P/N:

GAZELLE®



G9312
12 KV Insulation Resistance Tester User Manual

Preface

Thank you for purchasing the new G9312 insulation resistance tester. In order to use this product safely and correctly, please read this manual thoroughly, especially the Safety Instructions part.
After reading this manual, it is recommended to keep the manual at an easily accessible place, preferably close to the device, for future reference.

Limited Warranty and Liability

GAZELLE guarantees that the product is free from any defect in material and workmanship within one year from the purchase date. This warranty does not apply to damages caused by accident, negligence, misuse, modification, contamination or improper handling. The dealer shall not be entitled to give any other warranty on behalf of GAZALLE. If you need warranty service within the warranty period, please contact your seller directly.
GAZELLE will not be responsible for any special, indirect, incidental or subsequent damage or loss caused by using this device.

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1. Overview

The G9312 is a digital high voltage insulation resistance tester with 6 ranges: 500V , 1000V, 2500V, 5000V, 10000V and 12000V. Fine adjustment of voltage with 10% step at each range (except 12000V) is available. Test data can be saved in the tester memory and transferred to a PC via the dedicated USB cable, or be transferred to a PC in real time.

2. Features

- Designed to meet IEC61010-1, CAT IV 600V and Pollution Degree 2 safety standards
- For insulation resistance test, max test voltage: 12kV, max test resistance: 10TΩ, max short-circuit current: 5mA
- Automatic display of Dielectric Absorption Ratio (DAR) and Polarization Index (PI)
- Large memory for saving up to 999 sets of test data
- Dual power supply: Dedicated power adapter (DC15V, 1A) or 10 pcs 1.5V alkaline batteries (Lr14)
- 5.1-inch industrial display (320×240 pixels)
- Simultaneous display of insulation resistance and leakage current values in the test
- PC software for data analysis
- Green light indication for POWER button and red light warning for TEST button
- Auto discharge function: When insulation resistance like a capacitive load is tested, electric charges stored in capacitive circuits are automatically discharged after testing. Discharge progress can be displayed.
- Backlight Function: To facilitate working at dimly illuminated location or at nighttime

3. Accessories

Open the package box and take out the tester. Please double check whether the following items are missing or damaged.

a) User manual ---------- 1 pc
b) Test leads (red, black, green, 1 each) ---------- 3 pcs
c) USB cable ---------- 1 pc
d) Dedicated power adapter ---------- 1 pc
e) 1.5V alkaline batteries (LR14) ---------- 10 pcs

If any of the above is missing or damaged, please contact your supplier immediately.

4. Safety Instructions

The tester is designed, manufactured and tested according to IEC61010 safety standards (safety requirements for electronic measuring apparatus). It conforms to double insulation, CAT III 1000V and CAT IV 600V safety standards. This manual contains warning information and safety regulations. Please read them carefully and observe them strictly to ensure the safety of the user and tester.

⚠ Warning

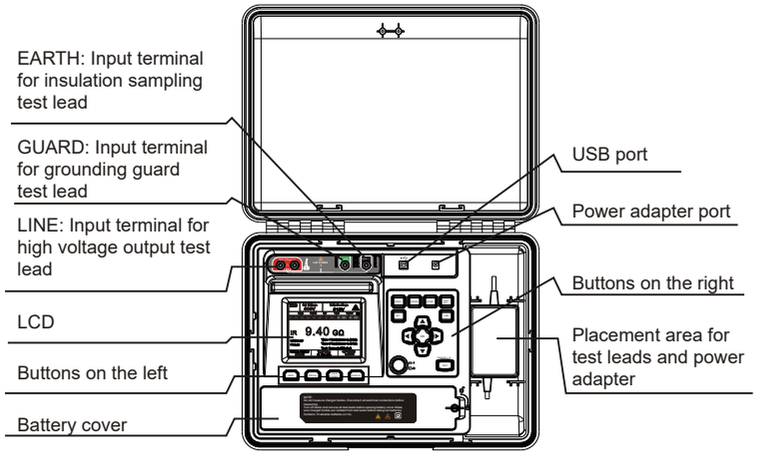
- The G9312 is a 12kV digital high voltage insulation resistance tester . Please read the Safety Instructions in detail.
- The tester outputs high voltage. Please read and understand the Operating Instructions thoroughly before use.
- Keep the manual at an easily accessible place to enable quick reference whenever necessary.
- Use the tester only as specified.
- Please strictly follow all the instructions, or it may cause damage to the tester and user!
- Please wear insulated gloves before use.
- Do not measure in circuits with voltage above AC 750V or DC 1000V.

