Dear customer,

Thank you for purchasing our products. Before you use the instrument for the first time, please read this manual in detail, which will help you to get familiar with and use the instrument faster and more skillfully.

Our tenet is to constantly improve and perfect our products, so there may be a little difference between the instrument you actually purchased and the user manual. If there is any change, we will not be able to inform you in time, please understand! If you have any questions about our products, please contact us and we will serve you wholeheartedly!

Safety Warning

In order to avoid personal injury and prevent damage to this product or any other products connected to it, please read the following safety precautions carefully. At the same time, in order to avoid possible dangers, this product can only be used within the specified range.

- Before the test, please make sure that the tested object is in off state or the power has been disconnected. This instrument cannot be used for testing live equipment and devices.
- Before the test, please sure that the withstand voltage of the tested object must be above the output voltage gear, and do not use the insulation resistance tester as a withstand voltage tester.
- Before the test, please make sure that the instrument and accessories are in good condition, the instrument shell and the insulation layer of the test wire are not damaged, exposed or broken.
- Before testing, make sure that the tester voltage display is not higher than 36V.
- The instrument output high voltage, please be sure to connect the test line first, and confirm that the connecting plug of the test line has been tightly inserted into the instrument interface port. Press the test button to test after the hand leaving the test line, otherwise there is a risk of electric shock.
- During the test, do not switch gears, and it is strictly forbidden to touch the exposed conductor

and the measuring circuit.

- After the test, do not discharge in an external short circuit, the tester has the function of automatic rapid discharge. After finishing the automatic discharge, the screen shows the output voltage lower than 36V then can remove the test line, to ensure that the equipment and components are fully discharged.
- When removing the test line after the test, please hold the finger protector back end of the test line clip.
- Do not use the instrument when the hands and the instrument surface are wet
- It is strictly forbidden to using the tester in the environment of explosive gas, steam or dust.
- Do not place and store the meter in high temperature&humidity or dewy places and under direct sunlight for a long time.
- Use, disassembly, calibration, and repair of this tester must be performed by authorized personnel.
- Use, disassembly and maintenance of the detector shall hand by authorized personnel.
- The instrument manual with the danger mark "⚠", users must follow instructions to operate safely.

CONTENT

1. Introduction

RD3215E Insulation Resistance Tester is a high performance high voltage insulation resistance tester of well research and development by our company. The instrument has perfect testing function of various insulation resistance parameters and excellent anti-interference ability, which can be used to test the insulation resistance of large capacity high voltage electrical equipment and transmission lines in substation with strong induction electric environment. The instrument adopts true color touch screen, and all the test data and battery power are displayed on the same screen for viewing clear and obvious. The combination of knob switch and button makes the operation very simple. The user does not need to memorize the operation method, but just click "**HELP**" on the screen to pop up the operation method, effectively guiding the user to operate the instrument. The instrument has the function of rapid discharge, the charge of the tested object is released automatically after the test. The voltage monitor of the instrument automatically monitoring the live voltage of the measured object, when the voltage exceeding 36V will automatically prohibits testing and effectively protects the instrument and operator.

The instrument adopts large capacity rechargeable lithium battery pack. The test timer of the instrument automatically records the test time and stores the test results with date and time. The touch screen can easily check the historical data recorded. The fully isolated USB interface can upload the test data to the PC safely. The instrument is equipped with the test line with double insulation and shielding layer, and the high voltage rod is equipped with replaceable crocodile clip and hook, which can adapt to various test places. The instrument adopts a strong double-shell structure, and the outer case of the instrument has a protection rating of IP65, which can prevent the intrusion of moisture and dust as well as prevent to impact in the transportation and storage process, effectively protect the instrument.

2. Performance and Feature

1. 5-inch touch colorful screen, the test data is displayed on the same screen. It is very convenient to do the test operation and view history data.
2. Output rated voltage : RD3205E: 50V, 250V, 500V, 1kV, 2.5kV, 5kV
   RD3210E: 50V, 250V, 500V, 1kV, 2.5kV, 5kV, 10kV
   RD3215E: 50V, 250V, 500V, 1kV, 2.5kV, 5kV, 10kV, 15kV.
3. Insulation resistance range: 0.005MΩ ~ 10TΩ (RD3205E), 0.005MΩ~ 20TΩ (RD3210E), 0.005MΩ~ 30TΩ (RD3215E).
4. Max short circuit current 7mA.
5. Large output power, strong anti-interference ability, and with stable test capability in large

distributed capacitance site (such as long cables) and strong electromagnetic interference environments (such as substations).

6. Perfect measurement feature: insulation resistance (IR), polarization index (PI), dielectric absorption ratio (DAR), step voltage (STEP), ramp (RAMP), dielectric discharge index (DD), distributed capatiance measurement (CAP) , voltage measurement (V)
7. Custom setting measurement mode: PI, DAR, DD calculation formula can be selected to provide users with multiple choices.
8. Custom setting voltage mode: the test voltage and test duration can be set freely, which is convenient for special site.
9. Voltage monitor: Automatically monitor the live voltage of the measured object. The voltage exceeds 36V will automatically prohibits the test to effectively protect the instrument and the operator.
10. Current monitor: Automatic display the current of test circuit
11. Temperature monitor: Automic display the temperature and humidity of tester inside.
12. Automatic discharge function, automatically and quickly release the electric charge of the tested object after the test, no need an external discharge circuit.
13. Large capacity rechargeable lithium battery pack 14.8V 6200mAh, to ensure long-term testing work.
14. Large-capacity test record memory, test records can be browsed and analyzed directly in the tester, can automatically store the real-time test data with test date and test timing.
15. USB communication and upload function, the record data can upload to computer store and analysis.
16. Bluetooth communication function, which can upload the testest result to mobile.
17. Double shell structure, which isdurable and the protection level reach IP65

3. Product Technical Parameters

1. Insulation resistance range and accuracy

Rated Voltage	Insulation Resistance Rage	Accuracy	Remark
50V	0.005MΩ ~ 10.0GΩ	±5%rdg±3dgt	
	10.0GΩ ~ 100GΩ	±10%rdg±3dgt	
250V	0.05MΩ ~ 50.0GΩ	±5%rdg±3dgt	
	50.0GΩ ~ 500GΩ	±10%rdg±3dgt	
500V	0.1MΩ ~ 100GΩ	±5%rdg±3dgt	
	100GΩ ~ 1.00TΩ	±10%rdg±3dgt	

1kV	0.5MΩ ~ 200GΩ	±5%rdg±3dgt	
	200GΩ ~ 2.00TΩ	±10%rdg±3dgt	
2.5kV	1MΩ ~ 1TΩ	±5%rdg±3dgt	
	1TΩ ~ 5.00TΩ	±10%rdg±3dgt	
5kV	2MΩ ~ 2.00TΩ	±5%rdg±3dgt	
	2.00TΩ ~ 10.0TΩ	±10%rdg±3dgt	
10kV	5MΩ ~ 4.00TΩ	±5%rdg±3dgt	
	4.00TΩ ~ 20.0TΩ	±10%rdg±3dgt	
15kV	10MΩ ~ 6.00TΩ	±5%rdg±3dgt	
	6.00TΩ ~ 30.0TΩ	±10%rdg±3dgt	

