

# Dragonfly Energy

## Battle Born Batteries



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ENERGY



## Heat Enable Instruction

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Thank you for purchasing one of our internal heat batteries. Read prior to use. Please note the BB10012H battery model is used in this manual's diagrams.

## Tools

Upon arrival, please verify your battery has arrived with the following items:

### Included with every Heat Battery:

\*See Figure 1 and Figure 2.

- 1 - SPST Rocker Switch [Figure 1]
- 1 - 25' 18 AWG wire terminated with 0.187 QD and #8 ring lug [Figure 1]
- 1 - 25' 18 AWG wire terminated with 0.187 QD and 5/16 ring lug [Figure 1]
- 1 - Jumper Wire [Figure 2]



Figure 1: Heat Battery Kit



Figure 2: Jumper Wire



Figure 3: Add-on Kit

If you need to modify the harness, use the following items:

- 2 - 3/8" ring lugs
- 2 - 5/16" ring lugs
- 2 - #8 ring lugs
- 4 - 1-inch pieces of shrink wrap
- 1 - Extra M4 x 4mm long Philip head screw

If you purchased more than one heat battery you will receive a Heat Battery Add-on Kit which provides the necessary components to daisy chain the heat enable posts. This allows for each batteries heat function to be enabled and disabled via a single rocker switch.

### Items in the Add-on Kit include:

If you are installing more than one heat enabled battery you will need the Add-on Kit. See Figure 3.

- 1 - 14-inch 18 AWG wire terminated with two #8 ring lugs
- 2 - M4 x 5mm long Philip head screws
- 1 - #8 ring lug
- 1 - 1-inch piece of shrink wrap

You will need the following tools for install:

\*See Figure 4. Items not provided.

- #2 Phillips screwdriver
- 3/8 inch Forstner drill bit, step bit, or equivalent
- 220 grit sandpaper
- The included "Heat Battery Kit". See Figure One.



Figure 4: Additional Tools Needed

### Please Note:

To enable the heater circuit on your battery a connection from the heater enable post to the positive terminal needs to be made. The heater will be automatically activated when the internal temperature reaches ~35°F and will shut off when the internal temperature reaches 45°F.

If the battery has been exposed to below freezing temperatures for a long period of time without the heater enabled, it will take 2 to 4 hours for the internal components of the battery to heat up enough for the battery to take a charge. The heater will continue to operate until the battery disconnects for low voltage cutoff. With no charging, or other loads, this could take up to four days in an insulated box in subzero temperatures.

**\*ALWAYS DISCONNECT THE HEATER WHEN STORING THE BATTERY.**

## Installing a Single Heat Enable Battery

Included in every purchase of a heat battery is a standard heater enable jumper wire. See Figure 2.

To enable the heating function, use the provided jumper to connect the **POSITIVE** terminal and the heater enable stud.

### Step One: Making a connection on the Positive Terminal

The 5/16" side of the heater enable jumper wire should go on the positive terminal connection **between** the washer and the nylok. The connection should then be torqued down using a 1/2" wrench, a 1/2" socket and a torque wrench set to 10' lbs. See Figure 12.

**Please note**, once the connection had been made, the heater enable jumper wire, the connection is now live at 12V so avoid any contact with other live wires or grounds. Also note that the heater enable post is not current carrying itself so this connection should not spark when contact is made.

### Step Two: Enabling the Heat Function

To enable the heat function on the battery, remove the screw and place the other end of your jumper wire onto the post. It is important that you do not over tighten this connection. The connection should be tightened just enough to engage the lock washer feature on the ring terminal itself, so that vibration does not rattle the connection loose. Now that the connection is tightened down, the internal heating function of the battery will be activated.

### Step Three: Deactivating the Heat Enable Function

To deactivate the heat enable function on your BB10012H, simply remove the heat enable jumper wire from the heat enable post. Remember to tape down the end of heat enable jumper wire with electrical tape and cover the ring terminal, so it does not make contact with other live wires or grounds. Be sure to put the heat enable screw back into the post so you don't lose it.

## Installing Multiple BB10012H's

If you purchased multiple Heat Enabled Batteries, there are two ways in which you can set up the heat enable function for your battery bank.

### Option One: The Heat Enable Jumper Wire

The first option is to install an individual heat enable jumper wire on every single battery using the steps above from the "Installing a Single Heat Enable Battery" section. Please note, if you proceed with this option, each battery must be manually disconnected and reconnected to activate or deactivate the heat enable function. This option is recommended for batteries connected in parallel **only**.

### Option Two: Daisy Chained

For option two you will use the Add-on Kit. We suggest that you configure your daisy chain set up first, then install the jumper from the heater post to the positive terminal with the on/off switch in line. Whether your system is in series, parallel, or series-parallel you can daisy chain the enables together to control the heat function from a single switch.

**\*ALWAYS ENABLE FROM THE HIGHEST VOLTAGE.** For example, if you have a 48V system, make sure you jumper from the positive terminal that is at 48 volts to the enable stud. See Wiring Diagrams Section on page 5.

