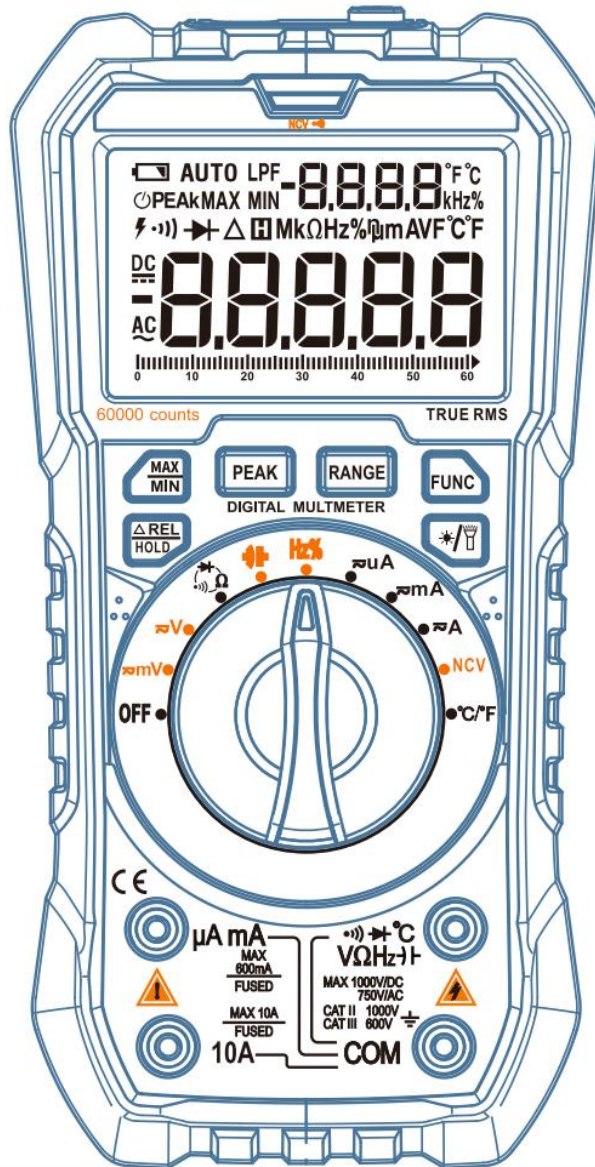


Instructions

60000 Counts Digital Multimeter



Contents

- 1. Safety**
- 2. Overview**
- 3. Operation instructionst**
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- 5. Replace batteries, fuses, and accessories**

1. About Safety


1.1 Safety instructions

- When using this meter, the user must comply with all the standard safety regulations concerning the following two aspects:
 - A: Protection against electric shocks.
 - B: Prevent the misuse of the instrument's safety procedures.
- To ensure your personal safety, use the test pen provided with the table, check before use, and make sure they are intact.

1..2 Safety precautions










- The use of meter instruments near devices with large electromagnetic disturbances will be unstable and may even cause large errors.
- Do not use when the appearance of the meter or the test pen is broken.
- If the meter is not used correctly, the safety functions provided by the meter may fail.
- Care must be taken when working around bare conductors or buses.
- Do not use this instrument near explosive gas vapor or dust.
- The correct input function must be used to measure the range.
- The input value must not exceed the limit of the input value specified for each range to prevent damage to the instrument,
- Do not touch the unused input when the instrument is connected to the circuit under test.
- When the measured voltage exceeds 60V DC or 36 V AC , use caution to prevent electric shock.
- When measuring with a test pen, place your finger behind the guard ring of the test.
- Before converting the range, it must be ensured that the test pens have left the circuit under test.
- For all DC functions, to avoid the risk of electric shock due to possible incorrect readings, use this function first to confirm the presence of any AC voltage, and then select a DC voltage range equal to or greater than the AC voltage.
- Before carrying out a resistance, diode, capacitance measurement or continuity test, the circuit under test must be powered off and all high-voltage capacitors in the circuit under test should be discharged.
- Do not measure the resistance on a live circuit or perform buzzer test.
- Before conducting the current measurement, the fuse of the meter

should be checked. Before connecting the meter to the circuit under test, the power of the circuit under test should be turned off.

