



C3060A/B v1.0

PFC programmable charger
High efficiency wide input voltage
90V~265VAC Input
For 7S LiPo, 8S LiFe battery
1~60Amps 1500W max.



Thanks for your purchasing the intelligent and powerful charger.

Read the ENTIRE instruction manual to become familiar with the features/functions of the device before operating.

Feel free to send an email to jasonwang3a@163.com or call at 86 755 2643 6165 should you have any questions and suggestions.

A handwritten signature in black ink, appearing to be 'Jason Wang'.

Jason Wang



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Features

The Battery Charger has been designed to provide reliable, quality charging for battery systems in electric drive vehicles. It is a high efficiency wide input voltage charger, the charger can output 1500W at AC90V~265V in a smaller size. Many creative technology help to realize up to 94% of efficiency, and the internal temperature is still under 50°C. The following are some new features:

- Intelligent control output voltage and current by microprocessor, 100% calibration before delivery
- $\pm 1\%$ voltage and current accuracy
- **Active PFC**: smaller AC input current less interference, and Conform to European Commission Regulation no 278/2009 and Energy Star Version 2.0
- AC **90-265V** worldwide operation: need not any alternative switcher, worldwide safe operation.
- Low power consumption (**less than 1W**) at idle mode and standby mode
- Up to **94%** of convert efficiency.
- Programmable output voltage from **10V** to 30V
- Programmable output current from **1A** to 60A
- **TFT color LCD** display output Voltage, current, power and internal temperature on time.
- Over current, over voltage, over load, over temperature, and short circuit protection
- Short-circuit protection on output, safer and more reliable.
- 2 Intelligent cooling fans turned on and adjust speed upon the temperature automatically
- ZVS/ZCS and Synchronous Rectification assure the highest efficiency.
- High power density: **652W/Kg**
- Start at no load or full load
- Approved by CE
- 24 months warranty

Application

- Home application
- Electric drive vehicles



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Protection functions

1. Over current protection
2. Over voltage protection
3. Charge power protection
4. Over temperature protection
5. Low battery voltage protection
6. Anti spark on battery connection even 100V battery connect to charger
7. Reverse polarity protection of battery connection
8. Prevent any cell from over charging, adjust charge current automatically fit with Chargery BMS

Main battery type and cell count

Battery Type	Cell Count	Output Voltage/V	Terminal charge Voltage per cell			Charge current	Terminal charge current/A	Charge Mode
			Min.	Type	Max.			
LiPo	1S-7S	10-30	2.75	4.20	4.25	1.0-60A	5-60%	Pre-charge CC/CV and maintain
Li-ion	1S-7S	10-30	2.50	4.10	4.15			
LiFe	1S-8S	10-30	2.00	3.65	3.70			
LiTo	2S-11S	10-30	1.50	2.70	2.70			
Pb	2S-12S	10-30	1.75	2.40	2.50			
			- delta Voltage /mV					
			Min.	type	Max.			
NiMH /NiCd	Auto	10-30	100	300	1000			CC



Warning

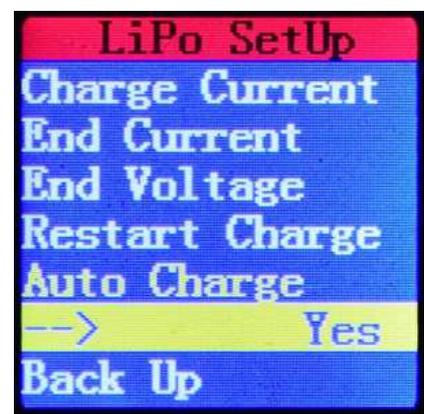
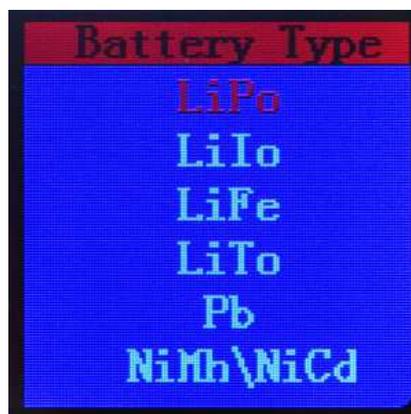
1. For any lithium battery, such as LiPo, LiFePO4, Li-ion, LiTo and other Li battery, the PCM (Protection Circuit Module), BMS, cell monitor, saver etc. must be built-in the battery pack, because the charger don't monitor each cell voltage, even the total battery voltage don't be over charged, the single cell voltage is possible be over charged, special for larger impedance cell. So if no PCM or BMS protect each cell from over charged, it is very dangerous.
2. Before charge, the cell count must be setup correctly, it is very important. Cell count is not the cell quantity in a battery pack, it means cell count of connection in series, even 5 cells connected in parallel, the cell count is 1 NOT 5. Please according to your battery pack rated voltage and the following table get the cell count.

