

QuickStart Guide

Welcome to the world of lithium-ion

Green Cubes SAFEFlex lithium-ion batteries are safe, reliable, and provide exceptional cycle life and cost of ownership. This guide will help you understand the basics of storing, installing and operating your new Green Cubes SAFEFlex lithium-ion battery. Please read through this guide and contact us if you have any questions.

Safety and Precautions

- Battery should be handled and installed by a trained professional with proper lifting straps and equipment rated for weight listed on data plate.
- Prior to servicing, the battery must be keyed off and disconnected from truck and/or charger.
- Battery is only to be opened by trained professional.
- Cell tops must be insulated before performing all service work.
- Tools must be insulated to protect battery against short circuits during servicing.

Installation

The battery should be installed in the battery compartment by a trained professional using a forklift and lifting straps. In addition, there are cutouts in the battery case that must be used when lifting the battery. The service weight of the battery is printed on the data plate. Make sure your equipment is properly rated to handle the battery weight.

Main Power Connection

Once installed, the main power connection should then be connected to the truck and will be either a Euro or SB style connector (shown below).



Euro Connector



SB Connector



Truck- Battery Data Connection

In some cases, the battery and truck will have a separate data connection that must be connected as well. The data connection is required on some trucks to provide accurate battery discharge indicator reporting and/or Early Warning System (EWS) information.

If a data connection is required, the battery will not supply power to the truck until it is properly connected. If there is no data connection, then a battery discharge indicator (BDI) is required.

On/Off Switch

The on/off switch should be easy to locate on the outside of the battery. To turn the battery on, press the switch. The line designates the on position and the circle designates **off**.



On/Off Switch
(shown in the
"Off" position)

If the battery is being stored or waiting for deployment in a truck, make sure it is turned off until put into use. The Battery Management System draws a small amount of power and will slowly discharge the battery over time. Turning the battery off prevents the possibility of overdischarge.

Battery Discharge Indicator

If there is no data connection to the truck, the battery requires a Battery Discharge Indicator (BDI). In some batteries the BDI will be integrated into the battery. If the BDI is not integrated an external BDI must be installed in a location that is easily seen by the driver. In some applications there will be a GCT BDI and a data connection to the truck.

The BDI displays useful information for the driver, along with error codes. The default view shows the state of charge, the pack voltage, and the current draw or charge.



Green Cubes BDI

The BDI will flash the red light and beep if it needs attention. The following conditions will trigger the alarm:

- Overvoltage
- Undervoltage
- Over Temperature
- Under Temperature
- Low State of Charge

The truck operator should stay aware of the battery BDI while in operation. When the battery gets low (<10%) the BDI will flash and beep, signaling the battery must be charged. Once the battery is empty it will cut power to the truck.

Charging Instructions

Batteries without internal chargers are charged either through their main power connector (Euro or SB), a separate charge port, or a charge port on the external of the truck. Make sure to use the appropriate charge port when charging the battery.

Some of the smaller batteries have internal chargers. To charge these batteries simply use the extension cord provided, and plug the battery into a standard 110-120VAC outlet.

Use **ONLY** an approved and properly configured charger to charge your SAFEFlex lithium-ion battery. Use of an unapproved or incorrectly configured external charger may damage your battery and void the warranty. The battery is designed for fast opportunity charging and charges to specific voltage levels that may not be programmed into your charger if it has not been approved or properly configured.

Opportunity Charging

The battery is designed for opportunity charging, and plugging it in whenever not in use (breaks, lunch, and after hours) will lengthen the runtime and lifetime of the battery. It is strongly recommend the battery be plugged in for charging whenever it is not in use.

Operating Temperatures

Standard operational temperatures for the battery are:

Discharge: -4°F - 131°F

Charge: 32°F - 113°F

The battery may have additional options such as internal heaters, if you wish to operate outside these temperatures.

Storage Temperatures

Storage (<1 month): -4°F - 113°F

Storage (>1 month): 41°F - 68°F

In addition, make sure to turn the battery off while in storage or while equipment is waiting for deployment. Refer to our extended storage instructions when planning to store the battery longer than 1 month.

Troubleshooting

If there is an error code on the BDI, follow the appropriate instructions.

Over Temp: Allow the battery to cool.

Under Temp: Allow the battery to warm.

Over Voltage: Allow the BMS to bleed down the excessively high voltage.

Under Voltage: Charge the battery.

If the battery has cut power and there is no error code (as detailed in the Battery Discharge Indicator section) turn the battery off for 30 seconds, then turn it back on.

If this does not fix the issue, contact your dealer or Green Cubes Technology Service directly at: (765) 831-8009

Thank you!

ABOUT GREEN CUBES TECHNOLOGY

Green Cubes Technology harnesses over 30 years of industry experience to ensure we design, develop and deliver solutions for the most challenging energy needs. We offer battery technology innovation, application design and performance management to drive productivity, scalability and sustainability.

For more information, email info@greencubestech.com or visit greencubestech.com

