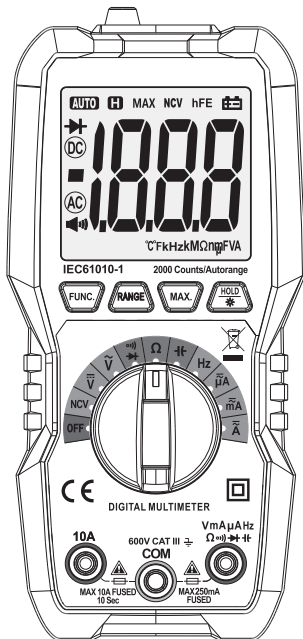


INSTRUCTIONS

- It is subject to the actual product as the picture is for reference only.



Please read the instructions carefully before use.

DIRECTORY

Statement	1
Summary	2
Safety instructions	2
Safety symbol	2
Safe operation specifications	3
Instrument instructions	5
LCD symbol instructions	7
Measurement instructions	8
Non-contact electricity verification (NCV)	8
DC voltage measurement	10
AC voltage measurement	10
Connectivity/ diode measurement	11
Resistance measurement	12
Capacitance measurement	12
Frequency measurement	13
uA current measurement	13
mA current measurement	14
A current measurement	15
General technical index	16
Accuracy index	17
DC voltage	17
AC voltage	17
Diode and connectivity	18
Resistance	18
Capacitance	19
Frequency	19
AC current [40Hz~400Hz]	19
DC current	20
Instrument maintenance	20
General maintenance	21
Replacement of the battery and fuse tube	21

Statement

According to the Universal Copyright Convention, without permission and written consent, no content of this manual may be reproduced in any form (including storage and retrieval or translation into the languages of other countries or regions). This manual is subject to change in future versions without extra notice.



CAUTION

The "CAUTION" sign indicates the condition and operation that will cause damage to the instrument or equipment.

It requires that care must be taken when performing this operation. If it is not performed correctly or this operation step is not followed, the instrument or equipment may be damaged. Do not continue to perform any operation indicated by the caution sign unless these conditions are met or fully understood.

Please read the manual carefully and pay attention to the relevant safety warning information before using the instrument.

Summary

This instrument is a compact hand-held 2000 counts digital multimeter with high performance and high reliability. It is equipped with overload protection circuit, which can be used to measure AC and DC voltage and current, resistance, capacitance, frequency, diode, circuit connectivity test, non-contact electricity verification, It can be widely used in schools, research institutes, factories, enterprises and other social fields.

Safety instructions

This instrument is designed and produced in strict accordance with the Safety Standard IEC61010, and meets the safety standard of Overvoltage Standard 600V CAT III and Pollution level 2.

Please use the instrument as this manual, otherwise the protection function provided by the instrument may be reduced or invalid.

Safety symbol

	Please refer to the instructions for important safety information,
	AC high voltage danger
	Non-recyclable
	The fuse must be replaced according to the designated specification in the manual.

Safe operation specifications



WARNING

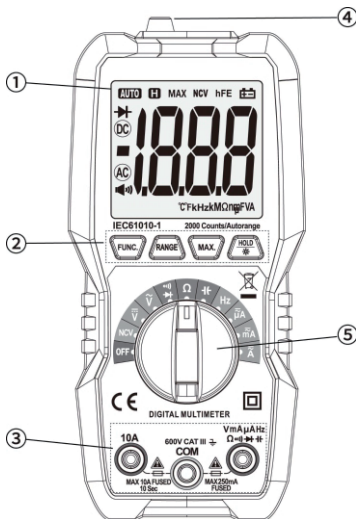
To avoid possible electric shock or physical injury, please comply with the following specifications:

- Before using the instrument, please read the manual carefully and use the instrument in strict accordance with it, otherwise the protection provided by the instrument may be reduced or invalid.
- Check the shell before using the instrument. Check whether there is crack or plastic part defect. Please carefully check the insulator near the input terminal.
- If the instrument works abnormally or is damaged, do not use it.
- It is forbidden to touch live conductors whose voltage exceeds 30V RMS AC, 42 V AC peak or 60V DC.
- The instrument should be used according to the specified measurement category, voltage or current rating.
- When the indication of insufficient battery power is displayed, please replace the battery in time to prevent measurement errors.
- Please comply with local and national safety specifications. Wear personal protective equipment (approved rubber gloves, masks, flame retardant clothing, etc.) to prevent injury caused electric shock and arc when dangerous live

conductors are exposed.

