

INTRODUCTION

Congratulations on your purchase of this BH EMOTION.

This user manual has been conceived to help you with the functions and maintenance of your pedal assisted BH EMOTION bicycle. We recommend that you read this manual in detail before your first use to make the most of your new BH EMOTION.

You will find complete and detailed information regarding all the electronic components of your bicycle in this manual. For consultations on conventional mechanical aspects, refer to the supplementary user manual attached.

Should you have any doubt after consulting this manual, please go to your closer BH dealer.

Enjoy your BH- **E^{ASY}motion**

GENERAL VIEW OF THE BH EMOTION



PEDAL ASSISTANCE SYSTEM

How does it work?

The BH EMOTION pedal assistance system comprises the following elements:

- A. A motor**, which drives the bike. The location of the motor describes the system of the e-bike:
 - o **FDS** (Front Drive System). Motor located in the front hub.
 - o **IBS** (Integrated Bottom bracket System). Motor integrated in the bottom bracket.
 - o **RDS** (Rear Drive System). Motor located in the rear hub.



FDS

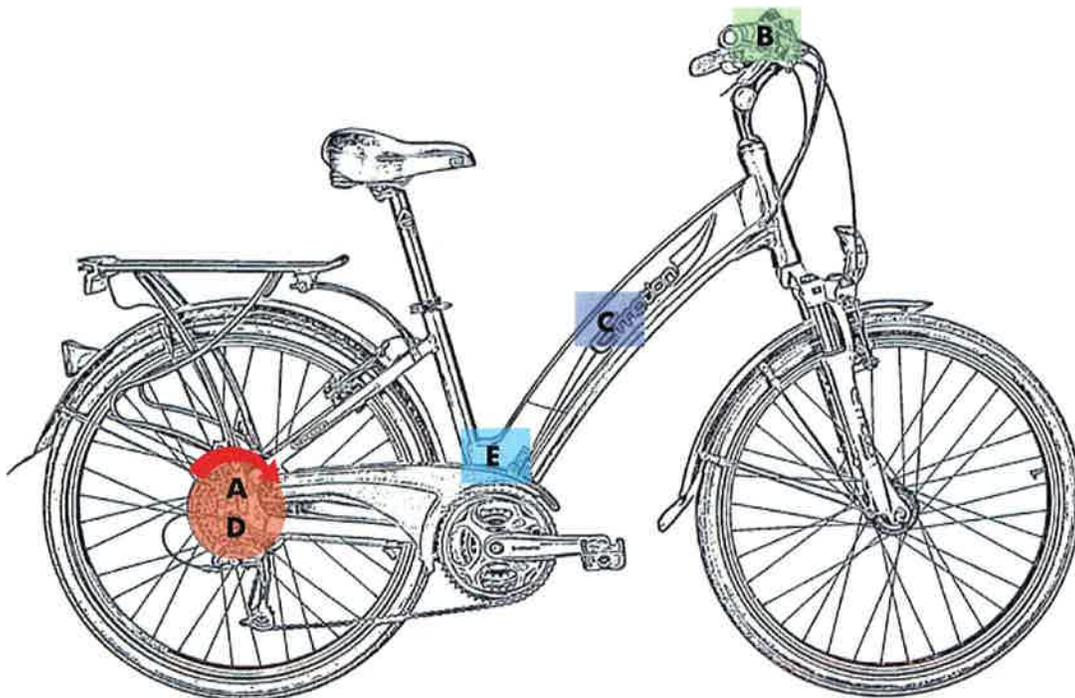


IBS



RDS

- B. A display panel**, which allows, amongst other things, the selection of assistance levels.
- C. A battery**, which provides power for the motor's operation. It can be located in different places.
- D. A torque sensor**, which reads the force applied on the pedal by the user.
- E. A control unit**, which performs as the system's brain by receiving and sending signals to other elements.



After the user starts the system by means of the display panel, the control unit activates all the system elements. From then onwards, the force applied on the pedal is read by the torque sensor, which sends a signal to the control unit. The control unit processes this signal and activates the motor, which is powered by the battery. This process is immediate, in such a way that the motor responds to the force applied to the pedals instantaneously. When the system is connected, the motor remains inactive if no force is applied.

