Battery Care Guidelines –

Lithium Batteries

OPERATING VOLTAGES:

36v ('nominal') packs will be full at 42v and empty at 30v. 48v packs will be full at 54.5v and empty at 41v.
Voltage will drop a couple of volts when the motor is working hard ('under load'), then rise up again when idle. As the battery ages, this voltage drop under load will increase; this is known as "sag", and range will decrease with this.

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, there is a red light which will be on when plugged in, and a Charge light which will be 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).
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 (avoid leaving it more than 24 hours), 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, or leave it sitting on something flammable. 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.

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 manage this yourself, by avoiding riding if there are no bars left on your battery gauge, and avoid restarting the motor if the low-voltage cutout has stopped the power (ie, limp hom eon the pedals!). E-bike controllers have low-voltage cutout functions built-in, with the default values on ours being at 30v for a 36v battery and 41v for a 48v battery. We can increase the low-voltage cutout level of your controller, to have your system automatically manage this for you. This is done via computer on mid-mount systems please ask us if desired.

2. **Avoid charging above 4.1v per cell.** This is a little trickier to self-manage, since it would involve taking the battery off charge a little before it's full (at around 41v for a 36v battery, or 53.5v for a 48v battery)
In this case, the pack won't actually perform it's balancing function, which happens right at the end of the charge cycle. So you must charge it to full at least 1 time in 5. The key is to not charge to full more frequently than required, so only charge when you need to (the night before a long ride).
Battery life is measured in "charge cycles", so minimising the frequency of full charges is a good practice.

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, presuming there is no load at all on the battery (it's turned off / disconnected).

4. **Avoid extreme temperatures** (below 5 degrees and over 35 degrees Celsius). Keep the battery out of direct sun as much as possible. Be gentle on your battery if it's very cold.

IMPORTANT FOR BATTERY CARE:

* Ensure you **charge the battery at least once every 3 months**, to keep the voltage within the safe operating range.
* **Keep dry**; the pack is water resistant, but not water proof. DO NOT SUBMERGE THE PACK IN LIQUID.
* **Ensure a FULL CHARGE at least one time in 5**.
* Do not short circuit the battery, by allowing the positive and negative wires to contact each other. Be sure terminals on mounting brackets are dry prior to mounting battery, as water can conduct electricity.
* Never use this battery for anything other than your REV-Bike. Never use another charger than that supplied.

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

*** 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 this:
http://batteryuniversity.com/learn/article/how_to_prolong_lithium_based_batteries