1 TΩ (Tera ohm) =1000 GΩ = 10^{12}Ω

1 GΩ (Giga ohm) =1000 MΩ = 10^{9}Ω

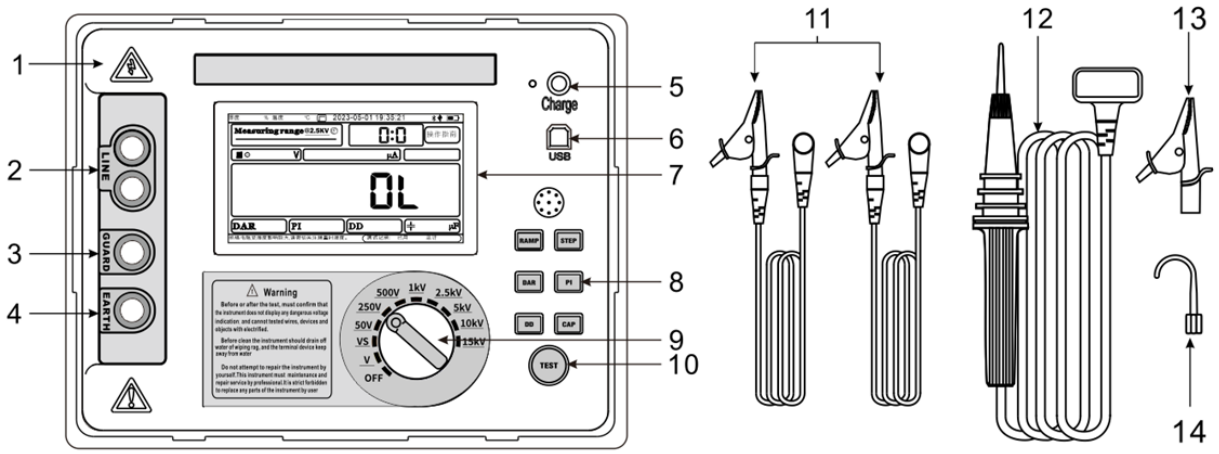
1 MΩ (Mega ohm) =1000 kΩ = 10^{6}Ω

2. Technical specification

Function	insulation resistance (IR), polarization index (PI), dielectric absorption ratio (DAR), step voltage (STEP), ramp (RAMP), dielectric discharge index (DD), distributed capatiance measurement (CAP) , voltage measurement (V)
Power Supply	Rechargeable lithium battery pack 6.2Ah/14.8V
Rated Voltage	RD3205E: 50V, 250V, 500V, 1kV, 2.5kV, 5kV RD3210E: 50V, 250V, 500V, 1kV, 2.5kV, 5kV, 10kV RD3215E: 50V, 250V, 500V, 1kV, 2.5kV, 5kV, 10kV, 15kV
Output Voltage Accuracy	(5% ~ 10%) ±10V
Insulation Resistance Range	RD3205E：0..005MΩ～10.0TΩ RD3210E：0.005MΩ～20.0TΩ RD3215E：0.005MΩ～30.0TΩ
Short Circuit Current	7mA
Capatiance Measurement	Range: 10nF ~ 200μF; Accuracy: ±10%rdg ± 10nF
Voltage Measurement	Range: DC:0V~1000V；Accuracy: ±5%rdg±3V Range: AC: 0V~700V; Accuracy: ±5%rdg±3V
Custom Setting Output Voltage	RD3205E: 40~5kV, RD3210E:40V~10kV, RD3215E: 40V~15kV
Custom Setting Test Time	10s ~ 3600s

Real Time Current Value	Display test current value, current display range: 0.001nA ~ 7.5mA
Real Time Voltage Value	Automatically monitoring the voltage of the measured object. When the voltage exceed 36V and will automatically prohibit to test to effectively protect the instrument and the operator.
Test Timer	Automatically record test duration, timing range: 0s ~ 9999s
Test Time	After selecting the DAR, PI, DD test options, the test will be stopped immediately after the test result is obtained; in the custom test mode, the test duration can be set by user; in the normal test mode, the test time is not limited, and the operator can manually stop the test.
Store Function	Automatically store the test date, time and timing, total of 1000 groups, which can view and replay the stored test record
USB Comminication	Yes, upload the test record to PC through the USB cable
Bluetooth Communication	Yes, it can connect to the Android mobile or others with the buletooth communication device
Battery Power Indication	With the battery power indication, when battery voltage low will remind to charge in time
Automatic Shutdown	After 15 minutes start up will shut down automatically without any operation
Tester Dimension	280mm×260mm×160mm
Tester Weight	Host: 4326g (include the battery); Total weight: 6.96kg (Accessories)
Protection Level	Close the case IP65; open the case IP40
Working Environment	-20℃ ~ 50℃; 80%RH
Store Environment	-25℃～65℃; 80%RH
Insulation Resistance	50MΩ (1000V, between the test circuit and shell)
Withstand Voltage	AC 3kV 50Hz 1min (between the test circuit and shell)
Suitable Safety Standard	IEC61010-1, IEC61326-1

4. Tester Structure



1	Outside case
2	**LINE**: high voltage terminal (red)
3	**GUARD**: protection terminal (green)
4	**EARTH**: grounding terminal (black)
5	Charge interface
6	USB interface
7	Touch colorful screen
8	Function selection button
9	Measurement range selection switch
10	Test button
11	Test line with alligator clip (each 1pc of green and black)
12	HV test line（red）
13	HV test line accessory - alligator clip
14	HV test line accessory - test hook

5. Safety Tips

To avoid electric shock or personal injury, follow these guidelines:

1. Do not work alone or in explosive gas, steam or high dust environment.
2. Before testing, make sure that the tester voltage display is not higher than 36V.
3. Confirm that the tested device is in a power-off state. This instrument is not allowed to be used

to test live device.

4. Confirm that the withstand voltage of the tested device is within the output voltage range of the selected test gear.
5. After the test, do not take away the test line when the voltage is higher than 36V to ensure that the distributed capacitor electric charge is completely discharged.
6. Check whether the insulation of the test line is damaged, if damaged, please replace the cable.
7. Insert the test line into the correct port, otherwise high voltage may be output to dangerous parts.
8. During the test, do not touch the test line clip and the connected part of the tested device. If touch may cause electric shock accident.
9. When removing the test line after the test, please hold the finger protector back end of the test line clip.

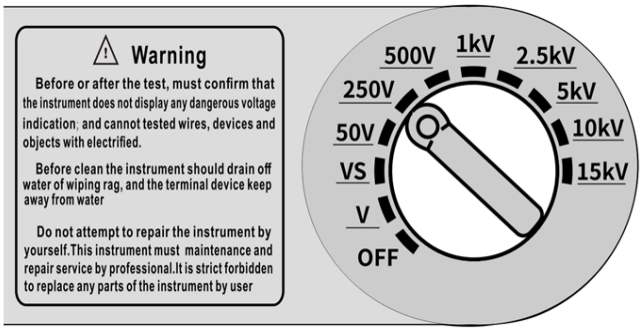
6. Measurement Method

1. Measurement steps

1) Non-destructive inspection of the instrument, confirm the tester and test line are not damaged.
2) Check the battery voltage, check the battery power indicator after start up the tester, if the power is too low, please charge first.
3) Check the storage space for test records, and check the used rate of the storage space in the lower right corner after start up the tester. If the remaining space is small should be cleared in time.
4) Correct wiring connection, insert the test cable into the corresponding jack, and connect the tested device.
5) Check whether the teste device is lived or not, and it is strictly forbidden to test when the device is living.
6) Confirm the test voltage gear to prevent the tested device from being damaged under the selected voltage gear.
7) Set the measurement mode, can choose the calculation formula when measuring DAR, PI, and DD parameters.
8) Test and record the measurement results.
9) After the test, the instrument should be cleaned of dirt and proper storage in ventilated and dry place.

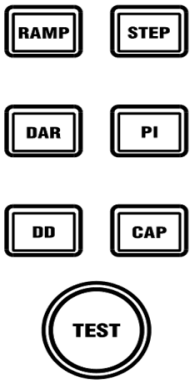
2. Rotary switch & button function

Gear	Function
OFF	Power off
V	Voltage test
VS	Custom setting voltage
<Other>	Output voltage gear



Rotary Switch Diagram

Button	Function
RAMP	Ramp mode
STEP	Step voltage mode
DAR	Dielectric absorption ratio
PI	Polarization index
DD	Dielectric discharge index
CAP	Distributed capacitance
TEST	Test

