

# **LEADER FOX**



## **Instructions for use of the e-bike**

The seller is legally obliged to include the instruction manual for the LEADER FOX electric bicycle with each product.



**E – BIKE** POWER RIDE

**Cody**



# Foreword

Dear users,

To ensure the optimal functioning of your e-bike, please read the E-LF product information carefully before using it. By means of a conscientious description, we inform you in the following text about all details (including device installation, settings and normal use of the display) related to the use of our display. This manual will also help you to resolve any uncertainties and faults.

## What is an e-bike?

An electric bicycle is a classic bicycle with an electric drive to assist in riding. The motor function is activated by pedalling, which is sensed by a special sensor located in the pedalling centre. So you have to pedal all the time on the electric bike, the motor only helps you. You can also set the e-bike in motion using the control button or the accelerator, but only up to the maximum permitted speed, i.e. 6 km/h (e.g. for walking assistance). The maximum speed of a motor-assisted e-bike is 25 km/h with a tolerance of 10 % (when you reach this speed, the motor switches off and you continue pedalling as on a normal bicycle). When the battery runs out or the motor is switched off, you can ride the e-bike like a normal bicycle without any resistance.

An electric bicycle that complies with the European standard EN 15194-1 is treated as a normal bicycle in terms of road traffic law, i.e. you can ride on cycle paths, you do not need a driving licence and a helmet is only compulsory up to the age of 18.

## Description



## Electric bike range factors

1. The range of an e-bike cannot be accurately determined because it is influenced by many factors.
2. **Tyre rolling resistance.** LEADER FOX electric bikes use tyres with low rolling resistance and increased puncture resistance. It is also important that the tyres are properly inflated. So if you have under-inflated tyres on your e-bike, for example, your range will be reduced.
3. **Weight of the electric bike.** The lower the weight of the e-bike, the more range it has.
4. **Battery status.** It depends on whether the battery was fully charged before the ride. You should also take into account that the higher the number of discharge cycles the battery has had, the lower its capacity. Profile and surface of the route. The higher the elevation, the worse the surface and the steeper the hills, the shorter the range.
6. **Driving mode.** It depends on which of the driving modes you have set when driving.

**7. Air resistance.** It depends if you are riding a low-frame bike in an upright position or if you are riding a sportier bike and have the saddle set at the same height as the handlebars.

**7. Wind strength.** The stronger the wind at our backs, the longer the range and vice versa.

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

**9. External temperature** The lower the temperature, the lower the battery capacity.

# Safety recommendations

## Batteries:

Do not throw the battery into the fire. Do not use the battery with other devices. Do not disassemble or modify the battery.

Do not connect the positive and negative poles of the battery with a metal object. Do not immerse the battery in water.

## The charger:

Do not disassemble or modify the charger Do not use to charge other batteries. Avoid impact and contact with water. Do not touch the charger with wet hands. Keep the charger out of reach of children and pets.

Do not cover the charger or place other things on top of it.

When disconnecting the charger, do not pull the cable but the plug. Do not use the charger if it is obviously damaged.





# Batteries

## Battery charging and maintenance:

Charge the battery in a dry environment to prevent damage from short circuits.

Charge the battery at least once every 3 months, even when the bike is not in use, to at least 60 % capacity. Do not cover the battery or the charger.

Do not leave the battery connected to electricity at all times.

Do not use the battery for other appliances. It is made specifically for this model. Do not disassemble or modify the battery case.

Do not throw into fire or expose to extreme temperatures. The time to charge the battery from zero to 100 % is 1-5 hours.

## Warranty for the drive:

The warranty covers those parts of the drive that are not susceptible to rough handling (packaging, electronics, charger, etc.), these parts are covered by a 24-month warranty.

The warranty does not cover the chemical parts of the battery and the reduction in capacity caused by normal use (39 % after a period of two years), these parts are covered by a warranty of 12 months.

