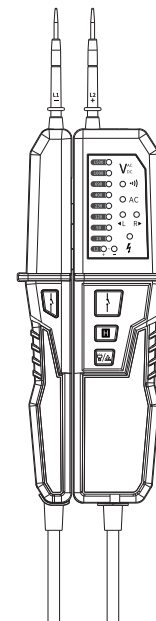


USERS MANUAL

User Manual for Voltage, Phase Sequence, Continuity and RCD Comprehensive Electrical Tester



EMC&LVD

Designed and Complies to
IEC61010-1
CAT IV 600V



Designed and Complies to
IEC61010-1
CAT IV 600V

Y01-04-0247



Before using the instrument, please read this manual carefully, and save it well for future using.

尺寸 : 125x85mm
红框不要印

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Statement

1. For your personal safety, please read the user manual carefully before use.
2. The voltage detector is provided for trained personnel.
3. Unauthorized personnel shall not disassemble the voltage detector.

1. Security Information

WARNING

Take special attention to this instrument, as improper use may cause electric shock or damage to the instrument. During use, it is necessary to follow the usual safety regulations and fully comply with the security measures specified in the user manual.

To fully utilize the functions of the instrument and ensure safe operation, please carefully read and follow the instructions in this manual.

The instrument complies with the security requirements of IEC 61010-1, IEC 61243-3:2014, EN 60529, and EN 61326-1 for electronic testing instruments, and belongs to Class II pollution. The overvoltage standards are CAT IV 600V and CAT III 1000V.

Please follow the security guidelines to ensure safe use of the instrument.

1.1 Security Instructions

When using this instrument, the operator must comply with all standard security regulations regarding the following two points:

- Security regulations for preventing electric shock.
- Security regulations for preventing incorrect use of instruments.

 **To ensure your physical security, check and ensure that the instrument is in good condition before using it.**

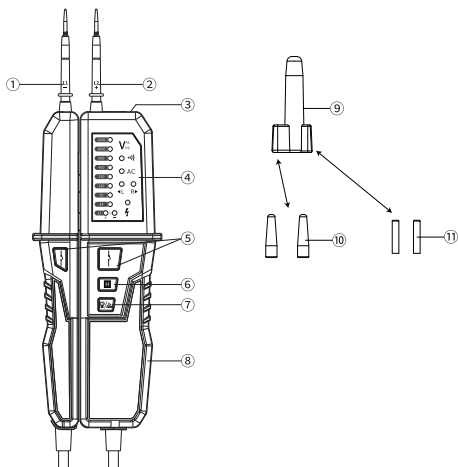
1.2 Security symbols

Symbols used in the instrument body and user manual:

	Warning. An important security symbol. Refer to the user manual before using the device. Incorrect use may cause damage to the device or its components.
	AC (Alternating Current)
	DC (Direct Current)
	Working in power-on status is allowed
	Grounding
	Double insulation protection
	Compliant with European Union instruction
	High voltage warning
1000V CAT III	1000V CAT III overvoltage protection
600V CAT IV	600V CAT IV overvoltage protection

2. Descriptions

2.1 Names of Components

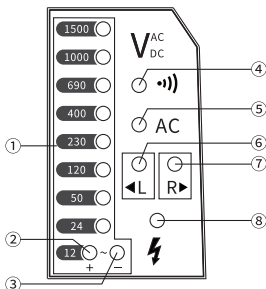


- ① Probe L1- ② Probe L2+ ③ Light ④ Indication panel
- ⑤ RCD test key ⑥ HOLD key ⑦ Lights key ⑧ Battery cover
- ⑨ Probe tip protection ⑩ Probe tip insulation cap
- ⑪ Probe tip metal threaded cap

2.2 Descriptions of Keys

1. RCD Key : 
2. HOLD Key: **H**
3. Lighting Key: 

2.3 Descriptions of LED Indicator



- ①Voltage indication (LED) ②12V Voltage and positive indication
③Negative indication ④Connectivity indication ⑤AC indication
⑥Reverse rotation indication ⑦Positive rotation indication
⑧High voltage indication

