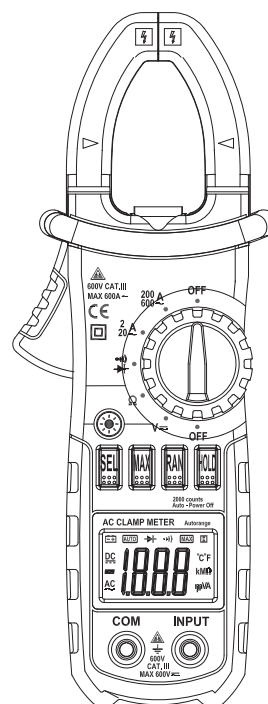


USERS MANUAL

DIGITAL AC CLAMP METER



EMC&LVD

Designed and Conforms to
IEC61010-1
CAT.III 600V



Y01-04-0056 A0



Before using the instrument, please read this manual carefully, and save it well for future using.

尺寸 : 100*142mm

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1. SAFETY INFORMATION



BE EXTREMELY CAREFUL WHEN USING THIS METER. Improper use of this device can result in electric shock or destruction of the meter. Take all normal safety precautions and follow the safeguards suggested in this manual.

To exploit full functionality of the meter and ensure safe operation, please read carefully and follow the directions in this manual.

This meter has been designed according to IEC-61010 concerning electronic measuring instruments with an overvoltage category CAT III 600V and pollution 2.

Follow all safety and operating instructions to ensure safe use of the meter.

1.1 PRELIMINARY

- ⇒ When using the meter, the user must observe all normal safety rules concerning:
 - General protection against electric shock
 - Protection of the meter against misuse
- ⇒ When the meter is delivered, check whether it has been damaged in transit.
- ⇒ After being stored and delivered under harsh conditions, the meter should be checked and confirmed whether any damages have been incurred.

- ⇒ Test leads must be kept in good condition. Before using check whether the insulation on test leads has been damaged and any wire has been exposed.
- ⇒ Use the test leads supplied to ensure operation safety. If required, they must be replaced with test leads of the same model or class.

1.2 DURING USE

- ⇒ Use the right input jack, function and range.
- ⇒ Do not take measurements that exceed the protection limit values indicated in the specifications.
- ⇒ Do not touch the metal tips of the test leads when the meter is connected to the circuit to be measured.
- ⇒ Keep your fingers behind the probe barriers when taking a measurement with an effective voltage above 60V DC or 30V rms AC.
- ⇒ Do not take voltage measurement if the value between the terminals and earth ground exceeds 600V.
- ⇒ Select the highest range if the value scale to be measured in the manual range is unknown.
- ⇒ Disconnect the test leads from the circuit under test before turning the rotary selector to change functions.
- ⇒ Do not measure the resistance, diode or continuity of live circuits.
- ⇒ Do not connect the meter to any voltage source while the rotary

selector is in the current, resistance, diode or continuity range.

- ⇒ Do not use the meter near explosive gases, steam or dirt.
- ⇒ Stop using the meter if any abnormalities or faults are observed.
- ⇒ Do not use the meter unless its rear case and battery cover is securely fastened in its original position.
- ⇒ Do not store or use the meter in areas exposed to direct sunlight, at high temperature or with high relative humidity.

1.3 SYMBOLS

	Caution, risk of danger (Important safety information; refer to the operation manual.)
	Application around and removal from HAZARDOUS LIVE conductors is permitted.
	Double insulation (Protection class II) .
CAT III	Overvoltage (Installation) category III, Pollution Degree 2 per IEC1010-1 refers to the level of Impulse Withstand Voltage protection provided.
	Conforms to European Union Directive
	Earth (ground) terminal

1.4 MAINTENANCE

- ⇒ Do not attempt to remove the rear case to adjust or repair the meter. Such actions should only be performed by a technician who fully understands the meter and the danger involved.

