REV 1.0/6.23

Eco Battery

GEN2 LITHIUM BATTERY

USER MANUAL

MODELS COVERED:

38V 105AH	A-038105-03
51V 72AH	A-051072-03
51V 105AH	A-051105-01
51V 105AH	A-051105-03
70V 105AH	A-070105-06
51V 160AH	A-051160-06

Eco Battery

READ BEFORE INSTALL!

HEAVY
TEAM LIFT REQUIRED

HIGH VOLTAGE
HANDLE WITH CARE

DO NOT PRESSURE
WASH OR SUBMERGE

CHARGE BATTERY
BEFORE USE

WARNINGS

- High Voltage. DO NOT install or service this battery unless you are properly trained.
- Use only with components that have the same voltage and current rating as the battery.
- DO NOT touch or connect to the terminals unless the battery is manually turned off.
- DO NOT open or attempt to service the battery, there are no user serviceable parts inside.

USE & CARE

- Charge the battery every night to ensure it is always fully charged and ready to use.
- Batteries will not charge if the internal battery temperature falls below 34F.
- DO NOT pressure wash, submerge, or use chemical agents to clean your battery.
- Clean the battery using a damp cloth that does not include chemical agents.

For additional product info, user manuals, user guides, and warranty information, please **visit https://ecobattery.com/quickstart or scan the QR code.**

BATTERY COMPONENTS

STATE OF CHARGE METER (SOC Meter)

CAN LCD METER

Eco Battery Gen2 batteries are only compatible with Gen2 SOC meters.

BATTERY VOLTAGE

The voltage will vary based on the current load or charge placed on the battery.

STATE OF CHARGE (SOC)

The state of charge is displayed in percent. 0% = empty and 100% full.

BATTERY CURRENT

Discharge current (in amps) is diaplayed as a negative number.
Charging current (in amps) is displayed as a positive number.

METER CALIBRATION

The Eco Battery SOC meter does not require calibration by the end user. The SOC meter performs a self-calibration at the end of each full charge cycle. Accuracy is +/- 5%.

Due to lithium's flat voltage curve, SOC % is the most accurate method for monitoring a lithium batteries state of charge. Please monitor the SOC % rather than battery voltage when determining when to charge.

Avoid running the battery completely dead. Although the BMS protects against detrimental discharge, it is not advised to run your battery below 20%. When driving your cart, be aware of your state of charge, just as you would monitor your vehicle's fuel gauge. The further you are from a charging location, the more battery you should reserve.

Your meter may be programmed with a sleep timer that will darken the meter after a few hours of inactivity. To wake the meter, the battery needs to see current in or out of it. Driving your cart a few feet or connecting the charger, or cycling the power button will awaken the meter.

Some Gen2 gauges are programmed to display DTCs (Diagnostic Trouble Codes) if a battery fault has been detected. These faults can vary in severity depending on the situation. **SEE PAGE 7 FOR TROUBLE CODES.**

If a trouble code appears on your meter, please record the trouble code and contact your dealer to discuss the code and, if necessary, take any actions required to correct it.

POWER BUTTON

The power button controls flow of power in and out of the battery. It functions as a safety device to allow for safe handling of the battery during installation and maintenance. It also serves as a way to completely disconnect the battery during storage to prevent unnecessary discharge over extended periods.

POWER BUTTON

To power on the battery, press and release the power button until the green light illuminates.
To power off the battery, press and release the power button until the green light turns off.
If the battery is not charged or driven for an extended period of time, the battery will automatically power off to conserve power. (See POWER SAVE MODE pg. 5)

The power button does not need to be turned off with each use. It is recommended to leave the power button on and the battery charger connected if the cart will be used within 15 days. If the cart will be unused for longer than 30 days, fully charge the battery, disconnect the charger AC power cord, and turn the battery off.

The power button MUST be turned on to charge or discharge the battery.

CAN CONNECTORS

CAN CONNECTORS

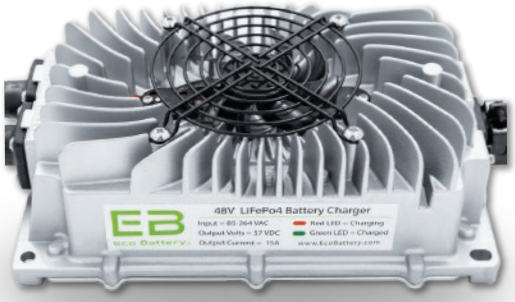
The two connectors located on your meter cable are CAN communication ports used for diagnostics, or communicating with a charger or motor controller.

Some battery chargers are CAN enabled, and will have a male CAN plug to connect to either one of the two CAN ports. If your charger is CAN enabled, the charger will NOT charge unless CAN is connected.

If your motor controller is CAN enabled and compatible with the Eco Battery CAN protocol, connect the CAN connector from the controller into either of the CAN ports on the meter cable.

CHARGER

BATTERY CHARGER



Use only genuine Eco Battery lithium chargers, or a lithium charger specifically approved by Eco Battery. This will ensure optimal charging and will extend the batteries service life.

DO NOT USE UNAPPROVED BATTERY CHARGERS OR TENDERS.

DO NOT CONNECT DC OUTPUT CABLES TO BATTERY WITH REVERSE POLARITY.
Doing so will cause irreversible damage and is not covered under warranty.

CHARGING INSTRUCTIONS

1. Connect the DC output ring terminals to the battery terminals.
2. Connect AC input to AC power.
3. Charger LED will will blink red when charging and will be steady green when complete.

