

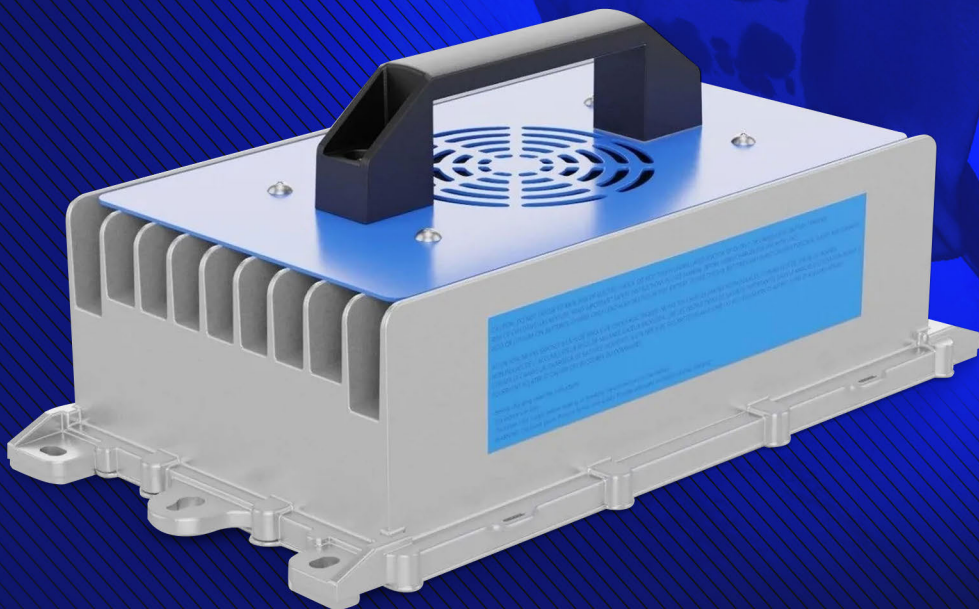


**ABYSS
BATTERY**

POWER YOUR PURSUIT.

**ONBOARD MARINE
LITHIUM BATTERY**

CHARGER



USER MANUAL

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THANK YOU

For purchasing the Abyss Battery Charger. Follow the relevant provisions in this manual throughout the operation, maintenance, and repair of this charger. We are not responsible for the results of its operation. If the user is involved in violation of such requirements, we are not responsible for the results of the operation.

QUALITY ASSURANCE

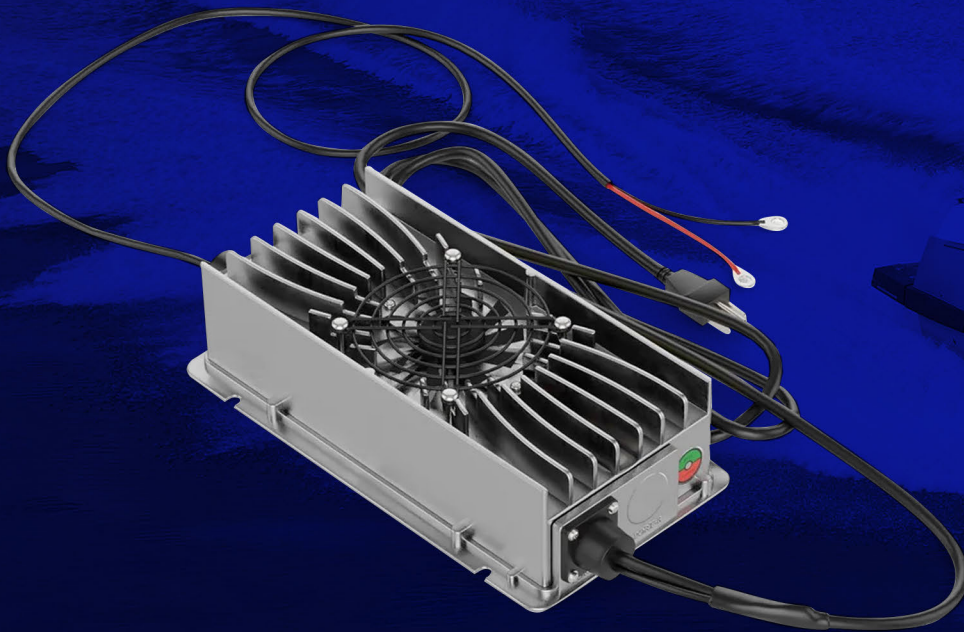
All Abyss Lithium battery chargers undergo strict quality testing. If you claim any manufacturing defect under the warranty period, we will give you a free replacement. Once the maintenance period is over, you will need to pay maintenance costs depending on the actual situation.