- When performing TV repairs or measuring power conversion circuits, care must be taken in the high-amplitude voltage pulses in the circuit under test to avoid damage to the meter.
- The power supply of instrument uses three pieces AAA 1.5V batteries. The battery must be properly installed in the battery compartment of the meter.
- When the battery with low voltage symbol  appears, replace the battery immediately. Insufficient battery power can make the meter read incorrectly, which may result in electric shock or personal injury.
- When measuring Category II voltages, do not exceed 1000V. For measurement category III, do not exceed 600V.
- Do not use the instrument when the instrument's housing or part of the housing is removed.

1..3 Safety symbols

Symbols used in the meter's body and manual:

	Warning: Important safety signs. Refer to the instruction manual before use. Improper use can result in damage to the device or its parts.
	AC
	DC
	AC or DC
	Ground
	Double insulation protection
	Fuse
	Meet EU standards
	High voltage warning
CAT. II	II category. 1000V overvoltage protection
CAT. III	III category. 600V overvoltage protection

1.4 Maintenance

- When opening the instrument case or removing the battery cover, pull out the test pen first.
- The specified replacement parts must be used to service the meter.
- Before opening the meter, all relevant power must be disconnected. At the same time, you must ensure that you do not have static electricity to avoid damage to the meter.
- Instrument components, instrument calibration and maintenance

- operation instructions are operated by professionals.
- When opening the instrument housing, some capacitance in the instrument must be noticed. Even after the instrument is turned off, dangerous voltages are kept.
 - If the instrument is observed any abnormality, the table should be immediately stopped and sent for repair, and to ensure that it can not be used before inspection qualified.
 - When not in use for a long time, please remove the battery, and avoid storing in high temperature and humidity.

1.5 Input protection measures

- The limit voltage is 1000 DCV or 750 ACV when the voltage is measuring.
- The meter can withstand AC voltages not exceeding 250V or equivalent when making frequency, resistance, continuity and diode measurements
- When measuring μ A current and mA current, it is protected by a fuse (600mA/250V).
- When measuring 10A large current, it is protected by a fuse (10A/250V).

1.6 General maintenance

To avoid electric shock or damage to the meter, do not get the inside of the meter wet. Before opening the case or battery

Before removing the cover, turn off the power and check that the test pen is disconnected from the circuit being measured.

Clean the instrument case regularly with a damp cloth and a small amount of detergent. Do not use abrasives or chemical solvents.

Dirty or moisture can cause metal surfaces to oxidize, which may affect readings.

To clean the input socket:

- 1) Turn off the meter and unplug all test leads from the input sockets.
- 2) Remove any dirt from the socket.
- 3) Clean each socket with a new cotton ball moistened with detergent or lubricant. Lubricant can prevent moisture-related socket contamination.

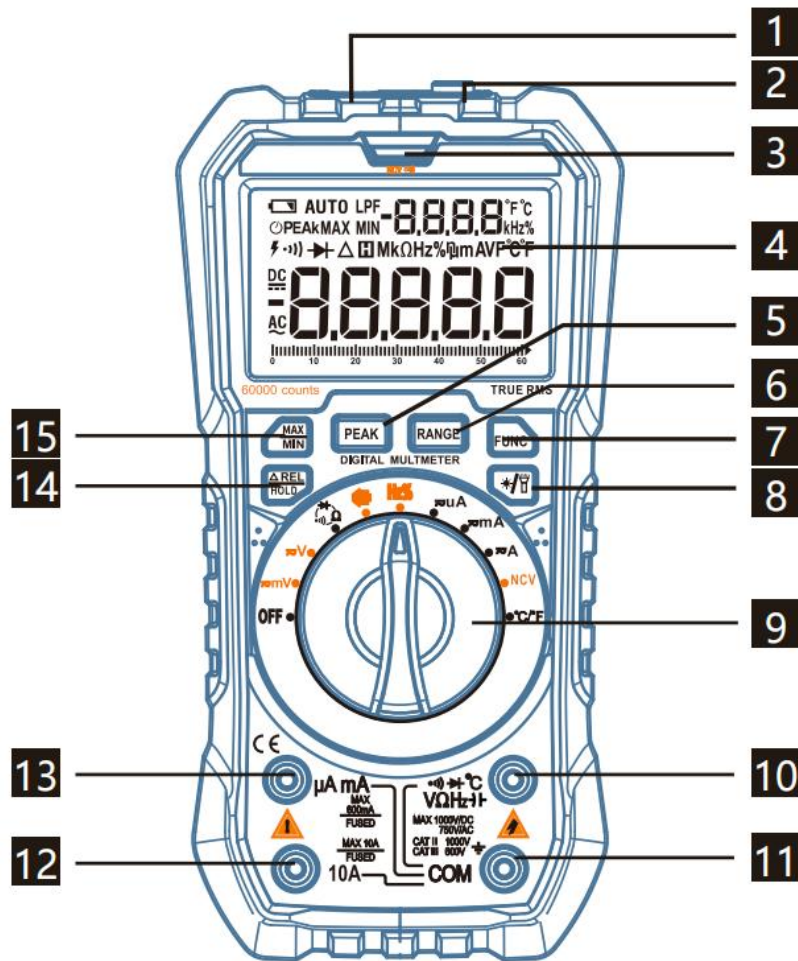
2. Instrument instruction:

