



# **evinci™ ELECTRIC BICYCLE USER MANUAL**

## **infinity HD-Series**



**PLEASE READ CAREFULLY**



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## Safety Instructions

Thank you for purchasing an **evinci** electric bike, designed by NZEBIKES. Your **infinity** mountain bike features the most recent innovation in technology and applies to the AS/NZ standard. For safety reasons, it is most important that you read this User Guide BEFORE you operate the bike. Improper handling can reduce its riding performance and most importantly, pose danger to your safety and health!

NZEBIKES is continuously updating and innovating this product. The printed manual may therefore not always include the latest updates. However, we shall make sure that our online manual will always be up to date on [evinci.nz/support](http://evinci.nz/support).

We want also encourage you to **register** your bike with your frame serial number. This allows us to help you finding your bike in case of theft, as we get contacted by the police when bikes are recovered.

Your frame serial number is stamped into frame at the bottom of the crank axle.



To register just go to our **evinci** website ([evinci.nz](http://evinci.nz)) and click on "Login" to create an account with your details. You may register up to two bikes within the same account.

## Symbols

Please pay particular attention to information next to one of the symbols shown below as it can be very important for your safety.



### WARNING

This symbol indicates that improper handling poses a risk to your health and safety



### ATTENTION

This indicates that improper handling could damage components and make void the warranty.



### NOTE

Points out to useful tips

## **Introduction**

You have decided in favour of a Pedelec (Pedal Electric Cycle) - a bicycle that is equipped with an electric hub drive motor to give you additional assistance when riding.

With this bicycle, you can make better progress in headwinds, when transporting heavy loads or on steep slopes.

You can select the level of power assistance required according to the weight of your load and/or the prevailing road conditions, the effectiveness of the power assistance depends on your pedal power and the level of assistance selected.

Before switching on the electric assistance system, please read the chapter "Charging the battery". The battery must be fully charged before you go for a ride the first time.

### ***Mode of operation and extent of electronic power assistance***

As soon as you turn on the electric assistance system and begin pedalling or pushing the throttle, electronic power assistance is available. Depending on the selected assistance level the motor will add a certain amount of power to assist you. The amount of support is also proportional to the force pushed into the pedals thanks to the torque sensor integrated into the crank axle.

An average rider can easily reach on flat tracks up to 80km out of the standard 13Ah battery.

### ***Levels of support***

There are currently five support levels:

1 = 20%, 2 = 40%, 3 = 60%, 4 = 80%, 5 = 100%

With higher support the motor will reach also a higher speed.

## **What comes with the bike?**

- 240V mains charger
- Manual

## **Optional accessories**

- Rear carrier: lightweight and sturdy alloy carrier suitable for pannier bags
- Mudguards
- PowerBuddy: a 12V direct charger. Allows charging your battery through your car or RV battery without an additional inverter.
- Powerful rechargeable LED front and rear lights

## Components



1	LCD Display	5	Battery Charge Port
2	Control Buttons	6	Battery Lock
3	Thumb-Throttle	7	Suspension Lock Out
4	Torque Sensor	8	Suspension Rebound Control

## Basic Safety Tips



Always pull the brakes and hold the handlebar firm and straight before taking off to make sure you stay in control of the bike when power assistance is in action! Also, keep in mind that the left-hand thumb-throttle is active when the bike is turned on.

## For your road safety

- Always wear a suitable bike helmet
- Wear bright clothing or reflective elements to be seen better by other road users
- Wear shoes with a non-slip sole
- Wear close-fitting clothing on your legs or wear trouser clips
- Wear bicycle gloves



Ref (1)

## How to use your charger

Your **infinity** comes with a 3Ah quick charger to charge your battery. Please do not use any other charger.

The typical time to charge an empty 13Ah battery is about 5 hours.



*If you want to charge your battery from a car or motor home (12V systems), NZEBIKES or your retailer can supply a special charger called PowerBuddy for this purpose.*

Before you use the charger the first time please read the following notes regarding safety carefully!



- To prevent any possible injury, this charger should only be used for the original lithium battery which is supplied together with the **infinity** e-bike
- Any other battery is not compatible and risks to explode while charging, causing serious injury to people as well as damage to other equipment
- Please make sure that the charger is always kept dry and does not get wet at any time.

Should there be an incidence of contact with water or any other liquid, make sure to unplug the charger immediately from the power socket and have it inspected by your dealer.

