

Digital clamp meter

Operation Manual

To avoid possible electric shock or personal injury, please read the Operation Manual before use and follow all safety instructions.





1. General

This meter is a portable digital clamp meter, which is used to measure ACA, ACV, DCV, resistance, capacitance, temperature, frequency and other functions. It's an excellent instrument for auto checking, repair, maintenance. It can be used in laboratory, home, as well as large current measurement sites.

2. Safety note

The meter meets the standards of IEC1010-1 (EN61010-1) pollution2, CAT.III600V and UL3111-1. Read the operation manual carefully before operation.

2-1. Safety Symbols

“”THE OPERATOR MUST REFER TO THE MANUAL, “”LOW BATTERY. “”EXISTS DANGEROUS VOLTAGE, “”DUAL INSULATION.

2-2. Notes

2-2-1. Read the operation manual carefully before operation, in order to avoid endangering the personal safety and meter damage, we need to operate in accordance with the specification requirements.

2-2-2. Before opening back cover to replace batteries, remove test leads and disconnect meter from any circuits being measured. Water is forbidden to leak into the meter cover inside.

2-2-3. Do not operate the meter with the cover removed or the case open.

2-2-4. Do not input limit over-ranged.

2-2-5. Do not input voltage value at resistance, capacitance, Continuity, diode and temperature range.

2-2-6. The power switch should set to OFF after finishing measurement.

2-2-7. For storing a long time, remove the battery to avoid battery leakage damage to internal components.

2-2-8. When working with voltages above 60V DC or 30V AC RMS, which will pose a shock hazard.

2-2-9. Please be especially careful when the meter clipped not insulated conductor or bud bars, accidental conductor contact will result in electric shock.

3. Features

3-1. General Features

3-1-1. Displaying: LCD.

3-1-2. Max display: 4000 (3 3/4) digits automatic polarity display.

3-1-3. Max. jaw open: 35mm.

3-1-4. Over-range display: “OL” displayed in the highest digit.

3-1-5. Hold: Data hold.

3-1-6. Relative value measurement.

3-1-7. Sampling rate: 3times/sec.

3-1-8. Low battery display.

3-1-9. Continuity test: If the resistance is $<(50\pm 10)\Omega$, the buzzer sounds continuously.

3-1-10. Auto range or manual range.

3-1-11. Auto power off.

3-1-12. power consumption: Approx. 3Ma.

3-1-13. Battery: 2pcs 1.5V battery (“AAA”7# battery).

3-1-14. Working environment: $(0 \sim 40)^{\circ}\text{C}$, relative humidity $<70\%$ RH.

3-1-15. Size: 228mm*75mm*35mm (length*width*height).

3-1-16. Weight: about 260g (including battery).

3-1-17. accessories: operation manual, test leads, temperature probe, 2pcs AAA batteries ,gift box.

3-2. FEATURES

3-2-1. Accuracy: $\pm(a\% \times \text{reading data} + \text{digits})$, environment temperature at $(23\pm 5)^{\circ}\text{C}$, relative humidity $<75\%$, One year guarantee since production date.

3-2-2. Temperature coefficient: 0.1% ted accuracy / 1°C ($<18^{\circ}\text{C}$ or $>28^{\circ}\text{C}$).

3-2-3. DC voltage

Range	Accuracy	Resolution
400mV	$\pm(1.0\%\text{reading}+5)$	0.1mV
4V	$\pm(0.5\%\text{reading}+5)$	1mV
40V		10mV
400V		100mV
600V		1V

Input impedance: approx. 10M Ω ;

Overload protection: 600V DC /ACRMS

3-2-4. AC voltage

Range	Accuracy	Resolution
400mV	$\pm(1.5\%\text{reading}+5)$	0.1mV
4V	$\pm(1.0\%\text{reading}+5)$	1mV
40V		10mV
400V		100mV
600V		1V

Input impedance: approx. 10M Ω ;

Overload protection: 600V DC/AC RMS

Frequency response: (50~60) Hz at 600V range, other range:(40~400) Hz.

3-2-5. AC current

Range	Accuracy	Resolution
400A	$<800\pm(2.0\%\text{reading}+5)$	100mA
1000A	$\geq 800A\pm(4.0\%\text{reading}+10)$	1A

Over load protection: 600A (input time can't exceed 1 minute).

