

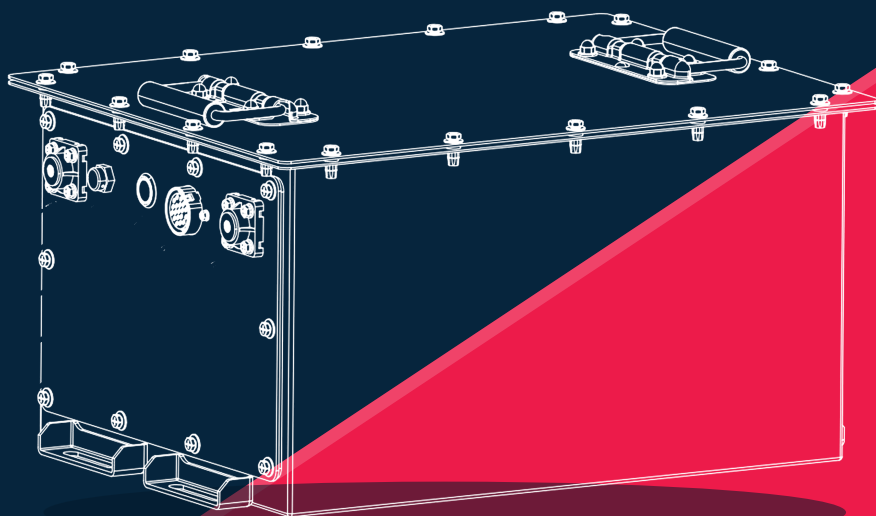
BIG BOX SERIES

48V 150Ah

GOLF CART LITHIUM BATTERY KIT

— — **MODEL BB51150A-Kit-1**

48 V GOLF CART · COMPLETE KIT · BLUETOOTH · IP67 · 11-YEAR WARRANTY



51.2_V

NOMINAL VOLTAGE

150_{Ah}

CAPACITY

7.68_{kWh}

STORED ENERGY

300_A

CONTINUOUS
DISCHARGE

1,000_A

PEAK (≤ 2 s)

ABOUT THIS MANUAL

IMPORTANT NOTICES AND SAFETY SYMBOLS

Purpose

This manual provides instructions for safe handling, installation, charging, operation, storage, maintenance, troubleshooting and warranty support for the Epoch BB51150A-Kit-1. It helps users and installers reduce risk, protect connected equipment and get reliable performance.

Qualified installation

Battery systems can deliver very high current. Installation and service should be performed by people who understand DC electrical systems, lithium battery charging, overcurrent protection, conductor sizing, terminal torque and safe work practices. When the battery is part of a boat, RV, vehicle, trailer, cabin or building system, follow all applicable codes and equipment manufacturer requirements.

Product changes

Specifications, accessories, firmware, labels and documentation may change without notice. Use the latest Epoch Batteries documentation and product labeling, and confirm that the model on your battery label matches this manual.

Warranty and compliance

Failure to follow this manual, using incompatible chargers or accessories, modifying the battery, improper installation, abuse, water intrusion beyond the product rating, incorrect polarity, overcurrent events or operation outside specified limits may void warranty coverage and may create safety hazards.

⚠ WARNING

Incorrect installation or use can cause fire, electric shock, severe injury, death, or damage to the battery and connected equipment. Stop and contact Epoch Batteries support if any instruction is unclear.

Safety signal words

⚠ DANGER

Indicates a hazardous situation that, if not avoided, **will** result in death or serious injury.

⚠ WARNING

Indicates a hazardous situation that, if not avoided, **could** result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates practices that can damage the battery, connected equipment or property.

How to read the figures

CONCEPTUAL DIAGRAM

Explains a principle or a typical layout. It is simplified, not to scale and not a substitute for a system design reviewed against applicable codes.

MODEL-SPECIFIC DATA

Shows published ratings or dimensions for model BB51150A-Kit-1.

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48V 150Ah · MODEL BB51150A-KIT-1

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QUICK REFERENCE

Nominal voltage · capacity **51.2 V · 150 Ah**

Stored energy (nominal) **7.68 kWh**

Max continuous discharge **300 A**

Peak discharge **500 A for ≤ 15 s;
1,000 A for ≤ 2 s**

Max continuous charge **150 A**

Charger **Included 48V 22A
lithium charger**

Maximum charge voltage **58.4 V**

Charge temperature **0 °C to 55 °C**

Battery banks **Parallel only · max
2P**

 **1-888-501-1846**

Monday–Friday, 9 AM–4 PM Eastern

01

INTRODUCTION

ABOUT YOUR BATTERY AND THIS MANUAL

Thank you for choosing Epoch Batteries. The BB51150A-Kit-1 is a 51.2 V, 150 Ah, 7.68 kWh Bluetooth LiFePO4 battery designed for golf cart 48 V deep-cycle energy systems.

This manual explains how to install, charge, operate, store and maintain the battery safely in 48 V golf cart, neighborhood electric vehicle and utility vehicle applications where the system requirements match the battery specifications.

KEEP THIS MANUAL

Store it with the battery or with your vehicle or vessel documents. The latest version is available at epochbatteries.com/resources.

Who should use this manual

- **End users** who need safety, charging, Bluetooth and storage guidance.
- **Installers** who need model-specific electrical limits, terminal information and battery-bank requirements.
- **Dealers, support teams and service technicians** who need a consistent troubleshooting and warranty reference.

Check your battery label first

Confirm that the model number on the battery label is **BB51150A-Kit-1**. Similar-sized Epoch batteries can use different BMS current limits, apps, heaters and bank configurations, and earlier production may carry different ratings. If your label does not match this manual, contact Epoch support before installing the battery or changing charger settings.

Is this battery right for your system?

The BB51150A-Kit-1 is a large-format lithium deep-cycle battery. It is not a drop-in replacement for every lead-acid or AGM installation. Before installation, verify tray fitment, terminal clearance, cable size, overcurrent protection, charger profile, charging-source compatibility and load requirements.

NOTICE

Deep-cycle battery. This model is not a cranking-rated battery. For engine starting, use a cranking-rated battery or confirm compatibility for the specific engine and installation directly with Epoch before installation.



Product page and downloads

Scan for the latest user manual, technical data sheet and Safety Data Sheet (SDS).

02

PRODUCT OVERVIEW

FEATURES, USES AND KEY TERMS

02

A 51.2 V (48 V class), 150 Ah, 7.68 kWh lithium iron phosphate battery kit for converting 48 V golf carts from lead-acid. The kit includes the battery, a 48V 22A onboard lithium charger with a cart-specific charge port plug, a Bluetooth battery gauge, a remote on/off switch, a fused 48 V to 12 V converter and cart-specific mounting brackets.



Complete conversion kit

Battery, 22 A charger and cord, gauge, remote switch, 12 V converter, charge port plug and brackets in one box.



150 Ah · 7.68 kWh

One 51.2 V LiFePO₄ battery replaces a full bank of 8 V or 12 V lead-acid batteries.



300 A continuous

500 A for up to 15 s and 1,000 A for up to 2 s for acceleration, hills and upgraded controllers.



Regen-ready charging

150 A continuous charge, and up to 500 A for 15 s of regenerative braking current.



Gauge, app and OTA

The dash gauge and the Epoch Li-Ion app show charge, voltage, current, temperature and warnings; firmware updates over the air.



IP67 enclosure

Dust-tight and protected against temporary immersion to 1 m for 30 minutes; not rated for water jets or pressure washing.



