User’s Manual of Digital Clamp Multimeter

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I. General

It is a 3 3/4-bit digital clamp meter of automatic range conversion and a high-reliability digital clamp multimeter with stable performance and driven by battery. It adopts 16mm font height LCD display of clear readings. With the functions of data holding and automatic power-off, it is more convenient to use.

This meter can be used to measure such parameters as DCV, ACV, DCA, ACA, resistance, capacity, frequency, diode, continuity test, etc. Centered on the dual slope A/D conversion of large-scale integrated circuit, the whole set has the function of automatic range conversion and thus is a meter with excellent performance and a desirable tool for labs, factories, radio fans and homes.

 **Warning: Before use, please read carefully the information under "Safety Notices".**

II. Unpacking Check

After unpacking, please carefully check if the following items are missing or damaged. If yes, please contact the distributor immediately.

■	Digital clamp multimeter	1 set
■	User's manual	1 piece
■	Test leads	1 set
■	9V battery	1 piece

III. Safety Notices

Please note warning mark "⚠" and the sentence titled with "Warning", which represent the circumstances or actions that endanger the user, may cause damages to the clamp multimeter or the tested equipment.

This meter is designed and produced strictly in accordance with the safety requirements of GB4793 electronic measuring meters and IEC61010-1 and IEC1010-2-032 Safety Standards and conforms to the safety standards of double insulation and over-voltage

CAT III 600V and Grade II pollution. Before use, please read this manual carefully.

1. When measuring the voltage above 30V, the AC electric line with inductive loads and the AC electric line during electric fluctuation, be cautious against electric shock.
2. Before measurement, check if the measurement function switch is at the proper gear, check if the test probe touches the measured item reliably, with proper connection, good insulation, etc, in order to avoid electric shock.
3. The clamp multimeter cannot conform to the requirements of the related safety standards until it is used together with the attached test probe. If the test probe cable is broken, it must be replaced with the cable of the same type or the same electric specifications.
4. Do not use any other batteries not confirmed or unauthorized to replace the battery of the meter; do replace the battery with only the battery of the same type or the same electric specifications. Before replacing the test probe, keep it away from the

measured point and make sure there are no signals on the input end.

5. During the electric measurement, never directly touch the ground or touch naked metal terminals, output ports, lead clamps, etc that may have ground potential.
6. Do not store and use the meter in the environment of high temperature, high humidity, high flammability, high explosion potential and strong magnetic field.
7. Measuring the voltage out of the allowed limit voltage may damage the meter and endanger the operator. The allowed limit voltage is marked on the panel of the meter. Never measure the input signal out of this standard in order to prevent electric shock and damage on the meter.
8. Do not attempt to calibrate or repair this meter. Surely, when necessary, the calibration and repair must be conducted by specially trained personnel or qualified professional personnel.
9. During measurement, the function/range selection switch must be placed at the correct range gear. When converting the function/range selection switch,

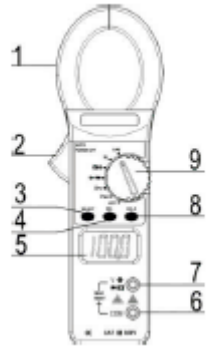
be sure to disconnect the test probe cable from the tested item and make sure there are no signals input into the input end. Never convert the function/range selection switch during measurement.

10. When the LCD display shows "  ", please replace the battery in time to ensure the measurement accuracy.
11. Do not change the circuits of this meter without any permission to avoid damaging this meter and endangering safety.

IV. Common Electric Symbols

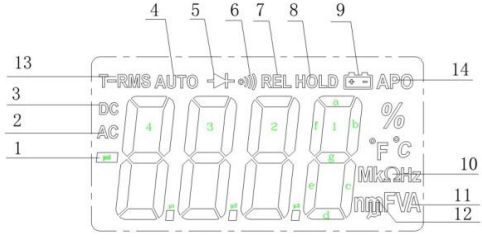
	Warning!		DC
	High voltage! Danger!		AC
	Ground		AC/DC
	Double insulation		European directives complied
	Low battery		Fuse

V. External Structure



1. Clamp head;
2. Clamp head trigger;
3. Function selection (SELECT) key;
4. Reset (REL) key;
5. LCD display;
6. COM input port: Negative input terminal with black test probe inserted;
7. VΩ input port: Positive input terminal for measuring voltage, resistance, capacity, frequency, diode and continuity with red test probe inserted here;
8. Data Hold key (HOLD);
9. Function/range selection button: used to select various measuring functions and ranges.

