Operating Instructions

CHARGERY 680B

Synchronous Rectification and microprocessor controlled high performance rapid Charger/Balancer for LiPo, LiFe battery packs with cell balancer.

Charge current up to 8A, 150W, for 1-6 LiPo/LiFe cells

Chargery Power Co., Ltd.

Head Office

Add: Room 20B, Haihui Building, Nanhai Avenue, NanShan, ShenZhen, China

Zip code: 518054

Tel: +86 755 26436165

Fax: +86 755 26412865

Email: Jasonwang3a@163.com

Web: www.chargery.com

Welcome to the CHARGERY 680B intelligent balance charger designed especially for 1 to 6 LiPo and LiFe cells. Please read the instructions carefully before using the charger.

Special Features

- **Built-in balancer for LiPo and LiFe cells**
  The CY-680B has a built-in individual cell balancer. LiPo/LiFe batteries are automatically balanced during charging ensuring that when the battery is fully charged it is also properly balanced.

- **High power and high performance circuit**
  The CY-680B has a maximum output power of 150W with up to 90% power conversion efficiency. The unit can charge 1-6S LiPo/LiFe cells at a maximum current of 8.0A. The automatic thermal management and efficient cooling system ensures that the charger can operate at full power without risk of overheating. As a result it can charge 6 series of LiPo and LiFe batteries at maximal current of 5A.

- **Dual confirmation for battery count in series**
  In addition to the user manually setting the cell count (displayed as "S"), the CY-680B will identify the count automatically (displayed as "R"), and adjust the charging voltage and current automatically through comparing the "S" with "R".

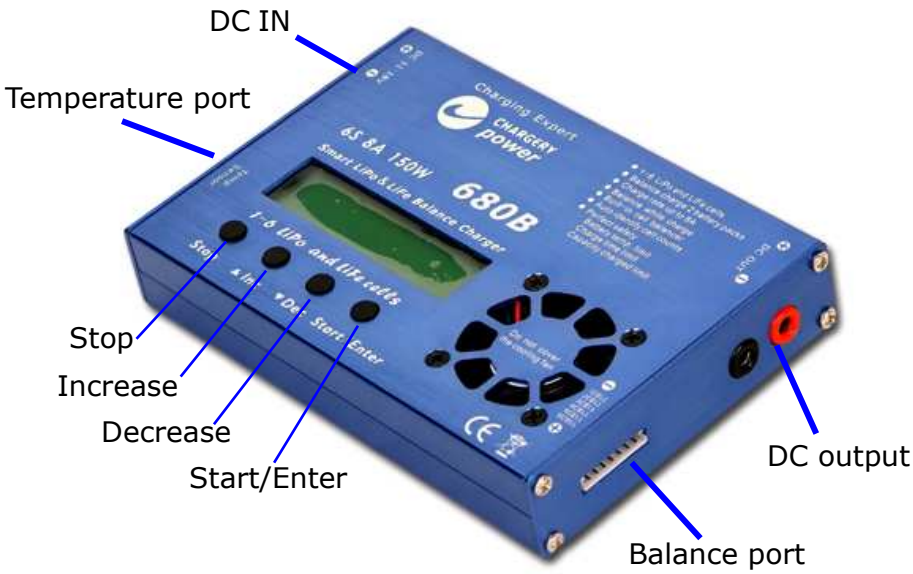
- **Perfect safety design**
  Charging time limit
  The charging time can be restrained; you can set it upon the battery status to prevent from any possible defect.
  Battery temperature limit
  The battery temperature will rise by its internal chemical reaction. If you set the limit of temperature the charging process will be stopped forcibly when the temperature reach the limit.
  Capacity charged limit
  The capacity charged always calculated by multiple of the charge current and time. If the capacity charged reached the limit you set the charging will be terminated automatically.
  Input power monitor
  To protect the car battery using as input power from being damaged the input voltage always monitored. If it drops the lower limit the charging process will be ended automatically.
  At the same time, when you use the AC adaptor or transformer as input power, if the input voltage is more than the limit the charging process will be terminated to protect the CY-680B from being damaged.