This instrument is a handheld measuring digital multimeter with true RMS value. With large screen 60000counts LCD digital display, the display screen has a backlight (the brightness automatically adjusts after being turned on) and lighting, making it easy for users to read; it has overload protection and battery under-voltage indicator, display and input light indication; whether used by professionals, factories, schools, enthusiasts or families, it is an ideal multi-function meter.

This series of digital multimeters is based on the international electrical safety standard IEC-61010 for electronic measuring instruments and handheld digital multimeters.

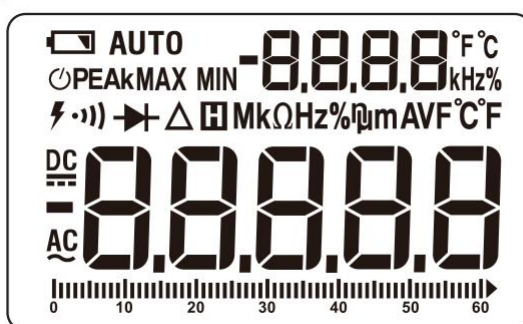
Designed and produced according to the safety requirements.

2.1 Panel diagram




1. Illumination
2. NCV sensing area
3. NCV and buzzer indicator light
4. LED display
5. Peak to Peak Measurement
6. Range switching button
7. Functions switch button
8. Lighting/Backlight
9. Gear rotary switch
10. VΩHz°C input socket
11. COM input socket
12. 10A input socket
13. µA mA input socket
14. Data hold/relative value measurement
15. Maximum and minimum switching

2.2 Symbol instructions of display






Symbol	Description
	Battery low voltage display
	Auto power off
	Negative polarity input indication
AC	Alternative input indication
DC	Direct input indication
	In continuity test mode
	In diode test mode
AUTO	Auto ranging mode
	Data hold mode
	In relative value measurement mode
PEAK	Peak-to-peak measurement mode
MAX	Maxium
MIN	Minum
°C、 °F	Temperature
%	Duty cycle
	High voltage danger warning I (displayed when DC voltage is 60V or AC voltage is above 36V)
V、 mV	Volt, unit of Voltage
A、 mA、 μA	Ampere, unit of current
Ω、 kΩ、 MΩ	Ohm, unit of resistor
MkHz	Hz, hertz, unit of frequency
mF、 μF、 nF	Farah, unit of capacitance

2.3 Instructions of button functions

Buttons	Instructions
FUNC	Short press this key to enter the FUNC function selection key, for example: Temperature measurement gear: °C or °F switch. Voltage gear and current gear: AC or DC switching, switching to Hz/% when AC is used On/off/diode/resistance gear: three gears switching.
$\frac{\Delta \text{REL}}{\text{HOLD}}$	Relative value measurement: Press and hold for 2S to enter this function, then press and hold for 2S to cancel this function. Data hold function: Short press this key to enter the data hold function. At this time, keep the instantaneous measurement value. Short press again to cancel the function.
	Short press this button to turn on the backlight, short press again to turn off the backlight; Long press 2S to light up and backlight at the same time, short press again to turn off; if not pressed this key will automatically turn off after 30s.
RANGE	Voltage/resistance/current, switch to manual range
$\frac{\text{MAX}}{\text{MIN}}$	Short press this key to switch between maximum and minimum value measurement, long press for 2S to exit this function.
PEAK	Peak-to-peak measurement: In the AC voltage and current signal state, short press this key to enter this function, long press for 2S again to turn off this function.

