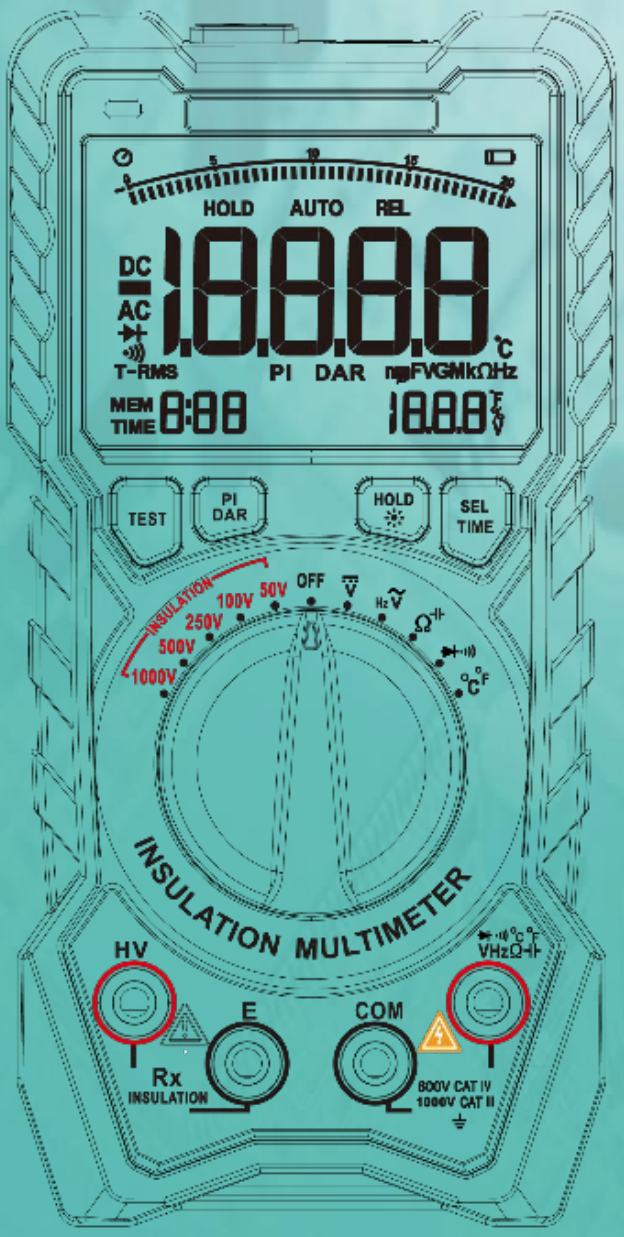
User Manual



Limited Warranty and Scope of Liability

From the date of purchase, this product is covered by a one-year warranty.

This warranty does not cover disposable batteries (once depleted), or damage resulting from accidents, negligence, misuse, modifications, contamination, or abnormal operating conditions.

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Overview

This product is a 2-in-1 digital insulation resistance tester and multimeter. It features comprehensive functions, high accuracy, reliable operation, and user-friendly design.

The insulation tester section offers selectable test voltages of 50V, 100V, 250V, 500V, and 1000V, making it suitable for measuring the insulation resistance of various electrical equipment and insulating materials, such as transformers, motors, cables, switches, and appliances. It is ideal for maintenance, testing, and inspection of electrical equipment and components.

With a clear display, compact design, and easy portability, this instrument is an excellent choice for electricians and electronics professionals.

Safety Instructions

To avoid potential electric shock, fire, or personal injury, please read the safety precautions before use. Use the product only for its intended purposes; improper use may compromise its protective features.

