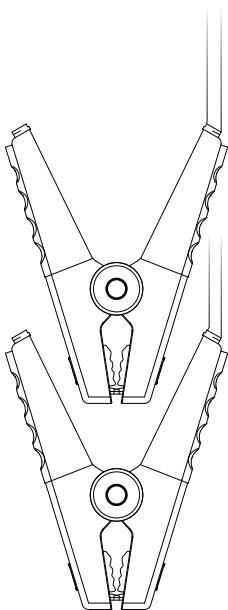


FNIRSI™

BTM-24

BATTERY TESTER MANUAL

V1.0



※Please read this instruction manual carefully before using the product and keep it properly.

CONTENTS

1. SAFETY REQUIREMENTS	>>>	16
2. PRODUCT OVERVIEW	>>>	18
3. TECHNICAL SPECIFICATIONS	>>>	27
4. OPERATION GUIDE	>>>	30
5. QUICK START	>>>	31
6. TROUBLESHOOTING	>>>	31
7. MAINTENANCE	>>>	32
8. CONTACT US	>>>	33
9. WARRANTY INSTRUCTIONS	>>>	34
WARRANTY CARD	>>>	Last Page

1.SAFETY REQUIREMENTS

1.1 Environmental Requirements

Precautions

- Avoid high temperatures, open flames, corrosive gases, humid or dusty environments to prevent equipment failure.
- Testing should be carried out in well-ventilated places, and avoid using in closed, narrow and airless spaces to prevent the accumulation of flammable gases such as hydrogen released by the battery and reduce the risk of explosion.
- Avoid using near strong electromagnetic fields, large motors, transformers, etc. to prevent electromagnetic interference from affecting the normal operation of the tester and the accuracy of the test data.
- Check whether the insulation layer of the test wire clamp, cable, etc. is intact, without damage, exposure or broken wires, ensure that the connection is firm and the contact is good, and avoid looseness and virtual connection that may cause heating and sparking.
- When testing car batteries and other potentially dangerous scenes, it is recommended to wear protective equipment such as goggles to prevent battery electrolyte from splashing and injuring the eyes, or to prevent foreign objects from flying into the eyes with the engine.
- It is strictly forbidden to plug and unplug the connection terminals, replace the battery, etc. when the battery or tester is powered. The power must be cut off first, and the corresponding operation can be performed after the voltage returns to zero.
- Before use, check that the appearance of the tester is not damaged, the display screen is normal, the button operation is

sensitive, and there is no short circuit, open circuit or other faults in the internal circuit. Calibrate and maintain the tester regularly to ensure that its measurement accuracy and performance meet the requirements.

 Keep away from the following items:

- Heaters: Avoid overheating or fire risks.
- Air conditioning outlets, high humidity environments: Avoid equipment working in humid environments.
- Water sources, chemicals: Solvent leakage may damage the equipment or cause a fire.
- Strong magnetic equipment: Prevent magnetic fields from interfering with the normal operation of the equipment.

 Waste Disposal

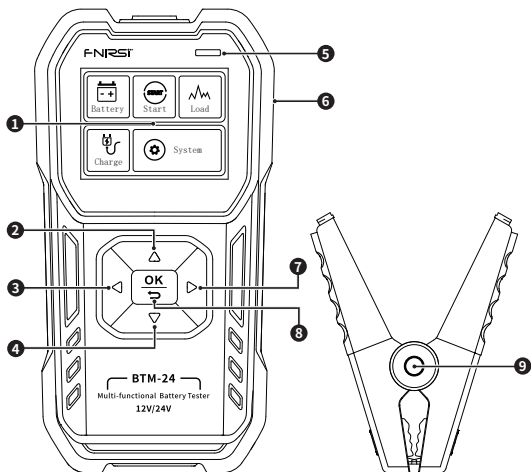
Do not discard used batteries or meters with household waste. Dispose of in accordance with national or local regulations.

