LEADER FOX

Electric Bicycle Operating Instructions

Under the law, the dealer is obliged to attach the LEADER FOX Electric Bicycle Operating Instructions to every product

E – BIKE POWER RIDE

Lovelo

Introduction

Dear users,

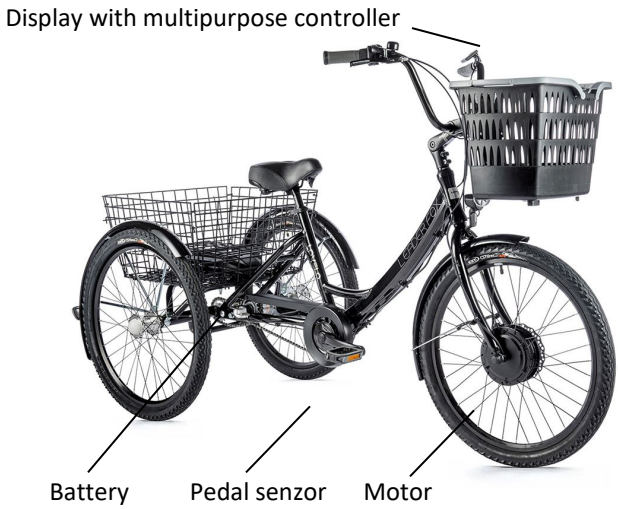
Please read carefully all the information regarding your E-LF product to ensure optimal functioning of your e-bike. The following text containing a comprehensive description will provide you with information on all aspects and details (including installation, setting up and general use of the display) regarding the use of our display. This instruction document will also help you solve potential problems and failures.

What is an electric bicycle?

Electric bicycle is a conventional bicycle with an electric drive added to assist the rider. The motor function is actuated by pedalling, which is scanned by a special sensor installed in the pedal hub. Therefore, you have to keep pedalling on an e-bike, the motor is there only to help you. You can set an electric bicycle in motion also using a control button or an accelerator but only up to the maximum permitted speed of 6 KMPH (e.g. for walk assistance). The maximum speed of an e-bike with motor assistance is 25 KMPH, with a 10% tolerance (when this speed limit is reached, the motor switches off and you need to pedal just like with a regular bicycle). When your battery runs out of power or your motor is off, you can ride your electric bicycle as a conventional bike, without any resistance at all.

From the point of view of the Road Traffic Act, an electric bicycle whose features conform to European standard EN 15194-1 is regarded as a regular bicycle, i.e. you can ride on bike trails, do not need a driver's license and a helmet is mandatory only up to 18 years of age.

Description



Factors influencing the electric bicycle range

1. Rolling resistance of the tyres. Leader Fox e-bikes are fittet with tyres with low rolling resistance and increased resistance to puncture. It is also important that the tyres are inflated properly. Therefor, if the tyres of your electric bicycle are underinflated, the range will decrease.

2. Weight of the electric bicycle. The lower weight of the electric bicycle, the greater the range.

3. Battery status. It depends on whether the battery was fully charged before your trip. It is also to be expected that the higher the number of discharge cycles the battery has undergone, the smaller capacity it has.

4. Profile and surface of the track. The higher the elevation difference and the steeper hills you negotiate and the worse surface, the shorter the range.

5. Riding mode. It depends on which of the three riding modes you have set.

6. Continuity of riding. The more braking and acceleration, the shorter the range.

7. Air resistance. For example, it depends on whether we ride a bicycle with low frame and sitting upright or whether we ride sporty bicycle with seat set to the same height as the handlebars.

8. Wind strength. The stronger the wind we have beck, the longer the range and vice versa.

9. Weight of the rider and load. The greater the weight, the shorter the range.

10. External temperature. The lower the temperature, the less battery capacity can be used while riding.

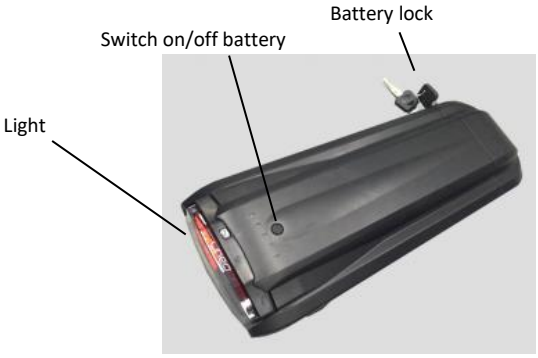
Battery

Riding safety:

While riding, pay only as much attention to the bicycle settings and display as not to jeopardize your safety.
Before riding, check that wheels have been securely fitted in the frame and fork, since their incorrect installation can cause serious injury.
When riding the electric bicycle, you should be fully familiar with its behaviour and control, otherwise it could result in serious injury.
If you ride in poor visibility conditions or at night, use the lights.

