

Digital AC/DC Clamp Meter Manual

1. SUMMARY

This 3 3/4 Digit Highly Stable clamp meter uses two AAA (1.5V) batteries. It has a LCD with 18mm digit display, which makes the reading clearer and the operation more convenient. It can test DCV, ACV, DCA, ACA, resistance, capacitance, frequency, temperature, diode, continuity, as well as non-contact AC voltage test. It is equipped with clamp jaw lighting, Backlight, unit symbol display, True RMS, MAX, MIN, data hold function, Relative measurement, auto power off and warning functions. It works in both auto range and manual range. To assure high accuracy and resolution, it adopts a micro-processor which drives the LCD directly and a dual integral A/D converter IC. It is an ideal tool for labs, factories radio-technology and household.

2. SAFETY NOTICE

The instrument is designed according to IEC1010-1 standard (safety standard issued by International Electro technical Committee), CAT III 600V and UL3111-1. Please read the followings carefully before any operation.

- 1. Introduction for safety symbols:
⚠: Existing High Voltage. ⚡: Dual Insulation. ⚠: Operator must refer to manual. 🔋: Low battery indication.
- 2. Notice:
 - (1) Please disconnect any signal and pluck out the test leads before opening the outside cover.
 - (2) To avoid electric shock and damage to the meter, water should not be leaked inside.
 - (3) DO NOT use this meter to do any test if the case hasn't finished installation and its screws haven't been tightened.
 - (4) DO NOT input the value higher than the limit at every range.
 - (5) Please don't input voltage in resistance terminal.
 - (6) Please turn the power switch to OFF after the test.
 - (7) To avoid the damage of battery leakage to the meter, please remove the battery for long-term storage.
 - (8) To avoid electric shock and damage to the meter, do not input voltage higher than DC 60V or AC 36V during the measurement.
- (9) To avoid electric shock, please be seriously careful when nipping the bus bar or something insulated.

3. FEATURES

1. GENERAL FEATURES

- (1) Display: LCD.
- (2) Max. display: 4000 digits (3 3/4), and auto polarity display.
- (3) Clamp open: Max. Open: 52mm.
- (4) Over-range display: "OL" displayed.
- (5) Data hold.
- (6) Relative Value measurement.
- (7) Sampling rate: approx.3 times/sec.
- (8) Low battery indicator: "🔋" displayed.
- (9) Continuity test: buzzer sounds when<50Ω.
- (10) Range: Auto range or Manual range.
- (11) Auto power off.
- (12) Power consumption: about 3mA.
- (13) Power: 2 × 1.5V batteries (AAA 7#battery).
- (14) Working environment: (0~40)°C, relative humidity: <70%.
- (15) Dimension: 270mm×123mm×35mm (length × width × height).
- (16) Weight: approx. 280g (including battery).
- (17) Accessories: user manual, test leads, temperature sensor TP01 banana probe, two AAA batteries.

2. TECHNICAL FEATURES

- (1) Accuracy: ± (a% × reading data + digits). To assure accuracy, the environment temperature should be (23±5) °C, relative humidity be <70%. One year accuracy guarantee since production date.
- (2) Temperature coefficient: 0.1×specified accuracy/1°C (t <18°C or >28°C) .
- (3) DC voltage (DCV)

Range	Accuracy	Resolution
400mV	± (1.0% reading+5 [^])	0.1mV
4V	± (0.5% reading+5 [^])	1mV
40V		10mV
400V		100mV
1000V	± (1.0% reading+5 [^])	1V

Input impedance: at 400mV range >40MΩ, at other ranges is 10MΩ.

Overload protection: 1000Vrms.

(4) AC voltage (ACV)

Range	Accuracy	Resolution
4V	± (0.8% reading+5 [^])	1mV
40V		10mV
400V		100mV
750V		1V

Input impedance: 10MΩ.

Overload protection: 1000Vrms.

Frequency response: 750V at 40Hz~1kHz, other ranges 40Hz~2kHz.

Display: True Rms Response (calibration base on Sine Wave RMS).

(5) DV Current (DCA)

Range	Accuracy	Resolution
40A	± (1.5% reading+5 [^])	0.01A
400A		0.1A
1000A		1A

Overload protection: 1200A (input time <60 seconds).

