

6000counts

Pocket Clamp Digital Multimeter Instruction Manual

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1. Overview

This is a pocket-sized 3 5/6-digit automatic digital meter. It has stable performance, high precision, high reliability, clear reading and overload protection. Driven by AAA 1.5V battery, the instrument adopts large screen LCD display and adopts boost power supply. Even at the edge of 2.3V low battery, it can ensure the high brightness of backlight and flashlight. The meter is easy to carry and is very popular among users. The instrument's backlight can be turned on and off automatically after 15 seconds. This series of instruments can be used to measure DC voltage and AC voltage, AC and DC current 600A, resistance, capacitance, diode, temperature, continuity test, square wave output, frequency measurement and true RMS. It is a superior tool and an ideal tool for laboratories, factories, radio enthusiasts and families.

2. Safety precautions

This series of instruments is designed in accordance with IEC1010 (Safety Standards promulgated by the International Electrotechnical Commission), please read the safety precautions before use.

1. When measuring voltage, do not input a limit voltage exceeding the effective value of DC 1000V or AC 750V;
2. The voltage below 36V of the current file is a safe voltage, when measuring AC voltage higher than 36V DC and 25V AC, check whether the test leads are in reliable contact, whether they are connected correctly, whether they are well insulated, etc., to avoid electric shock;
3. When changing functions and ranges, the test pen should leave the test point;
4. Select the proper function and range, beware of wrong operation, although the series of instruments with a full-range protection, but for safety reasons, you still pay more attention;
5. Safety Symbol Description: “” Exist dangerous voltage, “” Ground, “” Double insulation, “” Low voltage symbol.

3. Characteristics

1. General Characteristics

- 1-1. Display: liquid crystal display (LCD);
- 1-2. Maximum display: 5999 (3 5/6) bit automatic polarity display;
- 1-3. Measurement method: double integral A/D conversion;
- 1-4. Sampling rate: about 3 times per second;
- 1-5. Overrange display: The highest position shows “OL”;
- 1-6. Low voltage display: “” symbol appears;
- 1-7. Working environment: (0~40)°C, relative humidity < 80%;
- 1-8. Power: AAA 1.5V battery;
- 1-9. Volume (size): 176×67×33mm (L×W×H);
- 1-10. Weight: about 300g (including 1.5V battery);

1-11. Attachment: One instruction manual, one certificate, one leather case, one outer packaging box, one pair of test leads, one type K thermocouple TP01 temperature probe, two AAA1.5V batteries.

2. Technical characteristics

2-1. Accuracy (reading data of a%+ least significant digits), guaranteed accuracy environment temperature: $(23 \pm 5)^{\circ} \text{C}$, Relative humidity <75%, calibration guarantee period from the date of manufacture for one year.

2-2. Performance (Note "▲" indicates that the meter has this function)

Function	
DC voltage DCV	▲
AC voltage ACV	▲
DC current DCA	▲
AC current ACA	▲
Resistor / Diode / On-Off Test / Capacitor	▲
Frequency F	▲
Square wave output	▲
NCV	▲
Zero line / Fire line test	
Full unit symbol	▲
Backlight manual/Auto off	▲
True RMS measurement	▲
Temperature (°C/°F)	▲
Flashlight lighting	▲

4. Operation panel instructions

1. The clamp head measures vertically through the center of the hole.
2. Product model label position.
3. RANGE is the manual range conversion button, which is the REL relative measurement function when testing the capacitance file.
4. Function selection key SELECT, long press for 2 seconds for the backlight to be turned on and off.
5. LCD display window.
6. COM input; negative input, insert black test pen.
7. Voltage, resistance, diode, capacitor, frequency, square wave output, current input port.
8. HOLD is the data hold button, long press for 2 seconds for the flashlight to turn on and off.
9. Function rotation knob.
10. Current measuring wrench.
11. Pliers opening.