Battery:

DO NOT use the battery with other devices.
DO NOT dismantle or modify the battery.
DO NOT connect positive and negative poles of the battery with a metal object.
DO NOT immerse the battery in water.
DO NOT throw battery into fire.



Charging set

Description

Battery charging and maintenance:

Charge the battery in a dry enviroment to avoid short-circuit damage.
Charge the battery to at least 60% of the capacity once every 3 months even when the bicycle is not used.
Do not cover the battery or the charger.
Do not leave the battery constantly connected to the power source.
Do not use the battery for other appliances. It has been made specifically for this model.
Do not disassemble or modify the battery pack.
Do not throw the battery into fire or expose it to extreme temperatures.
Recharging time from zero to 100% is 1-7 hours.

Drive warranty:

The warranty applies to those drive parts that are not sensitive to improper handling (pack, electronics, charger, etc.); such parts are covered by a 24-month warranty.
The warranty does not apply to chemical parts of the battery and to capacity reduction due to normal use (39% after the expiry of two years); those parts are covered by a 12-month warranty.

Charging:

The battery is the most expensive part of an electric bicycle; therefore, pay increased attention during handling, charging and storage. The battery is sensitive to precise charging. Therefore, it is necessary to charge Li-Ion rechargeable batteries using only a charger supplied by us. Connect the charger to 220-240 V power outlet. 5A protected circuit is sufficient. The charger will automatically suspend charging when full capacity of all cells is reached.

We recommend discharging the battery in full after each ride to ensure that your battery will be up to its full capacity for your next ride. Charging the battery may last 1 to 5 hours depending on the condition of the battery cells. Charge it exclusively in covered dry areas (moisture and dripping water can damage the charger) at a temperature of 5 to 40°C.

The charging process is indicated by a red glowing LED. It will turn green when the battery is charged and the charging process is complete. The battery contains a charge-monitoring indicator (when the charge indicator button is pressed, the light indicator will come on). Always switch off the battery when finished riding the bike.

Normal battery behaviour:

If the motor stops running smoothly and switches to intermittent operation, it could be a sign of low battery capacity. In that case switch off the electric drive system and continue without motor assistance, as if riding a conventional bicycle.

Battery warming is normal and does not indicate any defect. The battery is protected by a temperature sensor and switches off automatically in case of excessive overheating. Wait until the battery cools down to its normal operating temperature and then ride on.

If you feel your total battery capacity has dropped, it could be caused by charging or operation in suboptimal climatic conditions. Carry out 3 full charging cycles. Fully discharge the battery while riding and then charge to its full capacity at room temperature.

If the charge indicator shows that the battery is discharged, there is still a minimum voltage level in it which protects it against damage but is not enough to power the electric bicycle. Recharge the battery as soon as possible. Never leave the battery fully discharged, it could results in its damage.

Proper care of the battery prolongs its life.

1 Product Name

1.1 The Middle install intelligent LCD Display

1.2 Model: APT13LCD450U

2 Suppliers

2.1 Tianjin APT Science and Technology Co., Ltd.

2.2 Email : yzhao@aptdevelop.com apt@aptdevelop.com

3 Electrical Parameters

- ✧ 24V/36V battery supply
- ✧ Rated operating current : 10mA
- ✧ Max operating current : 30mA
- ✧ Off leakage current < 1uA
- ✧ Max output current to controller : 50mA
- ✧ Operating temperature : -20～70℃
- ✧ Storage temperature : -30～70℃

4 Dimensions & Material

4.1 Product shell is ABS, transparent window is made with high strength Acrylic, the stiffness equals the tempered glass.