## Installing the Add-on Kit

To install the Add-on Kit, you will still need to install the heat enable jumper wire on one battery. For systems set up in series, the heat enable jumper wire should be installed on the battery with the highest voltage. On the selected battery, you will remove the M4 x 4mm long screw that comes standard for the Heat Enable post. Place the 14-inch jumper on the enable post with the main jumper and use the M4 x 5mm long screw from the Heat Enable Battery Kit bag and tighten them down together. Take the free end of the jumper wire and install it onto the next battery. Repeat installation of the 14-inch jumper wire for all batteries in the bank. For each heater enable post you have two jumper wires connected to, you will need to swap out the M4 x 4mm crew that comes standard out for the M5 x 5mm screw that comes in the Add-on kit.



Figure 5: Close up of Heat Post with Add-on Kit



Figure 6: Side view of daisy chained heat enable post



Figure 7: Top view of daisy chained heat enable post

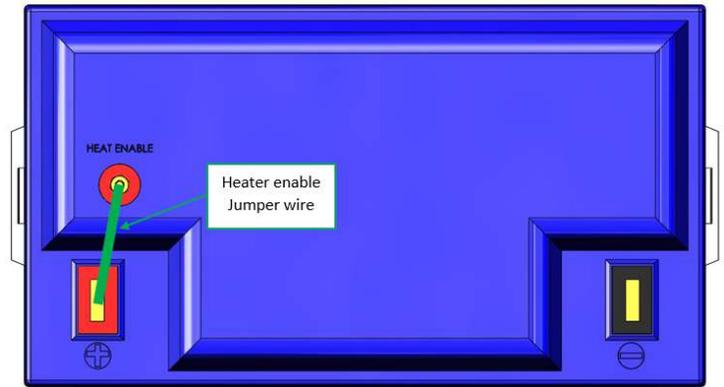


Figure 4: Heat Enable Jumper Wire Setup

## Installing the ON/OFF Switch

The Heat Battery Kit provides the components for you to install a remote switch for enabling/disabling the heat function of the battery, however it is not a requirement. If you have multiple batteries, we suggest that you configure your daisy chain first, then, instead of installing the jumper from the stud to the positive terminal you install the switch, see Figure 8 for an example. See Step One.

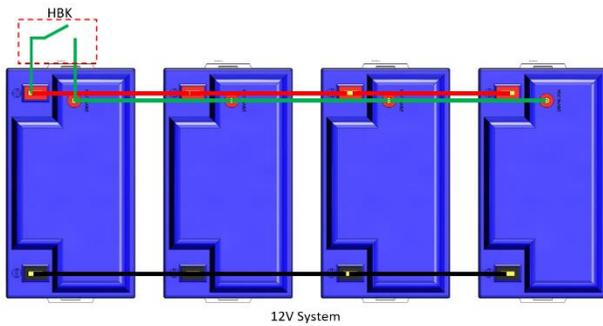


Figure 8: 12V daisy chained enable wires set up in parallel

## Installation Steps:

1. Choose a location that works best for your toggle switch within your space. The kit comes with 25-foot wires so you can install somewhere in the coach or right next to the batteries.
2. If the location you chose requires drilling a hole, apply some painters tape to the area you plan to drill. Doing so will reduce the chance of material chipping around the hole.
3. Drill a  $\frac{3}{4}$  inch hole using a Forstner or any other appropriately sized drill bit. Be sure to check behind the surface you are drilling so you do not accidentally damage something when you poke through.
4. After drilling the hole, remove the nut from the switch body and test fit the switch. Use sandpaper if necessary. You want the switch to fit snug, but not so snug that you damage the threads when installing.
5. Once you have a good fit, take the quick disconnect sides of the Heat Battery Kit harness and pass them through the plastic nut you just removed. Ensure that the teeth on the nut are facing towards the quick disconnects. Then feed the quick disconnects through the back of the hole you just drilled. See Figure 9 for an example.
6. Connect the wires to the back of the rocker switch. Please note that it does not matter the order or location of the quick disconnects on the back of the rocker switch. Give the connections a decent tug to ensure that the connection is solid and will not fall off due to vibration. See Figure 10.
7. Thread the plastic nut onto the switch and tighten by hand. Do not overtighten. The "I" indicates that the switch is in the ON position. When the "O" is pressed down the switch is in the open or OFF position. See Figure 11 for an example if the switch in the ON position.
8. Route the other end of the wires from the Heat Battery Kit to your battery bank. Place the 5/16" ring lug between the nylok nut and the washer, as seen in Figure 12. Be sure to tighten and torque all terminal connections to 10 ft-lbs.  
\*Please note, when this connection is made, the wire will be live at 12 volts (or higher if connected in series).
9. Install the #8 ring terminal onto the heater enable post and tighten it down firmly to engage the internal teeth. Inspect the connection to see if vibration could cause it to come loose. See Figure 13.
10. Roll up and zip tie any slack left in the harness, and this completes the install of the heater enable remote switch.

Please note, you can visit <https://battlebornbatteries.com/product/heated-100ah-12v-battery/> to view the installation video. The installation video covers all the installation methods discussed in this manual. You will also find some helpful tips and FAQs about your new BB10012H battery on this page as well.

