BM6018
Battery Tester-Charger-Discharger-Maintainer

User Manual

REV1.3

Revision Date：February 2024

Features

BM6018 is an intelligent instrument that integrates the four functions of battery testing(analyzing), charging, discharging and maintenance. It is designed with a portable plastic shell, and with color TFT displayer and silicon touch keys.

The BM6018 is a powerful assistant for electronic engineers. It can be used to perform performance testing, capacity testing, characteristic curve measurement, and activation and maintenance of long-term storage batteries for various commonly used rechargeable batteries.

BM6018 is widely used for performance testing and routine maintenance of most rechargeable batteries in many portable electronics/electrical devices (such as smart phone, tablet PC, drone, e-bike, e-scooter, power tool, car …). Battery voltage range is 2V ~ 16V capacity range 1Ah~100Ah, and battery types cover Li-ion /LiFePO4 /Pb-Acid /NiMH.

The four main functions are

1. **Charging**: can set constant current & constant voltage for charging process.
2. **Discharge**: can set constant current value & cut-off voltage for discharging.
3. **Test/analyze**: can measure battery voltage, internal resistance, SOC, SOH, true effective capacity Ah value and charge/discharge curves.
4. **Maintenance**: for the battery that has been left standing or in standby for more than 6 months, do a auto maintenance process to keep or recover battery good active capacity and health life.

Input of BM6018 is AC100~240V, universal global voltage range. The adjustable range of output constant current charging current is 0.4A~4.0A ; The charging limit voltage and the discharge cut-off voltage can also be adjusted under 3V~18V. It has a variety of abnormal safety protection measures such as battery reverse connection, wrong connection, short circuit, overvoltage, undervoltage, over-current and over-current heat.

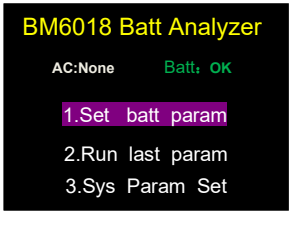
BM6018-BL has Bluetooth function, through which users can view the historical charging and discharging data and curves with their phones or PC.

View of product

Battery cable connector
LCD Displayer
Battery clips
Buttons：
Enter: functions/confirm
Up: increase/page up
Down: decrease/page down
AC Input port
Battery Charger&Tester
25.2V 30Ah 铁锂电池
SOC 电量: 18%
SOH 状态: 良好
放电中
电池内阻: 5.2mΩ
12.4 V
运行时间: 5h33m
5.50 A
放出容量: 22.5Ah
Enter
Charger
Discharg
Analyser
Maintain

How to use

1.Connect battery: Please make sure the voltage of the battery un does not exceed 18V, find red and black alligator clip cable, insert it's yellow plug to BM6018, let red clip connect to positive pole of battery, and black clip connect to negative pole.If the battery is connected correctly and there is still electricity in the battery, the LCD screen of BM6018 will be following displayed.

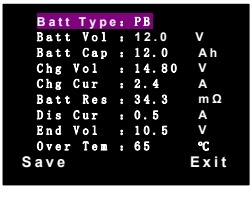


2. Connect AC power: If you only want to test battery parameters quickly, you can skip to step 3 directly, without connecting to AC power.To charge, discharge and maintain battery, or accurately measure the battery capacity Ah value and healthy SOH value, please insert mains power (AC100V~240V), if AC power is connected, LCD displays the following information:

Note: Following examples are all based on 3.6V 8000mAh Li-ion battery.

3.Set Battery Parameter: BM6018 can be used for many types batteries. To get the accuracy test results and charge safety, at first you should set the connected battery parameters. ***If the battery connected is the same as last time, please refer to Clause 3.2; Otherwise, please execute the following***

3.1 select [1. Set battery param] (When the background of this item is highlighted, it means selected, the same below), press <Enter> Key , screen will be:



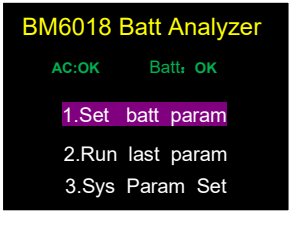
[Battery type]: Select of one from LiFePO4, Li-Ion, Pb-Acid, NIMH, NICD,

[Battery voltage]: Select battery nominal voltage from 2.0V ~ 16V, marked on battery label.

[Battery capacity]: Input the Ah value of battery capacity, which is marked on battery label.