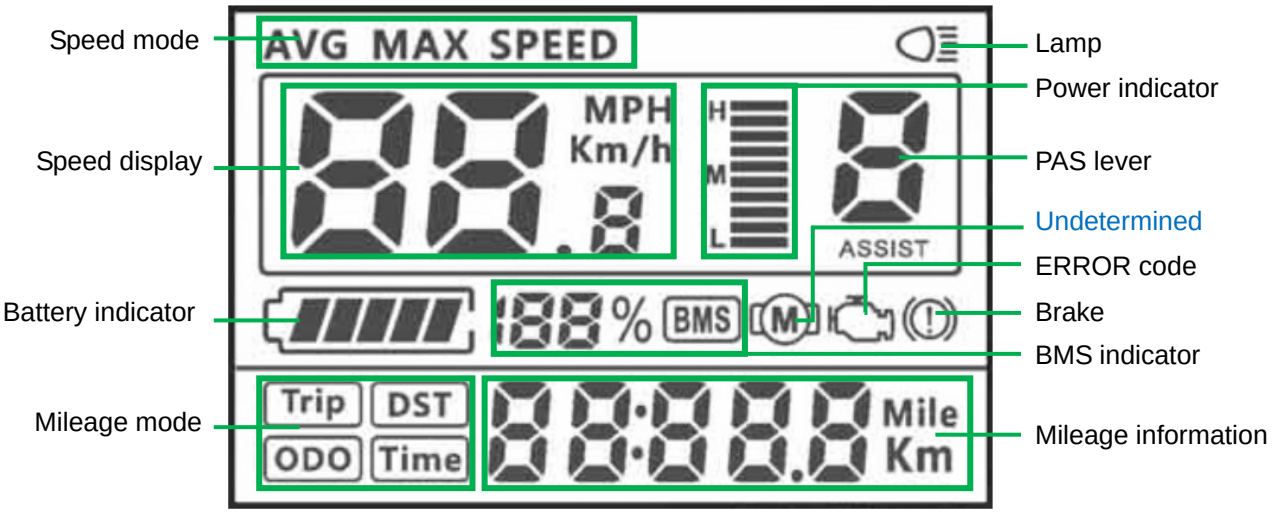
4.2 Dimensions : host/L78mm*W46.8mm*H12.7mm

5 Features

- ✧ Serial communications.
- ✧ **Speed display :** AVG SPEED, MAX SPEED, SPEED(Real-time).
- ✧ **Kilometer / Mile :** Can be set according to customers' habits.
- ✧ **Smart battery indicator :** Provide a reliable battery indicator, it will not fluctuate with the motor on/off.
- ✧ **BMS support:** BMS indicator, battery percentage, indicating the mileage indicator (need access to BMS information system support)
- ✧ **Power indicator :** Real-time battery power indication
- ✧ **The brightness of the backlight adjustable :** 5-sections
- ✧ **9-level PAS :** 3-PAS/5-PAS/6-PAS/9-PAS... optional
- ✧ **Mileage indicator :** Odometer/Trip distance/ Riding time
- ✧ **Error code indicator**
- ✧ **Parameter settings :** Multiple parameter can be set through computer USB port, including PAS level / Wheel diameter / Voltage / Speed limit…

6 LCD instructions

The figure of LCD display see below:



7 Functional Description

7.1 Power On/Off

Press and hold Power button for 1.5 second can turn on/off the display. The Display can automatically shut down when there is no operate & ride for X minutes（X could be 0~9）.

7.2 PAS operating

Short press UP/DOWN button can change the PAS level. Top PAS level is 9, 0 for neutral. Level quantities can be adjusted according to the customer requirements.

PAS operating

7.3 Speed mode switch& Mileage mode switch

Short press POWER button can change the speed mode& the mileage mode, **Speed**->**AVG Speed**->**MAX Speed**->Trip->ODO-> Time>Power.