- Do not use the HOLD function to measure unknown voltage. After HOLD is turned on, the display screen will not change when different voltages are measured.
- Measure a known voltage to determine whether the instrument operates normally.
- When measuring, the correct function and range gear must be used.
- Do not use the instrument around explosive gas and steam or in humid environment.
- Do not use damaged probes. Check whether the insulation of the probe is damaged, whether there is exposed metal or signs of wear. Check the continuity of the probes.
- When measuring, please connect the neutral wire or ground wire first, and then the live wire; when disconnecting, please cut off the live wire first, and then disconnect the neutral wire and ground wire.
- When measuring, please hold your fingers behind the probe finger protector.
- Please disconnect the probe from the measured object before opening the back cover of the instrument.
- Do not use the instrument in an environment that exceeds the measurement category (CAT) rating of the lowest rated single element in the instrument, probe or accessories.

Instrument instructions



①. LCD display :

Nixie tube display, maximum display value 1999.

②. Key area :

FUNC. Function selection key: Push "FUNC" key, can rotary switch between functions.

RANGE Range mode key: Briefly press the key to

enter manual range mode, and long press the key for about 2 seconds to return to automatic range mode. It only works on voltage, current and resistance levels.



Maximum value measurement key: Briefly press the key to turn on or turn off the maximum value measurement.



Data retention / LCD backlight key: Briefly press the key to turn on or turn off the data retention display, and long press the key for about 2 seconds to turn on or turn off the LCD backlight and worklight.

③. Input jack area:

10A jack: The positive input terminal of 10A current measurement (connected with the red probe).

COM jack : Common input terminal for voltage, resistance, diode, capacitance, connectivity, current and frequency measurement (connected with the black probe).

VmAμAHz



jack : Positive input terminal for voltage, resistance, diode, capacitance, connectivity, live wire detection, current measurement within 200mA (connected with the red probe).

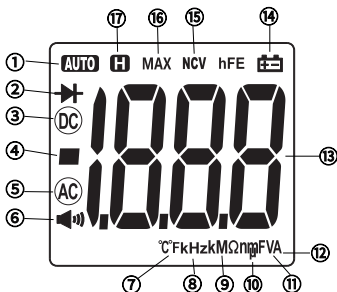
④. NCV sensing area:

It is used for non-contact voltage verification.

⑤. Function rotary switch:

It is used to select the measurement function.

LCD symbol instructions



①	Auto range indicator	⑩	Capacitance unit: nF、μF、mF
②	Diode measurement indicator	⑪	Voltage unit: mV、V
③	DC indicator	⑫	Current unit: μA、mA、A
④	Data minus indicator	⑬	Data display area
⑤	AC indicator	⑭	Battery low voltage indicator
⑥	Connectivity measurement indicator	⑮	Non-contact electricity verification indicator

⑦	Invalid symbol	⑮	Maximum value indicator
⑧	Frequency unit: kHz	⑰	Data hold display indicator
⑨	Resistance unit: Ω , k Ω , M Ω		

Measurement instructions

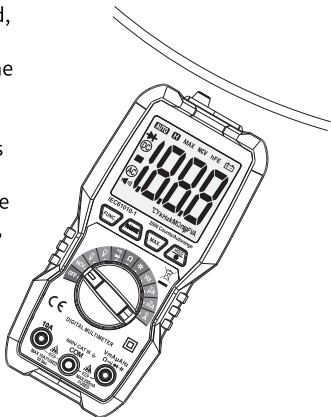
Precautions before operation:

1. Turn on the power and check whether the battery is under voltage. If "", is displayed on the screen, you need to replace the battery before operation.
2. The "" warning symbol next to the jack of the measurement probe indicates that the input voltage or current should not exceed the indicated value, which is to protect the internal circuit of the instrument from damage.
3. The backlight function and the lighting function will turn off automatically about 15 seconds after it is turned on.

Non-contact electricity verification (NCV)

1. Turn the knob switch to the "NCV" position.
2. Under the NCV function, place the NCV sensing area close to the wire to be measured. When the

AC voltage is detected, the buzzer will make an intermittent sound, which varies with the intensity of the induced voltage. Meanwhile, the number of " ■ " is displayed on the display screen. The more the number, the stronger the induced signal.