2.4 Instructions of input socket

Input socket	Description
COM	Common inputs for all measurements, connected to black test lead or to the common input of a dedicated multi-function test socket.
   $V\Omega$ Hz% °C/°F	Positive input for diode, capacitor, buzzer, temperature, voltage, resistance and frequency. (connected with red test lead)
μA mA	μA mA (inductance) input socket
10A	Positive input terminal with current 10A

3. Operation instruction

3.1 Auto power off

After about 15 minutes after power on, if there is no operating instrument, it will give audible voice prompts, will automatically cut off the power, enter the hibernation mode, in the automatic shutdown mode, any key can be restarted. Press the "FUNC" button to restart the instrument. The instrument will beep three times, the automatic shutdown function will be cancelled, and the instrument will remain on.

3.2 ACV and DCV measurement

⚠ Do not measure any voltage greater than 1000V dc or 750V ac RMS to prevent electric shock or damage to the instrument.

Do not apply more than 1000V DC or 750VAC RMS voltage between the common and earth to prevent electric shock or damage to the instrument.

The direct voltage ranges are:100mV, 600mV, 1V, 60V, 600V and 1000V; the alternative voltage ranges are:100mV, 600mV, 1V, 60V, 600V and 750V

1. Turn the switch to " $\approx V / \approx mV$ ", At this time, the red indicator light of the corresponding input socket flashes.
2. Connect the black test pen to the COM jack and the red pen to the V jack.
3. Measure the voltage value of the circuit under test with the other two ends of the test pens.
4. The reading will be shown on the LED display as well as the polarity of the end connected with the red lead.

Notes:

- ① In the AC and DC 1V range, even if there is no input or test pen connected, the meter will have a digital display. In this case, short-circuit the "V/ Ω " and "COM" terminals. If the meter displays back to zero, it means the meter is normal.
- ② When measuring the AC voltage signal, the frequency of the AC voltage signal will be displayed in the upper right corner of the display screen at the same time (this level can only read frequencies below 30KHz).
- ③ When measuring the DC voltage signal, the upper right corner of the display will display normal temperature at the same time.
- ④ The AC voltage value measured by this instrument is the true effective value (root mean square). For sine waves and other waveforms (without DC offset), such as square waves and triangle waves, these measurements are accurate.

3.3 Resistance measurement

⚠ To avoid damage to the meter or device under test, all power to the circuit under test should be cut off before measuring resistance, and all high-voltage capacitors should be fully discharged.

The unit of resistor is Ohm.

The resistor ranges are : 60k Ω , 60k Ω 600k Ω 6M Ω , 60M Ω

Resistor measuring:

1. Rotate the rotary switch to the " $\Omega / \bullet || / \blacktriangleright$ " position and press "FUNC" button to " Ω " position. At this time, the corresponding input plug-in the red indicator light flashes.
2. Connect the black test pen and the red test pen to the "COM" input socket and "V- Ω " input socket
3. Uses the test pen to test the resistance value of the circui, which

shows on the display window.

Notes:

*The resistance value measured on the circuit is usually different from the rate resistance.

*To measure the low resistance accurately, please short-circuit the two test pens to read out the short-circuit resistance of the test leads, and subtract it by the readings to get accurate resistance value.

*When measuring high resistance, it will take a few seconds for the reading to stabilize. This is normal for high resistance measurements.

*When the meter is not in circuit, the display will show "OL", indicating that the measurement value is out of the measurement range.

3.4 Diode measurement

⚠ To avoid damage to the meter or device under test, all power to the circuit under test should be cut off before measuring diode, and all high-voltage capacitors should be fully discharged.