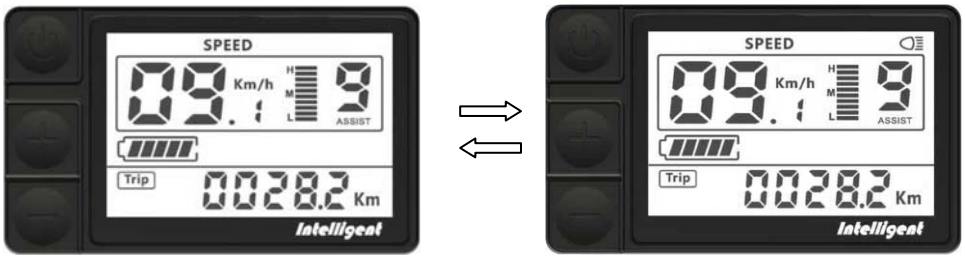
Speed mode switch& Mileage mode switch

***If there is no operation for 5 seconds, display will return Speed (Real-Time) display automatically.**

7.4 Headlight/backlight On/Off

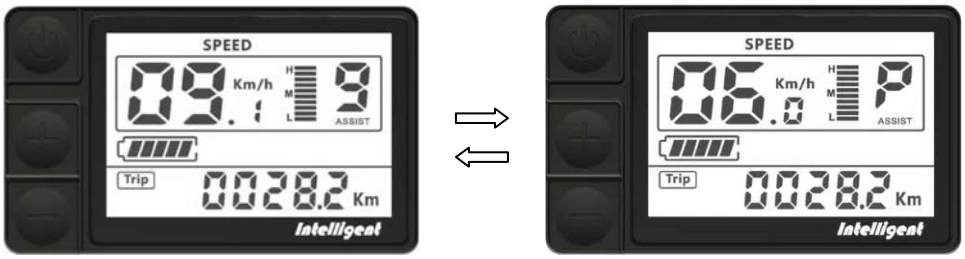
Press and hold UP button for 1 second can turn on/off the headlight/backlight.

The motor does not work when the battery voltage is low, Display still can keep the headlight on for a while when E-bike is in riding.



7.5 6km walk

Press and hold DOWN button for 2 seconds can get into walk mode, out of the mode when release the button.



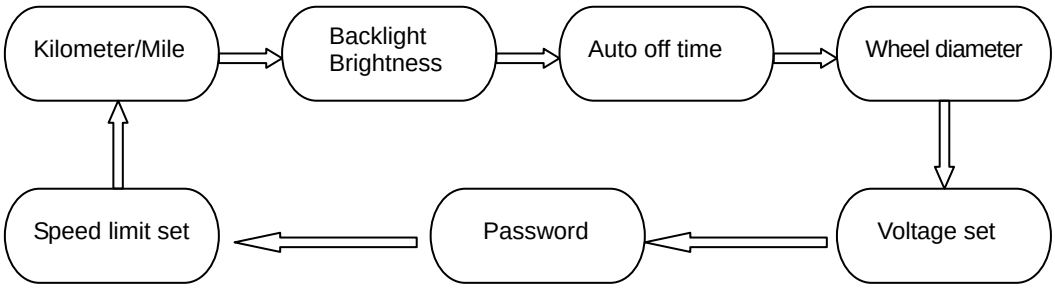
7.6 Data cleanup

Press and hold UP & DOWN buttons together for 1 second can reset several temporary data, temporary data include **AVG Speed / MAX Speed / Trip / Time**.

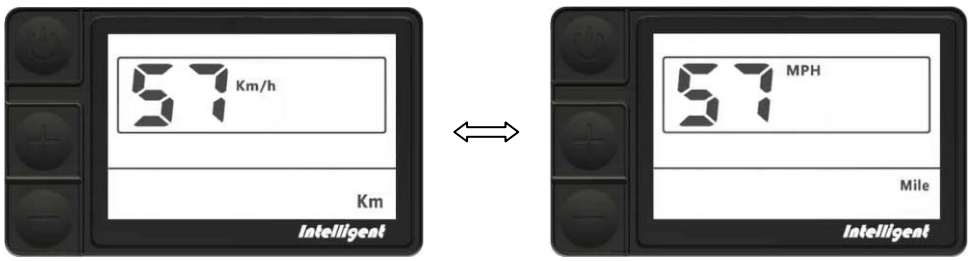
8 Parameter setting

Double press POWER button(press interval less than 0.3 second) can get into parameter setting state, the parameter twinkles. Short press UP/DOWN buttons to change the parameter value, short press POWER button can switch to the next parameter. Double press POWER button(press interval less than 0.3 second) can quit from the parameter setting state. The display will automatically quit the parameter setting state when there is no operation for 10 seconds.