Without pedal assistance

BH EMOTION may be used as a conventional bicycle. It comes equipped with a direct current electrical motor featuring Brushless technology. The magnetic type torque sensor also uses brushless technology. Therefore, pedalling without assistance is carried out with no additional resistance.

The BH EMOTION's use without pedal assistance was considered when its design was carried out and therefore, it has been manufactured with high quality lightweight materials and components. It is amongst the lightest bicycles in the market, weighing between 14,20 kg and 24.4 kg, including the motor and Ion-Lithium battery. The lack of friction in combination with its light weight provides a pleasant gliding sensation when pedalling.

Start pedalling

Before resting your feet on the pedals you must sit on the saddle and hold the handlebar firmly. Special attention must be paid if you start pedalling when using the mode that provides the most assistance (BOOST or SPORT Mode), as the motor will react with maximum drive and losing control is possible. For the purpose of easing acceleration, the motor offers an additional initial drive when starting to pedal. Therefore, the force needed to put the bicycle in motion is minimal, helping in a swift and safe entering into traffic.

 Start pedalling using a small development (large cogs) and a low assistance mode (ECO mode). In addition to providing greater control and safety on the bicycle, it requires less energy consumption and, therefore, provides higher autonomy. Starting with a greater assistance mode (Levels STANDARD, SPORT or BOOST), may suppose a safety risk for the user.

 EMOTION bicycles have been designed for urban use. A use for jumping or on mountain roads must be avoided.

DISPLAY PANEL

General View of Display Panel

The display panel of the pedal assistance system is on the left of the handlebar and it features the following functions:



1. SET button for starting or stopping the system and for switching the assistance levels.
2. (+) button for switching on or off the lights of the bicycle and the backlight of the display panel.
3. (-) button for selecting the information shown in the display panel.
4. Bicycle lights and display panel backlight indicator.
5. Bicycle instant speed indicator.
6. System error indicator.
7. Pedal assistance level indicator.
8. Battery level indicator.
9. Bicycle information indicator.
10. Assistance cut off indicator.

Display panel operation

1. Removable display panel

The user can make the display panel be removable or not, as easily as inserting or removing a M3 screw, as it is shown in the image below:



By default, the display panel will be removable. Following next steps, user can remove the display panel with no effort:

1. User will push the flap located in the down side of the display panel.
2. While pushing the flap, the user will slide the display panel towards upside.
3. The display panel will be removed from the bracket.



2. Start and stop of the pedal assistance system

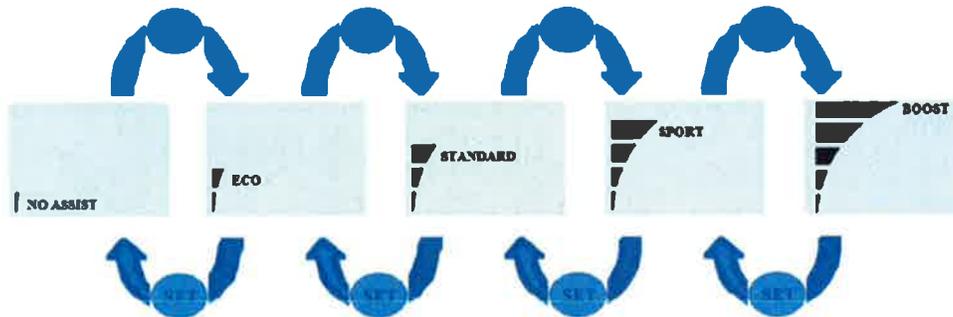
The pedal assistance system is activated or deactivated by pressing the SET button for 3 seconds. The bicycle can be used normally with no assistance like a conventional bicycle.



Wait for 2 seconds after switching on the system before start pedaling. During this 2 seconds, the system is starting the torque sensor.

3. Selection of pedal assistance level

The selection of pedal assistance has 5 levels (including the unassisted mode). To switch between assistance levels, the user will push the SET button as many times as it is necessary until the desired assistance level appears in the display panel, as shown in the next diagram.