- Do not test in flammable places. Sparks may cause an explosion.
- Never use the tester if its surface or the operator's hands are wet.
- Be careful not to short-circuit the metal part with the test leads when testing voltage or it may cause personal injury.
- Do not exceed the maximum allowable range during measurement.
- To prevent damage to the tester from high voltage output, do not press the TEST button when the test leads are connected to the tester.
- Never open the battery cover during measurement.
- Do not touch the circuit under test when measuring insulation resistance or right after measurement, otherwise it may pose an electric shock.
- Stop the test if contamination or carbonization which may impair insulation characteristics is found on the test leads or around the terminals.
- Avoid short circuit and open circuit of the test leads when measuring insulation resistance. Otherwise, the measurement may be ceased and the light of the TEST button may go out.
- Before use, please check if there is any item which is damaged or behaving abnormallyIf any abnormal item (such as bare test lead, damaged tester housing, broken LCD, etc.) is found, or if the tester is considered to be malfunctioning, please do not use the tester.
- Do not use the tester if the battery cover is not covered up, or it will pose a shock hazard!
- When using the tester, keep fingers behind the finger guards on the test leads, and do not touch exposed wires, connectors or alligator clips to prevent electric shock.
- Select correct output voltage before measurement. It is forbidden to change the voltage during measurement to avoid damage to the tester.
- When the “ ▭ ” symbol appears on the LCD, please replace the batteries in time to ensure measurement accuracy. If the tester is not in use for a long time, please remove the batteries. Make sure the tester is turned off before opening the battery cover.
- Do not change the internal circuit of the tester to avoid damage to the tester and user!
- Do not use or store the tester in high temperature, high humidity, flammable, explosive or strong magnetic field environments.
- Clean the tester housing with a soft cloth and mild detergent. Do not use abrasives or solvents!

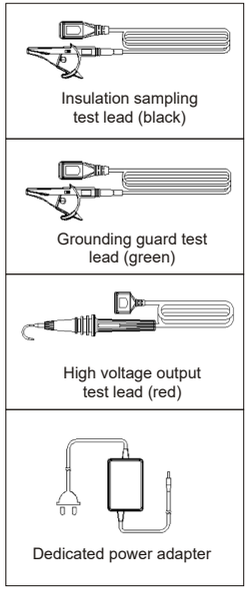
5. Electrical Symbols

Symbol	Description
	Equipment protected throughout by DOUBLE INSULATION or REINFORCED INSULATION
	Earth (ground) Terminal
	Warning or Caution
	Alternating current
	Direct current
	Low battery
	Caution, possibility of electric shock

6. External Structure (Picture 1)



Picture 1



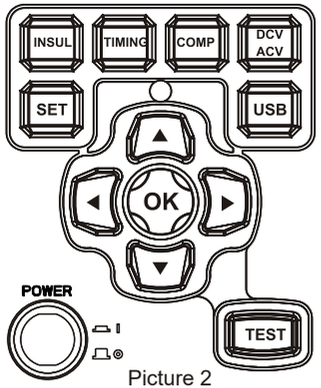
7. Indicators and Buttons

7.1 Display Indicators

No.	Indicator	Description	Remark
1		Battery level	• 0 level: Battery voltage <11.0V. Replace the batteries. • 1 level: Battery voltage (11.0V~12.0V), for 500V\1000V \2500V\5000V\10000V test • 2 level: Battery voltage (12.1V~13.0V), for 500V\1000V \2500V\5000V\10000V test • 3 level: Battery voltage (13.1V~13.5V), for 500V\1000V \2500V\5000V\10000V test • 4 level: Battery voltage (13.6V~14.0V), for 500V\1000V \2500V\5000V\10000V\12000V test • 5 level: Battery voltage (>14.1V), for 500V\1000V\2500V \5000V\10000V\12000V test
2		Power adapter	When the power adapter is used, the battery indicator is automatically turned off. Power adapter (15V), for 500V\1000V\2500V\5000V\ 10000V\12000V test
3		Caution, possibility of electric shock	High voltage output indicator

4		Analog bar	Analog bar for insulation resistance
5	USB	PC communication	Only for insulation measurement
6	VDC	DC voltage	
7	VAC	AC voltage	
8	+	DC voltage positive pole	
9	−	DC voltage negative pole	
10	>,<,=	greater than, less than, equal to	Comparative measurement results
11	mA/uA/nA	Current units	

7.2 Buttons (Picture 2, Picture 3)



Picture 2



Picture 3

INSUL	Switch to insulation measurement. The tester defaults to insulation measurement after booting. This button also can be used to exit each setting interface.
TIMING	Short press to turn on/off timing measurement. The tester defaults to continuous measurement mode after booting.
COMP	Short press to turn on/off comparative measurement. The tester defaults to continuous measurement mode after booting.