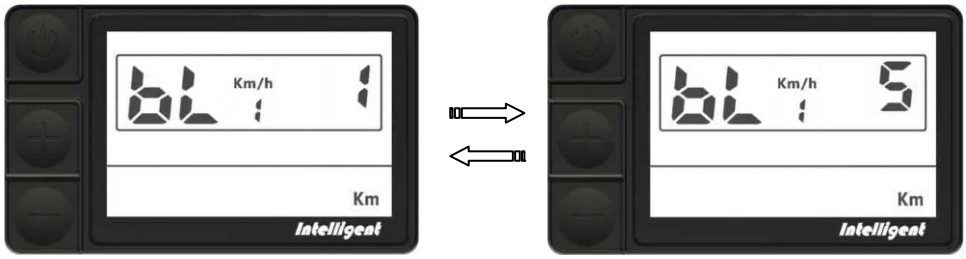
The order of parameters is as follows.



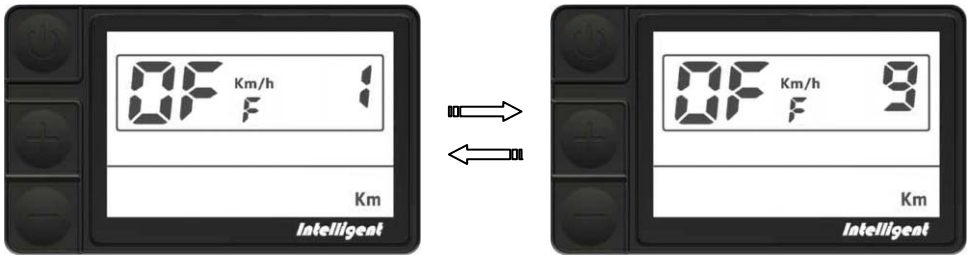
8.1 Kilometer / Mile : The location of speed displays symbol S7, press UP/DOWN button rotate display the symbol **km/h / MPH** (**Km** / **Mile**)



8.2 .**Backlight brightness** : The location of speed displays symbol **bL1**, press UP/DOWN button display symbol **1~5** to change the brightness of the backlight.



8.3 Auto off time : The location of speed displays symbol **OFF**, press UP/DOWN button to change the value from**1** to **9**, the number represent delay time (minutes) before display shutdown automatically, default value is 5 minutes.

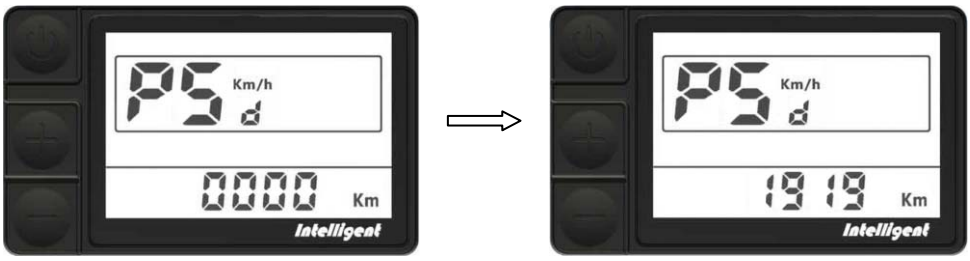


8.4 Wheel diameter : The location of speed displays symbol **Wd**, press UP/DOWN button rotate display the symbol **16/18/20/22/24/26/700C/28/29**, value represents the diameter of the wheel (inch). Wrong value for wheel diameter will cause speed&mileage abnormal.

8.5 .**Voltage set** : The location of speed displays symbol **bU0**, press UP/DOWN button rotate display the symbol **24V/36V/UbE, UbE** means user-defined voltage setting, this parameter can be set through computer.

8.6 Password/Speed limit set : The location of speeds displays symbol **PSd**, require to input passwords, press UP/DOWN buttons to change the password value (0~9),

short press POWER button to switch the password item, password is 4 digits, the default password is "**1919**". Press POWER button when password adjustment is completed. Display will return to the **Voltage set** item if the password is incorrect. Correct password will enter the **Speed limit set** item.