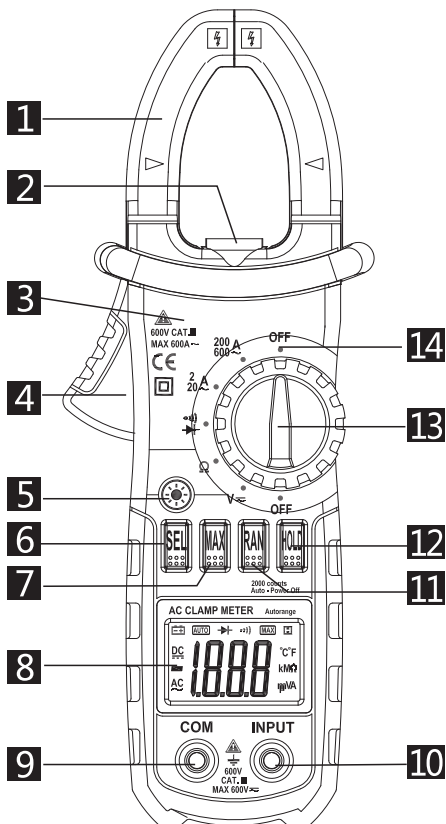
- ⇒ Before opening the case and battery cover of the meter, always disconnect test leads from all sources of electric current. Disconnect the test leads from all sources of electric current before opening the rear case and battery cover of the meter.
- ⇒ To avoid any electric shock caused by error readings, replace the batteries immediately when the “” sign appears on the display.
- ⇒ Use damp cloth and mild detergent to clean the meter; do not use abrasives or solvents.
- ⇒ Turn the rotary selector to OFF position to switch off the power when the meter is not in use.
- ⇒ Remove the batteries to avoid damages to the meter if it will idle for a long time.

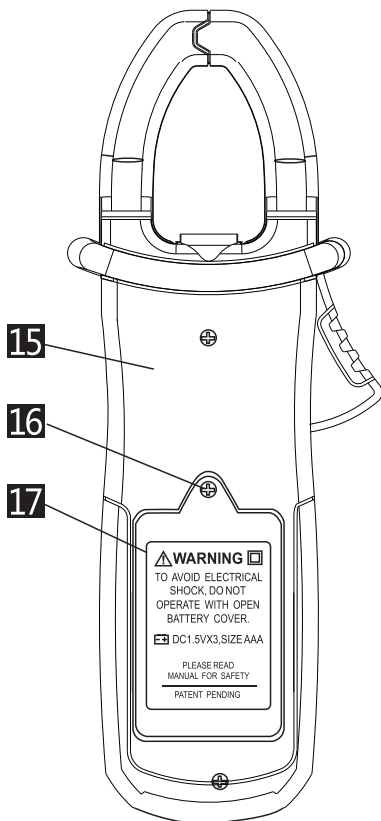
2. DESCRIPTION

- This meter is a portable professional measuring instrument with LCD and back light easily reading. The 'single-hand operation' design for the range switch makes measurement simple and easy. Overload protection and low battery indication are provided. It is an ideal multi-function Instrument with scores of practical applications for professional, workshop, school, hobby and home use.
- The meter can perform measurements of AC current, AC/DC voltage, resistance, as well as continuity and diode test.
- Both auto range and manual range are available.
- This meter is equipped with reading hold function.
- This meter is equipped with maximum value measuring function.
- This meter has function of auto power off.

2.1 NAMES OF COMPONENTS

- 1** Current Clamp
- 2** Clamp Lighting Bulb
- 3** Panel
- 4** Trigger
- 5** Back Light Switch Button ()
- 6** Function Switch Button (SEL)
- 7** MAX Switch Button (MAX)
- 8** Liquid Crystal Display (LCD)





- 9** COM Jack
- 10** Input Jack
- 11** Auto/Manual Switch Button (RAN)
- 12** Reading Hold (HOLD)
- 13** Rotary selector
- 14** OFF - power switch
- 15** Rear Case
- 16** Fixing Screw Of The Battery Cover
- 17** Battery Cover

2.2 SWITCH, BUTTONS AND INPUT JACKS



Button - For control backlight

SEL Button - For switching among measuring functions

MAX Button - For switching maximum value measurement

RAN Button - For switching between auto and manual ranges

HOLD Button - For holding the reading

INPUT Jack - For measuring voltage, resistance, diode and continuity.

