



Trikke Lithium-Ion Battery and Charger Manual - English - V2 04/27/12

**TRIKKE**<sup>TM</sup>  
CARVING VEHICLES

**LITHIUM - ION BATTERY AND  
CHARGER MANUAL**

# LITHIUM - ION BATTERY AND CHARGER MANUAL

**APPLICATION** These are lithium-ion batteries with high energy density which were designed to power Trikke Electric Vehicles (EV) under normal riding conditions and up to the specific rated power of each model.

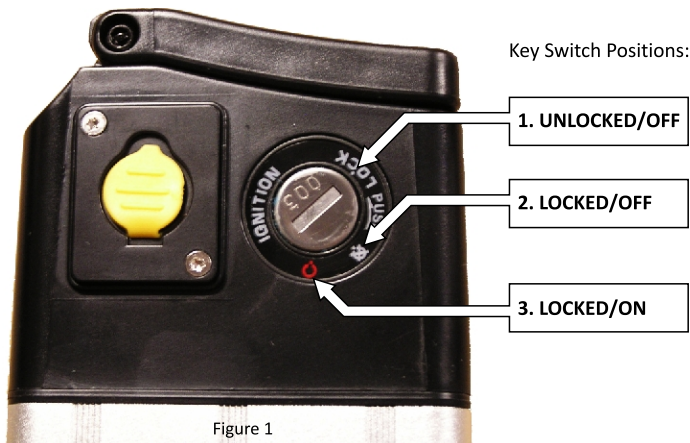
## BATTERIES AND CHARGER SPECIFICATIONS

BATTERY MODEL	BAT-005	BAT-003	BAT-004
RATED VOLTAGE	36 V	36 V	48 V
RATED CAPACITY	4.5 Ah	9 Ah	11.25 Ah
RATED ENERGY	162 Wh	324 Wh	540 Wh
TOP VOLTAGE	42 V	42 V	54 V
LOW VOLTAGE	31 V	31 V	42 V
WEIGHT	1.90 kg (4.2 lbs)	2.65 kg (5.8 lbs)	4.13 kg (9.1 lbs)
DIMENSION	88x86x290 mm (3.5x3.4x11.3 in)	88x86x350 mm (3.5x3.4x13.8 in)	88x86x395 mm (3.5x3.4x15.6 in)
CHARGER MODEL	CHG-002		CHG-003
RATED VOLTAGE	36 V		48 V
CHARGING VOLTAGE	42 V		54 V
CHARGING CURRENT	1.5 A		3.5 A
INPUT VOLTAGE	100-240 V		100-240 V
FULL CHARGING TIME	2.5 hours	5 hours	3.5 hours
WEIGHT	0.37 kg (0.8 lbs)		1.27 kg (2.8 lbs)
DIMENSION	120x60x30 mm (4.7x2.3x1.2 in)		200x130x75 mm (4.7x5.1x2.9 in)

## OPERATION

1. Charge the battery pack before first use. This may take up to 5h for a full charge depending on the battery model and charger used. Refer to the charging section for more details.
2. Install the battery pack on the vehicle. Please refer to the vehicle's manual on how to install. Battery should slide on the mounting rail while key is in pos1 (unlocked/OFF).

3. Lock the battery to the mounting rail – turn the key to pos2 (locked/OFF).
4. Switch the battery power ON by turning the key to pos3 (locked/ON). Battery is ready for use.
5. The recommended ambient temperature range for using the battery is between 10-40°C (50-104 F). Operating the battery outside the recommended temperature range will result in reduced vehicle mileage.
6. To remove the battery from the vehicle, return the key to pos1 (unlocked/OFF). Note that you must push the key in to turn from pos2 to pos1. Pull the battery pack up by the handle to slide it off the rail. You may need to remove the key in order to slide the battery on or off for Trikke EV 36V model with fairing.



## CHARGING AND STATE OF CHARGE (SOC)

1. Press the white dot button located on top of the battery pack to check the SOC.
2. The LED indicators will light up for 5sec showing the remaining battery charge: 4 lights on for 75-100% charge; 3 lights on for 50-75%; 2 lights on for 25-50% charge; 1 red light on for 0-25% charge.



