USER'S MANUAL

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DIGITAL MULTIMETER

MADE IN CHINA

CE RoHS

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Table of Contents

1. Overview
1.1 Security Information....1
1.1.1 Security Instructions....1
1.1.2 Security Precautions....1-3
1.1.3 Security Symbol....3
1.1.4 Safe maintenance habits....3-4
1.2 Input protection measures....4

2. Instrument indication instructions
2.1 Appearance of the instrument....5
2.2 Description of display symbol....6-7
2.3 Description of function button....7
2.4 Description of Input socket....7
2.5 Accessories....8

3. Operation manual
3.1 Normal operation....8
3.1.1 Reading Hold Mode....8
3.1.2 Lighting function....8
3.1.3 Frequency conversion voltage measurement function....8
3.1.4 Automatic shutdown function....8

3.2 Measurement Guide....9
3.2.1 Measuring AC and DC voltages....9-10
3.2.2 Measuring resistance....10-11
3.2.3 Test of the Diodes....11-12
3.2.4 Measuring capacitance....12
3.2.5 Measurement frequency....12-13
3.2.6 Measurement current....13-14
3.2.7 NCV test....14
3.2.8 Live Line and Netural Line Distinguish....14
3.2.9 Measurement of temperature and humidity....15
3.2.10 Battery Test....15
3.2.11 Buzzer Test....16

Table of Contents

4. Technical indicators
4.1 Comprehensive indicators....16-17
4.2 Precision Index....17
4.2.1 DC voltage....17
4.2.2 AC voltage....18
4.2.3 Resistance....18
4.2.4 Diode....18
4.2.5 Buzzer and continuity test....18
4.2.6 Capacitance....19
4.2.7 Direct current....20
4.2.8 Alternating current....20
4.2.9 Measurement of temperature and humidity....21
4.2.10 Battery Test....21
4.2.11 Buzzer Test....21

5. Instrument maintenance
5.1 General Maintenance....22
5.2 Replacing the battery....22

1. Overview

This instrument is a 9999-counter, hand-held digital multimeter with true virtual value and manual/automatic integration. It has a large, double, invert digital LCD display with simulation bars and illumination lights which are easy for users to read. It has the functions of alarm for fuse tube fused, wrong insertion of measurement probe, overload protection and battery undervoltage indication. It is an ideal multi-function instrument for either professionals, factories, schools, enthusiasts or families.

It is designed and manufactured according to the safety requirement for electronic measuring instruments and handheld digital multimeters specified in the international electrical safety standard IEC-61010. It meets the requirements of IEC61010's 600V CAT IV, 1000V CAT. III and Pollution Degree 2. Before using the instrument, please read the instruction manual carefully and pay attention to the safe working practices.

1.1 Safety Information

1.1.1 Safety Instructions

* When using this instrument, the user must observe all standard safety procedures for the following two aspects:

A Safety procedure for preventing electric shock.

B Safety procedures for the prevention of incorrect use of the instrument.

* To ensure your personal safety, please use the measurement probe provided with the instrument. Check and make sure they are intact before use.

1.1.2 Safety Precautions

* When using the instrument near a device with large electromagnetic interference, the reading of the instrument will be unstable. A large error may occur.
* Do not use the instrument or the measurement probe when its appearance is damaged.

* If the instrument is not used correctly, the safety functions provided by the instrument may expire.
* You must be extremely careful when working around bare conductors or buses.
* Do not use the instrument near explosive gas, steam or dust.
* Measurements must be taken using the correct input terminal, functions, and ranges.
* The input value must not exceed the input limit specified for each range to prevent damage to the instrument.
* When the instrument is connected to the line to be tested, do not touch the input terminal that is not used.
* When the measured voltage exceeds 60Vdc or 30Vac RMS, operate carefully to prevent electric shock.
* When measuring with a measurement probe, place your finger behind the guard ring of the measurement probe.
* Before converting the range, you must ensure that the measurement probe has left the circuit under test.
* For all DC functions, to avoid the risk of electric shock due to possible incorrect readings, use the AC function first to confirm the presence of any AC voltage. Then, choose a DC voltage range equal to or greater than the AC voltage.
* Before performing resistance, diode, capacitance measurement or make-and-break test, the power of the circuit under test must be cut off and all high voltage capacitors in the circuit under test must be discharged.
* Do not measure resistance or perform make-and-break tests on live circuits.
* Check the fuse tube of the instrument before making current measurements. Before connecting the instrument to the circuit under test, turn off the power of the circuit under test.
* When performing TV service or measuring the power-switching circuit, you must be careful of the high voltage pulse in the circuit under test to avoid damage to the instrument.