Battery type, cell count and rated voltage table

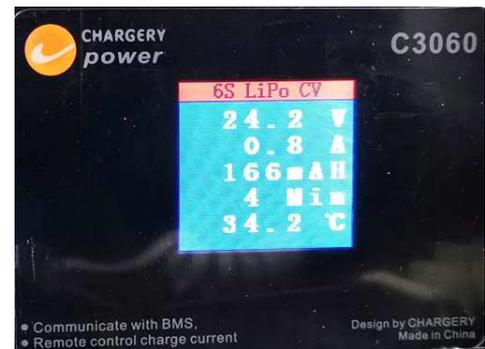
cell count/Battery rated voltage	LiPo,V	Li-ion,V	LiFePO4,V	LiTo,V	Pb/VRLA/Gem battery,V
1	3.85	3.75	3.2	2.4	2.0
2	7.7	7.5	6.4	4.8	4.0
3	11.55	11.25	9.6	7.2	6.0
4	15.4	15.0	12.8	9.6	8.0
5	19.3	18.8	16.0	12	10.0
6	23.1	22.5	19.2	14.4	12.0
7	27.0	26.3	22.4	16.8	14.0
8			25.6	19.2	16.0
9				21.6	18.0
10				24.0	20.0
11				26.4	22.0
12					24.0

Operation Instructions

1. Connect C3060A/B to AC 110 / 220V outlet by the special heavy power cable, if use other brand cable, please note the wire AWG must be AWG14 at least.
2. Connect battery to charger.
3. Connect Chargery BMS8T to charger if possible.
4. 2 seconds later, the idle interface is displayed; the charger is ready to charge. Actual output voltage, current and internal temperature is also displayed, but C3060A/B is at idle mode (no output) to save power consumption.



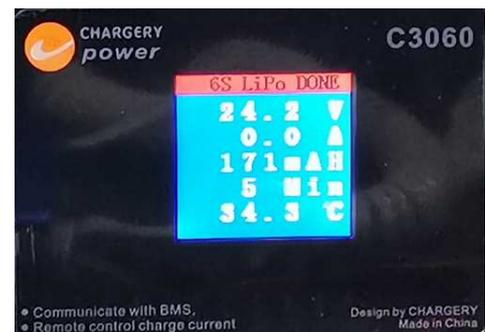
5. Press **knob** shortly can choose Battery type; press again on Battery type such as LiPo can enter into LiPo charge setup interface. Here, you can setup cell count, charge current, charge terminal current, and charge terminal voltage per cell, and then press **knob** for 3 seconds start charging.



6. Stop charging, the battery voltage will goes down because of self-discharge, if need maintain battery voltage, please setup the **Restart Charge YES** (only for C3060B), the charger will continue to charge when battery voltage goes down to 5% of total battery voltage.

If set up to **YES**, the charger display KEEP after charge finished.

If set up to **NO**, the charger display DONE after charge finished.



7. Setup the charger work at Auto mode (only for C3060B),

Finish all charge settings, alternate Auto charge YES and press Knob for 3 seconds, the charger will start to charge, and work at Auto mode in future till disable it.

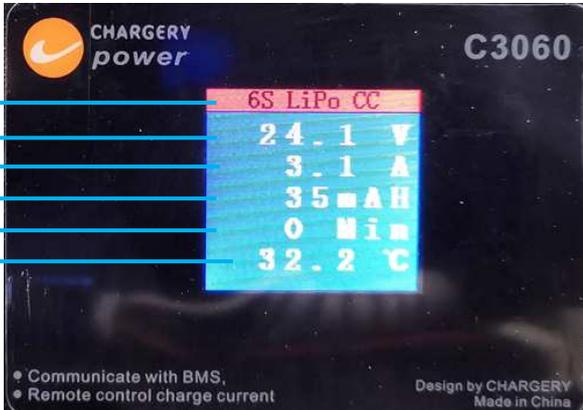
When the charger work at Auto mode, what you need to do is connect the AC power and battery to the charger. The charger will operate at last settings.

