

Range Calculator

How to estimate real-world range for a CEMOTO bike, with the factors that matter and a planning method.

“ **Use the official tool:** CEMOTO provides an interactive **Electric Bike Range Simulator** that models range against real-world inputs. [Open the CEMOTO Range Simulator](#)

Published range figures

Model	Maximum range (manufacturer-stated)
D02 Classic	Up to 30 miles (48 km)
D03 Pro	Up to 34 miles (55 km)
D02 Track	Up to 50-60 miles (80-96 km)
D03 Beast	Up to 50 miles (80 km)

Test conditions

These figures are measured with:

- **70 kg rider**
- **25 °C ambient temperature**
- **20 km/h constant speed**

The owner manual states it plainly: "*Due to different test environments, the values of cruising range will vary greatly.*"

These are maximums, not guarantees — and they are not achievable simultaneously with top speed.

Energy content by model

Model	System	Energy
D02 Classic	48V × 21Ah	~1008 Wh
D03 Pro	48V × 23Ah	~1104 Wh
D02 Track	72V × 25Ah	~1800 Wh
D03 Beast	72V × 25Ah	~1800 Wh

Higher watt-hours means more range **potential**, but consumption varies enormously with how the bike is ridden.

Estimating your range: a planning method

Rather than a precise formula, use a **multiplier method**. Start from the published maximum and apply realistic adjustments.

Step 1 — Start with the published maximum

Use the figure for your model. This assumes a 70 kg rider, 25 °C, and 20 km/h on flat ground.

Step 2 — Apply your factors

Factor	If it applies to your ride	Approximate effect on range
Higher average speed	Riding at 40 mph instead of 20 km/h	Severe reduction — drag rises with the square of speed. Expect roughly half the range or less
Hilly terrain	Sustained climbing	Moderate to severe reduction, depending on gradient and length
Rider weight above ~70 kg	Each additional 10 kg	Small but consistent reduction
Heavy load / cargo	Carrying gear	Small reduction

Factor	If it applies to your ride	Approximate effect on range
Headwind	Exposed route, strong wind	Equivalent to a continuous climb
Cold weather	Below ~15 °C	See the temperature table below
Under-inflated tires	Below recommended pressure	Noticeable reduction — check pressure first when range drops
Aggressive riding	Frequent hard acceleration and braking	Moderate reduction
Higher power mode	Using a high gear / mode throughout	Moderate reduction
Trail surface	Loose sand, mud, gravel	Moderate to severe reduction versus hard-pack
Battery age	Pack more than a year old	Gradual reduction with capacity loss

Step 3 — Temperature correction

For a cold-weather estimate, multiply by the available-capacity figure:

Battery temperature	Approximate available capacity	Multiplier
14 °F (–10 °C)	~70 %	× 0.70
32 °F (0 °C)	~80 %	× 0.80
70 °F (21 °C)	~90–95 %	× 0.90–0.95

Step 4 — Build in a reserve

Plan to return with at least 30 % charge remaining. This:

- Protects the battery from deep discharge, which causes irreversible capacity loss
- Gives you margin for a wrong turn or a change of route
- Prevents the performance drop that occurs as the battery approaches empty (the manual notes the bike may not maintain consistent high speed when the battery is low)

Reserve multiplier: × 0.70 on your estimate.

Worked example

Ride: CEMOTO D03 Pro on a hilly trail in 10 °C weather, 85 kg rider with a 5 kg pack.

Step	Calculation	Result
Published maximum	—	34 miles
Average speed higher than test (moderate)	× 0.75	25.5 miles
Hilly terrain	× 0.80	20.4 miles
Rider + gear weight above test weight	× 0.95	19.4 miles
Cold weather (~50 °F / 10 °C, interpolate ~85 %)	× 0.85	16.5 miles
30 % reserve	× 0.70	~11.5 miles usable

So a rider planning this trip should treat roughly **11-12 miles** as the usable radius — significantly less than the headline 34 miles. **This is normal**, and it is why the simulator and this method exist.

Practical range-maximization tips

From the owner manual and general practice:

1. **Ride at medium speed.** The manual explicitly recommends driving at medium speed. Speed is by far the biggest variable.
2. **Avoid frequent braking, starting or heavy loading.**
3. **Reduce frequent uphill riding and riding against the wind** where routes allow.
4. **Maintain correct tire pressure.** Low pressure increases resistance and reduces range.
5. **Use pedal assistance on eBikes** when climbing or in windy conditions to save energy and extend battery life.
6. **Use a lower power mode** for range-focused rides.
7. **Charge before the ride**, not during — a full pack delivers better performance.

When range drops suddenly

A **sudden** drop is different from gradual seasonal or age-related decline. Check:

1. **Tire pressure** — the most common and cheapest cause
2. **Brake drag** — lift the wheel and spin it; it should rotate freely
3. **Battery charge acceptance** — is it actually reaching full charge?
4. **Parameter accuracy** — incorrect **P06** (wheel diameter) or **P07** (speed magnets) makes the odometer under-count, appearing as a range loss
5. **Ambient temperature** — compare against the table above

See [Range & Performance](#) for full diagnostics.

Related pages

- [Range & Performance](#)
 - [Battery Care & Charging](#)
 - [Tires, Wheels & Suspension](#)
 - [Display & Settings](#)
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