* This meter is powered by 2 sets of 1.5V AA batteries, which must be correctly installed in the battery compartment of the instrument.
* When the battery undervoltage symbol [▭] appears, replace the battery immediately. Insufficient battery power can cause incorrect instrument readings that can result in electric shock or personal injuries.
* Do not exceed 1000V when making measurement category III voltage measurement; do not exceed 600V when making measurement category IV voltage measurement.
* Do not use the instrument when the outer casing (or part of the outer casing) of the instrument has been removed.

1.1.3 Security Symbol:

Symbols used on the instrument body and in the instruction manual:

⚠ Refer to the instruction manual for warning, important safety mark before usage. Incorrect usage can result in damage to the device or its components.

~	AC (alternating current)
⎓	DC (direct current)
⎓~	AC or DC
⏚	Earth
▣	Double insulation protection
▭	Fuse
CE	Conforms to the directives of European Union
ϟ	High voltage warning
▬	Disconnected fuse tube
CAT.III	Class Ⅲ 1000 V overvoltage protection
CAT.IV	Class Ⅳ 600 V overvoltage protection

1.1.4 Safe maintenance habits

* When opening the instrument case or removing the battery cover, first pull out the measurement probe.

* When repairing the instrument, the specified replacement parts must be used.
* Before turning on the instrument, you must shut down all relevant power sources, and you must also ensure that you do not have static electricity to avoid damaging the components of the instrument.
* Calibration and maintenance of the instrument can only be performed by professionals.
* When opening the casing of instrument, it must be noticed that some of the capacitors in the instrument retain dangerous voltages even after the instrument is turned off.
* If any abnormality is observed on the instrument, the instrument should be immediately disused and sent for repair, and make sure that it cannot be used until it passes the inspection.
* When it isn't used for a long time, please remove the battery and avoid storing it in a place with high temperature and humidity.

1.2 Input protection measures

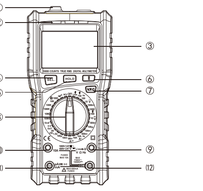
* The maximum input voltage that can be withstood is 1000V DC voltage or 750V AC voltage when making voltage measurement.
* an AC voltage of less than 250V or equivalent rms voltage can be withstood when making measurements on frequency, resistance, on-off and diode.
* it can be protected by a fuse tube(F600mA/250V) when measuring μA current and mA current.

In order to avoid damage to the instrument, if the red instrument is inserted by mistake into the current jack in other gears except the current gear, the screen will show LEAd, and the buzzer will give an alarm, prompting the measurement probe to be inserted in a wrong jack. At this time, the red measurement probe should be reinserted in the right jack once again for measurement.

In the μA and mA gear, if the fuse tube is fused, the screen will display FUSE and the [▬] symbol, prompting that the fuse tube is disconnected after the measurement probe is inserted into uA/mA jack. At this time, the fuse tube of the corresponding specification needs to be replaced again before the measurement can be continued. The same prompt function is also available in the 10A current gear.

2. Instructions for instrument indication

2.1 Schematic diagram of the Instrument



Appearance of the instrument

① Non-contact voltage sensing area
② Non-contact voltage indicator light
③ Liquid-crystal display
④ SEL Button
⑤ Hold Button
⑥ Flashlight Button
⑦ V.F.C Button
⑧ Range Rotary Knob
⑨ "V/Ω/Hz%/Live/⊣⊢/⇥/◁" Input Socket
⑩ 10AInput Socket
⑪ mA/μAInput Socket
⑫ "COM"Socket

2.2 Symbol description of display

Symbol	Description
[▭]	Battery undervoltage indicator / low battery capacity ⚠ In order to avoid suffering electric shock or personal injury caused by incorrect readings, the battery should be replaced as soon as possible when the low voltage symbol display of the battery appears.
⏲	Indicator for automatic close-down function
ϟ	High voltage warning symbol
—	Negative input polarity indication
AC	AC input indication.
DC	DC input indication.
◁)	The instrument is in continuity test mode.
⇥	The instrument is in diode test mode.
H	The instrument is in data hold mode.
℃/℉	Temperature unit (°C: Celsius; °F: Fahrenheit)
%	Duty cycle
NCV	The instrument is in non-contact AC voltage
(•))	Buzzer Output
V.F.C	Frequency conversion y voltage measurement
Live	Firing line test
Manual	Manual range
[▬]	Fuse tube is blown out.
FUSE	Fuse tube is blown out.
LEAd	Measurement probe is inserted in wrong
V,mV	V：Volts, the unit of voltage. mV：Millivolts, 1x10-3 or 0.001 volts.