Figure 2 - Battery SOC

3. Never leave the battery discharged for extended time.
4. Connect the charger to the battery pack (figure 3) before plugging the charger into the wall outlet.
5. The power indicator on the charger will glow RED when charging and GREEN when fully charged (or disconnected from the battery pack).

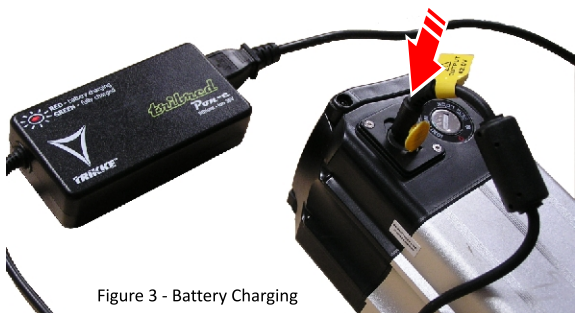
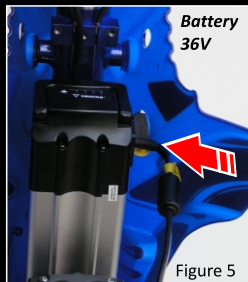


Figure 3 - Battery Charging



6. After charging, unplug the charger from the wall outlet then disconnect charger from battery pack.
7. Use only the charger originally supplied with the battery. Do not use another charger as it may overcharge, overheating the cells, damaging the battery and posing risk of fire.
8. Avoid exposing the charger to humid or wet locations as moisture may get inside and damage the electronics.
9. Charging time will vary according to the battery state of charge and charger model used. Full charge from empty state will take from 3-5h. Refer to the table of specs.
10. Charger will become hot during charging. Keep good ventilation and do not cover it to allow good heat dissipation. Some models have a fan and vents for air flow inside. Do not obstruct the vents.
11. Handle charger carefully. Protect from accidental drop, which can damage internal parts, causing malfunction.
12. In cold weather, bring the battery to a warmer room for charging. This will allow the battery to accept a complete charge.

**IT IS NOT NECESSARY TO REMOVE BATTERY FROM VEHICLE**



## **BATTERY USEFUL LIFECYCLE**

Lithium-ion batteries will lose capacity and performance with use (aging) depending on: number of cycles, discharge pattern and time. A loss of capacity of about 20% per year is the normal average. Trikke batteries will offer a life of approximate 500 cycles when used under moderate load (low speed setting), ambient temperature within the recommended range, and when good charging practice is followed. After 500 recharges per the above use recommendations, it is expected that the battery will have approximately 60% of its original capacity. A full cycle is a full charge followed by a full discharge.

## **TIPS TO EXTEND THE BATTERY LIFE**

- Avoid full discharge - best to keep battery charge level between 25-100%
- Store in a cold and dry place (to slow aging). Do not use in excessively hot weather.
- Operate under moderate load (preferably ride on low speed when possible)
- For long term storage, it is best to keep the charge level at around 50%. Plug in the charger for a little while every 90 days.

**WARNING**

**The following points should be noted regarding use of the battery pack with your Trikke EV.**

1. Do not leave battery fully discharged.
2. Use only TRIKKE approved charger.
3. Protect from moisture or rain.
4. For long term storage it is best to recharge every 90 days to approximately 50% of capacity.
5. Store in a dry and cool place; do not expose to heat.
6. Read warranty terms and conditions; read battery manual.
7. Battery is not permitted to fly on passenger aircraft.
8. Do not dispose of in household trash; search online for a battery recycling center near you.
9. Avoid overloading the Trikke EV. The maximum weight limit should not exceed the rider's weight limit.
10. When climbing up hills, it is important to add your body power assistance to lessen the drag.
11. Avoid riding up extended inclines inclines of 4 degrees or more..
12. Avoid riding on poor road surfaces.
13. If the battery pack begins overheating, leaking,

deforming, giving out a strange odor or smoke, stop using the battery pack immediately. Place it in an open area away from flammable substances until it is stable, then dispose of it accordingly.

