INSTRUCTION MANUAL

MT987

20A MICRO-OHMMETER

Contents

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1. INTRODUCTION

The MT987 DC Resistance Tester, also recognized as the Transformer DC Resistance Tester, DC Resistance Quick Tester, and Earth Continuity Tester, incorporates advanced microprocessor technology and utilizes the four-wire method for testing. It ensures a safe, precise, and reliable assessment of various electrical components.

Primarily designed for measuring transformer winding resistance, conducting earth continuity tests on down conductors, and determining the wire resistance of cables, switches, connectors, relays, coils, motors, equipment casings, lightning protection belts, and more, this tester plays a crucial role in diverse applications. It is instrumental in assessing earthing connection resistance between metal components such as beams, structures, cabinets, steel bars, water pipes, windows, guardrails, radiators, and assembly lines.

With widespread applications in telecommunications, electricity, metrology, computer rooms, oil fields, power distribution lines, tower transmission lines, gas stations, factory grounding grids, lightning rods, and beyond, the MT987 offers versatility and reliability.

Comprising a host unit, monitoring software, test cables, and communication lines, the MT987 features a charging function, a full-color large-screen LCD display, and an intuitive touch screen operation for user convenience. Additionally, it incorporates a port overload prevention function and boasts a large storage capacity for up to 800 sets of data. The accompanying upper computer software enhances functionality by enabling users to read, consult, and save historical data effortlessly.

2. SAFETY RULES AND PRECAUTIONS

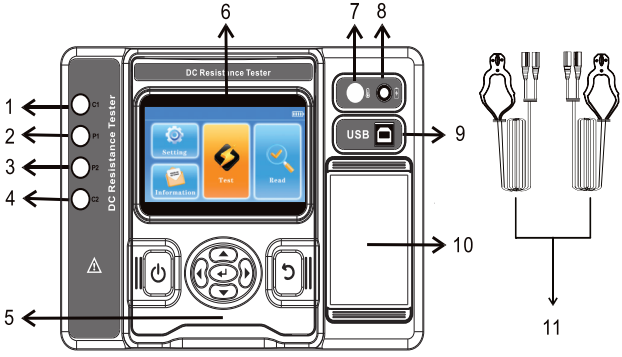
The instruction manual must be read and the safety rules and precautions listed in this manual must be strictly observed. Strict attention must be given before you use this instrument in order to avoid possible electric shock or personal injury.

When using this instrument please pay special attention to safety.

- This instrument is designed, produced, and inspected according to IEC61010 safety standards.
- Pay attention to words and symbols on the tester.
- Ensure that the tester and accessories are in good condition before use. There should be no damages or broken parts in the test leads or insulation.
- Can be used without disconnecting.

- During measurement, DO NOT touch bare or uninsulated conductors or circuits under measurement.
- Confirm that the connector plug of the test lead has been inserted into the tester's interface correctly.
- Do not measure in flammable or gaseous areas.
- Stop using the tester when there is exposed metal caused by a broken enclosure or test lead during testing.
- Do not keep or store the tester in an area with high-temperature, moisture, or condensation, or under direct daylight radiation for a long period of time.
- Pay attention to the measuring range and operating environments stipulated by this instrument.
- This meter is only to be used, disassembled, adjusted, and repaired by a qualified and authorized personnel.
- If the tester is damaged during usage, it may be removed from site and sent away to an authorized personnel for repairs or disposal.
- For risk of danger icon in manual "⚠", users must perform safety operations strictly in compliance with the manual content.