## Charging:

The battery is the most expensive part of an electric bike, so pay extra attention when handling, charging and storing it. The battery is sensitive to accurate charging, so for Li-ion batteries it is necessary to use only the charger we supply. Plug the charger into a 220/240 V mains supply, a 5 A fused circuit is sufficient. The charger itself will stop charging when all cells have reached full capacity.

We recommend that you always fully charge the battery after each journey to ensure that you always have a full battery capacity for your next journey. Charging the battery can take from 1 to 5 hours depending on the state of the battery cells.

It should be carried out in a covered, dry area (moisture and water can damage the charger) at a temperature of 5 to 40°C.

The charging process is indicated by a red LED on the charger. When the battery is charged and the charging process is complete, it will light up green. The battery contains a charge indicator light (the charge indicator light comes on when the charge indicator button is pressed).

Switch off the battery after riding.

## Normal battery behaviour:

If the engine stops running smoothly and starts running "jerkily", the battery may be too low. In this case, switch off the electric drive system and continue without motor assistance as on a normal bicycle.

Battery overheating is a common occurrence and is not a fault. The battery is protected by a temperature sensor and will automatically switch off in the event of excessive overheating. Wait for the battery to cool down to normal operating temperature and continue riding.

If you feel that the overall battery capacity has dropped, this could be due to charging or operation in non-ideal weather conditions. Perform 3 full recharge cycles. Fully discharge the battery by driving and

then recharge to full capacity at room temperature.

If the status indicator shows that the battery is discharged, there is still a minimum voltage in the battery to protect it from damage, but it is not sufficient to power the e-bike. Recharge the battery as soon as possible. Never leave the battery completely discharged, as it could be damaged.

If the battery has been switched on for 30 minutes and the bike is not in use, it will switch off automatically.

**Proper care of the battery extends its life.**

# LCD display

## Product Name:

Middle install intelligent LCD Display

## Supplier:

Tianjin APT Science and Technology Co., Ltd.

## Electrical parameters:

24 V/36 V battery power supply

Rated operating current 10 mA Leakage current at shutdown <1 uA

Display Specifications 1.3 "OLED (64\*128dots)

UART protocol

Maximum output current to controller 50Ma

Operating temperature - 20~70 °C

Storage temperature - 30 ~ 70 °C

## LCD display material and description:

The product housing is made of ABS (acrylonitrile butadiene styrene) material, the transparent part is made of high strength acrylic with the rigidity of tempered glass.

Can be used down to -20°C.



**Description of OLED Displays:**

Kilometers/miles. Can be set according to customer preferences.

Speed display: AVG SPEED, MAX SPEED, SPEED (real time).

Smart Battery Indicator: provides a reliable battery indicator, will not fluctuate.

With engine on/off.

BMS support.

(need access to BMS information system support).

Backlight brightness setting: 5 sections.

9step PAS: 3-PAS/5-PAS/6-PAS/9-PAS... optional.

Odometer: odometer/distance travelled/driving time

Error code display

Parameter setting: multiple parameters can be set via the USB port of the computer, including PAS level / wheel diameter / voltage / speed limit...

**Maximum range:**

Maximum range is calculated with a fully charged battery, on flat terrain and with a slight headwind. Average range is calculated with ideal mode switching and slightly hilly terrain.

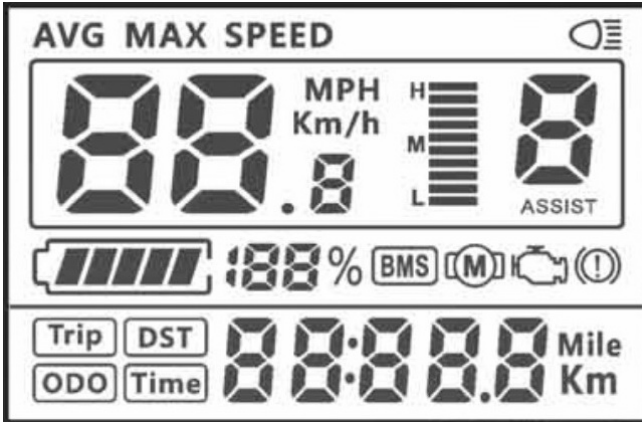
# Assembly and disassembly



## **Mounting the display:**

Please pay attention to the tightening torque of the screws. Before mounting or removing the display or controller, it is necessary to remove the grip, brake and shift lever, if applicable, and remove the display from the handlebars. Damage caused by excessive tightening torque or improper assembly/disassembly is not covered by warranty.