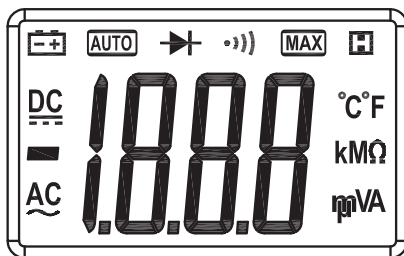
COM Jack - Common input connection for current, voltage, resistance, diode and continuity measurement.

OFF Position - For turning off the power.

Rotary Selector - For selecting functions and ranges.

Clamp - For measuring current

2.3 LCD (Liquid-crystal display)



AC

Alternating current

DC

Direct current



Diode test



Continuity buzzer

AUTO

Auto range mode

MANU

Manual range mode

MAX

The maximum value is being measure



Battery low

H

This indicates that the display data is being held.

mV, V

Milli-volts, Volts (Voltage)

A

Amperes (Current)

Ω, kΩ, MΩ

Ohms, Kilo-ohms, Mega-ohms (Resistance)

3. SPECIFICATIONS

Calibration is required once a year, to be carried out at a temperature between 18°C and 28 °C (64°F to 82°F) and relative humidity below 75%.

3.1 GENERAL SPECIFICATIONS

- Auto range and manual range options are available.
- Overrange protection is provided for all ranges.
- Maximum voltage between terminals and earth ground: 600V DC or rms AC
- Operating altitude: max. 2000 meters (7000 ft.)
- Display: LCD
- Maximum value display: 1999 digits
- Polarity indication: automatic; '-' for negative polarity.
- Overrange indication: 'OL' or '-OL'
- Sampling Time: approx. 0.4 second per sample
- Unit indication: function and unit.
- Auto power off time: 15 min.
- Operating power : 1.5V×3 AAA batteries
- Battery low indication:  on LCD
- Temperature factor: < 0.1×Accuracy /°C
- Operating temperature: 0°C to 40°C (32°F to 104°F)
- Storage temperature: -10°C to 50°C (10°F to 122°F)

- Dimension: 208×78×35mm
- Weight: approximate 340g (including batteries)

3.2 ELECTRICAL SPECIFICATIONS

Ambient temperature: $23\pm5^{\circ}\text{C}$ Relative humidity: < 75%

3.2.1 AC Current

Range	Resolution	Accuracy
2A	0.001A	$\pm (3.0\% \text{ of rdg} + 15 \text{ digits})$
20A	0.01A	
200A	0.1A	$\pm (3.0\% \text{ of rdg} + 10 \text{ digits})$
600A	1A	

- Max. input current: 600A
- Frequency range: 50 to 60Hz
- Response: average, calibrated in rms of sine wave

3.2.2 AC Voltage

Range	Resolution	Accuracy
2V	0.001V	$\pm (1.0\% \text{ of rdg} + 5 \text{ digits})$
20V	0.01V	
200V	0.1V	
600V	1V	$\pm (1.2\% \text{ of rdg} + 5 \text{ digits})$

- Input impedance: 10M Ω
- Overload protection: 200mV range: 250V DC or rms AC, 2V-600V ranges: 600V DC or 600V rms AC.
- Max. input voltage: 600V rms AC
- Frequency range: 40 to 400Hz
- Response: average, calibrated in rms of sine wave

NOTE:

At small voltage range, unsteady readings will appear before the test leads contact the circuit. This is normal because the meter is highly sensitive. When the test leads contact the circuit, the true reading will be shown.