3. Operation Instructions and the Use Scope of the Tester

This tester including test of AC/DC voltage (including three-phase AC), phase sequence indication of three-phase AC, RCD test, continuity test, simple voltage detection without battery power supply, overvoltage indication and low voltage indication, etc. The attached flashlight provides convenience for using the tester in dark environments. This

tester comes with a probe protection case, which can protect the probe and, more importantly, protect the operator. After using this tester, put on a protective cover and it is best to place it in the toolbox to prevent the tester's probe from causing physical harm. Be sure not to put the tester into the pocket. This tester can be used in various situations, including homes, factories, power departments, etc.

This tester has the following characteristics:

1. The attached probe protective case can ensure physical security.
2. The maximum test of AC/DC voltage can reach 1200V AC/1500V DC.
3. Continuity tes.
4. Indicate the phase sequence of three-phase AC voltage.
5. Testing voltage without battery.
6. Lighting function.
7. Indication of voltage exceeding range.
8. RCD testing.
9. Automatic shutdown.
10. Wake-up function.

4. Security Issues During Use

- Before testing, please confirm that the test probe and testing instrument are in good condition.
- When using this device, hands can only touch the handle part.
- The equipment should be used within the specified range (based on technical specifications) and with a voltage not exceeding 1200V AC/1500V DC, and please ensure that the equipment is in good condition before using it.
- To ensure the normal operation of the tester, please first test a known voltage value object.
- When one or several functions fail or there is no functional indication,

the tester cannot be used any more.

- Do not use it in damp conditions.
- The display is only good when the temperature range is $-5^{\circ}\text{C}\sim+40^{\circ}\text{C}$ and the relative temperature is $<85\%$
- If the instrument is not used for a long time, the battery should be removed to prevent damage to the instrument.
- Use a damp cloth and mild detergent to clean the instrument, do not use abrasives or solvents.
- To avoid electric shock caused by incorrect readings, please short circuit the meter probes before testing, and judge the battery condition based on whether there is a " - " flashing. When the battery is under voltage, the use of this instrument should be prohibited.
- Before opening the bottom case or battery cover, the probe should be removed from the tested circuit.
- If the operator's safety cannot be guaranteed, the instrument must be sent for repair.
- If the following situations occur, security is no longer guaranteed:
 1. There is obvious damage.
 2. The function of the tester is inconsistent with its normal function.
 3. It has been stored for a long time under unsuitable condition.
 4. Mechanical compression during transportation.

5. Voltage Testing

Following the security testing specifications mentioned in Point 4 of the manual, the operation of this tester is as follows:

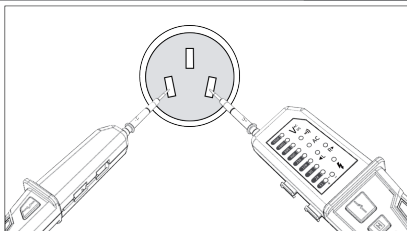


Fig.3

1. Before the formal testing, select a known voltage object, and then connect the two probes to it, such as a 220V socket, to ensure the accuracy of the tester (see Figure 3). This tester cannot test AC or DC voltages below 12V. When testing a voltage of $<12\text{V}_{\text{ac/dc}}$, the LED indicator may not be lit.

2. When testing DC voltage, if the probe L2 is connected to the positive pole of the tested object and L1 is connected to the negative pole of the tested object, the "-" LED indicator will be turned off. Otherwise, the "-" LED indicator will be lit. To determine the positive and negative poles of the object being tested, connect either probe to the object being tested. If the "-" LED indicator of the tester is not lit, it indicates that the end connected to L2 is the positive pole, and the other end connected to L1 is the negative pole.

3. When testing AC voltage, the two probes can be connected to either end of the object being tested. The "-" and "+" LED indicators will be lit simultaneously, while the "AC" LED indicator will also be lit.