WARNING :

1. Measurement range: about 36V~600V, 50Hz or 60Hz.
2. When using, even if there is no sound or display prompt, the wire to be measured may still have voltage. Because the measurement sensitivity will be affected by other factors(such as shielded wires and cables, thickness of insulation layer, distance from voltage source, diversity in socket design, etc.), it fails to sense the existence of alternating current.

DC voltage measurement

1. Insert the red probe into the " $VmA\mu AHz$ " jack and the black probe into the "COM" jack.
2. Turn the knob switch to the " $\overline{V}$ " position, and connect the probe to the power supply or load to be measured. The polarity and measured value of the contact terminal of the red probe will be displayed on the screen.



Attention:

1. Before turning the function rotary switch, leave the measurement probe from the circuit under measurement.
2. When the screen only displays "OL", it means that the range has been exceeded and the measurement should be terminated.
3. Do not input AC voltage with effective value higher than 600V, otherwise there is a risk of damaging the instrument.
4. Pay special attention to avoid electric shock when measuring high voltage.

AC voltage measurement

1. Insert the red probe into the " $VmA\mu AHz$ " jack and the black probe into the "COM" jack.
2. Turn the knob switch to the " $\tilde{V}$ " position, and connect the probe to the power supply or load to be measured, and the measured value will be displayed on the screen.

**Attention:**

1. Before turning the function rotary switch, leave the measurement probe from the circuit under measurement.
2. When the screen only displays "OL", it means that the range has been exceeded and the measurement should be terminated.
3. Do not input AC voltage with effective value higher than 600V, otherwise there is a risk of damaging the instrument.
4. Pay special attention to avoid electric shock when measuring AC voltages greater than 36V.

Connectivity/ diode measurement

1. Insert the red probe into the " $VmA\mu AHz$
 $\Omega \rightarrow \rightarrow \rightarrow$ " jack and the black probe into the "COM" jack.
2. Turn the knob switch to the " $\rightarrow$ " position and press the "FUNC." key to switch the measurement of connectivity and diode.
3. Connect the probe to the measured object and read the measurement result from the display.

**Attention:**

1. Before turning the function rotary switch, leave the measurement probe from the circuit under measurement.
3. Do not input AC voltage with effective value higher than 600V, otherwise there is a risk of damaging the instrument.

Resistance measurement

1. Insert the red probe into the " $VmA\mu AHz$ $\Omega \rightarrow \rightarrow \rightarrow$ " jack and the black probe into the "COM" jack.
2. Turn the knob switch to the " Ω " position.
3. Connect the probe to the resistance ends and read the measurement result from the display.



Attention:

1. Before turning the function rotary switch, leave the measurement probe from the circuit under measurement.
2. Do not input AC voltage with effective value higher than 600V, otherwise there is a risk of damaging the instrument.

Capacitance measurement

1. Insert the red probe into the " $VmA\mu AHz$ $\Omega \rightarrow \rightarrow \rightarrow$ " jack and the black probe into the "COM" jack.
2. Turn the knob switch to the " $\rightarrow$ " position.
3. Connect the probe to the capacitor ends and read the measurement result from the display.



Attention:

1. Before turning the function rotary switch, leave the measurement probe from the circuit under measurement.
2. Do not input AC voltage with effective value higher than 600V, otherwise there is a risk of damaging the instrument.
3. Capacitance can not be measured on the line, the capacitor should be discharged before

measurement when the measuring capacitors is above 1mF, otherwise it may lead to incorrect measurement values.

Frequency measurement

1. Insert the red probe into the " $\text{VmA}\mu\text{AHz}$
 $\Omega \rightarrow 0 \rightarrow \rightarrow$ " jack and the black probe into the "COM" jack.
2. Turn the knob switch to the "Hz" position.
3. Connect the measurement probe to the measured terminal and read the value from the display screen.



WARNING :

1. Before turning the function rotary switch, leave the measurement probe from the circuit under measurement.
2. Do not input a voltage with an effective value higher than 600V, otherwise there is a risk of damaging the instrument.
3. The true RMS value of voltage from Frequency starting signal is 200mV when the measured signal is positive and negative, the voltage amplitude from frequency starting signal is about 2.5V when the measured signal is an offset positive signal.

uA current measurement

1. Insert the red probe into the " $\text{VmA}\mu\text{AHz}$
 $\Omega \rightarrow 0 \rightarrow \rightarrow$ " jack and the black probe into the "COM" jack.
2. Turn the knob switch to the " μA " position and press the "FUNC." key to switch the AC current or DC

current measurement.