On Auto interface, press Knob for 3 seconds alternate to Idle mode.

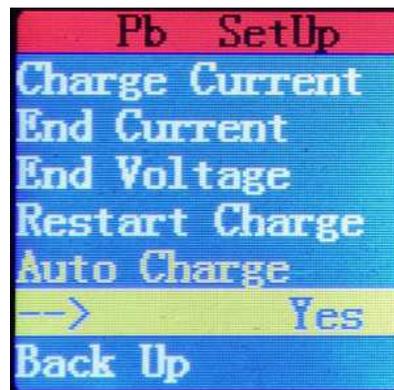
If need not charge as last settings, please set up Auto Charge is NO

8. During charge, many charge information is displayed as below

Cell count, Battery Type, Charge status	6S LiPo CC
Battery voltage	24.1 V
Charge current	3.1 A
Capacity charged	35mAh
Charge time	0 Min
Internal temperature	32.2 C



9. Similar with LiPo charge setup, you can setup Lilo, LiFe, LiTo, Pb battery and NiMH/NiCd.



10. At any time Press knob shortly stop charging. The charger will work at idle mode to save power consumption. Generally you needn't disconnect it from AC outlet, because it only consume under 1W power at idle mode.

Tips

- All parameters will be remembered by the C3060A/B till next change.
- Choose battery type, and press knob for 3 seconds start to charge at last setup



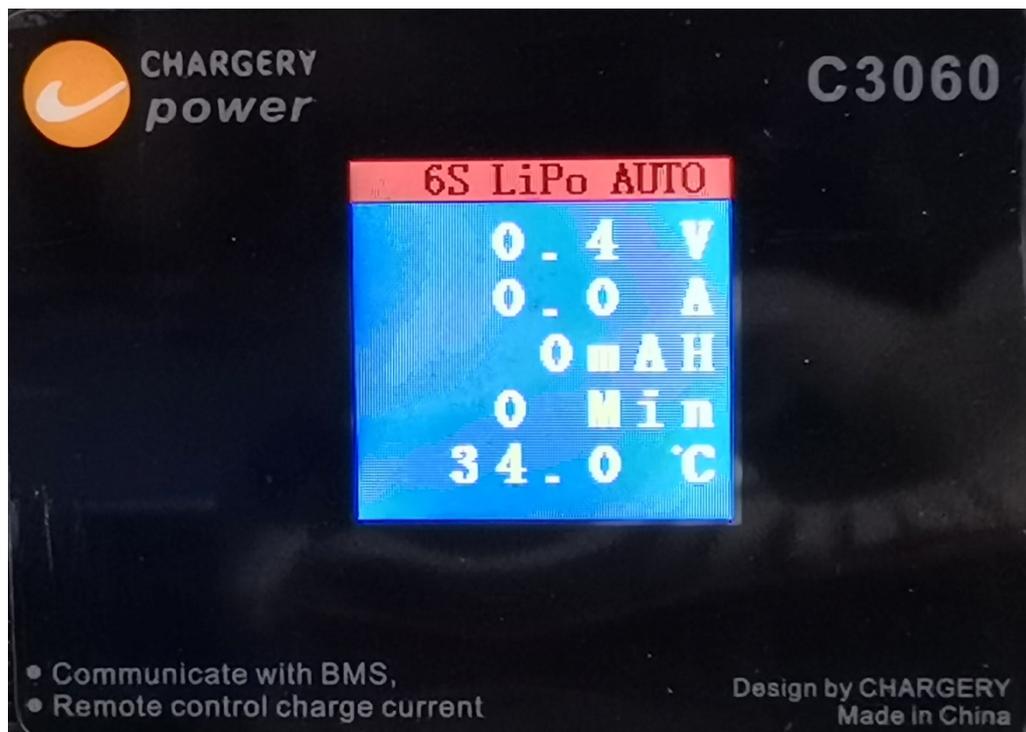
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Auto mode operation instructions

When you need charge same one battery repeat, you can set up Auto Charge is yes (Only for C3060B), the charger will charge automatically next time, need not setup any parameters. At AUTO charge, press Knob button shortly stop charging at any time, and press it again start to charge. Or during charge, disconnect battery stop charging, and connect it, start to charge again automatically.