Symbol	Description
A, mA, μ A	A：Ampere, the unit of current. mA：1x10-3 or 0.001 amps. μ A:Microampere, 1x10-6 or 0.000001 amps.
Ω, kΩ, MΩ	Ω：Ohm, the unit of resistance. kΩ：Kilo-ohm, 1000 ohms. MΩ：Megohm, 1,000,000 ohms.
MKHz	HZ：Hertz, frequency unit. KHZ：Kilohertz, 1x103 Hz. MHz：Megahertz, 1x106 or 1000 kHz.
mF, μ F, nF	F：Farah, the unit of capacitance. mF：Millifarad, 1x10-3 or 0.001 Farah μ F：Microfarad; 1x10-6 or 0.000001 Farah. nF：Nanofarad, 1x10-9 or 0.000000001 Farah.

2.3 Function button description

Key	Function description
SEL	Function selection button, located in the automatic AC and DC voltage gear and temperature gear. The function can be switched by pressing this button.
HOLD	Data hold button
☀	Short press on/off flashlight
V.F.C	Button for frequency conversion voltage measurement, located in the automatic AC voltage gear. The frequency conversion voltage can be measured by pressing this button.

2.4 Input socket description

Input socket	Description
COM	The common input terminal of all measurements is connected to the common output plug of a black measurement probe or dedicated multi-function test socket.
⊣⊢ ⇥ ◁) V Ω Hz % Live	Positive input terminal of capacitance, diode measurement, buzzer make-and-break test, voltage, resistance, frequency, duty cycle and zero line and firing line judgment (connected to red measurement probe).
μ A mA⏛ ⊣⊢	Positive input terminal of Current A, mA (connected to the red measurement probe)。battery test,continuity test
10A	Positive input terminal of current 10A (connected to the red measurement probe)

2.5 Accessories

① Operation instruction One
② Measurement probes One Pair
③ 1.5V AA battery One Pair

3. Operation instructions

3.1 Normal operation

3.1.1 Reading Hold Mode

The reading hold mode can keep the current reading on the display. The reading hold mode can be exited by either changing the measurement function gear or by pressing the HOLD button only once.

To enter and exit the reading hold mode:

1. Press the"H"button, the reading will be held and the" H " symbol will be displayed on the LCD at the same time.
2. Press the " H "button again to return the instrument to its normal measurement state.

3.1.2 Lighting function

The instrument equipped with the lighting function facilitates the user to operate in darker lighting conditions. Turn on or off the flashlight as follows:

1. Press the " ☀ " button to turn on the light.
2. Press the " ☀ "button once again to turn off the light.

3.1.3 Frequency conversion voltage measurement function

In the automatic AC and DC voltage gear, press the SEL button y to switch to the AC voltage gear, and then press the V.F.C button to enter the frequency conversion voltage measurement function, which can measure the frequency conversion voltage stably.

3.1.4 Automatic shutdown function

1.The instrument will emit a ticktack sound to automatically cut off the power and go to dormancy state after no operation is taken 15 minutes after starting, press the SEL and V.F.C buttons in the auto power off mode to restart.

2.Cancel Auto power off function

Press SEL button to start up in power off mode and auto power off function cancel, power off and power on again,, auto power function restore.

3.2 Measurement Guide

The instrument adopts manual range measurement.

3.2.1 Measuring AC and DC voltages

⚠ Any voltage above 1000V DC or 750V AC rms can't be measured to prevent electric shock and/or damage to the instrument. The voltage of more than 1000V DC or 750V AC rms can't be imposed between the common terminal and earth to prevent electric shock and/or damage to the instrument.

The DC voltage range of this instrument is: 999.9mV，9.999V;99.99V and 999.9V，the AC voltage range is: 999.9mV, 9.999V, 99.99V and 750V.