By default, when starting the system, the assistance level will be the same level set before the system was last switched off.

In Eco mode, the energy supplied is minimal. It provides higher autonomy with a lower assistance ratio. In Boost mode, pedal assistance is maximum, with a ratio of 1:3 (user's force: motor force), and as a result the action ratio will be significantly reduced.

During a trip, a suitable selection of assistance modes considering the surface or pedalling conditions encountered will provide you an optimum ratio between battery economy and pedalling comfort.

4. Switch on and off the lights of the bicycle and the backlight of the display panel

The lights of the bicycle and the backlight of the display panel can be switched on and off by pushing the (+) button. At the moment of switching on the lights, next indicator will be shown in the display: 

5. Selection of display information

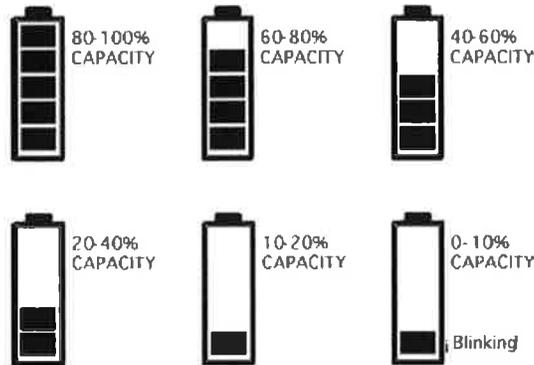
The display panel allows the user to see different information. The user may switch among the next options by pushing the (-) button:

- Total distance (km).
- Total time (hh:mm).
- Average Total Speed (km/h).
- Trip distance (km).
- Trip time (hh:mm).
- Average Trip Speed (km/h).

For resetting the trip information to zero, the user will push (-) button for 3 seconds.

6. Battery level indicator

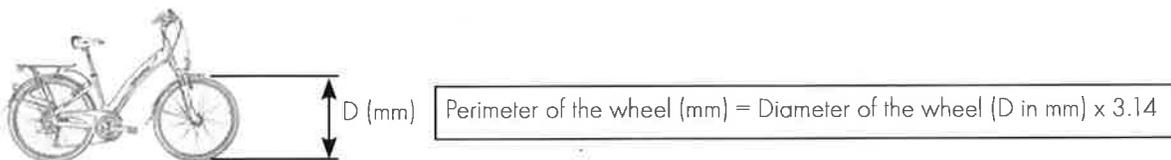
The battery level presents the following states:



7. Selection of the wheel measurement

At any moment, the user may change the size of the wheel by pressing at the same time (-) and (+) buttons for 1 second. As a result, the dimension of the wheel's perimeter shall be displayed on the console; the measurement is expressed in millimetres and its equivalency is displayed in inches (16, 20, 24, 26, 27 or 28). This dimension may be changed by pressing buttons (+) and (-).

The measurement method used on the wheel's perimeter is as follows:



8. Throttle function up to 6 km/h

The BH EMOTION system has an integrated throttle function included in the control console which limits speed to a maximum of 6 km/h, in accordance with the EN 15194 Regulation. To activate the system's throttle, the user shall press the (+) button for at least 3 seconds and provide the bicycle with small initial push. To cancel the throttle function the user shall stop pressing the (+) button.

9. Accelerator function up to 20 km/h (exclusive to the Neo Nitro model)

The Neo Nitro model will incorporate an accelerator, with a maximum speed of 20 km/h, on the right handlebar grip.

10. System error indicator

The BH EMOTION system continuously verifies its state. It is an intelligent system which is continuously checking the state of the different elements which comprise it.