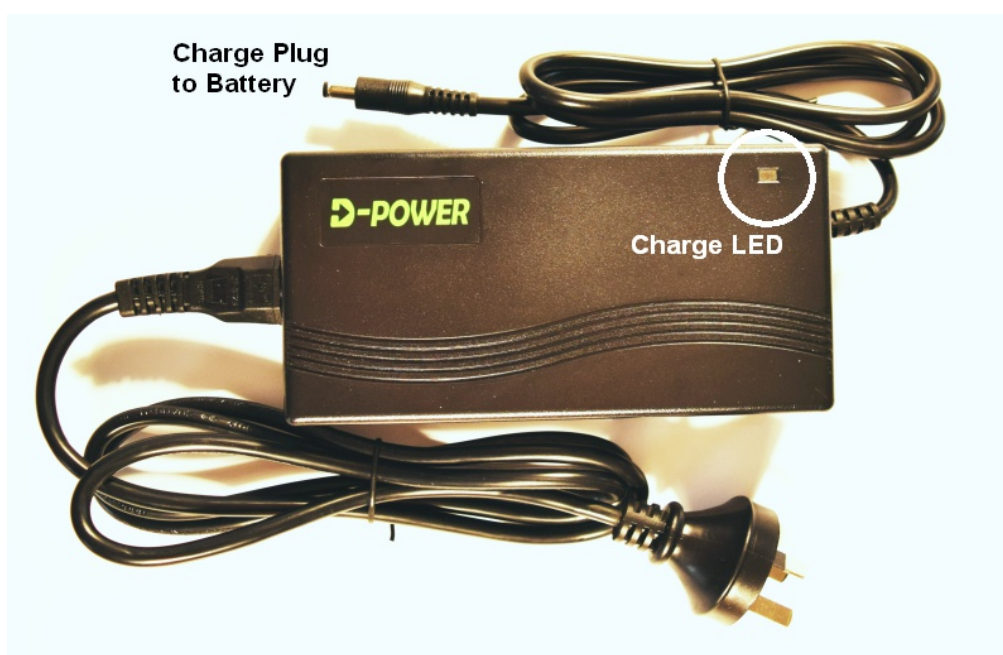
Please make sure the charger is always placed on a flat surface when in use. Also, make sure that the charger is always unplugged and removed from the

power socket when not in use.

Before using the charger, always make sure that the plug and the cables are not damaged.

Never connect a damaged cable or plug to the power socket. Never try to disassemble the charger. There are no serviceable parts in the charger.

Always unplug the charger before cleaning it. The charger should only be cleaned with a dry cloth. Never use a wet cloth, oil or any other liquid.



The charger LED (1) indicates the battery status:

LED	STATUS
green	the battery is not connected
red	the battery is charging
green	the battery is charged, the charger has switched off



*Before using your e-bike the first time, the battery has to be charged once overnight for at least 12 hours.*

## Safety notes concerning the battery



- Keep the battery out of reach for children
- Never try to open the battery. Apart from this being dangerous, all warranty will be void
- Remove the battery from the bike when transporting on an external bike rack
- Do not dip the battery in water or any other liquid
- Do not keep the battery close to heat or open fire
- A battery needs to be recycled after use, never throw it in an open fire as it could explode
- If the battery is damaged because it has been dropped or because of a biking accident, there might be a risk of an internal short-circuit. Immediately stop using a damaged battery.

To maximise the use of this battery, please consider the following:

The battery will not charge when exposed to temperatures below +0°C or above +60°C. It is therefore recommended to keep the battery at room temperature before charging it.

The charger operates with a microcomputer system with automated control functions. It automatically stops charging when the battery is full. It cannot be damaged by overcharging.

None the less, we strongly recommend to always disconnect the power plug from the wall socket after the battery is charged as power surges, i.e. lightning, through the grid can damage the charger or battery electronics!

When storing the battery for a longer time period, (>3 months, e.g. over winter) it is important to place it in a dry and cool place. Furthermore it is from advantage to have the battery only at about 80% charge. There is usually no need to recharge the battery.



*Li-Ion batteries have the chemical property to create small amounts of gas if stored for a longer time period with 100% charge. This will affect the capacity and life time. From a technical point of view it is therefore better to store Li-Ion batteries not fully charged.*

## Charging the battery



You may charge the battery on the bike or remove it to a more convenient place.