3.2.3 DC Voltage

Range	Resolution	Accuracy
200mV	0.1mV	$\pm(0.8\% \text{ of rdg} + 2\text{digits})$
2V	0.001V	
20V	0.01V	
200V	0.1V	
600V	1V	$\pm(1.0\% \text{ of rdg} + 2\text{digits})$

- Input impedance: 10M Ω
- Overload protection: 200mV range: 250V DC or rms AC, 2V-600V ranges: 600V DC or 600V rms AC.
- Max. input voltage: 600V DC

NOTE:

At small voltage range, unsteady readings will appear before the test leads contact the circuit. This is normal because the meter is highly sensitive. When the test leads contact the circuit, the true reading will be shown.

3.2.4 Resistance

Range	Resolution	Accuracy
200 Ω	0.1 Ω	$\pm(1.2\% \text{ of rdg} + 2\text{digits})$
2k Ω	0.001k Ω	
20k Ω	0.01k Ω	
200k Ω	0.1k Ω	
2M Ω	0.001M Ω	
20M Ω	0.01M Ω	$\pm(2.0\% \text{ of rdg} + 5\text{digits})$

- Open circuit voltage: 0.25V
- Overload protection: 250V DC or rms AC

3.2.5 Diode

Range	Resolution	Function
	0.001V	displaying approximate forward voltage of diode

- Forward DC current $\sim 1\text{mA}$
- Reversed DC voltage $\sim 1.5\text{V}$

- Overload protection: 250V DC or rms AC

3.2.6 Continuity

Range	Resolution	Function
	0.1 Ω	Built-in buzzer will sound, if resistance is lower than 60 Ω .

- Open circuit voltage ~ 0.45V
- Overload protection: 250V DC or rms AC

4. OPERATION INSTRUCTION

4.1 HOLDING READINGS

- 4.1.1 Press the "**HOLD**" button to hold the readings while taking measurement and the value on the display will be held.
- 4.1.2 Press the "**HOLD**" button again to release the READING HOLD function.

4.2 SWITCHING RANGES

- 4.2.1 When the meter is turned on, it is at the auto range mode for measuring current, voltage, resistance, capacitance and frequency.
- 4.2.2 Press the "**RAN**" button for manual range mode. The range will go up one level at each press and return to the lowest level when the highest level is reached.
- 4.2.3 Press the "**RANGE**" button for two or more seconds to return to the auto range.
- 4.2.4 When measuring the maximum or minimum value, press the "**RAN**" button, the meter will recover the normal working condition.

4.3 SWITCHING MAXIMUM VALUE

- 4.3.1 At the voltage and current range, press the "**MAX**" button to switch to maximum value measurement.

4.3.2 Press the "**MAX**" button again, the meter will recover the normal working condition.

4.4 SWITCHING FUNCTIONS

4.4.1 Press the "**SEL**" button to switch between AC and DC measurement at the voltage ranges.

4.4.2 Press the "**SEL**" button to switch among diode and continuity ranges.

4.5 BACK LIGHT AND CLAMP LIGHTING BULB

4.5.1 Press the " button for two or more seconds to switch on the back light if the light in the environment is too dim for taking reading, which will last for 15 seconds.

4.5.2 In the courts of, press the " button for two or more seconds again to switch off the back light.

4.5.3 At the current range, when the back light is switch on, the clamp lighting bulb will brighten up.

NOTE:

- LED, which requires a larger working current, is the main source of back light. Although the meter is equipped with a timer set at 15 seconds (i.e. the back light will be off automatically after 15 seconds), frequent use of the back light will shorten the life of the batteries. Therefore, do not use the back light unless necessary.
- When the battery voltage is $\leq 3.6V$, the symbol " (battery low)

will appear on the LCD. When the back light is on, even if the battery is $\geq 3.6\text{V}$, the "" may appear because of its large working current which will cause the voltage to drop. (The accuracy of the measurement cannot be assured when the "" symbol appears.) In this case, you need not replace the batteries yet. Normally, the batteries can last until the "" appears when the back light is not being used.