12 V accessories

The fused 25 A converter, switched by the key, powers 12 V lights, radios and USB outlets.



Advanced BMS

Over-voltage, under-voltage, over-current, short-circuit and temperature protection with cell balancing.

Primary uses

- 48 V golf carts: EZGO TXT configuration, or Other for compatible 48 V carts
- Neighborhood electric vehicles and utility vehicles
- Commercial fleet and specialty 48 V power systems
- Carts with 12 V lights and accessories powered through the included converter (25 A maximum load)
- Upgraded controllers and motors whose current demand fits the battery ratings

Key terms used in this manual

LiFePO₄ (lithium iron phosphate)

A lithium-ion chemistry valued for thermal stability and long cycle life. This battery uses a 16S1P arrangement — 16 cells in series — to reach 51.2 V nominal.

Nominal voltage

The typical voltage during discharge — 51.2 V for this battery. Actual voltage varies with state of charge, load and temperature within the 40–58.4 V operating range.

Amp-hour (Ah)

A measure of charge capacity. The rated capacity of this battery is 150 Ah.

Watt-hour (Wh) and kilowatt-hour (kWh)

A measure of energy: volts × amp-hours. 51.2 V × 150 Ah = 7,680 Wh ≈ 7.68 kWh. This is nominal energy, not a guaranteed usable-energy figure.

C-rate

Current expressed relative to capacity. For this battery $1C = 150\text{ A}$, $0.5C = 75\text{ A}$, $0.2C = 30\text{ A}$ and $C/20 = 7.5\text{ A}$.

Continuous and peak current

Continuous current can be sustained; peak current is a short-duration rating. This battery allows 300 A continuous and 500 A for up to 15 seconds, or $1,000\text{ A}$ for up to 2 seconds.

State of charge (SOC)

Remaining charge as a percentage of full. The app's SOC is a calculated estimate; resting voltage alone is not a precise SOC indicator for LiFePO₄.

Battery management system (BMS)

Electronics inside the battery that monitor voltage, current and temperature and switch off charging or discharging to protect the cells.

Depth of discharge (DoD)

How much of the capacity has been used. At 70% DoD, 30% state of charge remains.

Low-voltage disconnect (LVD)

The BMS switches off the output at its low-voltage limit to prevent over-discharge.

Battery connections and controls

Equalization

A lead-acid maintenance mode that applies elevated voltage. It must be disabled for LiFePO₄ batteries.

Series and parallel

Series connections add voltage while capacity stays at 150 Ah ; parallel connections add capacity while voltage stays at 51.2 V .

Overcurrent protection device

A fuse or DC-rated circuit breaker that protects wiring from overloads and short circuits.

IP67

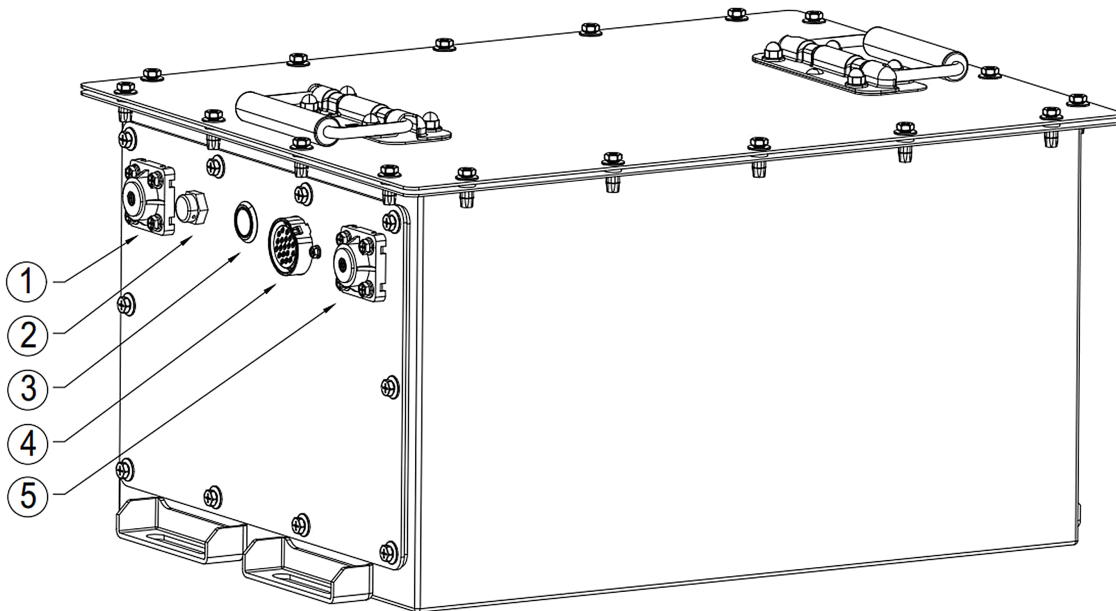
An IEC 60529 enclosure rating: 6 = dust-tight, 7 = protected against temporary immersion (up to 1 m for 30 min). IP67 is not a rating for water jets or pressure washing.

Parasitic load

A small, continuous draw from connected equipment that discharges the battery even when the system appears to be off.

Cycle life

The number of charge–discharge cycles a battery can deliver before its capacity falls to a stated end-of-life level. This battery is rated for 4,000+ cycles.

MODEL-SPECIFIC DATA


Battery connections and controls: 1 positive terminal, 2 vent, 3 on/off switch, 4 communication port, 5 negative terminal. Shown on the 105 Ah case; positions on the 150 Ah case may differ.

- 1 · Positive terminal — main positive connection to the cart and charger.
- 2 · Vent — keep it clear; do not cover or seal it.
- 3 · On/off switch — turns the battery on together with the remote switch on the wiring harness.
- 4 · Communication port — connects the wiring harness for the gauge, on/off switch and charger.
- 5 · Negative terminal — main negative connection to the cart and charger.

What's in the kit

- 48V 150Ah LiFePO4 golf cart battery
- 48V 22A onboard lithium charger with a 10 ft heavy-duty extension cord
- Digital Bluetooth battery gauge (dash mount)
- 6 ft remote on/off power switch with wiring harness
- Fused 48 V to 12 V step-down converter (25 A) with key-on wire
- Cart-specific charge port plug and mounting brackets

03

SPECIFICATIONS

MODEL BB51150A-KIT-1 RATINGS AT 25 °C UNLESS NOTED

03

GENERAL	
Brand	Epoch Batteries
Model / SKU	BB51150A-Kit-1
Series	Big Box Series
Battery type	LiFePO4 golf cart battery, 48 V class
Kit contents	Battery, 48V 22A charger with 10 ft cord, gauge, on/off switch and harness, 12 V converter, charge port plug, brackets
Cart configurations	EZGO TXT; other compatible 48 V carts
Chemistry	LiFePO4 (lithium iron phosphate)
Cell configuration	16S1P
Bluetooth	Yes — Epoch Li-Ion app (iOS and Android)
Firmware updates	Over the air (OTA) through the app
12 V converter	Fused, key-on enable wire; input 40–90 V; regulated 13.5 V output; 25 A maximum load
Cycle life	4,000+ cycles
Warranty	11-year limited manufacturer warranty

ELECTRICAL	
Nominal voltage	51.2 V (48 V class)
Nominal capacity	150 Ah
Stored energy (nominal)	7.68 kWh (7,680 Wh)
Operating voltage range	40–58.4 V
Maximum charge voltage	58.4 V
Power-down state	Any cell below 2.2 V, or pack voltage about 38 V
Self-discharge	3% per month