Frequency response: (50~60)Hz

3-2-6. Resistance

Range	Accuracy	Resolution
400 Ω	$\pm(0.8\%\text{reading}+5)$	0.1 Ω
4k Ω	$\pm(0.8\%\text{reading}+3)$	1 Ω
40k Ω		10 Ω
400k Ω		100 Ω
4M Ω		1k Ω
40M Ω	$\pm(1.2\%\text{reading}+5)$	10k Ω

Overload protection: 250V DC /ACRMS.

Warning: Please don't input voltage value at this range.

3-2-7. Capacitance

Range	Accuracy	resolution
4nF	$\pm(5.0\%\text{rading}+20)$	1pF
40nF	$\pm(3.5\%\text{reading}+10)$	10pF
400nF		100pF
4uF		1nF
40uF		10nF
200uF	$\pm(5.0\%\text{reading}+10)$	100nF

Overload protection: 250V DC /ACRMS.

Warning: Please don't input voltage value at this range.

3-2-8. Frequency

Range	Accuracy	Resolution
100Hz	$\pm(0.5\%\text{reading}+5)$	0.1Hz
1kHz		0.1Hz
10kHz		1Hz
100kHz		10Hz
1MHz		100Hz
10MHz		1kHz

Input sensitive: $>0.7V$.

Overload protection: 250V RMS.



3-2-9. Temperature

Range	Accuracy	Resolution
$(-40\sim 750)^{\circ}\text{C}$	$<400^{\circ}\text{C}\pm(1.0\%+5)$ $\geq 400^{\circ}\text{C}\pm(1.5\%+15)$	1 $^{\circ}\text{C}$

Sensor:K type banana probe (Ni-Cr - Ni-Si).

Warning:Please don't input voltage value at this range.

3-2-10. Continuity test

Range	Display	Test condition
	Forward voltage drop of diode	Forward DCA is approx. 0.5mA, the backward voltage of open circuit is approx 1.5V
	Buzzer makes a long sound while resistance is less than $(50\pm 10)\Omega$	Voltage of open circuit is approx 0.5V.

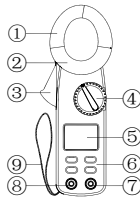
Over load protection: 250V DC /ACRMS.

Warning: Please don't input voltage value at this range.

4. Operation

4-1. Panel description (see Figure 1)

1) Jaw: A device to test the AC current, which makes the current into voltage. The single conductor must get thought the clamp center



2) Hand protection: A safe design to protect users from touching the dangerous area.

3) Clamp gunlock: Pressing the gunlock releases the clamp; releasing the gunlock closes the clamp.

4) Function choosing switch: Selects AC current, DC, AC voltage, resistance, capacitance, frequency, temperature, etc.

5) LCD display.

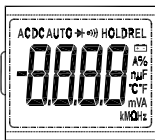
6) Function key: Chooses basic function.

7) Voltage, Resistance, Frequency, Temperature" input COM.

8) GND COM.

9) Carrying belt.

4-2. Displaying symbols



No.	Symbols	Meaning
1	Auto	Auto Range
2	-	Negative reading
3		Low battery indication
4	AC	AC mode
5	DC	DC mode
6		Diode, Continuity test
7	REL	Relative value symbol
8	M-H	Maximum reading display
9	D-H,HOLD	Data hold
10	mV-V	Voltage unit: mV/ V
11	Ω /K Ω /M Ω	Resistance unit: Ω /K Ω /M Ω
12	uA/mA/A	Current unit: uA/mA/A
13	nF/uF	Capacitance unit: nF/uF
14	Hz/kHz/MHz	Frequency unit: Hz/kHz/MHz
15	°C/°F	Temperature unit: °C/°F

4-3. Button functions and Auto off

1) **SELECT**: Under mull-function mode, press SELECT to choose related function.

2) **RANGE**: Press this button to select suitable range. Press it for more than 2 seconds to get back to AUTO mode.

3) **HOLD**: Press this button to hold the current measured value on LCD. Press it again to exit the hold model.

Note: after AUTO off, press the **HOLD** button to cancel the auto off function.

4) **REL**: Press this button to make the current displayed value as reference value, meanwhile the LCD displays as zero.

Measuring values hereafter will automatically deduct the reference value, unless pressing the REL button again to exit reference value test function.

