

# AC Clamp Meter

## Introduction

This clamp meter has been designed according to IEC-61010-2-032 concerning electronic measuring instruments with 600V CAT III .  
To fully utilize this meter, please keep this manual for reference .


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1. Safety
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



### Series Function List

Max. Display	1999 (3 1/2)
Basic Accuracy	0.5%
DC Voltage	200mV-600V
AC Voltage	200mV-600V
AC Current	2A-600A
Resistance (Ω)	200Ω-20MΩ
Temperature (°C/°F)	-20°C-1000°C 0°F-1800°F
Diode	Yes
Continuity	Yes
NCV Detection	Yes
LINE Test	Yes
Manual Range (RAN)	Yes
Select (SEL)	Yes
Data Hold (HOLD)	Yes
Max. Hold (MAXH)	Yes
Auto Power off	Yes
Safety Rating	CAT III 600V

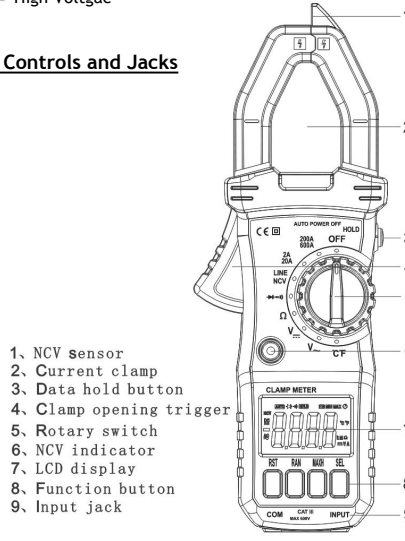
### 1. Safety

- \* Before measurement, the meter should be switched on for 30 seconds.
- \* Do not operate meter if there are damages of meter or test leads
- \* Only use the factory supplied test leads, or are placement test lead with the same specification to ensure safety.
- \* If meter is operated in a noisy environment, the readings might not be stable or with error.
- \* Do not connect test leads to circuit under test when changing the measuring range.
- \* put to max range position if actual range is unknown.
- \* Make sure the correct jacks of test leads insert or correct position of rotary switch during the operation.
- \* Hold the insulation part of test leads when measuring.
- \* Use great care when making measurements if the voltages are greater 60VDC or 36V AC RMS, these voltages are considered a shock hazard.
- \* To avoid damages to the meter, do not exceed the maximum limits of the input values shown in the specification.
- \* Do not insert test leads into jacks once measuring current.
- \* Always discharge capacitors and remove power from the device under test before performing Diode, Resistance or Continuity tests
- \* When  icon appears at the display, please replace battery to avoid wrong readings.

### Safety Symbols

-  This symbol, adjacent to another symbol or terminal, indicates the user must refer to the manual for further information.
-  Earthing
-  Double Insulation
-  High Voltage

### 2. Controls and Jacks



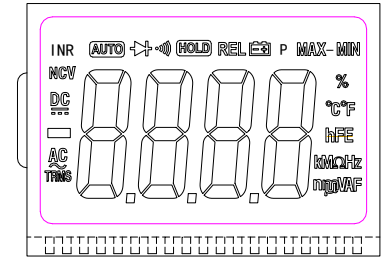
1. NCV sensor
2. Current clamp
3. Data hold button
4. Clamp opening trigger
5. Rotary switch
6. NCV indicator
7. LCD display
8. Function button
9. Input jack













Note: Battery compartment is on rear of unit

### 3. Front Panel Description





No	Function	Description
1	NCV Detection	Move the rotary switch to NCV position, hold the meter once detect the voltage, meter will be alarmed and LED flash
2	Current Clamp	When measuring current, put the wire inside of clamp area, the LCD displays the current value
3	NCV Indicator	Once NCV function detects the voltage, the LED indicator will be blinking
4	Data Hold	Push this button to hold the readings in LCD
5	Clamp Open Trigger	Max. jaw opening: 21.5mm
6	Rotary Switch	Move the rotary switch for selecting proper range and function
7	LCD	Display readings of measurement
8	Function Keys	1.SEL: Function selection button to shift °C/°F, diode/continuity
		2.RAN: Manual range selection key, push the button to switch proper range under voltage and resistance measurement mode
		3.HOLD: Data Hold, push the button to hold the readings in LCD, press again to exit
		4.MAXH: push this button to display the max. readings of measurement, if the max. value is changed during the measurement, it is updated automatically
9	Input Jack	INPUT jack for all measurements except current testing connected with red test lead; COM jack if for public terminal connect with black test lead

### Symbols of LCD display




Symbol	Description	Symbol	Description
	Data Hold		Low Battery
	Diode Test		Continuity
	Max. Value Hold		Unit of current
	Non-Contact Voltage Detection		Centigrade Temperature
	Unit of Voltage		Fahrenheit Temperature
	Direct Current		Alternating Current