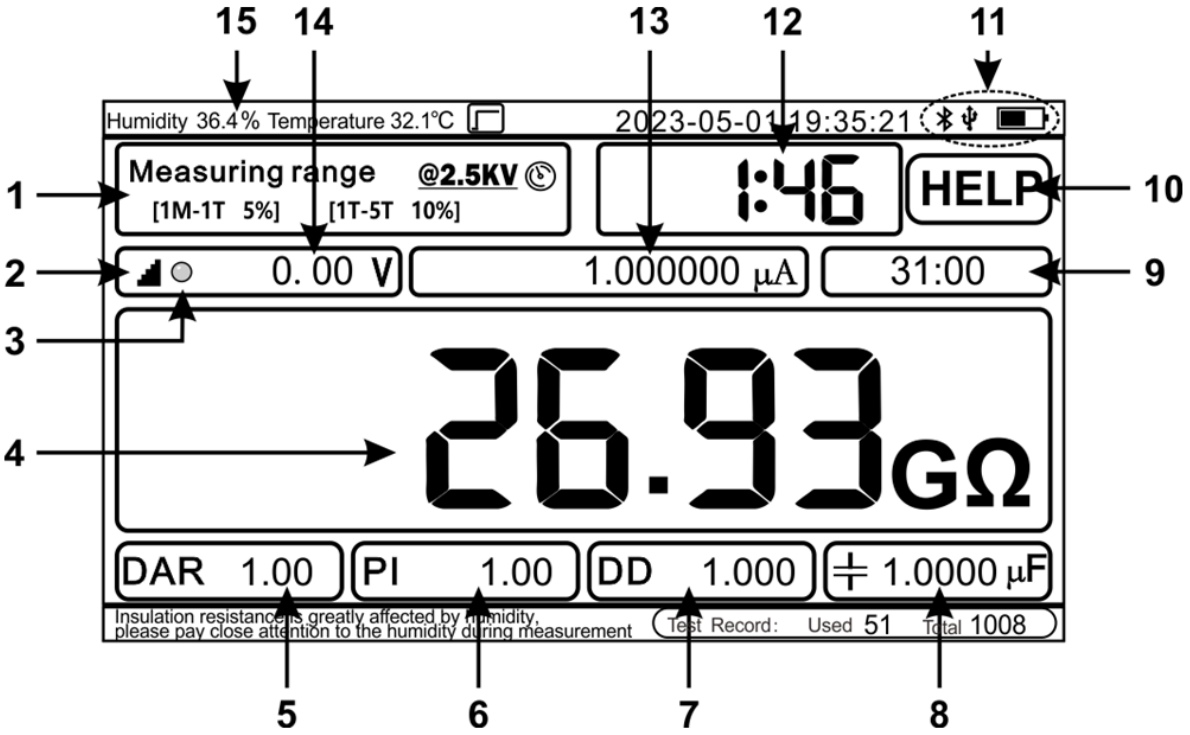


Button Diagram

1) Normal test, press the TEST button directly to start the test after selecting the voltage gear, and press the **TEST** button again to stop the test.
2) If need others test modes or test items, should press the corresponding button before the test, and then press the TEST button to start the test; it is not allowed to change the test mode or option during the test.
3) **RAMP** and **STEP** modes can only be selected in preset gear, and these two modes are not allowed to be selected in **V** gear and **VS** gear.
4) When select the dielectric discharge DD mode, the capacitance **CAP** will be automatically selected, because the distributed capacitance of the tested device need to be measured when calculate **DD**.
5) When selecting the dielectricabsorption ratio(**DAR**), polarization index(**PI**), and dielectric discharge(**DD**), there will be test duration requirement, and the test will be automatically stop after the corresponding test result is collect; if the test is stop by pressing the test button in advance during the testing, the corresponding test option will be discarded and will not get the test result.

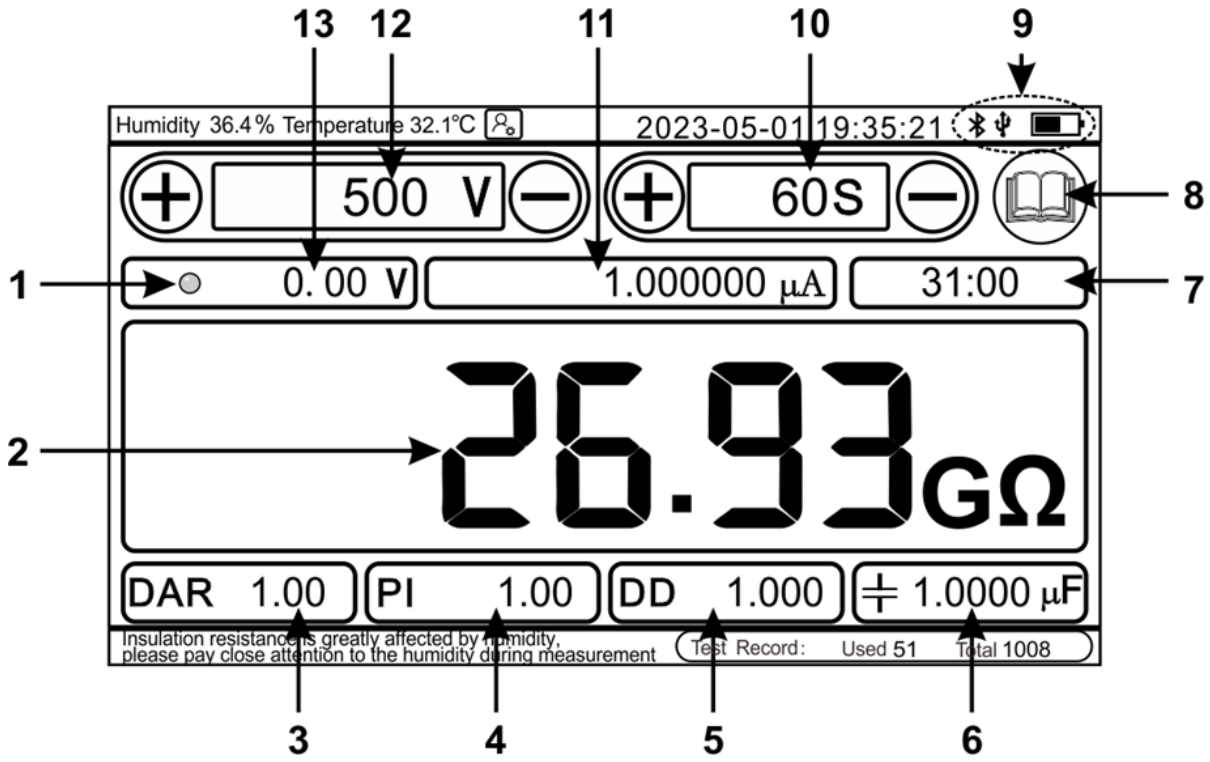
3. Test interface description

1) Normal measurement mode interface



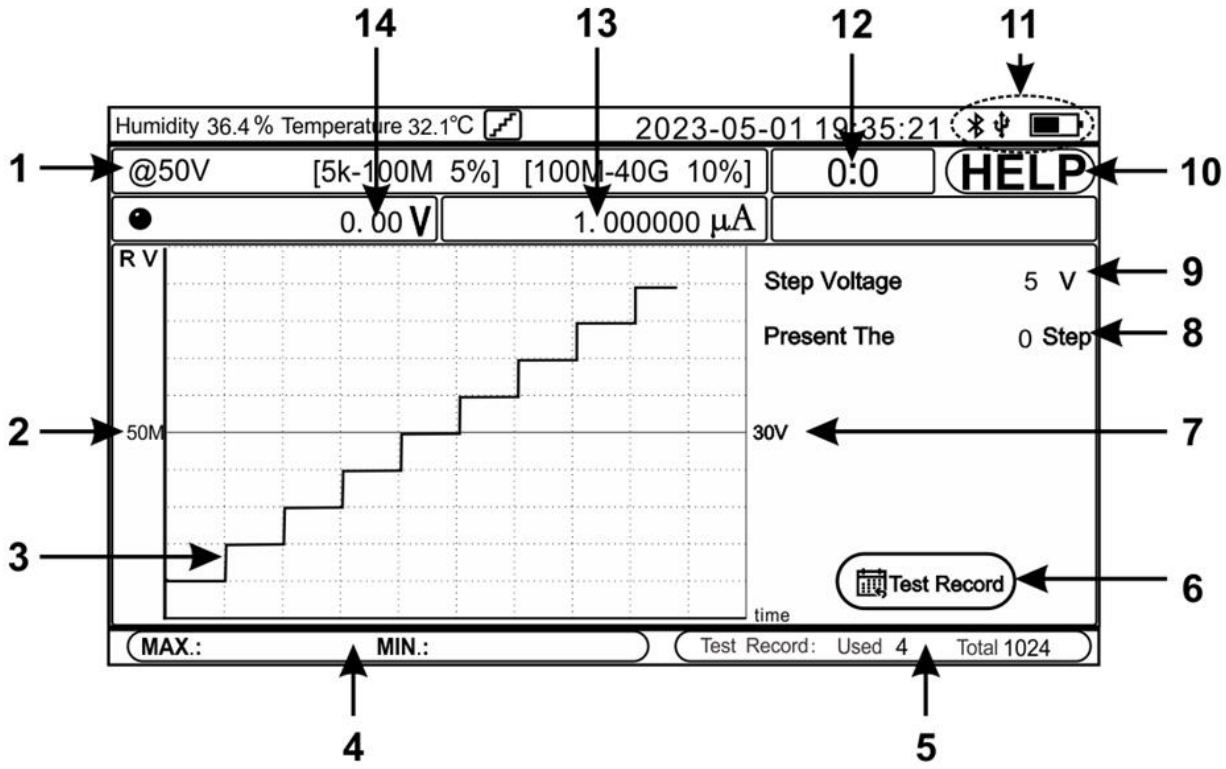
1	Present voltage gear and range
2	Normal/Ramp mode indication
3	Present output terminal state(Red-output, Yello-voltage over 36V)
4	Insulation resistance IR
5	Dielectric absorption ratio DAR
6	Polarization index PI
7	Dielectric discharge index DD
8	Distributed capacitance CAP
9	Estimated test duration (Stop by manual will not display)
10	**HELP** button
11	Bluetooth, USB, battery power indication
12	Test time
13	Transient current value
14	Transient Voltage value
15	Ambient temperature and humidity during the test (housing inside)

