

Multifunctional Battery Tester RFNT4 User Manual

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Summary

RFNT4 is a single channel and multifunction battery tester.

Features

- Support polymer li-ion battery, NI-MH battery, Ni Cd battery, power, adapter
- Supply for charging, discharging, battery testing, power/adapter testing, internal resistance testing, and voltage testing, capacity testing.
- LCD screen display function information.
- Enter, Down, Right, Adjust function keys.
- Charging consists of activate, pre-charge, constant current charge, constant voltage charge, end of charge.
- Discharging can adjust to constant current discharge, system support 1000mA Max, can set by DIS.CHG. External load, Max discharge current add to 4A
- Internal resistance testing support 20000mΩ Max. Voltage testing support DC 50V Max.
- Capacity testing support real time charge capacity and discharge capacity.

Parameters

- Size: 201 x 99 x 35 mm
- Weight:383g
- Adapter
Input 100~240V Output 24V/3A
- Display mode
Segment LCD with white backlight + LED in red and green
- Discharge mode
Constant current discharge, system support 1000mA Max, can set by DIS.CHG. External load, Max discharge current add to 4A
- Charge mode
Constant current and constant voltages are the main mode. Active charge and pre-charge are available according to different battery voltage.

Active charge

Tester may not recognize 0V-battery. Users should press the charge key to start up the active charge function. Being activated and going to normal charging status, when the battery establishes communication with the tester.

Pre-charge

Battery goes into pre-charge status when voltage of battery under setting pre-charge voltage.

Constant current charge

Battery goes into fast charge status when voltage of battery over setting pre-charge voltage. Fast charge time relates to the battery design capacity and fast charge current.

Constant voltage charge

Battery goes into constant voltage charge, when battery voltage up to battery saturation voltage, now current will be decreasing by battery saturation voltage

End of charge: When the current reduced to terminate current, Or e capacity reaches 100%

➤ Charge current

3000mA Max, set by CHARGE function

➤ Battery testing

Testing battery charge and discharge function is good or bad, test time set by user, according to user demand, can set by BT.TEST item. Test passed will display “OK” otherwise display “NG”

➤ Standby power consumption

≤1W

➤ Working temperature

0—40°C、20%—90% RH (Non Condensing)

➤ Storage temperature

-20°C—65°C、10%—95% RH (Non Condensing)

Functions

Power Up

- 1) Connect the adapter to AC power source
- 2) Connect the tester with the adapter
- 3) Machine goes into main menu

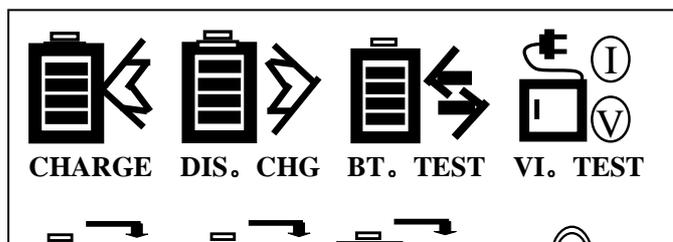
Connect accessories

User according to demand and connect accessories,

User according to demand and choose menu.

Detailed operating as below:

Main panel SOD function display



① CHARGE

For charging the battery, charging consists of activate, recharge, constant current charge, constant voltage charge, end of charge.

② DIS.CHG

For discharging the battery, constant current discharge, system support 1000mA Max, can set by DIS.CHG. External load, Max discharge current add to 4A

③ BT.TEST

For testing the battery, test battery charge and discharge function is good or bad, testing time is set by user.

④ VI.TEST

For testing power/adapter, test power/adapter is good or bad and meets user's requirements.

⑤ R.TEST

For testing internal resistance, correspond to Multimeter resistance file , Max range 20000mΩ

⑥ V.TEST

For testing voltage, correspond to Multimeter voltage file, ax range 50V

⑦ C.TEST

For testing capacity, test real time charge capacity and discharge capacity

⑧ SYSTEM

Display manufacturer relate information.

