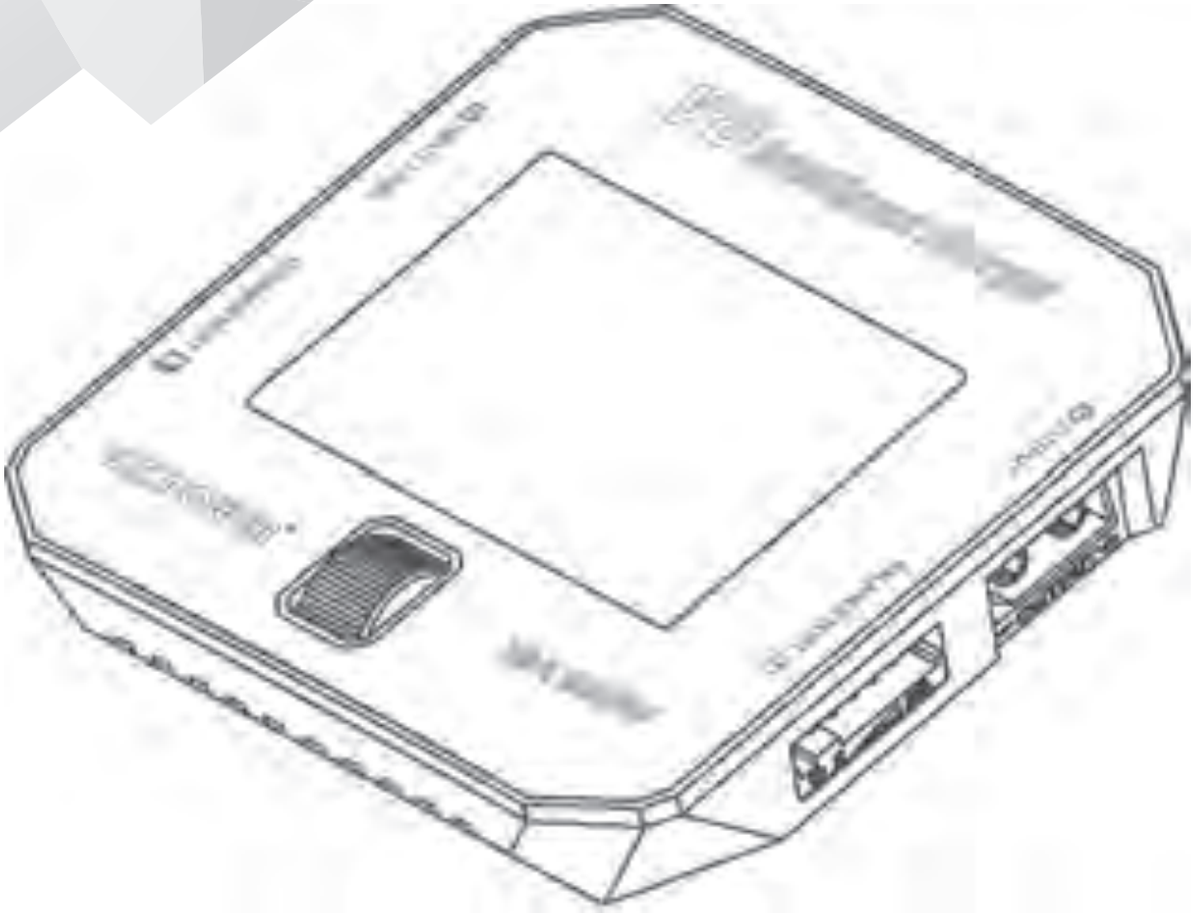
V6 Intelligent Balance Charger/ Discharger Manual



Thank you for your purchasing GT Power V6 Charger.This is a rapid charger/discharger computerised with microprocessor and specialised operating software.Please read this manual completely and attentively before using.