### 4. Function Keys Description

-  Power Button
  - Power on or power off the meter
  - APO SET - Auto power off setting button
  - Push this button before power on meter, the meter will be powered off in 15 minutes automatically; if this button is activated, the meter will not power off automatically.
- HOLD - Data Hold button
  - Push this button to hold the readings in LCD
-  AC/DC Shift Button
  - Push this button to shift measurement of AC/DC signals
- RANGE - Range Selection Button
  - Manual range selection button, activate this button to switch proper range accordingly and repeat. Hold one more time to activate auto range.
-  Diode/Continuity Selection Button
  - Set the rotary switch to  position, push this button to select diode test or continuity check.

### 5. Technical Specification

- General Specifications:
  - Operating temp.: 0-40 °C / Humidity: <80%RH
  - Storage temp.: -10-60 °C / Humidity: <70%RH, remove battery)
- Maximum input voltage between input socket and the earth: 600VRMS
- The measuring principle: double integral A/D conversion conversion
- The sampling rate: about 2 times/sec.
- Display: 3 1/2 LCD display, max. reading 1999
- Automatically display the unit symbol of each measuring range
- Range selection: auto ranging switch
- Over range indication
- Once input voltage over 600VRMS, LCD indicate "OL" (DCV & ACV Range)
- Input polarity: Display "-."
- Low battery indication
- Once the battery lowers the normal working voltage,  will be displayed in LCD
- Power Supply: DC 1.5V X2 (SIZE AAA)
- Max jaw opening capacity: φ23mm
- The maximum measured conductor size: φ23mm
- Dimension: 194x72x35mm (LxWxH)
- Weight: Approx. 230g(including batteries)

- Accessories:
- User manual - 1pc
- Test Leads - 1set
- Gift box - 1pc

Temperature probe - 1pc

### Measurement Specifications

Accuracy:  $\pm(\% \text{ readings} + \text{digit})$

Warranty period: 12 months

Environment temperature: 18°C - 28°C; humidity:  $\leq 80\%$

\* Under AC current measurement, put the conductor under test in the middle of clamp for getting the accurate value.

### AC Current

Range	Resolution	Accuracy
2A	0.001A	$\pm(2.5\%+10d)$
20A	0.01A	
200A	0.1A	
600A	1A	

Frequency response: 50-60Hz

### DC Voltage

Range	Resolution	Accuracy
200mV	0.1mV	$\pm(0.5\%+3d)$
2V	0.001V	$\pm(0.8\%+5d)$
20V	0.01V	
200V	0.1V	
600V	1V	$\pm(1.0\%+5d)$

Input impedance: 10M $\Omega$

Max input voltage: 600V DC or 600V AC RMS.

### AC Voltage

Range	Resolution	Accuracy
200mV	0.1mV	$\pm(1.0\%+10d)$
2V	0.001V	$\pm(1.0\%+5d)$
20V	0.01V	
200V	0.1V	
600V	1V	$\pm(1.2\%+5d)$

Input impedance: 10M $\Omega$

RMS 40Hz-400Hz



Max input voltage: 600V DC or 600V AC RMS.

### Resistance

Range	Resolution on	Accuracy
200 $\Omega$	0.1 $\Omega$	$\pm(1.0\%+10d)$
2k $\Omega$	0.001K $\Omega$	$\pm(0.8\%+5d)$
20k $\Omega$	0.01K $\Omega$	
200k $\Omega$	0.1K $\Omega$	
2M $\Omega$	0.001M $\Omega$	$\pm(2.0\%+10d)$
20M $\Omega$	0.01 M $\Omega$	

Overload protection: 250V DC or 250V AC RMS.

### Diode and Continuity

Range	Function
	Display approximate forward voltage of diode, reverse shows OL
	Built-in buzzer will be sounded if resistance is less than 30 $\Omega$

Overload protection: 250V DC or 250V AC RMS.

### Temperature

Range	-20°C - 1000°C	
Resolution	1°C	
Accuracy	-20°C - 0°C	$\pm(5\% \text{ reading} + 4 \text{ digit})$
	0°C - 400°C	$\pm(2\% \text{ reading} + 3 \text{ digit})$
	400°C - 1000°C	$\pm(3\% \text{ reading} + 3 \text{ digit})$
Range	0°F - 1800°F	
Resolution	1°F	
Accuracy	-0°F - 50°F	$\pm(5\% \text{ reading} + 4 \text{ digit})$
	50°F - 750°F	$\pm(2\% \text{ reading} + 3 \text{ digit})$
	750°F - 1800°F	$\pm(3\% \text{ reading} + 3 \text{ digit})$

Overload protection: 250V DC or 250V AC RMS.