2.PRODUCT OVERVIEW

2.1 Product Introduction

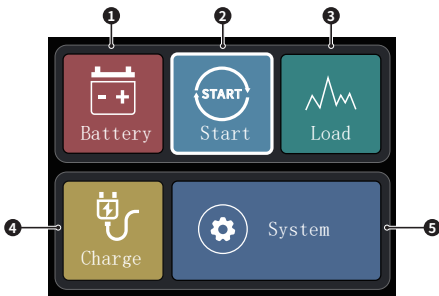
BTM-24 is a battery tester that ensures the stable operation of various types of batteries. It is a professional device that can accurately detect multiple key indicators of batteries and provide a scientific basis for judging their health status. It is mainly used in the automotive industry, power industry, communications industry, industrial equipment, medical equipment and other occasions. The device supports real-time monitoring functions such as battery measurement, startup measurement, load detection, and charging measurement.

2.2 Product operation



- ① **Screen Display Area:** This area displays the device operation content.
- ② **Select the upper button:** Press the upper button to operate, and long press the function interface to exit.
- ③ **Select the left button:** Press the left button to operate.
- ④ **Select the lower button:** Press the lower button to operate.
- ⑤ **Alarm indicator:** When the measured value is lower than the standard value, the alarm indicator flashes red.
- ⑥ **Type-c interface:** used for firmware upgrade.
- ⑦ **Select the right button:** Press the right button to operate.
- ⑧ **Confirm return button:** Confirm operation button, automatic measurement button, return operation button.
- ⑨ **Detection clip:** Red and black detection clip, used to connect the detection battery port.

2.3 Battery Tester Main Page



- ① **Battery Measurement Module:** Detect the battery voltage of the battery, support 6 standards for detection standards, and detect internal resistance.
- ② **Startup Measurement Module:** Detect the battery dynamic voltage, startup voltage detection, and reference table standards of the battery.

- ③**Load Measurement Module:** Detect the battery dynamic voltage, minimum voltage detection, and reference table standards of the battery.
- ④**Charging Measurement Module:** Measure the battery charging, and the measurement data include dynamic voltage, minimum voltage, maximum voltage, etc.
- ⑤**System Measurement:** Functions include "language settings, theme mode switching, factory reset", etc.

BUTTON	OPERATION	FUNCTION
OK 	Short press	Confirm the operation button, which is the measurement button in the function interface
	Long press	Operation return button
	Short press	Execute the corresponding button operation, up, down, left, and right
	Long press	Long press the operation up button to exit the corresponding function module

2.4 System Settings

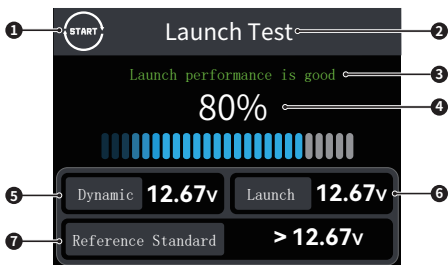


- ①**Language Settings:** The device supports Simplified Chinese/English language switching.

- ②**Theme Mode Switching:** The device supports day mode/night mode theme switching, which is convenient for users to change the display theme according to the environment.
- ③**Factory Reset:** Contains device information version number, device model and factory reset.

BUTTON	OPERATION	FUNCTION
	Short press	Confirm operation button
	Long press	Operation return button
	Short press	Execute the corresponding button operation, up, down, left, and right
	Long press	Long press the operation up button to exit the corresponding function module

2.5 System Settings

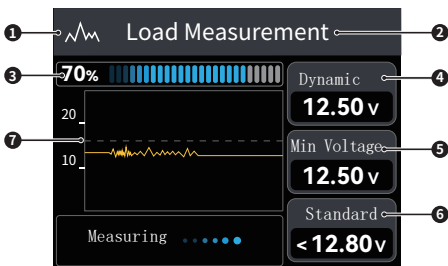


- ①**Start Measurement Icon:** This area indicates that the device enters the start measurement function.
- ②**Start Measurement Indicator Area:** This area displays the current functional status of the device.
- ③**Detection Judgment:** Make corresponding judgments based on the current battery detection value.

- ④ **Measurement Percentage:** This area displays the measurement percentage.
- ⑤ **Dynamic Voltage:** The voltage data measured by the device in real time and displayed.
- ⑥ **Start Voltage:** The voltage data recorded by the device detection.
- ⑦ **Reference Standard:** The device performs standard matching based on actual measurements and gives the corresponding standard value.