G.T.POWER®

Contents

1. Specification.....02

2. Exterior of the unit.....03

3. Warnings and safety notes 04

4. How to Confirm Charging Current.....07

5. Charge Mode Selection.....08

6. Program Setting 11

7. Showing Screen.....12

8. System Setting.....15

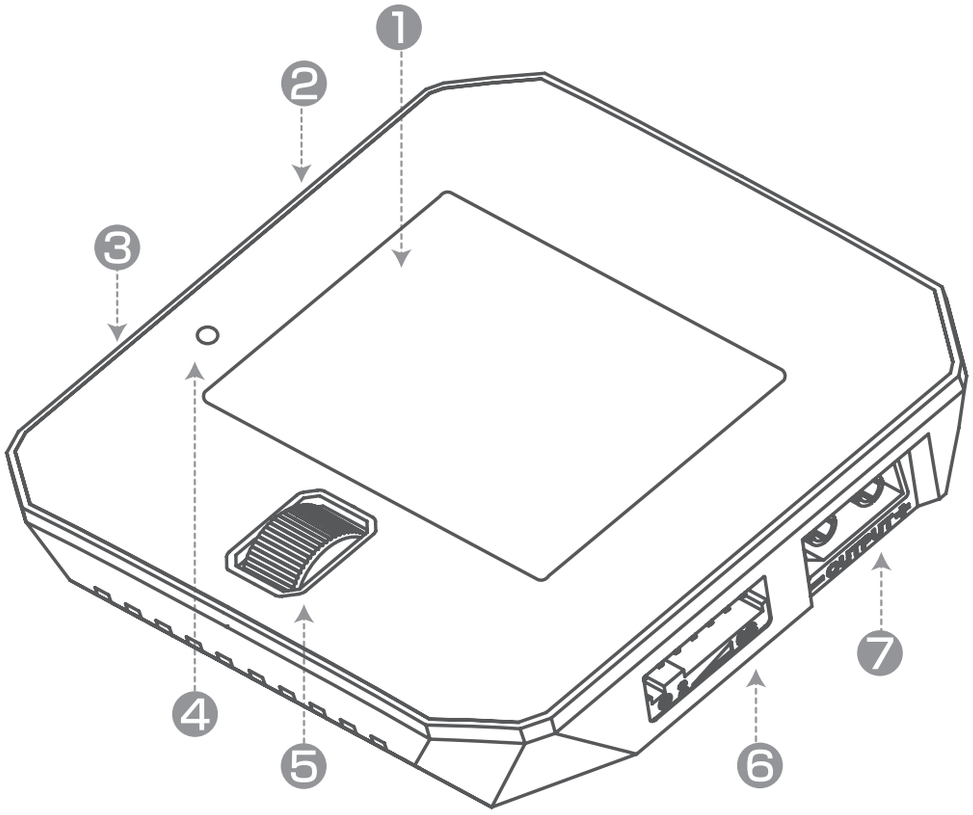
9. Alarm and Error Inforamtion:.....17

10. Warranty and Service 18

1. Specification

Input Voltage	DC 7-28V
Input Current	Max.15.0A
Charge Current	0.1-16.0A
Discharge Current	0.1-3.0A
Charge Power	Max.300W (@Input>21V)
Discharge Power	Max.5.0W
Balance Current	Max.1A
Balance Accuracy	±0.01V
Charging cells	NiMH/NiCd: 1-16cells
	LiPo/LiFe/Lilon/LiHv: 1-6cells
Pb Battery Voltage	2-24V
Size	80*80*32mm
Weight	120g

2. Exterior of the unit



❶ Screen
❷ Input port
❸ Update port
❹ Opto-sensor
❺ Select key
❻ Balance port
❼ Battery port

Select key

Long press: Enter system setting / terminate current task

Short press: Enter task setting / confirm current setting

Horizontal scroll: Select menu

3. Warnings and safety notes

- Do not use the charger in unattended; in case of any functional abnormity, please stop using it and refer to the manual.
- Keep the charger away from dust, damp, rain and heat, direct sunshine place
- Power input of the charger is direct current 9-28V
- Please place the charger on a head-resistant, non- inflammable and non-conductive surface. Never place them on the car's seats, carpet or other similar place. Keep all the inflammable volatile materials well away from operation areas
- Make sure the cooling hole in the bottom of the charger is uncovered while in use, and ensure the cooling fan ventilated
- Please setting the data correct when charge and dischage. Incorrect setting will damage to the charger and battery, especially for the Li-XX battery, it will be result to explosion if the battery over charge.
- To avoid short-circuits between the charger cables, please connect the cable and charger first, then connect the battery.Reverse the operation when disconnecting.
- You have to pay attention to verify the capacity and the voltage of the Lithium battery pack. It may be composed of parallel and series connection mixed. In parallel link the capacity of the battery pack is multiplied by the

number of cells but the voltage remains same. That kind of voltage imbalance causes a fire or explosion during charge process. We recommend you compose the Lithium battery pack in series only.