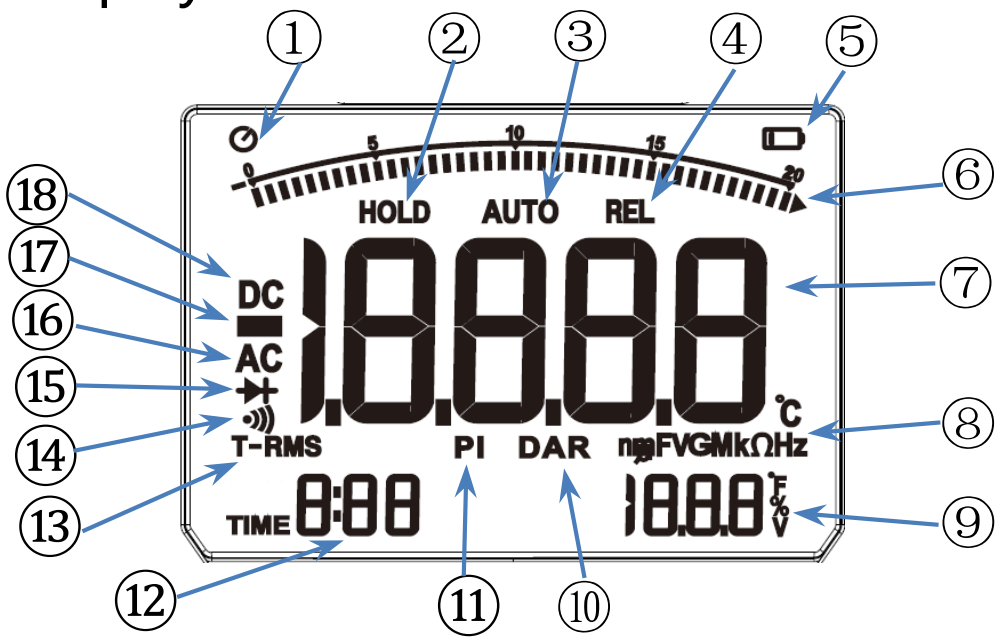
Before using the product, carefully inspect the casing and input terminals for cracks or damage, and ensure that the test leads are intact.

Always follow the instructions in this user manual, use the correct input terminals and range settings, and perform measurements within the specified limits.

- Do not use this product in the presence of explosive gases, vapors, or in humid environments.
- Always keep your fingers behind the protective barrier on the test probe.
- Do not touch unused input terminals while the product is connected to a circuit under test.
- Disconnect the test leads from the circuit before changing measurement modes.
- When measuring DC voltages above 36V or AC voltages above 25V, serious injury may occur. Users should take precautions to avoid electric shock.
- Always select the correct measurement mode and range to prevent damage to the instrument or personal injury. If the measured value exceeds the instrument's range, the display will show "  ".
- Low battery voltage may affect measurement accuracy. Replace the battery promptly when needed.
- Do not use this product if the battery compartment cover is not properly secured.
- During insulation resistance testing, the instrument outputs a voltage ranging from 50V to 1000V.
- Do not touch the output terminals or the metal parts of the test probes to avoid electric shock.

Product Introduction

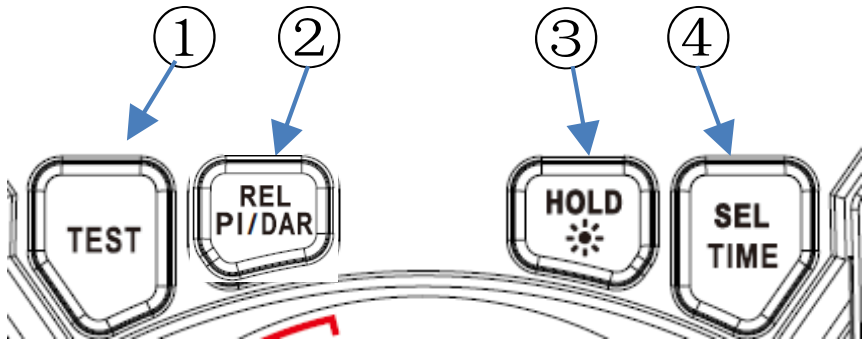
LCD Display



①		Auto Power Off Symbol
②	HOLD	Data Hold Symbol
③	AUTO	Auto-ranging
④	REL	Relative Value Measurement
⑤		Low Battery Indicator
⑥		Analog Bar Display
⑦		Primary Display (shows measurement value)
⑧	nμFVGMkΩHz	Unit Symbol (displays corresponding unit)