4.6 AUTO POWER OFF

- 4.6.1 If there is no any operation within any fifteen minutes after power is on, meter will auto power off.
- 4.6.2 Turn the rotary selector or press any button to resume operation of the meter under auto the power off mode.
- 4.6.3 At the same time power on, if press the "HOLD" button, auto power off disable.

4.7 PREPARATING FOR MEASUREMENT

- 4.7.1 Switch on the power by turning the rotary selector. If the battery voltage is lower than 3.6V , the "" symbol will appear and the batteries should be replaced.
- 4.7.2 The "" symbol shows that the input voltage or current should not exceed the specified value in order to protect the internal circuit from damage.
- 4.7.3 Turn the rotary selector to the required function and range to be

measured. Under the manual mode, choose the highest range when the value scale to be measured is unknown.

- 4.7.4 Connect the common test lead first and then the charged test leads when making connection. Take away the charged test lead first when disconnecting.

4.8 MEASURING AC CURRENT



Beware of Electrocution.

Ensure that the test leads are disconnected from the meter before making current clamp measurements.

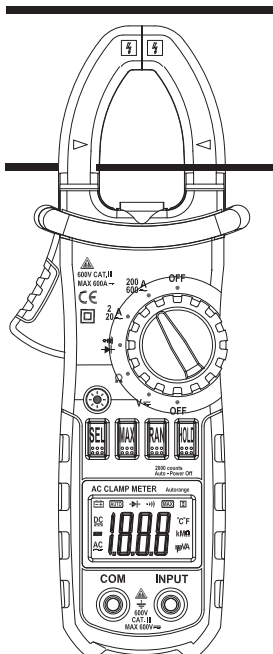
- 4.8.1 Set the rotary selector to the **A** $\sim$ range position.
- 4.8.2 If need be, press the "**RAN**" butt on to choose the manual range mode.
- 4.8.3 Press the trigger to open jaw. Fully enclose only one conductor.
- 4.8.4 Take the reading on the LCD.

NOTE:

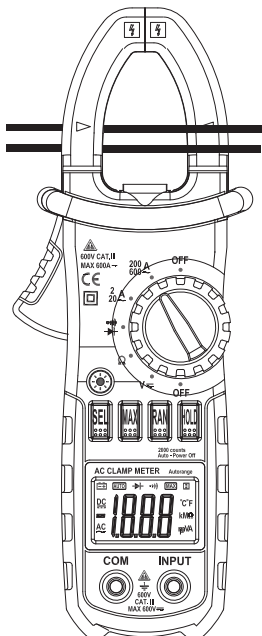
- 1) For right results, do not enclose more than one conductor in the jaw.
- 2) For optimum results, center the conductor in the jaw.
- 3) At the manual range mode, when only 'OL' is shown on the LCD, it means the measurement has exceeded the range. A higher range should be selected.
- 4) Under the manual range mode, when the scale of the value to be

measured is unknown beforehand, set the range to the highest.

- 5) “” means the maximum input current is 600A rms AC.



Correct



Incorrect

4.9 MEASURING AC VOLTAGE



Beware of Electrocution.

Pay special attention to avoid electric shock when measuring high voltage.

Do not input the voltage which more than 600V rms AC.