NiCd/ NiMH	voltage level:	1.2V/cell
	allowable fast charge current:	1C~2C depends on the performance of cell
	discharge voltage cut off level:	0.85V/cell(NiCd), 1.0V/cell(NiMH)
Lilo	voltage level:	3.6V/cell
	max.charge voltage:	4.1V/cell
	allowable fast charge current:	1C or less
	min.discharge voltage cut off level:	2.5V/cell or higher
LiPo	voltage level:	3.7V/cell
	max.charge voltage:	4.2V/cell
	allowable fast charge current:	1C or less
	discharge voltage cut off level:	3.0V/cell or higher
LiFe	voltage level:	3.3V/cell
	max.charge voltage:	3.6V/cell
	allowable fast charge current:	4C or less(e.g. A123M1)
	discharge voltage cut off level:	2.0V/cell or higher

LiHV	voltage level:	3.8V/cell
	max.charge voltage:	4.35V/cell
	allowable fast charge current:	1C or less
	min.discharge voltage cut off level:	3.0V/cell
Pb (Lead-acid)	voltage level:	2.0V/cell(Lead-acid)
	max.charge voltage:	2.46V/cell
	allowable fast charge current:	0.4C or less
	discharge voltage cut off level:	1.50V/cell or higher

Discharge

- The typical purpose of discharge is to determine the residual capacity of the battery, or to lower the voltage of battery to a defined level. When you discharge the battery you also have to pay attention on the process same as charging. To avoid the battery becoming deep-discharged, set the final discharge voltage correctly. Lithium batteries should not be deep-discharged to lower than the minimum voltage, as this leads to a rapid loss of capacity or a total failure. Generally, you do not need to discharge Lithium battery voluntarily.
- Some rechargeable batteries are said to have a memory effect. If they are partly used and recharged before the whole charge is drawn out,

they'remember' this and next time will only use that part of their capacity. This is a 'memory effect'. NiCd and NiMH batteries are said to suffer from memory effect. They prefer complete cycles; fully charge then use until empty, do not recharge before storage-allow them to self-discharge during storage. NiMH batteries have less memory effect than NiCd.

- The Lithium battery prefers a partial rather than a full discharge. Frequent full discharges should be avoided if possible. Instead, charge the battery more often or use a larger battery.

Those warnings and safety notes are particularly important. Please follow the instructions for a maximum safety; otherwise the charger and the battery can be damaged violently. And also it can cause a fire to injure a human body or to lose the property.

4. How to Confirm Charging Current

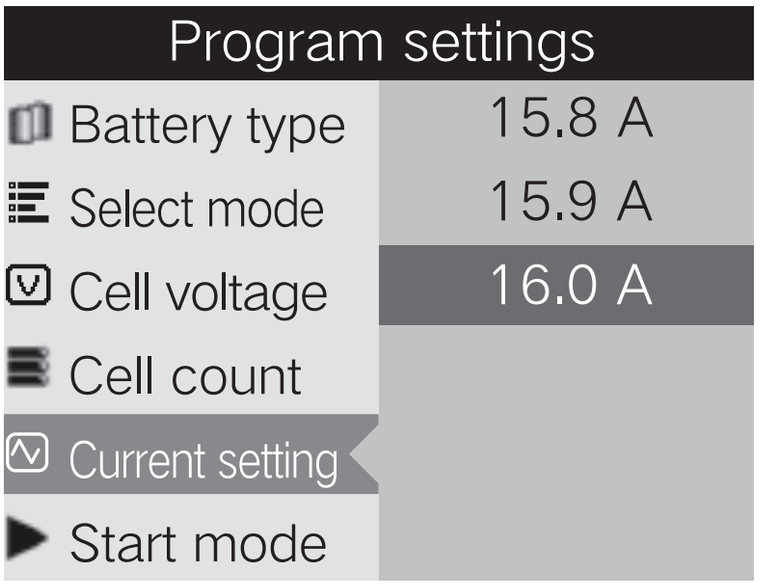
It is very important to know the maximum charging current of the battery as excessive current could influence the life span of battery and damages the battery. In addition, excessive current will cause heating and even explosion of the battery during the charging process.