NOTE: Clear to zero before measurement, The testing object shall be placed in the middle of the clamp jaw.

(6) AC current (ACA)

Range	Accuracy	Resolution
40A	± (1.5% reading+5 [^])	0.01A
400A		0.1A
1000A		1A

Frequency response: Sine wave and triangle wave 40Hz- 1kHz; other waveforms 40Hz-200Hz.

Overload protection: 1200A (input time <60 seconds)

NOTE: The testing object shall be placed in the middle of the clamp jaw.

(7) Resistance

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

Open circuit voltage: 500mV, Overload protection: 250Vrms.

NOTE: DO NOT input any voltage value at this range!

(8) Capacitance

Range	Accuracy	Resolution
4nF	± (5.0% +10 [^])	1pF
40nF		10pF
400nF		100pF
4uF		1nF
40uF	± (2.5% +5 [^])	10nF
400uF		100nF
4mF		1uF
40mF		10uF

Overload protection: 250Vrms. Warning: DO NOT input voltage value at this range!

(9) Frequency

Range	Accuracy	Resolution
10Hz	± (0.5% reading+4 [^])	0.01Hz
100Hz		0.1Hz
1kHz		1Hz
10kHz		10Hz
100kHz		100Hz
1MHz		1kHz
10MHz		10kHz

Input sensitivity: >0.7V. Overload protection: 250Vrms.

(10) Temperature

Range	Accuracy	Resolution
(-40~1000)°C	<400°C: ± (1.0%+5 [^]) ≥400°C: ± (1.5%+15 [^])	1°C
(-40~1832)°F	<750°F: ± (1.0% + 5) ≥750°F: ± (1. 5%+ 15)	1°F

Sensor: K type banana plug (Nickel-chromium-Nickel silicon).

Warning: DO NOT input voltage value at this range!

(11) Continuity Test

Range	Description	Test Conditions
⚡	Diode forward voltage drop	Forward DC current is approx0.8mA, reverse voltage is approx2.2V.
∞	When the resistance under test is less than 50Ω, buzzer sounds continuously.	Open circuit voltage: 2V

Overload protection: 250V TRMS.

Warning: DO NOT input voltage value at this range!

4. OPERATION

4.1 PANEL DESCRIPTION

- (1) Jaw: 0 to 1000A AC current and NCV detecting device.
- (2) Hand protection: A safe design to protect users from touching the dangerous area.
- (3) Clamp gunlock: Pressing the gunlock can turn on or off the clamp.
- (4) Clamp light: Opening the clamp light can light up the tested area in the dark to prevent the danger.
- (5) NCV indicator: Detect the existence of the high voltage around to prevent the electric shock.
- (6) Hold button: When pressing this button, the current measured value will be kept on the LCD and cannot measure any new value at the moment. Press this Hold button again to exit the hold mode.
- (7) Function choosing switch: Used to select the function, range or turn on or turn off the clamp meter.

Function	Description
	DCA, ACA measurement.
	ACV, DCV measurement. Press "SELECT" to switch the measurement mode. Press "Hz/DUTY" to switch to Frequency/Duty cycle measurement mode.
NCV	Non-contact voltage test.
	Press "SELECT" to switch to Diode, Continuity, Capacitance and Resistance measurement mode.
Hz	Frequency measurement.
°C/°F	Temperature measurement. Press "SELECT" button to switch to °C or °F.

(8) Function key.

SELECT / KEY:

1) This is a key for Selecting function, Base on a working principle of Trigger action. Short press this key to choose measurement modes: Choose DC or AC at "", choose" → → → → ", choose "°C" or "°F" when at Temperature range.

2) The Meter will be Auto-power off when it is not being using within 15 minutes, then it will be entering into sleeping mode, the Buzzer will makes 5 times of alarm reminder within 1 minute before Auto-power off; Please press this "SELECT" function or Power on/off button to turn on the Power if you want to restart it.

3) Press this key and put it on Hold and then turn on the Power to awake it from sleeping mode, and then Auto-power off function will be canceled.

4) Illuminating lamp control key, press it for more than 2 minutes to turn on Illuminating lamp, and then press it for more than 2 minutes again to make it off.

2) Backlight control key, press it for more than 2 minutes to turn on Backlight (it will be shown on LCD) then press it for more than 2 minutes again to make it off. Backlight function will be off automatically when you release backlight control key after 30 minutes.

