



## Guidelines for Cold and Hot Weather Operation and Storage

Zero motorcycles are designed to operate under most normal temperature and environmental conditions. However, extreme cold and heat may impact the vehicle's performance, both in terms of operation as well as charging.

To ensure best performance of your Zero motorcycle, 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

Cold weather operation of the motorcycle has no permanent impact on its power pack/cells; however, the rider may see a reduction in range due to the effect cold temperature has on the amount of energy the pack/cells can release. The colder the weather, the greater the effect; so that, as compared to operation in 80°F (27°C) ambient, at 30°F (-1°C) ambient the rider could experience a temporary reduction in range of up to 30%.

In extreme cold weather the motorcycle may also experience a temporary reduction in power and, correspondingly, achieved top speed.

It is not recommended that the motorcycle be ridden while its battery temperature is below 23°F (-5°C). If it is, its battery needs to be put on the charger at a temperature above 32°F (0°C) as soon as the ride is concluded. It is worth noting that the Battery Management System (BMS) will not allow the battery to be discharged below -22°F (-30°C), which is the absolute lowest discharge temperature prescribed by the cell manufacturer.

Storage of the motorcycle for the winter in a non-heated garage is acceptable, as long as:

1. the coldest temperature in the garage does not fall below -31°F (-35°C)
2. the battery is left on the charger continuously
3. the battery is initially topped off at a temperature above 32°F (0°C)

Storage temperatures below -31°F (-35°C) may result in accelerated permanent decay of the battery performance, and hence it is not recommended. Above this temperature, working as a system with the BMS, the charger will ensure the battery survives winter storage with no permanent damage, even if the temperatures dip well below freezing for weeks at a time. Note that, to prevent battery damage, the BMS will prevent the charger from charging the battery at a temperature below 32°F (0°C). Again, as long as the battery was initially topped off by the charger above 32°F (0°C) and remains on the charger through the winter at temperatures above -31°F (-35°C), the system will guard the battery from damage.

### Hot Weather Operation

Operation of the motorcycle in hot temperatures should not result in any noticeable performance changes. However, the BMS will not allow motorcycle operation and its associated battery discharge above 140°F (60°C), as measured at the battery.

In hot temperatures greater than 110°F (43°C), the charger reduces its charge current to the battery, increasing charge time accordingly; the hotter the ambient temperature, the greater the effect. Above a battery temperature of 131°F (55°C), the BMS will no longer allow charging.

*Note: Storing the motorcycle or its battery in direct sunlight in ambient temperatures above 105°F (41°C) may result in accelerated permanent decay of battery performance, and hence it is not recommended.*

---