3. Connect the measurement probe in series to the load, and the polarity of the red probe connection will be displayed when the current value is displayed.



WARNING :

1. Before turning the function rotary switch, leave the measurement probe from the circuit under measurement.
2. When the screen only displays "OL", it means that the range has been exceeded and a higher gear range should be switched for measurement.
3. Do not input a voltage with an effective value higher than 600V, otherwise there is a risk of damaging the instrument.
4. Do not input a current with an effective value higher than 2000uA, otherwise there is a risk of damaging the instrument.

mA current measurement

1. Insert the red probe into the " $VmA\mu AHz$ " jack and the black probe into the "COM" jack.
2. Turn the knob switch to the " $\tilde{mA}$ " position and press the "FUNC." key to switch the AC current or DC current measurement.
3. Connect the measurement probe in series to the load, and the polarity of the red probe connection will be displayed when the current value is displayed.

**WARNING :**

1. Before turning the function rotary switch, leave the measurement probe from the circuit under measurement.
2. When the screen only displays "OL", it means that the range has been exceeded and a higher gear range should be switched for measurement.
3. Do not input a voltage with an effective value higher than 600V, otherwise there is a risk of damaging the instrument.
4. Do not input a current with an effective value higher than 200mA, otherwise there is a risk of damaging the instrument.

A current measurement

1. Insert the red probe into the "10A" jack and the black probe into the "COM" jack.
2. Turn the knob switch to the " $\tilde{A}$ " position and press the "FUNC" key to switch the AC current or DC current measurement.
3. Connect the measurement probe in series to the load, and the polarity of the red probe connection will be displayed when the current value is displayed.

**WARNING :**

1. Before turning the function rotary switch, leave the measurement probe from the circuit under measurement.
2. When the screen only displays "OL", it means that

the range has been exceeded and the measurement shall be terminated.

3. Do not input a voltage with an effective value higher than 600V, otherwise there is a risk of damaging the instrument.
4. Do not input a current with an effective value higher than 10A, otherwise there is a risk of damaging the instrument.

General technical index

- Service environmental conditions:
IEC/EN 61010-1 600V CAT III, Pollution level 2.
Altitude < 2000m.
Temperature of working environment: 0~40°C.
Humidity of working environment: <80% RH.
Temperature and humidity of storage environment:
-10~60°C (<70% RH, remove the battery).
- Temperature coefficient: $0.1 \times \text{accuracy} / ^\circ\text{C}$.
- The maximum allowable voltage between the measuring terminal and the ground: 600V DC or AC RMS.
- Sampling rate: about 3 times / second.
- Automatic shutdown: about 15 minutes.
- Display: the maximum displayed value is 1999.
- Range exceeding indication: "OL" is displayed.
- Battery low voltage indication: when the battery voltage is lower than the normal working voltage, the "" will be displayed on the LCD.
- Input polarity indication: the "—" symbol is

automatically displayed.

- Battery : DC 1.5V AAA × 2.
- Overall dimension: 166mm×78mm×64mm.
- Weight: about 268g.

Accuracy index

Accuracy: $\pm$ (% reading + digit), warranty period of 1 year.

Reference conditions: the ambient temperature is 18 °C to 28 °C, and the relative humidity is not greater than 80%.

DC voltage

Range	Resolution	Accuracy
200mV	0.1mV	$\pm(0.5\% \text{ reading} + 2 \text{ digits})$
2V	1mV	
20V	10mV	
200V	100mV	
600V	1V	$\pm(0.8\% \text{ reading} + 2 \text{ digits})$

* Input resistance: 10M Ω .

* Maximum input voltage: 600V DC or 600V AC RMS.

AC voltage

Range	Resolution	Accuracy
200mV	0.1mV	$\pm(1\% \text{ reading} + 3 \text{ digits})$
2V	1mV	
20V	10mV	
200V	100mV	
600V	1V	$\pm(1.2\% \text{ reading} + 3 \text{ digits})$

- * Input resistance : 10M Ω .
- * Measurable frequency range : 40~400Hz.
- * Maximum input voltage : 600V DC or 600V AC RMS.

Diode and connectivity

Range	Description	Remarks
	Display approximate diode forward voltage value	The circuit voltage is about more than 2V
	The conductive resistance is about less than 30 Ω , and the buzzer sounds continuously.	The circuit voltage is less than 1V

- * Overvoltage protection : 600V Dc or 600V AC RMS.