Test a diode outside the circuit:

3. Turn the rotary switch to " $\Omega / \bullet || / \rightarrow +$ " and press "FUNC" button to " $\rightarrow +$ " position. At this time, the corresponding input plug-in the red indicator light flashes.
2. Connect the black test pen and the red test pen to the "COM" input socket and " $V - \Omega$ " input socket
3. Connect the black test pen and red test pen to the negative and positive electrodes of the diode under test.
4. The meter will display the forward bias value of the diode under test. If the polarity is reversed, then it shows 'OL'.

3.5 Buzzer test

⚠ To avoid damage to the meter or device under test, all power to the circuit under test should be cut off before measuring on-off of the circuit and all high-voltage capacitors should be fully discharged.



1. Turn the rotary switch to " $\Omega / \bullet || / \rightarrow +$ " and press "FUNC" button to " $\bullet ||$ " position. At this time, the corresponding input plug-in the red indicator light flashes.
2. Connect the black test pen and the red test pen to the "COM" input socket and " $V - \Omega$ " input socket
3. If the resistance of the circuit under test is not greater than about 50 ohms, the indicator light will turn on and the buzzer will sound continuously. If the measured resistance is greater than 40 ohms and less than 1000 ohms, display shows resistance value, If the measured resistance is greater than 1k Ω , the display shows "OL".

3.6 Capacitance measurement

⚠ To avoid damage to the meter or device under test, all power to the circuit under test should be cut off before measuring

capacitance. All high-voltage capacitors should be fully discharged.

The ranges of capacitance are: 6nF, 60nF, 600nF, 6uF, 60uF, 600uF, 6mF, 60mF.

1. Turn the rotary switch to "  " position. At this time, the corresponding input plug-in the red indicator light flashes.
2. Connect the black test pen and the red test pen to the "COM" input socket and  input socket
3. Measure the capacitance value of the circuit under test with the other two ends of the test pens. The reading will be shown on the LED display window.

Notes:

*It needs a certain time to measure the big capacitor.

*When measuring large capacitance, pay attention to measurement after discharge to avoid damaging the instrument.

3.7 Frequency measurement



Do not test any voltage higher than 250V to prevent electric shock or damage to the instrument.

1. Turn the switch to HZ%. At this time, the corresponding input plug-in the red indicator light flashes.
2. Connect the black test pen to the COM jack and the red pen to the HZ jack.
3. Measure the frequency value of the circuit under test with the other two ends of the test pens.
4. The reading will be shown on the LED display. At the same time, the duty cycle % is displayed in the upper right corner of the display.

3.8 NCV test

Rotate the rotary switch to the NCV position and place the top of the meter close to the conductor. If the meter detects the AC voltage meter, light the corresponding signal strength indicator according to the detected signal strength (low-yellow, high-red), and the buzzer will send out different frequency alarms.

Notes:

1. Even if there is no indication that the voltage may still exist, do not rely on non-contact voltage detectors to determine if there is a voltage detection operation on the conductor, which may be affected by factors such as socket depth, insulation thickness, and type, etc.
2. When the input voltage is input to the instrument, due to sensing in the presence of voltage, the voltage-sensing indicator light may light.
3. Interference sources in the external environment, such as flashlights, motors, etc., may accidentally trigger non-contact voltage detection.

3.9 Temperature Measurement

1. Turn the rotary switch to the "°C/°F" position, and the instrument will directly display the ambient temperature. At this time, enter the

corresponding the red indicator light of the socket flashes.

2. Remove the test leads and connect the thermocouple with the correct polarity to the "COM" and "V/ Ω " inputs with the indicator light flashing.
3. Place the thermocouple on the surface of the object being measured or in the environment being measured.
4. At this time, the display shows the temperature measurement value.