BUTTON	OPERATION	FUNCTION
OK ↶	Short press	Measurement Button
	Long press	Operation Return Button
⬆ ⬇ ⬆	Long press	Long press the upper button to exit the corresponding function module

2.6 Load Measurement

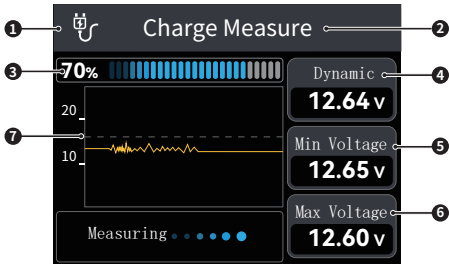


- ① **Load Measurement Icon:** This area indicates that the device has entered the load measurement function.

- ②**Load Measurement Indicator Area:** This area displays the current functional status of the device.
- ③**Measurement Percentage:** Displays the percentage measured by the device.
- ④**Dynamic Voltage:** The voltage data measured by the device in real time is displayed.
- ⑤**Minimum Voltage:** The minimum voltage measured by the device is recorded and displayed.
- ⑥**Reference Standard:** The device matches the standard according to the actual measurement and gives the corresponding standard value.
- ⑦**Curve Recording and Display Area:** The measured data is represented by a curve for data visualization.

BUTTON	OPERATION	FUNCTION
	Short press	Measurement Button
	Long press	Operation Return Button
	Long press	Long press the upper button to exit the corresponding function module

2.7 Charging Measurement

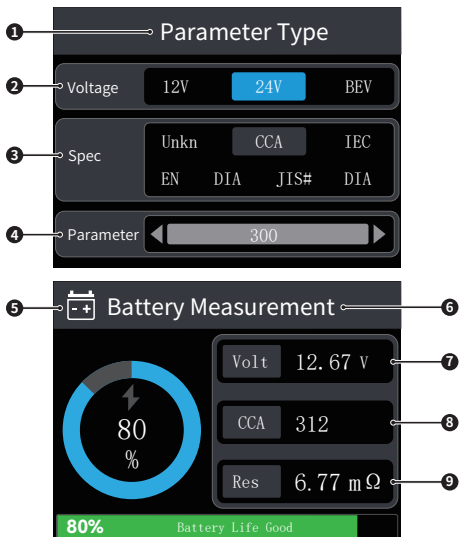


- ①**Charging Measurement Icon:** This area indicates that the device has entered the charging measurement function.
- ②**Load Measurement Indicator Area:** This area displays the current device charging performance.
- ③**Charging Performance Percentage:** Displays the percentage measured by the device.
- ④**Dynamic Voltage:** The voltage data measured by the device in real time is displayed.
- ⑤**Minimum Voltage:** The minimum voltage measured during the device measurement is recorded and displayed.
- ⑥**Maximum Voltage:** The maximum voltage measured during the device measurement is recorded and displayed.
- ⑦**Curve Recording and Display Area:** The measured data is represented by a curve, and the data is visualized.

BUTTON	OPERATION	FUNCTION
OK ↺	Short press	Measurement Button
	Long press	Operation Return Button

BUTTON	OPERATION	FUNCTION
	Long press	Long press the upper button to exit the corresponding function module

2.8 Battery Measurement



- ① **Battery Measurement Indicator Area:** This area displays the current functional status of the device, and the current setting is the battery type.
- ② **Battery Voltage Setting:** You can set 12V, 24V and electric vehicles, etc.

- ③**Reference Standard Selection:** You can choose unknown, CCA, IEC, EN, DIN, JIS#, GB, etc.
- ④**Battery Parameters:** CCA optional parameters 0~2000.
- ⑤**Battery Measurement Icon:** This area indicates that the device enters the battery measurement function.
- ⑥**Battery Measurement Indicator Area:** This area displays the current functional status of the device, and the current setting is battery measurement.
- ⑦**Measured Voltage:** The battery voltage measured by the device in real time.
- ⑧**Standard Selection:** Displays the standard type and measurement standard value.
- ⑨**Measured Internal Resistance:** The battery internal resistance measured by the device in real time.