CURRENT RATINGS	
Max continuous discharge	300 A
Peak discharge	500 A for up to 15 s; 1,000 A for up to 2 s
Max continuous charge	150 A
Peak charge (regenerative braking)	500 A for up to 15 s

BATTERY BANKS	
Series connection	Not supported
Parallel connection	Max 2 batteries (300 Ah)

TEMPERATURE AND ENVIRONMENT

Charge temperature	0 °C to 55 °C (32 °F to 131 °F)
Discharge temperature	-10 °C to 55 °C (14 °F to 131 °F)
Storage temperature (up to 1 month)	-20 °C to 55 °C (-4 °F to 131 °F)
Storage temperature (recommended)	0 °C to 35 °C (32 °F to 95 °F); up to 12 months
Enclosure rating	IP67 — dust-tight; temporary immersion (1 m, 30 min); not rated for water jets or pressure washing

MECHANICAL

Dimensions (L × W × H)	19.84 × 15.35 × 9.84 in (504 × 390 × 250 mm)
Weight	135 lb (61 kg)
Case material	Stainless steel
Controls and ports	On/off switch, communication port, vent, positive and negative terminals

BMS PROTECTION

Over-voltage	Cell and pack over-voltage protection
Under-voltage	Cell and pack under-voltage protection
Over-current	Charge and discharge over-current protection
Short circuit	Discharge short-circuit protection
Temperature	Charge and discharge over/under-temperature, ambient and MOSFET over-temperature protection
Cell balancing	Integrated; cell-unbalance alarm
Low-charge warning	Buzzer and flashing gauge below 20% SOC

COMPLIANCE AND LISTINGS

Enclosure	IP67 per IEC 60529
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Ratings at 25 °C unless otherwise noted. Recommended charger settings are in Section 9, page 20. Verify charger programming, cable ampacity, fuse ratings and environmental limits before final installation.

04

SAFETY

READ BEFORE INSTALLING, CHARGING OR SERVICING

Safe use depends on correct equipment, proper wiring, clean connections, compatible chargers, correct terminal torque and operation within the temperature and current limits in this manual.

04

⚠ DANGER

Short-circuit hazard. Never connect the positive and negative terminals together, and never let tools, jewelry or other conductive objects bridge them. A short circuit can release extremely high current and cause arcing, burns, fire or equipment damage.

General safety rules

- Read all instructions before use and keep this manual for reference.
- Keep the battery away from children and pets.
- Do not open, drill, crush, puncture, drop, burn or modify the battery.
- Remove jewelry, use insulated tools and wear appropriate personal protective equipment.
- Confirm polarity before connecting chargers, loads, DC-to-DC chargers, solar controllers, inverters or series/parallel wiring.
- Stop using the battery immediately if it becomes unusually hot, emits odor or smoke, leaks, swells, makes unusual sounds or is physically damaged.

Do not

- Mix this battery with lead-acid batteries in the same bank.
- Mix different battery models, capacities, ages or chemistries in a series or parallel bank.
- Charge it with the cart's original lead-acid charger unless that charging system is confirmed compatible with LiFePO4 settings.
- Use lead-acid equalization, desulfation or repair modes.
- Exceed 150 A continuous charge current or 300 A continuous discharge current.
- Exceed the peak discharge ratings (1,000 A for 2 s; 500 A for 15 s), or draw more than 300 A for longer than 15 seconds.
- Install the battery without properly sized DC overcurrent protection.
- Submerge, pressure-wash or expose the battery to standing water.
- Continue use after a severe impact, fire, water intrusion or visible case damage.

⚠ WARNING

External protection is required. The internal BMS protects the cells. It does not replace a correctly rated external fuse or DC circuit breaker for your wiring.

If something goes wrong

If the battery smokes, becomes unusually hot, emits odor, leaks, swells or behaves abnormally, stop use immediately. If it is safe to do so, disconnect chargers and loads. Move people away from the battery and contact emergency services when fire, smoke, chemical exposure or injury is possible. Follow the product Safety Data Sheet (SDS) and emergency responder instructions.

⚠ WARNING

Do not use water directly on a damaged or burning lithium battery unless directed by emergency responders. Use an appropriate extinguisher and follow local emergency procedures.

SAFETY DATA SHEET

The SDS for this battery is listed under Downloadable resources on the product page. Keep a copy with your emergency information.

05

INSTALLATION

PREPARE, LOCATE AND SECURE THE BATTERY

Pre-installation checklist

Most installation problems can be prevented before the first cable is attached.

- ☐ The battery case is undamaged and the terminals are clean.
- ☐ The label shows model BB51150A-Kit-1, and voltage, capacity and application requirements have been confirmed.
- ☐ The tray or mounting location fits the 19.84 × 15.35 × 9.84 in case with cable clearance.
- ☐ The included lithium charger is installed, and the original lead-acid charger is no longer connected.
- ☐ All batteries in a bank are the same model, age and capacity, and are at the same state of charge.
- ☐ The main fuse or circuit breaker is selected for the wire, load and system voltage.
- ☐ Cables and lugs are sized for current, length, voltage drop and installation environment.
- ☐ Polarity has been verified with a multimeter before making final connections.
- ☐ Terminal hardware and a torque wrench for are available.
- ☐ The Epoch Li-Ion app is installed if you will monitor the battery during commissioning.
- ☐ The battery will be registered within 90 days of purchase for full warranty coverage (Section 15).

WARRANTY TIP

Damage caused by an unsecured or improperly secured battery is excluded from warranty coverage. Use a tray, strap or bracket rated for the application. Epoch offers a battery tray sized for the BB51150A-Kit-1 as an accessory.

05

Choose the location

- Install in a clean, dry, accessible location protected from accidental impact.
- Allow airflow around the battery and connected equipment.
- Keep away from heat sources, sparks, open flames, fuel and flammable materials.
- Avoid prolonged direct sunlight and locations that exceed the temperature limits.
- Do not install where standing water can collect around the case or terminals.

Mounting and orientation

Secure the battery so it cannot slide, tip or strike nearby equipment during operation, vehicle or trailer motion, vessel motion or transport. Use a tray, strap, bracket or enclosure appropriate for the application. Secure the battery with the cart-specific brackets supplied in the kit; the battery weighs 135 lb (61 kg). Install

the battery upright unless Epoch documentation for this exact model allows another orientation, and keep the top terminals and wiring protected from accidental contact.

Environmental protection

The IP67 enclosure is dust-tight and protected against temporary immersion up to 1 m for 30 minutes. It is not rated for water jets or pressure washing. Keep the communication port and harness connectors sealed, and inspect the battery after any immersion.

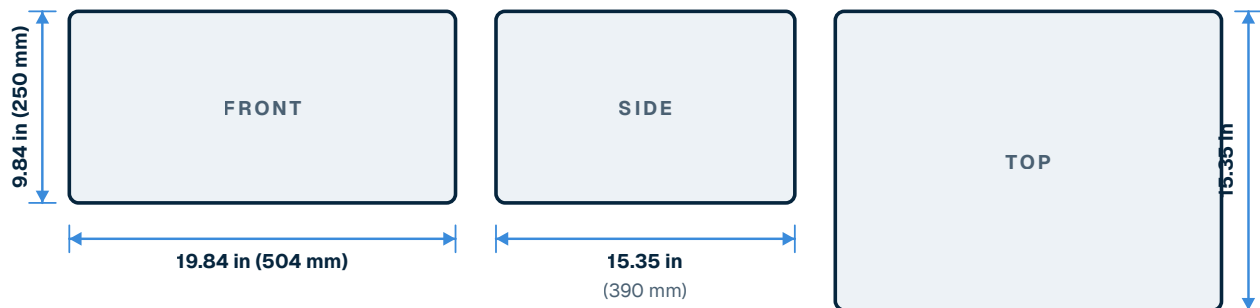
NOTICE

Leave enough clearance above the terminals for cable bend radius, terminal boots and inspection. Do not force cables to bend sharply at the terminal posts.