14. The battery pack has been designed specifically for the Trikke EV. Do not use the battery pack for any other application. Doing so will void the warranty.
15. Use the charger supplied with this battery pack to charge the battery. The use of any other charger not certified by Trikke Tech, Inc. is prohibited so as to avoid damaging the battery pack and will void the battery warranty.
16. Do not place the battery pack on or near a heat sources such as radiators or other heating elements, particularly microwave ovens and high pressure containers to avoid the heat from damaging the battery pack.
17. Do not short-circuit the positive and negative terminals of the charger. This will seriously damage the charger and is very dangerous.
18. There is high tension circuitry inside the charger. Do not open the casing of the charger to avoid danger and damaging the charger.
19. While charging, heat will be generated by the charger and therefore do not put anything above or cover the charger. Do not place flammable substances within 30.5cm (12 in) of the charger to avoid danger.

**NOTE!**

1. If the battery pack or charger is found to be defective, please call Trikke Tech technical support at 877-4TRIKKE (877-487-4553). Please do not attempt to open the casing of the battery pack or the charger for your safety and to prevent damaging the parts inside. Warranty will be voided if the battery pack or the charger is found to have been opened.
2. Do not use gasoline or other solvents to clean the battery pack or charger. Use a soft cloth to wipe clean any water or dirt found on the surface of the battery pack or charger.
3. Do not place the battery pack in an exposed environment for extended periods of time to avoid sun and rain damage of the battery pack.
4. Do not place the battery pack in a humid environment. Keep the battery pack away from water.
5. Be careful to not short circuit the charging terminals or discharging terminals of the battery pack. This can be caused by tampering with the battery terminals or to the electrical cables on the vehicle that are connecting to the battery's bottom connector..
6. Do not throw the battery away in the trash. Go to <https://search.earth911.com> to find a Li-Ion battery recycling center near you.
7. If you ever need to ship this battery pack: Li-Ion batteries are categorized as dangerous goods and must be shipped accordingly. Find a dangerous goods certified shipper (such as UPS or Fed-Ex) and designate the battery as dangerous goods, class 9, Un3480.

## **BATTERY STORAGE**

1. The battery pack should be removed from the vehicle and stored indoors to avoid prolonged exposure to sun and rain.
2. Store the battery pack in a cool, dry and ventilated place with temperatures between -20~30°C (4~86 F).
3. For extended storage of the battery pack, it is recommended that you charge the battery to about 50% charge to maintain the capacity of the battery pack, i.e. with 2~3 LED's on. Repeat the same procedure every 90 days. Totally discharged batteries should be recharged immediately afterwards.

## **BATTERY AND CHARGING TROUBLE SHOOTING**

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### **BATTERY HAS NO POWER: WITH KEY TURNED ON (POS 3) MEASURE\* VOLTAGE (V) BETWEEN + AND – POWER TERMINALS (V=0)**

- Battery is discharged. Charge battery.
- Check FUSE. Replace if blown.\*\*

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### **BATTERY HAS NO POWER AND DOESN'T ACCEPT CHARGE, SHOWS FULL CHARGE OR NO SOC LIGHTS**

- Battery was left discharged for long period and it's over discharged. Battery may be serviced.
- Internal electronic failure or damage. Battery must be replaced.

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### **BATTERY HAS POWER BUT DOESN'T ACCEPT CHARGE**

- Battery charging circuit or connector damaged. Battery may be serviced.
- Damaged charger unit or cable. Test with another charger.