The charging and discharging capacity of battery is usually marked with C value. Multiplying the charging C value and battery capacity equals to the maximum charging current supported by the

battery. For example, for a 2000 mAh battery with a charging capacity of 5C, the maximum charging current would be 2000*5=10000mA; therefore, the maximum charging current is 10A.

For lithium battery, if it can not confirm the supported charging C value, please set the charging current below 1C for the sake of safety.

The reference relation between C value and charging time: charging time ≥60 minutes/ charging C value (it therefore needs around 60~70 minutes to complete charging with 1C). Due to the difference in battery conversion effciency, the time might be extended.



5. Charge Mode Selection

The working mode of the charger is series charging; it must connect to the output cable of the battery while connect to the battery. For the lithium battery, in orde to promise charger can monitor the voltage of each cells and balance the ones which bad consistency, it is highly suggested that connect the balance port to enter balance charge. The charger will alarm before charge if do not connect the balance port.

	Balance Charge Mode	Charge Mode	Fast Charge Mode	Discharge Mode	Storage Mode
LiPo/LiFe/ Lilon/LiHv	√	√	√	√	√
NiMH/NiCd	×	√	×	√	×
Pb	×	√	×	√	×

Li-XX Battery Balance Charge Mode

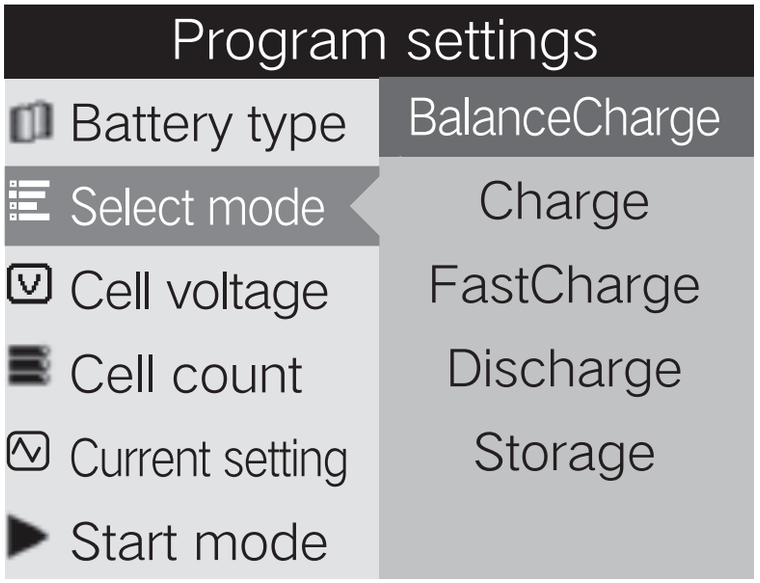
The purpose of this mode is that to making each cell to full voltage after finish charge. The inner system will monitor the voltage of each cell and control the current of each cell, then to balance the individual cell voltage. It not only has to connect the battery to the output port of the charger but also to the balance port when charging.

Battery Fast Charge Mode

The charge current gets smaller and smaller as the charge finished. The fast charging program will finish charge in advance and decrease the CV and balance process. Actually, when the fast charge process finished, the charging current will go to 1/5 of initial value. The charging capacity may be a bit smaller than normal charging capacity, but the charging time will be decreased.

Li-XX Battery Storage Charge Mode

This function is for making each types of Li-XX battery to adjusted the



corresponding voltage (Lipo: 3.85V, Lihv: 3.85V, Lilo: 3.75V, LiFe: 3.3V) and keep the Li-XX battery storage for a long time.When selecting storage mode, automatic charging task can be initiated if the battery voltage is lower than the preset storage voltage, If the battery voltage is higher the preset storage voltage, then it will automatic discharging. In order to save time, the voltages of cells should not be accurately balanced; however, it is normal phenomenon that there may be some errors between cell voltage and preset value as the tasks are completed

Li-XX Battery Discharge Mode

The purpose of discharging is to confirm the rest capacity of battery or the healthy condition of battery. To avoid over-discharging, please set up the right rated discharge voltage before you discharge the battery. The voltage of Lithium battery shouldn't be lower than the lowest voltage. Due to it will damage capacity fast. Normally, there is not necessary to discharge Lithium battery. For safety reason, discharge current data display on screen couldn't exceed to the rated max discharge current, and

the rated voltage couldn't lower than voltage level recommended by manufactory to avoid over-discharging.