05

MODEL-SPECIFIC DATA

Simplified case outline. All three views share one scale; drawing is not full size.



Overall case dimensions of the BB51150A-Kit-1. Allow additional space for terminal hardware, cable bend radius, ventilation access and service removal.

Golf cart installation

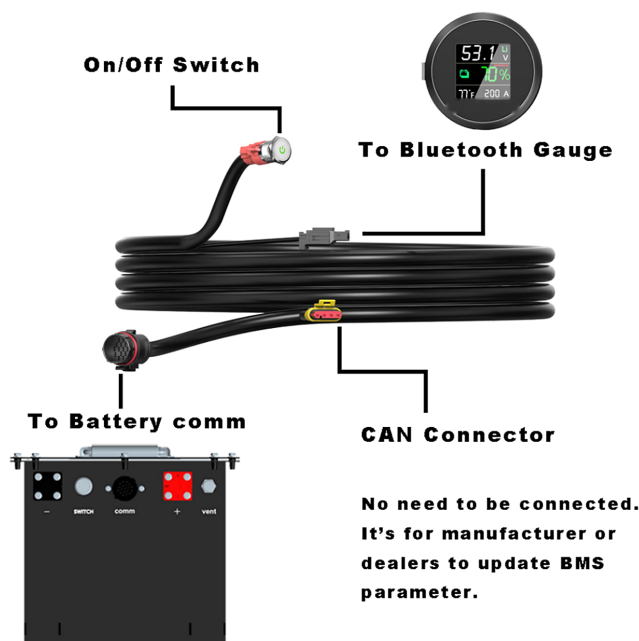
NOTICE

Only authorized mechanics or technicians should install the battery. Before starting, turn off the cart and all accessories.

- 1 Open the battery compartment, disconnect all cables safely and remove the original lead-acid batteries.
- 2 Fasten the cart-specific bracket in the compartment as the base.
- 3 Install the charger in the compartment.
- 4 Replace the cart's factory charging receptacle with the supplied cart-specific charge port plug; this step is required for safety.
- 5 Mount the gauge and the remote on/off switch on the dashboard.

- 6 Route the wiring harness that connects the battery communication port, charger, on/off switch and gauge.
- 7 Set the battery in the compartment and fasten it to the bracket base.
- 8 Connect the battery positive and negative terminals to the charger's positive and negative leads.
- 9 Connect the battery positive and negative terminals to the cart's positive and negative cables, observing polarity.
- 10 Install the 12 V converter, and connect its key-on (enable) wire to the cart's key switch and its output to the 12 V accessory circuits.
- 11 Connect the wiring harness to the battery communication port, on/off switch, gauge and charger.
- 12 Turn on the on/off switch and confirm that the gauge lights and shows the state of charge.
- 13 If the state of charge is low, charge the battery before first use.

MODEL-SPECIFIC DATA



Wiring harness: on/off switch with LED, gauge connector, battery communication connector and CAN connector. The CAN connector does not need to be connected; it is for manufacturer or dealer BMS updates.

06

ELECTRICAL CONNECTIONS

POLARITY, TERMINALS AND PROTECTION

Polarity

Connect positive (+) to positive and negative (–) to negative. Reverse polarity can damage the battery, charger, inverter, electronics or connected loads, and reverse-polarity damage is excluded from warranty coverage.

⚠ DANGER

Before tightening the final connection, use a multimeter to confirm system polarity and voltage. Never rely only on cable color or assumptions.

KEY TERM: AMPACITY

The current a conductor can carry continuously without exceeding its temperature rating. It depends on wire size, insulation rating, bundling and ambient temperature.

WHY FUSE NEAR THE BATTERY?

A fault on an unprotected cable can draw very high current from the battery. A main fuse close to the positive terminal protects the entire cable run.

06

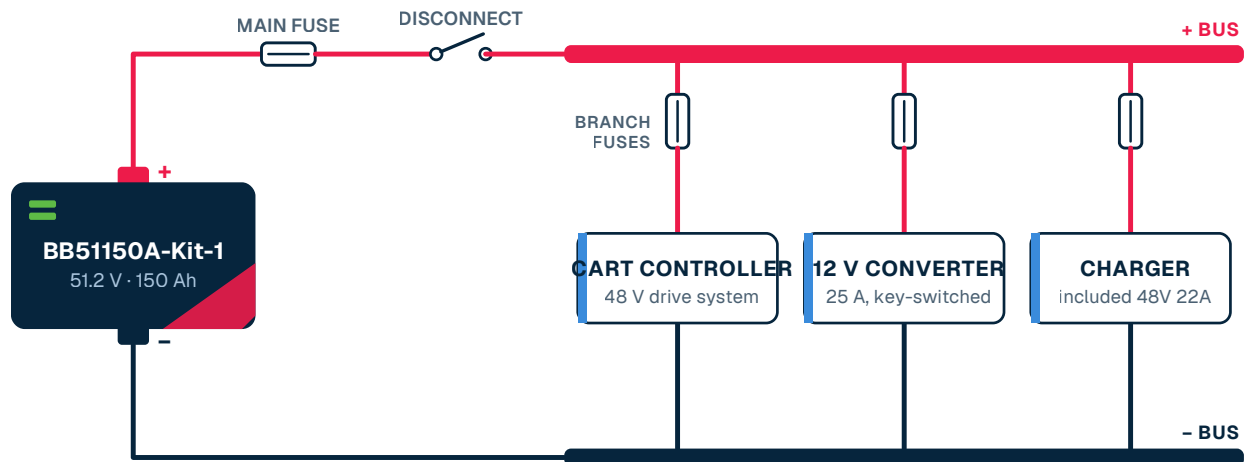
Terminal connection procedure

- 1 Turn off chargers, inverters, loads and DC disconnects before wiring.
- 2 Remove jewelry and use insulated tools.
- 3 Keep terminal caps or covers in place until each terminal is being wired.
- 4 Use clean, properly crimped lugs with flat contact surfaces.
- 5 Connect and tighten the positive terminal, then connect and tighten the negative terminal.
- 6 Tighten the terminal hardware to the torque specified by Epoch for this battery, and keep the terminal covers installed.
- 7 Install terminal boots or protective covers after final torque is confirmed.

Cable and protection requirements

ITEM	REQUIREMENT
Cable size	Size conductors for maximum current, circuit length, voltage drop, ambient temperature and applicable code requirements.
Main protection	Install a fuse or DC-rated circuit breaker as close as practical to the battery positive terminal.
Voltage rating	Protection devices and switches must be rated for the maximum system voltage — especially in series banks.
Wire ampacity	The fuse or breaker must protect the smallest conductor in the circuit.
Lug stack	Keep the terminal stack flat and secure. Use a busbar if several conductors must connect to one battery terminal.
Cable routing	Route cables away from sharp edges, heat sources, moving parts and wet areas.

