Power, beyond your imagination

User Manual

Model No : S4 PLUS (V3.0)

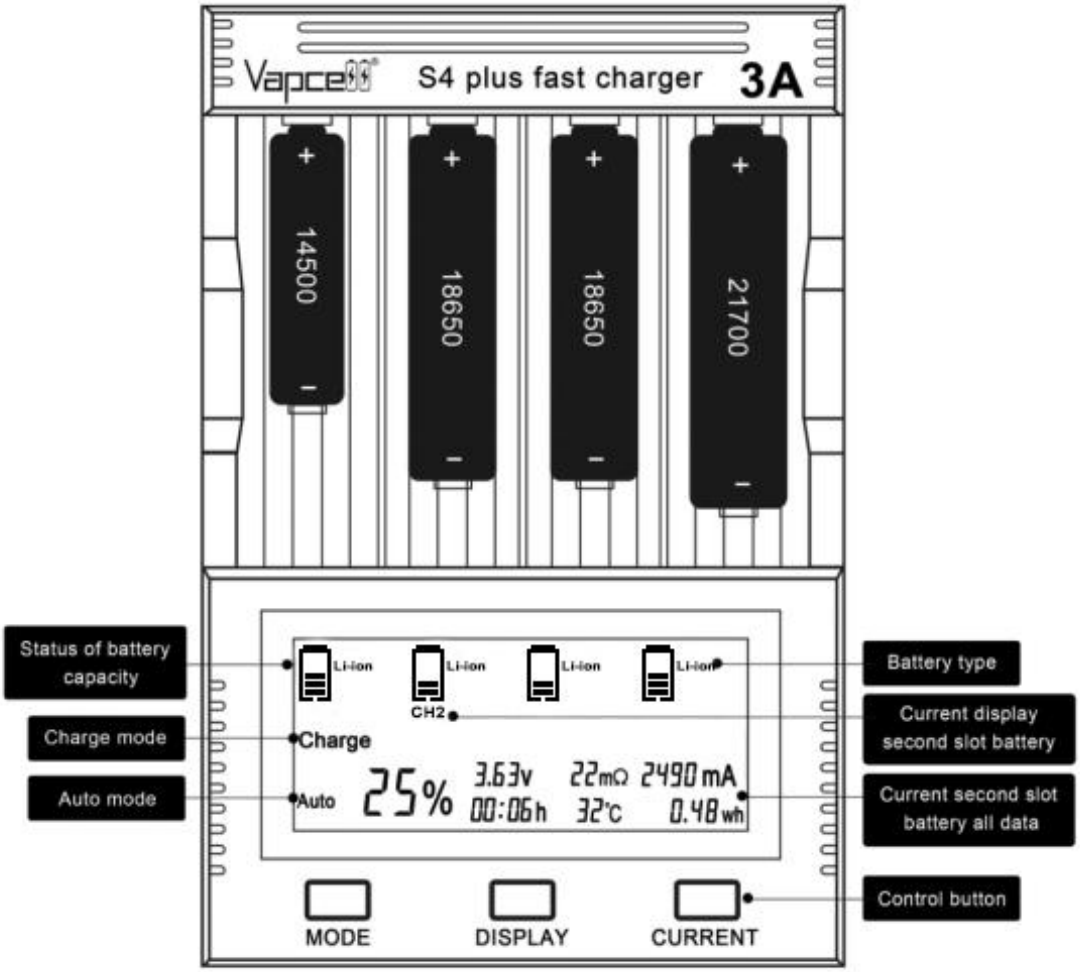
S4 plus is currently upgraded to V3.0. Performance has been improved.

The Vapcell S4 Plus is a Super,Revolutionary,Intelligent charger ,3A each slot ,12A in total charging current with almost all cylindrical rechargeable batteries,such as 16340, 10440, 14500, 16340, 18500, 18650, 26650, 21700 20700,even button top or PCB 21700,20700, which eliminate to own several chargers.

