

SMART LITHIUM

Charging, Maintenance, Storage, and Software Updates



STAR EV LITHIUM BATTERY

Thank you for your purchase of the STAR EV Lithium-Ion Battery Pack. Lithium-Ion batteries are designed to provide years of reliable, trouble-free performance. From full charge to discharge, STAR Lithium batteries deliver consistent speed and acceleration for the long haul. You get full power any time you're behind the wheel.

Smartphone app monitor battery current, voltage, and temperature, and when paired with the internet the battery management software can be updated for the latest software versions.

Drive smart, drive clean, drive sure: Zero emissions, rapid recharge, and recyclable. The safest lithium batteries on the planet are STAR-smart.

This manual is designed to assist you in maintaining your new Lithium Battery in accordance with recommended procedures. Compliance with the procedure and troubleshooting tips will ensure your battery's best performance and reliability.

For STAREV Lithium Warranty please visit :
<https://starev.com/LithiumWarranty>



WARNING

- Only Licensed STAR EV Technicians and Authorized Dealers may perform any warranty repairs to STAR EV products. Failure to do so may result in voiding warranty, personal injury, or even death.
- Maintain the battery as per these guidelines in this manual. Failure to follow the procedures listed in this manual may result in a decreased duration of your lithium battery and/or voiding warranty.
- Unauthorized modifications to this vehicle may reduce performance and safety capabilities which could result in equipment failure, personal or property damage, or death.
- Never use the chassis or body as a grounded connection.



CAUTION

The warranty is invalidated if any of the following occurs, but not limited to:

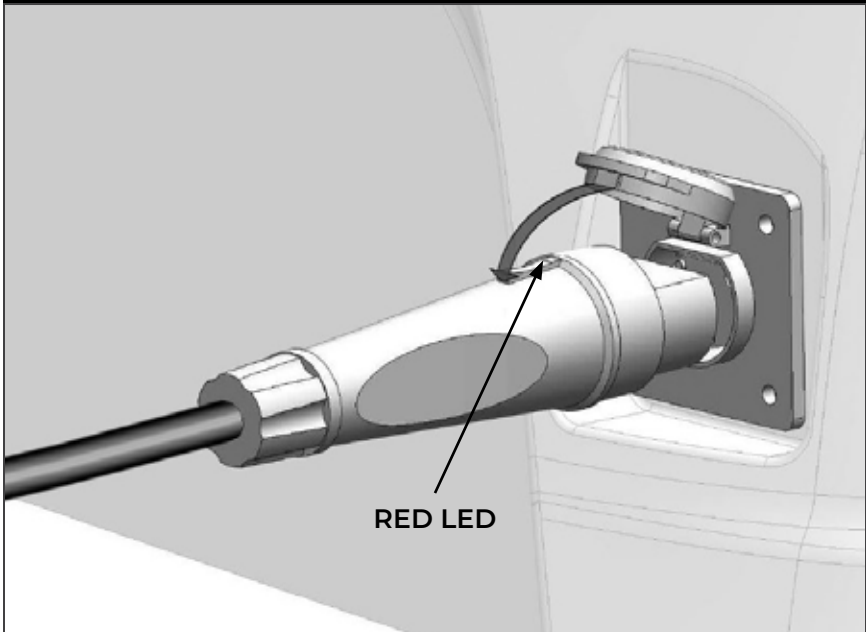
- Failure to properly install the battery
- Failure to properly store the battery as indicated
- Product used for applications other than which it was designed and intended (Example: Wrong voltage application)
- Damage due to over-tightening and stripping of the terminals
- Damage due to shipping/mishandling of the product
- Breakage, freezing, wreckage, water damage, melted or broken terminals
- Product that has been opened, modified, or tampered with
- Damage due to extreme hot/cold temperatures outside the range defined above
- Leaving the battery uncharged for more than 14 days after the state of charge is less than 10%
- Leaving the battery in an environment with temperature greater than 113°F (45°C) with state of charge less than 20% for more than 1 day
- Connecting the battery key switch circuit to any electronic device that drains power from the circuit (Example: Keypad, GPS and etc.)