CONCEPTUAL DIAGRAM



Single-battery 48 V system. Place the main fuse as close as practical to the battery positive terminal; busbars simplify protected distribution and service disconnects. Terminal positions are simplified — both terminals are on the battery lid. Final designs must be reviewed for cable ampacity, fuse coordination, voltage drop, environmental conditions and applicable electrical or marine codes.

Disconnecting the battery

- 1 Turn off all chargers and loads.
- 2 Open the DC disconnect or breaker.
- 3 Remove the negative cable, then the positive cable.
- 4 Cap or cover the terminals immediately.

NOTICE

Charge or discharge switches in the app, where available, are operating controls. They do not provide safe electrical isolation for service — open the DC disconnect and remove the cables.

07

BATTERY BANKS

PARALLEL BANKS

Parallel wiring increases capacity and runtime while the system stays at 51.2 V nominal. The BB51150A-Kit-1 supports up to 2 batteries in parallel. Use only matched BB51150A-Kit-1 batteries of similar age, condition and firmware, all at the same state of charge.

⚠ WARNING

Do not connect BB51150A-Kit-1 batteries in series. This model is limited to one battery in series and up to 2 in parallel.

Parallel connections — more capacity

Parallel wiring connects positive to positive and negative to negative. Capacity and runtime add up while voltage stays at 51.2 V nominal. Use balanced wiring so each battery sees similar resistance during charging and discharging.

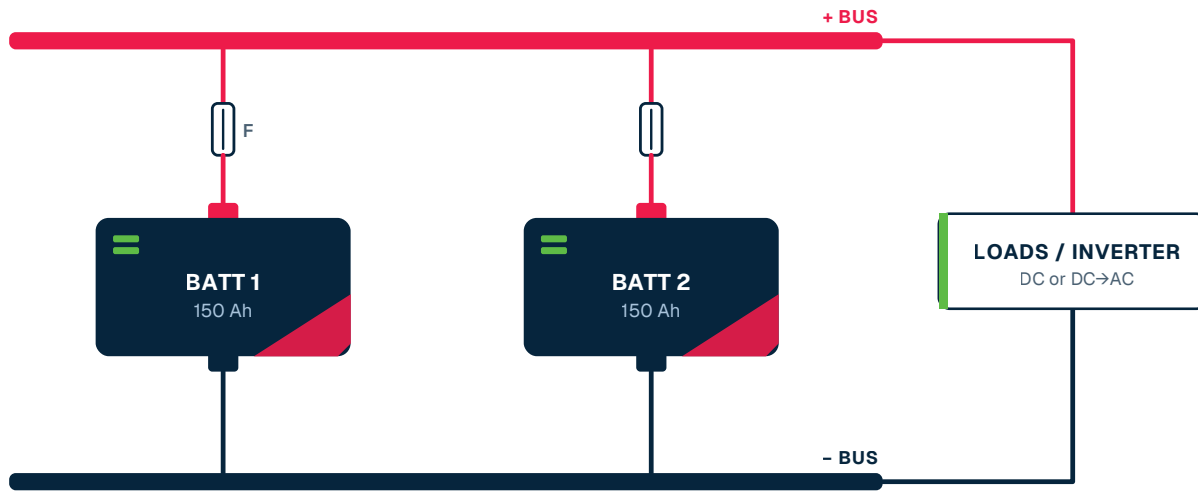
IF ONE BATTERY GOES OFFLINE

If one battery in a parallel bank disconnects — for example, because its BMS has switched off — the remaining batteries carry the whole load and the bank's current capability drops. Reduce the load; do not rely on the original bank limit.

07

BATTERIES IN PARALLEL	SYSTEM CLASS	NOMINAL VOLTAGE	CAPACITY	ENERGY
1P	48V	51.2 V	150 Ah	7.68 kWh
2P	48V	51.2 V	300 Ah	15.36 kWh

CONCEPTUAL DIAGRAM



Parallel bank, up to 2 batteries. Fuse each battery branch, keep branch cables equal in length and gauge, and connect the system through common busbars.

07

Balanced wiring practices

- Charge each battery fully before connecting batteries into a bank.
- Use identical cable lengths and gauges for each battery whenever practical.
- Connect loads and chargers through properly rated positive and negative busbars for larger banks.
- Fuse each battery or string when required by the system design and applicable standards.
- Do not daisy-chain large banks where unequal cable resistance could cause uneven charging or discharging.

Before energizing a bank

- Do not hot-connect batteries. Make all bank connections with chargers, loads and disconnects off.
- Pre-charge large inverters where required.
- Confirm full-bank charger voltage, inverter low-voltage settings, conductor insulation rating, enclosure clearance and overcurrent protection.

08

GOLF CART APPLICATIONS

COMPATIBILITY, CONTROLLERS AND 12 V ACCESSORIES

The kit replaces a full bank of 8 V or 12 V lead-acid batteries with one 48 V-class LiFePO4 battery. Confirm that your cart is a compatible 48 V platform, that the battery bay fits the 19.84 × 15.35 × 9.84 in case, and that the controller's current demand fits the battery ratings, before installation.

Cart configurations

- EZGO TXT: select the EZGO TXT configuration when ordering; brackets and charge port plug are matched to the cart.
- Other compatible 48 V carts: select Other, and confirm tray space, mounting, cable routing and charge-port wiring.
- Stretched carts: a 13 ft harness is available if the 6 ft switch harness does not reach the dash.

Controllers, motors and regenerative braking

The battery supports 300 A continuously, 500 A for up to 15 seconds and 1,000 A for up to 2 seconds. Check the controller's continuous and peak current settings, especially on upgraded or tuned controllers, and keep them within these ratings. Regenerative braking can return up to 500 A for 15 seconds; the continuous charge limit is 150 A.

12 V lights and accessories

Power 12 V headlights, light bars, radios, USB outlets and other accessories through the included converter. It is fused, runs from 40–90 V input, delivers a regulated 13.5 V output and supports up to 25 A of accessory load. Connect its key-on (enable) wire to the cart's key switch so the converter turns on with the key, and keep the total accessory load within 25 A.

Range

Range depends on terrain, passenger weight, tire size, lift kits, controller tuning, motor condition, speed and accessory load. Track your own usage with the gauge and the app to learn your cart's range.

09

CHARGING

INCLUDED CHARGER, CHARGE PORT AND CHARGING HABITS

Charge the battery with the included 48V 22A onboard lithium charger. Lead-acid chargers use different charging profiles and will not properly charge or balance a LiFePO4 battery.

CHARGING AT A GLANCE

Charger	48V 22A onboard lithium charger (included), powered through the cart's charge port
AC connection	10 ft heavy-duty extension cord (included) from the cart's charge port to a standard 120 V AC outlet
Charge time	About 7 h from empty (estimate: 150 Ah ÷ 22 A, plus final absorption)
Maximum charge voltage	58.4 V
Charge temperature	0 °C to 55 °C (32 °F to 131 °F)
Charge current limits	150 A continuous; up to 500 A for 15 s of regenerative braking

Charging from outside the cart

The onboard charger is powered through the cart's charge port, so you plug in from outside the cart. The kit's cart-specific charge port plug replaces the factory lead-acid charging receptacle; replacing the original receptacle is required for safety.

What happens while charging

- The battery charges whether its on/off switch is on or off, and the gauge display rolls while charging.
- When the battery is full, or reaches over-voltage protection, the state of charge resets to 100% and the gauge shows 10 bars.
- If the charger stays connected, it restarts charging when the state of charge drops below about 95%. Above 95%, charging does not restart until the battery has been discharged.