Measurement of AC or DC voltage:

1. Rotate the rotary switch to the V⎓gear to enter the manual range measurement mode (press the SEL button to switch between AC and DC voltage), or rotate the knob to 1000mV, 10V, 100V, 1000V in V⎓, or 1000mV,10V, 100V, 750V of V⎓gear, enter manual range measurement mode to measure DC or AC voltage.
2. Connect the black measurement probe and the red measurement probe to the COM input socket and the V input socket, respectively.
3. Use another two terminals of the measurement probe to measure the voltage value of the circuit under test. (connection in parallel with the circuit to be tested)
4. The measured voltage value is read by the liquid crystal display, and the voltage value can be directly displayed in the automatic gear. If the manual voltage gear is used, the knob needs to be rotated to the appropriate gear to read the voltage value. When measuring AC voltage, the display will display both voltage value and frequency values at the same time. When measuring DC voltage,he display will simultaneously display the polarity of the voltage to which the red measurement probe is connected.

Note:

① In the 1000mV range of DC and C, even if the measurement probe isn't entered or connected, the reading will be displayed on the instrument. In this case, short-circuit the "V⎓ Ω"and"COM" terminals to make the instrument display return to zero.

② Under the AC voltage function, press the V.F.C button to measure the AC frequency conversion voltage.

3.2.2 Measuring resistance

⚠ To avoid damage to the instrument or the device under test, turn off all power to the circuit under test and fully discharge all high-voltage capacitors before measuring resistance.

The unit of resistance is ohms (Ω).

The instrument's resistance range is 999. 9Ω, 9.999kΩ, 99.99kΩ, 999.9kΩ, 9.999MΩ, 99.99MΩ.

Measuring resistance:

1.Rotate the rotary switch to the Ω gear, rotate the knob to 1000Ω, 10KΩ, 100KΩ, 1000KΩ, 10MΩ, 100M to test the resistance.

2. Connect the black test pen and the red test pen to the COM input socket and the V / input socket, respectively.
3. Use another two terminals of the measurement probe to measure the resistance value of the circuit under test.
4. Read the measured resistance value from the LCD when the knob rotate to appropriate Resistance position.

Note:

① The measured resistance value on the circuit will usually differ from the rated value of the resistor.

② When measuring low resistance, please short-circuit the resistance of the two shorts to read the short of the test leads in order to keep the accuracy of the measurement. After measuring the measured resistance, the resistance value needs to be subtracted.

③ In the 100M gear, it takes a few seconds for stabilizing the reading. This is normal for high resistance measurements.

④ When the instrument is in the open circuit or the resistance of the measured object is too large, the display will show "OL", indicating that the measured value is out of range.

3.2.3 Testing continuity and diode

The instrument adopts the continuity/diode automatic identification function.

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

⚠ In order to avoid damage to the instrument under test, all power to the circuit under test should be cut off and all high voltage capacitors should be fully discharged before the buzzer make-and-break test.

Perform continuity or diode measurements:

1. Turn the rotary switch to the ⇥◁) gear.
2. Connect the black measurement probe and the red measurement probe to the COM input socket and the V/ Ω input socket, respectively.
3. Connect the black measurement probe and the red measurement probe to the two terminals of the object to be tested.
4. If the object to be measured is a diode, place the red and black measurement probes at the positive and negative terminals of the diode respectively. The instrument will display the forward bias value of the diode under test. If the polarity of the measurement probe is reversed or the polarity of the test point connected to the diode is reversed, the instrument will display "OL". In the circuit, a normal diode should produce a forward voltage drop of 0.5V to 0.8V; however, the reading of reverse bias will depend on the change in resistance of the other channels between the two measurement probes.

5.If the resistance of the circuit under test is less than about 100 , the instrument will automatically switch to the make-and-break measurement mode. When the resistance of the circuit under test is more than about 15, the instrument will automatically switch to continuity, and the indicator light (green light) induced will be on for a long time. The buzzer will make a continuous sound. When the resistance of the circuit under test is between about 15~30, the indicator light (green light) will flash and the buzzer will make interrupted sound.

3.2.4 Measuring capacitance

⚠ To avoid damage to the instrument or the device under test, turn off all power to the circuit under test and fully discharge all high-voltage capacitors before measuring electric capacity. The DC voltage gear is used to determine that the capacitors have been discharged.

The instrument's capacitance range is 9.999nF, 99.99nF, 999.9nF, 9.999μF, 99.99μF and 999.9μF,9.999mF.

