

Manual and Installation Guide



BB10012



Charging Parameters

Bulk/Absorption

For your Bulk/Absorption stage, the ideal voltage is between 14.2v-14.6v. For full charge and balance, the absorption mode should be set to last for at least 20 minutes per battery (for multiple batteries in parallel).

Float

Our batteries do not need a float stage for charging, but a float voltage between 13.4V and 13.8V can be used when connected to shore power.

Equalization

Equalization is not recommended for our batteries. Most chargers will allow you to shut this feature off or use a setting that does not use equalization. If you cannot turn off this mode, then you will need to adjust the equalization voltage to below 14.6v

Temperature Compensation

Temperature compensation is not needed with our batteries and in some cases, may trigger the built in BMS to go into protect mode. For this reason, we recommend that temperature compensation be shut off or set to 0.

BMS Basic Features

All Battle Born Batteries come with a built-in battery management system (BMS) that protects the cells for long-term cycling. The BMS protects against the following conditions:

High voltage: > 14.7V

If an individual cell voltage exceeds a prescribed threshold during charging, the BMS will prevent a charge current from continuing. Discharge is always allowed under this condition.

Low voltage: < 10V

If an individual cell falls below a prescribed threshold during discharge, the BMS will prevent further discharge. Although the battery is in “low-voltage disconnect” mode, it will still allow a charging current. (Note: many chargers must detect a voltage over 10v to send a charge to the battery).

High temperature: > 135F

The BMS will not allow a charging or discharging current.

Low temperature: < 25F

The BMS will not allow a charging current.

High Current

The BMS will not allow a current that exceeds 100 (+/- 5%) Amps for 30s, or 200 (+/- 10%) Amps for 0.5s. Although these thresholds have been verified with a DC load bank, the 30 second high current threshold may be reduced from 200A to around 150A for certain highly variable loads through an inverter – like a microwave or space heater. After a high current disconnection, the battery will automatically reconnect after 5 seconds.

A passive balancing process is activated by the BMS at the top of each charge cycle, when the battery voltage exceeds around 14V. This ensures that all the cells remain at the same state of charge, which helps for pack longevity and performance.

IEC 62133 certification mandates that charging has been certified between 37F and 113F (3C and 45C).

Installation

The batteries may be mounted in any orientation. But care must be taken in connecting to the battery terminals. The positive and negative terminals are labeled and color coded (red for +, black for -).

DO NOT REVERSE POLARITY THE BATTERY AS THIS WILL DAMAGE BOTH THE BATTERY AND THE DEVICE BEING CONNECTED!!!

The batteries come standard with a flag style terminal post with a 3/8" hole to accommodate a 5/16" bolt and lug sizes up to 2 AWT. Larger lugs may require a 1/4" bolt. All batteries ship with 18-8 stainless steel 5/16 – 18 bolts, brass washers, and 18-8 stainless steel nuts with nylon inserts. If multiple lugs are used, the washers may be removed, or longer bolts may be required in order for the bolt to fully seat into the nylon insert of the nut.



WHEN CONNECTING TO BATTERY TERMINALS, DO NOT FINGER TIGHTEN. ALL CONNECTIONS MUST BE TIGHTENED TO THE SPECIFICATIONS OF THE BOLT MANUFACTURER. FOR THE BOLTS INCLUDED WITH THE BATTERY, TIGHTEN USING A TORQUE WRENCH TO BETWEEN 9 AND 11 ft-lbs. FAILURE TO ADEQUATELY SECURING CONNECTIONS CAN RESULT IN FIRE.

Parallel

Multiple BB10012 may be mounted in parallel to increase the current capacity of the system. When batteries are mounted in parallel, the voltage of the system does not change, but the current limits are additive. For example, two BB10012 batteries mounted in parallel can deliver 200A continuously and 400A for 30 seconds. Three BB10012 batteries mounted in parallel can deliver 300A continuously and

600A for 30 seconds. Therefore, all cables and connections MUST be able to accommodate the high currents that can be delivered by the battery. Appropriate fuses and circuit breakers are also highly recommended to protect downstream components from current spikes and short circuits.