VI. Symbols Displayed



1. Negative sign;
2. AC signal measurement sign;
3. DC signal measurement sign;
4. Automatic range sign;
5. Diode measurement sign;
6. Buzzer symbol;
7. Relative value measurement sign;
8. Data hold sign;
9. Low battery sign;
10. Resistance measurement unit(Ω);
11. Current measurement unit (A);
12. Voltage measurement unit(V, mV);
13. True RMS sign;
14. Auto power off sign.

VII. Functions of Keys and Automatic Power-off

(1) **SELECT:** Selects functions in the trigger mode. When two or above measurement functions combine at the same gear, press this key to convert measurement functions.

(2) **HOLD:** Holds readings in the trigger mode. Press this key to lock the displayed value and press it again to relieve the locking state and then enter the normal measurement state.

(3) **REL:** Measures relative values in the trigger mode. Press this key at the DCA gear and then this meter will regard the currently displayed value as the reference value and automatically reset the LCD display. In the subsequent measuring results, the reference value will be automatically deducted until the relative value measurement function exits by pressing this key again.

⚠ **Automatic power-off function:** During measurement, whether pressing function keys or rotating function/range selection button, if idle for 15min, the meter will automatically "power off". In such state, press the function keys (for effective key operations, see VIII) or rotate the function/range selection button, then the meter will automatically "Power on" and enter the measurement status. To power off the meter, hold the SELECT key, then the automatic power-off function will be cancelled. "Auto Power-off" represents a sleep status. In such state, a small amount of current (approximately

5μA) will be consumed. If the meter is not used for long, be sure to shut off its power.

(5) **Buzzer:** Press any function key at any gear; if such key is valid, the buzzer will buzz; if invalid, the buzzer will not buzz; the buzzer will give 5 continuous warning buzzes for within about 1min before auto power-off; the buzzer will give a long buzz for warning before power-off. The buzzer sounds at the continuity measurement resistance less than about 50Ω.

VIII. Effectiveness of Keys

Not all key operations are effective at any gear. Only the effective key operation can choose corresponding operation function or wake up the sleeping clamp multimeter. See the following table for details (●means effective):

Key	REL	HOLD	SELECT
V⎓	●	●	
V~	●	●	
(((·-◀		●	●
Ω⊣⊢	●	●	●
Hz		●	
A~	●	●	●

Note ①: The capacitance gear has relative value measurement function.

IX. Features

1. General Features

1-1. Display mode: LCD display;

1-2. Max. display: 3999(3 3/4)bit auto polar display or unit display;

1-3. Measurement mode: Dual slope A/D conversion;

1-4. Conversion rate: 3 times/s;

1-5. Over-range display: “OL” displayed in the highest

1-6. Low battery display: “  ” occurs on the upper part of the LCD;

1-7. Auto power-off function;

1-8. Max. head opening size: dia. 38mm;

1-9. Max. size of predicted current lead: dia. 36mm;

1-10. Effect of electromagnetic field: If used for devices nearby electromagnetic field, unstable or incorrect readings may be displayed;

1-11. Error caused by test position: When measuring current, please place the source to be tested in the center of the head; otherwise, certain additional error will occur;

1-12. Operating environment: (0~40)℃, RH＜80%;

1-13. Storage environment: -10~50℃, RH＜80%;

1-14. Power supply: 9V battery;

1-15. Volume (dimensions): 225mm×76mm×32mm (L×W×H) ;

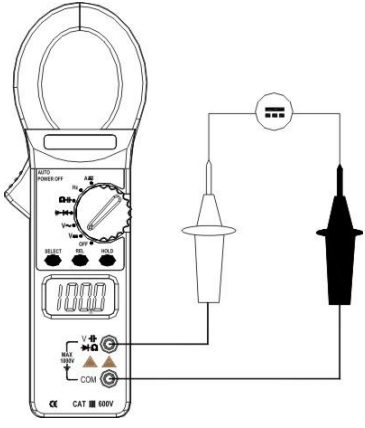
1-16. Approx. 270g (battery included).

2. Technical

Accuracy: ± (a% of reading + word count) with accuracy ensured. Ambient temperature: (23±5)℃, RH＜75%; calibration warranty period as one year from ex-works date.