The S4 Plus automatically detects and charging Li-ion,Ni-Mh and Ni-Cd batteries, Intelligent charging circuit selects the optimal charging mod (CC,CV and -dV/dt) for a given battery and each slot independently charge.

The charger can measure the internal resistance (DC IR) of the battery intelligently, and automatically distribute the appropriate charging current or discharge current according to the internal resistance of the battery.
S4 plus charger have Manual and Auto mode selection for charging and discharging currents.
S4 plus have five mode: Charge ,Discharge,Cap test(Capacity Test),Storage， Repair.
The capacity of batteries can be accurately measured by Discharge mode and Cap test mode, and li-ion batteries and Ni-Mh and Ni-Cd batteries can be repaired by Repair mode.If li-ion batteries want to be stored, users can use storage mode to extend battery life
Furthermore,LCD display show voltage ,capacity, temperature, internal resistance , charging time and percentage of capacity clearly.

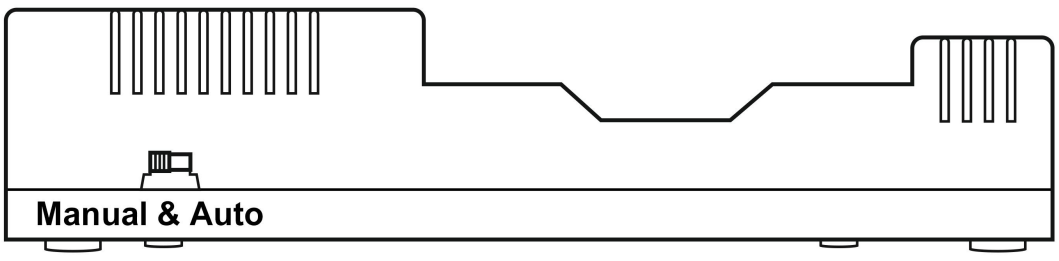
For better use of the charger, please read the instructions.



1. Function Description:

1.1 Manual&Auto button

There's a button on the right side of the charger. Manual selection of charging and discharging current or automatic intelligent distribution of charging and discharging current



1.1.1 Manual button

The advantage of manual mode is that the user can choose the ideal charging current or discharge current.

When the battery starts charging or discharging , the default current is 500mA and flashes continuously, indicate the user to choose the current option you want
For specific current parameters, please refer to the charger parameter table.

1.1.2 Auto button

The charger can measure the internal resistance (DC IR) of the battery intelligently, and automatically distribute the appropriate charging current or discharge current according to the internal resistance of the battery.
Please keep the contactor clean and bright without oil stain, good contact can test internal resistance accurately.

1.2 Mode Button

The Mode mode have five functions: Charge, Discharge , Cap test,Storage and Repair
The default Charge mode of the system. Press on the MODE button to select other functions.

1.2.1 Charge

The system automatically determines the type of battery, recharges Li-ion batteries or Ni-Mh,Ni-Cd batteries.
Li-ion batteries are charged in CC CV mode and Ni-Mh,Ni-Cd batteries are charged by -dV/dt mode.

