINDOWS- Program- Attachment- Communication- Hyper terminal, set the Baud rate at 2400, communication bit at 8, stop bit at 1, no parity check, and flow control at software. Then choose the right communication entrance, connect the signal power cord of the device and start the measurement. At the end of every measurement, a set of data will be sent onto the computer screen.

K=7800 C=0.050 T=0106.5 N=0015 V=0.160

K=7800 C=0.050 T=0108.4 N=0016 V=0.165

V. Maintenance of the Device

Unplug the device if not to be in use for a short time. Charge the device every 3 months if the time is too long.

Rinse the current meter and the measuring stick with clean water at the end of measurement every time. Dry them with a towel and keep them in the right place.

VI. The Whole Set of the Device

No.	Product Name	Quantity
1	LS-A velocity measuring instrument	1
2	Measuring rod	1
3	LS20B propeller	1
4	Signal connection	1
5	*Communication cable (selective)	1

6	Tail	1
7	Charger	1
8	Attachments: ABDT-LS20B portable velocity meter user manual	1

Special warning :

Charge the device for above 3 hours at the first time. Set the test time above 20 seconds. Run out the battery before recharging. (The device contains a protector for over-charging and over-discharging)

Contact

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