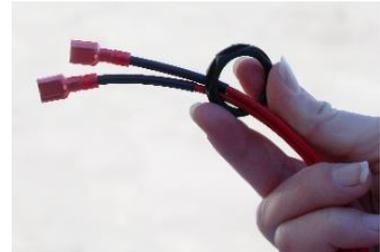


Figure 9: Heat Battery Kit harness through plastic nut



Figure 10: Heat Battery Kit harness connected to rocker plastic nut from rocker switch



Figure 11: Rocker switch fully installed and in the "ON" position

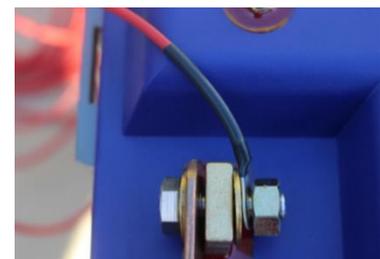


Figure 12: Bolt, washer, battery cable, positive terminal, washer, 5/16" heat enable wire, nylok



Figure 13: #8 ring terminal onto the heater enable post

## Wiring Examples for Heat Enable:

### 12V System

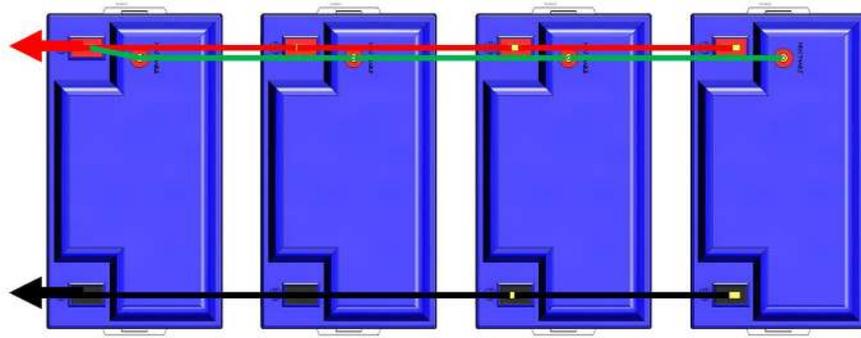


Figure 14: Heat Enable daisy chained in 12V parallel

### 24V System

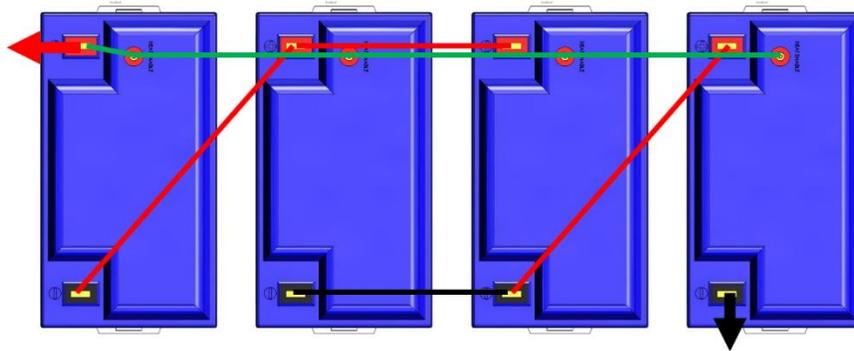


Figure 15: Heat Enable daisy chained in 24V series/parallel

### 48V System

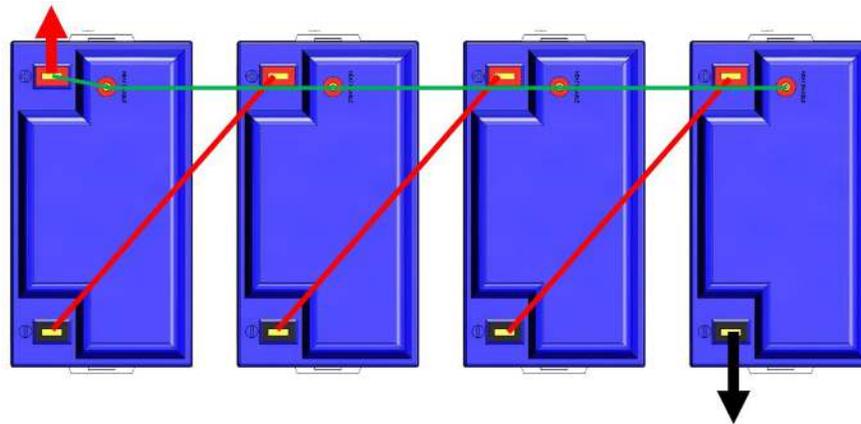


Figure 16: Heat Enable daisy chained in 48V series

For additional product information, please visit our website. You will be able to find additional product information on any of our internally heated batteries at <https://battlebornbatteries.com/product-category/lifepo4-batteries/>, under the specific model's product listing. You will also find additional information such as frequently asked questions, installation videos, battery manuals and warranty information.

If you have any please contact us by calling 855-292-2831 or email us at [info@battlebornbatteries.com](mailto:info@battlebornbatteries.com).

Thank you for choosing Battle Born Batteries.