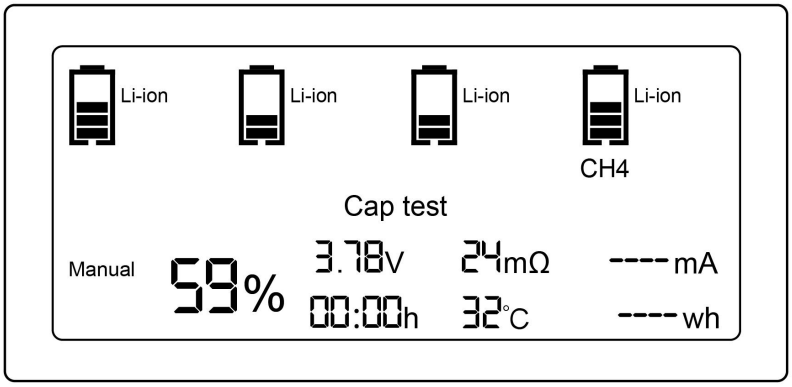
1.2.2 Discharge

This function can measure the capacity of batteries.
The system automatically determines the type of battery, Li-ion batteries or Ni-Mh,Ni-Cd batteries.
The Discharge mode is from constant current to cut-off voltage. Li-ion battery discharged to 2.5V, Ni-Mh,Ni-Cd battery discharged to 0.9V.
The discharge capacity shown after discharge refers to the current capacity of the battery. It can discharge at any time with any battery above the cut-off voltage.
For example, a li-ion battery with an initial voltage of 4.0V is discharged to the cut-off voltage with a constant current of 500 mA and a time-consuming of 4 hours.
The discharge capacity is shown to be 500 mA*4 h=2000 mAh.
Note that this is not the total capacity of the battery.if want to get the full capacity of the battery, please fully charge the battery then discharge.

1.2.3 Cap test

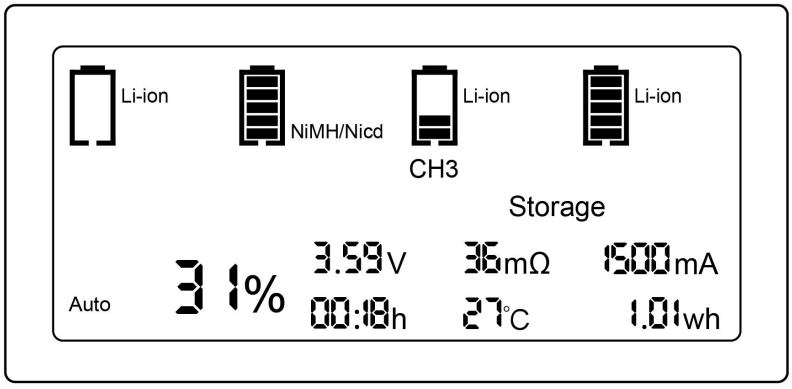
Cap test is short for capacity test **,**similar to Discharge mode, but more intelligent to test battery capacity.

There are three steps in this mode: Charge-Discharge-Charge
The charger full charges the battery first. then discharge at a constant current to the cut-off voltage, the charger shows the capacity of the battery.then the charger fully charge the battery again .but the charging capacity is not displayed.



1.2.4 Storage

In order to increase the cycle life of li-ion batteries, the new version has added storage mode. There is evidence that controlling the battery level to around 50% for storage will increase the battery's lifespan.There is a discharge and charging process in the storage mode. When the initial voltage of the li-ion battery exceeds 3.70V, It will discharge to 3.70V and stop. If the initial voltage of the battery is lower than 3.70V, it will be charged to 3.70V.The charge and discharge current reference charger parameters.
After the storage program is completed, the battery voltage will be around 3.7V.



1.2.5 Repair

Repairable li-ion batteries and Ni-Mh,Ni-Cd batteries
When the over-discharge voltage of li-ion batteries is less than 2.5V, or the over-discharge voltage of lithium batteries with PCB is lower than the cut-off voltage.the charger is activated to charge with a small current, and the lithium battery can continue to be used.
There is memory effect in some Ni-Mh,Ni-Cd battery. The charger can refresh the battery

and reduce the memory effect through repeated charging and discharging cycles.

1.3 DISPLAY Button

The parameters displayed on the screen interface are the parameters of a single battery. For example, when CH2 appears on the display screen,all display data show the parameters of the second slot battery, then press the DISPALY button to display CH3 and CH4 CH1 in turn, showing the parameters of each battery in turn.
LCD display show voltage(V) ,capacity(mAh,Wh), temperature(℃), internal resistance (mΩ), charging time（00:00）,current(mA)and percentage of capacity clearly（%）.
The display screen is on by default when working. Long press DISPLAY to close the display screen and save power

1.4 CURRENT Button

In Manual mode, you can choose the current you need.
In the Auto mode, the system will measure the internal resistance of the battery and automatically distribute the current.
S4 plus charger have a lot of current option, if you want to know more, please refer to the parameter table.