2-1. DCV Measurement

A) Turn the function/range SELECT switch ⎓ gear



B) Respectively insert the red test probe and black test probe into the VΩ and COM ends.

C) Parellelly connect the test probe cable onto the tested circuit or the power supply, then the polarity of the red test probe cable and the tested voltage value will be shown on the screen.

D) Read the currently measured result from the display.

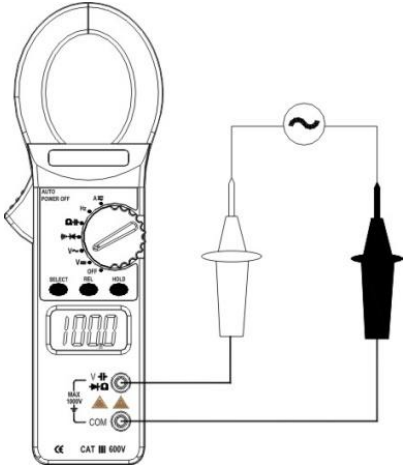
DCV Technical Indicators:

Range	Accuracy	Resolution
400mV	±(0.5%+4d)	0.1mV
4V		1mV
40V		10mV
400V		100mV
1000V	±(1.0%+6d)	1V

Input resistance: 10MΩ.

Overload protection: 1000V DC or AC peak.

2-2. ACV Measurement



A) Turn the function/range SELECT switch V~ gear..
B) Respectively insert the red test probe and black test probe into the VΩ and COM ends.
C) Parellelly connect the test probe cable onto the tested circuit or the power supply.
D) Read the currently measured result from the display.

ACV Technical Indicators (True RMS)

Range	Accuracy	Resolution
4V	±(0.8%+10d)	1mV
40V		10mV
400V		100mV
750V	±(1.0%+10d)	1V

Input resistance: 10MΩ.

Frequency response: sine wave and triangle wave :(40~1000)Hz ,other wave form :(40~200)Hz;

Display: True RMS

Overload protection: 1000V DC or AC peak.

⚠ Note:

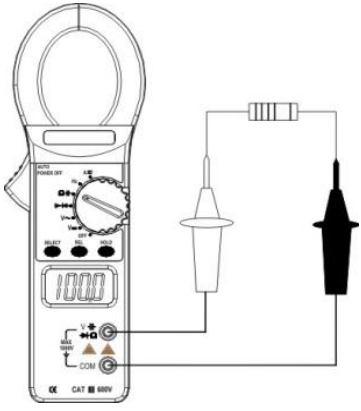
• Do not measure the DCV above 1000V or ACV above 750V.

• When high voltage is measured, be sure to avoid electric shock. After measurement, immediately disconnect the test probe and the tested circuit.

2-3. Resistance Measurement

A) Turn the function/range switch to Ω⊣⊢ gear.

B) Respectively insert the red test probe and black test probe into the VΩ and COM ends.



C) Parellelly connect the test probe cable onto the tested resistor, then the tested resistance value will be shown on the screen.

D) Read the currently measured result from the display.

⚠ Note:

- When the online resistor is measured, be sure to shut off the line power supply and discharge all capacitors completely.
- If the tested resistor is open or its resistance is out of the max. range of the clamp multimeter, it will show "OL"

- When the resistance above 1MΩ is measured, the reading on the meter will not be stable until several seconds have passed. This is normal for high-resistance measurement.
- When the resistor is measured, do not input voltage value. Never input the voltage above the overload protection, otherwise, the meter may be damaged and the operator may be hurt.
- After the measurement is over, immediately disconnect the test probe from the tested circuit.

Resistance (Ω)Technical Indicators

Range	Accuracy	Resolution
400Ω	±(0.8%+5d)	0.1Ω
4kΩ	±(0.8%+4d)	1Ω
40kΩ		10Ω
400kΩ		100Ω
4MΩ		1kΩ
40MΩ	±(1.2%+10d)	10kΩ

Open voltage:400mV

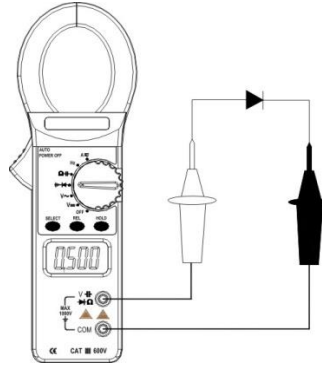
Overload protection: 250V DC or AC peak.