Battery must be powered on with the power button illuminated to accept a charge.

Note: If your charger utilizes CAN charging, you will need to connect the CAN connector from the charger into either of the two CAN ports on the meter cable.

CAN CONNECTORS TO METER CABLE

CAN CONNECTOR FROM CHARGER

CHARGE TIME

The charge time can be calculated by the formula below:
Ah capacity of Battery / Charging Amps of Charger
Example : 105Ah battery / 15A charger = 7 hours
(assuming the battery is fully depleted)

The Eco Battery charger is not a float charger or battery maintainer, and will not hold the battery at 100% after a charge. If left plugged in, the battery battery must drop below a pre-set voltage before a new charge cycle can begin. It is normal for the state of charge to drop as low as 70-80% before the charger begins a new cycle, but it will not allow the battery to be completely discharged while plugged in.

It is a common misconception that lithium batteries develop a "memory" while charging and that they need to be completely discharged and charged with each use. This is not the case with Eco Battery lithium batteries. Charging every night will not harm the battery and will ensure that you are always topped off and ready for your next adventure. Topping off or partially charging to extend range is perfectly acceptable.

Recommended extension cord lengths:

Up to 15' = 12 -14 AWG
10 to 25' = 10 -12 AWG
>25' = not recommended

All Eco Battery chargers are capable of accepting AC input of 100 - 250 VAC, single phase, 50 or 60 htz

POWER SAVE MODE

If your battery was built after 08/01/2022 (or has updated firmware) it will be programmed to enter Power Save Mode after extended periods of inactivity. Power Save Mode will ensure that your battery will not be fully depleted in the event that your cart sits for an extended time. The time that must elapse before Power Save Mode will be activated, is dependent on SOC (see below). When Power Save is active, the battery will be completely powered off (no charge or discharge) and the meter will turn off.

SOC = 21% - 100%
The battery power and gauge will power off after 7 days of inactivity.

SOC = <20%
The battery power and gauge will power off after 24 hours of inactivity.

When in Power Save Mode, the green LED on the power button will not be illuminated, even if the power button is in the on position. To wake the battery from Power Save Mode, turn the battery's power button off, then back on.

If your battery has gone to sleep on its own, we suggest fully charging it before using it again.

STORAGE

It is always good practice to turn the key off to your golf cart when not in use.

For long term storage, fully charge the battery, unplug the AC power source to the charger, and turn off the power button.

After long term storage, it is advised to fully charge the battery before use, regardless of SOC displayed. During long term storage, the calibrated SOC may drift, and must be fully charged to re-calibrate.

The battery must be charged at least once every 6 months. Failure to charge for 6 months may permanently damage the lithium cells, and is not covered under warranty.

If your golf cart will be stored below -20°F, remove the battery from the cart and store in ambient temperature above -20°F. Also, keep in mind, while the battery will still function between -20°f and 32°f, the battery will not take a charge below 32°f. (See Cold Weather pg 6)

DO NOT USE THIRD PARTY BATTERY TENDERS.

CLEANING

Be mindful that there are sensitive electronics in your battery when cleaning your golf cart.

Although your lithium battery is well sealed, **DO NOT CLEAN BY PRESSURE WASHING**. Pressure washing can lead to premature damage to the lid seal of the battery , and is not covered under the warranty policy.

The recommended procedure for cleaning your battery is blowing off with a leaf blower, or wiping it off with a clean damp cloth.

NEVER USE CHEMICALS OF ANY SORT TO CLEAN YOUR BATTERY.

COLD WEATHER

Your battery is equipped with a temperature sensor that will shut it down in temperatures below -20°f. This feature protects the battery from cell damage caused by excessively low operating temperatures.

While your battery will discharge down to -20°F , it will not accept any type of charge below 32°F. This includes plug in charging as well as regenerative charging from your carts motor controller.

It is not recommend to drive a golf cart equipped with regenerative charging/braking systems when the overnight low temperature is under 32°F. Doing so may cause the battery to enter self-protection mode and can lead to braking system faults on certain carts.

It is important to note that the above temperatures are in reference to the core battery temperature and not the ambient air temperature. Your actual core battery temperature could be drastically different from the ambient air temperature as the battery will increase and decrease in temperature at a much slower rate than ambient air temperature.

As with all batteries, you may notice a decrease in performance and range in colder temperatures. This is normal and expected. Some decreases in performance may include shorter run times, slightly slower acceleration, and larger than normal voltage drops.

GEN 2 BMS ERROR CODES

CODE	ERROR DESCRIPTION	LEVEL
E01	MOS Error	1
E02	External Short Circuit	1
E03	Cell Differential	1
E04	Cell Over Voltage	2
E05	Cell Under Voltage	2
E06	Pack Over Voltage	2
E07	Pack Under Voltage	2
E08	Discharge Over Current	3
E09	Charge Over Current	3
E10	Discharge Temp High	3
E11	Charge Temp High	3
E12	Charge Temp Low	3
E13	Discharge Temp Low	3
E14	MOS Temp High	3
E15	SOC Low	3
E16	External Communication Error	1
E17	Internal Communication Error	1

Level 1 = Serious Fault. Will not self-resolve. Contact Eco Battery

Level 2 = Major Fault. Will self-resolve if conditions allow

Level 3 = Minor Fault. Will self-resolve if conditions allow

Eco Battery

NEED MORE HELP?

CONTACT:

SUPPORT@ECOBATTERY.COM

OR CALL:

877-326-2288