3.10 Current measurement

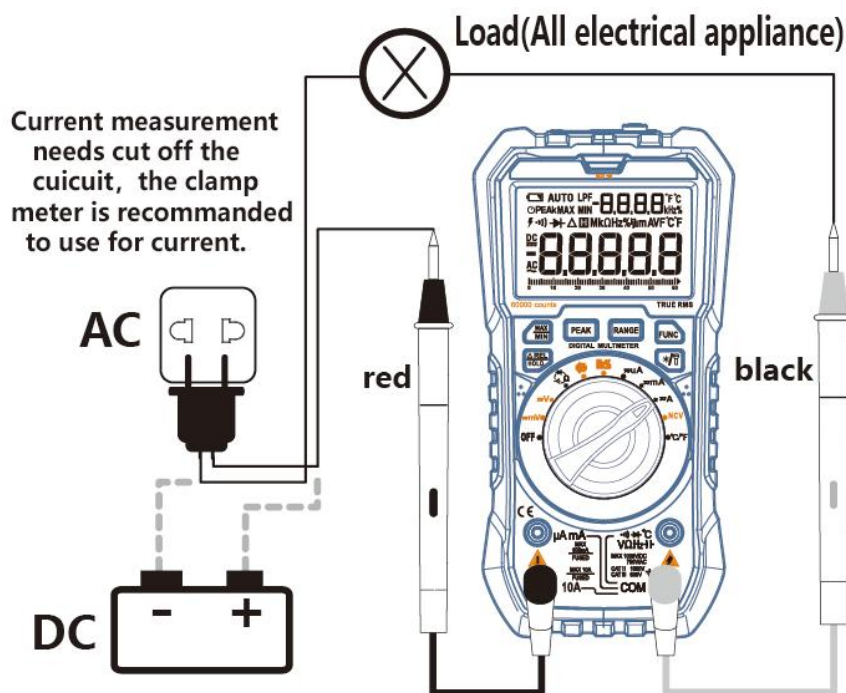
⚠ When measuring current, the meter needs to be connected in series to the circuit under test. Do not attempt to measure circuits in parallel or measure the mains power in parallel. If the fuse blows while taking measurements, you may damage the meter or injure yourself.

In order to avoid damage to the instrument or the equipment under test, before performing current measurement, you should pre-judge the size of the current being measured, select the corresponding current gear, and check the fuse of the instrument.

The DC current range of this meter is 600 μ A, 6mA, 60mA, 600mA, 6A and 10A.

AC current ranges are 600 μ A, 6mA, 60mA, 600mA, 6A and 10A.

1. Turn the rotary switch to the appropriate position. At this time, the red indicator light of the corresponding input socket flashes.
2. Connect the black test lead to the "COM" input socket. If the measured current is less than 1A, connect the red test pen to the "mA" input socket; if the measured current is between 1A and 10A, connect the red test pen to "10A" input socket.
3. Connect the test pen to the circuit under test in series, turn on the power of the circuit under test, and will display the current measurement value of the circuit under test.



4. Technical datasheet

4.1 Comprehensive indicators

*Operating conditions:

600V CAT III and 1000V CAT. II Pollution grade: 2

Height: under 2000m

Working temperature: 0-40°C (<80%RH, not considered <10°C)

Storage temperature: -10-60°C (<80%RH, take off battery)

*Test or calibration ambient temperature: 20°C ± 2°C.

*The biggest voltage between measurement end and ground: 1000V VDC or 750VAC

*Fuse protection: mA range , fuse: F 600mA/250V

A range, fuse: F 10A/250V

*Conversion rate: about 3s/second

*Display: 60000 counts LED display

*Overload display: 'OL' displayed

*Low voltage display of battery: "🔋" displayed when the working voltage is low

*Input polarity indicator: "-" shown automatically

*Battery: 3 X1.5V AAA

*Size: 187mm (L)*95mm (W)*55mm (H)

*Weight: about 331g (battery excluded)

4.2 Accuracy index

4.2.1 Direct current of voltage

Range	Resolution	Accuracy
100mV	0.001mV	± (0.1%readings+5digits)
600mV	0.01mV	
1V	0.0001V	± (0.05%readings+5digits)
60V	0.001V	
600V	0.01V	
1000V	0.1V	± (0.1%readings+5digits)

Input resistance: 10M Ω

Maximum input voltage: 1000VDC or 750VAC RMS

4.2.2 Alternative current of voltage

Range	Resolution	Accuracy
100mV	0.001mV	± (1%readings+10digits)
600mV	0.01mV	
1V	0.0001V	± (0.8%readings+10digits)
60V	0.001V	
600V	0.01V	
750V	0.1V	± (1%readings+10digits)