5) **AUTO OFF**: During measurement, if there is no operation with the buttons and switch, the unit will automatically turns off to save energy. To exit AUTO OFF function (hibernation mode), please press HOLD button. Under AUTO OFF mode, press any button or turn the switch, the unit will get into "AUTO ON" (working mode).

4-4. Measurement of AC current

1) Turn the function switch to ACA range

2) Open the clamp to clamp a conducting wire and read the display directly. To get accurate display, it is suggested to put the conducting wire in the center of the clamp.

3)The default states is auto range, display AUTO symbol, press "range" switch to select manual range , you can choose 400A,

600A range, if the amplitude is unknown, start from highest range and decrease as

necessary

(see Figure.3)

NOTE:

1) When only the most significant digit "OL" is displays, it means over-range, must set the range switch to a higher range.

2) The input current shall not exceed the current limit. Otherwise, the unit maybe destroyed.

4-5. Measurement of AC voltage

1) Turn the function switch to V~ range. Press SELECT switch to select AC measuring mode, then connect the red test lead into "V Ω Hz" input terminal and black test lead into "COM" terminal.

2) Connect the test leads to the test point, voltage and polarity of the point which connect with red test leads will be display on LCD.

3) The default states is auto range, display AUTO symbol, press "range" switch to select manual range , you can choose 400mV, 4V, 40V, 400V, 600V range, if the amplitude is unknown, start from highest range and NOTE:

NOTE:

1) The 400mV range only has the manual range, if you need to use 400mV range, press "RANGE" key to select this range.

2) When only the most significant digit "OL" is displays, it means over-range, must set the range switch to a higher range.

3) The input voltage shall not exceed the voltage limit. Otherwise, the unit may be destroyed.

4) Take extreme care to avoid the contact with high voltage circuits when taking measurements in these circuits.

4-6. Measurement of DC voltage

1) Turn the function switch to V= range. Then connect the red test lead into "V Ω Hz" input terminal and black test lead into "COM" terminal.

2) Connect the test leads to the test point, voltage and polarity of the point which connect with red test leads will be display on LCD.

3)The default states is auto range, display AUTO symbol, press "range" switch to select manual range , you can choose 400mV, 4V, 40V, 400V, 1000V range, if the amplitude is unknown, start from highest

range and decrease as necessary

(see Figure.5)

NOTE:

1) When only the most significant digit "OL" is displays, it means over-range, must set the range switch to a higher range.

2) The input voltage shall not exceed the voltage limit. Otherwise, the unit may be destroyed.

3) Take extreme care to avoid the contact with high voltage circuits when taking measurements in these circuits

4-7. Measure of resistance

1) Turn the function switch to Ω range, press **SELECT** to select resistance measuring mode.

2) Then connect the red test lead into "V Ω Hz" input terminal and black test lead into "COM" terminal.

3) Connect the test leads crossly with the resistor under tested.

3) If measuring the small resistance, should short-circuit at first, press "REL" switch, and then measuring the unknown resistance, it actual resistance will be display on the LCD.

3)The default states is auto range, display AUTO symbol, press "range" switch to select manual range , you

can choose 400 Ω , 4k Ω , 40k Ω , 400k Ω , 4M Ω , 40M Ω range,

(see Figure.6)

NOTE:

1) If the measured resistance is unsure beforehand, should set the range switch to a higher range, then, switch to a proper range according to the displayed value.

2) If "OL" displays, it means over-range, the range switch should be set to a higher range. When the resistance is over 1M Ω , the reading should take a few seconds to be stable. It is normal at high resistance measurement.

3. When input terminal is open circuit, "OL" displays.

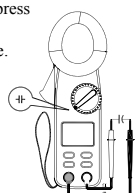
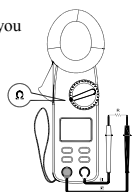
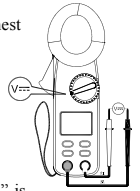
4. When measuring in-line resistance, be sure the power has been turned off and all capacitors are fully released.

5. Do not input voltage at this range.

4-8. Measurement of capacitance

1) Turn the function switch to $\overline{||}$ range, press **SELECT** to select resistance measuring mode.

2) Connect the red test lead into "V Ω Hz" input terminal and black test lead into "COM" terminal. (see Figure.7)



3) If the LCD is not display zero, press **REL** to make display as zero.