Resistance

Range	Resolution	Accuracy
200 Ω	0.1 Ω	$\pm$ (0.8% reading +2 digits)
2k Ω	1 Ω	
20k Ω	10 Ω	
200k Ω	100 Ω	
2M Ω	1k Ω	
20M Ω	10k Ω	$\pm$ (1.0% reading +2 digits)

- * Overvoltage protection: 600V Dc or 600V AC RMS.

Capacitance

Range	Resolution	Accuracy
20nF	0.01nF	$\pm (4.0\% \text{ reading} + 5 \text{ digits})$
200nF	0.1nF	
2uF	0.001uF	
20uF	0.01uF	
200uF	0.1uF	
2mF	0.001mF	

* Overvoltage protection : 600V DC or 600V AC RMS.

Frequency

Range	Resolution	Accuracy
20kHz	0.01kHz	$\pm (1.5\% \text{ reading} + 5 \text{ digits})$

* The input voltage range: 200mV~10V AC RMS.

* Overvoltage protection: 600V DC or 600V AC RMS.

AC current [40Hz~400Hz]

Range	Resolution	Accuracy
200uA	0.1uA	$\pm (1.5\% \text{ reading} + 4 \text{ digits})$
2000uA	1uA	
20mA	10uA	
200mA	100uA	
10A	10mA	

* Maximum input current of mA jack: 250mA (RMS).

* Maximum input current of 10A jack: 10A (RMS).

* Overvoltage protection: $\mu\text{A}/\text{mA}$ range F250mA/250V fuse, 10A range F10A/250V fuse.

DC current

Range	Resolution	Accuracy
200uA	0.1uA	$\pm(1.5\% \text{ reading} + 3 \text{ digits})$
2000uA	1uA	
20mA	10uA	
200mA	100uA	
10A	10mA	

- * Maximum input current of mA jack: 250mA.
- * Maximum input current of 10A jack: 10A.
- * Overvoltage protection:
 μA/mA Range: F250mA/250V fuse.
 10A range: F10A/250V fuse.

Instrument maintenance

This section provides basic maintenance information, including instructions for replacing fuse tubes and batteries. Unless you are an experienced maintenance technician and have relevant calibration, performance test and maintenance data, do not try to repair this instrument.



WARNING:

To prevent possible electric shock, fire or physical injury:

- When the shell is opened, do not use the instrument for any measurement operation.

- Remove the input signal before cleaning the instrument.
- Designated replacement parts should be used. Please have the instrument repaired by an approved technician.

General maintenance

Regularly use wet cloth and a small amount of detergent to clean the instrument shell. Do not use abrasive or chemical solvents.

Replacement of the battery and fuse tube

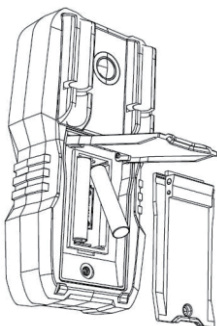


WARNING :

- In order to avoid electric shock or physical injury caused by wrong readings, the battery should be replaced in time when the "⚡" symbol appears on the instrument display screen.
- In order to ensure the safe operation and maintenance of the product, please take out the battery when the instrument is not used for a long time to avoid damaging the product by the battery leakage.
- Only fuses with specified amperage, fusing rating, voltage rating and fusing speed can be used.
- To avoid electric shock or physical injury, before opening the back cover to replace the battery, shut down the instrument and check to ensure that the probe has been disconnected from the measuring circuit.

Please replace the battery as the following steps:

1. Turn off the power supply of the instrument.
2. Disconnect the probe from the measured circuit.
3. Loosen the screws fixing the battery cover with a screwdriver and remove the battery cover.
4. Remove the battery and replace it with a new one. Pay attention to the positive and negative polarity of the battery.
5. Install the battery cover and tighten the screws.

**Please replace the fuse as the following steps:**

1. Turn off the power supply of the instrument.
2. Disconnect the probe from the measured circuit and remove the protective leather case.
3. Loosen the screws fixing the back cover with a screwdriver and remove the back cover.
4. Remove the damaged fuse tube and replace it with a new one.
5. Install the back cover, tighten the screws, and install the leather cover.

Attention :

F250mA fuse tube: F250mA/250V;

F10A fuse tube: F10A/250V;

**WARNING :**

The fuse tube should be replaced with the same specification and parameters, and it is strictly forbidden to use the fuse tube with different specifications and parameters, otherwise there will be a risk of damaging the instrument.