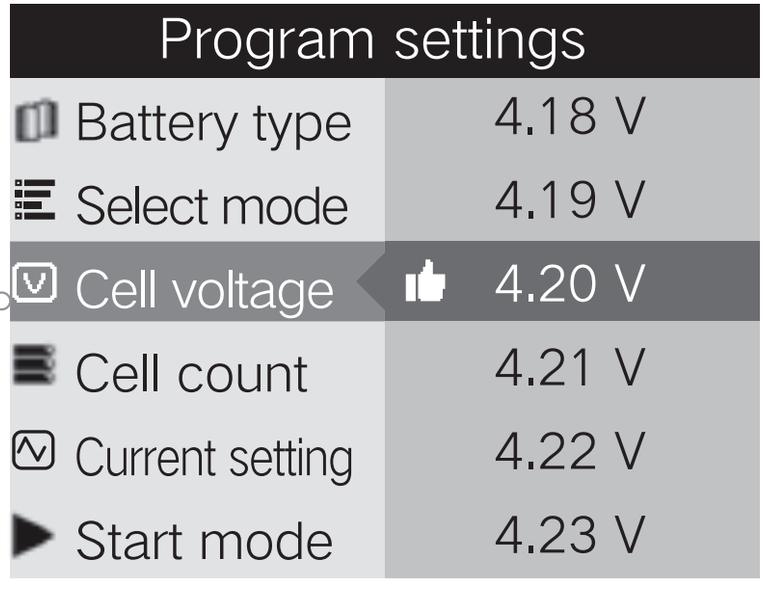
Activation and restoration functions of excessive discharged battery

When the charging task begins, a 0.1A current should be applied to activate and restore the battery if the cell voltage which checked to be lower than the pre-charge voltage; on the other hand, it should be adjusted to a rated voltage for charging when the cell voltage is higher than the pre-charge voltage. This design can protect excessively discharged batteries, as well as conduct activation and restoration.

6. Program Setting

Connect the charger to the power supply and wait for the charger to finish the self testing. Connect the battery to the charger under standby interface, and short press the Select key to show the program setting menu. The items in the menu are showing as follows:

Recommended Setting Value: 4.20V



Battery type	LiPo、LiFe、LiIon、LiHv、NiMH、NiCd、Pb
Select Mode	Balance Charge、Charge、 Fast Charge、 Discharge、 Storage
End Voltage	End Voltage slight adjustment, rang ±0.05V;
	Discharge End Voltage slight adjustment, rang ±0.3V
Cell Count	Li-XX battery 1-6cells NiMH/NICD 1-16cells, PB 1-12cells
Current Setting	Charge current 0.1-16A Discharge current 0.1-3A
Start Mode	Start
Back	Back