Charging habits

- Daily use: charge after each day's use.
- Occasional use: charge at least once a week.
- Avoid letting the state of charge fall below 20%.
- Disconnect the charger once the battery is full rather than leaving it plugged in for long periods.
- Turn the battery off when the cart is not in use.

Club Car carts with an On-Board Computer

If you install the kit in a Club Car that uses an older On-Board Computer (OBC) to control the original lead-acid charger, an OBC bypass may be required so the included lithium charger can charge the battery directly. Check your exact model and follow the kit instructions or a qualified installer's guidance.

Cold weather

This battery has no internal heater. The BMS blocks charging outside 0 °C to 55 °C (32 °F to 131 °F); let a cold battery warm above freezing before charging.

Recovering from power-down

If any cell falls below 2.2 V, or pack voltage falls to about 38 V, the battery enters a power-down state. Press the on/off switch to turn the battery on, then connect the charger immediately: in power-down, the battery can only charge after it has been switched on.

⚠ WARNING

Never bypass BMS protection, and never charge a battery that is swollen, leaking, damaged or has been submerged until it has been inspected.

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BLUETOOTH MONITORING

EPOCH LI-ION APP FOR iOS AND ANDROID

The built-in Bluetooth module connects to the free Epoch Li-Ion app for iOS and Android, so you can view state of charge, voltage, current, temperature, battery health and warnings on your phone. App screens and available data may vary by app version and battery firmware.

**App Store**

Search “Epoch Li-Ion” or scan the code with your iPhone camera.

**Google Play**

Search “Epoch Li-Ion” or scan the code with your Android phone.

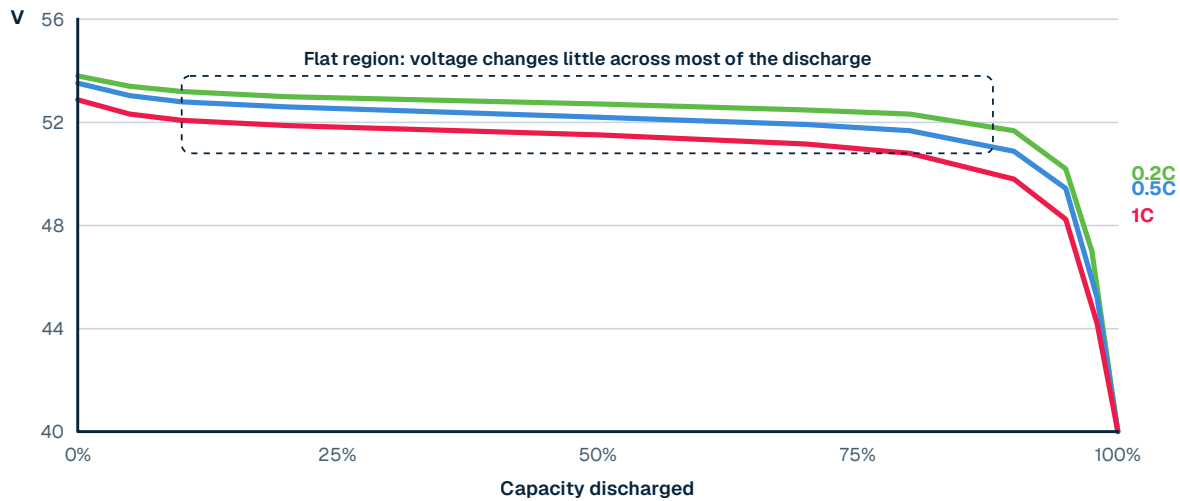
Set up the app

- 1 Install the Epoch Li-Ion app from the Apple App Store or Google Play.
- 2 Turn on Bluetooth on your phone.
- 3 Allow Bluetooth (nearby devices) permissions when prompted.
- 4 On Android, turn on location services if the operating system requires them for Bluetooth scanning.
- 5 Open the app near the battery and select it from the device list. If several batteries are nearby, match the serial number.

Reading the app

Check voltage, current, temperature and any active alarms together, not state of charge alone. SOC is a calculated estimate. LiFePO4 voltage stays nearly flat across most of the discharge (see the figure below), so resting voltage alone cannot give a precise SOC. The app's estimate may occasionally correct itself in a sudden step; that is a recalculation, not a sudden loss of stored energy.

CONCEPTUAL DIAGRAM



Typical LiFePO4 terminal voltage versus capacity discharged at 25 °C. A conceptual illustration of the chemistry's flat voltage profile — not measured data for this model. Actual values vary with temperature, age, load and test method.

Recommended monitoring checks

WHEN	WHAT TO CHECK
Before installation	Resting voltage, state of charge and absence of active faults.
During first charge	Voltage, current, temperature and charge status.
During heavy loads	Current draw stays within the continuous and peak limits.
During storage	State of charge at least every 3 months; recharge as needed.
After a fault	Record app data and fault messages before contacting support.

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If the app cannot find the battery

- Move closer to the battery and refresh the device list.
- Close the app on other phones or tablets that may already be connected to the battery.
- Confirm Bluetooth, nearby-device and — on some Android versions — location permissions.
- Update the app. If the battery may be asleep, cycling the charger or load can wake it.

MONITORING AID

Bluetooth data is a monitoring aid. It does not replace proper wiring, overcurrent protection, compatible charging equipment or safe installation practices.

Bluetooth ID and firmware updates

The battery's Bluetooth ID is printed on the label on the battery or on the gauge. Firmware can be updated over the air (OTA) through the app: keep the phone close to the battery, and if the Bluetooth connection drops and the update fails, repeat it.

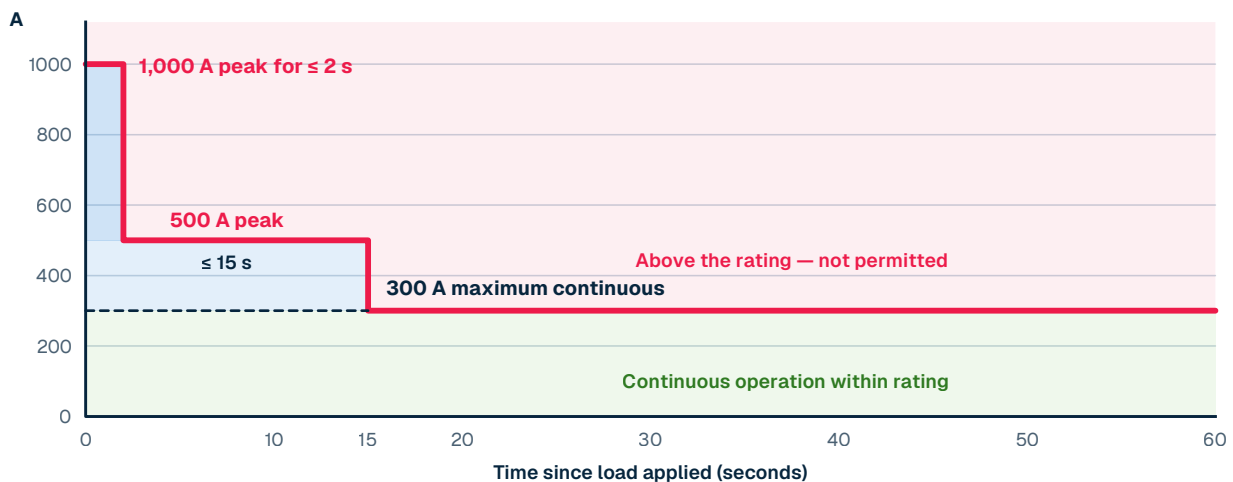
11

OPERATION AND STORAGE

LIMITS, DAILY USE AND LONG-TERM STORAGE

OPERATING LIMIT	VALUE
Continuous discharge limit	300 A
Peak discharge limit	500 A for up to 15 seconds; 1,000 A for up to 2 seconds
Continuous charge limit	150 A
Operating voltage range	40–58.4 V
Discharge temperature	–10 °C to 55 °C (14 °F to 131 °F)
Charge temperature	0 °C to 55 °C (32 °F to 131 °F)

MODEL-SPECIFIC DATA



Allowable discharge current over time for one BB51150A-Kit-1. The 500 A and 1,000 A ratings are short-duration peaks only: do not size continuous loads, busbars, switches, conductors or overcurrent protection around it. Use the continuous load current, surge profile, voltage drop and applicable standards.