BUTTON	OPERATION	FUNCTION
	Short press	Confirm the function button to confirm the current battery type setting, and short press it again to switch to the measurement function button
	Long press	Operation return button
	Short press	Select function buttons: up, down, left, right. In the battery parameter setting input box, you can long press the left and right buttons to quickly set parameters
	Long press	Long press the up button to exit the corresponding function module

3. TECHNICAL SPECIFICATIONS

3.1 Model Parameters

PARAMETERS	FUNCTION DESCRIPTION
Screen material	2.4-inch color screen
Language	Chinese, English
Product size	80.52*155.76*28.15mm
Bare weight	≈479g

3.2 Measurement Parameters

BATTERY TEST PARAMETERS	
Battery life is low	0-60%
Battery life is average	60%-80%
Battery life is good	80%-100%

※Note: Before testing, turn off the engine and turn the key to the OFF position while the car is running.

STARTUP TEST PARAMETERS	
Current startup performance is good	Startup voltage is above 10.2V
Current startup performance is poor	Startup voltage is 9.6~10.2V
Current startup performance is extremely poor, please check the circuit aging or charging	Startup voltage is less than 9.6V

※Note: Before testing, turn off the engine and turn the key to the OFF position while the car is running.

LOAD TEST PARAMETERS

Load voltage is within the normal range	Minimum voltage is greater than 13.4V (24V system is greater than 25.6V)
Battery voltage is less than 12.8V, please check the generator and wires	Minimum voltage is less than 12.8V (24V system is less than 25.6V), need to check whether the generator belt is worn and whether the wire is short-circuited

※Note: Before the test, start the car, select the load test mode, press the OK button, increase the speed to 2000~2500, and then press the OK button to obtain the measurement results.

CHARGING TEST PARAMETERS

Battery voltage is too high, please check the voltage regulator		Maximum voltage is greater than 15.0V (greater than 30.0V for 24V system), need to check the voltage regulator
Battery voltage is too low, please check the connection points, wires and generator		Minimum voltage is less than 13.3V (less than 26.6V for 24V system), check the connection points, wires and generator
Battery voltage is normal,	generator performance is excellent	Dynamic voltage>13.9V (24V system>27.8V)
	generator performance is good	Dynamic voltage>13.7V (24V system>27.4V)
	generator performance is normal	Dynamic voltage>13.5V (24V system>27.0V)
	generator needs to be observed	Dynamic voltage>13.3V (24V system>26.6V)

3.3 Standard Selection Parameters

Example of Standard Selection:

BATTERY IDENTIFICATION	STANDARD SELECTION	BATTERY PARAMETERS	REMARKS
12V/60Ah/ CCA 500A	CCA	300	12V battery, capacity 60Ah, cold start current 500A
300A EN	EN	300	EN standard value is 300A
12V 250A 60Ah DIN	DIN	250	12V battery, capacity 60Ah, DIN standard value is 250A
26A 19RMF 12V 60Ah	JIS#	200	12V battery, capacity 60Ah, check JIS code conversion 26A19R corresponding CCA is 200
26A 19RMF 12V 60Ah	JIS#	200	12V battery capacity 60Ah check JIS code conversion 26A19R corresponding MF CCA is 220
12V 60Ah	Capacity	60Ah	Estimate the CCA value based on the battery capacity. This method is used when the standard cannot be found

※Note: Users can also estimate CCA value based on vehicle displacement

VEHICLE DISPLACEMENT	REFERENCE CCA VALUE
1200~1600 CC	350
1600~2000 CC	500
2000~3000 CC	650
3000cc and above	750

4、OPERATION GUIDE

4.1 Power on the device

- Connect the device test clip to the corresponding terminal of the battery. After the connection is completed, the battery tester is powered on. Start to enter the main function interface.
- Or connect the side interface of the device to the Type-c power cable. After the connection is completed, the battery tester is powered on. Start to enter the main function interface.

4.2 Language Setting

- When the device is powered on, in the main interface, short press the button selection area to select system measurement, short press the OK confirmation button to enter system measurement, and short press the OK confirmation button again to switch the language. The device supports two languages: Chinese and English.

4.3 Setting Battery Type

● Entering Battery Type Setting

When the device is powered on, on the main interface, short press the button selection area to select battery measurement, short press the OK confirmation button to enter the battery measurement, and the current interface after entering is the battery type setting interface.