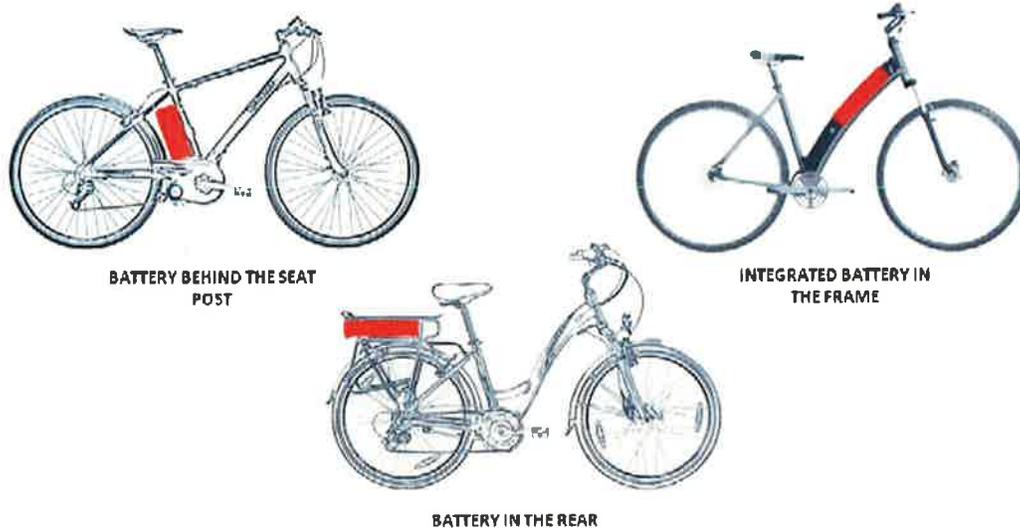
The system error indicator  is activated in the control console when a system failure occurs. When this happens, make sure that the battery is charged, stop the motor and start it again by pressing the POWER button, taking special precaution in not applying force on the pedal. If the problem persists, stop the motor and contact a BH dealer.

The table in page 35 describes possible operation errors.

BATTERY

Technology

The battery which comes equipped with your BH EMOTION is Ion-Lithium type and is the highest technology available regarding energy density (energy stored per kilogram of weight and per cm³ of volume). There are several different battery options depending on their location in the bicycle:



BH EMOTION batteries have different capacities, depending on the acquired version.



Use exclusively the battery model supplied by BH EMOTION.

An additional characteristic of BH EMOTION Ion-Lithium batteries is that they do not present "memory effect" and they are not affected by incomplete discharges. The BH EMOTION battery may be fully discharged (100%) approximately 500 times, with a maximum battery deterioration of 20%. In the event of partial discharges, only the discharged part is considered. For example, if we charge the battery each time the charge level is reduced in 25% we may charge the battery to its initial capacity of 100% up to 2,000 times.

In conclusion, the guaranteed durability of the battery with a maximum degradation of 20 % is 20,000 km.

Autonomy

The maximum distance which may be travelled with a fully charged battery depends on the assistance mode selected and the development used. A long development (small clog) demands more energy from the battery than a short development (large clog). Other factors which influence the duration of the battery are:

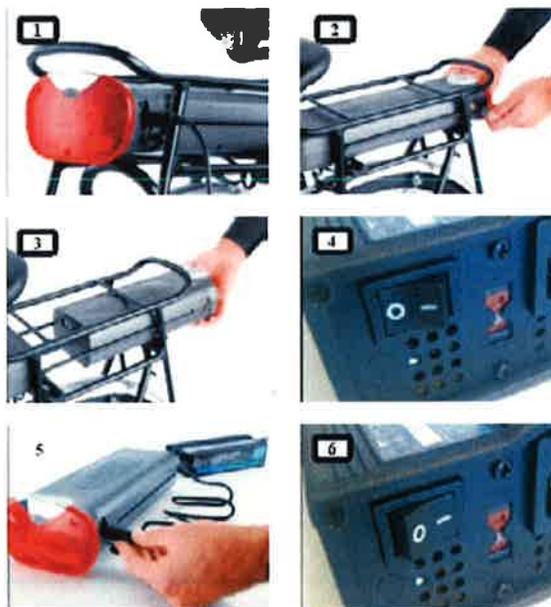
1. riding in sloped land
2. ambient temperature
3. brake friction
4. tire pressure and rolling resistance
5. wind direction
6. riding style, starting and stopping
7. weight of the rider

Charge of the battery

Due to its advanced Ion-Lithium technology, reaching a full discharge of the battery before connecting it to the charger is not necessary. Likewise, fully charging the battery to its 100% capacity before use is not necessary. But take into consideration that in order to obtain a maximum operation range a full charge is recommended.