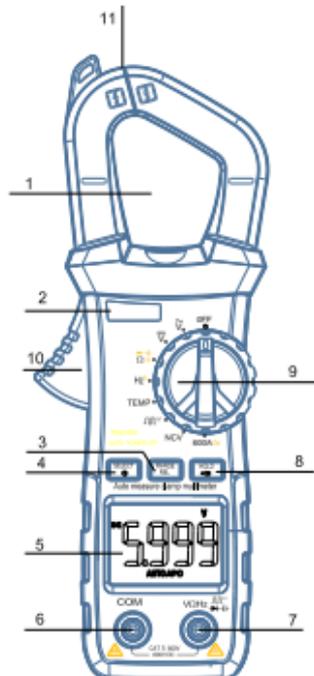


figure 1

3. Technical Specifications

2-3-1. DC voltage (DCV)

Accuracy Range	6000counts	Resolution
6V	$\pm (0.5\%+3)$	0.001V
60V		0.01V
600V		0.1V
1000V	$\pm (0.8\%+10)$	1V

Input impedance: 10M Ω ; Overload protection: 6V range is 550V DC or AC peak; the rest is 1000V DC or 750V AC peak.

The specific operations are as follows:

1. Insert the black test lead into the “COM” jack and the red test lead into the “V/ Ω /Hz” jack.
2. Turn the range switch to the corresponding “ \overline{V} ” range, which is displayed as the automatic DC voltage measurement mode. The internal switch will switch to the corresponding range according to the measured value of the input value.
3. The test pen is reliably contacted with the test point, and the screen displays the measured voltage value. When measuring the DC voltage display, the red test pen is the voltage polarity of the connected point.

Note:

- 1) Do not exceed the input voltage of DC1000V or AC750V. If it exceeds, there is danger of damage to the instrument circuit.
- 2) When high voltage circuit, pay special attention to avoid electric shock.
- 3) After completing all measurement operations, please disconnect the test leads from the circuit under test.

2-3-2. AC voltage(ACV)

Accuracy Range	6000counts	Resolution
6V	$\pm (0.8\%+3)$	0.001V
60V		0.01V
600V		0.1V
750V	$\pm (1.2\%+10)$	1V

Input impedance: $10M\Omega$; standard sine wave and triangle wave frequency response is 40Hz-1kHz; other waveform frequency response is 40Hz-200Hz;

The specific operations are as follows:

1. Insert the black test lead into the “COM” jack and the red test lead into the “V/ Ω /Hz” jack.
2. Turn the range switch to “ gear, which is displayed as the AC voltage automatic measurement mode. According to the input value measurement value, the internal switch will switch to the corresponding range. If it is not measured, the machine will have 6V screen LCD. Data changes are normal and do not affect measurement data.
3. The test meter will be reliably touched to the test point, and the screen will display the measured voltage value.

Note:

- 1) There are some residual numbers in each range before the test, but it does not affect the measurement accuracy;
- 2) The input voltage must not exceed 750Vrms. If it exceeds, there is danger of damage to the instrument circuit.
- 3) When measuring high voltage circuits, special care should be taken to avoid electric shock;
- 4) After completing all measurement operations, disconnect the test leads from the circuit under test.

2-3-3. DC current (DC A)

Accuracy Range	6000counts	Resolution
60A	$\pm (2.5\%+30)$	0.01A
600A		0.1A

Maximum measured voltage drop: 600mV; overload protection: 600A

The specific operations are as follows:

1. Turn the range switch to the corresponding “600A gear position, trigger the SELECT button to select the DC current automatic measurement (the default value is DC current), and the internal can be switched to the corresponding range according to the measured value (internal auto range 60A/600A). Using a device close to the electromagnetic field may indicate unstable or incorrect readings. Press REL to clear before measuring. As shown in Figure 1, press the handle 10, according to the size of the measuring wire diameter, slowly open the jaw opening, the measured current line vertically through the center of the clamp, the measured current value and the current polarity of the red test pen point will be displayed on the screen at the same time. The clamp can only measure one conductor at a time. If two or more conductors are measured at the same time, the measurement

reading will be wrong.

2. In the current measurement state, the measuring probe between “VR” and “COM” should be unplugged due to the large measuring current.

Note:

1) The maximum input current is 600A (depending on the red pen insertion position), and an excessive current will display OL.