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TECHNICAL SPECIFICATIONS:

Product name	24V10A	24V20A	36V10A	36V20A
Model	AB-CRG-24V10A	AB-CRG24V20A	AB-CRG-36V10A	AB-CRG-36V20A
Amps	10A	20A	10A	20A
Battery Information	LFP			
Noise	≤50dB			
Nominal AC input voltage	100~240VAC			
Nominal AC input frequency	50/60Hz			
AC input voltage range	85~270VAC			
Weight	≤2.5kg			
Real Power factor	>0.98			
Peak efficacy with high reliability	93%			

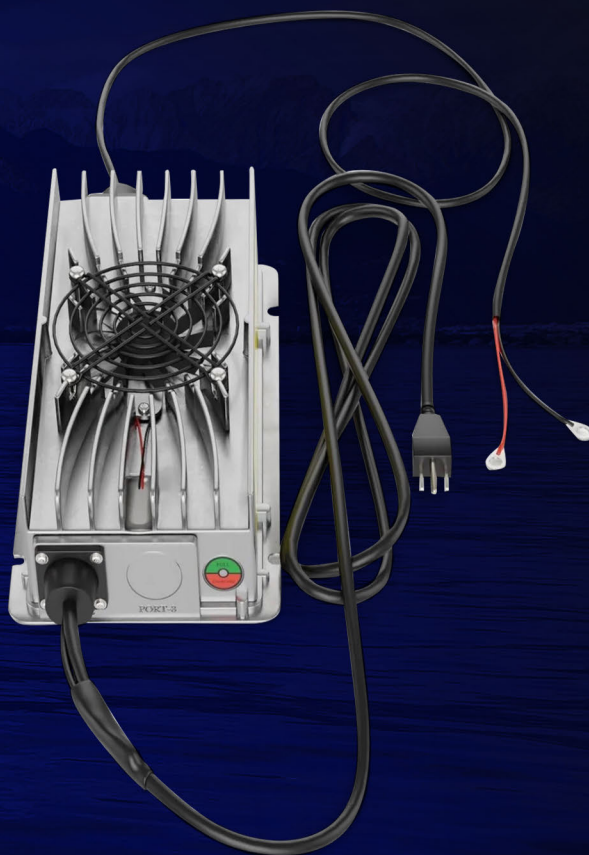


WORKING ENVIRONMENT:

Storage temperature	-40°C~95°C
Working temperature range	-30°C~40°C
Nominal working temperature	25°C
Relative Humidity	5%~95%
Altitude	Below 2000m

INTRODUCTION:

Abyss Lithium battery chargers are specifically designed to charge your Abyss Battery®. Our chargers offer users extended battery life and reliability with its built-in protection features. By using this charger users can get the quickest, most intelligent, efficient charge, and experience longer run times and shorter charge times of the battery. Its characteristics are small volume, high stability, and high security. Abyss Battery chargers are suitable for flooded lead-acid batteries, sealed(gel) lead-acid batteries, lithium batteries, etc.



FEATURES:

- IP68 Rating.
- Marine-grade construction.
- Overcurrent limit.
- High voltage safety.
- Reverse connection protection.
- Temperature protection.
- Full-Auto timing shutdown.
- Anti-Walking function.
- LED indicator for Charging Process.
- CAN communication (optional).
- 12V5A Auxiliary power supply (optional).