Depth of discharge

LiFePO₄ batteries can deliver more usable energy than lead-acid batteries, and routine operation at a moderate depth of discharge can improve long-term service life. Avoid leaving the battery fully depleted — recharge promptly after deep use. Routine full discharges are not needed as maintenance.

Storage

- Store in a clean, dry location at 0 °C to 35 °C (32 °F to 95 °F) whenever practical.

WARRANTY AND STORAGE

The limited warranty excludes storage outside the storage temperature limits in the specifications, prolonged storage in a fully discharged state, and batteries left uncharged for more than three months.

- For long-term storage, keep the state of charge between 60% and 90%, turn the battery off, and store it dry at 10–35 °C (50–95 °F) where practical. Check the state of charge at least every 3 months and recharge as needed.
- Disconnect loads and chargers during storage unless the system is designed for standby maintenance.
- Check the state of charge at least every 3 months and recharge as needed.
- Protect the terminals from accidental short circuits during storage and transport.

NOTICE

A battery stored at a very low state of charge can enter low-voltage protection and may not be recoverable if left discharged for an extended period.

Turning the battery on and off

- On: press the remote on/off switch once. The switch LED and the gauge light up, and the gauge shows the state of charge.
- Off: press the switch again. The LED and the gauge turn off. Disconnecting the wiring harness also turns the battery off.
- The battery is on when either the switch on the case or the remote switch is on; to turn it off, both switches must be off.

Automatic shutdown

- Above 20% state of charge, the battery shuts down after 7 days without discharge.
- At or below 20% state of charge, it shuts down after 24 hours without discharge.
- To restart after an automatic shutdown, press the on/off switch twice: once to reset the switch and once to turn the battery on.

Low-charge warning

Below 20% state of charge (two bars left on the gauge), the buzzer sounds and the gauge bars flash. Charge the battery as soon as possible.

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WARNINGS AND ALARM CODES

GAUGE DISPLAYS, BUZZER PATTERNS AND APP CODES

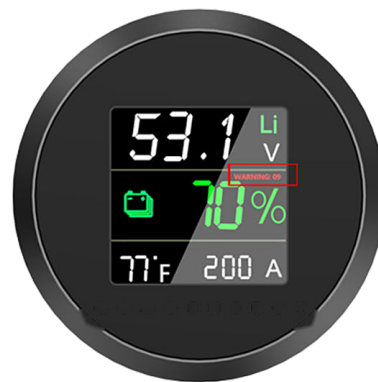
The BMS reports alarms and protection events on the gauge, with the buzzer, and in the app. An alarm is an early warning; a protection event means the BMS has limited or stopped charging or discharging.

If the buzzer sounds while driving, slow down or stop and check the battery. Otherwise, BMS protection may trigger and shut the battery down. The battery can work again once the alarm stops. Alarms beep 1 s on and 1 s off; protection events beep 0.2 s on and 0.2 s off.

MODEL-SPECIFIC DATA



Normal



Warning

Digital Bluetooth battery gauge in normal operation (left) and showing a warning (right).

Gauge warnings

DISPLAY	CAUSE	NOTES
WARNING2	Cell low voltage (alarm or protection)	Not shown while charging
WARNING4	Pack low voltage (alarm or protection)	Not shown while charging
WARNING5	Large cell-voltage difference (alarm or protection)	—
WARNING6	Over-discharge (alarm or protection)	—
WARNING7	Charging over-current (alarm or protection)	Not shown while charging
WARNING8	Over-temperature (alarm or protection)	Not shown while charging
WARNING9	Low temperature (alarm or protection)	Not shown while charging
WARNING10	Large temperature difference (alarm or protection)	—

DISPLAY	CAUSE	NOTES
WARNING11	Low state of charge: 11–20% (alarm pattern) or 0–10% (protection pattern)	Not shown while charging, or once the gauge confirms SOC
WARNING14	External communication failure (alarm)	—
No display	Cell or pack over-voltage (alarm or protection)	No buzzer

BMS warning codes in the app

PROTECTION OR FAULT	MEANING	ALARM	MEANING
Cell OV Prot	Cell over-voltage protection	Cell OV Alarm	Cell over-voltage alarm
Pack OV Prot	Pack over-voltage protection	Pack OV Alarm	Pack over-voltage alarm
Full CHG Prot	Full-charge protection	Cell UV Alarm	Cell under-voltage alarm
Cell UV Prot	Cell under-voltage protection	Pack UV Alarm	Pack under-voltage alarm
Pack UV Prot	Pack under-voltage protection	SOC Low Alarm	Low state-of-charge alarm
CHG OT Prot	Charge over-temperature protection	CHG OT Alarm	Charge over-temperature alarm
CHG UT Prot	Charge under-temperature protection	CHG UT Alarm	Charge under-temperature alarm
DSG OT Prot	Discharge over-temperature protection	DSG OT Alarm	Discharge over-temperature alarm
DSG UT Prot	Discharge under-temperature protection	DSG UT Alarm	Discharge under-temperature alarm
MOS OT Prot	MOSFET over-temperature protection	MOS OT Alarm	MOSFET over-temperature alarm
Amb. OT Prot	Ambient over-temperature protection	Amb. OT Alarm	Ambient over-temperature alarm
Amb. UT Prot	Ambient under-temperature protection	Amb. UT Alarm	Ambient under-temperature alarm
SC Prot	Discharge short-circuit protection	DOC Alarm	Discharge over-current alarm
DOC Prot	Discharge over-current protection	COC Alarm	Charge over-current alarm
COC Prot	Charge over-current protection	Cell Unbalance	Cell unbalance alarm
Temp. Fault	Temperature detection fault		
Voltage Fault	Voltage detection fault		
DSGFET Fault	Discharge MOSFET fault		
CHGFET Fault	Charge MOSFET fault		

What to do

- Low-voltage and low-charge warnings: stop using the cart and charge the battery.
- Temperature warnings: stop, let the battery return to its operating range, and check for blocked airflow or heavy sustained loads.
- Over-current warnings: reduce the load and check controller current settings against the battery ratings.
- Detection faults, MOSFET faults or a persistent cell-unbalance alarm: stop using the battery and contact Epoch support with the app screen and the gauge display.

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MAINTENANCE

INSPECTION SCHEDULE AND TERMINAL CARE

The BB51150A-Kit-1 is maintenance-free compared with lead-acid batteries: it needs no watering or acid service. Routine inspections keep it operating safely.

INTERVAL	ACTION
Before each trip or use	Inspect the case, terminals, cables, fuses, disconnects and mounting hardware.
Monthly during active use	Check terminal tightness, cable condition, app status and resting voltage.
At least every 3 months in storage	Check state of charge and recharge as needed.
Annually	Inspect torque, wiring layout, protection devices, battery tray, ventilation and charger settings.
After any fault or impact	Stop use, inspect for damage, record app data and contact support as needed.