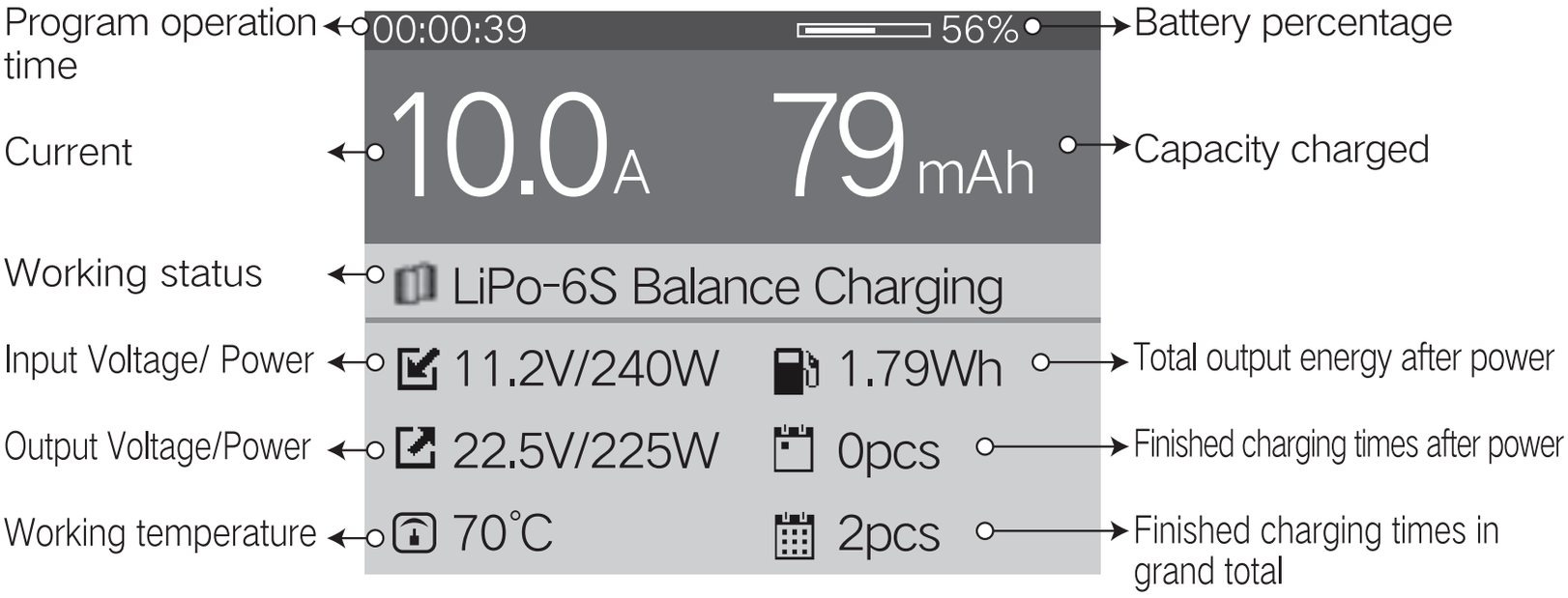
△**V Delta-peak sensitivity:** The program of tunr-off charge current automatically. The principle of operation is that the charge current will turn off and finish charge when the battery voltage increased to the highest and start to decrease. If the trigger voltage is setting too higher, it will lead to the dangerous of over- charge, if it is setting too lower, then the system will result in termination of charge advanced.

⚠ **Alarm: The Lihv model is just support 4.35V Li-battery, it is forbid to use this mode to charge other type batteries and forbid to charge the Lipo battery which the end voltage is 4.20V, otherwise it will lead to burn or explosion.**

7. Showing Screen

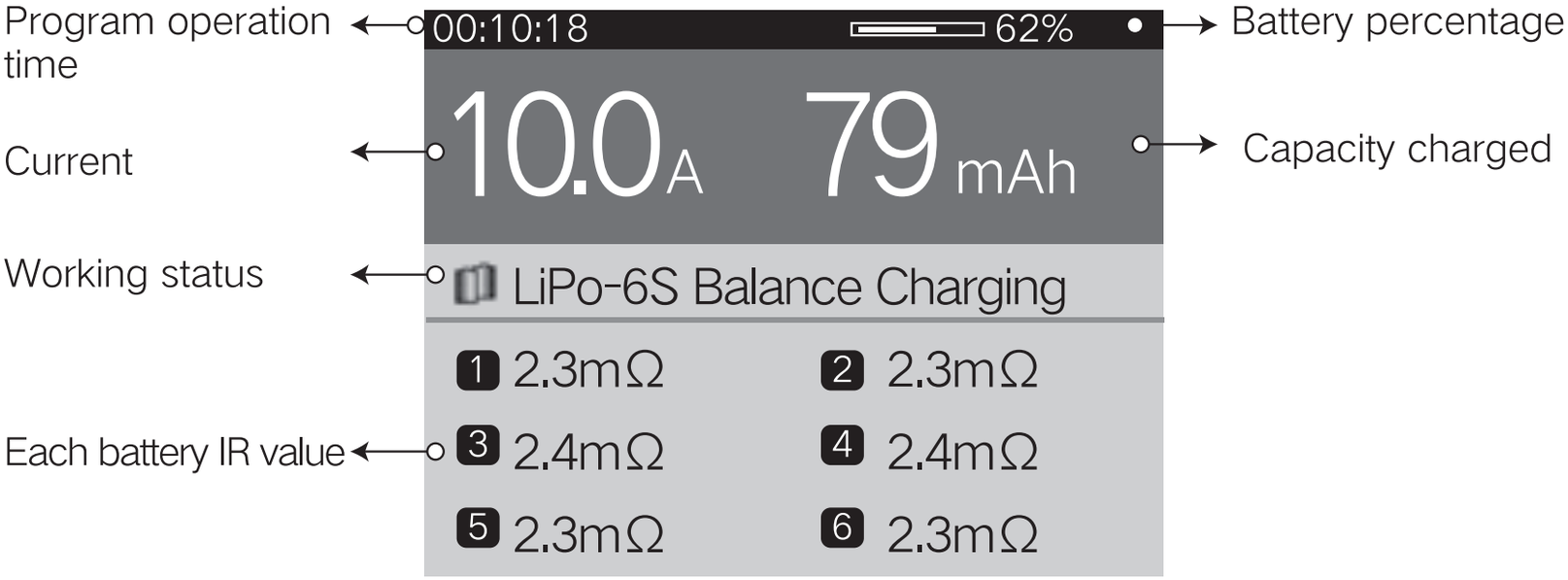
Controlling the select key to switch the displayed information in the lower half of the screen, which is cell voltage and working parameters.