RANGE KEY:

In voltage and resistance measurements, it is RANGE function, to choose from auto range or manual range. The meter is default in auto range. The symbol "AUTO" appears on LCD. Press this key for one time to switch to manual range. Press it again for one time to increase on step from low to high. Press it for more than two seconds to return to AUTO range.

MAX/MIN KEY:

1) is a key for Data hold. Press this key it'll be entering into Manual Range Mode automatically, and shows MAX value, press it again to show MIN value.

2) Press MAX/MIN key for more than 2 minutes to exit Data Hold mode. Auto-power off will be canceled when it's been entered into MAX/MIN mode, also HOLD and SELECT function will Not be available at this moment. Data Hold Key: Press HOLD key, the Meter will Keeps the Data of measurement on LCD, press it again to exit Data Hold; Any new measurements CAN'T be started when using this Data Hold function.

HZ/DUTY KEY: In ACA/ACV measurements, press this key to switch measurement between frequency, duty ratio, voltage and current. In frequency measurement, press this key to switch between measurement of frequency and duty ratio (1-99%).

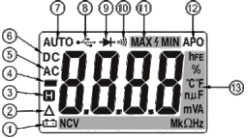
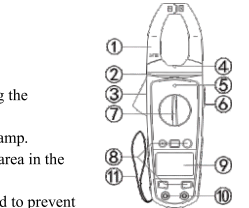
REL KEY:

In A~ and measurements, it is REL function. Press this key to clear "of reading" and enter relative value measurement. REL symbol will appear on the LCD. Press this key again to exit REL measurement. In A~ and measurements, if the display dose not return to zero before measurement, press this key to return to zero before measurement.

HOLD/ KEY:

1) It is a key for Data Hold, Base on a working principle of Trigger action, short press this key to keep the current Data of measurement on LCD, LCD will show symbol "", press this key again to exit Data Hold.

(9) LCD: Displaying measurement value and unit.



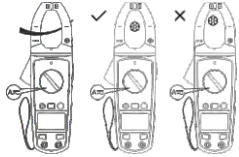
Sequence	Functions	Description
1		Low battery indication.
2	Δ	Relative measurement.
3	HOLD	Data hold
4	-	Indicates negative readings.
5	AC	AC measurement.
6	DC	DC measurement.
7	AUTO	Auto range.
8		Null.
9		Diode test.
10		Continuity beeper is on.
11	MAX $\frac{1}{2}$ MIN	MAX, MIN value, $\frac{1}{2}$ High pressure warning.
12	APO	Auto power off function has been activated.
13	hFE nF, μ F mV, V uA, mA, A %, °C, °F NCV M Ω , k Ω , Ω Hz, kHz, MHz	Null. Capacitance unit: nF, μ F. Non-contact voltage testing. Current unit: uA, mA, A. Null: uA, mA. Duty cycle, Degrees Celsius, Degrees Fahrenheit Non-contact voltage testing. Megohm, Kilohm, Ohm. Hertz, Kilohertz, Megahertz

(10) V/ Ω input terminal: Measurement inputs positive terminal (red test lead).
COM input terminal: Measurement inputs negative terminal (black test lead).

(11) Carrying belt.

4.2 DCA MEASUREMENT

- Press the clamp gunlock to open the clamp jaw to get testing wire inserted in the middle and clipped completely. To ensure measurement accuracy, please check to ensure that the testing wire is placed in the middle of clamp jaw. Measure one wire in one time. If measure more than one wires in one time, the reading will be inaccurate.
- Turn the rotary function switch to A \approx position. The meter is default at DCA measurement after power on. Press SELECT to switch between DC measurement.
- When the meter is used in a strong magnetic field, the readings could be unstable or inaccurate. Press REL to clear to zero before measurement.