4.9.1 Plug the black test lead into the **COM** jack and the red test lead into the **INPUT** jack.

4.9.2 Set the rotary selector to the **V $\sim$** range position, then the meter at the AC V measurement mode.

4.9.3 If need be, press the **"RAN"** button to choose the manual range mode.

4.9.4 Connect the test leads to the voltage source or load terminals for measurement.

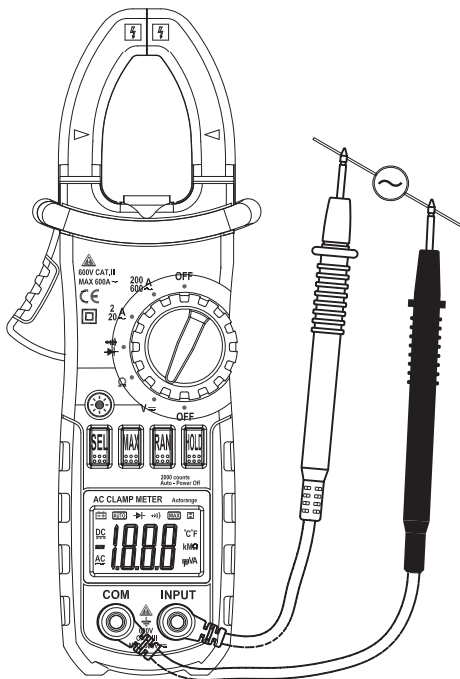
4.9.5 Take the reading on the LCD.

NOTE:

- 1) At small voltage range, unsteady readings may appear before the test leads contact the circuit. This is normal because the meter is highly sensitive. When the test leads contact the circuit, the true reading will be shown.
- 2) At the manual range mode, when only 'OL' is shown on the LCD, it means the measurement has exceeded the range. A higher range should be selected.
- 3) At the manual range mode, when the scale of the value to be

measured is unknown beforehand, select the highest range first and lower the range gradually.

- 4) “” means the maximum input voltage is 600V rms AC.



4.10 MEASURING DC VOLTAGE



Beware of Electrocution.

Pay special attention to avoid electric shock when measuring high voltage.

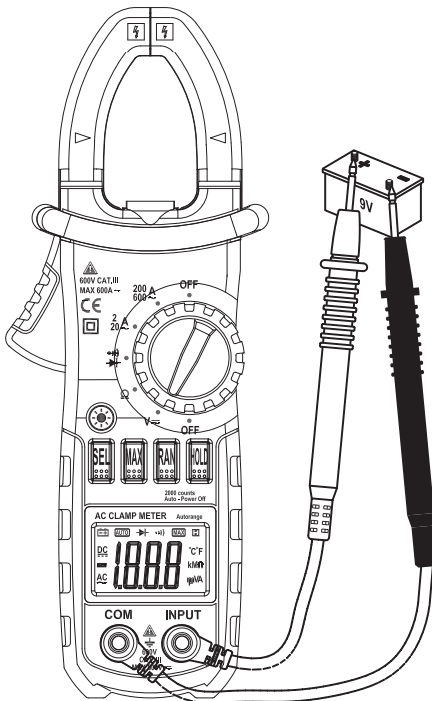
Do not input the voltage which more than 600V DC.

- 4.10.1 Plug the black test lead into the **COM** jack and the red test lead into the **INPUT** jack.
- 4.10.2 Set the rotary selector to at the **V $\sim$** range position.
- 4.10.3 Press the "**SEL**" to switch to DC V measurement. If need be, press the "**RAN**" button to choose the manual range mode.
- 4.10.4 Connect the test leads to the voltage source or load terminals for measurement.
- 4.10.5 Take the reading on the LCD. The polarity symbol denotes the polarity of the end connected by the red test lead.

NOTE:

- 1) At small voltage range, unsteady readings will appear before the test leads contact the circuit. This is normal because the meter is highly sensitive. When the test leads contact the circuit, the true reading will be shown.
- 2) Under the manual range mode, when only 'OL' or '-OL' is shown on the LCD, it means the measurement has exceeded the range. A higher range should be selected.

- 3) Under the manual range mode, when the scale of the value to be measured is unknown beforehand, select the highest range first and lower the range gradually.
- 4) “” means the maximum input voltage is 600V DC.