- **Brightly back-light LCD screen**
  The clear back- light LCD shows pack voltage, charge current, charge time, capacity charged.
- **Light and Attractive AL alloy case**
  High-quality aluminum case is light and durable and very efficient to cool out the internal heat.
- **Protection function**

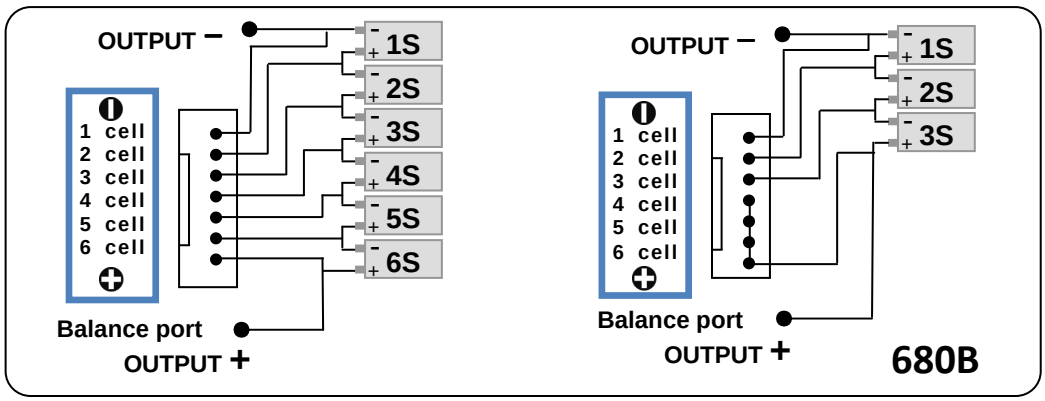
- Reverse polarity and short circuit protection(input and output)
- Over charge and Over current protection
- Detect the over-discharged battery and pre-charge the battery at a small current to resume the battery capacity
- For the battery voltage is less than 2V/each cell, the CY-680B will refuse to charge to prevent from happen safety accident.

- **With Special Connector Conversion Board(CCB-7KT-XH, CCB-7KT-EH, CCB-7BC, CCB-723, CCB-723TPQF) and conversion wire(CEHP-7) to fit all kinds of battery connectors**
- **Charge 2*3S or 3*2S battery packs simultaneously, the 2 or 3 packs should be connected to the CCB firstly, and then connect CCB to CY-680B.**