Note: When 400Ω is used, it is necessary to short circuit the test probe to test the resistance of the lead, which will be deducted from the actual test.

2-4. Diode Measurement and Continuity Test

2-4-1. Diode Measurement

A) Turn the function/range SELECT switch to gear. Press the SELECT key to choose the desired diode measurement mode.



B) Respectively insert the red test probe and black test probe into the VΩ and COM ends.

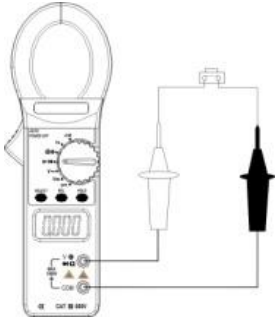
C) Connect the red test probe onto the positive of the diode and the black test probe onto the negative.

D) Read the currently measured result from the display.

⚠ Note:

- In case of open diode or reverse polarity, the display will show “OL”.
- When the online diode is measured, be sure to shut off the line power supply and discharge all capacitors completely.
- After the measurement is over, immediately disconnect the test probe and the tested circuit.

2-4-2. Continuity Test



A) Turn the function/range SELECT switch to gear.

B) Press the SELECT key to choose the desired

continuity measurement function.

C) Respectively insert the red test probe and black test probe into the VΩ and COM ends.

D) Parallelly connect the test probes onto the both ends of the tested circuit.

E) If the resistance between both ends of the circuit is less than about 50Ω, the built-in buzzer will sound.

Technical Indicators of Diode Measurement and Continuity Test

Range	Resolution	Description
Diode	1mV	Open voltage approx. 3.0V Forward voltage drop approx. 0.5～0.8V
Continuity Test	0.1Ω	Open voltage approx.0.45V; when less than 50Ω, the buzzer will sound.

Overload protection:250V DC or AC peak.

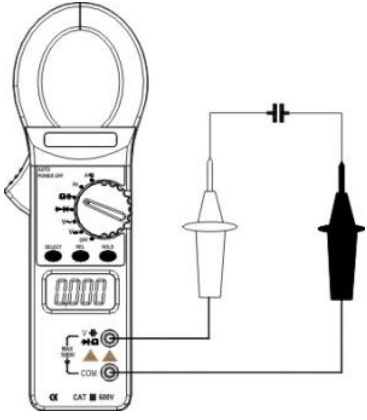
⚠ Note:

• If the tested circuit is open, the display will show "OL".

• In case of line continuity test, be sure to shut off the line power supply and discharge all capacitors.

• After the measurement is over, immediately disconnect the test probe and the tested circuit.

2-5. Capacitance Measurement



A) Turn the function/range switch Ω⊣⊢ gear.

B) Press the SELECT key to choose the desired capacitance measurement mode.

C) Press the REL key to clear.

D) Respectively insert the red test probe and black test probe into the VΩHz and COM ends.

E) Parellelly connect the testing end of the test probe cable onto the tested capacitor and then the tested capacitance value will be shown on the display.

F) Read the measured result from the display.

Capacitance (C) Technical Indicators

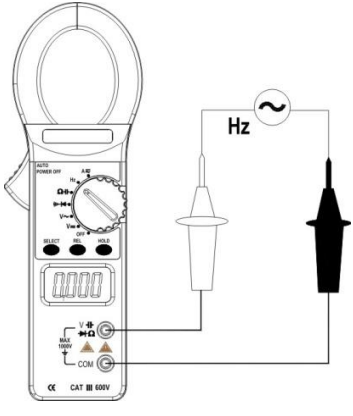
Range	Accuracy	Resolution
10nF	±(3.0%+10d)	10pF
100nF		100pF
1uF		1nF
10uF		10nF
100uF		100nF
1000uF	±(5.0%+10d)	1uF

Overload protection:250V DC or AC peak.

⚠ Note:

- The measurement of capacitance below 4nF is for reference only.
- When the online capacitor is measured, be sure to shut off the line power supply and discharge the capacitor completely.
- It will take long time to measure large capacitance.
- After the measurement is over, immediately disconnect the test probe and the tested circuit.

2-6. Frequency Measurement



A) Turn the function/range switch to the Hz gear as

shown in the right figure.

B) Respectively insert the red test probe and black test probe into the VΩ and COM ends.

C) Parellely connect testing end of the test probe onto the signal source to be tested.