**IF YOUR STATE OF CHARGE IS AT 10%
STOP DRIVING IMMEDIATELY AND CHARGE THE
BATTERY AS SOON AS POSSIBLE.**

CHARGING THE BATTERY

The charger should stay connected to the AC outlet until the charge cycle is complete. To plug in charger, lift receptacle cover and hold it in place while lining up and inserting the wand. Once lined up properly, push charger wand into place until the cover engages the lock tab on top of the wand. Once a connection is made, the meter will register the status. When the cycle is complete and the vehicle is completely charged, it will shut off automatically to prevent over-charging of the system. Remove the charging handle from the vehicle prior to operation. Make sure receptacle cover is locked in on the step of the plug to ensure secure connection. **The LED on the connector will always be RED**, which indicates AC power outlet is working. Your battery can be safely charged with the key in the OFF position.

CHARGE YOUR LITHIUM BATTERY COMPLETELY AFTER EACH USE



POWERING UP THE BATTERY

The top cover of each battery has a QR code to install the Smart Battery app, allowing you to view your battery's charge status, for added peace of mind. Your battery features a sleep mode, that will turn the power off after 1 hour of the key power being supplied without driving. If this happens, cycle your vehicle's key off and back on, to restart your battery. On the 80Ah, 105Ah, and 160Ah batteries you will have to press power button on the passenger side of vehicle.

OPERATING THE LITHIUM BATTERY

1. It is strongly recommended to charge the battery after each use.
2. Charge the battery as soon as possible when the SOC (state of charge) is below 10%
3. Avoid discharging the battery to less than 5% charge.
4. Strictly follow the operating temperature range below:
 - Discharge: -20~60C (-4~140F)
 - Charge: 0~50C (32~122F)
 - Storage: 0~30C (32~86F)
5. Even if not being used, fully recharge the battery at least once every 3 months, we recommended that you recharge every month.
6. Fully charge the battery before leaving if for a longer period of time (with in 3 months)
7. Avoid accelerating harshly as it may cause current spikes, triggering the battery's self-protective cut-off.

LITHIUM MAINTENANCE

Your lithium battery requires very little maintenance. To clean the battery, wipe it down with a damp cloth. DO NOT spray down or immerse the battery with water.

Yearly – use a 13 mm wrench or socket to check the main battery terminal bolts for tightness. The main terminal bolt torque should be 124 in-lb.

Every Six Months – You will see a 4-pin connector, located near your battery. Unplug this connector and inspect it for corrosion every six months.

For prolonged storage, charge the battery to 100%, unplug the charger, and you can leave the battery unplugged for 6 months after fully charged. When you return, the battery should be at 20% charge. Return the battery to full charge at this time.

GENERAL TROUBLESHOOTING QUESTIONS

Q: What if my battery won't turn on?

A: Verify that your battery power switch is pushed in, along with your dashboard pushbutton switch. Your battery should power up, with both of the switches pushed in.

Q: What if my meter seems to be inaccurate?

A: You MUST fully charge your Lithium battery before operating!

Q: What if my battery won't charge?

A: Verify that the red LED is lit on the AC charger cord plug. Then verify there are three cords connected to the charger, and that they are secure. Verify the correct polarity of the red and black wires under the black, plastic terminal cover on the finned side of the charger. On the side of the charger, look to see if there are any LED lights lit. If AC power is available to the charger, the blue LED should be lit. You can then download the Lester Charger Connect app onto your smartphone, to connect to the charger, for diagnostics.

STORAGE

For Lithium Batteries, fully charge, and then disconnect.

The most important things to avoid:

- **Freezing:** Avoid locations where freezing temperature is expected. Keeping a battery at a high state of charge will also prevent freezing.
- **Heat:** Avoid direct exposure to heat sources, such as radiators or space heaters. Temperatures above 80°F accelerate the battery's self-discharge characteristics.

The max environmental temperature for safe discharge is 140°F (60°C)

DO NOT charge your battery in ambient temperatures above 113°F (45°C)

The charger should not be used on the battery under 32°F (0°C).