[Charge voltage]: Charge voltage limit during charging process, marked on battery label.***This step can be skipped, BM6018 will auto set a good default data.***

[Charge current]: Set a constant current for charging process, recommend is 0.1C~0.5C.***This step can be skipped, BM6018 will auto set a good default data.***



[Battery in-resist]: Set the battery internal resistance, which is listed on battery datasheet.This data is only used for evaluate battery SOH. If you have no data,***this step can be skipped, BM6018 will auto set a general default data.***

[Dischar current]: Set a constant current for discharge process, recommend is 0.1C~0.5C.***This step can be skipped, BM6018 will auto set a good default data.***

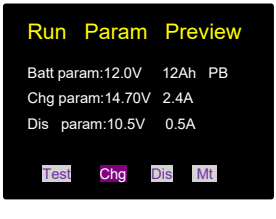
[Dischar cut-off]: Set cut-off voltage for discharge process. Recommend is 0.8*rating voltage.***This step can be skipped, BM6018 will auto set a good default data.***

Note: [Battery type], [Battery voltage], and [Battery capacity] is necessary forsetting process, the rest 5 items can be skipped if you have no special request.***Press <Up> or <Down> keys to highlight the items, press <Enter> key to Confirm selection, then press <Up> or <Down> change data, press<Enter> when the data is correct as you wanted. After that, press <Save>. Then screen will enter 3.3 step.***

3.2 Select [2. Run last param], if the battery data is same as last time for BM6018.

Press <Up> or <Down> keys to highlight the items, press <Enter> key to Confirm selection, ***Then screen will enter 3.3 step.***

3.3 After done 3.1 or 3.2 step, screen will be following:



If the parameters are correct, users can select the four listed in the menu according to their task requirement functions. Use <Up>, <Down> and <Enter> to select and run.If errors are found in the preview parameters, please press <Enter> for more than 2 seconds, and the system will return to the home page to reset battery parameters.

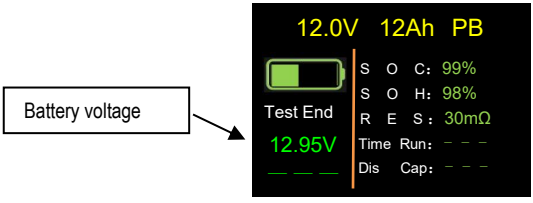
4. Main functions

4.1 [Test]: Measure battery voltage, internal-resistance, SOC and SOH within 5 seconds.

SOC, means State-of-charge of battery, range is 0 ~ 100%.

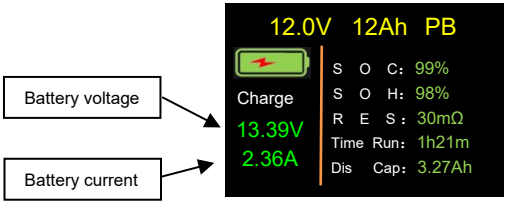
SOH, means State-of-health of battery, range0~100%.

Run [Test] function, after 5 seconds, screen will display test results:

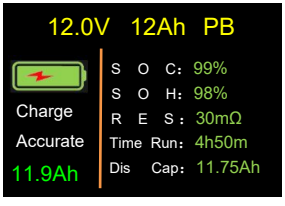


The fast tested SOC percentage is built based on the measured battery voltage and equipment learning. This SOC is calculated by looking up the voltage-SOC table. This fast tested SOC error may be relatively higher.The fast tested SOH, battery health status, is also based on the tested internal resistance of battery. This SOH is calculated by looking up the resistance-SOH table.This fast tested SOC error also may be relatively higher.To obtain accurate SOC and SOH, please select [Maintenance] function and run a cycle.

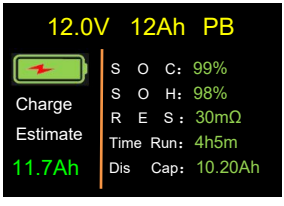
4.2 [Charge]: According to the selected battery type and charging parameters, the system automatically calls the best charging process curve. When charging, the LCD displays the following information:



After battery is fully charged, the display screen will two different display contents:

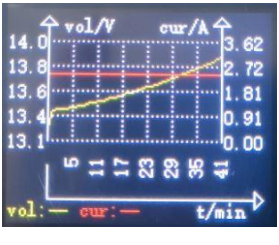


When you charge battery from empty state, after full charged, you will get an accurate capacity.



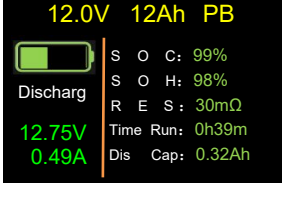
When you charge battery from non-empty state, after full charged, it can get an estimated capacity

After the battery is fully charged, to view the charging curve of the battery, please press <Up> Key, screen will display the complete battery charging curve, as follows:

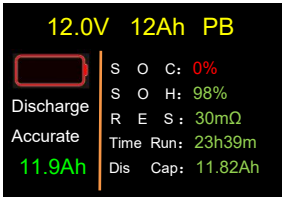


Press <Up> or <Down> key again, you can switch the graph and list pages alternately

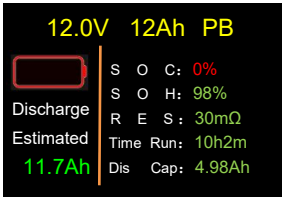
4.3 **[Discharge]**: Automatically discharge according to the selected parameters;During discharging process, screen will be following view:



After the battery is emptied, the display screen will There are two different display contents:

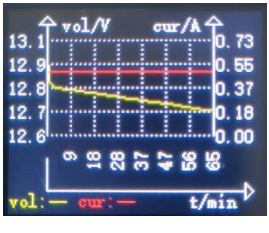


When discharge battery from full charged state, after discharged empty, it will get an accurate capacity.