Input resistance: 10M Ω

Maximum input voltage: 1000VDC or 750VAC RMS

Frequency response: 10HZ to 1KHZ true RMS

4.2.3 Frequency

Range	Resolution	Accuracy
100Hz	0.001Hz	± (1.5%readings+5digits)
1KHz	0.01Hz	
10KHz	0.1Hz	
100KHz	0.001KHz	
1MHz	0.01KHz	
10MHz	0.1KHz	
25MHz	0.001MHz	

Input voltage range: 200mV-10V AC RMS

Overload protection:250V DC/AC


4.2.4 Resistance

Range	Resolution	Accuracy
600Ω	0.001Ω	± (0.5%readings+10digits)
6kΩ	0.0001kΩ	
60kΩ	0.001kΩ	
600kΩ	0.01kΩ	
6MΩ	0.0001MΩ	± (1%readings+10digits)
60MΩ	0.001MΩ	

Overload protection: 250V DC/AC


Open circuit voltage: 0.5V

4.2.5 Diode

Function	Range	Resolution	Condition
Diode 	0-3.2V	0.001V	Forward direct current: about 1mA; The open circuit voltage: about 3.2V The display shows the approximate value of forward voltage drop.

Overload protection: 250V DC/AC

4.2.6 Buzzer

Function	Range	Resolution	Description	Condition
	1kΩ	0.1Ω	when buzz with red indicator, resistor less than 50	open-circuit voltage: about 1V

Overload protection: 250V DC/AC

4.2.7 Capacitance

Range	Resolution	Accuracy
6nF	0.001nF	± (4.0%readings+5digits)
60nF	0.01nF	
600nF	0.1nF	
6μF	0.001μF	
60μF	0.01μF	
600μF	0.1μF	
6mF	0.001mF	± (5.0%readings+5digits)
60mF	0.01mF	

Overload protection: 250V DC/AC

4.2.8 Temperature

Range	Resolution		Accuracy
°C	1°C	-50°C~1000°C	± (1.0%+3) readings
°F	1°F	-58°F~1832°F	± (1.0%+3) readings

Overload protection: 250V DC/AC

4.2.9 Direct current

Range	Resolution	Accuracy
600µA	0.01µA	± (0.5%readings+10digits)
6mA	0.1µA	
60mA	0.001mA	
600mA	0.01mA	
6A	0.0001A	
10A	0.001A	± (2%readings+10digits)

Overload protection: mA range (600mA/250V) and 10A range (10A/250V)

Max input current: mA: 600A RMS 10A :10A RMS

When the current is more than 5 A, the test time should be less than 10s and one min should be given to stop testing after such measurement.

4.2.10 Alternative current

Range	Resolution	Accuracy
600µA	0.01µA	± (1%readings+10digits)
6mA	0.1µA	
60mA	0.001mA	
600mA	0.01mA	
6A	0.0001A	
10A	0.001A	± (2%readings+10digits)



Overload protection: mA range(600mA/250V) and 10A range(10A/250V)

Max input current: mA: 600mA RMS 10A :10A RMS

When the current is more than 5 A, the test time should be less than 10s and one min should be given to stop testing after such measurement.

Frequency response: 40HZ to 1KHZ true RMS

5 . Replace batteries, fuses, and accessories

 **Replace batteries and fuses to avoid electric shock or personal injury caused by erroneous readings. When the symbol  appears on the instrument display, replace the battery immediately. Use only the specified fuse, instant fuse.**

Please follow the steps below to replace the battery:

1. Turn off the power of the instrument

2. Pull all the test pens out of the input socket,
3. Use a screwdriver to loosen the screws fixing the battery.
4. Remove the battery cover
5. Remove the old battery or the damaged fuse
6. Replace the new 3 × 1.5V AAA batteries or a new fuse (the spare fuse is under the battery cover)
7. Install batteries cover and close the screws.

Accessories

1. One instruction manual
2. One pair of test pen
3. One thermocouple
4. 3 x 1.5V AAA AA batteries
5. A canvas bag