DCV ACV	Switch to voltage measurement (automatic identification of AC/DC voltage)
SET	Short press the SET button to set system functions (short press the INSUL button to exit each setting interface): 1. Date/Time Set or adjust the system clock to match the current time and date. 2. Timing Measurement Set the insulation measurement countdown time (from 60s). Once the time is up, the insulation measurement will be stopped automatically. 3. DAR Measurement Set the DAR measurement Time 1 (range: 15s~299s; 15s by default); set the DAR measurement Time 2 (range: 60s~599s; 60s by default). 4. PI Measurement Set the PI measurement Time 1 (range: 1min~29min; 1min by default); set the PI measurement Time 2 (range: 10min~59min; 10min by default). 5. Factory Reset Restore all settings data to default values. When modifying a parameter, move the cursor with the LEFT/RIGHT button, use the UP/DOWN button to change the current value, select the OK or Cancel option, and short press the OK button to confirm the modification.
USB	Short press to turn on/off USB transmission function. When the function is on, the LCD displays the “USB” symbol.

	Insulation measurement: Select an output voltage range upwards. "Settings" function: Upward adjustment button
	Insulation measurement: Adjust the output voltage range downwards by 10%. "Settings" function: Leftward adjustment button
	Insulation measurement: Adjust the output voltage range upwards by 10%. "Settings" function: Rightward adjustment button
	Insulation measurement: Select an output voltage range downwards. "Settings" function: Downward adjustment button
	Insulation measurement interface: Confirm data clearing. "Settings" interface: Confirm an option.
	Power on/off (green light indication for the on state).
	Long press (>1s) to start insulation measurement, and short press to stop.
	When measuring insulation resistance, short press the SAVE button to save the current measurement data in the tester and “Storage Number 001/999” will be displayed in the lower left corner of the LCD. The storage number increases progressively from 001 to 999.

	After measurement, short press the RECALL button to recall the stored measurement data and the last saved data will be displayed by default. Short press the UP/DOWN button to scroll through other data. Note: The high voltage output test cannot be conducted during data recalling. Short press the RECALL button to exit the data recalling mode, and then do the test.
	Short press the CLEAR CURRENT button in recalling data and “Delete the current data?” will appear on the LCD. Short press the OK button and the current data will be cleared immediately.
	Long press the CLEAR ALL button for about 5s in recalling data and “Delete all data?” will appear on the LCD. Short press the OK button and all data stored in the tester will be cleared. Note: It may take some time to clear all data if the amount of data deleted is large.

8. Operating Instructions

8.1 Preparation for Measurement

8.1.1 Battery Voltage Check

Press the POWER button to turn on the tester and enter the insulation measurement interface without connecting the power adapter. When the battery indicator shown at the upper left on the LCD is 0 level (“▭”), it indicates low battery. See 7.1 Display Indicators for the corresponding battery voltage of each level. When the battery voltage Is below the lower limit of the operating voltage, the accuracy cannot be guaranteed. No measurement can be performed even the TEST button is pressed down. Please replace the batteries or insert the power adapter.

8.1.2 Test Lead Connection

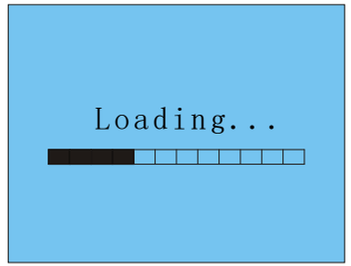
1) Insert the red test lead into the LINE terminal, black into the EARTH terminal.
2) Insert the green test lead into the GUARD terminal (leave the GUARD terminal unconnected unless establishing a guard is necessary).

⚠ Note: Do not insert the green or black test lead into the LINE terminal. This cannot enable measurement and may pose an electric shock.

8.2 Basic Measurement Operation

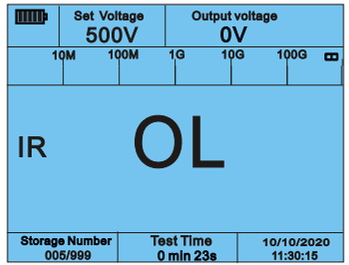
8.2.1 Starting up

Press the POWER button to turn on the tester , as shown in Picture 4.



Picture 4

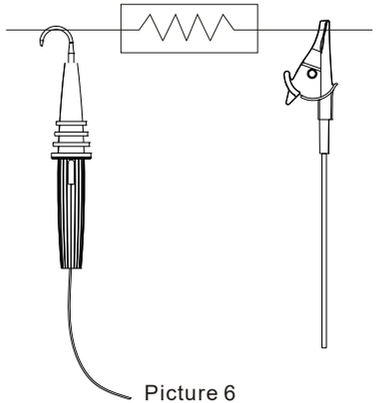
The tester enters the continuous measurement state of insulation resistance by default, as shown in Picture 5.