1. Open the plug cover at the right side of the battery (#5)
2. Connect charger cord to the battery
3. Connect the power cord to a mains socket



*The charger will get hot during charging – do not cover while in use as it might cause a malfunction.*

## How to remove and insert the battery

1. Removal: unlock the battery lock at the left side of the battery
2. Slide battery upwards and then lift it out of the rail
3. Insert: Slide the battery into the battery rail, secure it in the frame with the battery lock

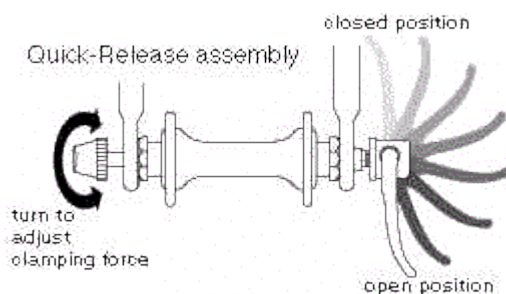
## Before starting to ride

### Mount or dismount front wheel

For easy transport, you may remove the front wheel using the quick release at the front wheel axle.

To remove the wheel flip the lever into the open position. Now hold the lever and turn the bolt on the other side about 8-9 times to loosen the axle – do not remove the bolt! You should be now able to lift the wheel out of the fork.

To mount the wheel repeat procedure the other way round. Guide the rotor in between the brake pads. Hold the lever pointing parallel to the fork in the open position (downwards), turn the bolt till you feel a slight resistance. Try to close the lever – if it is too hard to do so, loosen the bolt a bit and try again.



*Before every ride make sure the quick release is tightened properly. To fail so can lead to serious injuries!  
Never squeeze the brake lever without the wheel fitted!*

## Adjust seat height

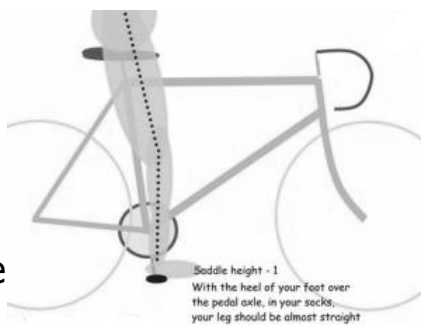
Open the quick-release lever at the seat clamp, adjust the seat height and close the lever firmly. If the lever is too loose, open the lever again and turn the adjusting nut clockwise until you feel resistance. Now close lever again. It should close with noticeable resistance.



*Never tighten the seat post if the maximum mark is visible, otherwise, you can injure yourself or damage the seat post.*

## How to find the correct saddle height?

1. Sit on the bike saddle
2. Try to reach pedal with your heel when it is in the bottom position. Your knee should be more or less fully straightened out
3. Place the ball of your foot on the centre of the pedal. If your knee is now slightly bent, the saddle height is correct



## Adjusting the saddle angle

Best riding comfort is found when the saddle is horizontal, some riders prefer a slight forward angled seat.



*Never angle a seat back as it can quickly lead to back pain or physical injuries*

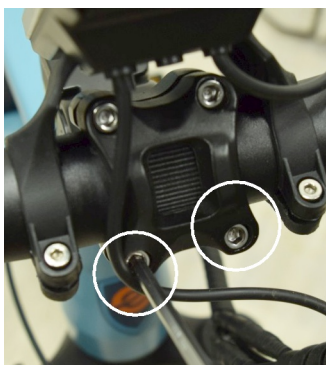
1. Loosen the clamping screw anti-clockwise
2. Tilt the saddle to the required angle
3. Tighten the clamping screw clockwise. Make sure that the screw is tightened firmly (20 NM)



## ***Adjust the stem and handlebar***

The angle of the stem can be adjusted by opening the 6mm Allen Key screw at the right side of the stem. Do

not remove the screw! There are two clamp plates, as soon as both are release you may adjust the angle. Re-tighten properly!

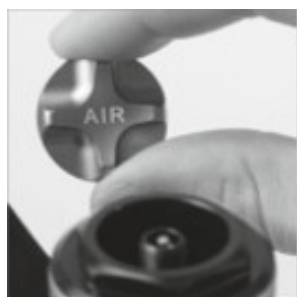


Adjust the tilt of the handlebar by opening two of the handlebar clamp screws (upper or lower, 5mm Allen Key).

## ***Check tire pressure***

It is very important to maintain the correct tire pressure. Too low pressure will decrease the range and can lead to rim or tire damages when riding over kerbs. The recommended tire pressure is 40 psi. For muddy undergrounds, the tire pressure can be reduced to improve traction.

## ***Suspension fork***



Your **infinity** mountain bike is equipped with a high-performance air suspension. This fork allows the rider to adjust the suspension to their riding style and terrain. The pressure of the air-cartridge can be adjusted on the left side by adding or releasing air pressure. A special pump is required for this purpose – your local dealer can help you with this. The pressure should be set according to the weight of the rider.