Series

Up to four BB10012 batteries may be connected in series to increase the voltage of the system up to a 48V system. When batteries are mounted in series, current capacities remain the same, but the system voltage is additive. Two BB10012 batteries mounted in series to form a nominally 24V system should be charged using a bulk and absorption voltage of 28.8V, and a float voltage of 27.2V. Four BB10012 batteries mounted in series to form a nominally 48V system should be charged using a bulk and absorption voltage of 57.6V, and a float voltage below 54.4V.

Batteries to be connected in series should be at the same state-of-charge before they are connected. For best results, fully charge each BB10012 battery using a 12V charger prior to connecting them in series, in order to ensure that they are at the same state-of-charge.

Inverter/Chargers (and other devices having large input capacitance < 10 microF)

Special consideration must be made for connection to devices that have a large input capacitance, because of the tendency of these devices to draw large current spikes upon initial connection to the batteries. This includes inverter/chargers that are greater than 4000 Watts in size. This applies to 12V, 24V, and 48V inverter chargers. Battle Born Batteries requires a current surge limiter (CSL500) that is for sale at Battle Born Batteries to be installed with each inverter/charger greater than 4000 Watts.

DO NOT CONNECT BATTERIES TO AN INVERTER/CHARGER THAT IS GREATER THAN 4000 WATTS IN SIZE WITHOUT A CSL500 CURRENT SURGE LIMITER. FAILURE TO INCLUDE A CSL500 WILL DAMAGE THE BMS AND PRESENT A POTENTIAL FIRE HAZARD.

DO NOT SUBMERGE THE BATTERIES

DO NOT SHORT CIRCUIT THE BATTERIES

DO NOT REVERSE POLARITY

DO NOT EXPOSE THE BATTERIES TO EXCESSIVE HEAT

DO NOT MISHANDLE, DROP, THROW, OR APPLY EXCESSIVE FORCE TO THE BATTERIES

DO NOT OPERATE WITH LOOSE TERMINAL CONNECTIONS

Storage and maintenance

Storage

Storage could not be easier simply charge the batteries to at least 50% state-of-charge and disconnect from any charge or discharge.

Maintenance

Battle Born Batteries require very little maintenance if any at all. If your batteries are in series and not being charged by a multi-bank charger it is recommended that you fully charge the batteries individually once a year. This will balance out the entire battery bank to ensure the batteries will reach its expected life span. If your batteries are in parallel this is not necessary. Our BMS has a built in passive balancing system that will take care of this for you.

Warranty Policy

In the unlikely event, you are having an issue with one of our batteries we have developed a straight forward warranty policy to help answer any questions you may have.

Battle Born Batteries offers a 10-year manufacturers defect warranty from the date of purchase (see attached Warranty)

We also warrant all other complimentary products (inverters, converters, chargers etc) we sell are free from defect for 30 days from the date of purchase. After that time it is the responsibility of our manufacturing partners and a standard manufacturer's warranty applies (1 year from date of purchase, unless otherwise stated by the manufacturer).

Return & Refund Policy

Thanks for shopping at Battle Born Batteries. If you are not entirely satisfied with your purchase, we're here to help.

Returns

You have 45 calendar days to return an item from the date the item shipped. To be eligible for a return, your item must be in the same condition that you received it in. **Keep the original packaging for 45 days.** Your item must be in the original packaging. Your item needs to have the receipt or proof of purchase. No return will be accepted without an RMA number, which can be obtained by filling out the return form at <https://battlebornbatteries.com/returns/>

Refunds

Once we receive your item, we will inspect it and notify you that we have received your returned item. We will immediately notify you on the status of your refund after inspecting the item. If your return is approved, we will initiate a refund to your credit card (or original method of payment). You will receive the credit within a certain amount of days, depending on your card issuer's policies.

Shipping

You will be responsible for paying for your own shipping costs for returning your item. Shipping costs are nonrefundable. If you receive a refund, the cost of return shipping will be deducted from your refund.

If you have any questions on how to return your item to us, please contact us.

Contact Us

If you have any further questions, or need help with anything regarding your battery please do not hesitate to contact us.

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