Picture 5

8.2.2 Measurement without Guard Terminal

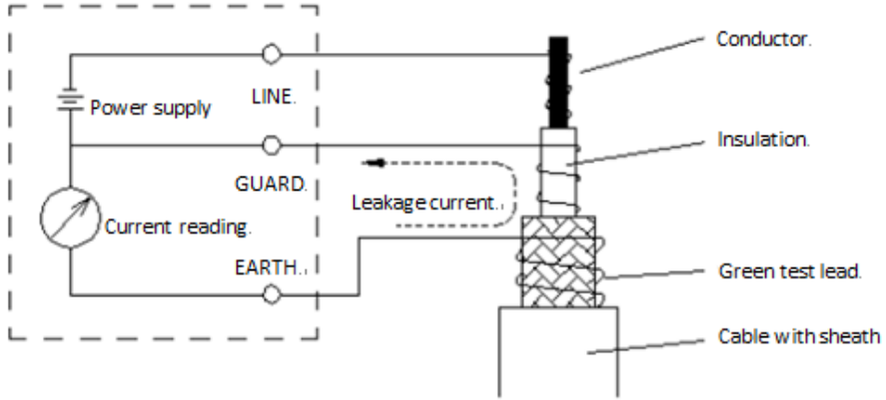
For most tests, only two test leads are used. Connect the red test probe and black alligator with the measured object as shown in Picture 6.



Picture 6

8.2.3 Measurement Using Guard Terminal

When measuring the insulation resistance from the conductor to the outer sheath of a cable, there may be a leakage current for the intermediate layer, causing measurement error. To prevent such error, connect the green test lead directly to the leakage current winding end (as shown in Picture 7), and the leakage current portion will not be counted in the displayed value. The reading value is only the insulation 3resistance from the conductor to the outer sheath of the cable.

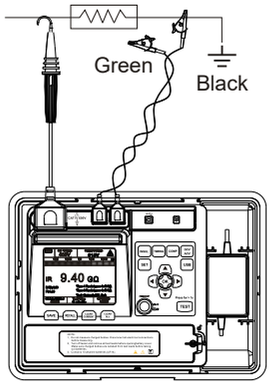


Picture 7

⚠ Note: Measurement using guard terminal is suitable for testing the entire circuit of a high voltage cable containing other high voltage equipment. Connect the GUARD terminal to the leakage current electrode of the measured object, and EARTH terminal to the green test lead. At this time, the leakage current cannot flow into the EARTH terminal for calculation. However, for this measurement method, the insulation resistance of the sheath (between the shielded cable and the ground) must be >1MΩ.

8.2.4 Use of Guard Terminal in Ultra-High Resistance Test

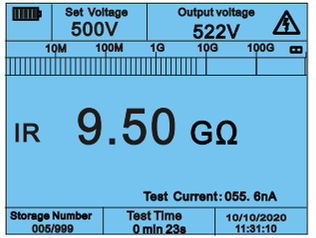
When the tester is powered by batteries instead of the power adapter, testing for high resistance above 100GΩ may cause measurement error. At this time, wind the green test lead which is inserted into the GUARD terminal around the black test lead to improve the measurement accuracy, as shown in Picture 8.



Picture 8

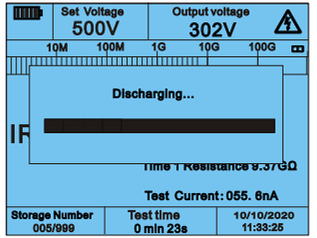
After connecting the insulation resistance under test according to the above as needed, press the ▲, ◀, ▶, and ▼ buttons to set the desired output voltage range. Then long press (>1s) the TEST button to start insulation measurement. he LCD displays the test value as shown in Picture 9.

⚠ Note: Once the insulation measurement is started, the TEST button lights up red and the LCD displays the " ⚠ " symbol.



Picture 9

Short press the TEST button to stop the insulation measurement. The “Discharging…” will be displayed on the LCD as shown in Picture 10. When the discharge is completed, the test value will be displayed on the LCD again, indicating the completion of the insulation measurement. Then remove the test leads.



Picture 10

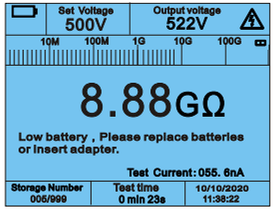
⚠ Note: Do not remove the test leads during discharge, otherwise the measured object will not be fully discharged and an electric shock will be posed. If the test leads are disconnected during discharge, reconnect the test leads to the measured object and continue the discharge. In this case, a longer discharge period is required because the internal discharge circuit of the tester does not work and the discharge is performed by other circuits.