2-3-4. AC current (ACA)

Accuracy Range	6000counts	Resolution
60A	± (2.5%+30)	0.01A
600A		0.1A

Maximum measured voltage drop: 600mV; overload protection: 600A;

The specific operations are as follows:

Turn the range switch to the corresponding “600A” gear position, trigger the SELECT button to select the AC current automatic measurement (the default value is DC current), and the internal can be switched to the corresponding range according to the measured value (internal auto range 60A/600A). As shown in Figure 1, press the handle 10, according to the size of the measuring wire diameter, slowly open the jaw opening, the measured current line vertically through the center of the clamp, the measured current value and the current polarity of the red test pen point will be displayed on the screen at the same time. The clamp can only measure one conductor at a time. If two or more conductors are measured at the same time, the measurement reading will be wrong.

2. In the current measurement state, the measuring probe between “VR” and “COM” should be unplugged due to the large measuring current.

Note:

1) The maximum input current is 600A (depending on the red pen insertion position), and an excessive current will display OL.

2-3-5. Resistance (Ω)

Accuracy Range	6000counts	Resolution
600 Ω	$\pm (0.8\%+5)$	0.1 Ω
6k Ω	$\pm (0.8\%+3)$	1 Ω
60k Ω		10 Ω
600k Ω		100 Ω
6M Ω		1k Ω
40M Ω	$\pm (2.5\%+3)$	10k Ω

Open circuit voltage: 1V; overload protection: 550V DC or AC peak;

The specific operations are as follows:

1. Insert the black test lead into the "COM" jack, insert the red test lead into the "V/ Ω /Hz" jack; turn the dial to the " Ω " position, trigger the "SELECT" key, and select the resistance file to automatically measure.

Note:

- 1) When measuring low resistance, the test leads will bring internal resistance. To obtain accurate reading, you can record the short value of the test lead first, and subtract the value when the test lead is shorted in the measurement reading;
- 2) When measuring the line resistance, all the power of the circuit under test must be turned off and all capacitors should be completely discharged to ensure the correct measurement value;
- 3) Do not input voltage in the resistance range. This is absolutely forbidden, although the instrument has voltage protection function in this position!

2-3-6. Diode and continuity test

Range	display value	test condition
Ω	Diode forward voltage drop	Forward DC current is about 1mA, open circuit voltage is about 3V
	The buzzer sounds long and the resistance of the test is less than $(50 \pm 20) \Omega$.	Open circuit voltage is about 3V, press "SELECT" for two-speed function switching

Overload protection: 550V DC or AC peak; Warning: For the safety, the input voltage value is prohibited in this range!

1. Insert the black test lead into the “COM” jack and the red test lead into the “V/ Ω /Hz” jack (note that the polarity of the red test lead is “+”);
2. Set the range switch to “ $\frac{+}{\Omega}$ ”, trigger the “SELECT” button, select the diode measurement, and connect the test leads to the diode to be tested. The reading is an approximation of the forward voltage drop of the diode. For a silicon PN junction, it is typically about 500mV~800mV is confirmed as normal value; if the diode under test is open or reverse polarity, “OL” is displayed.
3. Trigger the “SELECT” button, select the buzzer measurement, connect the test leads to the two points of the line to be tested. If the built-in buzzer sounds, the resistance between the two points is less than about $(50 \pm 20) \Omega$.

Note: It is forbidden to input voltage in “ $\frac{+}{\Omega}$ ” gear to avoid damage to the instrument.

2-3-7. Capacitance(C)

Range \ Accuracy	6000counts	Resolution
60nF	$\pm (3.5\%+20)$	10pF
600nF		100pF
6 μ F		1nF
60 μ F		10nF
600 μ F		100nF
6mF	$\pm (5\%+3)$	1 μ F
30mF		10 μ F

Overload protection: 550V DC or AC peak.

1. Insert the black test lead into the “COM” jack and the red test lead into the “V/ Ω /Hz” jack.
2. Turn the dial to the “ $\frac{+}{\Omega}$ ” position and trigger the “SELECT” button to select the capacitance file for automatic measurement.
3. Then connect the test leads across the capacitors under test.

Note:

- 1) When measuring capacitance with 10nF file, there may be residual reading on the screen display value. This number is the distributed capacitance of the test pen. It is an accurate reading and can be subtracted after measurement.
- 2) When the large capacitance file measures severe leakage or breakdown capacitance, some values will be displayed and unstable; when measuring

large capacitance, the reading takes several seconds to stabilize, which is normal when measuring large capacitance;

3) Please fully discharge the capacitor before testing the capacitor capacity to prevent damage to the fuse and meter.