Fast balance charge status:

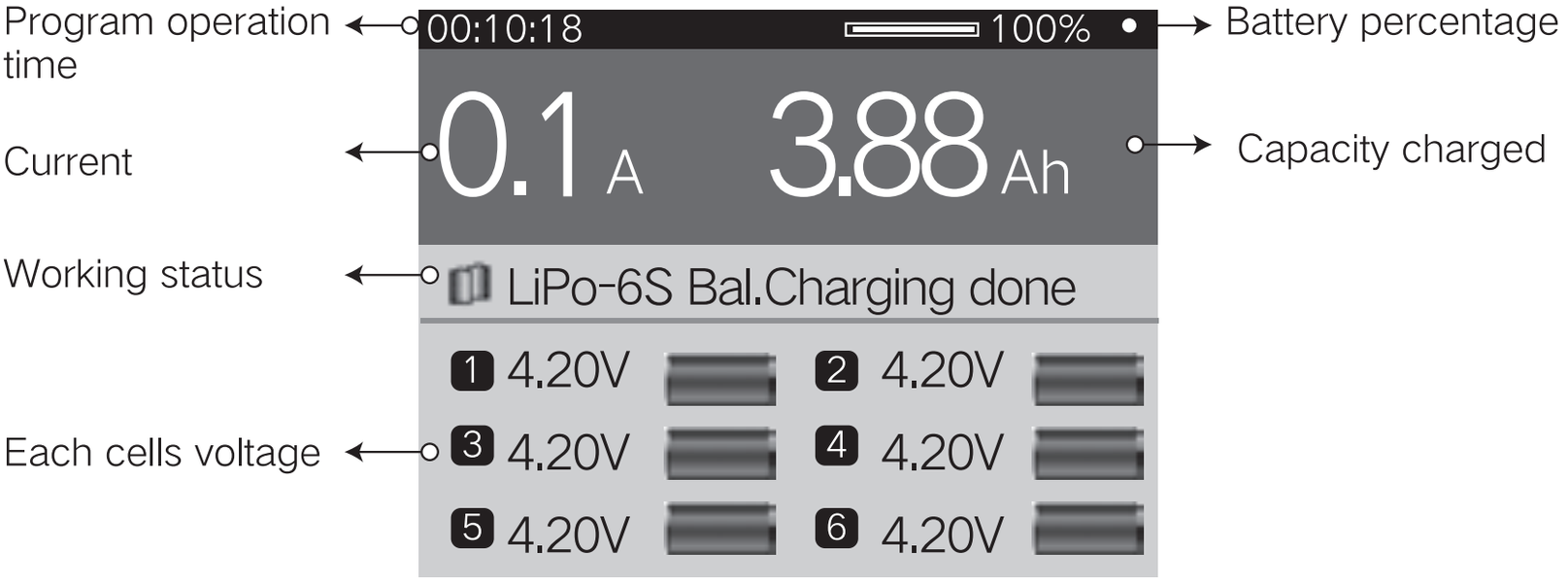


Li-XX battery IR Test:

The charger have the IR tesing function and it will just work when balance charging. It will test and calculate the IR value after charging 2 minutes later. It cannot be realized to measure the absolute value as professional internal resistance tester does. Therefore, the internal resistance value can only be referred to when conducting horizontal comparisons, such as judging the consistency of the cells' performance or making comparisons of the performance of dierent cells. The charging current is an in uential factor for measuring internal resistance; batteries with large capacity and small internal resistance would relatively need large charging currents to accurately measure the internal resistance.