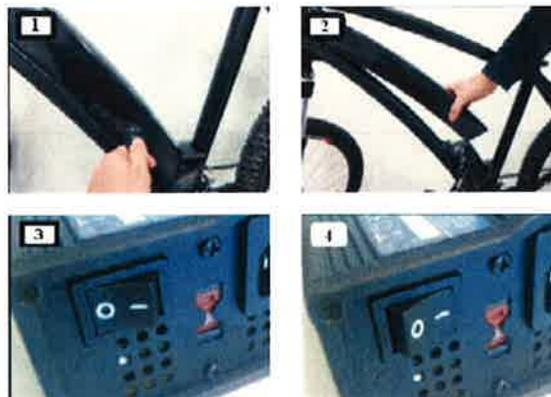
The following indications shall be carried out when charging the **battery in the rear carrier**:

1. The user may charge the battery by either removing it from beneath the luggage rack or directly without removing it from the rack. In the latter case, charging must be carried out with the pedal assistance system turned off.
2. The user shall open the battery's lock using the key provided.
3. The user shall carefully remove the battery from the rack.
4. The user must turn off the charger before proceeding the charging.
5. The user must connect the charger to the battery and to a common outlet which supplies 220 V.
6. The user must turn on the charger. A red LED (indicating that the charger is connected to the mains) and a yellow LED (indicating that the battery isn't fully charged) will light on the charger.
7. Once the yellow LED turns green, this means that the battery is fully charged to its 100% capacity.



The following indications shall be carried out when charging the **battery integrated in the frame**:

1. The user must open the lock located in the frame.
2. The user will turn and slide the battery out of the frame.
3. The user must turn off the charger before proceeding the charging.
4. The user must connect the charger to the battery and to a common outlet which supplies 220 V. The user must turn on the charger. A red LED (indicating that the charger is connected to the mains) and a yellow LED (indicating that the battery isn't fully charged) will light on the charger.
5. Once the yellow LED turns green, this means that the battery is fully charged to its 100% capacity.





Charging the battery shall always be carried out in a dry environment with temperature conditions between 5 and 40°C. Below 5°C, the charging time will be longer and over 40°C the battery may be damaged. Avoid charging the battery for long periods of time, such as over 48 hours, so as not to reduce its useful life.



Only use the charger provided with the battery. Do not place any object on the charger.



Charging the BH EMOTION battery at 70-80% is mandatory if not used or stored for a long time period. Additionally, control the level of the battery charger every 3 months and keep it always above 20% charge.



When battery is completely discharged, charge the battery within three days.

Checking the charge level of the battery in the rear carrier

The battery in the rear carrier includes a scale with 5 blue LEDs next to the rear light which indicate the charging state. By pressing the top button for a short time period, the LEDs will give you a precise reading of the current charge level. This information supplements the reading obtained from the control console.

- | | |
|--------------------|---|
| 1. 5 blue LEDs lit | Charge is between 80-100% of the capacity |
| 2. 4 blue LEDs lit | Charge is between 60-80% of the capacity |
| 3. 3 blue LEDs lit | Charge is between 40-60% of the capacity |
| 4. 2 blue LEDs lit | Charge is between 20-40% of the capacity |
| 5. 1 blue LED lit | Charge is between 10-20% of the capacity |
| 6. 0 blue LED lit | Charge is between 0-10% of the capacity |



Safety precautions

Please read and follow these instructions carefully in order to avoid accidents, or damaging the product or other properties.