1.5 USB output

You can insert batteries in each slot,they can charge for the digital devices like mobile phones, tablets and some USB devices.
S4 plus supply power for device start from the highest voltage battery firstly among multi ple batteries.Then, when the voltage of multiple batteries is the same, multiple batteries supply power to the equipment together.Through USB output only for lithium battery.
During USB output, acording to the comprehensive voltage of the li-ion batteries in the charger slot, it is converted into the percentage of battery capacity
The USB output power depends on the battery voltage, internal resistance and the quantity of batteries. USB standard output 5V 1A, maximum output 5V 2A.

2. Operation

2.1 Connect the charger and use our 12V5A DC adapter to supply power. The S4 plus starts to work.there will be a ringtone indicating that the power supply is switched on. At this time all parameters do not display. NULL appears in the center of LCD screen

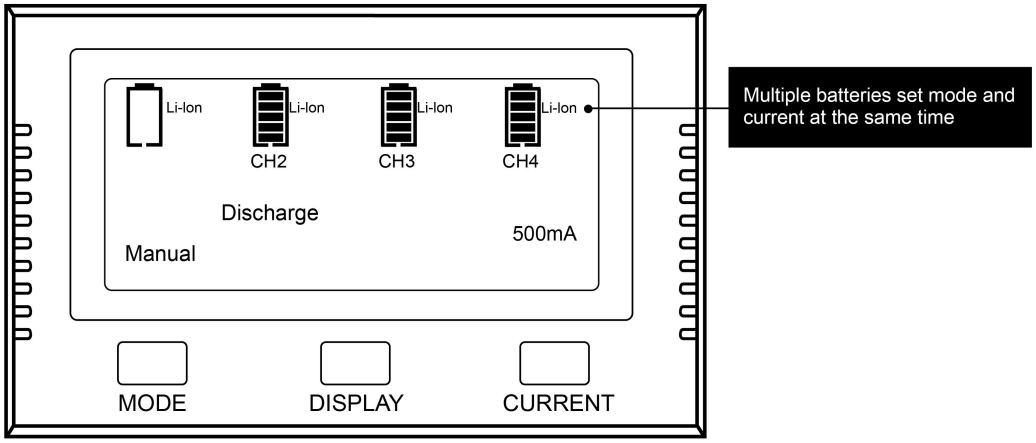
2.2 Select the Auto or Manual gear on the right side of the charger. Manual mode

requires manual selection of current, while Auto mode does not. Now let's explain the following operations in manual mode.

2.3 If the battery is reversed, “ Err” will be prompted in LCD screen. Users put the battery correctly into the charger.assuming that it is placed in the second slot, CH2 characters will appear on the display screen. Charger will automatically determine whether the battery is li-ion or Ni-Mh,Ni-Cd, and it's displayed on the screen.

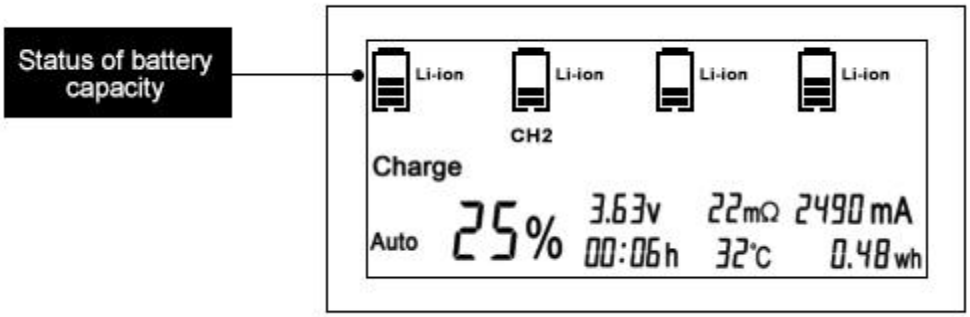
2.4 At this time, The default Charge mode, Charge is displayed on the LCD screen and flickers. If you need to switch other modes, Discharge,Cap test,Storage,Repair mode,please keep pressing MODE to find the desired mode.The current 500mA on the LCD screen is also flickering. The default charge or discharge current of the system is 500mA.

