

# Table of Contents

## 1. Overview

1.1 Safety information	1
1.1.1 Safety instructions	1
1.1.2 Safety notices	1
1.1.3 Safety symbols	4
1.1.4 Safety maintenance habits	4
1.2 Input protection measures	5

## 2. Instrument illustration

2.1 Instrument illustration	6
2.2 Display symbol description	7
2.3 Function key description	10
2.4 Input socket description	10
2.5 Attachments	11

## 3. Operation Guide

3.1 Regular operation	11
3.1.1 Reading hold mode	11
3.1.2 Backlight and lighting function	12
3.1.3 Automatic shutdown function	12
3.2 Measuring guide	13

3.2.1 Measuring AC and DC voltage	13
3.2.2 Measuring resistance	14
3.2.3 Measuring diode	15
3.2.4 Buzzer connection/continuity test	16
3.2.5 Measuring capacitance	18
3.2.6 Measuring frequency	19
3.2.7 Measuring current	19
3.2.8 NCV test	21

## **4. Technical indicators**

4.1 Comprehensive indicators	21
4.2 Precision indicators	23
4.2.1 DC voltage	23
4.2.2 AC voltage	23
4.2.3 Frequency	24
4.2.4 Resistance	24
4.2.5 Diode	25
4.2.6 Buzzer connection/disconnection	26
4.2.7 Capacitance	26
4.2.8 DC current	27
4.2.9 AC current	27

## **5. Instrument maintenance**

5.1 General maintenance	29
5.2 Replace the battery	30

## 1. Overview

The digital multimeter is designed and produced according to safety requirements on electronic measuring instrument and handheld digital multimeter of international electrician safety standard IEC - 61010.

It complies with 600V CAT III of IEC61010. III and pollution level 2 requirements. Before using this instrument, please read the user manual carefully and pay attention to related works safety standards.

### 1.1 Safety Information

#### 1.1.1 Safety instructions

- When using this instrument, the user must comply with all standard safety rules about the following two aspects:

A Safety rules about electric shock.

B Safety rules on prevention of error use of instrument.


- In order to guarantee your personal safety, please use the test pens provided with the instrument. Before use, check and guarantee they are in good conditions.

#### 1.1.2 Safety notices

- If the instrument is used near the equipment with larger electromagnetic interference, the instrument reading will be unstable, and even large error may occur.

- When instrument or pen appearance is damaged, do not use.
- When using the instrument incorrectly, safety function provided by the instrument may validate.
- When working around exposed conductor or bus, be careful.
- It is forbidden to use the instrument near explosive gas, steam or dust.
- It is required to use correct input end, function and range for measurement.
- The input value shall not exceed the input limit regulated by each range, to avoid damaging the instrument.
- When the instrument is connected to the line being measured, do not touch the input terminal not in use.
- When the measured voltage exceeds 60Vdc or 30Vac RMS, operate carefully to prevent electric shock.
- When use test pens for measurement, put your fingers at the back of the test pen protective ring.
- Before changing the range, make sure the test pens are removed from the circuit being measured.
- For all DC functions, in order to avoid the risk of electric shock due to possible incorrect readings, please use the AC function first to confirm the existence of any AC voltage. Then, select a DC voltage range equal to or greater than AC

voltage.









- When conducting resistance, diode, capacitance measurement or continuity test, it is required to cut off the power supply of the circuit being tested, and discharge all high-voltage capacitors in the circuit being tested.
- It is not allowed to conduct continuity test on electrified circuit.
- Before conducting current measurement, first check the insurance tube of the instrument. Before connecting the instrument to the circuit being measured, first shut down the power supply of the circuit being measured.
- When repairing TV set or measuring power conversion circuit, be careful of high amplitude voltage pulse in the circuit being measured, to avoid any damage to the instrument.
- The instrument uses 4 1.5V AAA batteries, and all batteries shall be installed in the battery box of the instrument correctly.
- When undervoltage symbol  appears, change the battery immediately. Insufficient battery may cause error reading of the instrument, which may cause electric shock or personal injury.
- Measurement CAT.III voltage shall not exceed 600V

during measurement;

- When the instrument shell (or part of the shell) is being dismantled, do not use the instrument.

### 1.1.3 Safety symbols:

Instrument body and symbols used in the user manual:

	For warnings and important safety signs, refer to the user manual before using. Misuse may cause damages to equipment or its parts.
	AC
	DC
	AC or DC
	Ground
	Double insulation protection
	Fuse
	Comply with European Union instructions
CAT. III	Category III 600V over-voltage protection

### 1.1.4 Safety maintenance habits

- When opening instrument shell or dismantling battery cover, plug out the test pens first.