When need to charge new battery at different parameters, disconnect battery at AUTO interface, press Knob button for 3 seconds alternate idle interface, the charger will work at intelligent operate mode, all parameters can be setup in this mode.

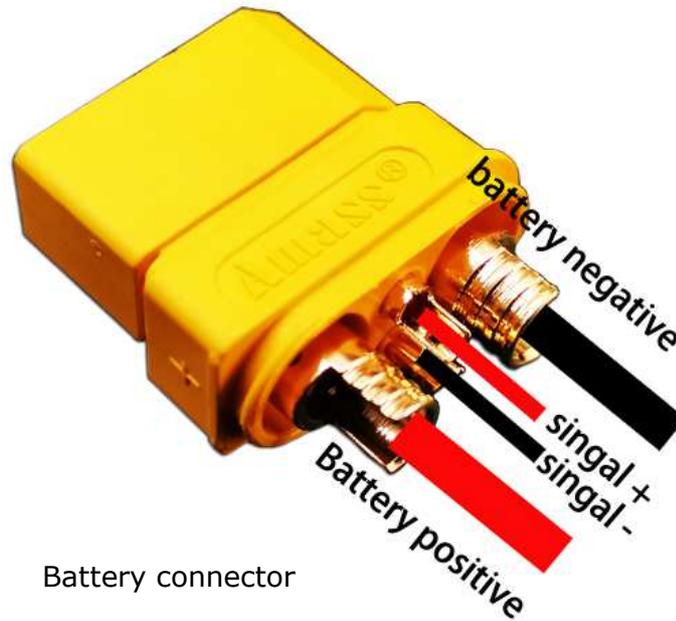


for more details about auto mode, Please watch the video on http://www.chargery.com/Video/C3060_Automode.mp4 .

Remote control charge Mode

COM1 is on the bottom of charger, connect to Chargery BMS, the charge current will be controlled by BMS when any cell voltage reach OVP.

Battery connector is as below, two heavy terminal connect to battery positive and negative separately, there are two slim terminal in middle of connector, it connect to external device. The charge current can be controlled by remote signal. The signal should be 1KHz 5V or 3.3V square



Note:

1. To realize remote control charge by external device, please purchase C3060A.
2. If don't connect external device, the charger can be operated by manual, if connect to the external device, and send a suitable signal, after press Knob for 3 seconds start to charge, the charge current will be adjusted according to external signal. External signal can turn off charge (charge current is zero, the charge status display KEEP), and control charge current at range 1A to 60A.



Warning

PWM signal adjust charge current, increase or decrease 10% maximal each time per one second.

Remote control operation instructions

1. Connect to AC source, turn on the charger
2. After finish initialization, the C3060A enter into idle model
3. Connect battery and external signal to the charger. Exclude battery positive and negative, the external signal must be connected to middle two terminals. The battery voltage will be displayed, but it is less than battery voltage , it is normal, when start to charge, the battery will be displayed accurately.
4. Press Knob enter into battery type interface, alternate battery type and press Knob, enter into charge setup interface,
 - a) Set up cell count,
 - b) Set up charge current, it should be the maximal current that the battery can be charged, when PWM failed, the charger will charge at this current.
 - c) Set up end current. At CV phase (constant voltage), when the charging current is lower than settings, the charger stop charging and the battery fully charged, display KEEP charge status. The end current is a percentage (1-60%) of charge current setting . Such as if the charge current setting is 10A, end current is setup to 10%, the end current is 1A.
 - d) Set up end voltage, the voltage is cell voltage NOT battery pack total voltage, it must be under or same as OVP on BMS. C3060A will charge at constant voltage when total battery voltage reach cell count*setup value.



Note: On the charge mode, cannot setup restart charge and Auto charge.

9. Press Knob for 3 seconds, the charger will start to charge, the charge current will be modified according to the Duty cycle of PWM from external device. The higher Duty cycle, the higher current. The current range is 1A-60A. need decrease the current, please decrease the Duty Cycle and then increase it.
10. Finish charge, the beeper sounds 10 times, charge current is zero, and display KEEP status. If need continue to charge, adjust duty cycle to under 3% then increase gradually to adjust charge current, start to charge again.
11. During charge, press Knob stop charging at any time.