8.7 Speed limit set : The location of speed displays symbol **SPL**, the location of mileage displays speed limit value, the default value is **25km/h**. Press UP/DOWN buttons to modify the value, the value can be set from 10 to 45km/h. Press POWER button to confirm when you finish the adjustment.

The maximum speed is restrict by the motor and controller, probably couldn't reach the setting value.

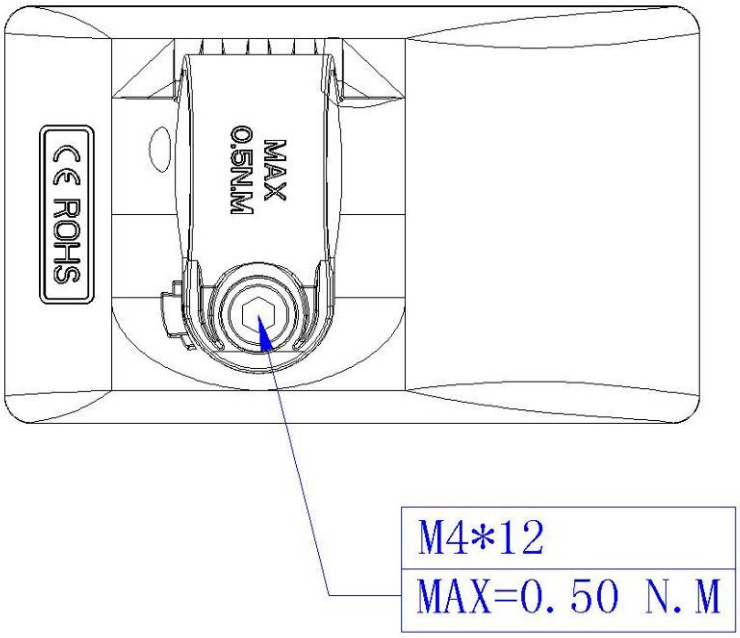
9 Error Code define

450U meter can give warning message when E-bike exist error, LCD display icon and the error code in speed position, error code is from 01 E~FF E, the definition see the table below.

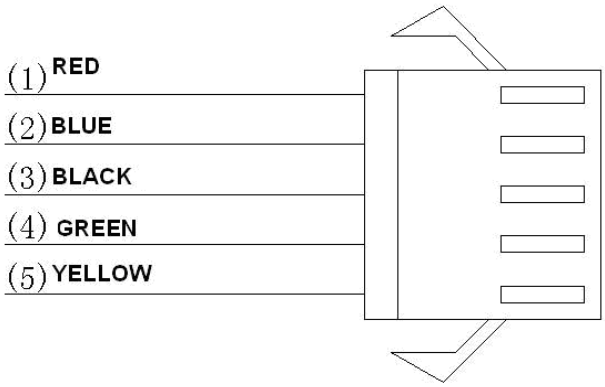
Error Code	Error description	Handle
01	Communication Error	Check the cable connection
02	Controller protection	Check three-phase power line.
03	three-phase power error	Check three-phase power line connection
04	Battery low	Charge the battery
05	Brake error	Check the brake connection.
06	Throttle error	Check turn to connect.
07	Hall error	Check the hall connection
08-99	Reserved	Please contact the manufacturer for error definitions

10 Assembly instructions

Please pay attention to the screw's torque value, damaged caused by excessive torque is not within the scope of the warranty.



11 Output wire instructions



1、 Red wire : Anode(24v/36v)
2、 Blue wire : Power cord to the controller
3、 Black wire : GND
4、 Green wire : RxD (controller -> display)
5、 Yellow wire : TxD (display -> controller)

12 PAS level instructions

PAS level can be customized, the highest level is 9, common used PAS level see the table below:

3 level	5 level	9 level	
0		0	No power assist
	1	1	
		2	
1	2	3	
		4	
	3	5	
2		6	
	4	7	
		8	
3	5	9	

13 Certification

CE / IP65 (water proof) / ROHS.