- During maintenance of instrument, use specified replacement parts.
- Before opening the instrument, cut off all related power supply, meanwhile guarantee you're not statically electrified to avoid damaging components of the instrument.
- The calibration and maintenance of instrument could only be done by special personnel.
- When opening the instrument, note some capacitance inside the instrument may still have dangerous voltage even after power-off.
- If any abnormality of the instrument is observed, stop the instrument immediately and send for maintenance. Guarantee to use only after qualified by inspection.
- When not in use for a long time, take down the batteries, and avoid storing them in high temperature and high humidity.

## 1.2 Input protection measures

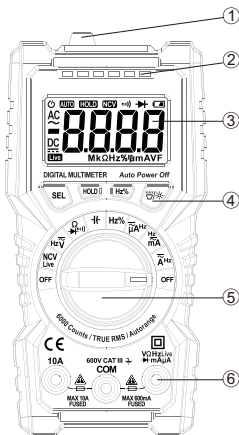
- During voltage measurement, the withstand max. input voltage is DC 600V or AC 600V.
- During frequency, resistance, on-off and diode measurement, AC voltage of 600V or voltage of equivalent RMS could be withstood.
- During measurement of  $\mu\text{A}$  current and mA current, protect

via protective tube (F600mA/600V).

## 2. Instrument illustration

The instrument is a handheld small volume measuring digital multimeter with true RMS. It has a LCD digital display, back light and lighting, which is easy for users to read. It has overload protection and battery under voltage indicator. No matter for professional personnel, factories, schools, fans or family use, it is an ideal multi-function instrument.

### 2.1 Instrument illustration





## Instrument appearance

(1) Non-contact voltage inducing area (2) Non-contact voltage indicator (3) LCD display (4) Button (5) Rotary switch (6) Input socket

### 2.2 Display symbol description

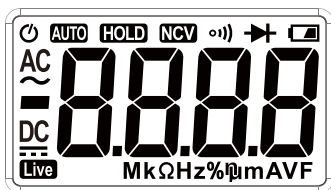


Fig. 1 Display

Table 1 Display Symbol

Symbol	Description
	Battery undervoltage indicator/battery low. <b>In order to avoid error reading, which may cause electric shock or human injury, when low voltage symbol of the battery appears, replace the battery immediately.</b>
	Automatic shutdown function indicator












	Negative input polarity indication
	AC input indication
	DC input indication
	The instrument is in on-off test mode.
	The instrument is in diode test mode.
	Indicate automatic range mode. .
	The instrument is in data hold mode.
	Duty ratio
	The instrument is in non-contact AC voltage detection

Table 1 Display Symbol (Continued)


<b>V, mV</b>	V: mV:	V, the unit of voltage. mV, $1 \times 10^{-3}$ or 0.001 V.
<b>A, mA, <math>\mu</math>A</b>	A: mA: $\mu$ A:	A, the unit of current. mA, $1 \times 10^{-3}$ or 0.001 A. $\mu$ A , $1 \times 10^{-6}$ or 0.000001 A.
<b><math>\Omega</math>, k<math>\Omega</math>, M<math>\Omega</math></b>	$\Omega$ : k $\Omega$ : M $\Omega$ :	Ohm, the unit of resistance. kilo-ohm, 1000 ohms. Meg-ohm, 1000,000 ohms.
<b>MkHz</b>	HZ : KHZ: MHz :	Hertz, the unit of frequency. Kilohertz, $1 \times 10^3$ Hertz. Megahertz, $1 \times 10^6$ or 1000 kilohertz.
<b>mF, <math>\mu</math>F, nF</b>	F : mF: $\mu$ F : nF :	F, the unit of capacitance. mF, $1 \times 10^{-3}$ or 0.001 F $\mu$ F , $1 \times 10^{-6}$ or 0.000001 F. . . nF, $1 \times 10^{-9}$ or 0.000000001 F.

## 2.3 Function key description

Key	Function description
<b>SEL</b>	Function selection key, i.e. Voltage or current: ACV/DCV ACA/DCA  $\Omega$ : Select diode or buzzer on-off mode or resistance
<b>HOLD</b>	When this key is pressed, the instant measured value is held. Press again to cancel this function.
	When hold the key for above 2 seconds, the light will turn on; long press for more than 2 seconds, to turn off the light. If this key is not pressed, it will turn off automatically after 15 seconds. Short press, to switch on/off the backlight.
<b>HZ / %</b>	AC voltage or AC current: Under the AC voltage or AC current measurement state, press this key to select ACV/HZ/% or ACA/HZ/% measurement mode.  Frequency measurement: Select HZ or % measurement mode.