Accurate Balance Status:



Charging finished adjustment

During the charging process, the screen displays to Green, which turns into Blue as the charging is finished. When the charging finished, the cells' voltage difference should be smaller than 10mV, while the screen turns into Blue. The charger should continue to carry out accurate balancing of the battery after the light turns Blue.

After the charging finished, it is normal for voltage decline to occur due to different performances. As the number of the charge cycle grows, the performance decreases, and the voltage decline phenomenon becomes obvious. To charge the battery with a larger current would also cause a more obvious voltage decline after the charging finished.

8. System Setting

Press the "Select" to set the system manual when in the standby status

Max Input Power	Max Input Power limited: 50-330W
MIN Input Voltage	Min Input Voltage Limited: 7-28V
Back light	High, medium, low and auto
Volume	high, medium, low; and turn off
Alarm sounds after finished	2kinds: 1 time and repeat
Language	7 kinds: English, Chinese and so on
Update	Connecting computer to update.
System information	Checking the system information
System self-checking	System self-checking without battery
Back	Back

Max input power limitation

When the input power fails to reach the max working power (330W), it need to set this parameter based on the actual output capacity , in this way, it can protect the input power and enable the charger to work stably. For example, the power connected 12V/15A, then it should set the power to 180W

Min input voltage limitation

This item can protect the battery to excessive discharge since it's used as input power. If the charger tests that the input voltage is lower than the default value, all tasked in operation would be terminated and there would be a warning of low voltage. For example, if a 6S Lipo battery is used as the input power source, the value of the item should be 21V to protect the battery from excessive discharge

Buzzer volume

When it setting to OFF, the operation sound would be OFF, but the sound of error warning will keep to ON

System settings	
Max. input Power	240W
Min. input Voltage	10.0V
Backlight	Middle
Volume	High
Completion tone	Single
Language	English

9. Alarm and Error Inforamtion

It combines with various protective functions and monitor systems to verify its electronic functions and status. The screen will display the error instructions with a warning sound if anything works wrong.

1.{" Battery type select error! "}

Battery type select error. Charger will select the battery type as the same as the real battery type again

2.{" Battery not connected ! "}

Battery do not connected to charger.please check the connection cables.

3.{" Short Circuit Error "}

Please check the charging cable

4.{" Input Voltage Error! "}

Input voltage is lower or higher than the limited voltage

5.{" BATTERY LOW VOLTAGE "}

The voltage is lower than the setting voltage, please check the number of cells in battery pack

6.{" BATTERY HIGH VOLTAGE "}

The voltage is higher than the setting voltage, please check the number of cells in battery pack

7.{" CELL LOW VOLTAGE "}

The cell voltage is lower. One of the battery voltage of Lithium battery pack is lower, please check the battery voltage one by one.

8.{" Battery Cell Voltage High! "}

The cell voltage is higher, the voltage of one cell of Lithium battery is higher, please check the battery voltage one by one.

9.{" Balance port connect break ! "}
Battery balance cable and charger disconnected, please check the balance cable

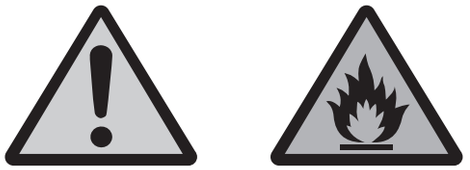
10.{" Charge Over heating! "}
Charging with overheating, the battery should be cooling since the internal temperature is higher.

11.{"Output polarity revsered !"}
The polarity reversed, please check the + - polarity of battery connection

12.{"Current add to fast !"}
Current is increasing too fast. Back to current charge mode.This is the self-protection of charger.

10. Warranty and Service

We warrant this product for a period of one year (12 months) from the date of purchase. The guarantee applies only to material or operational malfunctions. During that period, we will replace or repair the unit without any service fee. Invoice or receipt is required. This warranty does not cover the damage due to wear, overloading, improper handling or using of incorrect accessories.



NEVER USE CHARGER UNSUPERVISED!

- **Batteries pose a SEVER risk of fire if not properly handled.**
- **Read Entire operation manual before using charger.**
- **This unit may emit heat during use.**
- **Only operate this device in a cool ventilated area away from flammable objects.**
- **Failure to observe safety procedures may cause damages to property or injury.**