2) Custom setting output voltage measurement mode interface



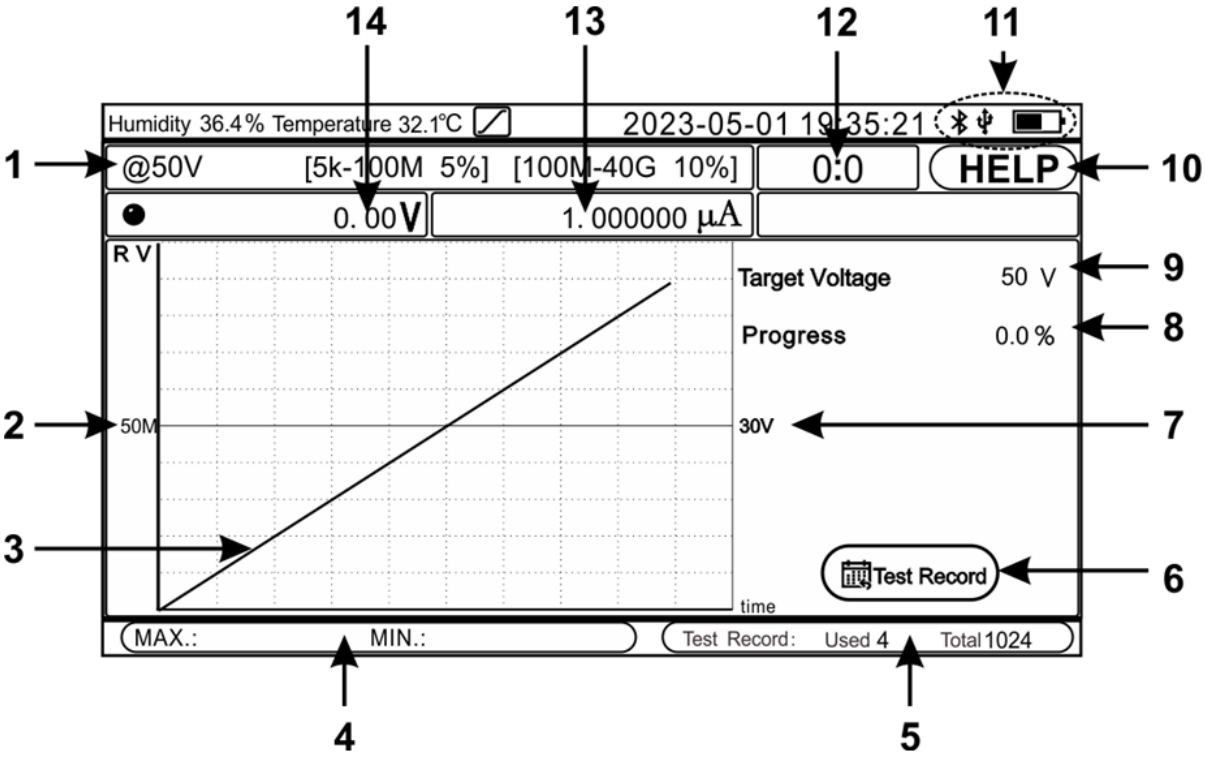
1	Present output terminal state(Red-output, Yello-voltage over 36V)
2	Insulation resistance IR
3	Dielectric absorption ratio DAR
4	Polarization index PI
5	Dielectric discharge index DD
6	Distributed capacitance CAP
7	Estimated test duration(Stop by manual will not display)
8	**HELP** button
9	Bluetooth, USB, battery power indication
10	Test time setting
11	Transient current value
12	Output voltage setting
13	Transient Voltage value

3) Step voltage(STEP) measurement mode interface



1	Gear test range
2	Insulation resistance curve value
3	Green curve is resistance, yellow curve is voltage
4	The MAX. & MIN. value of insulation resistance
5	Test record usage statistics
6	Check step test record
7	Voltage curve value
8	Step progress
9	Step voltage
10	**HELP** button
11	Bluetooth, USB, battery power indication
12	Test time
13	Transient current value
14	Transient Voltage value

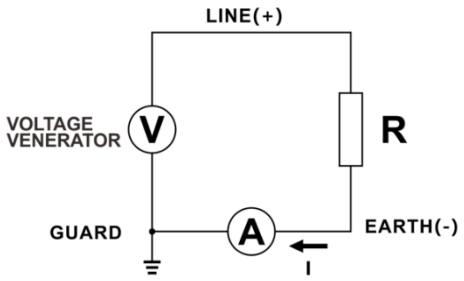
4) RAMP measurement mode interface



1	Gear test range
2	Insulation resistance curve value
3	Green curve is resistance, yellow curve is voltage
4	The MAX. & MIN. value of insulation resistance
5	Test record usage statistics
6	Check step test record
7	Voltage curve value
8	Step progress
9	Ramp target voltage(stop voltage)
10	**HELP** button
11	Bluetooth, USB, battery power indication
12	Test time
13	Transient current value
14	Transient Voltage value

4. Insulation resistance (IR) measuremnet

The principle of insulation resistance measurement is that a voltage **V** is generated by the high voltage generator and applied to both ends of the tested resistance. By measuring the current **I** flowing through the resistance, the resistance value **R** is calculated according to ohm's law.



$$R=V/I$$

5. Polarization index (PI) measuremnet

Polarization index (PI) refers to the ratio of insulation resistance between 10 minutes and 1 minute. The polarization index test took 10 minutes to complete. The polarization test will be completed and saved when the insulation test is 10 minutes or longer. In the custom setting mode, can select the caculate formula of PI

$$PI=\frac{R10min}{R1min} \text{ or } PI=\frac{R5min}{R1min}$$

Polarization index (PI)	>4	4~2	2.0~1.0	<1.0
Insulation state	Very Good	Good	Problems	Bad

6. Dielectric absorption ratio (DAR) Measurement

Dielectric absorption ratio refers to the ratio of insulation resistance between 1 minute and 15 seconds. Dielectric absorption ratio need to complete within 1 minute. Therefore, for all insulation tests less than 1 minute, the measurement data will be stored as invalid data. When the insulation test time is 1 minute or longer, the absorption ratio measurement is included in the results. In the custom setting mode, can select the caculate formula of DAR.

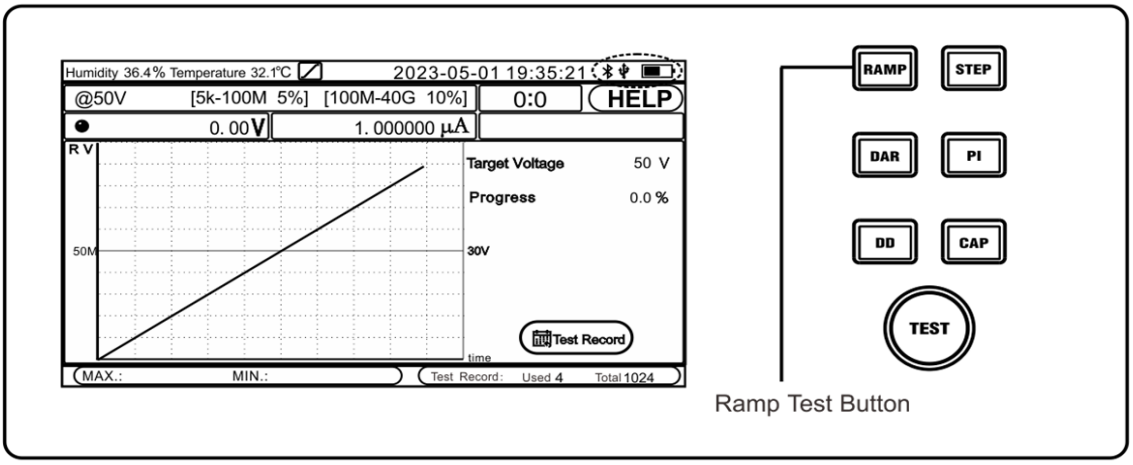
$$DAR=\frac{R60s}{R15s} \text{ or } DAR=\frac{R60s}{R30s}$$

Dielectric absorption ratio (DAR)	＞1.4	1.25~1.0	＜1.0
Insulation State	Very Good	Good	Bad

7. RAMP measurement

Ramp test mode is an automated test process. After the test start, the output voltage gradually rise to the selected voltage gear, and the instrument record the insulation resistance value every second during the voltage rising process. When the insulator is defective, the resistance value will decrease along with the increase of the applied voltage and time; when the insulator is no defective, the insulation resistance will basically remain unchanged during the voltage rising process.