HOW IT WORKS:

The Charger is a device that delivers Direct Current (DC) to the battery to restore the used-up electrolyte. It is a DC power supply source that works by supplying electric current to the batteries and is also a direct current power supply source where the alternating current mains input voltage is stepped down to a particular level. The whole process contains three things:

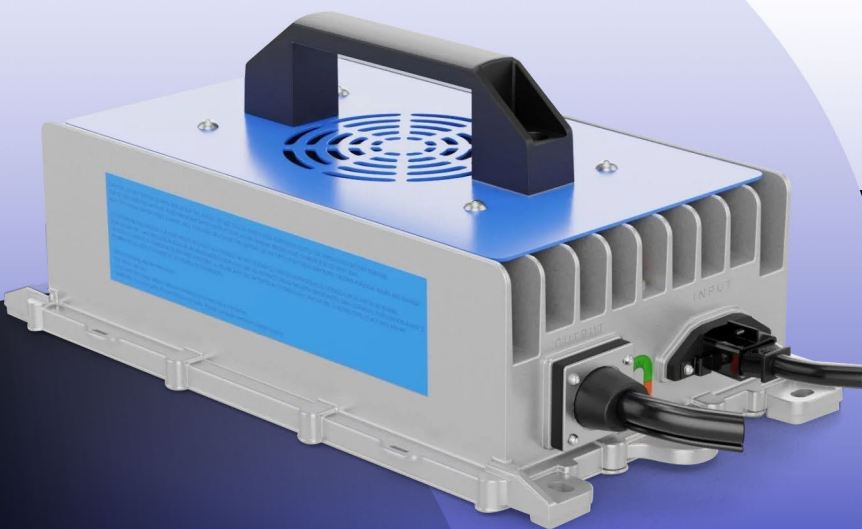
- **Charging**
- **Stabilizing**
- **Terminating**

The charging should instantly quit once a battery is fully charged. Overcharging batteries can damage not only a battery but also lessens its life.

LED INDICATOR STATUS:

INDICATOR LABEL	Diagram Charging: Red light
BATTERY INDICATOR	Full: Green light is on.
EMPTY LOAD	Green and red lights will alternately flash.
FAULT INDICATION ("-" :N PAUSE IS)	Overvoltage, Over Current: Red Green Red- - -
	Ambient temperature is too high is too low": Red-Green - Red - Green _ _ _ Charger Overheating: Green Red_ _ _ Output Under-Voltage: Red Green - - - - Input AC anomaly: Red Green Red Green Red _ _ _Integrated fault: Red Green Red.
FULL	Green light is on.

Note: The status of the indicator in the upper table is the default status of our factory. If the customer specifies the indicator status, the declaration that the indicator status is posted on the shell of the charger shall prevail.



PROTECTION FUNCTION:

- a. Protection for Reverse Connection:** There is no DC output for the charger when the batteries are connected reversely and will not damage the charger.
- b. No-load Protection:** There is no DC output when the batteries are not connected.
- c. Temperature Protection:** When the ambient temperature exceeds 40°C, the charger automatically reduces the current or turns off for protection. When the temperature is restored, the charger automatically resumes charging.
- d. Short Circuit Protection:** The charger will turn off when a short circuit is an output. The charger will restart charging only after troubleshooting.
- e. Automatic Shutdown after Full Charging:** The charger automatically turns off after the battery is fully charged according to the charger's judgment. Only when AC power is disconnected or the battery is recommended, the charger can recharge.
- f. Lock on Indicator (Optional):** According to the requirements of the vehicle design. The charger can make the car not in motion condition, the charging process through a normally open or normally closed unit to control the vehicle electronic control parts.
- g. Outlet Indicator (Optional):** When recharging, the charger will control the vehicle according to the need, and the charge lamp will show the current charging status of the battery. The specific way of learning about display mode, please verify with the vehicle manufacturer.



OPERATION METHOD:

1. MATCHING THE CHARGER WITH "AC POWER GRID" AND THE "BATTERY PACK"

- **Match for chargers and AC power grid:** Before using the charger, please make sure the AC power grid voltage and its frequency are in the range specified in the "Basic Parameters" label. If the voltage is below the nominal input voltage, the charger will reduce the charging current or shut down for protection (AC voltage is less than 90V), and it will affect battery charging performance.
- **Match for the charger and battery pack:** There is applied battery specification in the "Basic Parameters" label on the charger side. Please confirm whether battery type (flooded lead-acid batteries, sealed maintenance-free batteries, lithium batteries, nickel-metal hydride batteries, nickel-cadmium batteries, etc), the battery capacity (AH), and battery pack rated voltage (V) match those on the "Basic Parameters" label. If they do not match, it is likely to cause less charge or overcharge and even cause permanent damage to the battery pack, bringing serious economic losses.

