

Revised Friday, September 11, 2020

### **Lithionics Battery Internal Heater Kit Available On GT and GTX Series Only**

#### **Theory of Operation:**

The heater kit is a convecting type heating system internal to the battery or module that applies an average of 15 to 30 watts per hour (at -4F/-20C continuous ambient temperatures) and is controlled by an automatic thermostat. The thermostat maintains the lithium cell/core to a temperature between 35 and 40 degrees faranheight. This permits sub-freezing charging operation as well as a safe and durable storage condition in winter months.

#### **Factory-Installed Inside a Module**

- A solid-state thermostat and switching circuit is located adjacent to the lithium core.
- A proprietary silicone convection heating element is installed directly to the lithium cell surfaces.
- The module will have a 2-pin Delphi Weatherpack connector or “dongle” exiting the case. There are 2 ways to power the thermostat and heater kit:
  1. Bring the positive and negative connection points back to the DC common bus. Thus, if DC power sources are available, the thermostat is powered. Use this feature when batteries are ON and in-use.
  2. The module-based heater kit affords the user the ability to turn the battery off, placing it into storage mode, using an AC to DC power supply (available from Lithionics Battery) to bring a simple extension cord from an AC outlet to power the thermostat in “storage mode” through the winter season. You may purchase the power supply from Lithionics Battery but if you choose to purchase your own, size it for a 90 watt surge followed by a 70 watt continuous output. The heater kit operates 50% duty cycle per hour thus about 30 watts per hour power consumption net.
  3. The purpose of a heater kit internal to a module is to permit future expansion of additional modules using our Plug and Play Comber Box expansion system

#### **Factory Installed Inside an Internal BMS Battery (PN Example: GTX12V315A-E2017-CS200)**

- All batteries with an internal BMS with a suffix of “-CS200” have a full thermostat and heater pad internal and is always battery-powered. There is no exterior connection for the heater power as there is with a module.
- The battery must be ON for heater power to be available. In the event that no shore power or solar power is available, the battery will self-power and self-heat for a certain number of days or weeks and then the battery management system will power off when the battery is depleted.
- Always be sure to monitor your battery voltage and ensure that depleted batteries are re-charged. All batteries have natural self-discharge of the raw cells and thus a depleted battery can be harmed if left in the depleted state and not properly maintained. For storage procedures and advice, go to our website to locate the correct user guide for storage.

<https://lithionicsbattery.com/user-guides/>