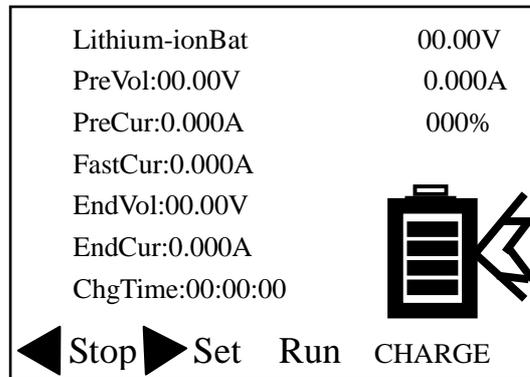
Charge

Charge divides into: activate、pre-charge、constant current charge、constant voltage charge、finish

charging. The battery original charge mode depend battery original voltage, charge process maybe don't need activate and pre-charge.

In the main menu page, user can choose charge function by press button "Adjust", "Right", "Down".

Press "Enter" button and go into charge menu. View option:



1. Battery type: go into charge menu, choose set option by "Right" button, press "Enter" button.

According to "Right" and "down" button to choose modification selection, character blink item is current choose item, according to "Adjust" button to modify. Battery type divides into Lithium battery, Ni-Mh battery, Ni-CD battery, and power/adapter. According to user's requirement to choose battery type.

2. Pre-charge voltage: When battery voltage under pre-charge voltage, the battery will go into pre-charge stage, this stage the charge current is lower, different battery, the set value is different. User can set by real requirement. Detail menu operation: go into charge menu option, Choose set option by "Right" button, press "Enter" and go into charge menu, choose the modification selection by "Right" and "Down" button, character blink is current selection, by "Adjust" button to set pre-charge voltage, set range is 0-21V.

3. Pre-charge current: When battery goes in to pre-charge stage, the current is very small, different battery, the pre-charge current is different, the set value is different. You can set as per your need.

Detailed menu operation: go into charge menu option, Choose set option by "Right" button, press "Enter" and go into charge menu, choose the modification selection by "Right" and "Down" button, character blink is current selection, by "Adjust" button to set pre-charge current, set range is 0-1.0A

4. Fast charge current: When battery voltage over pre-charge voltage, the battery goes into fast charge stage, also called constant current charge, the current value is set by user. Different battery, the set value is different. User can set by real requirement. Detail menu operation: go into charge menu option, Choose set option by "Right" button, press "Enter" and go into charge menu, choose the

modification selection by “Right” and “Down” button, character blink is current selection, by “Adjust” button to set fast current, set range is 0-3.0A

5. End voltage: user can set end charge voltage value by real requirement, generally end voltage is battery max voltage, also called battery saturation voltage, when battery voltage is ready to reach this max voltage, the battery will go into constant voltage charge. Detail menu operation: go into charge menu option, Choose set option by “Right” button, press “Enter” and go into charge menu, choose the modification selection by “Right” and “Down” button, character blink is current selection, by “Adjust” button to set end voltage, set range is 0-21V.

6. End current: when battery goes into constant voltage charge, the charge current will drop off, when drop off to set end charge current value, finish charging. User can set by real requirement. Detail menu operation: go into charge menu option, Choose set option by “Right” button, press “Enter” and go into charge menu, choose the modification selection by “Right” and “Down” button, character blink is current selection, by “Adjust” button to set end current, set range is 0-0.5A

7、Charging Time: You can set the charging time as your need, the time period is 0-16 hours.

Operating Steps: Choose the Charging Menu, then press Right button for choosing SET, then press Enter for setting charging parameters. You can set any parameters by Right, Down buttons. When the characters are lighting, which means it is being chosen currently.

8、Charging Voltage: the voltage displaying on the screen.

9、Charging Current: the current data displaying on the screen.

10、Capacity: capacity percentage displaying on the screen.

11、After setting the parameters, then choose Run option, Enter to charging status, and at this time the charging indicator is flashing in turn.

12、When it is on one of the below statuses, it means charging completed.

①、capacity \cong 99, current=0;

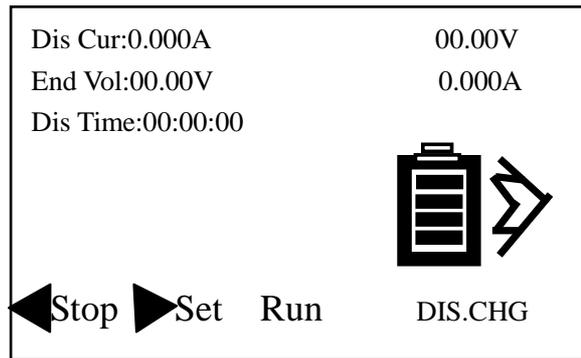
②、capacity is full, RMC= FCC;

③、constant charging stage, the current decreases to the minimum data.