4) Unit: 1F=1000mF, 1mF=1000uF, 1uF=1000nF, 1nF=1000pF

2-3-8 Frequency measurement

Accuracy Range	6000counts	Resolution
10Hz	$\pm (0.1\%+3)$	0.01Hz
100Hz		0.1Hz
1kHz		1Hz
10kHz		10Hz
100kHz		100Hz
1MHz		1kHz
10MHz		10kHz

Input sensitivity: 1V rms; overload protection: 550V DC or AC peak (no more than 10 seconds)

Frequency measurement

1. Insert the test leads or shielded cable into the "COM" and "V/ Ω /Hz" jacks;

2 Turn the range switch to the "Hz" position and connect the test leads or cables across the signal source or the load under test.

Note:

1) When the input exceeds 10Vrms, it can be read, but the error may be larger;

2) In a noisy environment, it is best to use a shielded cable when measuring small signals;

3) When measuring high voltage circuits, special care should be taken to avoid electric shock;

4) It is forbidden to input voltage values exceeding 250V DC or AC peak to avoid damage to the meter.

2-3-9. Temperature measurement (° C/° F)

Accuracy Range	6000counts	Resolution
(-20-1000)°C	$\pm (1.0\%+5) < 400^{\circ}\text{C}$; $\pm (1.5\%+15) \geq 400^{\circ}\text{C}$	1°C

(0-1832) F **$\pm (0.75\%+5) < 750 F$; $\pm (1.5\%+15) \geq 750 F$** **1 F**

The operation is as follows: (top right)

1 Dial to the “TEMP” file;

2. Insert the two input ends of the temperature probe into the “V/ Ω /Hz” and “COM” terminals of the red test pen. The test probe is inserted into the measured water, and the temperature of the measured water will be displayed on the LCD.

3. Press the SELECT button to toggle between Nie and Fahrenheit ($^{\circ}$ C/ $^{\circ}$ F).

Note:

1) It is forbidden to input voltage values exceeding 250V DC or AC peak to avoid damage to the meter.

2-3-10. Square wave output (\square)

The operation is as follows: (top right)

1 Dial to “ \square ” ; (default starting output is 50Hz);

2. Insert the two inputs of the device under test into the “V/ Ω /Hz” and “COM” terminals of the red test pen.

3. Trigger the “SELECT” button. The “V/ Ω /Hz” and “COM” terminals of the table respectively output 50Hz-100Hz-200Hz-300Hz-400Hz-500Hz-600Hz-700Hz-800-Hz-900Hz-1000Hz-2000Hz -3000Hz-4000Hz-5000Hz. At the same time, the LCD screen displays the current output value.

Note:

1) It is forbidden to input voltage values exceeding 250V DC or AC peak to avoid damage to the meter.

2-3-11. NCV measurement;

The operation is as follows:

1. dial to the “NCV” position; (in the no-measure state LCD displays “EF”);

2. The front end of the meter has NCV test points. As long as the point is close to the AC voltage, the buzzer will emit different continuations according to the different strength of the signal. At the same time, the LCD will display different number of segments according to the strength of the signal.

5. Automatic switch machine

When the meter is stopped for about 15 minutes, the meter will automatically power off and enter the sleep state; to restart the power supply, turn the dial to the OFF position and turn the rotary dial to the other position. Press and hold the “SELECT” button and turn on the power switch. The “APO” symbol on the screen disappears and the auto power off function will be canceled.

6. Troubleshooting

If your instrument does not work, the following method can help you solve the general problem, if the fault still can not be excluded, please contact the service center or dealer.

Failure phenomenon	Inspection site and method
Not shown	Battery not connected
	Replace the battery
Low battery symbol	Replace the battery
Current is not input	Replace fuse
Resistance display error	The test pen is not in contact

This manual is subject to change without notice;

The contents of this manual are considered correct. If the user finds any errors, omissions, etc., please contact the manufacturer;

The company does not bear the accidents and hazards caused by the user's wrong operation;

The functions described in this manual are not intended to reasons of the product for special purposes.

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