



Guidelines for Charging and Operation of Model Year 2013 and Later Models

Zero motorcycles are designed to operate under normal temperatures and environmental conditions. However, lithium-ion batteries, such as those used in the Zero Motorcycles' power packs, wear based on usage cycles as well as calendar time. Aging can be accelerated by high temperature and long-term storage of the power pack at a high state of charge. In order to maximize the life of your power pack(s) and support the worry free operation of your motorcycle, Zero Motorcycles has established the following guidelines for proper charging and operation.

Charging and Storage

To maximize the life of your power pack(s) and maintain healthy batteries, it is important to follow these guidelines:

- Once your motorcycle has been charging for 24 hours, we recommend that you disconnect the charger. The power pack will self-discharge extremely slowly over time. So if you haven't ridden it for a while and need to top it off to 100%, plug it in to the charger for a few hours. Unplugging the charger when not needed ensures the best long-term health of your power pack.
- *Caution: Never store your motorcycle at a low state of charge (below 30%). Leaving the power pack at a low state of charge for a prolonged period could damage it and void your warranty.*
- For long term storage (>30 days) of your motorcycle, you should reduce its state of charge to ~60% state of charge prior to storing it. Leave the charger disconnected. Again, the power pack will self-discharge extremely slowly over time. Every month, the state of charge should be checked and if it falls below the lower storage limit of 30% state of charge, we recommend charging it back up to the upper limit of 60%. In the table below, please note the temperature range for charging. When ready to remove your motorcycle from storage, charge it for 24 hours to ensure optimal battery balance is restored.
- To ensure best performance of your Zero motorcycle over its lifetime, please be certain that the vehicle's firmware is up to date. If you have questions, please contact the nearest Zero Motorcycles dealer.

Cold Weather Operation

Cold weather (< +10°C (+50°F)) operation of the motorcycle has no permanent impact on its power pack; however, the rider may experience a temporary reduction in power, achieved top speed and range due to the effect cold temperatures have on the amount of energy the power pack can release. The colder the weather, the greater the effect.

Hot Weather Operation

Hot weather (> +35°C (+95°F)) should not result in any noticeable performance changes. However, should the power pack temperature rise above the upper running mode limit, the rider may experience a temporary reduction in power and achieved top speed. Note that the BMS will not allow motorcycle operation and its associated power pack discharge above a power pack temperature of 60°C (140°F).

Also, for power pack temperatures greater than 43°C (109°F), the charger will reduce the available charge current to the power pack which ultimately increases charge time accordingly. The hotter the ambient temperature, the greater this effect.

Note: To maximize the life of your motorcycle's power pack, avoid leaving it parked in direct sunlight or on hot pavement at ambient temperatures 35°C (95°F) or above for an extended period.

Summary of environmental conditions:

Full performance temperature range for motorcycle	+10°C (+50°F) to +40°C (+104°F) Ambient
All functionality for running mode is maintained	-20°C (-4°F) to +50°C (+122°F) Power pack temperature
All functionality for charging mode is maintained	0°C (+32°F) to +50°C (+122°F) Power pack temperature
Prevented operation at power pack temperature	Below -20°C (-4°F) and above +60°C (140°F)
Recommended motorcycle storage temperature range	-20°C (-4°F) to +35°C (95°F) Ambient