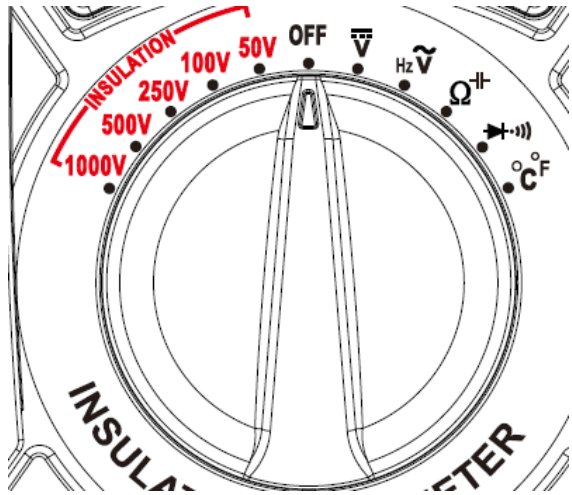
⑨		Secondary Display (shows output voltage or Fahrenheit value)
⑩	DAR	Insulation Resistance Absorption Ratio
⑪	PI	Insulation Resistance Polarization Index
⑫		Secondary Display (shows measurement duration)
⑬	T-RMS	AC Voltage True RMS
⑭		Continuity Measurement Buzzer Symbol
⑮		Diode Test Measurement Symbol
⑯	AC	AC Voltage Measurement Symbol
⑰		Negative Voltage Sign
⑱	DC	DC Voltage Measurement Symbol

Function Buttons



1	Insulation Resistance Tester Test Start Button: After turning the rotary switch to the desired test voltage range, press this button to output high voltage and begin the measurement.
2	REL: In multimeter mode, press this key to enter relative value measurement. DAR: In insulation resistance tester mode, press this key once to measure the dielectric absorption ratio (DAR). PI: In insulation resistance tester mode, press this key twice to enter the polarization index (PI) measurement.
3	HOLD key: Short press to freeze the measured value; long press to turn on the screen backlight and flashlight, press long again to turn them off.
4	SEL: In multimeter mode, short press this key to switch measurement functions. TIME: In megohmmeter mode, press this key to set the measurement duration.

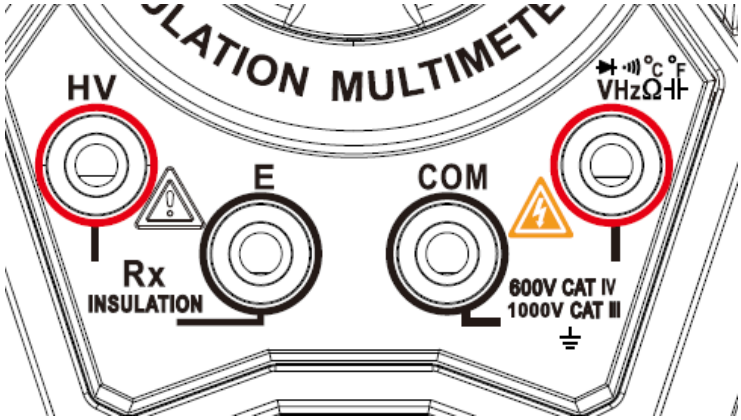
Rotary Switch



OFF	At this setting, the device will power off. If no function is changed or the dial is not operated within 15 minutes after powering on, the device will automatically shut down. One minute before automatic shutdown, the built-in buzzer will sound five “beeps” as a warning. After automatic shutdown, press the ESL button to wake the device up again. To disable the auto power-off function, press and hold the SEL button while turning on the device. If successful, the buzzer will beep five times, and the clock icon “ ” on the screen will disappear.

	DC Voltage Measurement Range
	AC Voltage and Frequency Measurement Range
	Resistance and Capacitance Measurement Range
	Diode and Continuity Measurement Range
	Temperature Measurement Range
	Megohmmeter 50V Test Voltage Range
	100V Test Voltage Range
	250V Test Voltage Range
	500V Test Voltage Range
	1000V Test Voltage Range

Input Ports



	Megohmmeter High Voltage Terminal
	Megohmmeter Ground Terminal
	Multimeter Common Input Terminal
	Input Ports for the following measurements: 1. AC/DC Voltage 2. Resistance 3. Capacitance 4. Frequency 5. Temperature 6. Continuity 7. Diode

Measurement Methods

Measuring DC Voltage

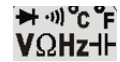
1. Insert the black test lead into the COM terminal and the red test lead into the VΩHz terminal.
2. Turn the dial to the DC voltage range;
3. Touch the correct test points on the circuit with the probe tips;
4. The voltage will be measured automatically—read the value displayed on the screen.

Measuring AC Voltage

1. Insert the black test lead into the COM terminal and the red test lead into the VΩHz terminal.
2. Turn the dial to the AC voltage range;
3. Touch the correct test points on the circuit with the probe tips;
4. The voltage will be measured automatically—read the value displayed on the screen.