4) Use the test leads (the read test lead as "+") to connect the capacitance into "COM" and "VΩ" terminal correctly. The LCD will display capacitance value.

NOTE:

1) Do not input voltage or current signal under the capacitance range. If there is display on LCD, press REL to make LCD display as zero so as to make sure of accurate measurement.

2) There is only auto measurement mode under capacitance range.

3) To protect the unit, make sure that the testing capacitances completely discharged.

4) Display of 200uF range is stable for more than 15 seconds.

4-9. Measurement of Frequency

1. Connect the red test lead into "VΩHz" input terminal and black test lead into "COM" terminal.

2. Turn the function switch to "Hz" range.

3 The range is auto-range. Connect the leads across to the signal under measured; the value will be displayed on LCD.

NOTE:

1. There is only auto-range at this range.

2. When input is over 10V Ac RMS, reading is possible, but maybe over-range.

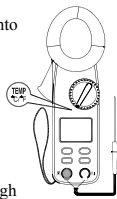
3. It's better to use shield cable when measuring small signals in noisy place.

4. Be careful when measuring high voltage.

5. Do not input voltage over 250V DC/ACRMS.

4-10. Measurement of temperature

Turn the function switch to TEMP range. Then connect the negative terminal (black) of thermocouple sensor to the "COM" terminal and the positive (red) to the "VΩHz" terminal. Put the testing terminal of thermocouple sensor on or into the testing object, then read the temperature (°C) from the LCD display. (see Figure.9)



NOTE:

1) During test, put the unit away from high

temperature, and use the testing terminal of thermocouple sensor within testing limits.

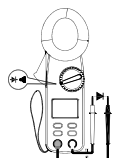
2) To make sure of accurate testing results, do no replace the thermocouple sensor randomly.

3) Do not input voltage under this range.

4) When the input terminal is in open circuit, will display the "normal temp.

4-11. Measure of Continuity and diode

1) Turn the function switch to $\rightarrow + \rightarrow \infty$ range, press **SELECT** to select **continuity** test mode.



2) Connect the red test lead into "VΩHz" input terminal and

black test lead into "COM" terminal. (see Figure.10)

3) Press **SELECT** to select **continuity** test mode, the LCD will display the symbol $\rightarrow \infty$

4) Connect the two test leads on the testing circuit with some distance. If the buzzer rings, the testing resistance will be less than $50 \pm 10 \Omega$.

5) Press **SELECT** to select diode test mode. The LCD will display the symbol $\rightarrow +$

6) Forward measurement: Connect the red test lead on the testing diode's positive polarity and black test lead on negative polarity, the LCD will display the approximated value of diode voltage drop.


7) Reverse measurement: Connect the red test lead on diode's negative polarity and black test lead on positive polarity, the LCD will display "OL".

8) A completer diode test includes forward and reverse tests. If the testing results are not in compliance with the above, then diode is broken.

NOTE: Do not input voltage under this range!

5. Maintenance

The unit is a precise instrument. Random changes to the circuit are not allowed. Users shall pay attention to the following:

1) If the LCD display the symbol , please replace the battery.

2) Before replacing the battery, move the test lead from the testing objects and turn off the power. Release the screws on the battery cover and replace the battery.


3) Do not expose the unit under direct sunshine, high temperature, flammable & explosive environment nor strong magnetic environment.

4) Keep away from humidity and dust. Do not fall it.

5) Use cloth with cleanser rather than corrosive solvents to wipe and clean the unit regularly.

6. Troubleshooting

If the unit dose not work normally, please refer to the following solutions. If the problems still cannot be solved, please refer to repairing service center or contact the local dealers.

Problems	Solutions
Do display	<ul style="list-style-type: none"> ■ Connect the unit to power. ■ Turn on the ON/FF switch. ■ Replace battery
 appears	<ul style="list-style-type: none"> ■ Replace battery
Obvious display error	<ul style="list-style-type: none"> ■ Replace battery

The specifications are subject to changes without notice.

The operation manual is considered as correct. Should the users find any mistakes or omission, please kindly contact the

manufacturer.

The manufacture dose not take responsibilities for accidents and harm caused by wrong operations by the users.

The functions described in this manual shall not be considered as the reasons to apply the unit to special usages.