④ In addition, when the setted charging parameters have been completed.

Discharging:

Choose DIS.CHG function in the main menu, then ENTER for discharging as below chart. There is discharging circuit inside, the highest discharging current supported is 1000mAh.



Discharging Current: the driving current of types of batteries are different. You can set the parameter as your needs. The operating details are: Enter the DIS CHG menu, then Right for SET, pressing ENTER into setting discharging parameters, when the characters are lighting, it means it is being chosen currently. The setted range is 0-4.0A, it can be setted by Input.

End Voltage: when the battery voltage decreases to an extent, its on-load capability also weakens. At this time, you have to set an end voltage for over-discharging protection. The detailed steps: choose SET option by Right Button, then Enter to set the parameters of discharging, and you can choose the data needed to correct by pressing Right, Down buttons. When the characters are lighting, which means it is being chosen presently. You can set end voltage by INPUT button, the setting range is 0-21V.

Discharging Time: You can set the discharging period as your need. The detailed steps: access to DIS.CHG main menu, choose SET option by Right button, ENTER to set the parameters of discharging. When the characters are lighting, which means it is being chosen presently. You can set the discharging period by INPUT button, the setting range is 0-16 hours.

Discharging Voltage: the data displaying on the screen.

Discharging Current: the data displaying on the screen.

After setting the parameters you need, then it goes to RUN status by pressing RIGHT button, and the indicator will be flashing in turn.

The tester has the discharging function with double loaders, which will help to shorten the discharging time period.

Internal loading: 1-1000mAh, you can set it by DIS CHG button.

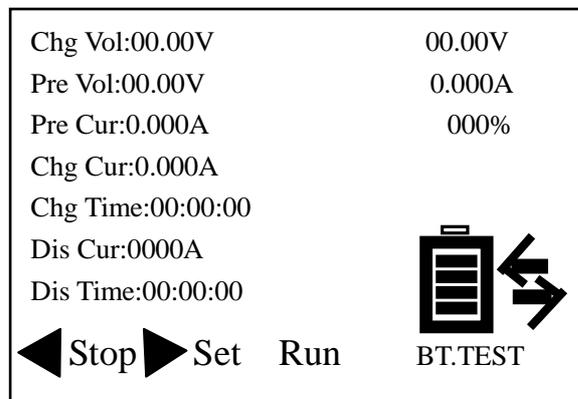
External loading: [300, 600, 900, 1200, 1500, 1800, 2100, 2400, 2700, 3000]mAh, 10 options, you can choose one of them by switch.

When one of the blow statuses appears, which means discharging completed.

- ① The current \cong the minimum driving loading current.
- ② the voltage \cong the setting point
- ③ when it is discharging to cut-off current.
- ④ In addition,the discharging status reaches to the setted point.Please pay attention that the discharging current is constant discharging.

4. BT.TEST

This function will check if the battery is able to be charged, discharged. The period can be setted manually according to your need. Please see the below chart.



Charging Voltage: the charging voltage must be higher than the maximum voltage of the battery. The detailed steps: access to the main menu of BT.TEST, then SET option by RIGHT button, ENTER to set the parameters. When the characters are lighting, which means it is being chosen presently.

Charging Voltage: The setted voltage must be higher than the maximum of the battery. The detailed steps: access to the main menu of BT.TEST, then choose SET option by RIGHT button, ENTER for setting the parameters. When the characters are lighting, which means it is being chosen presently. You can set the voltage by INPUT button in the range of 0-21V.

Pre-charge Voltage: when the voltage is lower than the pre-charging voltage, the battery will be into pre-charge stage.The charging current of this stage is lower.you can set the parameters as your need.The detailed steps:access to the main menu of BT.TEST, then choose SET option by RIGHT button, ENTER for setting the parameters. When the characters are lighting, which means it is being chosen presently. You can set the pre-charge voltage by pressing INPUT button in the range of 0-60V.