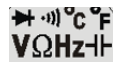
- Do not measure voltages that exceed the rated maximum test value, as this may damage the instrument and pose a risk to personal safety.
- When measuring high-voltage circuits, avoid any contact with the high-voltage components.

Measuring resistance

1. Measuring ResistanceInsert the black test lead into the COM terminal and the red test lead into the  terminal.
2. Turn the dial to the resistance/capacitance range;
3. Touch both ends of the resistor to be tested with the probe tips;
4. The resistance will be measured automatically—read the value displayed on the screen.

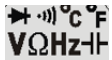
- Before measuring resistance, ensure that all power sources in the circuit under test are turned off and all capacitors are fully discharged.
- Applying voltage while in this mode is strictly prohibited.

Continuity Test

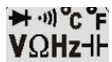
1. Insert the black test lead into the COM terminal and the red test lead into the  terminal.
2. Turn the rotary switch to the diode/continuity mode, then press the SEL key to enter continuity testing.
3. Touch two points of the circuit under test with the probe tips.
4. If the resistance is less than 50Ω, the buzzer will sound, indicating a short circuit. If there is no response, it indicates an open circuit.

- Do not apply any voltage while in this mode.

Measuring Diode

1. Insert the black test lead into the COM terminal and the red test lead into the  terminal.
2. Turn the rotary switch to the diode/continuity test mode.
3. Touch the red test lead probe to the positive side of the diode under test, and the black test lead probe to the negative side of the diode.
4. Read the forward voltage displayed on the screen.
5. If the test lead polarity is reversed or the diode is damaged, the screen will display “  ”.

Measuring Capacitance

1. Insert the black test lead into the COM terminal, and the red test lead into the  terminal.
2. Turn the rotary switch to the resistance/capacitance mode.
3. Touch the red test lead probe to the positive terminal of the capacitor under test, and the black test lead probe to the negative terminal. The meter will automatically select the appropriate range based on the capacitance value.
4. After the reading stabilizes, read the capacitance value displayed on the screen.

- If measuring a high-voltage capacitor, the capacitor must be discharged before testing.

Measuring Frequency

1. Insert the black test lead into the COM terminal and the red test lead into the VΩHz terminal.
2. Turn the rotary switch to the AC voltage range; press the SEL button to switch to frequency measurement.
3. Touch the desired test points on the circuit with the probe tips.
4. Read the frequency value displayed on the screen.

Measuring Temperature

1. Insert the black plug of the thermocouple into the COM terminal, and the red plug into the VΩHz terminal.
2. Turn the rotary switch to the temperature range; the screen will display the ambient temperature by default, with the main display showing ℃ and the secondary display showing ℉.
3. Touch the temperature probe of the thermocouple to the point to be measured.
4. Read the temperature value displayed on the screen.

- Do not apply any voltage while in this mode.
- When measuring high temperatures, avoid touching the test points to prevent burns.

Insulation Resistance Measurement

➢ Safety Precautions for Measurement Operations

1.During measurement, do not touch the object under test or any metal parts of the terminals to avoid high-voltage electric shock.

2.Ensure the object under test is not energized and is safely grounded. Before testing, short-circuit and discharge between the two test terminals of the object.

3.When measuring insulation resistance, do not allow external voltage to be applied to the test circuit.

4.When the TEST button is pressed to start testing, the red triangular indicator light in the middle of the input terminals will light up, indicating high voltage output at the terminals. Avoid contact to prevent electric shock.

➢ Insulation Resistance Measurement Method

1.Insert the red test lead into the red HV terminal and connect it to one end of the object under test; insert the black test lead into the black E terminal and connect it to the other end of the object under test.

2.Turn the dial to select the desired test voltage range, and press the SEL button to set the test duration.

3.Press the TEST button to start the measurement, and wait patiently for the result.

4.When you hear a beep and the red light turns off, the test is complete.

5.Read the insulation resistance value displayed on the screen.

➢ Important Note:

The insulation resistance tester measures the resistance across surfaces of the tested object, not point-to-point resistance. Therefore, the test probes should not be placed directly on non-conductive materials (such as cable insulation or plastic casing). Instead, first cover the surface of the object under test with a conductive material (such as tin foil), and then connect the test leads to this conductive surface to ensure accurate measurement.