## ***Lock Out Lever***

The right side lever allows to lock the oil cartridge. If the lever is turned clockwise any fork movement will be prevented. When going uphill it is usually better to lock your fork to prevent fork pumping.



## ***Rebound Control***

A rebound control knob can be found at the bottom of the right fork leg. For slow and bumpy rides adjust to (+) for fast rides that need good brake control choose a faster rebound setting (-).



## Operation



- Turn on the e-bike electronics by pushing the (I) button for 2 sec
- Select the desired assistance level with the (+) or (-) keys. Start riding.
- Use the throttle as desired to add additional power to the selected assistance (the throttle does only add power according to the selected level, this is a safety measure)
- When finished riding press the (I) button for 2 sec to turn the system off (it will also turn off after 5 min when not used)

## Display Operation



### BATTERY STATUS

The display shows the battery level with 10 segments and the real voltage. If the battery reaches the red zone, the controller or battery might turn off when a higher load is applied, i.e. riding uphill.

### POWER DISPLAY

In the upper left area a bar segment display shows how much current the motor is drawing from the controller. This allows the rider to see how efficient he or she is riding, less bars means the battery capacity will last longer.

**KM/H:** Shows your current riding speed

**ASSIST LEVEL:** Your selected level of assistance. 0 = no support, 5 = max support

**MODE BUTTON:** Toggles the display information. Shows ODO, trip time, max speed, average speed and your trip distance.

**TRIP:** accumulates until manual reset. To manually reset push the (+) and (-) keys together for >2 sec.

**TIME:** The total trip time

**Walk assistance:** you can activate the motor to support you pushing the bike up a hill. Press and keep depressed the (-) button. After 2 seconds the motor will start with a maximum speed of 6kph.



*Walk assistance is not supposed to be used while riding the bike*

## Throttle

The left hand side thumb-throttle allows the rider to add power to the selected assistance level. This can be useful when starting or to give you an extra boost when riding up a hill.

## Gears



*Only change gears while pedalling otherwise the derailleur might get damaged*

If you have to change gears, i.e. to start in first gear, lift the rear wheel using the side stand and turn the crank while changing the gears.

As a rule of thumb gears on a bike are changed and used similar to a car with a manual gearbox.

You will start in 2<sup>nd</sup> gear, on a flat road you will choose gear 6 or 7 to pedal

along. Uphill go back to 3 or for steeper hills gear 1. If you ride faster or downhill choose higher gears.

The assistance level chosen on the display will assist you up to a certain speed. Choose the assistance level and gear according to your needs and riding style. Watch your crank revolutions, if you have the feeling you have to push too hard



at too low revolutions, change to a lower gear. If you pedal very fast with less effort, choose a higher gear or reduce the assistance level.



*When you intend to stop it is good practice to change the gear back to a lower gear so you may start without any problems. This can easily be done while braking and slowly pedalling as the motor will not push you further.*

## **Brakes**

We recommend always using both brakes at the same time – this allows the rider to take the best control over the braking process without stressing the front or rear brake. To brake efficiently, your front brake is there to stop you and the back brake is there to shave off speed. Roughly 70-80% of your stopping power comes from the front brake. Leaving 20-30% for the back brake.



*Please note that this bicycle uses high performance hydraulic brakes with no special motor cut-out. When going around narrow corners adjust the power support to prevent unexpected high acceleration.*

## **Maintenance**

Your **infinity** e-bike needs regular maintenance as any other normal pushbike. All bike shops can help you with these maintenance steps. There is no maintenance necessary of the electrical components.

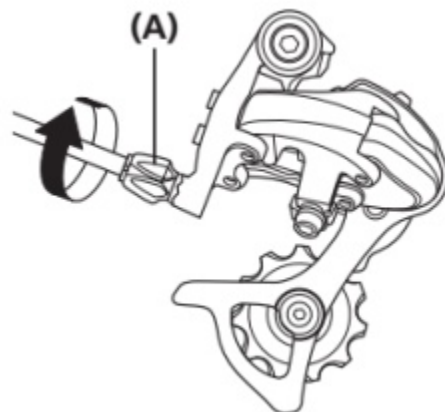
### **Brakes**

This bike uses high performance hydraulic brakes which are self-adjusting. If you feel that the brake force gets lower or you hear unusual noises then most likely the brake pads have to be replaced. Please see your local bike shop.

### **Gears**

Our **infinity** bike uses a solid and easy to maintain Shimano Deore gear system.