Please watch the operation video on <https://youtu.be/KDD-QWLkFQc>

Program Setup

1. In charger idle interface, press **knob** button for 2 seconds enter into Program Setup menu.
2. LCD display the following information in sequence and you can modify its value. When you want to alter a parameter value, press the **knob** button make the value blink then modify the value by rotate the button. The new value will be confirmed and saved by pressing the button again.
3. Press **knob** quit the setup menu.



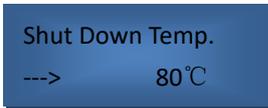
Picture 3 Program setup



Setup the maximal charge current, range from 1A~60A, step 0.1A, default 60A. It is only active for power supply.



Setup the fan starting temperature, range from 30~50°C, step 1°C, default 35°C. The fan speed will increase with the temperature go up.



Setup over temperature protection, range from 70~90°C, step 1°C, default 80°C. Over the temperature, the charger will power off



The beeper sounds for each button press to confirm your action. These sounds can be ON or OFF. Default ON.



This menu sets the back-light time of LCD screen backlight.
 Options: **1MIN, 5MIN, 10MIN, 20MIN and Always on, default 5MIN.** At default 5min, LCD back-light will be off to save the power, **press knob resume the back-light.**



Setup the Temperature unit, °C or °F, default °C.

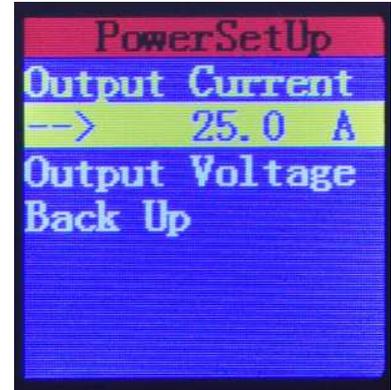
Note:

- All parameters will be remembered by the C3060A/B till next change.

As power supply

On Battery type interface, choose power supply setup output voltage and maximal output current, the charger will work as a programmed power supply; you can set up the output voltage and maximal output current, and then press **Knob** for 3 seconds power on the charger.

- Output voltage adjustment range: 10V~30V,
- Output current adjustment range: 5A~60A.





CHARGERY

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1~60Amps 1500W max.

Environment Requirements

- Ambient Temperature : -10--45°C
- Ambient Humidity : 5%--95%
- Storage Temp. : -20°C--70°C
- Storage Humidity : 30%--90%

Input

- Rated Voltage : AC110 / 220V
- Voltage allowed: AC90 ~ 265V
- Rated Freq. : 50/60Hz
- Freq. Allowed : 47~63Hz
- Max Current : 18A @90V, 7.5A @220V
- Efficiency: 94% at 65% load and 220Vac input.
- Active PFC: PF>0.99 at 90VAC and 100% of load; PF>0.97 at 220VAC and 100% of load



Output

- Voltage : 10 ~ 30V programmed
- Voltage accuracy: ±1%
- Current accuracy: ±1%
- Ripple voltage: 150mV.
- Charge Current: 1 ~ 60A programmed
- Power: 1500W max.



Protection

- Over voltage protection, over 2V setup value.
- Under voltage Protection, battery voltage is under 2V, don't charge.
- Over current protection, over 2A setup value.
- Over charge power protection, 1500W max.
- Over temperature protection, 90°C max.
- Short- circuit protection on output.
- Prevent any cell from over charging, adjust charge current automatically fit with Chargery BMS

Mechanical Characteristics

- Size: 278*145*68 (L*W*H, mm) or 10.8 * 6.7 * 2.7 (L*W*H, inch)
- Weight: **2.46**Kg without input cable
- Input power cable: AWG14 wire, 1.5m length
- Output DC connector: XT-90I male connector on C3060B or XT-90 male connector on C3060A



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Packaging Information

- C3060A/B base unit: 1pcs
- Power cable: 1pcs
- Communication wire: black, 1pcs
- XT-90 female connector: 1pcs, for C3060A
- XT-90I female connector: 1pcs, for C3060B



Total solution on E-Vehicle application

Chargery BMS is a successful combination with the charger C3060. When all cell voltage reach setup value, BMS communicate with charger, the charger continue to charge at a smaller current rather than stopping charging.