Terminal maintenance

- Turn off and disconnect chargers and loads before maintenance.
- Keep terminals clean and dry. Use a soft brush or dry cloth to remove dust and debris.
- Do not use solvents, abrasive cleaners or pressure washing on the battery.
- Confirm the terminal hardware is tight and the terminal covers are installed.
- Replace damaged lugs, cables, boots or hardware before returning the battery to service.

Voltage and current checks

Use a reliable multimeter to compare terminal voltage with the app reading. Resting voltage changes slowly on LiFePO4 batteries, so use the app's state of charge and a load test when you need a more complete health check.

⚠ WARNING

Never place a multimeter's current (amps) input across the battery terminals — it creates a short circuit. Measure current with a DC clamp meter or a correctly rated shunt.

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TROUBLESHOOTING

SYMPTOMS, CAUSES AND CORRECTIVE ACTIONS

Use the table below to identify common causes and corrective actions. Stop testing and contact support if there is smoke, heat, odor, swelling, leaking liquid, arcing or visible damage.

Before you start

- Note the model, serial number, charger model and settings, how the system is wired and what changed before the problem began.
- Record the app's voltage, current, temperature, state of charge and exact alarm text, with photos or screenshots.
- Measure voltage directly at the battery terminals, not only at the inverter or charger.

SYMPTOM	LIKELY CAUSES	CORRECTIVE ACTIONS
Battery will not charge	Charger off or faulted; reverse polarity; incompatible profile; BMS protection; cells warming in cold weather; blown fuse; battery already nearly full.	Confirm charger settings and polarity. Check fuses and disconnects. Measure voltage at the battery while charging. In cold weather, allow the heater time to warm the cells. Review app alarms. A nearly full battery accepts little current.
No output or low voltage	Battery discharged; parasitic load; BMS low-voltage protection; open fuse or disconnect.	Disconnect loads and measure at the battery terminals. Charge with a compatible LiFePO4 charger. Check for parasitic draws before storage. Do not connect another battery across the terminals to force a wake-up.
Shuts down when a load starts	Surge above the 500 A / 15 s peak rating; sustained load above 300 A; inverter inrush; loose or undersized connections causing voltage drop.	Compare the load's surge and running current with the ratings. Check connections and cable size. Use the inverter's pre-charge or soft-start provisions where required. Try a smaller load to confirm normal output.
Bluetooth not found	Phone Bluetooth off; permissions not granted; out of range; another device connected; battery asleep; app version.	Enable Bluetooth and permissions. Move closer and refresh. Close the app on other devices. Update the app. Cycle the charger or load to wake the battery.
Low runtime	Load higher than expected, including inverter idle draw; battery not fully charged; cold temperature; imbalance in a bank; parasitic loads.	Fully charge with the recommended profile. Measure the load current. Check bank wiring balance. Test batteries one at a time in a bank.
Fuse or breaker trips	Short circuit; overload; inrush current; undersized protection; damaged cable.	Disconnect loads. Inspect wiring. Confirm load current and protection rating. Replace damaged parts.
Battery becomes hot	High ambient temperature; excessive current; poor ventilation; charger fault.	Reduce load or charge current. Improve ventilation. Confirm charger settings. Stop use if heating is abnormal.
App shows a fault	The BMS detected a voltage, current, temperature or short-circuit protection condition.	Record the fault. Remove the load or charger. Allow protection to reset when conditions return to normal.

⚠ WARNING

Do not repeatedly reset a fuse, breaker, charger or BMS fault without identifying the cause. Repeated faults can indicate unsafe wiring or an equipment mismatch.

When to contact Epoch support

Stop using the battery if the case is cracked or separated, or if you see swelling, leakage, unexplained heat, odor or water intrusion. Do not open or reseal the battery. For repeated shutdowns, failed charging or implausible readings, contact support with the model, serial number, order information, installation photos, charger settings and alarm screenshots.

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WARRANTY AND SUPPORT

11-YEAR LIMITED MANUFACTURER WARRANTY

The BB51150A-Kit-1 is backed by an 11-year limited manufacturer warranty covering qualifying defects in materials and workmanship under normal use, subject to Epoch Batteries' warranty terms, model-specific remedy schedule and claim procedures.

Register your battery

Registration within 90 days of purchase is required for full warranty coverage. If the battery is not registered within that time, the warranty period begins from the battery's original manufacturing date. Proof of ownership is required for any claim, and coverage is non-transferable: it applies only to the original purchaser.



Register online

epochbatteries.com/pages/product-registration

Have your order number and serial number ready.

What is not covered

- Misuse, abuse, neglect, or improper handling, installation, maintenance or service.
- Damage from an unsecured or improperly secured battery.
- Loose, corroded or improperly connected terminals.
- Reverse polarity, short circuits and overcurrent.
- Series or parallel connections beyond the limits for this model, or mixing models, capacities, ages or chemistries in a bank.
- Use with incompatible chargers, accessories or third-party products.
- Use outside the specified voltage, current, temperature or environmental limits.
- Storage outside the storage temperature limits in the specifications, prolonged storage fully discharged, or batteries left uncharged for more than three months.
- Excessive resistance from poor crimps, undersized cables or damaged wiring, and faults in the external electrical system.
- Impact, dropping, collision, fire, flood, water submersion or pressure washing.
- Opening, modification, disassembly, unauthorized repair or tampering.
- Applications the battery was not designed for, including repeated engine starting or current draw above the rated discharge capacity.

How to make a warranty claim

- 1 Gather your proof of purchase, model number, serial number, installation date and a description of the issue and when it began.
- 2 Record photos or videos of the installation, cables, fuses, charger settings and any damage, plus app screenshots or fault messages.
- 3 Contact Epoch support for troubleshooting, then submit your claim through the Warranty Portal at warranty.epochbatteries.com.

- 4 Wait for approval and an RMA number with packing and shipping instructions. Do not ship a battery without a valid RMA — shipments without one may be refused.
- 5 Package the battery safely and in compliance with lithium battery shipping regulations, using a UN-approved lithium battery shipping box where required. The customer arranges and pays for shipment to Epoch.

This summary does not replace the full warranty terms at epochbatteries.com/pages/11-year-warranty, which govern coverage, remedies and exclusions.

Contact Epoch Batteries



1-888-501-1846

Monday–Friday, 9 AM–4 PM Eastern



epochbatteries.com/support

Messages, FAQs and scheduled calls



support@epochbatteries.com

Photos, invoices and app screenshots



warranty.epochbatteries.com

Warranty claims, returns and repairs

3075 Chastain Meadows Pkwy, Marietta, GA 30066, USA

954 Ponce de Leon Ave, Suite 401, San Juan, PR 00907, USA

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RECORDS

COMMISSIONING AND MAINTENANCE LOG

Commissioning record

Battery model / SKU	BB51150A-Kit-1
Serial number	
Purchase date	
Warranty registration date	
Installation date	
Installer / owner	
Application	
System voltage	
Number of batteries and configuration	
Initial resting voltage	
Initial state of charge	
Charger model and settings	
Main fuse / breaker rating	
Cable gauge and length	
Terminal torque confirmed ()	
Bluetooth app connected	

[illegible]



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Manuals, data sheet and SDS for BB51150A-Kit-1

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US-based technical support · Monday–Friday, 9 AM–4 PM Eastern