2.5 Now the charge and current flash at the same time, and the reminder is the common regulation mode,we can select the same mode and current for multiple batteries at the same time.Put multiple batteries of the same type into other slots within 5 seconds, and then press MODE or CURRENT to select the desired operation. Then multiple batteries have the same mode and current, which can save operation time. If you press display within 5 seconds after placing the first battery, you will exit the common adjustment mode, and mode and current will flash to remind the user of operation. If the first battery is not operated for more than 5 seconds, it will exit the common regulation mode by default and only charge this battery with 500mA current.



2.6 At the top of the LCD screen, there are four cylinders, representing four slots, which can display the charging status of four batteries. There are five small black grid in the cylinder, representing a rough percentage of capacity. This is based on the battery voltage. They represent 20%, 40%, 60%, 80% and 100% of battery capacity respectively.If charged in the second slot ,If the battery is charged in the second slot,The small grid in the second cylinder of the display will continue to increase to the fifth grid, and then start

again, reciprocating. This display indicates that the battery is charging. At this time, the display screen will display all the data of the second slot.voltage(V) ,capacity(mAh,Wh), temperature(℃), internal resistance（mΩ）, time （00:00）,current(mA) and percentage of capacity clearly（%）.If the battery is discharging, the cylindrical grid will flicker and decrease.



2.7 If multiple batteries are placed in the charger at the same time, we press the DISPALY button several times to display the battery data of each slot in turn.each slot is independent of each other, there are slots to charge, there are slots to discharge, there are slots to repair the process, without interference with each other. . If CH1 is displayed, it will be the data of the first slot battery.

2.8 When charging and other procedures are completed, there will be a bell reminder
The small cylindrical lattices of the display screen will no longer jump, and other parameters are recorded and maintained.And the display screen will turn off after five minutes.
If you do not want a ringtone reminder, long press and hold the DISPLAY button to turn off the display screen during operation and there will be no ringtone reminder after the program is completed.

3. Technical points

In order to use this charger well, please read the following technical knowledge

3.1 Measure the internal resistance of batteries

The Auto mode of the charger distributes the appropriate current by measuring the internal resistance(DC IR).so it is necessary to measure more precise values.Please keep the positive and negative connectors of the charger clean and free of grease stain, and the positive and negative electrodes of the battery clean.And check the spring of each slot to ensure that the battery and charger are in good contact.

3.2 Measure battery capacity

Industry-approved test capacity method, room temperature of about 24 ℃, charge battery with li-ion 4.20V, and then discharges at a constant current of 0.2C to 2.5V. Please remember keep record of discharging time.

In this way, the capacity mAh of the battery is obtained by multiplying the discharge current by the discharge time.

Capacity(mAh)= Current (mA)* Time (Hour)

So tell us that in order to use the S4 PLUS charger to measure the battery capacity more accurately, please measure room temperature around 24 degrees. If the temperature is too low, the battery capacity will be greatly reduced.Then choose the appropriate battery discharge current, about 0.2C rate.Please do not use the capacity shown during charging as the battery capacity, because many batteries are out of power from the device, and the battery voltage is about 3.0-3.4V.,the battery still have power.

In order to measure discharge capacity more accurately, we set the discharge cut-off voltage of li-ion battery at 2.5V.There are a lot of high capacity 18650,21700 batteries, The discharge mode is in the range of 3.0V-2.5V, there are still about 50-200mAh capacity.

3.3 Current selection

This charger have high charge current 3A and discharge current 1A,

To ensure safety, please refer to the battery specification and select the appropriate charge and discharge currents in Manual mode.