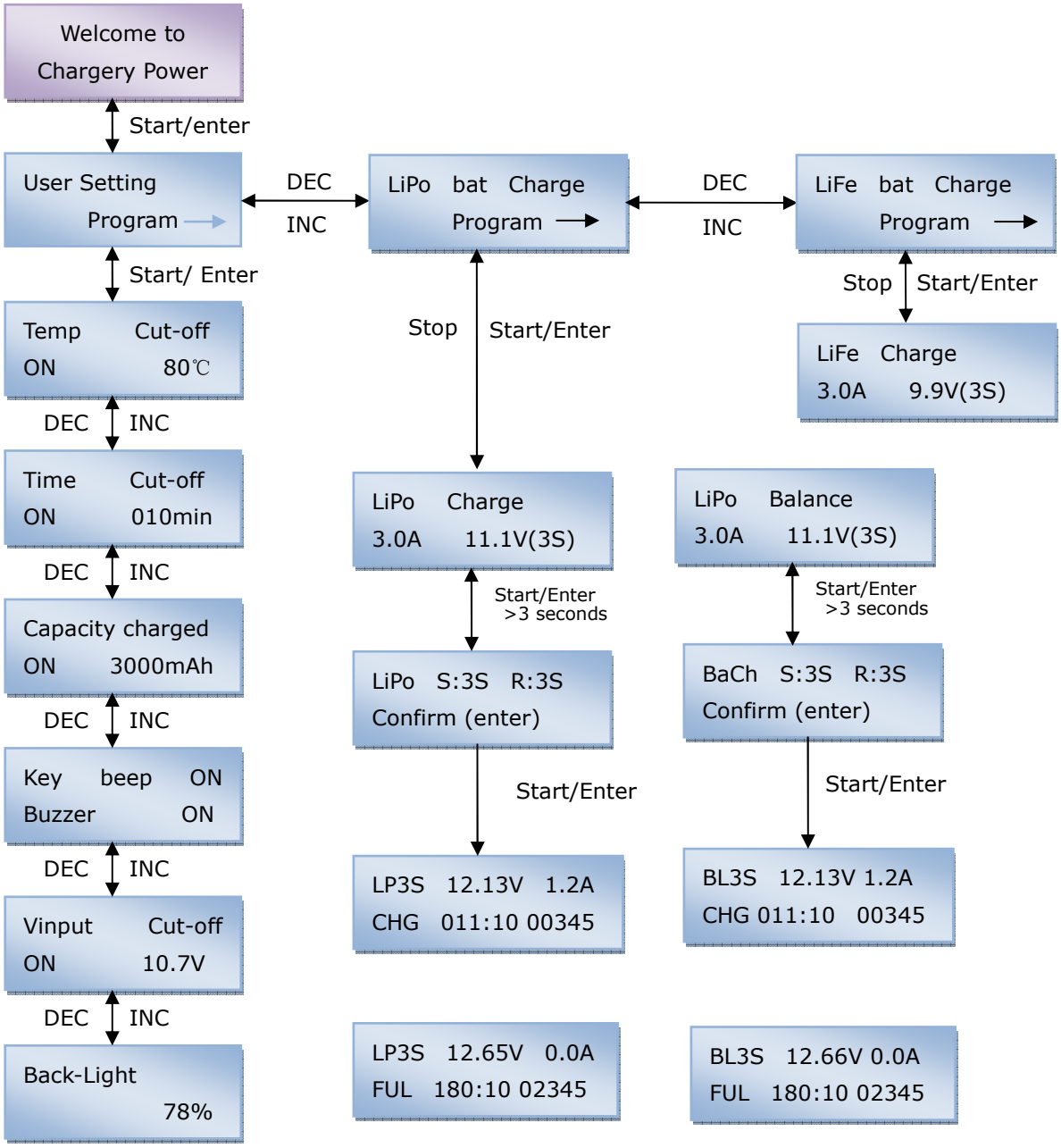
Interface of the CY-680B



Balance port and Individual Cell connection diagram:



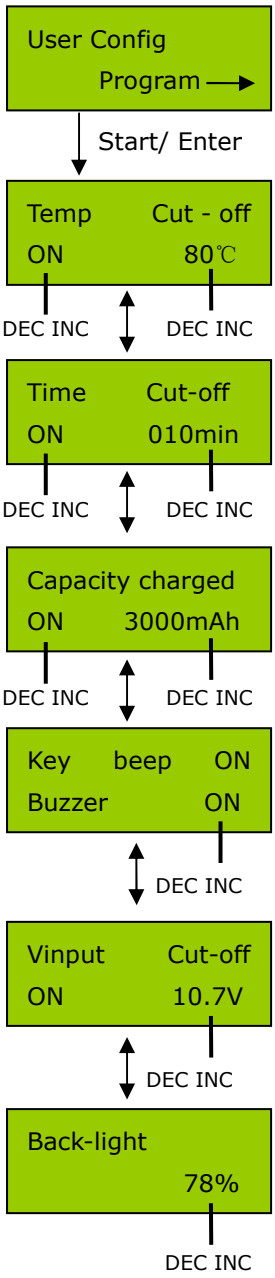
Program flow chart



Initial parameter set up

CY-680B will be operated with the default values for all User settings when it is connected to a 12V battery or an AC adapter for the first time. The LCD displays the following information in sequence and the user can change the parameter values at each step. When you are want to alter a parameter value press the **Start/Enter** button to the value blink then change the value with the **DEC** or **INC** buttons. The new value will be saved by pressing the **Start/Enter** button again.

.



This is the star screen.

An optional feature using temperature probe contacts the surface of battery. The feature can be on or off. If it is on, set the maximal temperature at which the charger allows battery to reach during charge. Once the battery temperature reaches the limit while charge, the charging will be ended to protect the battery

When you start a charge process, the integral safety timer automatically starts running at the same time. This is programmed to prevent overcharge the battery if it proves to be faulty or if the termination circuit can not detect the battery full charged. The value should be generous enough to allow a full charge of the battery

The program sets the maximal charge capacity that will be supplied to the battery during charge. If the termination circuit can not detect the battery full charged, this feature will automatically stop charging at the set capacity value.

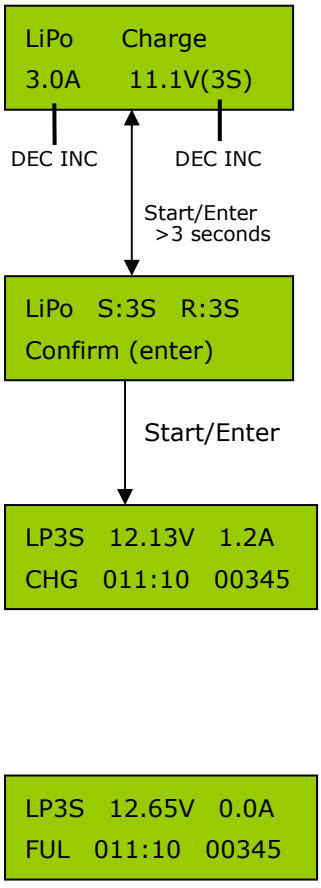
The beep sounds at every time pressing the buttons to confirm your action. The beep or melody sounded at various times during operation to alert different mode changes. These audible sounds can be on or off.

The program monitors the voltage of battery used as input power. If the voltage drops below the value you set, the charging process will be terminated forcibly to protect the battery.

You can adjust the brightness of LCD screen at the charger.