2. AC POWER WIRE, DC CHARGING CABLE POLARITY, AND PRECAUTIONS

- **AC input wire is at the rear of the charger:** I, N, and Earth are, marked on the input line plug. Please distinguish correctly. I, N, earth on AC plug should correspond with those of socket outlet. the Earth wire of the AC input socket should be connected firmly to the ground, otherwise, the shell leaks electricity or electrostatic and easily causes injury.
- **The charging output line is in front of the charger:** You can distinguish the positive and negative of the output line by colors. Red or Brown line is to connect battery "+" and Blue or Black to battery "-" (except for special requirements of customers). The special connection of charging polarity with batteries polarity depends on special charging plugs, sockets, and user special requirements. The polarity of the charging socket should be consistent with the polarity of the charging plug polarity, otherwise, it cannot charge. Please check before using.

3. USAGE INSTRUCTIONS

- a. First, firmly connect the charger output plug with the battery pack, and then firmly connect the AC plug with the AC outlet.
- b. After the correct connection, the current will be output from the charger, at the same time, the charger's red light will turn on indicating that the battery is charging.
- c. The green light turns on when the charging is completed. At this time, please disconnect the plug between the charger and the alternating current.

ASSEMBLY AND DIMENSION:

1. When a fixed position is needed, it is recommended to fix the charger in a safe position according to the way shown in the figure below:
2. The safe space around the charger should be more than 30mm as shown in the figure below;
3. The diameter of the fixed hole is 7mm, and it is recommended to fix it with M6 screws.

SAFETY INSTRUCTIONS:

- If the protective Ground terminal of the charging plug is damaged, it will cause a potential shock hazard that is harmful to the human body.
- The connecting wire from the battery to the charging socket should meet the safety standards. If not, it will impact the charging performance due to the line drop.
- The specification in line with safety standards of a three-hole socket should be selected as a Charger AC input socket. Choose the larger size fire retardant wire in line fitting safety standards and rules based on the overall line length.
- The connecting wire from the battery to the charging socket should meet the safety requirements of the charger output current. The nominal diameter of the copper wire should be $\geq (\text{input current}/5) \text{ mm}^2$, otherwise, they will affect the charging performance because of the line drop, or even fires can originate due to overheating.
- You should always check the charger cables, AC plug, socket, and DC charging plug, whether they are aging or damaged. If you find any defect, replace it. Otherwise, it will lead to electric shock, fire, or some other accidents.
- Place the charger, connecting wires, plugs, and sockets far away from flammable items such as clothing, paper, sofa, gasoline, and explosive gas
- The input of charger power must be installed over the current thermistor. Do not replace any non-professional personnel.
- Do not detach the charger. There is a high voltage inside the charger. Non-professionals do not open the shell.

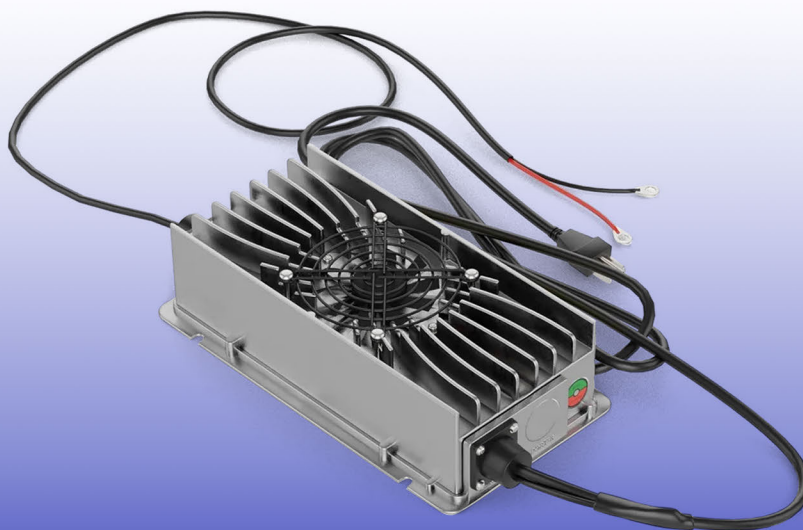
 **WARNING:**

- The appliance is not for the usage of any person or children with retarded physical, sensory or mental abilities or lack of understanding and knowledge.