1. Battery

- Do not throw the battery into fire.
- Do not use the battery with other devices.
- Use the specified charger provided with the battery.
- Do not disassemble or modify the battery.
- Do not connect (+) and (-) terminals by using metallic objects.
- Maintain the battery away from water. If an excess of water falls on the battery this may cause the battery to short-circuit and overheat.
- Do not place the battery under water.
- Keep out of animal and children's reach

2. Charger

- Do not disassemble or modify the charger.
- Do not use the charger with other batteries.
- Do not submit the charger to impact (i.e.: falls.)
- Do not place the charger under water.
- Do not cover the charger or place objects on top.

- Keep out of animal and children's reach.
- When unplugging the cable from the outlet, do not pull the cable, pull the plug. Always pull the charger's cable smoothly.
- Do not use outlets, connectors or other electrical systems with a different voltages than the standard.
- Do not use damaged components, such as the chargers casing, cable or pin; if the cable is damaged it must be replaced by the manufacturer or your distributor.

MOTOR

The motor meets the most strict quality requirements and is guaranteed for years of reliability. It is a direct current motor which is incorporated to the front wheel's bushing and is capable of developing 250 W (500 W in the Neo Nitro Model) with a tested energy efficiency higher than 80%. It is a very compact unit featuring a weight of only 2.5 kg. It operates without any friction thanks to its Brushless technology.

As any other part of your bicycle, the useful life of the motor depends on its use. In normal conditions, the motor may be useful for 10 or 20 years, or 100,000 km.

The motor emits a certain level of noise during its use. This is normal and it depends on the demand



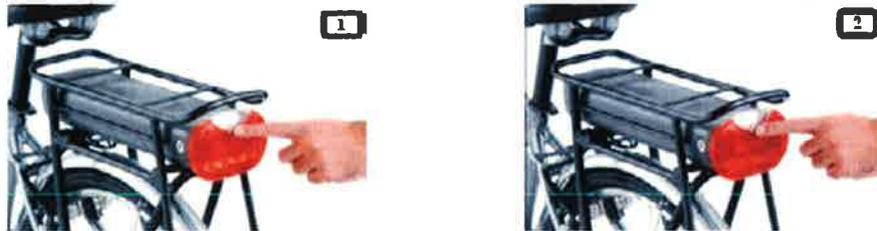
Usage when raining. Both the motor and the electrical connections are duly protected for a normal use under rain. However, the motor unit is not prepared for jet wash or immersion.

BASIC REPAIRS

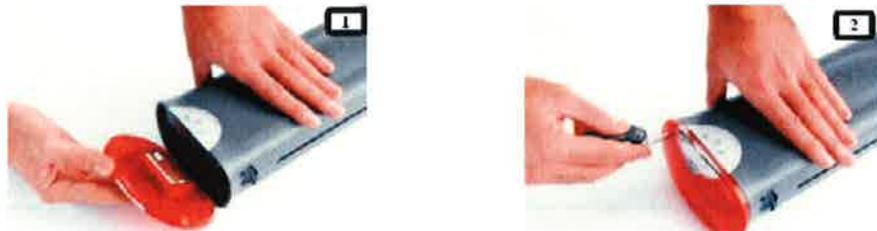
Rear light integrated in the battery in the rear carrier

Due to road safety, the energy used for the rear light is independent from the pedal assistance system. The rear light works with AA 1.5 V batteries.

The rear light switches on (1) and off (2) by pushing the button as illustrated below:



In order to replace rear light batteries, the user shall operate the battery away from the rack. Firstly, the user will unscrew the three screws which hold the rear light (1). This way the battery may be separated from the light and the batteries replaced by new ones (2)



Replacing the front wheel in FDS bicycles / Disconnecting the motor's cable

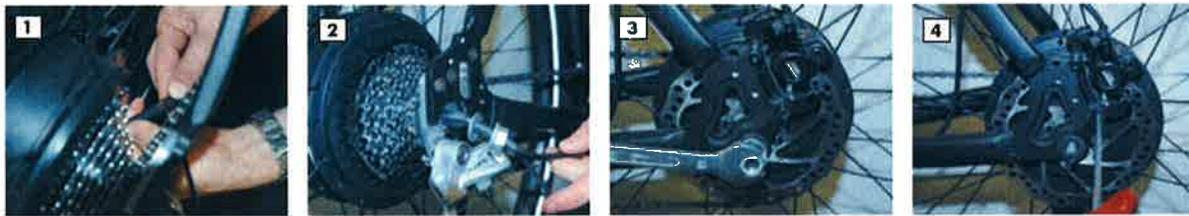
The motor is located at the front wheel's axis. When separating the front wheel, the user shall make sure to disconnect the motor's cable. For this purpose, the pedal assistance must be switched off.