## 2.4 Input socket description

Input socket	Description
--------------	-------------

<b>COM</b>	All measured public input terminals are connected to the black test pen or public output plug of the special multi-function test socket.
 <b>Live <math>\Omega</math></b> <b>V Hz% <math>\mu</math>A</b> <b>mA</b>	Positive input terminal of capacitance, diode measurement, buzzer on-off test, live line test, voltage, resistance, frequency, duty ratio, $\mu$ A and mA (connected to red test pen).
<b>10A</b>	Positive input terminal of current 10A (connected to red test pen).

## 2.5 Attachments

(1) User manual	1 manual
(2) Test pens	One pair

## 3. Operation Guide

### 3.1 Regular operation

#### 3.1.1 Reading hold mode

In reading hold mode, the current reading could be held on the display. Change measuring function gear or press HOLD again to exit reading hold mode.

To enter or exit reading hold mode:


1. Press "HOLD" key, the reading would be hold and the " **HOLD** "


symbol would display on the LCD display at the same time.

2. Press "HOLD" key again to restore the instrument to normal measurement state.

### 3.1.2 Backlight and lighting function

The instrument is configured with backlight and lighting function, so that users could read measurement results accurately even under unsound lighting conditions. The operation of turning on or off backlight is as follows:

1. Long press the  key for above 2 seconds, to turn on the light; short press the turn on the backlight.

2. Long press the  key for above 2 seconds again, turn off the light manually, and short press to turn off the backlight; or the backlight and light will turn off automatically after about 15 seconds.

### 3.1.3 Automatic shutdown function

If there's no operation within about 15 minutes after startup, the instrument will make a Di-Di sound to prompt the automatic shutdown of power supply, and enter sleep state. In automatic shutdown mode, press SEL key to restart.

## 3.2 Measuring guide

### 3.2.1 Measuring AC and DC voltage




**It is not allowed to measure any voltage higher than 600V DC or 600V AC rms, to avoid electric shock and/or damaged instrument.**

**It is not allowed to apply a voltage over 600V DC Or 600V AC rms on common port and The ground, to avoid electric shock and/or damaged instrument.**

The DC voltage range of the instrument is: 600.0mV, 6.000V, 60.00V and 600.0V; the AC voltage range is: 6.000V, 60.00V and 600.0V.

Measure AC or DC voltage:

1. Turn the rotary switch to , and press "SEL" key to switch DC or AC voltage function.
2. Connect the black test pen and the red test pen to COM input socket and V input socket.
3. Use the test pen to measure the voltage of the circuit to be tested . (In parallel connection with the circuit to be tested)
4. Read the measured voltage from the LCD display. When measuring DC voltage, the display will display the voltage polarity connected to the red pen.

### Note:

(1) In DC 600mV and AC 6V range, even if there' s no input or test pen connected, the instrument will have several displays, in this case, short circuit the "V -  $\Omega$ " and "COM" , to make the instrument display zeroing.

(2) Under AC voltage function, press HZ/% key to measure the frequency of AC voltage source (0HZ~10KHZ).

(3) AC voltage measured with this instrument is a true RMS (root mean square). For sine wave and other waveforms (without DC offset), such as square wave, triangle wave and staircase wave, such measurements are accurate.

### 3.2.2 Measuring resistance



**In order to avoid any damage to instrument or measured equipment, before measuring resistance, cut off all power supplies of the circuit being measured and fully discharge all high-voltage capacitor s.**

The unit of resistance is ohm ( $\Omega$ ).

The resistance ranges of the instrument are namely 600.0 $\Omega$ , 6.000k $\Omega$ , 60.00k $\Omega$ , 600.0k $\Omega$ , 6.000M $\Omega$ , and 60.00M $\Omega$ .

Measure resistance:

1. Turn the rotary switch to  $\Omega$  gear.
2. Connect the black test pen and the red test pen to COM



input socket and  $V/\Omega$  input socket.

3. Use the test pen to measure the resistance of the circuit to be tested .

4. Read the measured resistance from the LCD display.

**Note:**

(1) Resistance measured on the circuit is usually different from the rated value of resistance.