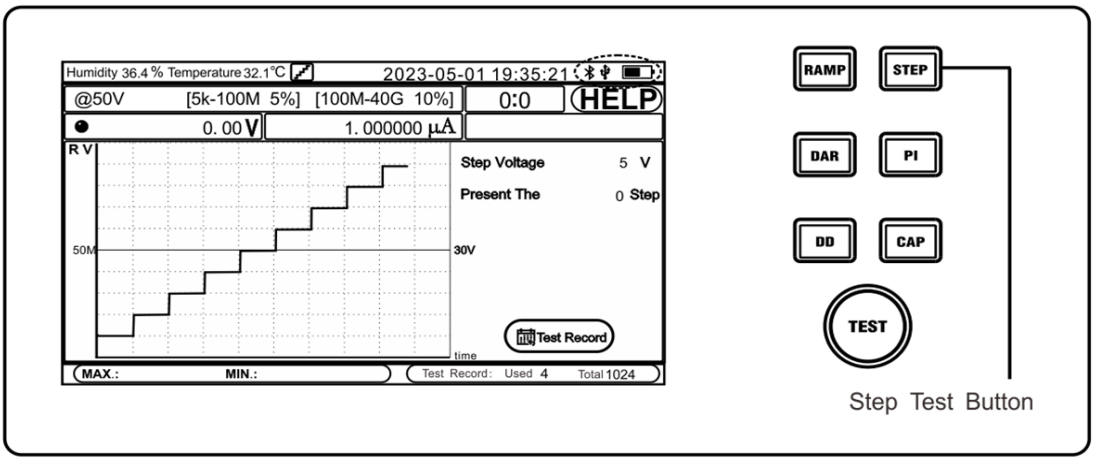
It should be noted that when selecting a lower gear voltage and the initial stage of voltage rising, the voltage fluctuates will be greatly, because the high voltage output is difficult to control in the low voltage stage, which is a normal phenomenon.



8. Step voltage (STEP) measuremnet

Step voltage test mode (STEP) is an automated test process. After the test start, the output voltage gradually rise with 10% of the selected voltage gear, and the instrument record the insulation resistance value every step during the voltage rising process. When the insulator is defective, the resistance value will decrease along with the increase of the applied voltage and time; when the insulator is no defective, the insulation resistance will basically remain unchanged during the voltage rising process.

It should be noted that when selecting a lower gear voltage and the initial stage of voltage rising, the voltage fluctuates will be greatly, because the high voltage output is difficult to control in the low voltage stage, which is a normal phenomenon.



9. Dielectric discharge index(DD) measurement

This test is suitable for the diagnosis of multilayer insulation. It is a good method to judge the bad

situation in the multilayer insulation object by measuring the discharge current value and the capacitance value of the tested object for 1 minute after the test is completed. In generally recommended to charge at 500V for 30 minutes, and measure the capacitance and residual current after 1 minute. When setting the measurement mode, can choose the DD calculation formula:

$$\text{Dielectric Discharge} = \frac{\text{Current value } \boldsymbol{I} \text{ after stop output voltage 1min}}{\text{Voltage value after stop output voltage } \boldsymbol{V} \times \text{Capacitance value}}$$

DD Value	<2.0	2.0~4.0	4.0~7.0	>7.0
Judgement Standard	Good	Warning	Poor	Worst

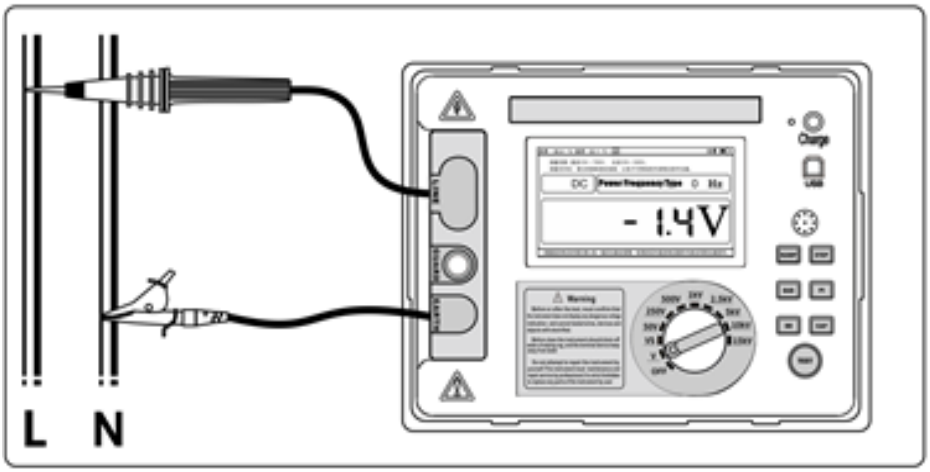
10. Capacitance (CAP) measurement

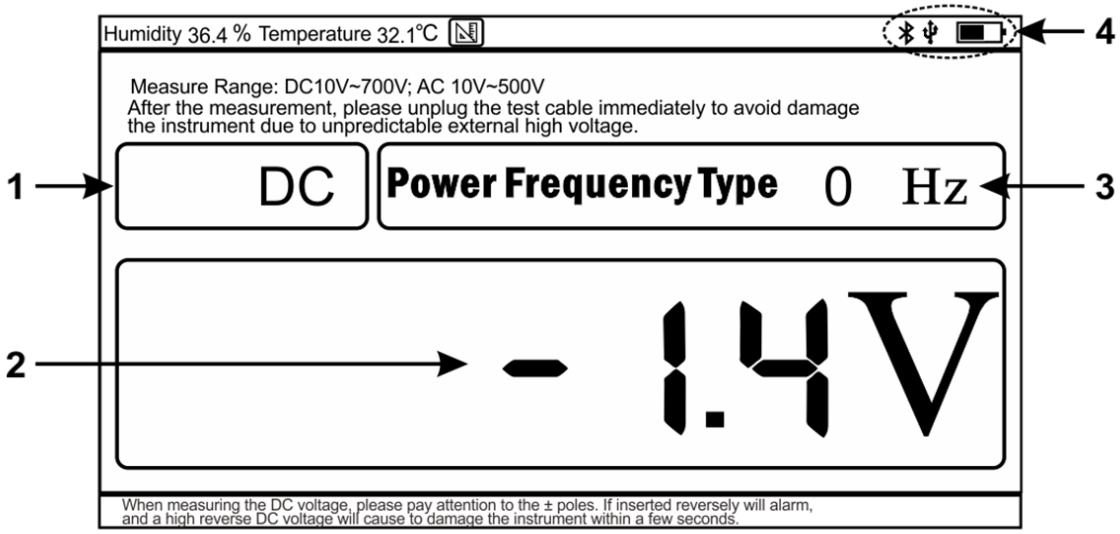
Capacitance test is used to test the stray distributed capacitance of the measured object, press the **CAP** button to enter the capacitance measurement mode. After selecting the capacitance measurement function, the tester measures the distributed capacitance through the discharge time after the test. Press the test button and stop the test, the buzzer will stops beeping, and the **TEST** indicator will be still flashing, and the **TEST** indicator will turn off after the measurement result is displayed.

11. Voltage (V) measurement

This instrument has the function of measuring AC and DC voltage. When measuring insulation resistance, this function is only used to help to check whether the tested circuit is live. Do not measure the AC or DC voltage above 1000V, advoid to damage the tester.

