Battery internal resistance tester

User's Manual

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• In order to use this instrument safely and accurately, please read the instruction manual carefully.
• When measuring high-voltage batteries, do not touch the metal parts to avoid electric shock.
• It is forbidden to use beyond the voltage range, and it is forbidden to test AC signals.

We will promptly improve and make a new version of this manual, without notice, for any print errors found in this manual and for any discrepancies with the latest information!
In line with the principle of continuous improvement and continuous development, we reserve the right to modify and improve the product without prior notice.

Section 1 Introduction

The tester can measure the internal resistance and voltage of the battery at the same time. The influence of contact resistance and wire resistance can be avoided by using the Kelvin four-wire test clamp, resulting in more accurate measurement.

The product adopts intelligent control, an LCD display and embedded Kalman filter mathematical algorithms. This has the advantages of high precision, high efficiency, low cost, light weight, energy saving and environmental protection, etc.
The internal 1000mAh lithium battery is charged at 5V so it is easy to use with an Android phone charger.

The product is widely applicable to various occasions such as battery production, maintenance, testing, scientific laboratory research and the like.
It can also be used to measure the AC resistance and the low resistance (ESR) of capacitors with high precision.

A serial communication function is included, and the powerful computer analysis software is provided free of charge.

Section 2 Specifications

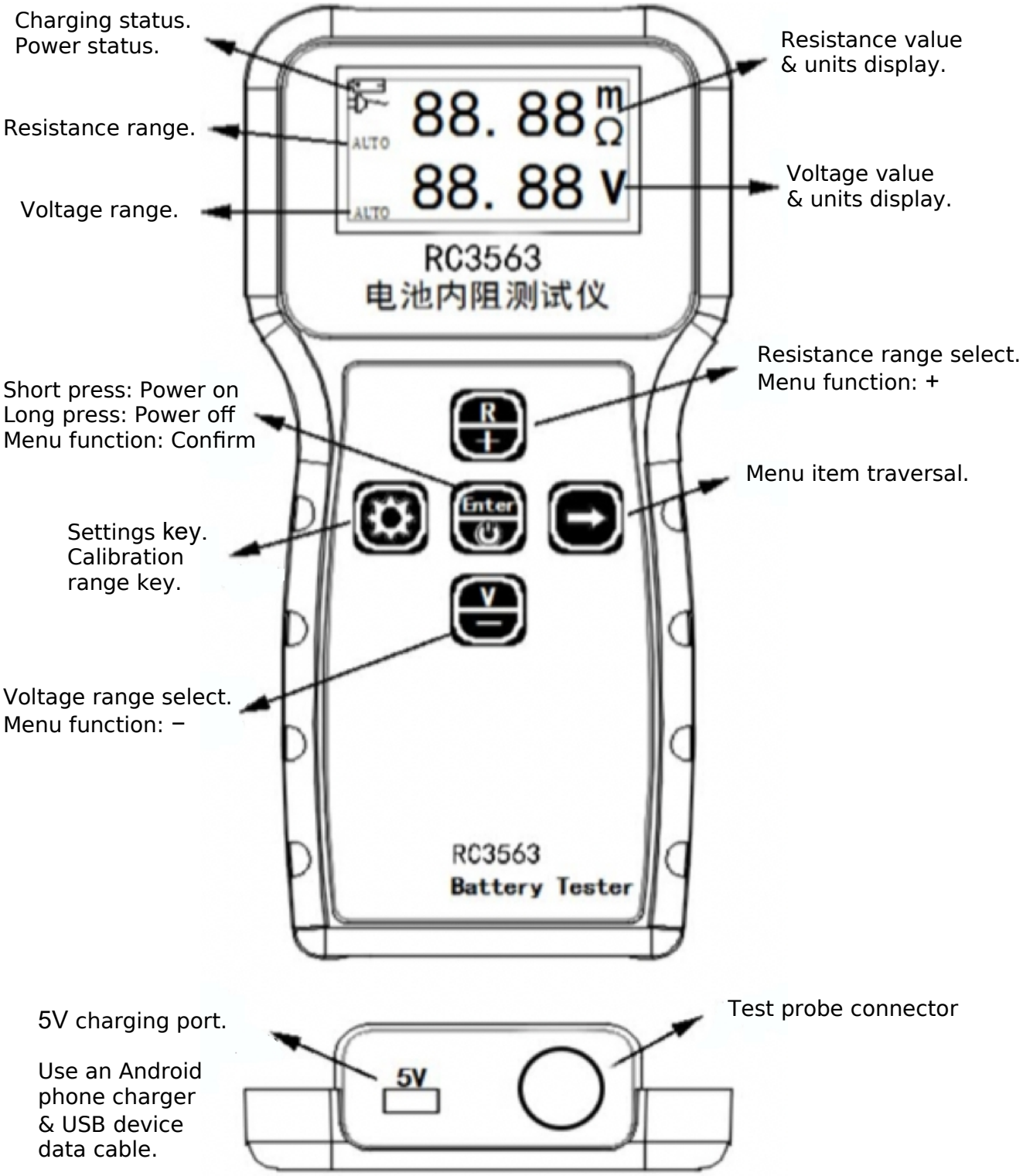
2.1 Rated operating conditions:

Working environment: -10°C ~ +40°C, relative humidity < 80%
Storage environment: -20°C ~ +80°C, relative humidity < 80%