Lithium polymer battery **CHARGE** mode

These programs are only suitable for charging LiPo batteries with a nominal voltage of 3.7V/cell. The type of battery need to be charged at constant current (CC) and constant voltage(CV) mode. The charge current is dependent on the battery capacity, generally the charge current is less than 1C (the C is battery capacity, for example, if the capacity is 1000mAH, the charge current is less than 1000mA). The terminal voltage of full charged is very important, it should be 4.2V/cell for the nominal battery of 3.7V/cell, if the voltage exceeds 4.2V, the battery will explode during charge. The charge current and nominal voltage as for cell count set on the charge program must always be correct for the battery to be charged.
You should connect the battery to the DC out port of charger at this program. When you want to alter the parameter value in the program, press START/ENTER button to make it blink then change the value with DEC or INC. The value will be stored by pressing START/ENTER button once again.



The value on the second line sets a charge current and the voltage of the battery pack. Press the START/ENTER button, and then press the **DEC or INC** to set value. After setting the current and voltage press START/ENTER button for more than 3 seconds to start the process. (Charge current: 0.1~8.0A, Voltage: 1~6 series)

The left screen shows the battery count, 'S' is the result set up by you at the previous screen and 'R' shows the battery count detected by the CY-680B. If both counts are identical you can start charging by pressing START/ENTER button. If not, press STOP button to go back to previous screen. Then carefully check the battery nominal voltage to charge again.

The screen shows the present situation during charge process. **LP3S means the battery pack charged is 3 cells in series even the cell count you selected is not 3**. On the top line it means battery count, charging current and battery voltage from left to right. While for the bottom line, it means Charge (CHG) or pre-charge (PRE), charging time and capacity charged.
To change the charge current, press START/ENTER button. Decrease or increase the current by pressing the **DEC or INC** button.
To stop the charge, press **STOP** button.

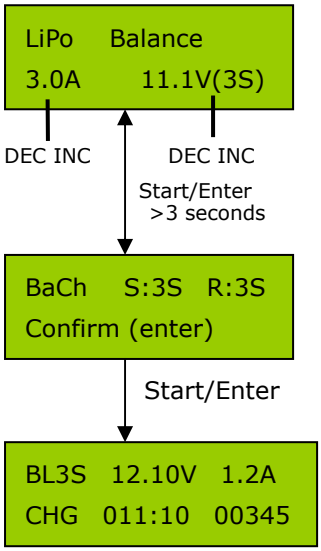
The battery is fully charged.

You can also check the parameters you set up on the USER CONFIG PROGRAM by pressing INC or DEC button; include Input voltage limit, Battery temperature Limit, and the real battery temperature.

Charging Lithium polymer battery at **BALANCING** mode

This is for balancing the voltages of the pack to be charged. To do this, the battery pack should have the balance connector, and connect it to the balance port at the right side of charger. At the same time, the battery should connect to the DC out port of the CY-680B.

In this mode, the charging process will be different from ordinary charging mode. The built-in balancer will monitor the voltage of each cell of the battery pack and control the charging current feeding to each cell to balance the voltage.



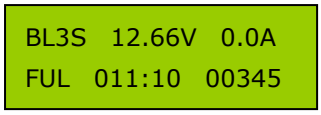
The value on the second line sets a charge current and the voltage of the battery pack. Press the START/ENTER button, and then press the **DEC or INC** to set value. After setting the current and voltage press START/ENTER button for more than 3 seconds to start the process. (Charge current: 0.1~8.0A, Voltage: 1~6 series)

The left screen shows the battery count, 'S' is the result set up by you at the previous screen and 'R' shows the battery count detected by the CY-680B. If both counts are identical you can start charging by pressing START/ENTER button. If not, press STOP button to go back to previous screen. Then carefully check the battery nominal voltage to charge again.

The screen shows the present situation during charge process. **BL3S means the battery pack charged is 3 cells in series even the cell count you selected is not 3**. On the top line, it means battery count, charging current and battery voltage from left to right. While for the bottom line, it means Charge (CHG) or pre-charge / the cell difference is over 200mV (PRE), charging time and capacity charged.

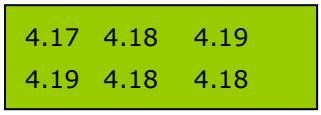
To change the charge current, press START/ENTER button. Decrease or increase the current by pressing the **DEC or INC** button.

To stop the charge, press **STOP** button.



The battery is fully charged.

You can monitor the present voltage of individual cell by pressing INC button during charge process.



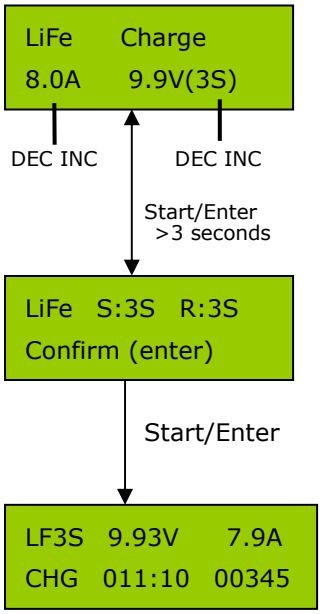
The first line of display shows the voltage of no.1 cell, no.2 cell and no.3 cell from the left. And the left of second line shows the voltage of no.4 cell, no.5 cell and no.6 cell. The flashing voltage means the corresponding cell is being balanced.