Pre-Charge Current: when the battery is on pre-charge stage, there will be very little current for pre-charging. You can set this parameter as your need. The detailed steps: access to the main menu of BT.TEST, then choose SET option by RIGHT button, ENTER for setting the parameters. When the characters are lighting, which means it is being chosen presently. You can set the pre-charge current by INPUT button in the range of 0-1.0A.

Charge Current: when the battery voltage is higher than pre-charge voltage, it will go into constant current charging stage. You can set the parameters as your need. The detailed steps: access to the main menu of BT.TEST, then choose SET option by RIGHT button, ENTER for setting the parameters. When the characters are lighting, which means it is being chosen presently. You can set the charge current by INPUT button in the range of 0-3.0A.

Charging Time: the detailed steps: access to the main menu of BT.TEST, then choose SET option by RIGHT button, ENTER for setting the parameters. When the characters are lighting, which means it is being chosen presently. You can set the charging time by INPUT button in the range of 0-16 hours.

Discharge Current: you can set this parameter as your need. The detailed steps: access to the main menu of BT.TEST, then choose SET option by RIGHT button, ENTER for setting the parameters. When the characters are lighting, which means it is being chosen presently. You can set the charge current by INPUT button in the range of 0-4.0A.

Charge Time: The detailed steps: access to the main menu of BT.TEST, then choose SET option by RIGHT button, ENTER for setting the parameters. When the characters are lighting, which means it is being chosen presently. You can set the pre-charge current by INPUT button in the range of 0-16 hours.

The current voltage will be displayed on the screen.

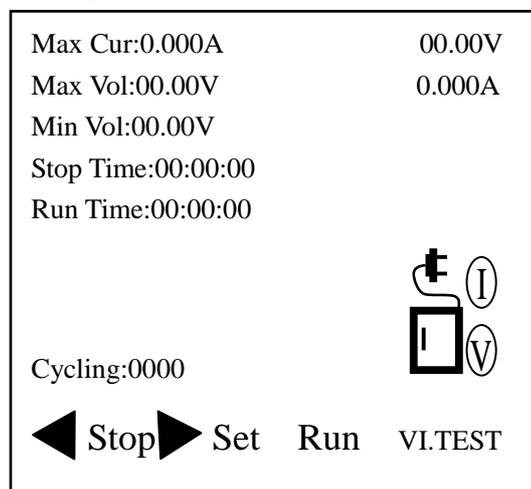
The current will be displayed on the screen.

The power capacity will be displayed on the screen.

You can set these data as your need. You choose RUN option by pressing RIGHT button, then ENTER into charging stage. The testing time period equals the setted charging time adds the setted discharging time. When it shows OK, which means it passes the testing, otherwise it shows NG and X on the test item.

The possible causes and measures for failure as below,

- 1) Setting the wrong parameters, you can try resetting.
 - 2) The battery voltage is over low, which causes discharge failed. You can try charging it firstly and test it later.
 - 3) The battery power capacity is high, which causes charge failed. You can try discharging it firstly and test it later.
 - 4) The connecting cable is disabled, you can try changing a new one.
 - 5) The tester does not work or the battery is disfunctional. You can repair the tester or replace a new battery.
5. **VI.TEST:** the tester will check if the power supply/adapter is able to meet the requirement by testing its current and voltage. Please see the below chart.



Max Current: you can set this parameter as per its rated current. The detailed steps:access to the main menu of VI.TEST, then choose SET option by RIGHT button, ENTER for setting the parameters of the power supply/adapter. When the characters are lighting, which means it is being chosen presently. You can set the max current by INPUT button in the range of 0-4.0A.

Max Voltage: you can set this parameter as per its rated voltage.The detailed steps:access to the main menu of VI.TEST, then choose SET option by RIGHT button, ENTER for setting the parameters of the power supply/adapter. When the characters are lighting, which means it is being chosen presently. You can set the max voltage by INPUT button in the range of 0-25V.

Min Voltage: you can set this parameter as per its rated lowest voltage. The detailed steps:access to the main menu of VI.TEST, then choose SET option by RIGHT button, ENTER for setting the parameters of the power supply/adapter. When the characters are lighting, which means it is being chosen presently. You can set the min voltage by INPUT button in the range of 0-24V.