When testing the voltage, turn the rotary knob to the voltage test gear "V" to enter the voltage measurement mode, connect the high voltage red test line to the LIEN port, and connect the ground black line to the EARTH port. (As shown figure below)





1	AC/DC and DC ± wiring connection indication
2	AC/DC voltage TRMS
3	AC power frequency type automatically judge the measured power frequency, and higher frequencies are all regarded as DC systems.
4	Bluetooth, USB, battery power indication
⚠	When measuring DC voltage, connect the red test line to the positive pole and the black test line to the negative pole. If the connection is reversed, there will be a prompt at the 1 position. Please correct it immediately if the external DC voltage is reversed for a long time, which will cause irreversible damage to the tester.
	Dot not measure the AC/DC voltage above 1000V, advoid to damage the tester

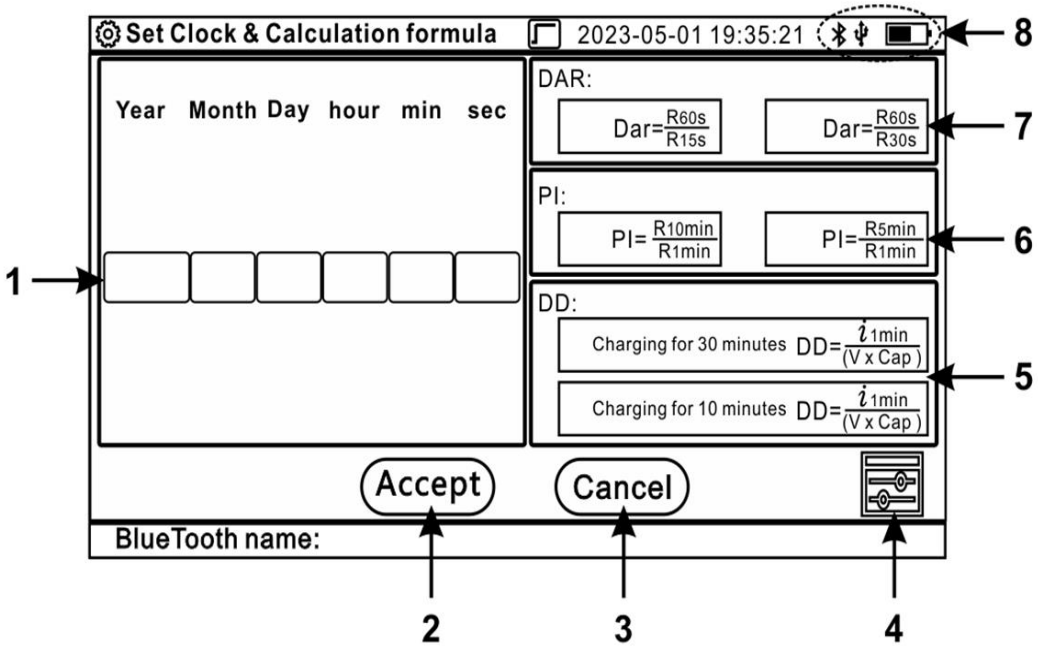
12. Setting

The tester can set the date and time, and select the calculation formula.

When modifying the date and time, slide up and down the correspond scroll bar.

When modifying the formula, check the calculation formula to be used. After all the settings are modified and finished, press the Accept button to save the modify and take effect and return to the previous page.

Calibration requires precision instruments and specialized skills, the content is beyond the scope of this manual.

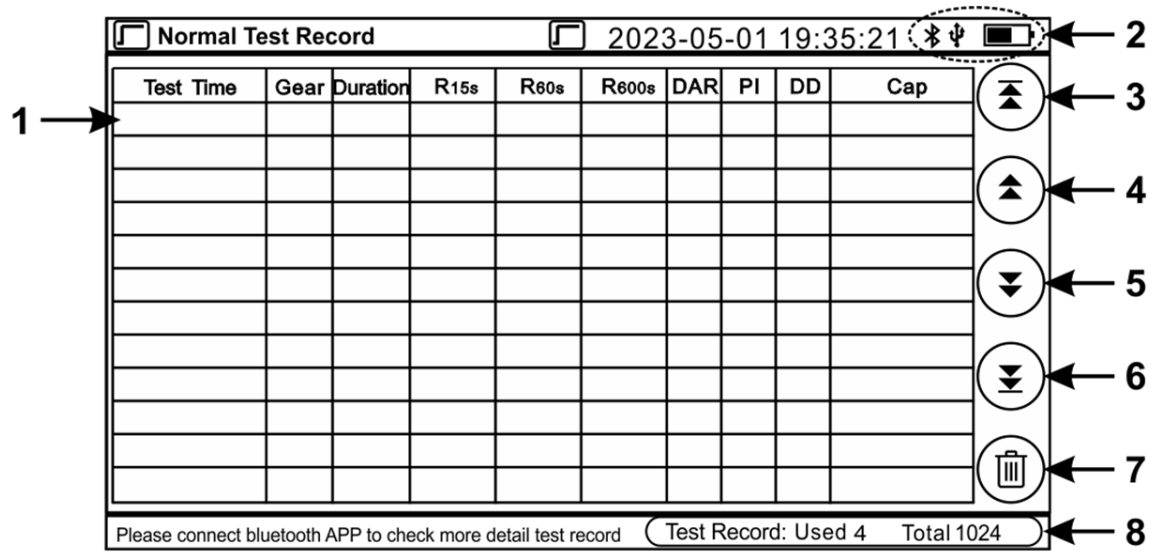


1	Date and time setting
2	Accept and save the setting value
3	Give up the modify value and return back to test interface
4	Calibration procedure, for professional use only
5	DD formula select
6	PI formula select
7	DAR formula select
8	Bluetooth, USB, battery power indication

7. Consult Test Record

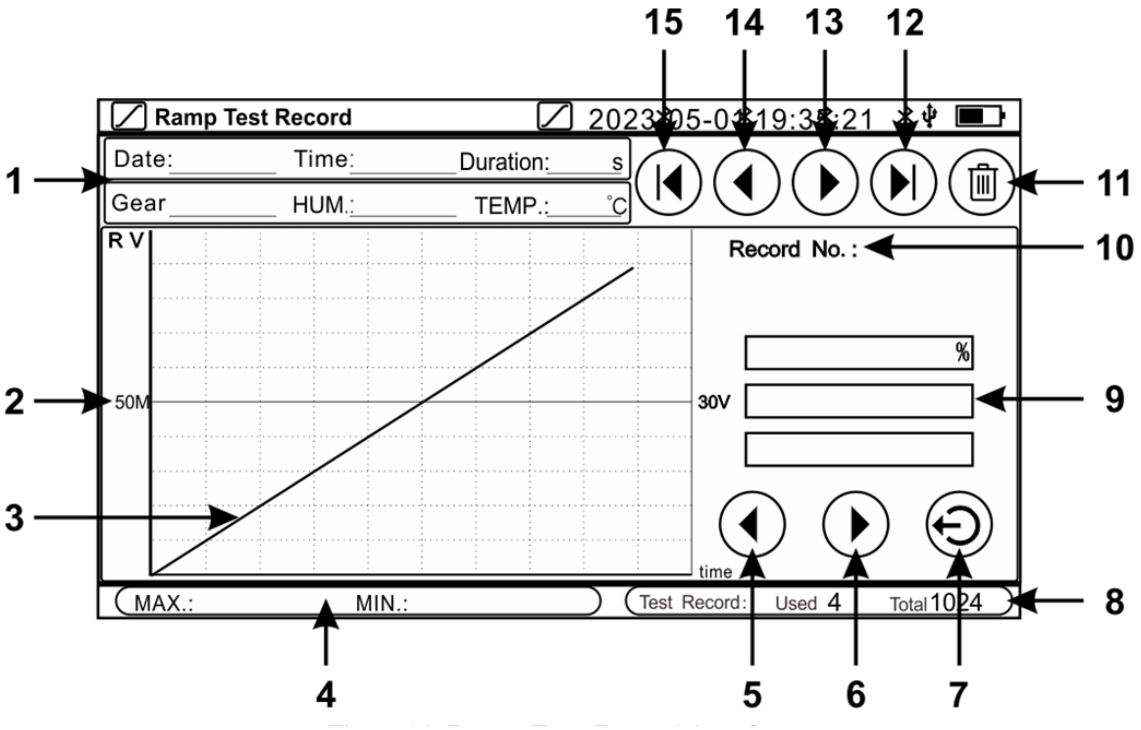
In each measurement mode, slide the screen to the left, and the screen switches to the test record browsing page