2.2 Technical parameters:

Resistance basic accuracy:	0.5%
Voltage basic accuracy:	0.5%
Resistance measurement range:	1μΩ ~ 200Ω
Voltage measurement range:	1mV ~ ±100VDC
Test signal frequency:	AC 1kHz
Test signal current:	20mΩ range 50mA 200mΩ/2Ω ranges 5mA 20Ω/200Ω ranges 0.5mA
Serial port:	Must be turned on in instrument to communicate with computer. It is turned off by default. The baud rate is 115200.
Resistance range:	6 ranges, auto and manual
Voltage range:	3 ranges, auto and manualcalibration
Display updates:	5 times/second
Resistance calibration:	Manual independent calibration of each resistance range. Calibration of one range does not affect any other.
Voltage calibration:	Manual independent calibration of each voltage range. Calibration of one range does not affect any other.
Factory settings:	Save the factory information. One -click to restore the factory defaults.
Calculate XY calibration:	Belongs to the resistance calibration process. To re-calibrate, enter the resistance calibration, press the set "SET" key to enter CALXY calibration, now insert a 20mΩ calibration resistance standard, long press the R key, XY calibration results appear. The same number in multiple iterations is good.
Power saving setting:	Automatic shutdown after 10 minutes of inactivity.
Charging power supply:	Charge internal lithium battery at 5V/1A with Android phone charger.
Dimensions:	Length 166mm, Width 80mm, Height 28mm
Weight:	190g
Language:	Chinese, English, switch as you wish.
Test line length:	Approximately 1 meter.
Note:	Keep the stylus or clips parallel as much as possible during use to minimize eddy current effects.

Section 3 Specific instructions for use



1. Short press "ENTER" 

key to power on.

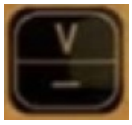
2. Hold "ENTER" 

key to power off.

3. Press "SETTINGS" 
key to enter setup, then press "SELECT" 
key to select different menus and press "ENTER" 

key to enter the desired feature.

4. Enter the resistance or voltage calibration menu and connect the test probe to the calibration resistance or voltage.
Press the "SETTINGS" 
key to select which range to calibrate
Then press "+" 

key or "−" 

key to make the display value equal to the calibration resistance or voltage. Press "SELECT" 
key for OK or Cancel, and then press the final 

key to save or cancel.

5. Key names:
Enter 

Menu 
Select 
Voltage select 

Resistance select 

Section 4 Warranty Services

- This instrument is provided with 6 months free warranty service from the date of sale. If the warranty period is exceeded, we still provide quality warranty service, only charging the cost of replacement parts.

- The following conditions are not covered by the Free Warranty:
  1) Faults caused by disassembly, modification or maintenance by the user.
  2) Failure to follow the instructions causes damage to the product.
  3) Use in an environment outside of the allowable range damages the product.
  4) Damage caused by natural disasters or other force majeure factors.
  5) Accessories are not covered by the warranty.
  6) Please pack and ship the products to be repaired properly, since we are not responsible for any damage or loss caused by the delivery process.
  7) Please read this product manual carefully before use.

Warranty Card

This card is the basic certificate of warranty,
please fill in and keep it properly.

Product Name (Product Model)	
Sale Date	
Selling Unit	
After Sales Phone	
Customer Name	
Contact Number	
Customer Address	
Fault description	

Note: This certificate is only valid when stamped by the seller!

Section 5 Frequently Asked Questions

> What battery capacity can I measure?

A: Batteries of any capacity can be measured no matter how large, as long as the internal resistance is within 0~200Ω and the voltage does not exceed 100V.

> Can the internal resistance be measured online without interrupting UPS power supply?

A: It can be tested online without affecting the battery power, so the battery can be continuously tested during UPS maintenance.

> Zero adjustment problem? The shorted clip does not show zero?

A: Shorting of the two clips might not produce zero and there could be X.XXX MΩ, which is a normal phenomenon. Only when the two clips are in perfect contact will a minimum value appear (which may be 0 or very close to 0). It doesn't matter if it is not 0. Theoretical zero has been calculated by internal program during measurement. Accuracy is not affected and 0 calibration is not required.

> Does the battery need to be fully charged during measurement?

A: The battery state of charge does not affect the internal resistance of the battery and so it can be measured. The internal resistance change is very small (except for defective batteries).

> Measurement results are fluctuating, inaccurate, unstable ?

A: If the test result is not stable then it may be that the test clip is not in good contact with the battery, the tested battery is unstable, the electrode has an oxide layer, or there is strong magnetic field interference around it.

> Is the measured internal resistance larger than the internal resistance of the battery?

A: The internal resistance of a large capacity battery is very small, so one must pay attention to the position of the measuring clips. The internal resistance of the battery electrodes or connecting wire is often larger than the internal resistance of the battery itself. Therefore Pay attention to the position of the clip and ensure good contact.

> Can the XXXX battery be measured?

A: The instrument can measure any type of battery, including lithium batteries, lead-acid batteries, nickel chromium batteries, king batteries, and so on.

> Why can measuring the internal resistance determine whether the battery is good or bad?

A: The same battery will gradually wear out during use. The capacity will decrease, and the internal resistance will rise. The lower the internal resistance of the same battery, the higher the load capacity, otherwise it heats up or wears out. The better the battery performance, the slower it ages, and the worse the quality of the battery, the faster it ages.

> What is the internal resistance of an 18650?

A: The internal resistance of a new 18650 Li-ion battery is generally below 50 mΩ, the better is about 20 mΩ, the ordinary is about 30 mΩ, and the poor is more than 50 mΩ.