# Controls



## Power on/off

Press and hold the power button for 1.5 seconds to turn the display on/off. The display can automatically turn off when not operated and run for X minutes (X could be 0~9) .

## 7.2 PAS control

You can change the PAS level by short pressing the UP/DOWN button. The highest PAS level is 9, 0 for Neutral. The number of levels can be set according to customer's requirements.



Speed mode switch and mileage mode switch:

Press the POWER button briefly to change the speed mode and the mileage mode,

Speed-> AVG speed->MAX speed-> Trip-> ODO-> Time-> Power.



Speed mode switch and mileage mode switch

\*If no operation is performed for 5 seconds, the display returns to the speed display (real time). Automatically.

7.4 Switching the headlights/backlight on/off

Press and hold the UP button for 1 second to switch the headlight/backlight on/off.

The engine does not run when the battery voltage is low, the display can still keep the headlight on for when the e-bike is in motion.



#### 7.5 6 km walk

Press and hold the DOWN button for 2 seconds to enter walking mode, exit the mode when the button is released.

#### Data cleaning

Press and hold the UP and DOWN buttons for 1 second to reset several temporary data.

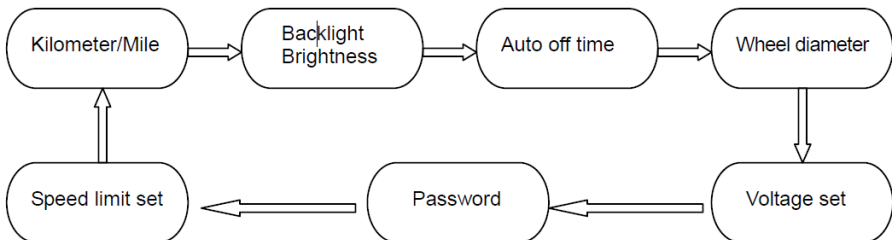
Temporary data includes AVG Speed / MAX Speed / Trip / Time.

#### 8 Parameter settings

By pressing the POWER button twice (press interval less than 0.3 seconds), you can enter the parameter to the setting status, the parameter flashes. Press the UP/DOWN buttons briefly to change the parameter. parameter value, short press POWER button to switch to the next parameter. By pressing the POWER button twice (the press interval is less than 0.3 seconds), you can switch from parameter mode.

From the parameter setting state. The display automatically exits the parameter setting state when none is available for 10 seconds.

The order of the parameters is as follows.



Kilometre/mile: the speed position is shown by the S7 symbol, press the UP/DOWN button. Rotate the button to display the km/h / MPH (Km / Mile) symbol.



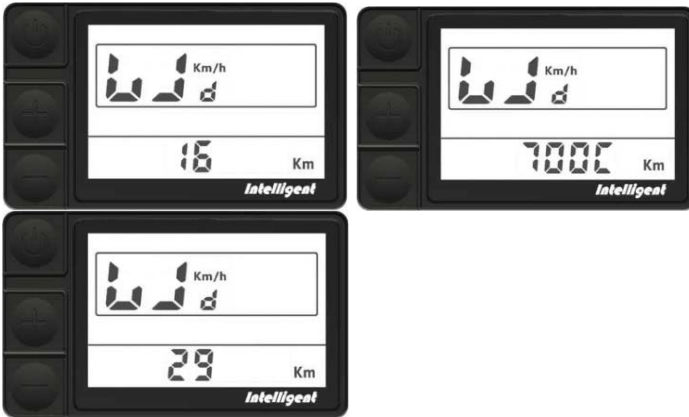
Backlight brightness: bL1 speed display symbol location, press. UP/DOWN button will display 1~5 symbol to change the backlight brightness.