The user shall unscrew the two screws that attach the protection casing to the fork (1). The user shall separate the cover from the protection casing (2) and disconnect the motor's connection to the pedal assistance system (3).



Replacement of the rear wheel with the RDS system / disconnection of the motor cable

To replace the back wheel you must disconnect the cable from the joint located behind the rear chainstay (1). Unscrew the nut and also remove the rear washer, taking care to leave the opening of the black tube facing downwards (2). Unscrew the nut on the left side (3), as well as the safety clamp, to be able to remove it (4). You can now take off the wheel, replace it with a new one, and then repeat the process in reverse.



WARRANTY PROGRAMME

Warranty

- In normal conditions of use, conservation and maintenance, BH offers a 2 year warranty for material and manufacturing defects in the entire bicycle and electrical components.
- Regarding batteries, the warranty is valid for 2 years from the delivery date.
- This warranty only applies to the main owner and in no case and under no circumstance are the rights given by the Warranty Programme transferable.
- Consult the Terms and Conditions of the Warranty in the warranty card which is provided separately with your BH EMOTION.

Exceptions

- The warranty does not apply to parts which are subject to wear and tear, such as tyres, chains, brakes, cables, chain rings, direction, crankset and sprockets, providing that they do not present material or assembly defects.
- The warranty shall be invalidated in the following cases:
 1. The bicycle has been damaged due to its use in competitions, jumps, descents, events or as a result of being exposed - or ridden - in extreme conditions or climate.
 2. The bicycle has been in an accident.
 3. The bicycle has been used in an unsuitable way or any other way which is uncommon considering the type of bicycle.
 4. The bicycle has not been repaired in accordance with the maintenance instructions manual.
 5. The bicycle has been repaired or maintenance has been carried out by a non-authorized BH distributor.
 6. Non-original bicycle parts have been assembled.
 7. The original owner has transferred the bicycle to a third party.

Liabilities

- BH assumes no responsibilities regarding damages to (parts of) the bicycle produced by an incorrect adjustment of mobile bicycle parts, the unsuitable use and/or maintenance of the bicycle (including a late replacement of parts subject to wear and tear).
- In the event that BH accepts a warranty claim, this does not imply, in any case, the acceptance of responsibilities due to the possible damages incurred. In the event of a dispute regarding damages suffered (subsequent), BH shall be exempt of any responsibility to that effect, as it is not legally bound to compensation.



Any non-authorized manipulation of the electrical system's components may be dangerous and shall be considered a reason for annulment of the warranty.

TECHNICAL SPECIFICATIONS

Motor	BH EMOTION with Continuous Current brushless
Power	250 W (500 W in the Neo Nitro model)
System voltage	36 V (48 V in the Neo Nitro model)
Battery	BH EMOTION Ion-Litio
Maximum assistance speed	25 km/h (45 km/h in the Neo Nitro model)

QUESTIONS AND ANSWERS

What is this bicycle's the maximum speed?

Depends on the user. There isn't a maximum limit. However, in speeds over 25 km/h, the pedal assistance is deactivated. This assistance limitation is a legal requirement for pedal assisted bicycles, according to the EN 15194 European Regulation. The Neo Nitro model is an exception and is classed as a motorcycle. The maximum assistance speed is limited to 45 km/h.

Isn't the BH EMOTION bicycle too heavy?

No, considering that the weight of BH EMOTION bicycles is between 16.75 kg and 24.40 kg, depending on different models, they are the lightest electrical bicycles in the market. The pedal assistance provides the BH EMOTION an additional weight of 5-6 kg when comparing a standard bicycle with the same characteristics, which is the sum of the battery and the motor.