Maintenance

Regular maintenance:

- maintain all components of the electric bicycle clean

- use only the recommended and tested cleaning materials

- regularly lubricate the chain with suitable oils

- in winter, clean the electric bicycle after each ride and pay increased attention to removing salt from battery contacts and other connectors

- while handling the electric bicycle, make sure the cables of the electric system are not damaged. Damaged cables pose a risk of electricshock

- regularly check all connections for correct tightening and brakes for correct function. Check also individual parts of the electric bicycle for damage. For example: cracks on the frame, fork, handlebars, stem, damage to cables, damage to battery pack, etc.

Battery transport:

Battery transport is subject to the requirements of regulations on dangerous goods. Private users may transport undamaged batteries on roads without having to conform to other conditions.

In case of transport by commercial users or by third parties it is necessary to comply with special packaging and marking requirements (e.g. ADR regulations)

Batteries should only be sent if the battery pack is undamaged. Plug loose contacts and pack the battery to prevent its movement in the packaging. Notify the forwarding service that the transport concerns dangerous goods.

Battery storage:

Store the battery in a dry and well-ventilated place, out of reach of direct sunlight and other heat sources. In case of cold storage it is necessary to let the battery warm up to normal room temperature (20°C) before putting into operation.

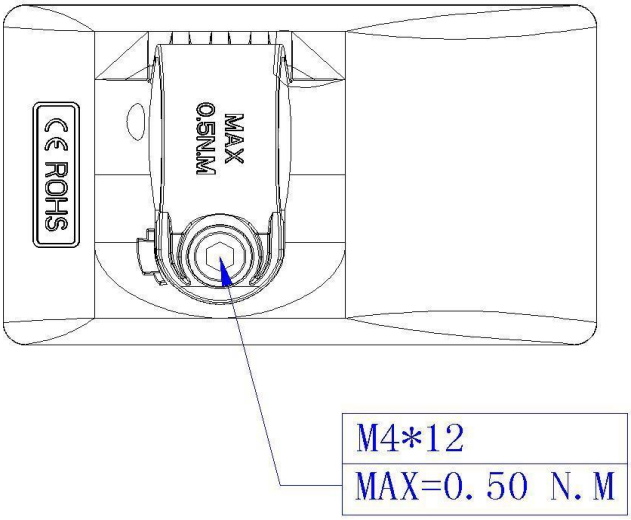
Never leave the battery fully discharged. It could result in its permanentdamage. For long-term storage keep the battery fully charged. However, do not store it while permanently connected to the charger or installed in the electric bicycle.

Li-Ion batteries are fully recyclable. After expiry of the battery life you can returnit at any collection point or your dealer.

If you use an e-bike in hard conditions (long-term use of the maximum assistance), for longer ride at higher temperatures (30 ° C or above), in direct sunlight or when the battery is partially discharged and a combination of these situations is it possible that bike will automaticly swith off. This is a fuse protecting the control unit against burning. We recommend stop the ride and let the bike (control unit) cool down little bit. This is not a defect.

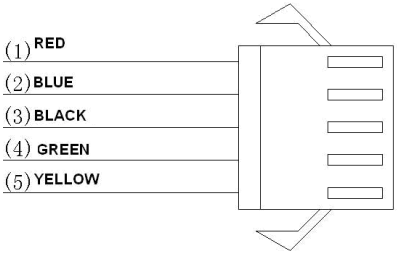
Assembly and disassembly

Display assembly:
Please pay attention to the tightening torque of the screws. Before assembly and during disassembly of the display, it is necessary to remove the grip and if needed also to remove the brake lever, gear lever and display from the handlebar. Damage caused by excessive tightening or incorrect assembly/disassembly is not covered by the warranty.



Output Wiring Connection:

1 - Red conductor: Positive pole (24V/36V)
2 - Blue conductor: Supply cable to the controller
3 - Black conductor: GND (earthing)
4 - Green conductor: RxD (from the controller to the display)
5 - Yellow conductor: TxD (from the display to the controller)



Possible problems and their solutions

In case of system failure perform its diagnostics or contact your dealer.