1. Normal test mode record interface (As shown figure below)



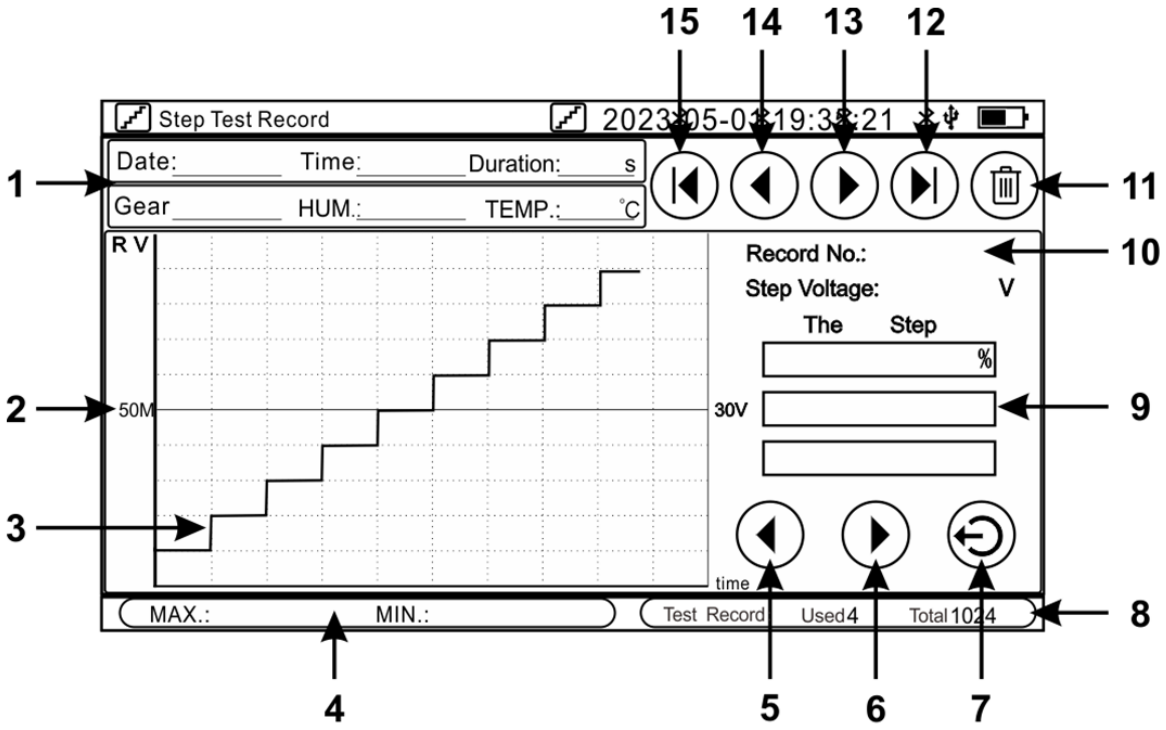
1	Test record(One set test record per line)
2	Bluetooth, USB, battery power indication
3	Skip to the first test record
4	Skip to the previous page test record
5	Skip to the next page test record
6	Skip to the last test record
7	Delete all test record
8	Test record usage statistics

2. RAMP test rcord interface (As shown figure below)



1	Test record summary
2	Insulation resistance value
3	Green curve is resistance, yellow curve is voltage
4	The MAX.&MIN. value of insulation resistance
5	Sursor move left
6	Cursor move right
7	Exit the test record browse interface
8	Test record usage statistics
9	Present cursor test data
10	Present record number
11	Delete all test record
12	Skip to the last test record
13	Skip to the next test record
14	Skip to the previous test record
15	Skip to the first test record

3. STEP test rcord interface (As shown figure below)



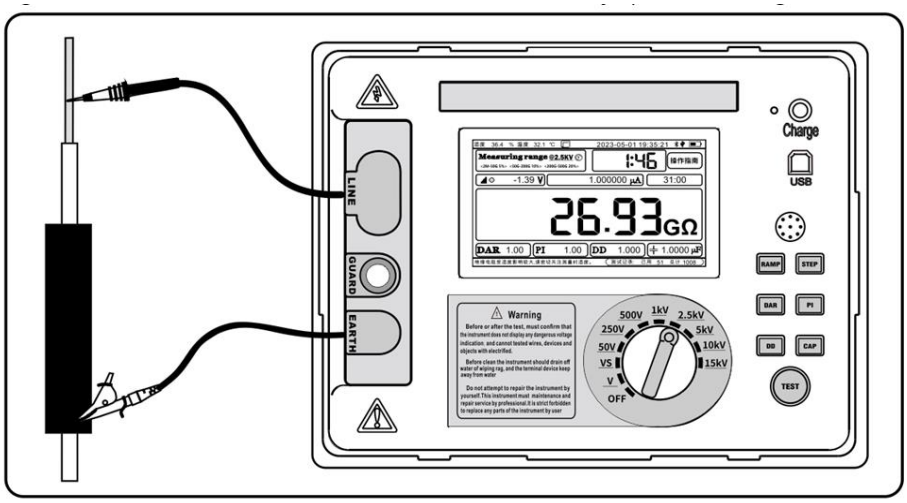
1	Test record summary
2	Insulation resistance value
3	Green curve is resistance, yellow curve is voltage
4	The MAX.&MIN. value of insulation resistance
5	Sursor move left
6	Cursor move right
7	Exit the test record browse interface
8	Test record usage statistics
9	Present cursor test data
10	Present record number and step voltage
11	Delete all test record
12	Skip to the last test record
13	Skip to the next test record
14	Skip to the previous test record
15	Skip to the first test record

8. Normal Wiring Connection Method

1. The insulation resistance test of cable

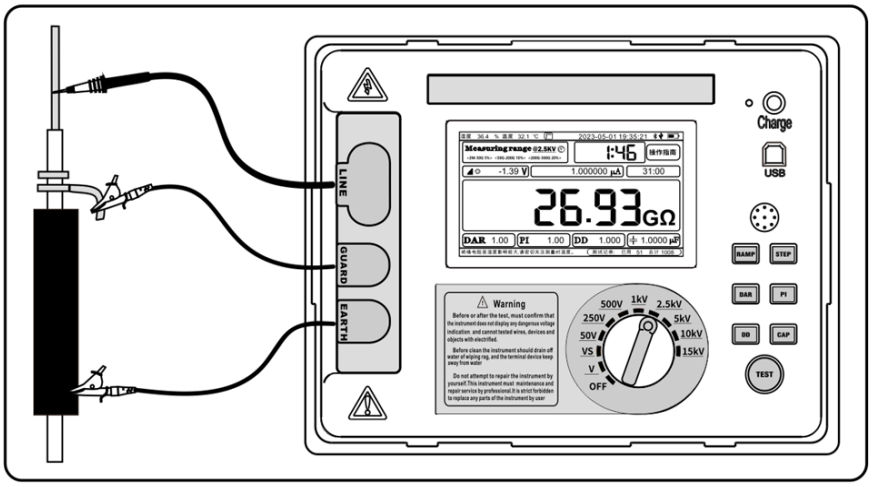
1) Normal -wires measurement connection mode

There is leakage current on the surface of the inner insulation layer near the end of the cable. This leakage current is also in the measurement current of the "-" terminal, which will make the measurement resistance reading value lower than the actual insulation resistance value. Non-ultra high resistance values can be measured in this way. (As shown figure below)



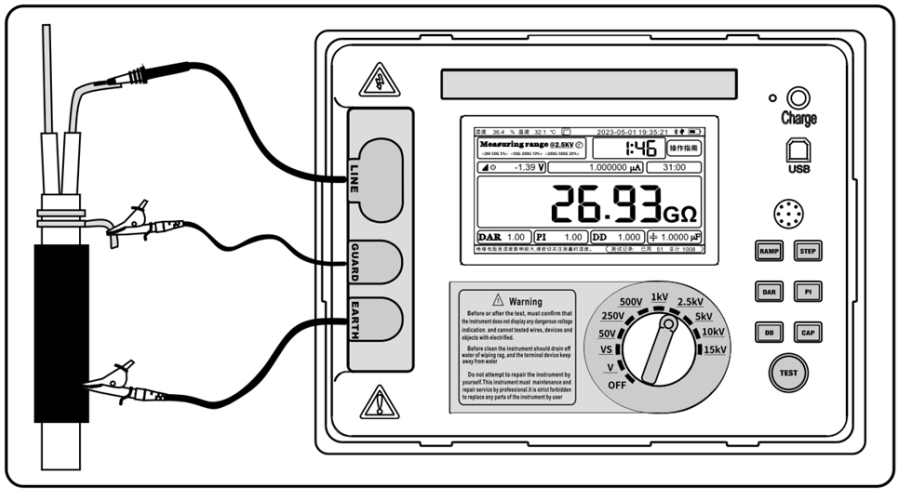
2) Ultra high resistance value 3-wire measurement connection mode

