

Battery Care Guidelines – Lithium Batteries



CHARGING PRACTICES:

Ensure the system / battery is turned off. Plug **the supplied charger only** into the battery (while not live), and then plug the charger into the wall socket (this avoids any arcing). On most units, the LED light will go RED during charging, and GREEN when fully charged.

Plugging in the charger will charge the pack to full, if left to complete its cycle. You can partially charge and disconnect the charger even if the green light has not come on, and then use the battery; just be aware that you will not have a full charge, and balancing of cells will not happen (this happens when close to the maximum voltage). We advise you to charge to full every fifth time at least.

You can leave the charger plugged in for a short while (a few hours to overnight) after the light goes green, this will not seriously harm the battery. The "BMS" (Battery Management System) inside the battery will prevent any possible overcharge. However, it is advisable to remove the charger once the pack has completed the charging cycle to minimise any risk. Do not leave on charge for extended periods, or charge while the battery / system is turned ON.

The charger will get warm during charging. Do not cover the charger or leave it inside a bag, allow plenty of air for the heat to dissipate. In the extremely rare event of a fault leading to thermal runaway, this is most likely to happen during charging, so we recommend supervising the battery during charging, and/or charging in the most secure / fire retardant location possible.

Never, NEVER throw the battery into a fire, under ANY circumstances.

PROLONGING THE LIFE OF YOUR BATTERY PACK:

To get the longest life out of your battery pack;

1. **Avoid running down to empty.** You can of course manage this yourself, in terms of not riding down past one bar on your battery gauge, and NEVER restart the motor if the low-voltage cutout has stopped power. Also, e-bike controllers have low-voltage cutout functions built-in, with the default values on ours being at 30v for a 36v battery and 40v for a 48v battery. You can increase the low-voltage cutout level on your LCD3 display to have your system automatically manage this for you. Do this by turning the system on, then within 5 seconds press and hold (for 2-3 seconds) the up & down buttons together until you get the top speed flashing (normally says 72). Press the middle button to get wheel size flashing, then again to see km/miles flashing, and once more so it stops flashing. Then press and hold the up & down buttons to take you to C settings. Scroll through these with the middle button until you get to P5, then once more so P5 stops flashing, then press and hold the up & down buttons to get to the C settings. Scroll through these using the middle button until you get to **C12**, which is the Controller Minimum Voltage Operating mode. Using the up button to select level 5 rather than the default 4 will increase the minimum voltage by 0.5v. On level 6 it will increase by 1v, and on level 7 (the highest level) will increase it by 1.5v. This will slightly shorten your range per charge, but will give you a nice long battery life.
2. **Avoid charging above 4.1v per cell.** This is a little trickier to self-manage, since it would involve taking the standard battery off charge a little before it's full. Our new Premium Packs are coming with special chargers and BMS's which will manage this automatically, and the number of charge cycles from the battery pack can DOUBLE by doing this. The drawback is up to 15% reduction in range per charge compared to charging to 4.2v per cell, but we think it's worth it in the long run. We are using better cells in these Premium Packs now anyway, to still get similar range as industry standard packs, but with much longer lifespans.
3. Always **turn off / disconnect** the battery from your REV-Bike when not in use. If storing without use for extended periods, never store the battery at full or empty, or you will do irreversible damage. You should store the battery around half full, and keep the temperature below 30 degrees, which should limit the leakage to about 5% per year, presuming there is no load at all on the battery (it's turned off / disconnected).
4. **Avoid high temperatures** (over 30 degrees C), and keep the battery out of direct sun as much as possible.

IMPORTANT FOR BATTERY CARE:

* **Keep dry**; the pack is water resistant, but not water proof. DO NOT SUBMERGE THE PACK IN LIQUID.

* Be gentle on your battery if it's very cold. You will get better performance if you keep it above 10 degrees Celsius.

* **Ensure a FULL CHARGE at least one time in 5.** Top-ups are fine, but you should allow your cells to balance by doing a full charge every so often. If the cells go out of balance, your range will dramatically reduce.

* Do not have extra weight on the key if your battery has a key switch (can put stress on the locking mechanism).

* Never use this battery for anything other than your REV-Bike. Never use another charger than that supplied.

* **SERVICE or REPAIR SHOULD ONLY BE PERFORMED BY A QUALIFIED BATTERY TECHNICIAN. NEVER OPEN YOUR BATTERY PACK YOURSELF.**

Learn more about Lithium Battery Technology at Battery University online, with great info such as http://batteryuniversity.com/learn/article/how_to_prolong_lithium_based_batteries