Maintenance and Care

Except for battery replacement, do not attempt to repair this product or modify its circuitry unless you are qualified and have the appropriate calibration, performance testing, and maintenance instructions.

Cleaning the Product

Please clean the casing with a damp cloth and mild detergent. Do not use corrosive agents or solvents. Dust or moisture on the test terminals may affect measurement accuracy.

*Before cleaning the product, disconnect all input signals.

Battery Charging

This product is powered by three 14500 lithium batteries.

When the low battery indicator "  " appears on the display, replace or recharge the batteries promptly.

Before replacing the batteries, first disconnect the test leads and turn off the instrument.

Unscrew the screw securing the battery cover and open the battery compartment.

Remove the batteries and place them in a 14500 battery charger.

After fully charging, take out the batteries and insert them back into the instrument.

Close the battery cover and tighten the screw.

Note:

1. Pay attention to correct polarity when charging and assembling the battery; do not reverse the positive and negative terminals.

2. The charging process should be carried out within a controllable and safe range.

Technical Specifications

General Specifications	
Display (LCD)	19999 counts
Range Selection	Auto
Material	ABS/PVC
Sampling Rate	3 times/s
True RMS	√
Data Hold	√
Backlight	√
Low Battery Indicator	√
Auto Power Off	15 minutes

Mechanical Specifications	
Dimensions	176×91×47 mm
Weight	330 g (excluding battery)
Battery Type	14500 Li-ion batteries × 3
Warranty	1 year

Environmental Specifications		
Operating Environment	Temperature	0~40℃
	Humidity	< 75%
Storage Environment	Temperature	-20~60℃
	Humidity	< 80%

Megohmmeter Specifications

Rated Test Voltage, Effective Measurement Range and Accuracy		
Rated Voltage	Measurement Range	Accuracy
50V	0.1MΩ~500MΩ	±(5%+5)
100V	0.1MΩ~2GΩ	±(5%+5)
250V	0.1MΩ~5GΩ	±(5%+5)
500V	0.1MΩ~10GΩ	±(5%+5)
1000V	0.1MΩ~20G Ω	±(10%+5)

Range Display		
Rated Voltage	Auto-ranging	Resolution
50V	4M/40M/400M Ω/1GΩ	0.001M~0.001GΩ
100V	4M/40M/400M /2GΩ	0.001M~0.001GΩ
250V	4M/40M/400M /4GΩ/5GΩ	0.001M~0.001GΩ
500V	4M/40M/400M/4G Ω/10GΩ	0.001M~0.01GΩ
1000V	4M/40M/400M/4G/20 GΩ	0.01M~0.01GΩ

Multimeter Electrical Specifications

Function	Range	Resolution	Accuracy
DC Voltage (V)	1.9999V	0.0001V	±(0.05%+3)
	19.999V	0.001V	
	199.99V	0.01V	
	1000.0V	0.1V	±(0.5%+3)
AC Voltage (V)	1.9999V	0.0001V	±(0.5%+3)
	19.999V	0.001V	
	199.99V	0.01V	
	750.0V	0.1V	
Resistance	199.99Ω	0.01Ω	±(0.5%+3)
	1.9999kΩ	0.0001kΩ	±(0.3%+3)
	19.999kΩ	0.001kΩ	
	199.99kΩ	0.01kΩ	
	1.9999MΩ	0.0001MΩ	±(1%+3)
	19.99MΩ	0.01MΩ	

Function	Range	Resolution	Accuracy
Capacitance	9.999nF	0.001nF	±(5.0%+20)
	99.99nF	0.01nF	±(2.0%+5)
	999.9nF	0.1nF	
	9.999μF	0.001μF	
	99.99μF	0.01μF	
	999.9μF	0.1μF	
	9.999mF	0.001mF	±(5.0%+5)
	99.99mF	0.01mF	
Frequency	9.999Hz	0.001Hz	±(0.1%+2)
	99.99Hz	0.01Hz	
	999.9Hz	0.1Hz	
	9.999kHz	0.001kHz	
	99.99kHz	0.01kHz	
	999.9kHz	0.1kHz	

Function	Range	Resolution	Accuracy
Temperature	(-20~1000)℃	1℃	±(2.5%+5)
	(-4~1832)℉	1℉	
Diode	√		
Continuity	√