Pay attention to the following during the measurement process:

Danger

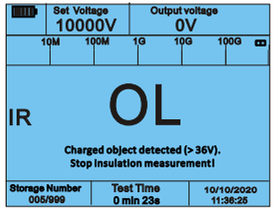
- Do not touch the circuit under test just after finishing the measurement to prevent electric shock.
- Do not touch the circuit under test or remove the test leads until the discharge is completed.
- Use a high voltage detector to check the circuit under test for electrical charge.
- Be sure to wear a pair of insulated gloves for high voltage operation.
- Please take care to avoid electric shock during insulation resistance measurement. Once the TEST button is pressed down, high voltage is present on the tip of test leads and on the circuit under test.
- Do not use the tester if the battery cover is not covered up.
- Do not make measurement in bad weather (thunder).
- Make sure the measured object is not energized or charged, otherwise there is danger of electric shock or damage to the tester.

If the battery is too low to guarantee the measurement accuracy, the measurement will be automatically terminated. The warning shown in Picture 11 will be displayed, and will disappear after 2s. Please replace the batteries or insert the power adapter.



Picture 11

If the measured object is charged and the voltage is above DC 36V or AC 72V, it is forbidden to measure again. The screen will display the warning shown in Picture 12. The electrical charge needs to be removed before continuing the measurement.

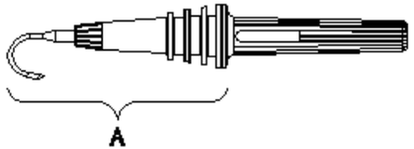


Picture 12

⚠ **Note:**

- When the insulation resistance value of the device under test is unstable, the display reading may also be unstable.
- Oscillation sound may occur in the insulation resistance test, but it is not malfunction.

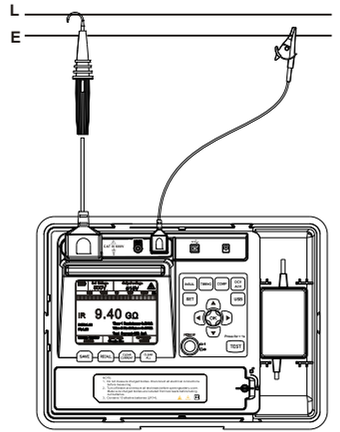
- It takes longer time to test capacitive loads, and the display readings may gradually increase or become unstable.
- When the TEST button is pressed right after the completion of a test, the next test may not be performed immediately. Wait a few seconds and press the TEST button again for measurement.
- In the insulation resistance test, output of the EARTH and GUARD terminals is positive voltage (+), while output of the LINE terminal is negative voltage (-).
- Do not extend the test leads for use, or it may affect measurement accuracy or impair safety.
- When measuring high resistance above 1TΩ, the Part A of the test probe indicated in the below illustration should not be touched with the things other than the measured object. In case that such a contact is unavoidable, use something with high insulation resistance like foamed plastic as a cushion.



- In the measurement without connecting the test leads to the measured object, the over range indication, e.g. ">10TΩ" (at 10kV, 12kV range), may not be displayed. It is likely caused in high humidity environments due to current leaked at unexpected points other than the measured object owing to applying high voltage.
- In the insulation resistance test, when short/open circuit between the LINE and EARTH (GUARD) is operated repeatedly or the measured object is broken down by high voltage and starts arc discharge, it may not be able to test normally due to influence of variations in the strong electric field or interference caused at discharging energy stored in capacitors. In this case, restart the tester to test again.
- The voltage monitor may indicate 10V to 500V instead of 0V when short-circuiting the red test probe and black test lead in outputting voltage. In this case, voltage applied to the resistors mounted in the testing circuit of the tester is included.

8.2.5 Voltage Measurement (Check of Power Failure)

Press the DCV/ACV button to switch to voltage measurement, and connect the test leads as shown in Picture 13.

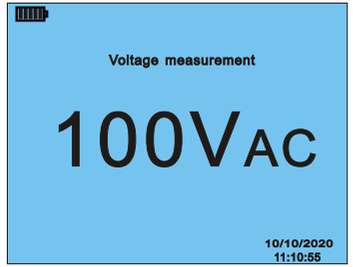


Picture 13

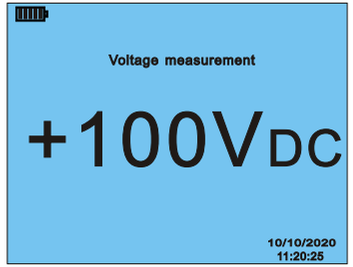
No need to press the TEST button to start voltage measurement. When the measured object is charged, the voltage will be directly displayed on the LCD, as shown in Picture 14 or Picture 15.
The tester is equipped with AC/DC auto-detect circuit and can measure AC/DC voltage automatically. In DC voltage measurement, when positive voltage is applied to the red test probe, positive values are displayed on the LCD.