● Setting Battery Type

After entering the battery type setting interface, you can set the battery voltage, standard selection, battery parameters, etc., select the corresponding option by pressing the button, select the function option by pressing the up and down buttons, and select and set the parameters by pressing the left and right buttons.

5. QUICK START

5.1 Quick Measurement

- Connect the red and black test clips of the device to the battery to be tested and start the device. Enter the test function.
- Select the corresponding function to perform. The functional tests supported by the device include battery measurement, startup measurement, load measurement, charging measurement, etc. Battery-related measurements can be performed.
- View the measurement data on the screen to understand the status of the battery currently being tested.

5.2 Firmware Upgrade

- If the device is not powered on, press and hold the down button and then power it on. At this time, the device will pop up the firmware update interface. Insert the USB Type-c data cable to connect to the computer and enter the firmware update interface to upgrade the firmware.
- After entering the firmware update interface, the computer recognizes the USB flash drive and directly copies the firmware file to the USB flash drive.
- In the firmware update interface, press and hold the down button to start the device.

6. TROUBLESHOOTING

6.1 Unable to boot

● Possible reasons:

- The Type-C interface is damaged or loose.
- The battery is not connected properly or the connection cable is aging.

●Solution:

- Check whether the interface is in good condition.
- If the device still cannot be turned on after changing the connection interface or connecting the test clip, the battery is exhausted. You can try to replace the battery.
- After the above operations, if the device still fails to start, the device may be damaged. It is recommended to repair it or contact the manufacturer.

6.2 Unable to display

●Possible reasons:

- The device is not powered on.
- The display hardware may be faulty.
- A system software error might be preventing proper display.

●Solution:

- Verify that the device is properly connected to a power supply.
- Try turning the device off and then on again to reset the system.
- If the problem persists, the display may need repair or replacement.

7.MAINTENANCE

Cleaning the outside of the device

●Frequency: Clean once a month, depending on the usage environment.

●Method: Gently wipe the surface of the device with a soft cloth. Avoid using chemical cleaners, especially those containing alcohol or strong acids or alkalis, to avoid damaging the casing or screen.

●Note:

- Regularly clean the dust around the device and buttons to keep the device in good condition.
- Ensure that no liquid, dust or debris enters the device interface.

Storage and Carrying

- **Storage environment:** The instrument should be stored in a dry and ventilated environment, avoiding high temperature, high humidity or drastic temperature changes. Avoid placing it in direct sunlight.
- **Carrying:** Be careful to avoid dropping it when using it, especially when carrying it.

Software Update

- Regularly check whether the device has new firmware updates. The latest firmware can fix known bugs and improve device performance.
- When updating, ensure that the operation steps are correct, use the officially released firmware files, and avoid power outages or other interference.

Restore factory settings

- If the device is abnormal or does not work properly, try to restore the factory settings. After restoring the settings, the device will clear all custom configurations and return to the initial state.
- For methods to restore factory settings, please refer to the user manual or contact the manufacturer's customer service.

8.CONTACT US

Product Name: Battery Tester

Brand/Model: FNIRSI / BTM-24

Manufacturer: Shenzhen Fnirsi Technology Co., Ltd.

Address: 8th Floor, West Side, Building C, Weihua Da Industrial Park,
Dalang Street, Longhua District, Shenzhen, Guangdong

Service Hotline: 0755-28020752

Service Email: support@fnirsi.com

Business Email: business@fnirsi.com

Official Website: www.fnirsi.com

Execution Standard: GB/T 31484



<http://www.fnirsi.com/>

9.WARRANTY INFORMATION

※This page is the basic warranty card. Please keep it.

Thank you for choosing our company's products. The warranty period of this product starts from the date of sale. During the product warranty period, if the product is installed and used in accordance with the product manual and used in normal environment and conditions, and the fault is caused by defects in the original materials and processing, you can enjoy free repair services according to the content of this warranty clause. Please keep this warranty card properly as a warranty certificate. No reissue will be issued if it is lost.

The following situations will incur paid repair services:

- Unable to present the original valid warranty card.
- Damage caused by improper installation not meeting product requirements, standards, or relevant specifications.
- Damage caused by accessories in the installation environment not meeting product requirements, standards, or relevant specifications.
- Damage caused by improper use, improper storage, unauthorized disassembly, or unauthorized repairs by the user.
- Expiration of the warranty period.