3. INSTRUMENT STRUCTURE



1 - C1 current pole is positive
2 - P1 voltage pole is positive
3 - P2 voltage pole is negative
4 - C2 current pole is negative
5 - Button panel
6 - Touch screen
7 - Temperature probe interface
8 - Charging interface
9 - USB interface
10 - Printer
11 - Test Cables

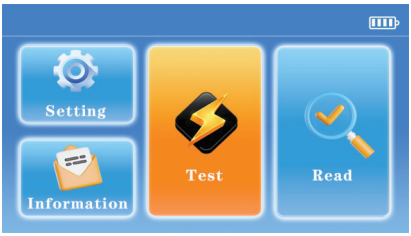
4. OPERATION METHOD

4.1. Power Function

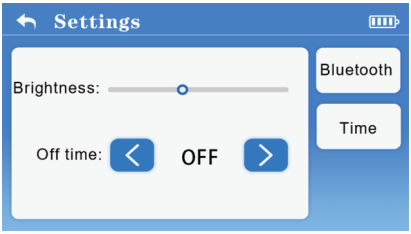
Press the "On/Off" key to switch the tester On or Off.

4.2. Interface Introduction

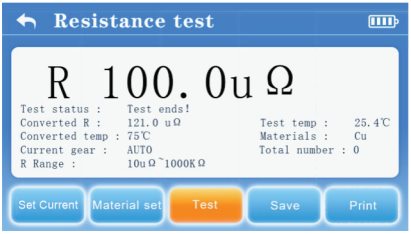
4.2.1. Main Interface



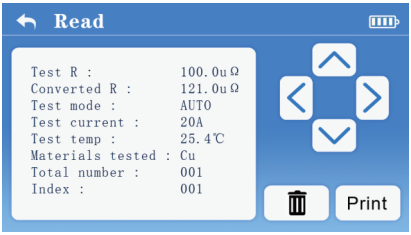
4.2.2. Settings



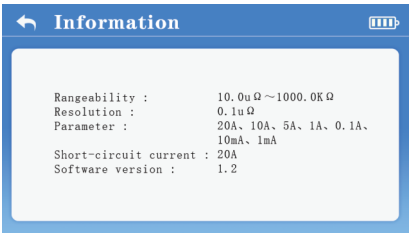
4.2.3. Resistance Test Interface



4.2.4. View Interface



4.2.5. Product Information Interface



4.3. Icon Description

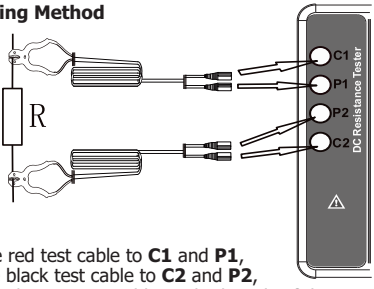
TEST	Test Button		Dimming
Set Current	Current Gear Setting		Return
Set Material	Material Settings		Delete
SAVE	Save Data	Print	Data Print
OK	Indicates that the data is saved successfully		Confirm Deletion
Bluetooth	Bluetooth Button		Cancel
Time	Test stop time setting		Minus 1 step-by-step review
	Bluetooth ON		Add 1 step to view
	Minus 10 step-by-step review		Add 10 step-by-step review

4.4. Battery Power Check

1. When turning the meter on and the low battery voltage symbol " " is displayed on the upper right corner of the LCD, it means that the battery is low, please charge it timeously. Only when the battery power is sufficient can the accuracy of the measurement be guaranteed.
2. When the power consumption during the test is higher than that of the standby mode, the LCD will display the low battery voltage symbol " " during the test, this means that the battery power is about to run low. Please charge it timeously. In order to ensure the accuracy of the test.
3. When the power is not enough to support the test, it will automatically shut down. Please charge the meter timeously.

4.5. Resistance Test

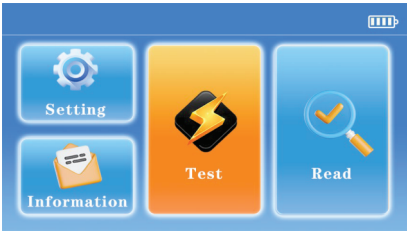
4.5.1. Wiring Method



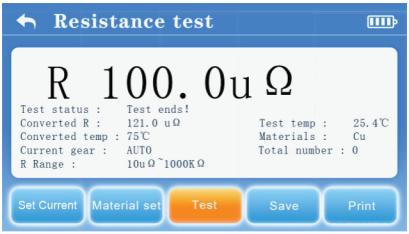
Connect the red test cable to **C1** and **P1**, connect the black test cable to **C2** and **P2**, and connect the two test cables to both ends of the DUT.
Note: There are two thick and thin test cables, the thick test cable is connected to the current **C1**, **C2**, and the thin test cable is connected to **P1**, **P2**.