⚠ **Danger**

- Do not measure in circuits with voltage above AC 750V or DC 1000V to avoid electric shock.
- When testing high-current devices (such as power cords), test in the secondary circuit of a circuit breaker to avoid personal injury.
- In the voltage test, please pay attention to minimize the short circuit between the power cord and the metal tip of test lead to avoid personal injury.
- Do not use the tester if the battery cover is not covered up.



Picture 14



Picture 15

8.2.6 Test Settings

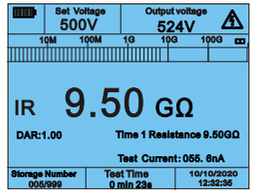
1) Measurement Voltage Setting

The step value and settable voltage range at each measuring range are as follows.

Range	Step	Min	Max
500V	50V	400V	600V
1000V	100V	500V	1200V
2500V	250V	1000V	3000V
5000V	500V	2500V	6000V
10000V	1000V	5000V	12000V
12000V	N/A	N/A	N/A

2) Continuous Measurement

The measurement time is continuously accumulated during continuous measurement until the TEST button is pressed to stop. Insulation measurement defaults to continuous measurement mode, as shown in Picture 16.



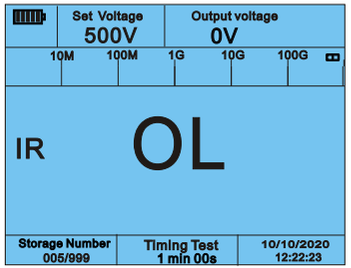
Picture 16

3) Timing Measurement

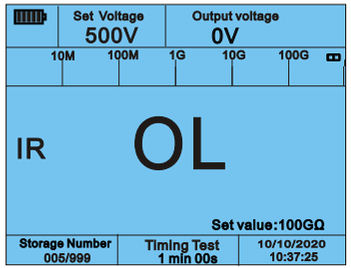
Short press the TIMING button to turn on timing measurement and the LCD will display timing measurement, as shown in Picture 17. During timing measurement, when the set time has elapsed, the measurement will be terminated automatically. For the set time, please refer to the description of SET button.

4) Comparative Measurement

Short press the COMP button to turn on comparative measurement (as shown in Picture 18) and the “000M” in the “Set Value: 000MΩ” will flash. Press the UP/DOWN button to adjust the value and LEFT/RIGHT button to adjust the carry, starting from the last flashing bit “M” by default. Press the OK button to complete the desired set value for comparison. Then press the TEST button to start measurement.



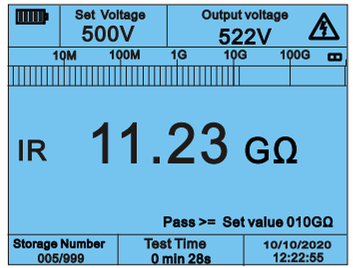
Picture 17



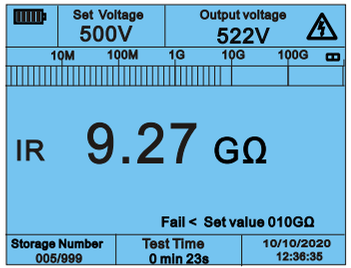
Picture 18

If the measured value is greater than the set value, it will be deemed a pass, and "PASS" will be displayed on the screen, as shown in Picture 19.

If the measured value is less than the set value, it will be deemed a fail, and "FAIL" will be displayed on the screen, as shown in Picture 20.



Picture 19



Picture 20

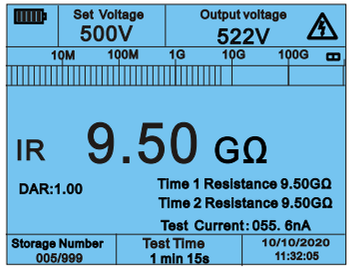
5) Automatic Measurement of Dielectric Absorption Ratio (DAR) and Polarization Index (PI)

When the measurement time reaches the set time of dielectric absorption ratio (DAR), the tester will automatically calculate and display the DAR value, as shown in Picture 21.

System default:

$$DAR = \frac{\text{1-min insulation resistance}}{\text{30-sec insulation resistance}}$$

Other time can be set in the "Settings" option to calculate the DAR value.