Measuring capacitance:

1. Turn the rotary switch to 10mF Range.
2. Connect the black measurement probe and red measurement probe to the COM input socket and ⊣⊢ input socket respectively.
3. Use another two terminals of the measurement probe to measure the electric capacity value of the electric capacity to be tested, and read the measured value from the liquid-crystal display.

Note:

When measuring large capacitance, it takes time to stabilize the reading.

3.2.5 Measurement frequency

⚠ When testing AC Voltage or AC Current,,the LCD will show the corresponding frequency at the same time.

Measuring frequency:

1. Rotate the rotary switch to the AC Voltage or AC Current Range.
2. Connect the black measurement probe and the red measurement probe to the COM input socket and the Hz input socket, respectively.
3. Measure the frequency value of the circuit under test with another two terminals of the measurement probe.
4. Read the testing value of AC Volatge or AC Current， the frequency value show on the LCD simultaneously.

3.2.6 Measuring current

⚠ When the open-circuit voltage to the earth exceeds 250V, be sure to not attempt to make current measurements on the circuit. If the fuse is burnt out during the measurement, you may damage the instrument or hurt yourself.
To avoid damage to the instrument or the device under test, check the fuse of the instrument before making current measurements. When measuring, use the correct input socket, function gear and range. When the measurement probe is plugged into the current input socket, do not connect the other terminal of the measurement probe in parallel to any circuit.

The instrument's DC current range is 99.99μA, 99.99mA, 600.0mAand 10.00A, the alternating current measuring range is 99.99mA,600.0mA and 10.00A;

Measuring current:

1. Turn the rotary switch to the appropriate gear.
2. Connect the black measurement probe to the COM input socket. Connect the red measurement probe to the uA/mA input socket if the measured current is less than 600mA; if the measured current is between 600mA and 10A, connect the red measurement probe to the 10A input socket.
3. Disconnect the circuit to be tested. Connect the black measurement probe to the terminal of the disconnected circuit (with lower voltage) and the red measurement probe to the terminal of the disconnected circuit (with higher voltage).

4. Connect the power to the circuit and read the displayed reading. In the AC current gear, the screen simultaneously displays the current value and frequency. If the display only shows "OL", which means that the input exceeds the selected range, the rotary switch should be placed at a higher range.

3.2.7 NCV test (non-contact voltage detection)

Rotate the rotary switch to the NCV gear to close the top of the instrument to the conductor. If the instrument detects the AC voltage, the instrument will light the corresponding signal strength indicator according to the detected signal strength. When the sensed voltage is low, the screen will display --- L, the green indicator light is on for a long time. When the sensed voltage is high, the screen displays -- H, the two red indicators light up, and the buzzer sounds an alarm at different frequencies.

Note:

1. Even if no indication exists, the voltage may still exist. Do not rely on non-contact voltage detectors to determine if a wire has a voltage. Detection operations may be affected by factors such as socket design, insulation thickness and type.
2. When the voltage is entered into the input terminal of the instrument, the voltage sensing indicator may also be bright due to the presence of induced voltage.
3. Interference sources in the external environment (such as flashing light, motor, etc.) may trigger non-contact voltage detection by mistake.

3.2.8 Live Line Test

1. Rotate the rotary switch to the Live gear.
2. Connect the red measurement probe to the V input socket.
3. Insert a single measurement probe into the power socket L jack or close to the live wire. If the instrument detects the AC voltage, it will judge whether the voltage is a firewire according to the detected signal strength. If it is judged to be a live line, the display will send display LIVE and the green indicator light will be on, the buzzer will send an alarm with different intensities.

3.2.9 Measurement of temperature and humidity

Set the range switch to DC Voltage, DC Current, Resistance, Battery Test, Buzzer/Continuity Range,the screen will display current Enviroment temperature and then press SEL button, it Will shows current Enviroment Humidity

Note:

1.The Temperature and humidity can only display in DC Voltage, DC Current,Resistance,Battery Test , Buzzer/Continuity Range.

2.The sensor for temperature and humidity is inside the multimeter, it takes about 10 minutes for the sensor sampling time for temperature and humidity, it is not for fast changing temperature and humidity.

3.Press ☀ button to exchange ℃/℉ Unit.