- Abyss Battery® Lithium chargers should not be exposed to direct rain or water.

Use this charger for charging lead acid or lithium-ion batteries only.

- Do not use this charger to supply power to an extra-low-voltage electrical system or charge dry-cell batteries because charging dry-cell batteries may cause burst.
- If it is necessary to remove the battery from the vessel to charge it, always remove the grounded terminal from the battery first.
- Do not use the battery charger unless the battery voltage matches the output voltage rating of the charger.
- Connect and disconnect DC output clips only after setting any charger switches to the off position and removing the AC cord from the electric outlet. Never allow clips to touch each other.
- Always shield eyes when working near batteries. Do not put wrenches or other metal objects across the battery terminal or battery top. Arching or explosion of the battery can result.



CAUTION:

- To reduce the risk of injury, the charger only leads acid or lithium-type rechargeable battery. Other types of batteries may burst to cause personal injury and damage. Do not attempt to recharge any non-rechargeable batteries.
- Lead-acid batteries generate explosive gases. Risk of explosive battery gases. Adequate ventilation during charging is required. Avoid exposure to heat, flames, or sparks.
- Never charge a frozen battery.
- Do not operate the charger if it has received a sharp blow, been dropped, or otherwise damaged. Have a qualified service technician examine and repair as needed.
- The battery charger must only be plugged into a ground socket-outlet.

MAINTENANCE:

- Users should remove the dust from the charger shell for at least half a year.
- Study all battery manufacturer's specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.
- Never place the charger directly above or below the battery being charged; gases or fluids from the battery will corrode and damage the charger. Locate the charger as far away from the battery as DC cables permit.
- Do not operate the charger in a closed-in area or restrict ventilation in any way. During charging, the battery must be placed in a well-ventilated area. (Boat hatches or in center-console is adequate)



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TROUBLESHOOTING:

If there is a fault with the charger, please check carefully all external wires whether they are connected correctly. If it is not wire faulty, you can check indicators' fault codes and their corresponding solutions as follows:

INDICATOR STATE “.” SHOW PAUSE	FAULT INDICATION	SOLUTION
Red-Green-Red-Green-Red-Green	Without load	Check if these happen: the connection between battery and charger is loose, the battery is reversed, or the battery voltage is too low.
Red-Green-Red- - -	Overvoltage or over current	If the error opens again after the restart, return it to factory repair.
Red-Green-Red-Green-	The ambient temperature is too high or too low	Please check if the ambient temperature is too high and if ventilation is good and the position of the battery temperature sensor.
Green-Red- - -	Charger Overheating	Please check whether the ambient temperature is too high and if ventilation is good.
Red-Green- - -	Output Under Voltage	Please return it to the factory.
Red-Green-Red-Green-Red	Input AC abnormality	Please check the input voltage and the plug's poor contact.
Green-Red-Green- - -	Any one of the above-mentioned faults repeats five times, then it appears.	Re-up electricity, match the indicator state to the above-mentioned faults then get the corresponding solution.

WARRANTY:

Thank you for taking interest in the products we offer at Abyss Battery. This Limited Warranty applies to physical goods, and only physical goods purchased from Abyss Battery. Unlike other Lithium battery companies, Abyss Battery has additional support through the purchase of our Extended Warranty program.

MANUFACTURER'S LIMITED WARRANTY

WARRANTY COVERAGE	2-YEAR FREE REPLACEMENT	AFTER 3 YEARS, 35% OFF A NEW REPLACEMENT UP TO 10-YEARS
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EXTENDED WARRANTY

EXTENDED COVERAGE	5-YEAR FREE REPLACEMENT	AFTER 5 YEARS, 50% OFF A NEW REPLACEMENT FOR LIFE
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COVERED UNDER WARRANTY:

- If input wire, output wire, or plug is damaged.
- If input wire or output wire is artificially cut.
- If you open or take apart the charger without permission.
- The sealing label is torn or damaged.

NOT COVERED UNDER WARRANTY:

- Breakdown faults and the damage that is caused by the force majeure; however, if the damage is caused by transportation, misuse, or vandalism within the warranty period, you can claim.
- If the shell or the circuit board is damaged by users
- The faulty charger is also out of the warranty period.



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