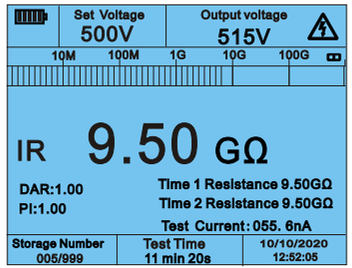
Picture 21

When the measurement time reaches the set time of polarization index (PI), the tester will automatically calculate and display the PI value.

System default:

$$PI = \frac{\text{10-min insulation resistance}}{\text{1-min insulation resistance}}$$

Other time can be set in the "Settings" option to calculate the PI value, as shown in Picture 22.



Picture 22

9. Specifications

9.1 Electrical Specifications

Error limit: ± (a% of reading + b digits), 1 year guarantee period
Ambient temperature: 23 °C±5 °C
Ambient humidity: 45~75%RH

9.1.1 Insulation Resistance Measurement

Rated voltage	500V	1000V	2500V	5000V	10000V	12000V
Max value	500GΩ	1.0TΩ	2.5TΩ	5.0TΩ	10TΩ	10TΩ
Accuracy	0.50MΩ-4.99GΩ ±(5%+5) 5.00G-49.9GΩ ±(10%+10) 50.0GΩ- 500GΩ for reference only	1.00MΩ-9.99GΩ ±(5%+5) 10.0G-99.9GΩ ±(15%+10) 100GΩ- 1000GΩ for reference only	2.50MΩ-24.9GΩ ±(5%+5) 25.0G-249GΩ ±(15%+10) 250GΩ- 2.5TΩ for reference only	5.00MΩ-49.9GΩ ±(5%+5) 50G-499GΩ ±(15%+20) 500GΩ- 5.0TΩ for reference only	10.0MΩ-99.9GΩ ±(10%+10) 100G-999GΩ ±(20%+20) 1000GΩ- 10TΩ for reference only	12.0MΩ-99.9GΩ ±(10%+10) 100G-999GΩ ±(20%+20) 1000GΩ- 10TΩ for reference only
Over range display	OL	OL	OL	OL	OL	OL
Short circuit current	3.7mA		5.0mA			
Output current	1mA <output current <1.2mA at 0.5MΩ	1mA <output current <1.2mA at 1MΩ	1mA <output current <1.2mA at 2.5MΩ	1mA <output current <1.2mA at 5MΩ	0.15mA <output current <1.2mA at 10MΩ	0.15mA <output current <1.2mA at 12MΩ

9.1.2 Output Voltage

Rated voltage	500V	1000V	2500V	5000V	10000V	12000V
Display accuracy	±(10% of reading±10V)	±(10% of reading±10V)	±(10% of reading±10V)	±(10% of reading±10V)	±(10% of reading±10V)	±(10% of reading±10V)
Output accuracy	0 +20%	0 +20%	0 +20%	0 +20%	−0 +20%	−0 +20%
Settable range	400V 600V	500V 1200V	1000V 3000V	2500V 6000V	5000V 12000V	12000V

9.1.3 Voltage Measurement (Automatic Identification of AC/DC Voltage)

Measuring range	DC voltage: 30V~1000V	AC voltage: 30V~750V (50~60Hz)
Accuracy	±(3%+5)	±(3%+5)
Over range display	OL	OL

9.1.4 Current Measurement

Measuring range	Effective test range of insulation resistance: 0.00nA~5.00mA
Accuracy	± (10%+5)

9.1.5 DAR and PI Measurement

Measurement mode	DAR	PI
Display range	0. 00~999	0. 00~999
Computational error	± 2 digits	± 2 digits

9.2 Environmental Specifications

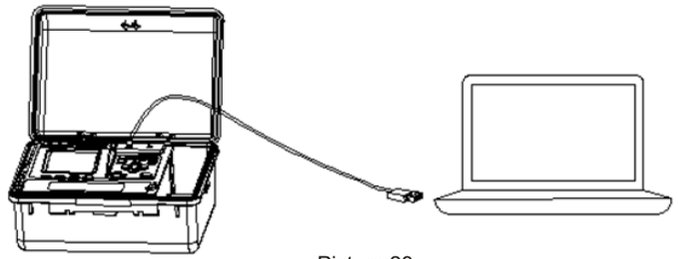
- Operating Altitude: 2000m
- Operating temperature and humidity: -10°C~50°C, ≤85%RH (no condensation when operating with the power adapter); 0°C~40°C, ≤85%RH (no condensation when operating with batteries)
- Storage temperature and humidity: -20°C~60°C, ≤75%RH (no condensation)
- IP rating: IP67 (with the hard case closed)

9.3 General Specifications

- LCD display: 320x240 pixels, 5.1 inch
- Response time: About 30s within ±5% accuracy range; about 60s or longer for accuracy range ≥ ±10% (the lower the output voltage, the longer the response time)
- Overload protection: AC 1200V/10s
- Withstand voltage: AC 8770V between lead terminal and housing/5s (50Hz/60Hz); AC 6880V between measuring terminal and housing/5s (50Hz/60Hz); AC 2330V between power socket and housing/5s (50Hz/60Hz)
- Insulation resistance: 1000MΩ or more/DC 1000V (between electrical circuit and housing)
- Dimensions: 410mm (L) × 350mm (W) × 200mm (D) (Tester and hard case)
- Weight: about 9kg (including batteries) (Tester and hard case)
- Power adapter: AC power adapter (220V/50Hz, 1A)

10. Communication Function (Including Software)

The tester can be connected with a PC via the dedicated USB cable, as shown in Picture 23.