It can happen after a while that gears do not perfectly change anymore or you experience a rattling noise while pedalling. This is normal due to the nature of the used control wire hells which can get compressed over time. To re-adjust it is usually enough to slightly tighten the gear wire.



For the rear derailleur turn (A) anti-clockwise while turning the pedals till the rattle goes away.

## Safety points

We recommend a 12-month interval service or every 1000 km.

Important checkpoints are:

- Quick-release front axle
- headset
- stem clamp
- bottom bracket and crank screw
- rear wheel axles nuts
- seat post clamp
- brake caliper screws
- spoke tension



Spoke tension has to be checked on a regular interval. Failing can cause spoke breakage and will void the warranty

## Repairing a puncture

With the motor in the rear wheel, it is more complex to replace a tire or tube. In case of a puncture, we first recommended to check if the puncture can be repaired using a patch.

1. Lay bike on the left side side
2. Pull tire of rim
3. Identify the puncture in tube and check tire for any sharp objects to be removed
4. If the tube is still repairable apply a patch
5. Refit and pump up the tire

To remove the rear wheel, first, unplug the motor cable at the right side of the chain stay. When assembling make sure the arrows on the plugs are aligned and the plug is entirely plugged in. If you get Error 8 on the display, unplug and try again.

## Troubleshooting

Problem	Resolution
The Display is turned on, but the motor won't start (throttle or pedal-assist) The Display shows error code 8	<ol style="list-style-type: none"> <li>1. Check motor plug at rear stay. Unplug once and plug back in (Align arrows! Needs some force!)</li> <li>2. Take the bike to your retailer for further checks.</li> </ol>
The Battery is charged but the display won't turn on	<ol style="list-style-type: none"> <li>1. Check plug going from display to frame harness</li> <li>2. If possible measure voltage at the battery socket (left and right pin). If no voltage can be measured, take the battery to your retailer.</li> </ol>
The Charger is plugged in, but LED stays green	Try to use another charger, otherwise it might be a battery fuse fault, please take the battery to your retailer
The Display is turned on, but the motor won't start (throttle or pedal-assist) The Display shows error code 4	Check the throttle lever – it might be jammed or otherwise engaged.



# **Glossary**

## ***BMS***

BMS is an electronic circuit for battery monitoring. It increases a battery pack's safety by making sure that all cells are operated within the permitted voltage range only. When current is too high, the temperature is too high or one line of batteries inside the battery is outside the permitted voltage range the charge output will be switched off. This avoids the total discharge of the battery during normal operation. An integrated balancer ensures that any differences in voltage between single cells are equalised. In case of a problem with the charging device, the BMS makes sure that the battery cannot be overcharged. A capacity gauge may be included to display the remaining capacity.

## ***Controller***

The controller is the heart of any electric bicycle. It has the power electronics to drive the motor and a microprocessor. The controller processes all input signals coming from the different sensors and it talks to the display on the handlebar. The microprocessor runs the firmware, which is the piece of software telling the controller what to do. Firmware updates can be applied to improve or add functions.

## ***Display***

The display is usually mounted to the handlebar and allows the rider to readout vital information about the e-bike system and control the functions in the controller. There are different kinds of controllers with LED or LCD interfaces.

## ***Hall sensor***

Hall sensors are used in motors, cadence sensors, brake switches, and power throttles. Inside the motor, they determine the motor direction and submit it to the controller so the motor will turn in the right direction right at the start. Inside the PAS they detect if the magnet disc is rotating. Inside the power throttle, they measure how far the throttle is rotated. Hall sensor can be of the analogue or digital kind. Functional principle: When hall sensors are passing by a magnetic field they emit an initial voltage, which is proportional to the product of magnetic field strength and current (Hall Effect). They are named after their inventor Edwin Hall.

## ***Pedal Assist Sensor (PAS)***

In an electric bicycle, the PAS measures if the crank is moving in riding direction. This information will be passed on the controller which then activates the motor to support the rider. The PAS can distinguish between forwards and backward movements of the crank.

## ***Torque Sensor***

By measuring the amount of force the rider applies to the pedals the torque sensor signals without any delay to the controller how much support the motor has to add. This creates a very responsive but at the same time smooth riding experience. Torque sensors are mostly placed in the crank, with or without the motor. They are more expensive to build than PAS sensors.

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### **References**

Ref (1): Ministry of Health NZ, Website

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Notes:



NZEBIKES 2016 Ltd  
19 Esk Street  
Tauranga

[evinci.nz](http://evinci.nz)

Ph: 022 675 2699

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