You can also check the parameters you set up on the USER CONFIG PROGRAM by pressing DEC button; include real input voltage, Battery temperature Limit, and the real battery temperature.

LiFe （A123 system）Lithium ion battery **CHARGE** mode

These programs are only suitable for charging LiFe batteries (A123system cell) with a nominal voltage of 3.3V/cell. The type of battery need to be charged at constant current (CC) and constant voltage (CV) mode. The charge current is dependent on the battery capacity, generally the charge current is less than 3C (the C is battery capacity, for example, if the capacity is 1000mAH, the charge current is less than 3000mA). The terminal voltage of full charged is very important; it should be 3.6V/cell for the nominal battery of 3.3V/cell. The charge current and nominal voltage as for cell count set on the charge program must always be correct for the battery to be charged.

You should connect the battery to the DC out port of charger at this program. When you want to alter the parameter value in the program, press START/ENTER button to make it blink then change the value with DEC or INC. The value will be stored by pressing START/ENTER button once again.

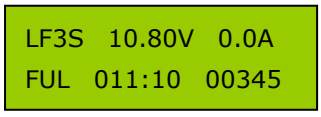


The value on the second line sets a charge current and the voltage of the battery pack. Press the START/ENTER button, and then press the **DEC or INC** to set value. After setting the current and voltage press START/ENTER button for more than 3 seconds to start the process. (Charge current: 0.1~8.0A, Voltage: 1~6 series)

The left screen shows the battery count, 'S' is the result set up by you at the previous screen and 'R' shows the battery count detected by the CY-680B. If both counts are identical you can start charging by pressing START/ENTER button. If not, press STOP button to go back to previous screen. Then carefully check the battery nominal voltage to charge again.

The screen shows the present situation during charge process. **LF3S means the battery pack charged is 3 cells in series even the cell count you selected is not 3**. On the top line it means battery count, charging current and battery voltage from left to right. While for the bottom line, it means Charge (CHG) or pre-charge (PRE), charging time and capacity charged.

To change the charge current, press START/ENTER button. Decrease or increase the current by pressing the **DEC or INC** button.



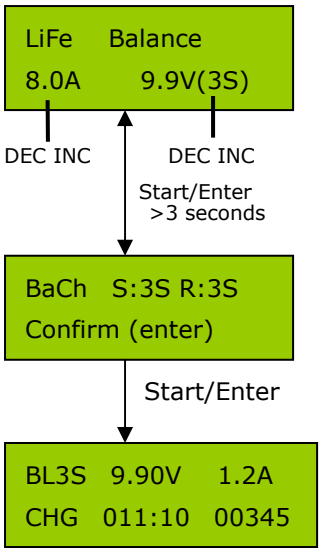
The battery is fully charged.

You can also check the parameters you set up on the USER CONFIG PROGRAM by pressing INC or DEC button; include Input voltage limit, Battery temperature Limit, and the real battery temperature.

Charging LiFe (A123system) lithium ion battery at **BALANCING** mode

This is for balancing the voltages of the pack to be charged. To do this, the battery pack should have the balance connector, and connect it to the balance port at the right side of charger. At the same time, the battery should connect to the DC out port of the CY-680B.

In this mode, the charging process will be different from ordinary charging mode. The built-in balancer will monitor the voltage of each cell of the battery pack and control the charging current feeding to each cell to balance the voltage.



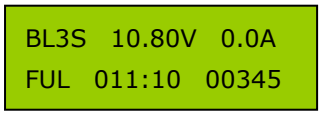
The value on the second line sets a charge current and the voltage of the battery pack. Press the START/ENTER button, and then press the **DEC or INC** to set value. After setting the current and voltage press START/ENTER button for more than 3 seconds to start the process. (Charge current: 0.1~8.0A, Voltage: 1~6 series)

The left screen shows the battery count, 'S' is the result set up by you at the previous screen and 'R' shows the battery count detected by the CY-680B. If both counts are identical you can start charging by pressing START/ENTER button. If not, press STOP button to go back to previous screen. Then carefully check the battery nominal voltage to charge again.

The screen shows the present situation during charge process. **BL3S means the battery pack charged is 3 cells in series even the cell count you selected is not 3**. On the top line, it means battery count, charging current and battery voltage from left to right. While for the bottom line, it means Charge (CHG) or pre-charge (PRE), charging time and capacity charged.