(2) During measurement of low resistance, in order to guarantee accuracy, first short circuit two pens and read the resistance for pen short circuit, and it is required to reduce such resistance after measuring the resistance.

(3) In  $60M\Omega$ , reading could be stable only after several seconds. This is normal to high resistance measurement.




(4) When the instrument is of open circuit, the display will indicator "OL", indicating the measured value exceeds the range.

### 3.2.3 Measuring diode



**In order to avoid any damage to instrument or measured equipment, before measuring diode, cut off all power supplies of the circuit being measured and fully discharge all high-voltage capacitors.**

Test a diode outside the circuit:

1. Turn the rotary switch to   $\Omega$ , and press "SEL" key to switch ,  or resistance function.
2. Connect the black test pen and the red test pen to COM input socket and V/ $\Omega$  input socket.
3. Connect the black test pen and the red test pen to the cathode and anode of the diode being tested.
4. The instrument will display the forward biased voltage of the diode being tested. If the polarity of the test pen reversely connected, the instrument will display "OL".


In the circuit, normal diodes shall still produce a forward voltage drop from 0.5V to 0.8V; but the reading of backward biased voltage would be determined by the resistance change of other channels between two pens.

### 3.2.4 Buzzer connection/continuity test



**In order to avoid any damage to instrument or measured equipment, before buzzer on-off test, cut off all power supplies of the circuit being measured and fully discharge all high-voltage capacitors.**

On-off test:

1. Turn the rotary switch to   $\Omega$  gear. Press "SEL", into buzzer connection/continuity test.
2. Connect the black test pen and the red test pen to

COM input socket and V/ $\Omega$  input socket.

3. Use both ends of the test pen to measure the resistance of the circuit being measured, if the measured circuit resistance is no greater than about  $40\Omega$ , the sensing indicator (green light) will turn on, and the buzzer will make continuous sound. If the measured resistance is greater than  $40\Omega$  and less than  $60\Omega$ , the sensing indicator (red light) will turn on.



### 3.2.5 Measuring capacitance



**In order to avoid any damage to instrument or measured equipment, before measuring capacitance, cut off all power supplies of the circuit being measured and fully discharge all high-voltage capacitors. Use DC voltage to confirm the capacitor is discharged.**

The capacitance ranges of the instrument are namely 10.000nF, 100.00nF, 1000. 0nF, 10.000 $\mu$ F, 100.00 $\mu$ F and 1000. 0 $\mu$ F, 10mF, 100mF.

Measure capacitance:

1. Turn the rotary switch to  gear.
2. Connect the black test pen and the red test pen to COM input socket and  input socket.
3. Use both ends of the test pen to measure the capacitance of the capacitor to be measured, and read the measured value from the LCD display.

**Note:**

- (1) When measuring large capacitance, a period time is required to achieve a stable reading.
- (2) When measuring capacitance with polarity, note the corresponding polarity, to avoid any damage to the instrument.

### 3.2.6 Measuring frequency



**It is not allowed to measure any voltage higher than 250V DC or AC rms, to avoid electric shock and/or damaged instrument.**

Measure frequency:

1. Turn the rotary switch to HZ%, and press “Hz%” key to switch between HZ and % function.
2. Connect the black test pen and the red test pen to COM input socket and Hz input socket.
3. Use both ends of the test pen to measure the frequency of the circuit to be tested .
4. Read the measured frequency from the LCD display.

### 3.2.7 Measuring current



**When the open-circuit voltage to the ground exceeds 250V, do not measure the current on the circuit. If the fuse is burnt during measurement, you are likely to damage the instrument or hurt yourself.**

**In order to avoid any damage to the instrument or the measured equipment, before measuring current, please check the fuse of the instrument first. During measurement, use correct input socket, function gear and range. When the test pen is inserted onto the current input socket, do not bridge the other end of the test pen to any circuit in parallel.**

The DC current ranges of the instrument are namely 600 $\mu$ A, 6000 $\mu$ A, 60.00mA, 600.0mA, 6.000A and 10.00A.

The AC current ranges are namely 600 $\mu$ A, 6000 $\mu$ A, 60.00mA, 600.0mA, 6.000A and 10.00A;

Measure current:

1. Turn the rotary switch to a proper gear, and press the "SEL" key to switch DC or AC current function.
2. Connect the black test pen to the COM input socket. If the measured current is less than 600mA, connect the red test pen to the  $\mu$ mA input socket; if the measured current ranges from 6A to 10A, connect the red test pen to the 10A input socket.
3. Disconnect the circuit to be measured. Connect the black test pen to one end of the disconnected circuit (with lower voltage), and connect the red test pen to one end of the disconnected circuit (with higher voltage).
4. Connect the power supply of the circuit, and then read out the reading from the display. If the display only shows "OL", it indicates the input exceeds the selected range, and the rotary switch shall be placed in a higher range.