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### **AFTER INSTALLING THE BATTERY TO THE VEHICLE, CAN'T TURN THE KEY ON**

- Confirm if the key can be properly turned when the battery pack is off of the vehicle.
  - The battery must be pushed down on the vehicle while turning the key. It's intentionally adjusted tightly against rubber stoppers on the bottom tray, to avoid play.
  - Refer to the vehicle's Owner's Manual for details on how to adjust battery/rail locking.
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*\*We recommend the use of a Voltmeter to measure battery power output (V).*

*\*\* To access the fuses, remove the cap with a philips screwdriver (figure 6).*

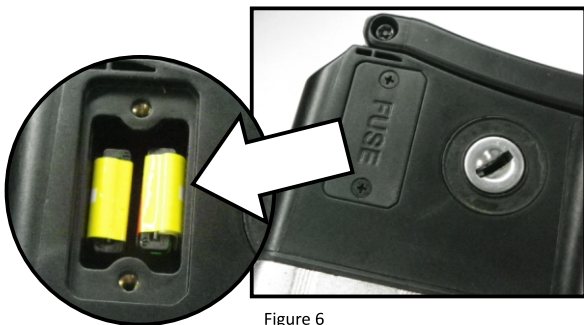


Figure 6

For tech support please contact your local distributor or write to [techsupport@trikke.com](mailto:techsupport@trikke.com) or call **1-877-4TRIKKE (USA)**.

## **IF YOU LOSE THE BATTERY PACK KEY**

Locate the key code stamped on the lock plate. Contact your local distributor or Trikke to get a replacement. You will be asked for the original purchase receipt to validate your request.

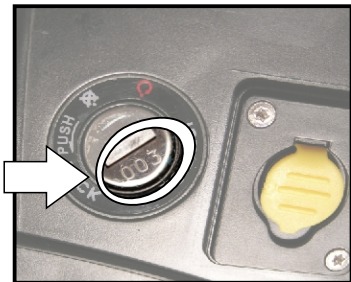


Figure 7 - Key code location

## **WARRANTY – TERMS AND CONDITIONS**

### **LITHIUM-ION BATTERY - 15 MONTH LIMITED WARRANTY**

Lithium-ion batteries originally installed on a Trikke electric vehicle or a replacement battery purchased from Trikke Tech, its distributors or authorized dealers are warranted for 15 months from the original purchase, with full replacement within the first 90 days, and partial (pro-rata) replacement after the initial 90 days of use. A suspect battery must be shipped to Trikke Tech for warranty in proper DG (Dangerous Goods) packaging, the Customer being responsible for shipping and costs. Trikke Tech will then check the battery and either repair or replace it. The battery will be returned to Customer at Trikke's expense. Pro-rata replacement takes into consideration the full number of months passed since the purchase date and divides the base retail price of a new battery by 15 (fifteen). If a new battery is required, Customer will be expected to pay 1/15 of the retail cost of the battery





for every month of use (if after 90 days of use). Purchases of replacement battery under pro-rata warranty must be directly from Trikke Tech. The new battery will be warranted with a new term of 15 months under the same conditions described above.

Important facts about the aging of lithium-ion batteries: The current technology of lithium-ion batteries presents a natural degradation (aging, loss of capacity) even if not in use. The level of degradation will depend on factors like discharge current (fast or low riding speed setting), temperature of operation/storage and the number of cycles of discharge.

Trikke Panasonic batteries should retain a minimum of 70% of the original capacity by 15 months and 300 recharges if vehicle is operated at express speed (speed 2) and up to 500 recharges if operated at econo speed (speed 1), at temperatures ranging between 10 - 38°C (50-100 F).

## **EXCLUSIONS**

Damages to the battery caused by short circuit, moisture, impact, perforation, abuse or marks of tampering with the battery pack will void the above warranty. Batteries kept discharged for a long period of time may not recover working capacity and will be permanently damaged. Failure to keep the battery properly charged will void the warranty.

## **LIMITATIONS ON WARRANTY**

THE ABOVE WARRANTY IS THE ONLY REMEDY PROVIDED BY TRIKKE TECH FOR ITS BATTERIES. NO OTHER PARTY HAS EXPRESS OR IMPLIED AUTHORITY TO CHANGE THIS WARRANTY IN ANY MANNER. TRIKKE TECH DISCLAIMS ANY LIABILITY FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES.



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