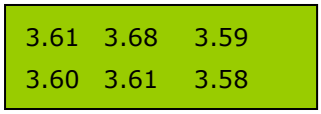
To change the charge current, press START/ENTER button. Decrease or increase the current by pressing the **DEC or INC** button.

To stop the charge, press **STOP** button.



The battery is fully charged.

You can monitor the present voltage of individual cell by pressing INC button during charge process.



The first line of display shows the voltage of no.1 cell, no.2 cell and no.3 cell from the left. And the left of second line shows the voltage of no.4 cell, no.5 cell and no.6 cell. The flashing voltage means the corresponding cell is being balanced.

You can also check the parameters you set up on the USER CONFIG PROGRAM by pressing DEC button; include real input voltage, Battery temperature Limit, and the real battery temperature.

Warning and error messages

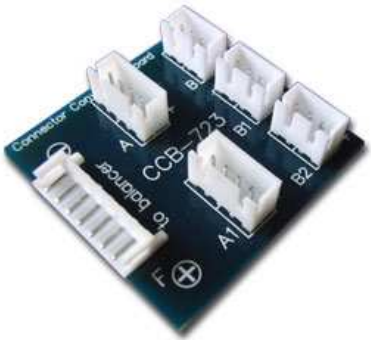
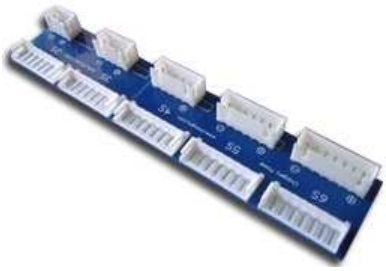
CY-680B designed a various protection and alarm functions to monitor the operation of charger. In any case of occurring error, the LCD will display the possible cause.

Battery Over-discharge	Battery voltage is lower than 2.0V
Battery Voltage High	Battery voltage is over 25.2V,
Short circuit	The battery connect reversely, or the DC out leads short-circuit
Connection Break	This will be displayed in case of detecting an interruption of the connection between battery and output
Low Input Power	The voltage of input power lowers the limit.
Battery Temp. High	The battery temperature rose over the limit.
Capacity Charged High	The capacity charged reached the limit.
Charging Time High	The charging time reached the limit.

Specifications

- Applied battery type: LiPo and LiFe battery
- LiPo and LiFe battery count: 1~6S series
- Input voltage: DC 11-18V，15A
- Charge current:0.1~8.0A
- Charge power: MAX. 150W
- Balancing current: 350mA/cell
- Weight:400g
- Dimensions:140*98*25mm

Accessories

CEHP-7 Conversion Wire	**CCB-723-EH or XH** for 2*3S and 3*2S Kokam and Align batteries pack	**CCB-723TPQF** for 2*3S and 3*2S TP, Flightpower and Polyquest, Hyperion batteries pack
		
CCB-7BC for 2S, 3S, 4S, 5S, 6S Thunder Power , Flightpower and Polyquest, Hyperion batteries pack	**CCB-7KT-EH** For 2S, 3S, 4S, 5S, 6S Kokam, Graupner, **XH** for Align, Chargery batteries pack	**CW9:** temperature sensor
		

Warnings and safety information

- Never leave the charger unattended when it is connected to its power supply. If any malfunction is observed immediately terminated charging and refer to the operation instructions.
- Keep away the unit from dust , damp, rain, heat direct sunshine and vibration. Do not drop it.
- The charger and the battery to be charged should be set up on a head-resistant,