The control LCD display is not on:

- always make sure the battery is charged
- check whether the battery is inserted correctly, whether the battery switch is on
- check the connections of the control unit and the display

The motor does not start when the walk assistance button is pressed

- check the connection of the motor cable (at the motor and the control unit)
- check the connections of the control unit and the display

The motor does not start when rotating the pedal cranks (pedalling)

- check the connection of the pedalling sensor to the control unit
- check the distance between the pedalling sensor and the magnet disk (max. 4 mm)
- check whether the disk is firmly attached to the central axle and does not spin freely
- in case of use of compact-type pedalling sensor

Electric set warranty

When there is a problem with the electric bicycle, it can show error messages. LCD display will show the icon and an error code will be displayed on the speed display. Error codes are marked from 01 E~FF E; see their meaning in the table below.

Error code	Description	Solution
1	Communication error	Check the cable connection
2	Regulator protection	Check the three-phase electric line
3	Three-phase supply error	Check the three-phase conncetion
4	Low battery	Charge the battery
5	Brake error	Check the brake connection
6	Turn error	Check the turn connection
7	Hall probe error	Check the hall probe connection

Assembly and disassembly of the wheel with the engine

For transportation and maintenance (replacing the tire tube) it may sometimes be necessary to disassemble the wheel with the engine.

First, pull lightly to disconnect the engine connector (about 20 cm from the engine entry).

Then loosen the brake (if it is used) and change the gear to the smallest wheel.

Remove the rubber covers from the wheel nuts.

Loosen the engine nut using a spanner and remove the wheel from the fork.

For assembly, reverse the order of these steps.

To connect the connector properly, the arrows on the connector must face each other.

Switch the drive unit on and test it.

During wheel assembly, pay attention to the proper position of the central axis of the wheel nave facing down. The cable must enter the engine from below. Otherwise, water could get into the engine on the cable and the engine could be damaged.

Warning

Complaint procedure:

Submit any complaints concerning the electric set or the battery to your dealer.
When filing a complaint, submit a proof of purchase and a warranty certificate with the registered serial number of the battery and indicate the reason for the complaint and a description of the defect.

Warranty conditions:

24 months for electric bicycle components – applies to manufacturing and material defects beyond normal wear and tear caused by use.
12 months for battery life – the nominal battery capacity does not drop below 70% of the total capacity over 12 months from the sale of the electric bicycle.

Warranty conditions:

The electric set must be used exclusively for the purposes it is intended for.
The electric set must be used, stored and maintained in accordance with these Operating Instructions.

A warranty claim shall expire:

If it is found out that the damage to the product is due to the user's fault (accident, inexpert handling beyond the framework of these Operating Instructions, tampering with the structure of the electric bicycle or connection of the electric system, improper storage, etc.).
Expiry of the warranty period.

The warranty only applies to the first owner

Upozornění

If you do not understand any of the points in these Operating Instructions, please contact the dealer for explanation. Please read the whole manual!

Do not lend the e-bike to persons not briefed in its use and operation. Complaints resulting from improper handling will not be accepted.

The LF Energy electric bicycle is not intended for use by children under 15 years of age. Likewise, the electric bicycle cannot be used by persons unable to pedal or handle it independently. The manufacturer is not to be held responsible for any potential injuries or damage to the bicycle!

Ideal weather conditions for using an electric bicycle are dry days, when the outdoor temperature is above 10°C. When used at lower temperatures, the battery discharges faster due to physical phenomena. Using the electric bicycle at temperatures below 0°C is not recommended.

Do not expose the bicycle to direct sunlight as it is fitted with a protective temperature sensor for the electric motor.

Never submerge the battery, the charger and other electric components in water or another liquid.

Never wash the electric bicycle in a pressure washer (WAP) and always remove the battery before washing.

It is forbidden to tamper with the connections of the electric motor, the control unit and the battery. Violating this section may result in the warranty not being acknowledged or in irreversible damage to the electric bicycle.

DO NOT USE chargers and components other than the ones included with the electric bicycle.

We cannot be held responsible for damage caused by use of other non-approved goods.

LEADER FOX

Enjoy many pleasant and safe kilometres on your new electric bicycle.

Your Leader Fox Team

Czech brand of electric bicycles.
BOHEMIA BIKE

Address
Na Pankráci 1724
14000 Praha 4 - Pankrác

Development, design and manufacturing
Okružní 697
České Budějovice 37001

Phone: 388 314 885
Email: info@leaderfox.cz