Wrapping the bare metal wire with good conductivity around the periphery of the inner insulation layer, and prevent the leakage current on the surface of the measured object by connecting the safety terminal to the outer conductor of the inner insulation layer. The surface leakage current will be directed to the safety terminal in order to eliminate the surface leakage current on the measurement path between the +/- poles and improve the accuracy of the measurement reading. (As shown figure below)



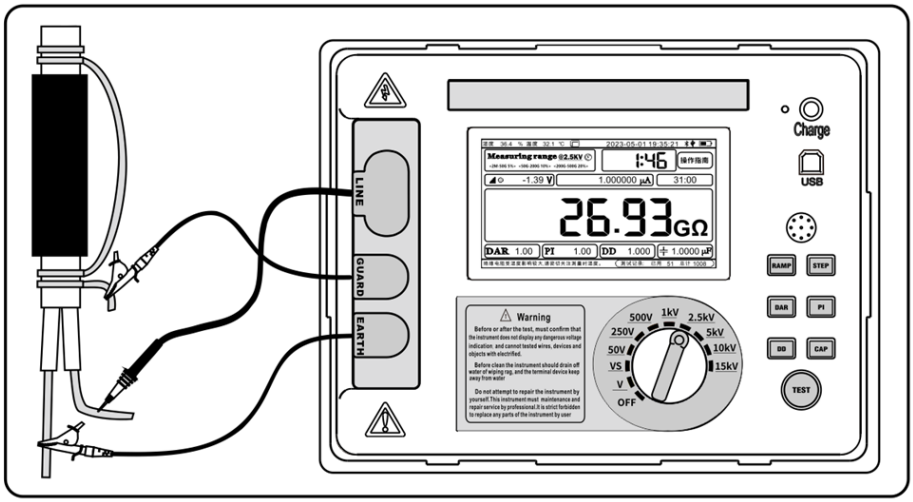
3) Ultra high resistance value 3-wire insulation resistance measurement connection mode

Wrapping the bare metal wires with good conductivity around the periphery of the inner insulation layer and connecting safety terminals to the outer conductors of the inner insulation and unused wire. The surface leakage current will be directed to the safety terminal in order to eliminate the surface leakage current on the measurement path between the +/- poles, which ensures that the measured insulation resistance is the insulation resistance between the selected cable and the outer insulation resistance, while eliminating leakage paths between cables. (As shown figure below)



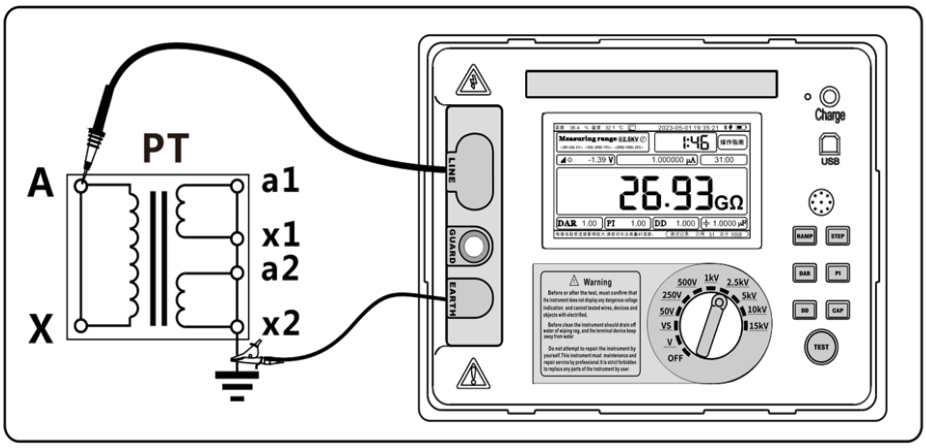
4) Ultra high resistance value 3-wire insulation resistance measurement connection mode

Wrapping the bare metal wires with good conductivity around the periphery of the inner insulation and connecting safety terminals to the outer conductors of the inner insulation layer. The surface leakage current will be directed to the safety terminal in order to eliminate the surface leakage current on the measurement path between the +/- poles, which ensures that the measured insulation resistance is the insulation resistance between the selected cable, while eliminating leakage paths between cables. (As shown figure below)

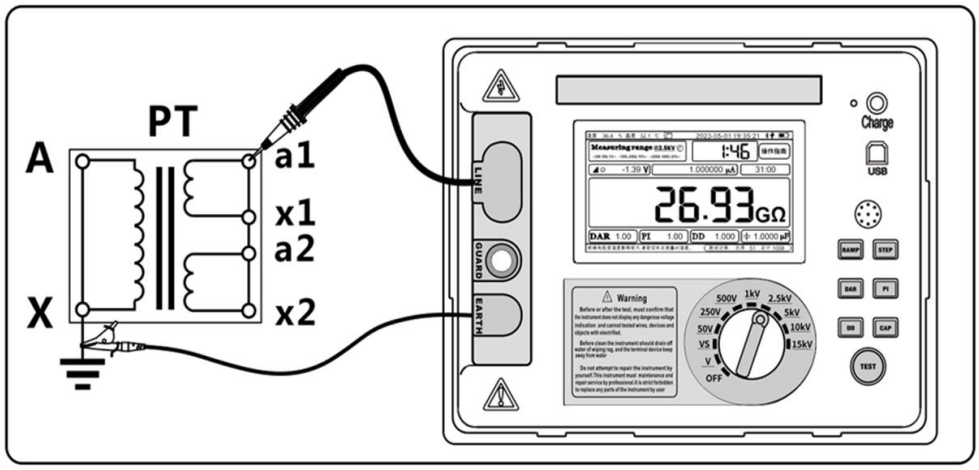


2. Transformer insulation resistance test

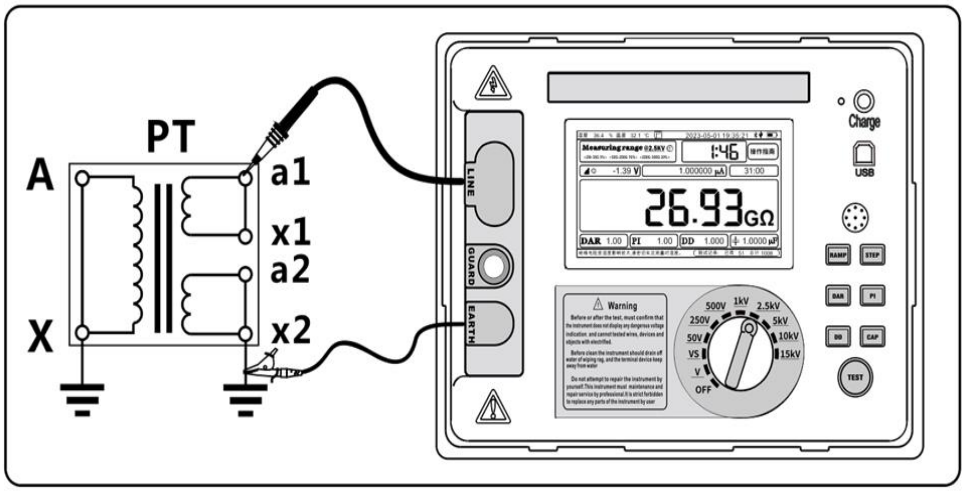
1) The insulation resistance test between primary winding and secondary winding. (As shown figure below)



2) The insulation resistance test between the primary winding grounding and the secondary winding. (As shown figure below)



3) The insulation resistance test between secondary winding. (As shown figure below)



9. Battery and Charge

1. When the battery power is only 1-2 grids, please charge in time. When charging, the charging indicator light is green and flashing. The charging indicator light it remains green when fully charged.
2. Shutdown and confirm that the tester is in off state, and connect the charger to charge through the mains.
3. If the tester will not used for a long time, please charge every 2 months.
4. The standard charger must be used for charging. After charging, please put away the charger so that convient to used next time.

10. Instrument Maintenance

To avoid electric shock or personal injury

- Do not try to repair or maintain the instrument out of scope described in this manual.
- This instrument is for professional maintenance only
- The user shall not replace any part of the instrument without permission.

The accuracy of the instrument can be maintained for 1 year after calibration at operating temperatures from 0°C to 35°C. For operating temperatures outside the range (-20°C to 0°C and 35°C to 50°C), error increase by ±0.25 % per °C.

Clean: In order to avoid the risk of electric shock or personal injury, before cleaning the instrument should wring out the moisture of the cloth, do not let any terminal touch the water. Clean the shell regularly with a mild cleaner. Do not use abrasive or solvent to clean this instrument.

Save: After use, the instrument should be stored in a dry and clean environment.

⚠	Use, disassembly, calibration, and repair of this tester must be performed by authorized personnel.