4.5.2. Test Operation

On the main interface, click the TEST icon to enter the resistance test interface as indicated in the figure below:

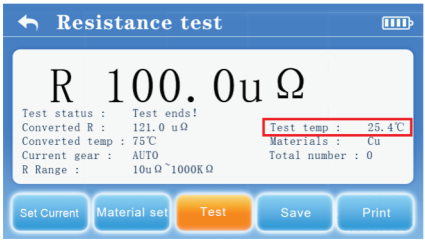


The automatic current display will be selected by default every time it is turned on. If you need to manually select other currents, please click the icon in the lower left corner to switch to the corresponding current display as indicated in the figure below:



Click the TEST icon to start the test. During the test, the buzzer will beep and the icons ● will blink, and the test status in the display area will display "Testing..."
At the end of the test, the instrument will automatically discharge. During the discharge process, it cannot be operated. Please wait for the end of the discharge before proceeding to the next step.
During the test, the test current cannot be switched, and the data cannot be saved, nor can it be returned to other interfaces. Please complete the test before operating.
Please pay attention to the display and prompts in the LCD for specific conditions during use.

4.6. Temperature Display

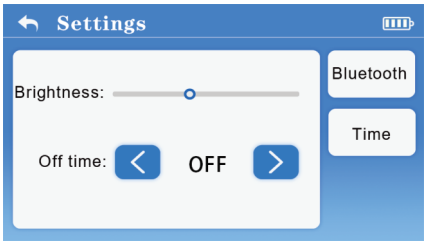


When the external temperature probe is connected, the screen displays the temperature measured by the external temperature probe. If the temperature probe is not connected, the screen displays the temperature measured by the internal temperature sensor of the instrument.

4.7. Backlight and Auto Power Off Settings

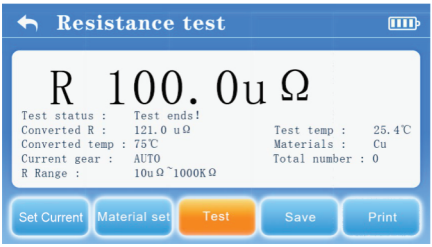
Backlight setting: Enter the setting interface, drag the icon to the left or right to adjust the brightness.

Automatic shutdown setting: Press the left and right keys to select the automatic shutdown countdown of "**OFF**", "5 minutes", "10 minutes", "15 minutes", "20 minutes", "25 minutes" and "30 minutes" as indicated in the figure below:



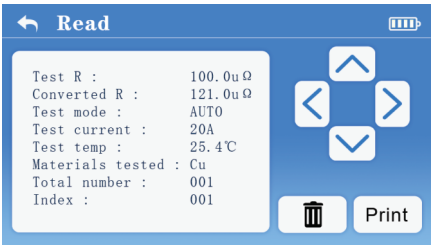
4.8. Data Storage

On the resistance test interface, after each test, click the SAVE icon to save the current test data (as shown in the figure below). If the save is successful, the SAVE icon will change to an OK icon.



4.9. Data Query/Deletion/Print

On the main interface, click the "**View**" icon to enter the query interface for data query and deletion (as shown in the figure below). If the instrument has not saved any data, the interface will prompt "No saved data yet!"



If the total number of saved data sets is not more than 10, you can check the data by clicking the icon plus 1 step or click the icon minus 1 step to look up the data.

If the total number of saved data sets is greater than 10, you can check the data by clicking the icon plus 1 step or click the icon minus 1 step to look up the data. You can also check the data by clicking plus 10 steps or click minus 10 steps to view the data.

If you want to delete the data, you can click the icon to enter the deletion state, thereafter, select the icon to confirm the deletion of the total data, or select the icon to cancel the deletion of the total data.