## 6. Operating Instruction

### Current Measurements

Disconnect the test leads before making clamp measurements

To avoid electrical shock and/or damage to the meter, do not attempt to take any voltage measurement that might exceed 600V.

- Set the rotary switch to proper current range
- Select the correct range based on measurement
- Press the clamp opening trigger to open the jaws and fully enclose one conducting wire
- Read the measured current value in the LCD display
- If display shows "OL", means overload, should select the higher range of measurements

### Voltage Measurement

$\Delta$  The max. input DC voltage is 600V DC, to avoid electrical shock and/or damage the meter, do not attempt to take any voltage measurement that might exceed 600V DC

- Set the rotary switch to the DCV or ACV position
  - Insert the black test lead banana plug into COM jack, insert the red test lead banana plug into INPUT jack
  - Touch with the black test probe tip the negative side of the circuit; touch with the red test lead probe tip the positive side of circuit
  - Read the voltage value in the display
- $\Delta$  NOTE: Unstable display may occur, especially at the low voltage range measurement (like 200mV range), even no test leads insert at input terminals, and it is the normal situation and not influences the accuracy.

### Resistance Measurement

$\Delta$  To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any resistance measurements

- Set the function switch to  $\rightarrow \Omega$  position and press the SEL button to select the  $\Omega$  range
  - Insert the black test lead banana plug into COM jack, insert the red test lead banana plug into INPUT jack.
  - Touch with the black test probe tip one side of the resistance under test; touch with the red test probe tip the other side.
  - Read the resistance value in the display.
- $\Delta$  NOTE:  
In order to ensure the best accuracy in measurement of low resistance, short the test leads before the measurement and subtract this resistance value of the test leads.

### Diode Test

$\Delta$  To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking diode test.

- Set the function switch to  $\rightarrow \rightarrow \Omega$  position and press the SEL button to choose diode test mode
- Insert the black test lead banana plug into COM jack, insert the red test lead banana plug into INPUT jack
- Place the red test lead on the anode of diode and black test lead on the cathode of diode
- The meter will show the approx. forward voltage of diode

### Continuity Check

$\Delta$  To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking continuity check.

- Set the function switch to  $\rightarrow \rightarrow \Omega$  position and press the SEL button to choose continuity check mode
- Insert the black test lead banana plug into COM jack, insert the red test lead banana plug into INPUT jack
- Touch the test probe tips across the circuit or component under test
- If the resistance is  $< 30\Omega$ , the audible signal will be

heard

### Temperature Measurement

- Set the function switch to  $\rightarrow \rightarrow \text{°C}$  position, the value of ambient temperature shows in display
- Press SEL button to shift  $\rightarrow \text{°C}$  mode or  $\rightarrow \text{°F}$  mode
- Insert the red terminal of temperature probe (K Type) into the INPUT jack, black terminal into COM jack, place the temperature probe tip where needed to measure.
- Read the temperature on the display

### NCV Detection

- Set the function switch to NCV position
- Approach the top part of meter with the circuit under test, the indicating LED will be flash and audible signal will be heard once detecting the voltage, the signal strength shown in LCD display

$\Delta$  NOTE:

- The detection result is for reference, do not determine the voltage by NCV detection ONLY.
- Detection may interfere by socket design, insulation thickness and other variable conditions.
- The external interference sources, such as flashlight, motor, etc, may cause the wrong detection.

### Line Test (Live Wire Recognition)

- Set the rotary switch to LINE NCV position
- Connect the red test lead to INPUT jack, and take out black test lead from jack, hold the insulation part of red test lead to touch the socket or plain conductor to distinguish the live wire or earth line.
- If detect the earth line or non-electrically charged object, there is no buzzer sounded and no LED flicker; once detect the live wire which over 60V, the buzzer of meter will be activated and red LED will flicker

$\Delta$  NOTE:

- 1) To avoid the interference electric field from COM input, please take out black test lead from COM jack before LINE test.
- 2) If in the dense high voltage situation, it might influence the accuracy of LINE Test, you can judge by the frequency of buzzer sound and LED contrast.

## 7. Maintenance


$\Delta$  WARNING:

- To avoid electric shock, disconnect the test leads from any source of voltage before removing the back cover or the battery or fuse covers.
- To avoid electric shock, do not operate the meter until the battery and fuse covers are in place and fastened securely.

### Cleaning and Storage

Periodically wipe the case with a damp cloth and mild detergent, do not use abrasives or solvents.  
If the meter is not be used for a long time, remove the battery and store it separately.

### Battery Installation

To avoid the false readings, replace the battery as soon as the battery indicator  appears.

- 1) Turn power off and disconnect the test leads from the meter.
- 2) Open the rear battery cover by using screwdriver.
- 3) Insert the battery into battery holder, observing the correct polarity.
- 4) Put the battery cover back in place, secure with the screws.