Should I take any additional precautions when riding a BH EMOTION instead of a standard bicycle?

No, but we recommended paying special attention when starting the BH EMOTION due to the additional drive provided by the motor. In this sense, we recommend starting in Eco mode and using a short development (large cogs).

Should I stop every time I want to activate the pedal assistance?

No, the pedal assistance may be activated while riding the bicycle, although we do not recommend it due to the distraction it may produce. The only condition established for a correct activation of the assistance is to stop pedalling for two seconds after pressing the POWER button, thus allowing a correct activation of all the electrical system elements.

May I remain standing, stopped or on the bicycle when at traffic lights?

Yes. The motor will stay inactive providing that you don't apply pressure on the pedal. The greater force applied on the pedal, a greater forward drive shall be result from the bicycle. This is a result of the continuous reading that the magnetic torque sensor carries out on the force applied on the pedal.

How frequently should I take my bicycle to a BH store for maintenance?

None of the electrical components of the BH EMOTION pedal assistance system needs a periodic maintenance. The rest of components require a similar service than the components of a standard bicycle, which depends on the frequency of the bicycle's use and its care.

What happens if I puncture? May I repair it myself?

Despite incorporating the motor to the front bushing, repairing a tyre on your own is very simple. It only requires disconnecting the motor's output cable, as described in the user manual.

Must I charge the battery when not in use?

It's not necessary. The battery may be stored in a dry place or left on the BH EMOTION bicycle.

What should I do when I am not going to use the bicycle for a long period of time?

A charge equivalent to 70-80% of the full capacity is recommended before storing for a long time period. Likewise, its charge level shall be supervised every three months and shall be maintained above 20% of its full capacity.

Why when it's frosty or very cold the autonomy is reduced?

Below -5°C the battery's performance is lower. This factor doesn't result in any problems or a damaged battery, it just doesn't allow for a full discharge of the battery thus the autonomy is reduced.

May I purchase additional batteries?

Yes, additional batteries are available at BH stores. In the event that a higher autonomy is required or there isn't the possibility of charging the battery between two journeys, the purchase of an additional battery in accordance with the characteristics of the purchased BH EMOTION bicycle is recommended.

May I use my wife's bicycle battery?

Yes, providing that the battery is from a BH EMOTION bicycle which is compatible with the model you have purchased. If the battery is from a non-compatible electrical bicycle, you must not use it with the BH EMOTION. This would damage the assistance system beyond repair and would result in the annulment of the warranty.

May I make copies of the battery lock?

Yes, it is a standard flat key.

Must I use a helmet?

The use of helmets depends on the law of each country, however, its use is recommended due to safety reasons, apart from the Neo Nitro model.

Should I have a third party insurance?

No, insurance is not compulsory, apart from the Neo Nitro model.

Is there a required minimum age for using a BH EMOTION?

No, any user may ride a BH EMOTION, apart from the Neo Nitro model.

Description	Error	Observations
System overcurrent	01	Check that the connection between the motor and the controller is correct. If not, replace the controller.
System overcurrent	02	Replace the controller.
TMM Sensor	03	Check that the connection between the TMM sensor and the controller is correct. Check to see if the output of the TMM sensor exceeds the normal range, it must be 0.1V-3.5V.
Motor error	04	Check the motor or controller connector.
Motor sensor error	05	Check that the connection between the motor and the controller is correct. If the sensor inside the motor is broken, replace the sensor or motor with a new one. Check that the connection between the motor cable and the controller is correct. If not, replace the controller.
Battery low	08	Check the battery level or replace it with a new one.
Motor blocked	09	Motor stopped due to accident. Motor off.
System overcurrent	10	If there is a bad contact bad between the controller and the motor connector, replace it with a new one.
Overheating	11	If the temperature exceeds the set value, the current gradually weakens.
Protection against overheating	12	Enters into temperature protection mode, and the controller stops.
Communication error	13	Check the cable and the connector.
Pedal error	14	Take your foot off the pedal and switch on again.
Sensor error	15	Readjust the sensor.