Auto Off Time: The speed location is displayed by the OFF symbol, press the UP/DOWN button. To change the value from 1 to 9, the number represents the delay time (in minutes). Before the display automatically shuts off, the default value is 5 minutes.



Wheel diameter: The speed location is shown by the Wd symbol, press the UP/DOWN button. Turn the button to display the symbol 16/18/20/22/24/26/700 C/28/29, the value represents wheel diameter (in inches). A wrong wheel diameter value will cause the speed and mileage to be abnormal.



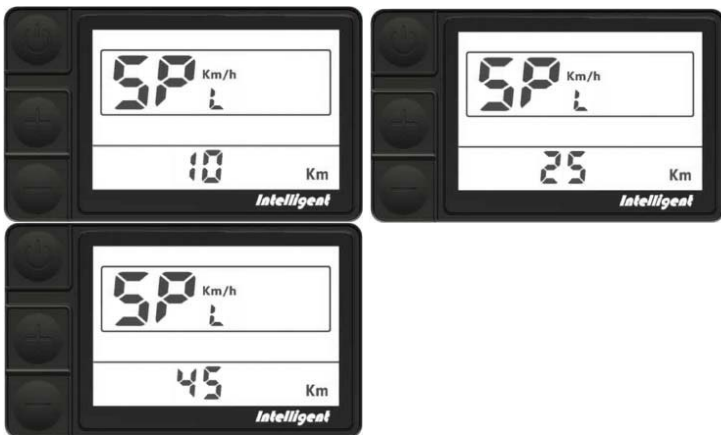
Voltage setting: the speed location is shown by the bUO symbol, press the UP/DOWN button. Rotate to display the 24 V/36 V/UbE symbol, UbE means user defined voltage setting, this parameter can be set via the computer.



Password/speed limit setting: speed location is shown by the PSd symbol, required to enter the password, press UP/DOWN buttons to change the password value (0~9), short press POWER button to toggle the password entry, the password is four digits. The default password is "1919". Press the POWER button when the password setting is complete. If the password is incorrect, the display will return to the Voltage Setting item. The correct password enters the speed limit setting item.



Setting the speed limit: Location of the SPL speed symbol, location of the kilometers displays the speed limit value, default value is 25 km/h. Press the UP/DOWN button to change the value, the value can be set between 10 and 45 km/h. Press the POWER button to confirm when the setting is complete.



The maximum speed is limited by the motor and controller, probably could not reach the setting value.

### Define error code

The 450U meter can issue a warning message when there is an E-bike error, LCD icon and speed position error code, the error code is from 01 E~FF E, see the table for definition. below.

### Error code Error description Handle

- 01 Communication error Check cable connection
- 02 Control unit protection Check the three-phase power line.
- 03 Three-phase power supply error Check the three-phase power line connection.
- 04 Low battery Charge battery
- 05 Brake fault Check the brake connection.
- 06 Throttle valve fault Check rotation for connection.
- 07 Hall error Check hall connection.
- 08-99 Reserved Consult manufacturer for error definitions.