If the battery is at or below this temperature, drive the vehicle before charging. This will warm the battery up internally, so that it can safely accept a charge.

For storage over one month, turn OFF the devices connected to the battery and push OUT the battery push button (if applicable) place the battery in a dry and ventilated location with temperature between 0~30C° (32~86F°)

DO NOT store the battery near corrosive material, fire or heat sources. Fully charge the battery before storage; Fully recharge the battery every 3 months.

LITHIUM BATTERY WINTER STORAGE

Batteries discharge over time. The rate of discharge changes according to the ambient temperature and the age and condition of the batteries. For winter storage, the batteries must be clean, completely charged and disconnected from any electrical drain.

Follow these steps to store your STAR EV Lithium battery during winter:

1. FULLY charge your STAR EV Lithium battery when storing
2. FULLY recharge the battery each month.
3. For storage over one month fully recharge the battery and TURN OFF the vehicle completely.
(If applicable – TURN OFF the battery with the push button.)
4. Store the vehicle in a dry, ventilated location with a temperature above freezing 32°F (0°C)
5. DO NOT store the battery near corrosive material, fire, or heat sources.
6. DO NOT try to charge the battery or operate the vehicle if the temperature is below freezing 32°F (0°C)

SPECIFICATIONS

	80 AH	105 AH	160 AH	210 AH
Part Number	2BA405	2BA410	2BA414	2BA415
2 Passenger Flat Ground Estimated Range*	15-25 Miles (24-40km)	30-40 Miles (48-64 km)	45-60 Miles (70-95 km)	50-80 Miles (80-129 km)
Nominal voltage	48 Volt	48 Volt	48 Volt	48 Volt
Nominal capacity	80 AH	105 AH	160 AH	210 AH
Stored energy	3.84 kWh	5.04 kWh	7.68 kWh	10.08 kWh
Self discharge	<5% per month	<5% per month	<5% per month	<5% per month
Max Continuous Discharging Current	105 A	105 A	150 A	200 A
Max Discharge Current (10 sec)	350 A	350 A	350 A	480 A
Standard charging time	3-4 hours	5-6 hours	7-8 hours	9-10 hours
Communication	CAN2.0B and RS485	CAN2.0B and RS485	CAN2.0B and RS485	CAN2.0B and RS485
Dimensions and Weight	17.5" x 12.2" x 9.8" (445 x 310 x 250 mm) 88 lbs (40 kgs)	18" x 13.4" x 9.8" (460 x 310 x 250 mm) 90 lbs (41 kgs)	20" x 14.75" x 9.4" (510 x 375 x 240 mm) 138 lbs. (63 kgs)	21" x 18" x 9.8" (539 x 454 x 250 mm) 198 lbs (90 kgs)
Recommended operating temperature range	Discharge: -20-60 °C Charge: 0-45 °C	Discharge: -20-60 °C Charge: 0-45 °C	Discharge: -20-60 °C Charge: 0-45 °C	Discharge: -20-60 °C Charge: 0-45 °C
BMS Protections:	cell-level voltage temp over voltage, under voltage, over current	cell-level voltage temp over voltage, under voltage, over current	cell-level voltage temp over voltage, under voltage, over current	cell-level voltage temp over voltage, under voltage, over current
Casing material	Cold rolled steel	Cold rolled steel	Cold rolled steel	Cold rolled steel

STAR SMART LITHIUM APP

Check STAR-smart lithium battery's charge status coming and going, with STAR EV's new wireless energy-monitoring app. Verify input and output in real time, so there's no need to think twice when you're ready to ride.

1. Download the App

For battery information, proactive monitoring and software updates download the STAR Lithium App and connect battery to smartphone through Bluetooth.

2. Connect Battery

Using the Star Lithium app, connect battery to your wifi network.

3. Charge

Charge the battery after each use and it will automatically check for updates.



IOS



ANDROID



**CHARGE YOUR LITHIUM BATTERY
COMPLETELY AFTER EACH USE**



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