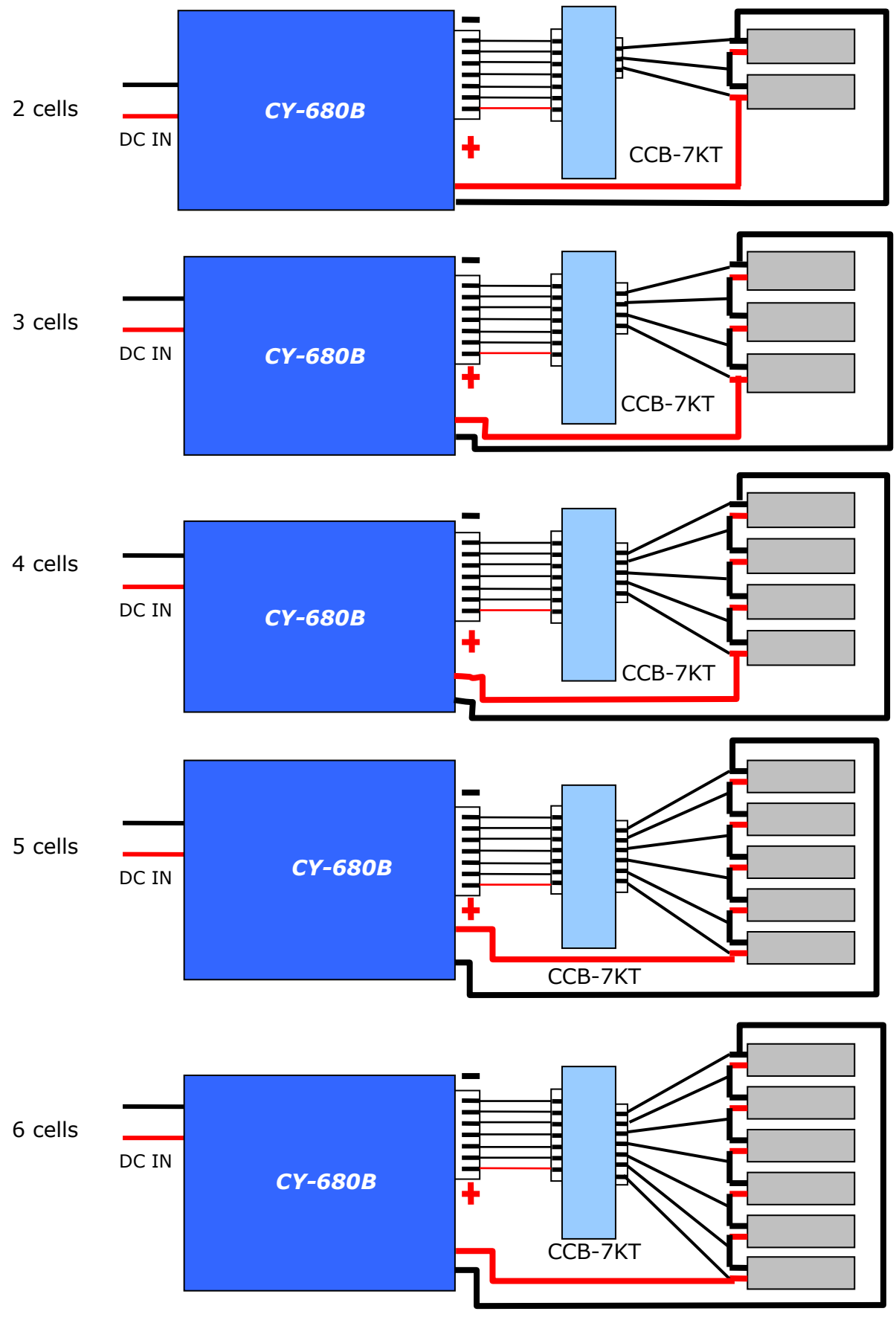
non-inflammable and non-conductive surface. Never place them on a car seat, carpet or similar.

- Keep all the inflammable volatile materials well away from operating area.
- Be sure to understand the information of the battery to be charged accurately. If the battery count is set up incorrectly the battery can severely be damaged, even cause a fire or an explosion by over-charged.
- Do not connect more than one battery pack to the charger output lead at any time.
- Do not attempt to charge the following types of battery:
  - Lead acid battery or VRLA
  - NIMH/NICd battery pack.
  - Any other types of battery except for li-ion and lithium polymer battery.
  - Battery pack, which consists of different types of cell (including different manufacturers).
  - Battery, which is already fully charged or just slightly discharged.
  - Non-rechargeable batteries (Explosion hazard).
  - Faulty or damaged battery.
  - Batteries with unconfirmed charging current
- Please bear in mind of checking the following point before charge operation.
  - Did you select the appropriate program, which are suitable for the type of battery?
  - Did you set up adequate current for charging?