NOTE:

- The meter uses Hall component to detect current. Hall component is a sensitive component. It is magnetic sensitive. It is also sensitive to temperature and mechanical stress. Any impact on it would cause the changes on reading in a short time. This causes some remaining values on the DC ampere reading when there is no current. To get accurate reading, press REL key to clear reading before measurement, and the testing wire must be placed in the middle of the clamp jaw.
- Press the clamp gunlock to open the clamp jaw to get testing wire inserted in the middle and clipped completely. Ensure that the testing wire is placed in the middle of clamp jaw. Otherwise there will be additional accuracy $\pm 1.0\%$ of reading. Read the measurement current value of the testing wire on the LCD.
- In the measurement of the DC current, if the reading is positive value, the current is top to down (broad is top, bottom cover is down).
- The max testing current is 1000A. Exceeding the rated current for long time will damage the meter.
Follow below instructions to get more accurate DC current measurement:
①Switch off the testing wire.
②Press the clamp gunlock to open the clamp jaw to get testing wire inserted in the middle and clipped completely. Ensure that the testing wire is placed in the middle of clamp jaw.
③When the meter reading is stabilized in the minimum value, press the REL key to clear it.
④Switch on the testing wire. Read after clamp meter remains stable.
⑤When measuring current, to get more accurate readings, the ambient temperature must be 0 to 40°C.

4.3 ACA MEASUREMENT

- Turn the rotary function switch to A \approx position. The meter is default at DCA measurement after power on. Press SELECT to switch between AC measurement.
- Open the clamp jaw and grip one wire and get the reading directly.
To get the most precise reading, should user put the wire in the middle of the close jaw.

NOTE:

- Firstly users should select the highest range, if users are not sure about the range of current under test, and then select the proper range based on displaying value.
- DO NOT input the current higher than the limit, or it would damage the meter.

4.4 DCV MEASUREMENT

- Set the rotary switch to “V \approx ” range and press “SELECT” to swift to “DCV” range.
- Turn the function swift to DCV range. Insert the black test lead into “COM”



- terminal, and the red one into “V/ Ω ” terminal.
- Connect test leads to the test point. LCD will display polarity and voltage of the test point connected by the red test lead.

Note:

- DO NOT input a voltage over the limit or It may cause damage to the circuit of the meter.
- Be careful while measuring a high voltage circuit. Do not touch the high voltage circuit.

4.5 ACV MEASUREMENT

- Set the rotary switch to “V \approx ” range and press “SELECT” to swift to “ACV” range.
- Turn the function swift to ACV range. Insert the black test lead into “COM” terminal, and the red one into “V/ Ω ” terminal.
- Connect the test leads into the circuit and get the measurement value from the LCD.

NOTE:

- DO NOT input a voltage over the limit or It may cause damage to the circuit of the meter.
- Be careful while measuring a high voltage circuit. Do not touch the high voltage circuit.

4.6 Non-Contact Voltage Detecting

WARNING

This Function might be disturbing by different external Sources, then might be incurred a wrong alarm reminder, test result is just for reference when using this function.
Turn Switch button to “NCV” position, the Target Circuit to be placed on the top of Meter, Meter will Shows strong and weak signals, meanwhile, Beeper will Makes “tick-tick-tick” of alarm reminder.

NOTE:

- Even if there is no any indication, the voltage might still be there. Do not rely on NCV detector as the only way to judge whether a Voltage is still existed on the Wire lead or not.
- Voltage detecting may be affected by power socket design, type of insulation and its thickness and other factors.
- Interference sources at the external environment such as flashing light, motor might cause a wrong signal for a wrong judgement.

4.7 RESISTANCE MEASUREMENT

- Set the rotary switch to “ Ω ” range and press “SELECT” to swift to “ Ω ” range.
- Insert the black lest lead into “COM” terminal and the red one into “V/ Ω ” terminal.
- Connect the test leads to the measured resistance to get the measurement value.

NOTE:

- Before measuring in line resistor, make sure that the power is off and all capacitors have discharged completely.
- Do not apply any voltage at resistance range.
- When input terminal is in open circuit, LCD will display “OL”.
- If there is an “OL” displayed on the LCD, it means it is over range, switch to a higher range. When the test leads are shorted, there would be about 1 Ω stray resistance.

4.8 DIODE AND CONTINUITY TEST

- Set the rotary switch to “ \rightarrow ” range. The original state is diode measurement mode.
- Forward measurement: Connect red test lead to the positive polarity and the black test lead to the cathode polarity of the diode. LCD will display the approx. value of forward voltage drop.
- Backward measurement: connect red test lead to the cathode polarity and the black test lead to positive polarity of the diode. LCD will display “OL”.
- The complete diode testing includes forward and backward measurement. If the result doesn't meet the descriptions above, it means the diode is broken.
- Press “SELECT” key to select the continuity measurement mode.
- Insert the black test lead into “COM” terminal, and the red one into “V/ Ω ” terminal.
- Connect test leads to two points of tested circuit, if the resistance is less than 50 Ω , the buzzer sounds.