It is very important at large current charge application. Because Start and Stop charging repeat by Close or Open relay or MOSFET, not only cause battery voltage fluctuation at a large range, shorten mechanical switch or electronic switch life, but also extend charging time notably.

Chargery BMS and charger as a total solution can charge and monitor each cell voltage, temperature, charge and discharge current, short circuit even cell voltage difference, and charge each cell to any voltage you want, such as you can set up the charge terminal voltage 3.85V per LiPo cell, when charge is done, the battery pack will be storage at safe status,



NOTE

Chargery charger decrease charge current according to "Over Charge Protection (P) Voltage" on BMS setup, so please setup the charge terminal voltage in accordance with Over Charge Protection (P) Voltage on BMS.



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Error Information

When the following error events triggered, the beeper will sound for 10 seconds and error information will be displayed, you can press **knob button** turn off beeper sound and back up to Idle or auto mode interface.

Error information	DESCRIPTION
Battery Vol. low	No battery connection or reverse polarity of battery connection or short circuit on output, the charger will be power off
Battery Vol. High	Battery voltage over setup, the charger will be power off
Over Current	Output current over 2A of setup for 2 seconds, C3060A/B turn off automatically and turn on manually
Over Voltage	Output voltage over 2V of setup for 2 seconds, C3060A/B turn off automatically and turn on manually
Over temperature	The heat sink temperature over setup for 2 seconds, C3060A/B power off automatically, and turn on manually
Connection Break	At normal charge, disconnect battery, the charger will stop charging, press Knob back up to idle interface

Warnings

- Never leave the charger unattended when it power on. If any malfunction is observed, please press Knob button power off the charger as fast as possible.
- Keep away the charger from dust, damp, rain, heat direct sunshine and vibration. Do not drop it.
- The charger should be set up on non-inflammable and non-conductive surface. Never place on a car seat, carpet or similar.
- Keep all the inflammable volatile materials well away from operating area.
- Do not attempt to charge any Lithium battery not built-in BMS, PCM, cell voltage monitor

Related parts

The following parts are similar to the C3060A/B and maybe of interest:

MODEL	DESCRIPTION	COMMENTS
C10325	4S-24S battery charger	
BMS16T	2-16S battery management system	
BMS24T	2-24S battery management system	
S400	High efficiency wide input voltage PFC charger	10~130V 13.5A 400W output
S600	High efficiency wide input voltage PFC charger	10~18V 33A 600W output
S1200	High efficiency wide input voltage PFC charger	12~24V 50A 1200W output
S1500	High efficiency wide input voltage PFC charger	10~30V 60A 1500W output





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Application Notes.

Storage Energy System

If C3060A/B charger applied to large capacity energy System such as PV system, C3060A is suggested, the charge current can be controlled by remote device. The C3060A can receive PWM signal and adjust charge current.

- The current range is 1A to 60A.
- When PWM duty cycle under 10%, C3060A will stop charging.
- When PWM signal fail, the charger will charge at the settings by manual.

E-car or other E- Vehicle

When C3060A/B applied to E-boat or other E- Vehicle battery, C3060B is suggested, and Auto charge mode is the best, after setup all charge parameters and setup Auto Charge YES, the charger can charge the battery automatically at any time. Need not any operation besides connect AC power source and battery to the charger.

RC or UAV

When C3060A/B need charge multiply chemistry battery, C3060B is suggested, on normal work mode, the charger is easy to set up for all kinds of battery. It is enough flexible to meet almost challenge.



CHARGER

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Order information

Function Description	MODEL	
	C3060A	C3060B
1. Remote control charge current by external device.	✓	
2. Start to charge automatically (Auto charge mode) after connect to AC source and battery to charger		✓
3. Restart charge when battery voltage drop 5-10%		✓
4. Normal charge mode , Setup battery type, cell count and all charge parameters	✓	✓
5. Power supply mode , 12-55V adjusted, 1-55A adjusted	✓	✓
6. BMS control charge , Charge current controlled by Chargery BMS, prevent any cell voltage from over charged	✓	✓

Version history

Version	
V1.0	First released



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Warranty and Service

Chargery Power Co., Ltd. as manufacture of R/C, E-Vehicle and UAV power warrants C3060A/B charger 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. This warranty does not cover the damage due to wear, misuse, incompetent handling or using of incorrect accessories.



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