3.2.10 Battery Test

⚠ Do not measure any voltage above 250V DC or AC rms to prevent electric shock and/or damage to the instrument. Do not applied any voltage above 250V DC or AC rms between the COM Socket and Ground to prevent electric shock and /or damage to the instrument

The Battery Range for this multimeter:1.5V/9V

Battery Test

1.Switch the range to 1.5/9V Battery Test Range.

2.Insert the Black Test Lead to COM Socket and the Red Test Lead to mA Socket.

3.Use the other side of Test Lead to test the voltage of the circuit (parallel circuit).

4.The display will show the value of voltage.

Note:

As it is with load when test the battery voltage,the testing value maybe smaller than the actual value, it is normal.

3.2.11 The speaker test for Buzzer

⚠ Do not measure any voltage above 250V DC or AC rms to prevent electric shock and/or damage to the instrument. Do not applied any voltage above 250V DC or AC rms between the COM Socket and Ground to prevent electric shock and /or damage to the instrument

1.Switch the range to OUT Range.

2.Insert the Black Test Lead to COM Socket and the Red Test Lead to mA Socket.dty, it is not for fast changing temperature and humidity.

3.Check according to the specification of the Buzzer,press SEL Button to select 2KHz/2.7KHz/3V to check the Buzzer.

4.Connect the Red probe and Black probe to both ends of the Buzzer,there should be loud sound for Buzzer, otherwise something is wrong with the Buzzer.

4 Technical indicators

4.1 Comprehensive indicator

Environmental conditions for usage:
600V CAT IV and 1000V CAT. III Pollution degree: 2
Altitude above sea level < 2000 m.
Temperature and humidity in the working environment:
0~40 OC (<80% RH, it isn't considered when <10°C).
Storage environment temperature and humidity:
-10~60 OC (when <70% RH, remove the battery).

- Temperature coefficient: 0.1 accuracy / OC (<18 OC or >28 OC).
- Maximum allowable voltage between the measuring terminal and the earth: 1000V DC or 750V AC RMS
- Protection of the fuse tube: mA gear: fuse tube FF 600mA/250V; A-gear fuse tube FF 10A/250V

- Conversion rate: about 3 times / second
- Display: 9999 counts displayed by LCD. The unit symbol is automatically displayed according to the measurement function gear.
- Overrange indication: The LCD will display "OL".
- Indication for low voltage battery: When the battery voltage is lower than the normal working voltage, " [▭] " will be displayed.
- Indication of input polarity: "−" is automatically displayed.
- Power supply: 2 x 1. 5V AA battery
- External dimensions: 185x88x52mm
- Weight: about 350g (including battery).

4.2 Precision Index

Accuracy: ±(% reading + word), the warranty period is one year from the date of delivery.
Reference conditions: ambient temperature 18 ° C to 28 ° C, relative humidity is not more than 80%

4.2.1 DC voltage

Measuring range	Resolution	Accuracy
999.9mV	0.1mV	± (0.5% reading +3 digits)
9. 999V	1mV	
99. 99V	10mV	
999.9V	100mV	

Input impedance: 10MΩ
Maximum input voltage: 1000Vdc or 750Vac rms.
Input impedance: 10MΩ
Maximum input voltage: 1000Vdc or 750Vac rms.

4.2.2 AC voltage

Measuring range	Resolution	Accuracy
999.9mV	0.1mV	± (0.8% reading +3 digits)
9. 999V	1mV	
99. 99V	10mV	
750. 0V	100mV	± (1% reading + 5 digits)

Input impedance: 10MΩ
Maximum input voltage: 1000Vdc or 750V ac rms.
Frequency response: 40Hz-1KHz true RMS (VFC: 2KHz attenuation -3dB)

4.2.3 Resistance

Measuring range	Resolution	Accuracy
999.9Ω	0.1Ω	± (0.8% reading +3 digits)
9. 999kΩ	1Ω	
99. 99kΩ	10Ω	
999. 9kΩ	100Ω	
9. 999MΩ	1kΩ	
99. 99MΩ	10kΩ	± (1. 2% reading +5 digits)

Overload protection: 600V DC/AC
Open-circuit voltage: 1 V

4.2.4 Diode

Function	Measuring range	Resolution	Test condition
Diode test ⇥	0. 15V~3V	0. 001V	Forward DC current: about 1mA; open-circuit voltage: about 3.2V. The display shows an approximation of the forward voltage drop of the diode.