Note: When testing AC voltage, the screen may display L and R, and the phase sequence indication at this time is an uncertain state. The L s mbol or R symbol may be displayed, and even be displayed

alternately. Only when testing three-phase power systems can the symbol L/R be display correctly and stably.

 WARNING

This instrument cannot test voltage for a long time. If it is necessary to test for a long time, it is necessary to follow the requirement of disconnecting the test for more than 240 seconds after testing for more than 30 seconds.

6. Testing Without Battery

A simple voltage test can be performed when the battery of the tester is depleted or there is no battery. Connect the two probes to the tested object. If the voltage of the tested object is greater than or equal to 50V, the LED at the bottom of the "/△" key will light up, indicating that the tested object carries dangerous voltage. As the tested voltage increases, the LED will gradually become brighter.

7. Continuity Testing

Before testing, it is necessary to ensure that the object being tested is not charged; Determine if the conductor is charged by testing the voltage at both ends of the conductor with the two probes.

Connect two probes at both ends of the tested object. If the resistance is $\leq 100\text{k}\Omega$, the continuity symbol ")" LED indicator will be lit, and the buzzer will sound continuously. If the resistance is $> 100\text{k}\Omega$, the continuity symbol ")" LED indicator will be turned off and the buzzer will not sound.

8. Phase Sequence Testing (Three-phase AC Phase Sequence Indication)

This test must follow the security testing rules mentioned in Point 3 of the manual.

- When testing phase sequence under strong electric field interference or strong radiation, the test results may be unstable.
- The rotation test is indicated by symbol L and symbol R, and it is only applicable to three-phase AC systems.

1. Range of three-phase voltage test: 150V~400V (50Hz~60Hz).

2. When testing, hold the main end of the tester with the hand (fingers on the handle part), as shown in the figure below, and connect the probe L2 to any one of the three phases of the electric circuit, and connect the probe L1 to any other phase.

3. One of R or L will be displayed, and if one of the probes is moved to another phase, the other (L or R) will be displayed.

4. If the positions of two probes are exchanged, the L or R LED indicator will also be lit. At the same time ,the LED indicates the range of voltage values ,indicating or displaying the three-phase voltage.

Diagram of three-phase power system testing (Fig.4)

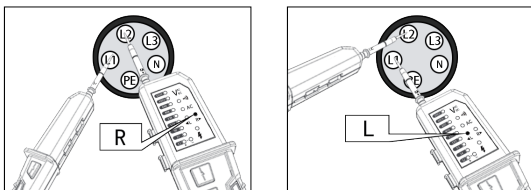


Fig.4

9. RCD Testing

In the process of voltage testing, the purpose of reducing interference voltage can be achieved by connecting a circuit with a lower impedance

than the tester in normal test mode between the two probes, which is the RCD circuit system. When conducting RCD trip test, in the normal voltage test mode, the two probes are connected to the L and PE terminals of the 230V AC system. At the same time, press the RCD key "" on both probes. If the circuit generates an AC current greater than 30mA at this time, the RCD system will trip.

It should be noted that RCD cannot be tested for a long time. At 230V, the testing time should be less than 10s and continuous test is not allowed. After one test is completed, wait for 60s before proceeding to the next one.



WARNING

It is prohibited to press two RCD keys during non RCD testing. Otherwise, it will cause the danger of burning the instrument and even harm the physical security of the operator.

10. Lighting Function

When using the tester in night or dark environments, the lighting function can be used; Gently touch the flashlight key on the panel of the tester with the fingers, and the lighting at the top of the tester will turn on, making it convenient for your work. After use, simply touch the key again to turn off the lighting.

11. Data Holding Function

During the use of the tester, you can keep the test LED indicator light on by lightly touching the HOLD button on the tester, which is convenient for reading and recording, making it easy to read and record, Tap the HOLD key again to release the data holding and return to normal testing status.

12. Low Battery Indication And Battery Replacement

During the use of the tester, short circuit the L1 and L2 probes. If the "-" LED indicator light is lit, the battery should be replaced immediately.