Stop Time: power supply/adapter working time period without loader.

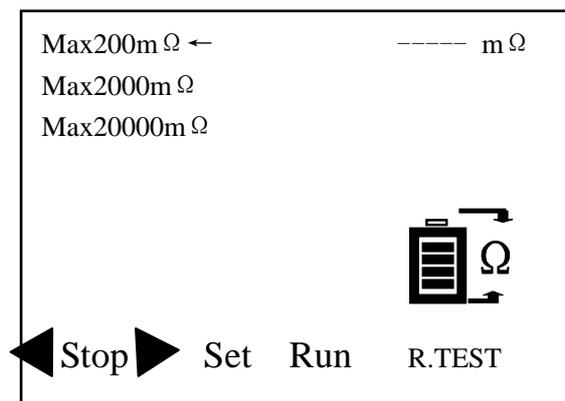
Running Time: power supply/adapter working time period with loader.

Recycle Time: Stop/Run cycle times. The testing time period equals to stopping time and running time. When the cycled time is setted to 0, the defaulted is 1, which means the recycle time is N+1.

You can set this parameter as per your need. You can choose the RUN option by pressing RIGHT button, then ENTER into power supply/adapter test status, the test time period equals to charge time adds discharge time. When it shows OK, it means it pass the test, otherwise it shows NG and X behind the tested item.

main menu of VI.TEST, then choose SET option by RIGHT button, ENTER for setting the parameters of the power supply/adapter. When the characters are lighting, which means it is being chosen presently. You can set the max voltage by INPUT button in the range of 0-25V.

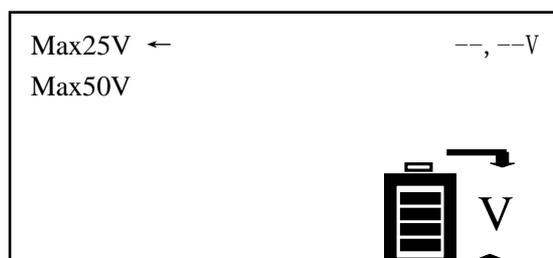
6. R.TEST



Enter the R.TEST menu and selected SET by RIGHT button, press ENTER button to enter the parameter setting menu, then choosing the right resistance stalls by DOWN button and press ENTER button to select it . Setting range is 200mΩ~20000mΩ

Customer should estimate the right resistance stalls, then select Run item to start the testing. The result displayed on the left corner of screen.

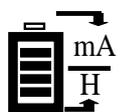
7. Voltage testing (V.TEST)





Enter the V.TEST menu and selected SET by RIGHT button, press ENTER button to enter the parameter setting menu, then choosing the right resistance stalls by DOWN button and press ENTER button to select it . Setting stalls have 25V and 50V
Customer should estimate the right voltage stalls , then select Run item to start the testing. The result displayed on the left corner of screen.

8. Capacity Test (C.TEST)

Mode:Dis	00.00V
Dis Cur:1.000A	0.000A
End Vol:03.00V	
Run Time:00:00:00	
Max Cap:00000maH	
	
Stop ◀	Set ▶
Run	C.TEST

Discharge Mode

Mode:Chg	00.00V
Chg Cur:1.000A	0.000A
Chg Vol:00.00V	
End Cur:0.000A	
Run Time:00:00:00	
MaxCap:00000maH	
	
◀ Stop	Set ▶
Run	C.TEST

Charging Mode

Enter C.TEST menu, Selected SET and press ENTER button into Capacity testing parameter set

menu, Choosing your target item to modify the parameter by RIGHT ,DOWN buttons, the chose character will blink. Press INPUT to switch the testing modes. Capacity test have Dis-charge(DIS) and Charge(CHG) 2 modes.

A. DISCHARGE MODE

Discharge current : to discharge the current from the battery, Setting the parameter of dis-current depends on the maximum drive current of battery.

Operation menu: Entering the C.TEST parameter setting menu and selected SET and press ENTER button into Capacity testing parameter set menu, Choosing the Mode item to modify the parameter by RIGHT ,DOWN buttons, the chose character will blink. Press INPUT button to choose DIS mode and choose the right dis-current by RIGHT, DOWN buttons. The parameter setting range is 0A to 4A (max.)