Overload protection: 600V DC/AC

4.2.5 Buzzer and continuity

Function	Measuring range	Resolution	Description	Test condition
•))	100Ω	1Ω	The built-in buzzer sounds continuously and the green indicator light is on when the resistance is less than15Ω.The buzzer will give an alarm intermittently, and the green indicator light flashes when the measured resistance is between15Ω and 30Ω.	Open-circuit voltage: about 1V

Overload protection: 600V DC/AC

4.2.6 Capacitance

Measuring range	Resolution	Accuracy
9.999nF	0.001nF	± (4.0% reading +30digits)
99. 99nF	0.01nF	± (4.0% reading +3digits)
999. 9nF	0.1nF	
9.999μF	1nF	
99. 99μF	10nF	
999. 9μF	100nF	
9.999mF	1μF	

Overload protection: 250V DC/AC
Open-circuit Voltage:1V

4.2.7 Direct current

Measuring range	Resolution	Accuracy
99.99μA	0.01μA	± (0.8% reading +3 digits)
999.9mA	0.01mA	
600mA	0.1mA	
10A	10mA	± (1. 2% reading +3 digits)

Overload protection: mA range fuse tube (FF630mA/250V);
10A range fuse tube (FF10A/250V).

Maximum 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 measurement time is no longer than 10 seconds, and the current measurement must be stopped for 1 minute after the measurement.

4.2. 8 Alternating current

Measuring range	Resolution	Accuracy
99.99mA	0.01mA	± (1% reading +3 digits)
600mA	0.1mA	
10A	10mA	± (1. 5% reading +3 digits)

Overload protection: mA range fuse (FF630mA/250V);
10A range fuse (FF10A/250V).

Maximum 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 measurement time is no longer than 15 seconds, and the current measurement must be stopped for 1 minute after the measurement.

Frequency response: 40Hz-1KHz, true RMS

4.2.9 Measurement of temperature and humidity

Humidity(RH)

Measuring range	Resolution	Accuracy
20~95%	1%	± 5. 0%RH

Working Temperature:-0℃~40℃

Sampling Rate: About 30S

Temperature(Sensor,.NTC thermistor,temperature display)

Measuring range	Resolution	Accuracy	
℃	0.1℃	0.℃to40℃	±2℃
℉	1℉	32℉to104℉	±3℉

Sampling Rate: About：20S

4.2.10 Battery Test

Resolution	Accuracy	Discharge current
1. 5V	± (2% reading +10 digits)	About 40mA
9V	± (2% reading +10 digits)	About 20mA

Overload protection:mA Range Fuse(FF 630mA/250V)

4.2.11 The Speaker Test for Buzzer

Resolution	Accuracy
2KHz	±5%
2. 7KHz	±5%
3V	±5%

Overload protection:mA Range Fuse(FF 630mA/250V)

5. Instrument maintenance

This section provides basic maintenance information, including instructions for replacing the fuse and replacing the battery. Do not attempt to repair the instrument unless you are an experienced serviceman with relevant calibration, performance testing, and maintenance information.

5.1 General Maintenance

⚠ To avoid electric shock or damage to the instrument, do not wet the inside of the instrument. The connection wire between the measurement probe and input signal must be removed before opening the case or battery cover.

Regularly clean the case of the instrument with a damp cloth and a small amount of detergent. Do not use abrasives or chemical solvents. Input sockets that are dirty or damp may affect readings.

Cleaning the input socket:

① Turn off the instrument and pull all the measurement probes out of the input socket.

② Remove any dirt from the socket.

③ Use a new cotton ball dipped in detergent or lubricant to clean each socket. The lubricant can be used to prevent socket contamination relevant to the moisture.

5.2 Replacing the battery and fuse

⚠ To avoid electric shock or personal injury caused by incorrect readings, replace the battery immediately when the " [▭] "symbol appears on the display of the instrument. Only use the specified fuse (600mA/250V, 10A/250V fast-thawing fuse)
To avoid electric shock or personal injury, turn off and check that the measurement probe has been disconnected from the measurement circuit before opening the battery cover and replacing it with a new one.

Please replace the battery according to the following steps:

1. Turn off the power of the instrument.
2. Pull all the measurement probes out of the input socket.
3. Loosen the screws that secure the battery cover with a screwdriver.
4. Remove the cover of the battery.
5. Remove the old battery or damaged fuse.
6. Replace with a new 2 x 1. 5V AA battery or a new fuse tube
7. Install the battery cover and tighten the screws.