When discharge battery from non-full state, after discharged empty, it will get an estimated capacity.

After the battery is fully charged, to view the charging curve of the battery, please press <Up> Key, screen will display the complete battery charging curve, as follows:

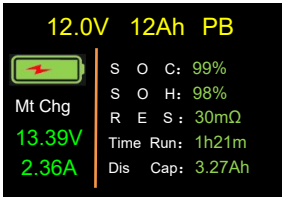


Press <Up> or <Down> key again, you can switch the graph and list pages alternately

4.4 **[Maintain]:** Automatic maintenance based on selected battery parameters:For batteries that have been idle for more than 6 months or have been floating charged for a long time, it should be regularly (preferably every 6 months or so)standard charging and discharging maintenance process. The standard maintenance procedure is to use 0.2C current first fully charge the battery - then drain the battery with 0.1C current - then use 0.1C charge current to full fill the battery. After finished this maintenance process, the vitality, the life time and the effective capacity of battery will be protected and improved to the maximum.

After starting the automatic maintenance function, the LCD screen displays the status message of

"Maintain **", here ** refers to CH--charging, DS--discharging, OK-- completion all maintenance jobs.Examples are as follows:



Generally, a complete maintenance process takes about 30 hours. After the process is completed, the battery capacity Ah value is the most accurate. Press <Up> key, the display screen will display the recorded complete battery charging/discharging curves.

Tips: During charging, discharging, maintenance and other processes, the user can press <Enter> briefly Pause, press again to resume; Long press <Enter> for 2 seconds to terminate the current process and return to the initial main page

4. Bluetooth function (Optional when order):

BM6018-BL has Bluetooth communication function, through which users can use mobile phones, PAD or PC checks the historical charging and discharging data and curves of the battery pack, also remotely sets and controls BM** working status.

The BM** series provides Android APP and PC Windows applications software. Please refer to the appendix "Introduction to the Use of Android App of BM** Battery Tester" document.

*Note: Once the BM** device is successfully connected to the mobile phone, tablet or PC through Bluetooth, the function keys on the BM** panel will be temporarily frozen and disabled. At this time, only the function keys in the mobile phone or PC APP can control the battery settings and function operation of the BM**. When the APP program is finally closed, the panel keys of the BM** can resume their normal functions.*

Specification

Items \ model	BM6018
AC input power	100~240V 50HZ
Suitable battery type	Pb-Acid(AGM, VRLA, SLA, Gel), Li-Ion, LiFePO4, NiMH, NiCd
Charging method	PreCharge -- C.C main charge -- special charge CV or CC -- end charge
Suitable battery capacity	1Ah ~ 100Ah
Suitable battery voltage*1	3.0V ~ 16.0V (For 24V battery, can only provide test function, no charge)
Charge/discharge voltage set	3.0V ~ 18.0V
Charge current set	0.4A ~ 4.0A (60W Max.)
Discharge current set	0.2A~2.0A (8W Max.)
Temperature compensation	Auto compensation charge voltage according to environment temperature
Voltage test precision	+- 1.0%
Current test precision	+- 2.5%
Capacity test precision	+- 2.5%
Abnormal protection	Shorted, reversed, OVP, OCP, OLP, OTP,
Bluetooth function	-BL model have this function
Size and weight	160*88*35mm, 280g
Safety standard	CE, EN62368, EN61000

Safety notes

- ✧ Be sure to understand the information of the battery to be charged or discharged accurately. If the parameters is set up incorrectly the battery may severely be damaged. Especially Lithium battery can cause a fire or an explosion by over-charging.
- ✧ If any malfunction is observed immediately terminate the process and refer to the operation manual.
- ✧ Keep away the unit from dust, damp, rain, heat direct sunshine and vibration. DO not drop it.
- ✧ This device and the battery to charge or discharge should be set up on a head-resistant, non-inflammable and non-conductive surface. Never place them on a car seat, carpet or similar. Keep all the inflammable volatile materials well away from operating area.
- ✧ The outer case slots and fan serve to cool the device so must not be covered of enclosed. Provide good ventilation.
- ✧ Please only use the official cable and clips, which are provided with device package. Other type cable or clip will affect testing and charging accuracy.
- ✧ Please clamp battery terminal poles tightly, otherwise the test result will be not Accuracy.
- ✧ Please don't want to charge batteries when:
  - The battery voltage exceeds the limit in specification.
  - Battery pack, which consists of different types of cell.
  - Non-rechargeable batteries (Explosion hazard).
  - Faulty or damaged battery.
  - Battery fitted with an integral charge circuit or special protection circuit.
  - Batteries are electrically linked to user's loads in device.