D) Read the measured result from the display.

Frequency Indicator:

Range	Accuracy	Resolution
9.999Hz	±(0.5%+4d)	0.001Hz
99.99Hz		0.01Hz
999.9Hz		0.1Hz
9.999kHz		1Hz
99.99kHz		10Hzz
999.9 kHz		100Hz

Sensitivity: Virtual value 1.5V.

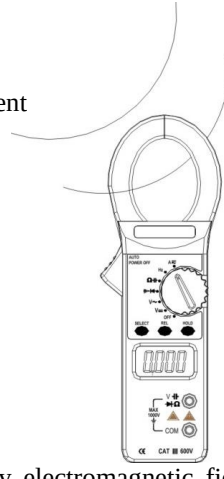
Overload protection: 250V DC or AC peak.

⚠ Note:

- Do not input the signal above 250V, otherwise, the meter may be damaged and the user may be hurt.
- After the measurement is over, immediately disconnect the test probe and the tested circuit.
- The signal measurement value above 1000 kHz is for reference only.

2-7. AC/DC Current Measurement

A) Turn the function/range key to "A ≂" as shown in the right figure.



B) Press the SELECT key to choose AC or DC measurement mode.

C) If used for devices nearby electromagnetic field, unstable or incorrect readings may be displayed;

D) Please press the REL key to reset before current measurement.

E) Press the head trigger to open the head and use the

head to clamp the conductor to be tested and then release the trigger slowly until the head is closed completely. Please confirm if such conductor is clamped in the center of the head because such conductor not placed in the center will cause additional error. This meter can only measure a current conductor once; if it measures two or above current conductors at the same time, the measurement readings will be incorrect.

DC Current Technical Indicators

Range	Accuracy	Resolution
40A	±(3%+8d)	0.01A
400A	±(2.5%+8d)	0.1A
1000A	±(3%+10d)	1A

AC Current Technical Indicators

Range	Accuracy	Resolution
40A	±(3%+10d)	0.01A
400A	±(2.5%+8d)	0.1A
1000A	±(3%+10d)	1A

Note:

1. AC frequency response: 50~60Hz;
2. If this meter is near to any place with strong magnetic field, it will display unstable or incorrect induction reading that does not affect the measurement result.

X. Maintenance and Care

 Warning: In order to prevent electric shock, before opening the bottom cover, take the test bar away.

1. General Maintenance

1-1. This meter is a precision instrument and thus users should not change circuits without permission;

1-2. Please take waterproof, dustproof and anti-falling measures;

1-3. Do not store and use this meter in high temperature and humidity and under easily explosive and flammable environment and in the strong magnetic field;

1-4. Please clean the housing of this meter with wet

cloth and mild detergent rather than strong solvents as abrasive, alcohol, etc;

1-5. If the battery is not used for long, please take it out in order to prevent the leakage from corroding this meter;

1-6. Do not use DC or AC peak voltage more than 1000V;

1-7. Never measure voltage values at the current gear, resistor gear, diode gear and buzzer gear;

1-8. Do not use this meter before the battery is not installed properly or the back lid is not inserted tightly;

2. Battery installation or replacement

Please pay attention to the use condition of 9V battery during use; when the "+ -"sign appears on the display or power-on is not available, please replace the battery according to the following figure.

The steps are shown as below:

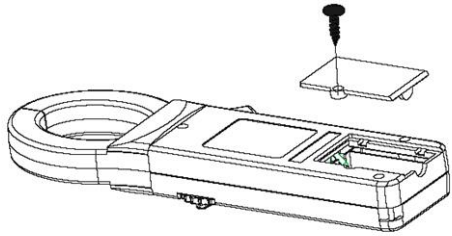
2-1. Switch off this meter and remove the test probe in the input terminal or current lead clamped in.

2-2. Let the panel of this meter faced down and screw out the screws on the battery lid and remove the lid.

2.3. Take out the old battery and install new battery according to the polar indication.

2-4. Please use the battery with the same model rather than improper battery.

2-5. After installing new battery, insert the lid and tighten the screws.



This user's manual is subject to any change without further notice.

The content in this user's manual is deemed correct; if you find any mistake, omission, etc, please contact the manufacturer.

We will not be held liable for any accidents or harms caused due to your wrong operations.

The functions set forth in this user's manual shall not be regarded as reasons for applying this product for special purposes.

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