If you need to print the data, click the Print icon to print.

4.10. Product Information Check

On the main interface, click the "**Product Information**" icon to enter the product information interface to view the product's technical specifications and software version information.

4.11. Overload Protection

Each time the instrument is switched on and before testing resistance, the instrument will perform an overload check. If an overload is detected, it will perform overload protection and prompt. Please shut down and ensure that the test body is not charged before starting the test.

After overload protection, please disconnect the connection, and then restart the instrument to start normally.

4.12. Test Stop Time Setting

In the event that the instrument cannot normally measure large inductive

loads within the default test stop time of 60 minutes, in the setting interface, click the Time icon in the lower left corner to enter the test stop time setting state to modify the time. The default time will be restored to 60 minutes each time the device is restarted.
The test time is within 60 minutes, the test process will make intelligent judgments, then display and wait for the data to stabilize before the test ends early. The data display does not mean the test has ended, and the test has stopped, you need to end the test yourself. If the modification time is longer than 60 minutes, it will not be intelligently judged to stop, and it needs to wait until the setting is reached. Time test to end.

4.13. APP and PC Upper Computer Operation

This instrument supports connecting Android APP and PC host computer.

PC host computer connection instructions:

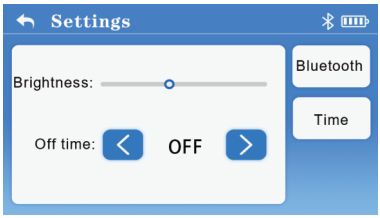
The USB driver and host computer software in the USB should be installed before connection.
After the instrument is turned on, use the instrument accessories USB cable to connect one end to the instrument's USB port and the other end to the computer's USB port, and run the host computer software. The software will automatically search for the port and connect. After the connection is successful, you can check the historical data through the software, generating excel reports and other operations.

Android APP Connection Instructions:

Confirm before use:

1. The system version of the mobile phone or tablet computer is Android 5.0 or above.
2. The "DC Resistance Tester" APP is installed in the smart device.

On the "Settings" page, click the Bluetooth icon to turn on Bluetooth, as shown in the figure below:



Open the app and search for "**DCR**" (abbreviation of DC Resistance Tester) and connect, if the connection is successful after that, functions such as wireless control measurement and data browsing can be realized.

5. SPECIFICATIONS

5.1. Range and Accuracy

5.1.1. Temperature Measurement Accuracy

Type	Range	Maximum Display	Resolution	Test Accuracy
Temp probe	-10.0°C to 60.0°C	60.0°C	0.1°C	±1.0°C
Internal temp	-10.0°C to 60.0°C	60.0°C	0.2°C	±1.0°C

5.1.2. Resistance Measurement Accuracy

Measuring Current	Measuring range	Accuracy	Resolution
20A	10.0uΩ to 1000.0uΩ	±0.2%FS ± 10dgt	0.1uΩ
	1.000mΩ to 10.000mΩ	±0.2%FS ± 10dgt	0.001mΩ
10A	10.00mΩ to 100.00mΩ	±0.2%FS ± 10dgt	0.01mΩ
5A	100.0mΩ to 1000.0mΩ	±0.2%FS ± 10dgt	0.1mΩ
1A	1.000Ω to 10.000Ω	±0.2%FS ± 10dgt	0.001Ω
0.1A	10.00Ω to 100.00Ω	±0.2%FS ± 10dgt	0.01Ω
10mA	100.0Ω to 1000.0Ω	±0.2%FS ± 10dgt	0.1Ω
1mA	1.000KΩ to 10.000KΩ	±0.4%FS ± 30dgt	0.001KΩ
	10.00KΩ to 100.00KΩ	±0.4%FS ± 30dgt	0.01KΩ
	100.0KΩ to 1000.0KΩ	±1%FS ± 30dgt	0.1KΩ

Temperature characteristics: Test accuracy x 0.3/°C within the operating temperature range. (outside 18°C to 28°C)
Calculation method: Accuracy = (Accuracy of Current gear) + 0.3 x (number of temperature difference) x (accuracy of current gear)
Example: 8°C (Temperature) / 20A (Current) = ±0.2%FS ± 10dgt (Accuracy). Accuracy = (0.2% FS ± 10dgt) + 0.3 x 10 x (0.2% FS ± 10dgt) = 0.8%FS ± 40dgt
Note: 1mA current 1000K gear test accuracy is only valid at 18°C to 28°C. Long-term testing of high-current gears are prone to cause heating and will affect accuracy. If there is any deviation, you need to wait for a while before testing.