NOTE:

DO NOT input any voltage value at this range!

4.9 CAPACITANCE TEST

- Set the rotary switch to “ \rightarrow ” range and press “SELECT” to swift to “ \rightarrow ” range.
- Insert the black test lead into “COM” terminal, and the red one into “V/ Ω ” terminal.
- Press “REL” key to clear the reading to make the LCD displayed zero.
- Connect the capacitor to “COM” and “V/ Ω ” terminal. (Note: the red test leads is for positive pole +). LCD displays capacitance value.

NOTE:

- Don't input voltage or current at Capacitance range.
- In order to assure the accuracy, please press “REL” to clear the reading before testing.
- There is only the auto range mode under the capacitance range.
- The capacitor must be completely discharged before testing.
- The reading of 200uF range will take more than 15 seconds to be stable.

4.10 FREQUENCY MEASUREMENT

- Turn the function swift to Hz range. Insert the black lest lead in “COM” terminal and the red one in “V/ Ω ” terminal.

- Connect the test leads to the measured circuit and get the measurement value.

Note:

- In noisy environment, it's better to use shield cable to measure a low signal.
- When measuring high voltage circuit, do not touch the high voltage circuit.
- Don't input voltage higher than 250Vrms or it may damage the meter.

4.11 TEMPERATURE TEST

- Turn Switch button to “°C/°F”, press “SELECT/” key to choose °C or °F measurement mode.
- Insert the black plug of the thermocouple sensor into “COM” and red one into “V/ Ω ” jack, and put the working terminal (temperature measuring end) of thermocouple on the surface or inside the object to be tested. Then you can read temperature from the screen, and the data is in Centigrade.

NOTE:

- The meter should be far away high temperature. Use the thermocouple probe within the specified temperature range.
- Don't change the temperature probe randomly, or the accuracy will not be guaranteed.
- Don't input voltage at temperature range.

4.12 AUTO POWER OFF

- The meter will auto power off if there is not any operation in 15 minutes and come into dormant mode. The beeper will sound five times within 1 minute before power-off.
- To restart the meter, please press any function key or turn to the function swift.
- Press “SELECT” key and turn on the meter or press “SELECT” when the meter is in dormant mode to wake up the meter and the “AUTO POWER OFF” function will be cancelled

5. MAINTENANCE

The meter is a precise instrument. Random changes to the circuit should be avoided.

NOTE:

- DO NOT put voltage higher than DC 1000V or AC 750V rms.
- DO NOT apply voltage in current, resistance, diode and continuity range.
- DO NOT make any measurements when the battery isn't installed or the back cover isn't fixed.
- Before replacing battery or fuse, please remove the test leads from the measuring point and turn off the power.
- Keep the meter away from water, dust and shock.
- DO NOT use the meter under high temperature, high humidity, combustible, explosive and strong magnetic environments.
- Clean the case with a damp cloth and mild detergent only. DO NOT use abrasives or alcohol or any other strong solvents to clean the meter.
- To avoid leakage damage, please take out the battery if the meter will not be used for a long time.
- When “ \rightarrow ” symbol is displayed, you should replace the battery according to the following steps:
 - Unscrew the screw on the battery door and remove the cover.
 - Replace the old battery with a new one. (For long life, it's better to use alkaline battery.)
 - Replace the battery door and tighten the screw.

6. TROUBLE SHOOTING

If the meter does not work properly, please check the meter as following steps:

(If the problems still cannot be solved, please refer to repairing center or contact the local dealers.)

Fault	Solution
No reading on LCD	Turn on the power Replace battery Release the HOLD key
signal appears	Replace battery
No current or temperature input	Replace fuse
Big error Value	Replace battery

- The specifications are subject to changes without prior notice.
- The content of this manual is regarded as correct. If users find out any mistakes or omissions, please kindly contact the manufacturer.
- The manufacturer will not be responsible for accidents and damage caused by improper operations.
- The functions described in this User Manual shall not be considered as the reason for any special usages.