If the current is too high, the battery may become very hot and explode!

In Auto mode, if the internal resistance of measurement is relatively large due to poor contact or oil stain, the allocated current will be relatively small.

If you want to increase the charging current, press the current button for at least 2 seconds. The current of the display screen will flicker continuously, then pressing the current button can change the current.

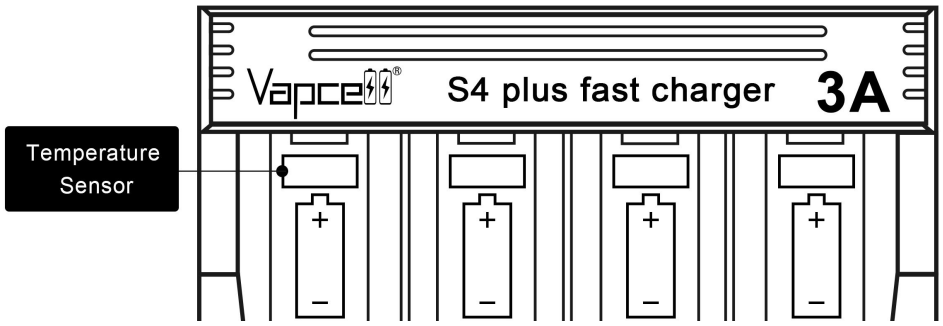
CC, CV mode is used for charging li-ion battery in charger

If li-oon battery voltage before charging is relatively high, such as 4.12V, put into the charger at Auto mode, even if the internal resistance is very low, very small charging current will be allocated,at present, it is in the CV stage of charging, that is, it will maintain a constant voltage of the battery, and the current will gradually decrease and cut of,so don't misunderstand that the charger needs maintenance

3.4 Charger Temperature Control

Temperature sensors are installed in each slot of the charger to monitor the temperature of

the battery in real time.If the battery temperature is too high, we will reduce the charging current intelligently,ensure safety.To increase temperature sensitivity, a milky white thermal conductive adhesive is added below the circular metal. If a small amount of colloid seeps out, please remove it with a cloth.



1. Temperature is higher than 65 ℃. If the charging current is higher than 1500 mA(excluding 1500 mA), it will be reduced to 2 level, for example your current charge current is 3000mA, it will be automatically charged at 2000mA.

2. The temperature of the slot is more than 70 ℃. If charge current is more than 500 mA (excluding 500 mA), the charging current will be forced to drop to 500 mA.

Battery charging current level:
250mA, 500mA, 1000mA, 1500mA, 2000mA, 2500mA, 3000mA

3.5 Re-change MODE or CURRENT

If the battery is charging or discharging, other modes can be changed by pressing the MODE button for 2 seconds, and the current can be changed immediately after changing the mode, but the data on the previous display will disappear. Please be careful.
When the charger works normally, if it is in automatic mode, press and hold the current button for more than 2 seconds to forcibly change the current. When grease or other factors affect the measurement of battery internal resistance, we can forcibly select the appropriate charging current of the battery. In manual mode, press and hold the current button, and the current will not change.

3.6 Extending the Service Life of Charger

This is an intelligent multi-function charger.
In order to obtain a longer service life, please keep operate in dry environment in door, and have enough space to emit heat. In order to prolong the service life, please try not to discharge/charge four slots at full load for a long time. Because full-load operation will

lead to the increase of charger temperature, long-term high temperature of charger will accelerate the aging of charger parts. Be kind to it and continue to serve you

4. Parameters and Features：

4.1 Parameters

Model	S4 plus
Input	DC 12V 5A (DC 5.5mm*2.5mm)
Output Voltage	DC 4.2V±1%/DC 1.48V±1%
Output Current	Li-ion(4*3A Max)
	Ni-Mh/Ni-Cd(4*1A Max)
Charge current option	0.25A/0.5A/1A/1.5A/2A/2.5A/3A
Discharge current option	0.25A/0.5A/1A(1A for the 1st＆4th slot)
Unique features	Charge/Discharge/Cap test/Storage/Repair
USB output	DC 5V 1A
Package Content	Charger, Power Adapter, Manual
Notes ： Batteries are excluded	