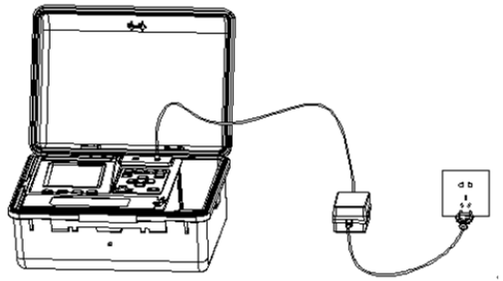


Picture 23

- Download the corresponding PC software from the official website of Uni-Trend (refer to UNI-T Documents Download Operation Guide), and install it according to the installation instructions.
- Support Windows Vista, Win 7 or above system.
- Use the USB cable to connect the tester with the PC. Short press the USB button on the tester and the “USB” symbol will appear in the upper left corner of the LCD. The data of the tester is available for USB communication now.
- Run the PC software and click on the "Connect" option. Then the PC is available for USB communication and the data of the tester will be displayed on the PC in real time.
- Upload the data of the tester to the PC for saving, printing, analysis and other operation.
- Data of the PC cannot be transmitted to the tester.

11. Use of Power Adapter

The power adapter operates at 220V/50Hz and has an output current of 1A. The tester can function properly with the power adapter but cannot be charged. When the power adapter is enabled, power supply will be automatically switched to the power adapter with battery power disconnected. Connection method of the power adapter is shown in Picture 24.

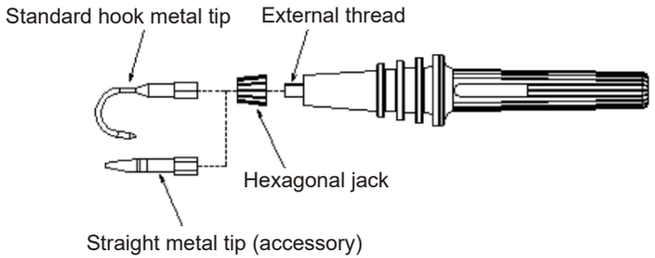


Picture 24

⚠ Note: The power adapter is specially designed for G9312. It cannot be replaced by other power adapters as this may damage the tester or cause inaccurate measurement.

12. Test Probe Metal Parts and Replacement

Standard metal tips for the metal part: Hook and straight types
Hook type: Used in the hanging test and installed on the test probe when purchased
Straight type: Need to be replaced for use
The method of replacing the metal tip is shown in Picture 25.
a) Rotate the top of the test probe to the left (counterclockwise).
b) Remove the mounted metal tip.
c) Insert the metal tip needed into the hexagonal jack and rotate it with the top of the probe to the right (clockwise) together to tighten the screws.



Picture 25

13. Maintenance

13.1 General maintenance

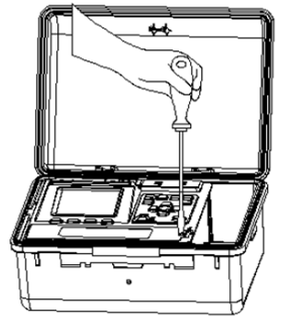
- Wipe the tester housing with a soft cloth or sponge wetted with clear water.
- Do not immerse the tester in water to avoid damage.
- If the tester is wet, please store it after drying.
- If the tester is not in use for a long time, please remove the batteries to avoid battery leakage and damage to the tester.
- The maintenance and service must be implemented by qualified professionals or designated departments.

13.2 Battery Replacement

The method of battery replacement is shown in Picture 26.

- Disconnect the power adapter from the 220V circuit, and remove the test leads from the terminals.
- Power off the tester and let the power light go out.
- Unscrew and remove the battery cover (take care not to lose screws).
- Replace with 10×1.5V alkaline batteries (LR14) according to the polarity indication.
- Secure the battery cover and tighten the screws.

⚠ NOTE: DO NOT open the battery cover during any testing.



Picture 26

The contents of this manual are subject to change without notice.

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Manufactured by an ISO Certified Company
Made in China