4.11 MEASURING RESISTANCE



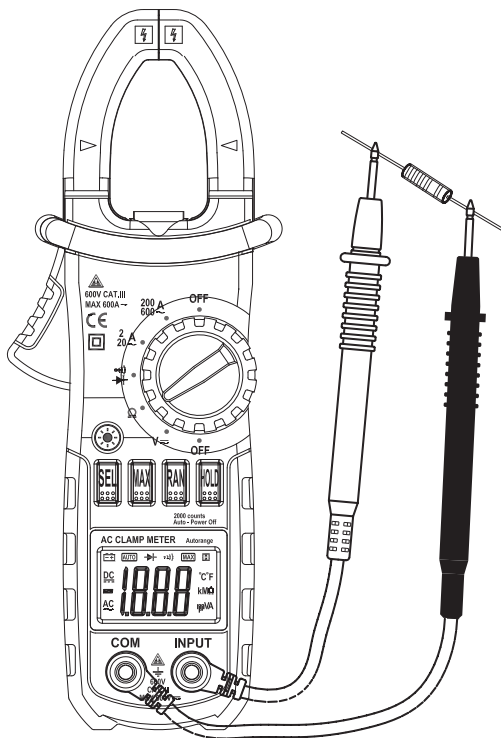
Beware of Electrocution.

When measuring in-circuit resistance, make sure that the power of the circuit under test has been turned off and that all capacitors have been fully discharged.

- 4.11.1 Plug the black test lead into the **COM** jack and the red test lead into the **INPUT** jack.
- 4.11.2 Set the rotary selector to the Ω range position.
- 4.11.3 If need be, press the "**RAN**" button to choose the manual range mode.
- 4.11.4 Connect the test leads to the ends of the resistor or circuit for measurement.
- 4.11.5 Take the reading on the LCD.

NOTE:

- 1) At the manual range mode, when only 'OL' is shown on the LCD, it means the measurement has exceeded the range. A higher range should be selected.
- 2) When the input is open, 'OL' will appear on the LCD to indicate that the range has been exceeded.
- 3) For measuring resistance above $1\text{M}\Omega$, it may take a few seconds to get a steady reading. This is normal for high resistance reading.



4.12 TESTING DIODE

4.12.1 Plug the black test lead into the **COM** jack and the red test lead into the **INPUT** jack.

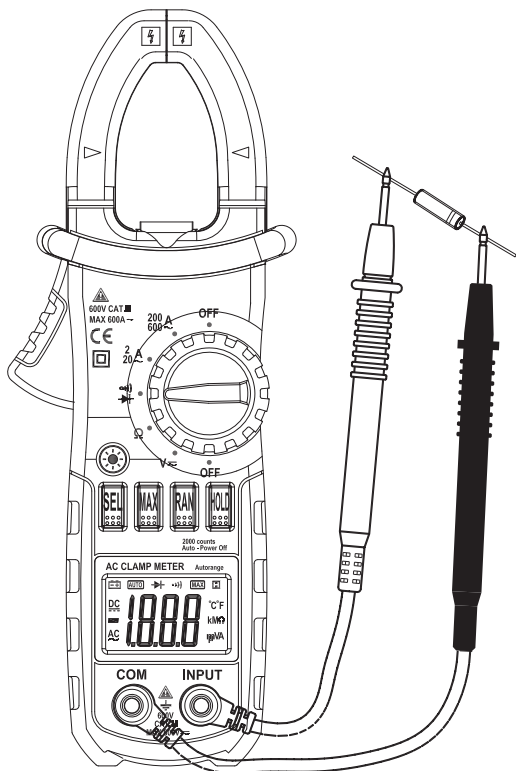
4.12.2 Set the rotary selector to the   range position, then the meter at the  test mode.

4.12.3 Connect the red test lead to the anode and the black test lead to the cathode of the diode for testing.

4.12.4 Take the reading on the LCD.

NOTE:

- 1) The meter will show the approximate forward voltage drop of the diode.
- 2) When the test leads have been reversed or open, 'OL' will appear on the LCD.