**Note:**

- Under AC voltage function, press HZ/% key to measure the frequency of AC current (0HZ~10KHZ).

### 3.2.8 NCV test (non-contact voltage detection)

Turn the rotary switch to the NCV gear, and close the instrument top to the conductor, if the instrument detects AC voltage, the instrument will light up indicator of corresponding signal strength (high, medium and low), according to the detected signal strength, meanwhile the buzzer will make alarm sounds of different frequencies.

**Note:**

1. Even if there's no indication, voltage may still exist. Do not judge whether there's voltage in lead depending on non-contact voltage detector. Detection may be impacted by factors such as different socket designs, and insulation thickness types etc.
- 2: When inputting voltage at instrument input terminal, for the existence of induced voltage, the voltage sensing indicator may also light up.
- 3: Interference sources from external environment (i.e. flash light, motor etc.), may trigger non-contact voltage detection by mistake.

## 4 Technical indicators

### 4.1 Comprehensive indicators


Use environmental conditions:

600V CAT III pollution level.

Altitude < 2000m.

Working environment temperature and humidity: 0~40°C  
(<80% RH, <10°C not considered).

Storage environment temperature and humidity: -10~60°C  
(<70% RH, battery taken off).

- Temperature coefficient:  $0.1 \times \text{accuracy}/^{\circ}\text{C}$  (<18°C or >28°C).
- Measure the maximum allowable voltage between the measurement end and the ground: 600V DC or 600V AC RMS.
- Fuse protection: mA gear: Tube FF 600mA/600V;  
Gear A: Fuse FF 10A/600V
- Conversion rate: About 3 times/second
- Display: 6000 counts LCD display. Display unit symbols automatically according to measurement function gear.
- Over range indication: The LCD displays "OL" .
- Battery low voltage indication: When battery voltage is lower than normal operating voltage, the "" will display.
- Input polarity indication: It will display "-" automatically.
- Power supply: 4 x 1.5V AAA battery.
- Dimension: 150 mm(L)×75mm(W)×48mm(H).
- Weight: About 240g (including battery).



## 4.2 Precision indicators

Accuracy:  $\pm$  ( %reading + characters), warranty is one year since the date of delivery.

Basic conditions: Ambient temperature is 18°C to 28°C, and relative humidity is no greater than 80%.

### 4.2.1 DC voltage

Range	Resolution	Accuracy
600mV	0.1mV	$\pm(0.5\% \text{ reading} + 3 \text{ characters})$
6V	1mV	
60V	10mV	
600V	100mV	

Input impedance: 10M $\Omega$ .

Max. input voltage: 600Vdc or 600Vac RMS.

### 4.2.2 AC voltage

Range	Resolution	Accuracy
6V	1mV	$\pm(0.8\% \text{ reading} + 3 \text{ characters})$ (<500Hz)
60V	10mV	
600V	100mV	$\pm(1.5\% \text{ reading} + 10 \text{ characters})$ ( $\geq 500\text{Hz}$ )

Input impedance: 10M $\Omega$

Max. input voltage: 600Vdc or 600Vac RMS.

Frequency response: 0Hz-10KHz true RMS

#### 4.2.3 Frequency

Range	Resolution	Accuracy
9.999Hz	0.001Hz	$\pm(0.5\% \text{ reading} + 3 \text{ characters})$
99.99Hz	0.01Hz	
999.9Hz	0.1Hz	
9.999KHz	0.001 KHz	
99.99KHz	0.01 KHz	
999.9KHz	0.1 KHz	
9.999MHz	0.001MHz	

Input voltage range:200mV-10Vac RMS

Overload protection: 600V DC/AC


#### 4.2.4 Resistance

Range	Resolution	Accuracy
600 $\Omega$	0.1 $\Omega$	$\pm(0.8\% \text{ reading} + 3 \text{ characters})$
6k $\Omega$	1 $\Omega$	
60k $\Omega$	10 $\Omega$	
600k $\Omega$	100 $\Omega$	
6M $\Omega$	1k $\Omega$	
60M $\Omega$	10k $\Omega$	

Overload protection: 600V DC/AC

Open circuit voltage: 1V

#### 4.2.5 Diode

Function	Range	Resolution	Test conditions
Diode test 	0-3V	0.001V	Forward DC current: About 1mA; open circuit voltage: About 3.2V. The display shows an approximate value of forward voltage drop of the diode.