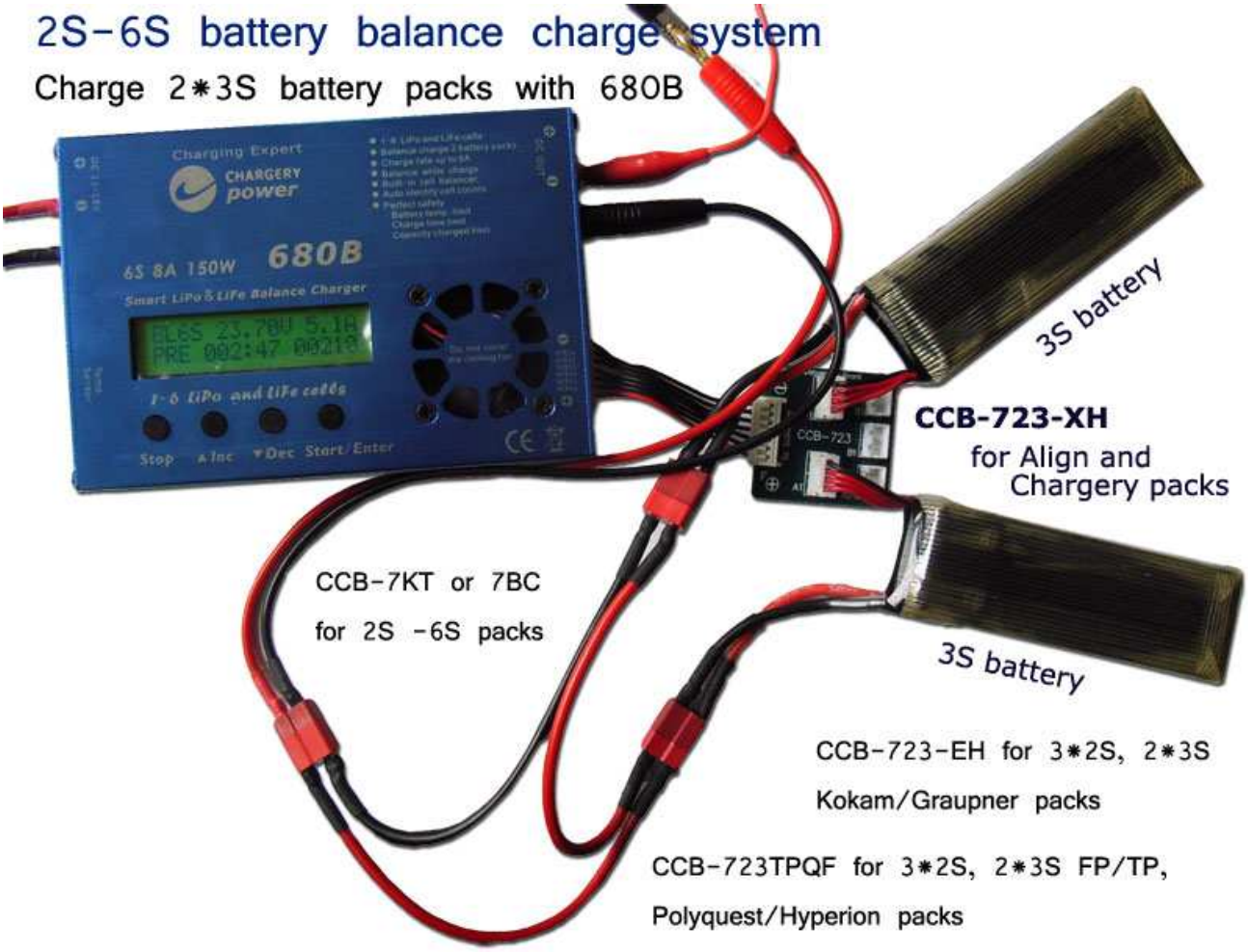
- Lithium battery pack can be composed with parallel and series circuits mixed. You have to check the composition of the battery pack carefully before charging.
  - Are all connection firm and safe, or is there an intermittent contact at any point in the circuit?

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.

Balance Connection Diagram for balancing charge



Balance Charge 2*5S battery packs, Please note the batteries being charged should all have the same nominal capacity (mAh).



Maximum circuit power chart

When the battery voltage is more than 18.75V, the actual charging current delivered to the battery will be automatically limited so as not to exceed the charger's rated charging power of 150 watts. The actual feeding current will be as follows:

Maximum charge current for different battery
At 200W of input power

battery type	cell counts	rated voltage(V)	Charge current(A)
LiPo	1	3.7	8.0
	2	7.4	8.0
	3	11.1	8.0
	4	14.8	8.0
	5	18.5	8.0
	6	22.2	6.8
liFe	1	3.3	8.0
	2	6.6	8.0
	3	9.9	8.0
	4	13.2	8.0
	5	16.5	8.0
	6	19.8	7.6

Warranty and Service

Chargery Power Co., Ltd. as manufacture of R/C model power warrants its CHARGERY charger and battery pack to be free of defects in material and workmanship. This warranty is effective for 12 months from date of purchase. If within the warranty period the customer is not satisfied with the products performance resulting from a manufacturing defect the accessory will be replaced or repaired.

Your selling dealer is your first point of contact for warranty issues. Return postage costs are the responsibility of the user in all cases. Please submit copy of original receipt with the return.

Damage due to physical shock (dropping on the floor, etc.), inappropriate power supply (unstable output voltage and insufficient power, etc.), water, moisture, and humidity are specifically NOT covered by warranty. It is best to carefully check your charger before considering returning it as problems in setup, cabling, or power supply are much more common than defects in the charger. If there is damage stemming from these causes within the stated warranty period, the company will, at its option, repair or replace the charger for a service charge not greater than 50% of its then current retail list price.

Date of purchase/delivery:
Dealer:

NOTE:

CHARGERY hope customers notify any change or modification made to this device.

Welcome any suggestions at jasonwang3a@163.com

Thanks and enjoy the power!

CHARGERY power
Charging Expert