

Battery Range and Efficiency

The UBCO 2X2 is powered by an automotive level lithium-ion cell pack. This provides the 2X2 with consistent discharge ability along with excellent cyclic durability.

2X2 batteries and connections are made to do the hard work. The battery is designed to be water and dust resistant and available in two capacities: 2.1kWh or 3.1kWh.

A solid workhorse, the Li-ion battery delivers a large capacity in a sturdy package. Each 2 × 2 battery is constructed from high-quality LG 18650 Cylindrical Cells, mounted into cell holders, sealed within an alloy case, and screwed shut.

UBCO batteries are UN38.3 certified and the charger is UL/CE certified to provide safe operation, use, and transit. All this results in a robust battery that can handle the ride – and all the mud and dust.

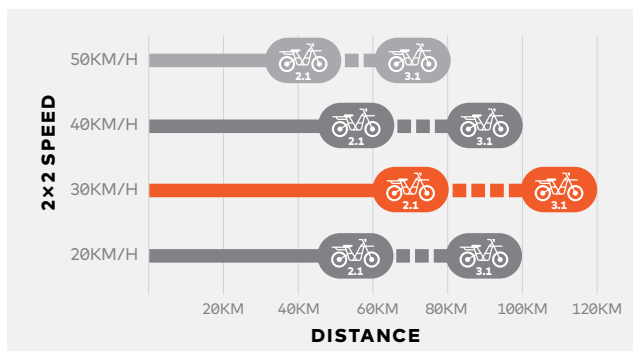
How far can I go?

Your range in a battery-powered vehicle is affected by similar variables to a combustion engine vehicle: carried weight, load, incline, speed, terrain, weather conditions, and tire pressure among others.

The graphic below shows how speed and efficiency affect range. The UBCO 2X2 is a high-torque, low-speed system, so its efficiency peaks below its top speed. The ranges expressed below are tested on testing tracks with an 80kg rider and are provided here for guidance only.

- Full speed (50km/h) at max throttle: Max distance ~ 65km with 3.1kWh battery, ~ 42km with 2.1kWh battery (in test conditions, noting that real-life variables such as weight and terrain will impact range)
- At the most efficient speed of 32.5 km/h: Max distance ~120km with 3.1kW battery, ~ 80km with 2.1kWh battery (in test conditions, noting that real-life variables such as weight and terrain will impact range)

2x2 Tested Battery Range



UBCO 2 × 2 with 2.1kWh or 3.1kWh battery. Test bike kept at constant speed with 80kg rider.

If you're wondering about off-road riding distances, we've completed field testing in Skippers Canyon, New Zealand. At mostly full throttle, on a gravel road, undulating hills, some of them steep, bikes consistently traveled about 70km.

How does regenerative braking help?

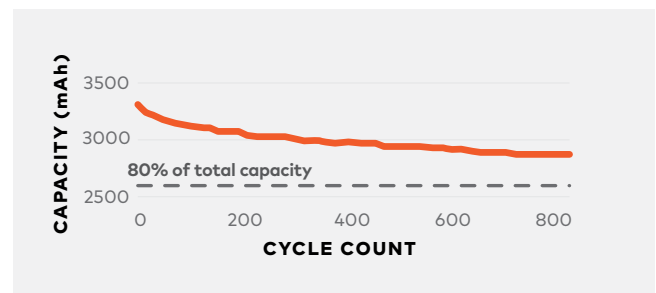
The 2X2 is unique in that it has both front and rear regenerative braking. This assists with slowing the bike and reducing brake wear, along with providing some extra charge back into the battery. Regenerative braking can draw up to 20% of the motor's rated power. For example, for every hour you climb, you would need to descend for 5 hours to put the energy used back. This can deliver 2-10% of the capacity back to the battery depending on the terrain and length of the ride. Steeper descents will deliver more back than on a flat road.

How long will my battery last?

The 2X2 battery uses automotive-class LG cells. These are selected for their cyclic durability and safety. Battery performance and lifespan is affected by a range of factors, from everyday usage to environmental conditions. For normal users, the battery should last a significant period of time.

The pack life is measured in 'discharge cycles'. The cells used are rated to retain 80% of their capacity after 800+ full discharge cycles (100-0%). (Note this does not take into account environmental factors such as temperature and the aging effect when packs are stored with too high or too low state of charge. Storing the battery with either too full or too low a charge can accelerate cell damage, reducing the battery life and capacity.)

Battery Discharge Cycles



Discharge Cycles

Work Use: Using the average distance traveled on farm each day of 25km at full speed over the course of a year, battery capacity could drop 20% over the course of about 5.5 years (~50,000km).

Recreational Use: Using the bike an average of 65km per week at full speed (~3,400km per year) battery capacity could drop 20% over the course of 15 years of use.

The cell performance will degrade in either high heat (60°C / 140°F) or very low temperatures (-17°C / 0°F).

Do the batteries have a memory?

Unlike traditional lead-acid batteries, lithium-ion does not have a memory and can be readily charged at a variety of battery levels. You can charge your UBCO battery at any time without impacting the battery health. Partially charge your battery at least once a month to ensure the health of the power supply — even if you haven't ridden your bike in a while.

If you are not using your bike for an extended period (longer than a month) ensure your battery has between 50-90% charge. Storing the battery with either too full or too low a charge can accelerate cell damage, reducing the battery life and capacity.

Battery Care & Safety?

The 2X2 lithium-ion battery and charger are designed to work exclusively with the 2X2. Do not attempt to use any power supply or charger other than those supplied by UBCO. Extra batteries and chargers can be purchased from UBCO Ltd or your UBCO dealer.

- Lithium-ion batteries do not suffer from the same charge memory problems as other batteries, therefore they can be topped up at any time.
- Charge your battery at least once a month to ensure its health.
- Secure the battery in place when riding.
- Do not drop the battery into the 2X2 from a height. Lower it into place carefully.
- Do not submerge the battery or the 2X2.
- Store in a cool place indoors when not in use.
- Do not burn the battery or place it near heat sources above 80°C (176°F).
- Keep away from children.

Advantages of lithium-ion over traditional battery chemistry (lead-acid)

- Increased energy density.
- About 1/3 of the weight of lead-acid (for the same capacity).
- Much more efficient in both charge and discharge

- Lithium-ion batteries can be discharged for longer and with vastly more discharge cycles than lead-acid.
- Much better at maintaining voltage throughout discharge.

UBCO 2X2 Battery Specifications

DIMENSIONS

Length: 300mm | 11.8"

Depth: 150mm | 5.9"

Height: 290mm | 11.4"

WEIGHT

KX2.1: 14kg | 30.6lb

KX3.1: 18kg | 39.6lb

CAPACITY

KX2.1: 2100Wh

KX3.1: 3100Wh

POWER

Multiple voltage platform

Nominal voltage: 50.4V

Max voltage: 58V

Continuous current: 80A

Max current: 120A

3400mAh ultra-high longevity lithium-ion cells.

UBCO DUAL SAFETY SYSTEM

Active Safety:

UBCO battery management system.

Real-time performance and safety monitoring.

Passive Safety:

IP66-rated sealed alloy enclosure.

Vented enclosure with venting pathways.

3400 mAh high safety factor INR (LiNiMnCoO₂)

18650 lithium-ion cells.

Designed for disassembly at end of life.

CHARGING

10A alloy fast charger (sold separately)

4-6 hours charge time

Charger detect disables the bike when charging

COMMUNICATION

CAN bus communication integrated into the bike system.