Overload protection: 600V DC/AC

#### 4.2.6 Buzzer connection/disconnection

Function	Range	Resolution	Description	Test conditions
o1))	600Ω	0.1Ω	When the built-in buzzer sounds, and the green indicator lights up, the measured resistance is no greater than about 30Ω. At about 40Ω -60Ω, the red indicator lights up. Greater than 600Ω and display OL	Open circuit voltage : About 1V

Overload protection: 600V DC/AC

#### 4.2.7 Capacitance

Range	Resolution	Accuracy
10nF	0.001nF	±(4.0% reading + 10 characters)
100nF	0.01nF	±(4.0% reading + 3 characters)
1000nF	0.1nF	
10μF	1nF	
100μF	10nF	
1000μF	100nF	
10mF	1μF	
100mF	0.01mF	±(5.0% reading + 3 characters)

Overload protection: 600V DC/AC

#### 4.2.8 DC current

Range	Resolution	Accuracy
600 $\mu$ A	0.1 $\mu$ A	$\pm(0.8\% \text{ reading} + 3 \text{ characters})$
6000 $\mu$ A	1 $\mu$ A	
60mA	0.01mA	
600mA	0.1mA	
6.000A	1mA	$\pm(1.2\% \text{ reading} + 3 \text{ characters})$
10.00A	10mA	

Overload protection: mA range fuse (FF600mA/600V);  
10A range fuse (FF10A/600V).

Max. input current: mA gear: 600mA DC or AC RMS;  
10A gear: 10A DC or AC RMS

When the measured current is greater than 5A, the continuous measuring time cannot exceed 10 seconds, and it is required to stop the current measurement for 1 minute after measuring.

#### 4.2.9 AC current

Range	Resolution	Accuracy
600 $\mu$ A	0.1 $\mu$ A	$\pm(1.0\% \text{ reading} + 3 \text{ characters})$
6000 $\mu$ A	1 $\mu$ A	
60mA	0.01mA	
600mA	0.1mA	
6A	1mA	$\pm(1.5\% \text{ reading} + 3 \text{ characters})$
10A	10mA	

Overload protection: mA range fuse (FF600mA/600V); 10A range fuse (FF10A/600V).

Max. input current: mA gear: 600mA DC or AC RMS;

10A gear: 10A DC or AC RMS

When the measured current is greater than 5A, the continuous measuring time cannot exceed 10 seconds, and it is required to stop the current measurement for 1 minute after measuring.

Frequency response: 0Hz-10KHz, true RMS

## 5. Instrument maintenance

Basic maintenance information provided in this section, includes instructions on the replacement of protective tube and the replacement of battery.

Unless otherwise you are an experienced maintenance person and possess related calibration, performance test and maintenance information, do not try to repair this instrument.

### 5.1 General maintenance



**In order to avoid electric shock or damage to instrument, do not wet the inside of the instrument. Before opening the shell or the battery cover, be sure to dismantle the connecting wire between the test pen and the input signal.**

Use wet cloth and a small amount of detergent to clean the instrument shell, and do not use any abrasive or chemical solvent.


If the input socket is polluted or wet, it may affect the reading.

#### **Be sure to clean the input socket:**

- (1) Turn off the instrument, and pull out all test pens from the input socket.
- (2) Remove all pollutants on the socket.
- (3) Use a new cotton ball to soak with detergent or lubricant,

to clean each socket, while the lubricant could prevent socket pollution related to moisture.



**In order to avoid electric shock or personal injury caused by error reading, replace the battery immediately when the "  " symbol appears on the instrument display.**

**Only specified fuse (600mA/600V, 10A/600V quick-acting fuse) could be used.**

**In order to avoid electric shock or personal injury, before opening the battery cover and replacing the battery, it is required to shut down and check whether the test pens have been disconnected from the measured circuit.**

## 5.2 Replace battery and fuse

Please replace battery according to the following steps:

1. Disconnect the power supply of the instrument.
2. Pull out all test pens from the input socket.
3. Use a screwdriver to unfasten screws fixing battery cover.
4. Remove the battery cover.
5. Remove the old battery or damaged fuse.
6. Replace with a new 4 x 1.5V AAA battery or new fuse.
7. Place the battery cover and fasten the bolts.