



Handbook

ABDT-1306A Portable Velocity Meter

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ABDT-1306A Portable Velocity Meter

ABDT-1306A 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-1306A intelligent velocity meter can be equipped with the new sensor of the flow rate rotating propeller. The sensor is developed by the advanced technology at the end of 2004. The helical angle, thread pitch, craftsmanship and materials are all been redesigned., the initial velocity $\leq 1\text{cm/s}$. Indicators like initial velocity, measurement range, linearity, concentricity, the Calibration coefficients and mean variance are been greatly improved. The measurement range of the flow velocity: 1~400cm/s and that of sampling time: 1~99 seconds.

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℃, it is a new portable velocity meter in China.

I. Technical Requirement of the Device

Velocity measurement formula:

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

Serial number: _____, K _____, C _____

Range of the velocity measurement: 0.01-5.00 m/s

Error in current measurement: $\leq 1.5\%$

Working depth: < 20m; Test Rod: 0.45m;

Display screen: 4×16 liquid crystal display

Measurement method: Rod positioning measurement

Temperature range: -20℃ - 60℃

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

II. Measurement Principle

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

2.1 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:

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

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.

2.2 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=000000.000m³\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
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On the screen, the "Automatic-0" means automatic operation, if manual operation is

needed, change "0" into "1".

On the screen, the delayed time is "3" which means the device will conduct the automatic operation in 3 seconds after finishing the setting and back to the measurement interface. If the setting is automatic, the device will automatically repeat the measurement.

If it is manual, press "start/stop" button and start or stop the measurement. After the value on the screen is obtained, press the button again so that you can proceed with your next measurement.

Volume of flow on the sectional area: Unit: Square meter. The volume of flow on the sectional area can be obtained by the formula $Q=V \cdot S$ (S is the sectional area)

3.1.3 Version number communication displays the communication mode. (No communication in default mode)

Setting 3	Setting 4
Turns-----01	Ver-zmlsy-1.0
Pulse-----01	Comm. Rs232
Language english	Bps 9600 1 8 n 1

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.

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 $1V=0.000M/S$ 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

(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- Super 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.

V. The Whole Set of the Device

No.	Product name	Quantity
1	ABDT-1306A current meter	1
2	ABDT-1306A rotating propeller	1
3	Signal line	1
4	*Communication cable (selective)	1
5	Charger	1
6	Attachments: ABDT-1306A 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)

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