5.2. Technical Specifications

Function	Range
Function	Measures transformer DC resistance, transformer winding resistance, earth grid connection continuity, cable wire resistance, switch, connector, relay contact resistance, coil, motor, metal riveting resistance, metal components Interconnection resistance test, low value resistance test, contact resistance test, etc.
Sample Type	Optional Copper (Cu), Aluminium (Al), Iron (Fe), Gold (Au), Silver (Ag) material
Resistance Range	10.0uΩ - 1000.0KΩ
Resolution	0.1 uΩ "**OL**"
Overflow Display	Symbol display when over-range overflow
Detection Method	Four-wire test
Test Current	20A, 10A, 5A, 1A, 0.1A, 10mA, 1mA
Short Circuit Current	20A
Temperature Check	Yes, external temperature probe, internal temperature sensor, dual sensor design
Temperature Conversion	Yes, temperature conversion, can convert 75°C measurement results
Overload Protection	Yes
Automatic Discharge	Yes
Power Supply	DC14.6V (12000mAh Large capacity lithium battery)
Charging Function	Yes
Display	5-inch touch screen (854 pixels x 480 pixels) full-color LCD display
Interactive Mode	Touch screen / button
LCD Size	Length and Width: 108 mm x 65mm
Meter Size	Length x Width x Height: 277.2mm x 227.5mm x 153mm
Test Lead Length	5 meters, 1 red and 1 black
Mobile APP	Bluetooth connection to Android Devices
Computer PC	USB cable connection
Data Storage	800 Group
Data Review	Data lookup function
Printer	There is a printer embedded in the instrument panel, press the print button to print the test results.
Battery Voltage	The battery power is displayed in real time, prompting that the battery needs to be charged in time when the voltage is low.
Automatic Shut-Down	Optional off, 5 minutes, 10 minutes, 15 minutes, 20 minutes, 25 minutes, 30 minutes
Power Consumption	Standby: about 4W (30% brightness)
	Measurement: 100W Max Meter: 3.1kg (including battery)Test leads: 850g
Weight	Meter: 3.1kg (including battery)
	Test leads: 850g

Function	Range
Working Temperature and Humidity	-10°C to 40°C 70% RH
Storage Temperature and Humidity	-20°C to 60°C 70% RH
Insulation Resistance	More than 10MΩ (500V between the circuit and the shell)
Pressure Resistance	AC 3700V/rms (between the circuit and the case)
Electromagnetic Properties	IEC61010-4-3, radio frequency electromagnetic field ≤1V/m
Safety Regulations	IEC61010-1, CAT III 600V, pollution degree 2, JJG724-1991 "Verification Regulations for DC Digital Ohmmeter", JJG166 1993 "Verification Regulations for DC Resistors", "DL/T967-2005 Loop Resistance Tester and DC Resistance Fast Tester Verification Regulations".

6. QUANTITY OF STANDARD ACCESSORIES

Tester	1 pcs
Testing Cables	2 pcs（Red 1pcs, black 1pcs）
Temperature probe	1 pcs
USB	1 pcs
Standard Resistance	1 pcs
Data Line	1 pcs
Charger	1 pcs
Instructions, Warranty	1 set
Tester toolbox	1 pcs

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Major Tech is not responsible for other losses caused by use.
Major Tech reserves the right to modify the content of the user manual.
If there is any modification, no further notice will be given

MAJOR TECH (PTY) LTD

South Africa

www.major-tech.com

sales@major-tech.com

Australia

www.majortech.com.au

info@majortech.com.au