End Voltage: All battery have over-discharge protection function and its parameter can be reset.

Operation menu: Entering the C.TEST parameter setting menu and selected SET and press ENTER button into Capacity testing parameter set menu, Choosing EndVol item to modify the parameter by RIGHT ,DOWN buttons, the chose character will blink. Press INPUT button to EndVol item to set dis-current by RIGHT, DOWN buttons. The parameter setting range is 0V to 21V (max.).

Run time: Log the running time of the current mode

Max Cap: display the real-time capacity.

Voltage : display the real-time battery voltage

Current: display the real-time battery current

B. CHARGE MODE

Charge current: When the voltage of battery is biggest than pre-charge voltage, then battery is in the charging process, the parameter is pre-set by customer as fast charge volume. According to the battery capacity, current, voltage to reset the parameter.

Operation menu: Entering the C.TEST parameter setting menu and selected SET and press ENTER button into Capacity testing parameter set menu, Choosing CHG item to modify the parameter by RIGHT,DOWN buttons, the chosen character will be blinking. Press INPUT button to CHG item to set Charge current by RIGHT, DOWN buttons. The parameter setting range is 0A~3.0A (max.).

Charge Voltage: To charge the battery ,the input voltage must bigger than internal voltage, According to the battery capacity, current, voltage to reset the parameter.

Operation menu: Entering the C.TEST parameter setting menu and selected SET and press ENTER button into Capacity testing parameter set menu, Choosing DIS item to modify the parameter by RIGHT ,DOWN buttons, the chose character will blink. Press INPUT button to DIS item to set Charge current by RIGHT, DOWN buttons. The parameter setting range is 0V~21V (max.). The Customer should set the parameter according to the battery's capacity, voltage.

End Current: When the battery into the constant voltage charging mode, the charging current will reduce it to the pro-set end charging parameter. Then the charging is end. According to the battery capacity, current, voltage to reset the parameter.

Operation menu: Entering the C.TEST parameter setting menu and selected SET and press ENTER button into Capacity testing parameter set menu, Choosing DIS item to modify the parameter by RIGHT ,DOWN buttons, the chose character will blink. Press INPUT button to DIS item to set Charge current by RIGHT, DOWN buttons. The parameter setting range is 0A~9.999A (max.). The Customer should set the parameter according to the battery's capacity, voltage.

Run time: Log the running time of the current mode

Max Cap: display the real-time capacity

Voltage : display the real-time battery voltage

Current: display the real-time battery current

Customer should set the parameter according to the real capacity ,voltage, current, then selected the Run item by RIGHT button and press ENTER button into the capacity testing mode, press ENTER again to stop the testing.

9、System Information

You can get the information about the manufacturer as below.

RFNT4	2012/12/05
TEL:86-755-83107575	
86-755-83107832	
FAX:86-755-83107020	
HTTP://WWW.POLOSO.COM	
EMAIL:POLOSO@POLOSO.COM	

■Active

When the battery or power supply/adapter discharge fully, the protection board will start the

discharge protection function, the interface voltage will be zero, which may cause it cannot be communicated normally. At this time, it needs to be charged in proper voltage till it is activated and automatically into normal communication.

■ Intelligent Protection

Over-current protection: normally the current and voltage are both limited. The output current will be less than 3A even there is circuit fault.

Over-voltage protection: on normal condition, current and voltage within limited. Even if this part fault, the fuse of output port also can protect the output current less than 3A.

Short-circuit protection: when counter-connect the battery or short -circuit, there is no power output

Over-temperature protection: intelligent fan control, when inner temperature of machine above 50°C, cooling fan start working automatically.

When machine working, fan start working; when temperature above 50°C, fan start working automatically.