Apply to (battery diameter:10-26mm,length:34-75mm)
Li-ion:
10340(RCR123),10440,14500,16340,16650,17500,17650,17670,
18350,18490,18500,18650,20700,21700,22650,26500,26650
Ni-MH/Ni-Cd:
AAAA,AAA,SC,C

4.2 Features

- 3A each slot ,12A in total.
- Charge/Discharge/Capacity test /Storage/Repair
- Automatically select the optimum charge current.
- Easily choose current you want at manual mode.
- Wide & High charging current choice: 0.25A /0.5A /1A/1.5A/ 2A/ 2.5A/ 3A for each slot.
- Show charging status in real-time like voltage ,capacity,temperature,time,current.
- Enough space for 21700 battery, even button top 21700, PCB 21700 .
- Top surface have a button top type feature to make contact in recessed battery
- Support 4 slots charging independently without interference.

- Automatically activate and repair “0 voltage”lithium battery.
- Automatically calculate the battery percentage.
- Charging protection, over-discharge protection and protection of polar reverse,short circuit protection .also, it can detect a broken battery.
- Temperature control protection. Keep your battery safe, most important,your life safety.
- Intelligent power bank 5V 1A .
- Certified by FCC CE ROHS .

4.Precaution

- Indoor condition only，and enough space for heat dissipation.
- Don’t take apart your charger.
- Keep it dry when you don’t use it .
- Please don’t charge leakage, corrosion or dead battery
- Please remember to cut off the power when you don’t use
- Please don’t be exposed your charger to rain or water or snow.
- Charger are getting hot during operation for a long time, handle with care!
- This charger is for charging the cylindrical lithium-ion (li-ion 3.7v), Ni-Mh / Ni-Cd batteries. Be sure to know LiFePO4 batteries(3.2V),Non-rechargeable batteries, rechargeable alkaline batteries (RAM), lead acid batteries must not be charged with S4 plus charger. There is danger of explosion!
- Please read these instructions before use; pay attention to the recommended charging current, never choose the wrong charging current.
- Use the default configuration of the 12V5A adapter. If the user uses a low output power adapter, the charger may not work, or its function may be limited.
- Please cut off the electricity and remove the battery from the charger when charging is complete.
- Data guideline of chargers are for your reference only; please refer to professional instrumentation, if you need accurate data.
- Don’t repair yourself. Please contact the professional maintenance person when you need.
- Please make sure the correct program and setting are chosen and set . Incorrect program or setting may damage the charger or case fire or explosion
- Do not misuse in any way! Use for intended purpose and function only .

5.Warranty Service

After sales warranty service is only for the products purchased from authorized sources,

this rule is compliant to all products

products have after-sales warranty service .
In the purchase of this product within 15 days , if any quality problems can be asked to the dealer free replacement. In the purchase of this product enjoy one year free warranty service
Beyond 12 months, a limited warranty applies,covering the cost of labor and maintenance , but not the cost of accessories or replacement parts .

The free warranty does not apply to the following :

1. Man-made destruction , dismantling, modification of this product
2. Incorrect operation results in damage to the products(such as refitting the battery, putting it into a non-rechargeable battery, or violating the warning)
3. Battery Leakage causes product damage

For the Latest information on vapcell batteries and services, please contact a local vapcell distributor or send an email to admin@szfyte.com

6. Upgrade content

S4 plus Old Version （V2.0）	S4 plus New Version （V3.0）
After the program is completed, there will be a ringtone to remind you	Long press the DISPLAY key to close the display screen, It will remain quiet and the ringtone will no longer remind you
Storage Mode : NO	Storage Mode : Yes

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