Please follow the steps below to replace the battery (as shown in Figure 5):

1. End the testing status of the tester and disconnect the two probes from the tested object.
2. Unscrew the screw that fixes the battery cover with a screwdriver.
3. Remove the battery cover.
4. Remove the battery to be replaced.
5. Install a new battery according to the battery symbol and direction on the panel.
6. Insert the battery cover and fasten it with screws.

Note: Batteries belong to garbage containing harmful substances, and in most cases, batteries can be collected at fixed recycling points. Please follow the effective recycling rules in various regions, and then dispose of replaced batteries according to the disposal rules for old and wasted batteries.

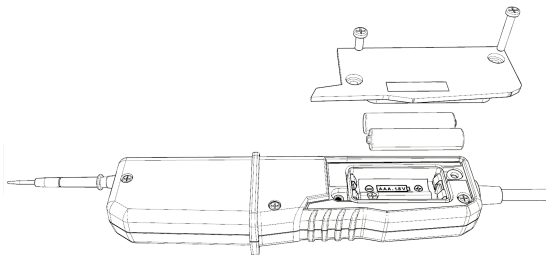


Fig.5

13. Equipment Cleaning

Before cleaning, disconnect the tester from the circuit being tested. If the instrument gets dirty during daily use, wipe it with a damp cloth or a small amount of mild household cleaning agent. Do not use acidic cleaning agents or solvents for cleaning. Do not use this tester for approximately five hours after cleaning.

14. Technical Indicators

Function	Range	Accuracy	Remarks
DC voltage AC voltage	12V	$\pm 1V$	AC voltage Frequency 50~1kHz
	24V	$\pm 2V$	
	50V	$\pm 4V$	
	120V	$\pm 8V$	
	230V	$\pm 12V$	
	400V	$\pm 14V$	
	690V	$\pm 18V$	
	1000V	$\pm 24V$	
DC voltage	1500V	$\pm 30V$	
Continuity	$\leq 100k\Omega$ buzzing, Indicator light is on.		

Input impedance: ELV-AC 50V/50Hz 300k Ω .

Current peak: $\leq 3.5mA$ 1000V Power off state, $< 350mA$ 1000V Power on state.

Working time t_{on}/t_{off} : $\leq 230V$ without limitation, $> 230V$ t_{on} 30 seconds / t_{off} 240 seconds.

Temperature coefficient: $0.1 \times \text{accuracy} / ^\circ C$.

15. Function Description

Automatic recognition of test type: Display "---" when the AC/DC voltage is less than 5V or in no testing status.

Frequency range: 40Hz~1kHz.

Voltage polarity indication: automatic LED light indication.

Range selection: automatic.

RCD test: voltage 230V(40~1000Hz), Current: 30mA~40mA, testing time<10s, recovery time: 60s.

Continuity test: $\leq 100\text{k}\Omega$ buzzer.

Phase sequence test: three-phase AC voltage range: 150V~400V, frequency 50Hz~60Hz.

Power supply: 1.5V x 2 AAA batteries.

Battery undervoltage indication: about less than 2.5V. Short circuit the L1 and L2 probes in the power-on state, and check the status of the "-" LED indicator. If the indicator is lit, it indicates undervoltage.

Working temperature: $-5^{\circ}\text{C}\sim+40^{\circ}\text{C}$.

Storage temperature: $-20^{\circ}\text{C}\sim+60^{\circ}\text{C}$.

Working humidity: $\leq 85\%\text{RH}$.

Overvoltage protection level: CAT IV 600V、CAT III 1000V .

Pollution level: Level 2.

Altitude: $<2000\text{m}$.

Waterproof and dustproof level: IP65.

Wake up: Press the key to wake up or wake up when testing an AC/DC voltage greater than 12V.

Automatic shutdown: Shut down automatically for about 30 seconds in no testing status.

Size: 290*80*34mm

Weight: about 305g not batrray