4.13 TESTING CONTINUITY



Beware of Electrocution.

Make sure that the power of the circuit has been turned off and the capacitors have been fully discharged before testing the continuity of a circuit.

4.13.1 Plug the black test lead into the COM jack and the red test lead into the INPUT jack.

4.13.2 Set the rotary selector to the  range position.

4.13.3 Press the "SEL" button to switch to  continuity test.

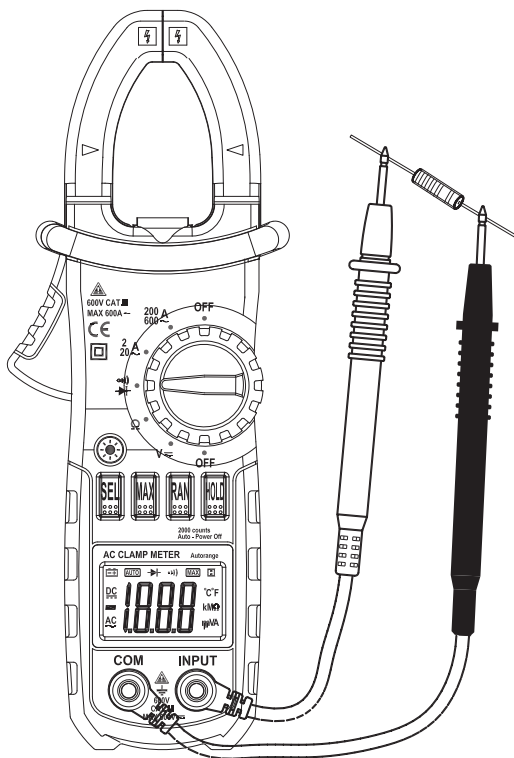
4.13.4 Connect the test leads to the two ends of the circuit for measurement.

4.13.5 If the resistance of the circuit being tested is less than 50Ω , the built-in buzzer will sound.

4.13.6 Take the reading on the LCD.

NOTE:

If the test leads are open or the resistance of the circuit is over 200Ω , "OL" will appear on the LCD.



5. MAINTENANCE

5.1 REPLACING THE BATTERIES



To avoid electric shock, make sure that the test leads have been clearly move away from the circuit under measurement before opening the battery cover of the meter.

5.1.1 If the sign “” appears, it means that the batteries should be replaced.

5.1.2 Loosen the fixing screw of the battery cover and remove it.

5.1.3 Replace the exhausted batteries with new ones.

5.1.4 Put the battery cover back and fix it again to its origin form.

NOTE:

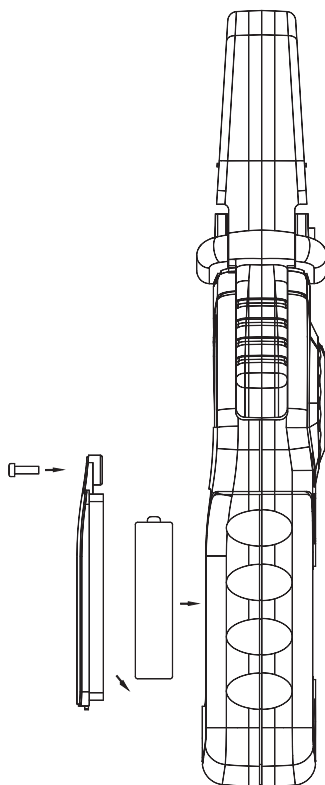
Do not reverse the poles of the batteries.

5.2 REPLACING TEST LEADS



The replacement must be test leads in good working condition with the same or equivalent rating: 1000V 10A.

A test lead must be replaced if the insulation layer has been damaged, e.g. the wire inside is exposed.



6. ACCESSORIES

- | | |
|--|--------------|
| ① Test Leads: Electric Ratings 1000V 10A | 1 pair (set) |
| ② Operating Manual | 1 copy |
| ③ 1.5V AAA Battery | 3 piece |