■ Clear Parameters Setting

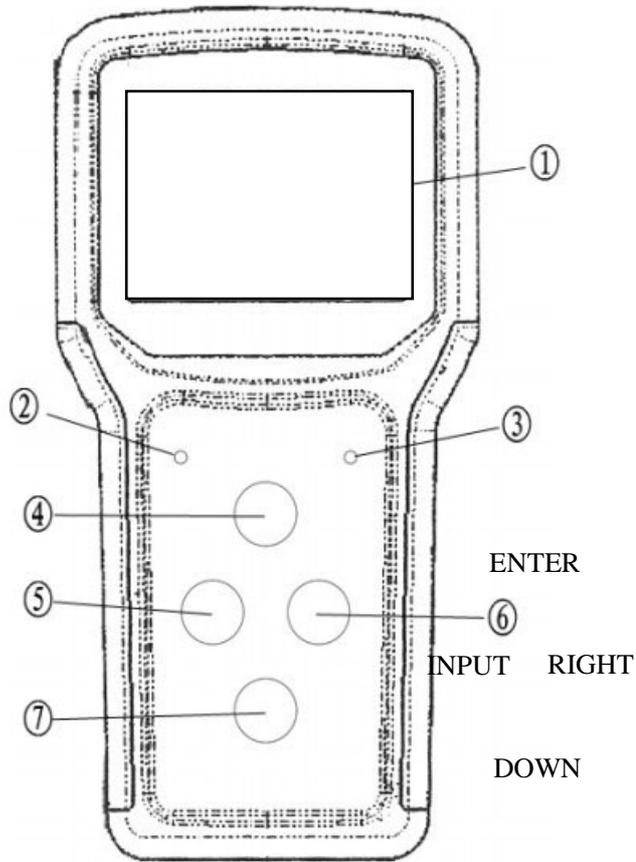
Before connecting to power supply, press “Enter”, ”Input”, “ Down”, “ Input”, four buttons at the same time, when connect to power supply, machine will clear all setting parameters.

■ Restore the factory settings

Before connect to power supply, press “Input”, “Input” two buttons at the same time, when connect to power supply, system will restore all setting parameters to factory settings.

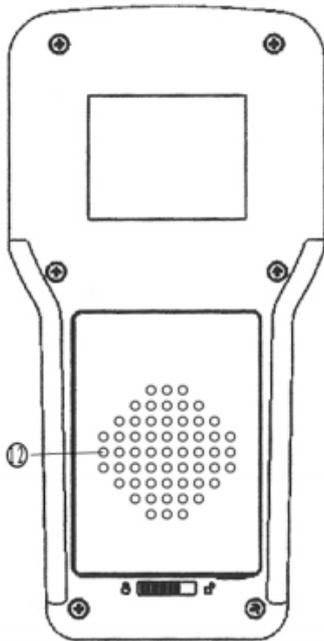
Structure

Front Panel



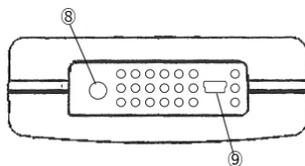
- ① segment LCD, main menu display panel
- ② monochrome LED, red (reserved)
- ③ monochrome LED, green(reserved)
- ④ Enter
- ⑤ Input: adjust button, has double functions: when in the main menu, it's left shift button; when in test submenu. It's modification parameter function
- ⑥ Right:right shift
- ⑦ Down:down shift

Back Panel



(12) Heat dissipation holes

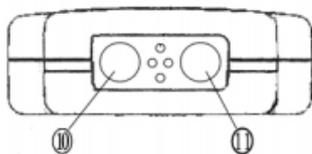
Top Panel



⑧ 24V/3A DC input port

⑨ Mini USB resistance test port

Bottom Panel



⑩ Connecting battery holder port

(11) Connecting external load port

Accessories

- 1 x loader
- 1 x adapter

- 1 x battery holder
- 1 x connecting wire of battery holder
- 1 x resistance testing wire
- 1 x load connecting wire
- 1 x User Manual

Cautions

- Use the adapter of our tester. Nonstandard adapters might lead to working disability, or damage the tester and batter.
- The product is good for indoors. Do not expose and use it in outdoors.
- Don't use it on dust space.
- Do not keep the product under the direct rays, beside the hot devices or in other hot environment.
- Keep machine on a flat surface when using, avoid the louver be blocked.
- When using, adapter connect to power supply, then tester connect to adapter.
- If long time no use, please pull out adapter.
- Do not disassemble or assemble the product by yourself.
- Don't use it when none available, avoid the fire.