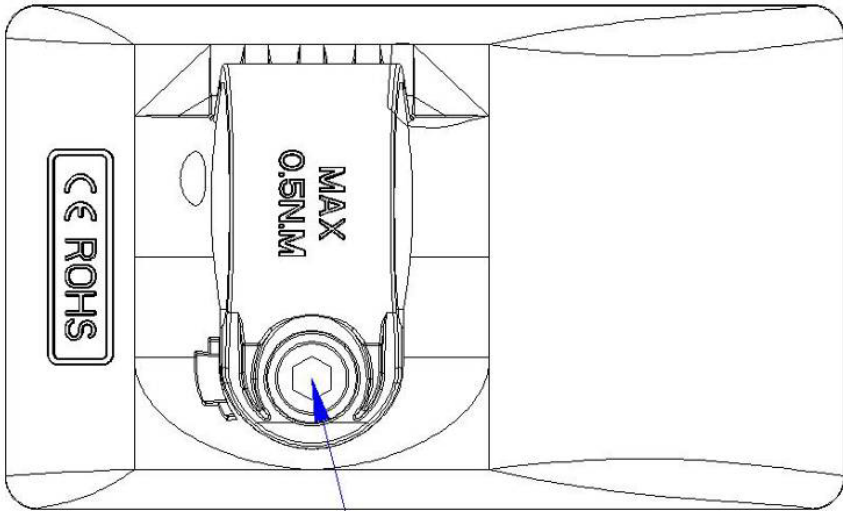


### Installation instructions

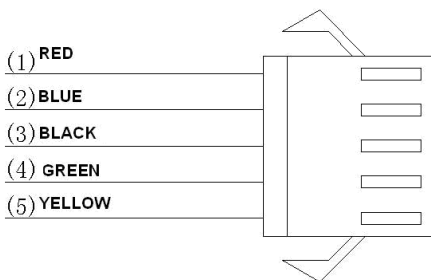
Pay attention to the bolt tightening torque value, damage caused by excessive tightening torque.

### Output wire instructions

### Output wire instructions



M4\*12  
MAX=0.50 N.M



- 1、 Red wire: anode (24v/36v)
- 2、 Blue wire: power cable to the controller
- 3、 Black wire: GND
- 4、 Green wire: Rx D (controller -> display)
- 5、 Yellow wire: Tx D (display -> controller)

# Maintenance



## Regular maintenance:

keep all components of the e-bike clean

use only recommended and tested cleaning materials

regularly lubricate the chain with suitable oils

in winter, clean the e-bike, especially the battery contacts and other connectors of salt after each ride

take care not to damage the cables of the electrical system when handling the e-bike in any way. Damaged cables pose a risk of electric shock

regularly check that all connections are tightened correctly and that the brakes are working. Also check individual parts of the electric bike for damage. For example: cracks on the frame, fork, handlebars, stem, damaged cables, damaged battery cover, etc.

Always remove the battery before transporting the e-bike on or in the car

## Transportation of the battery:

The requirements of the Dangerous Goods Regulations apply to the transport of batteries. Undamaged batteries can be transported by private users on the road without complying with other conditions.

Special packaging and labelling requirements (e.g. ADR regulations) must be observed when transported by commercial users or third parties.

Only ship batteries if they do not have a damaged cover. Seal loose contacts and pack the battery so that it does not move in the packaging. Notify the delivery service that this is dangerous goods.

## Battery storage:

Store the battery in a dry and ventilated place out of direct sunlight and other heat sources. In case of cold storage, the battery must first be allowed to warm up to normal room temperature (20 °C) before being put into operation.

Never leave the battery fully discharged. It could be permanently damaged. Keep the battery fully charged during long-term storage. However, do not store it permanently connected to the charger or placed in the electric bike.

Li-ion batteries are fully recyclable. At the end of the battery's life, you can dispose of it at any collection point or at your dealer.

If the bike is used under heavy loads (prolonged use of maximum assistance), for extended periods of riding in hot temperatures (30 °C or more), in direct sunlight, or with a partially discharged battery, and a combination of these situations, the e-bike may shut down. This is a fuse to protect the control unit from burning. The bike should be allowed to cool down for a while and then you can continue riding. This is not a defect.

# Possible problems and solutions

In the event of a malfunction, have the system diagnosed or contact your dealer.

## **The LCD control display does not light up:**

- always make sure the battery is charged
- check that the battery is inserted correctly, that the battery switch is on
- check the connectors on the control unit and the display

## **The motor does not start when the walk assist button is pressed**

- Check the motor cable connection (at the motor and at the control unit)
- Check the connectors on the control unit and the display

## **The motor does not turn when turning the cranks (pedalling)**

- Check the connection of the pedal sensor connector to the control unit
- Check the distance between the pedal encoder and the magnet disc (max. 4 mm)
- check that the sensor disc is firmly seated on the centre axis and does not rotate

## Meaning of error codes

In case the e-bike is malfunctioning, the instrument may emit warning messages, an icon will appear on the LCD display and an error code will appear on the speed display; the error codes are indicated from 01 E~07 E, their meanings are shown in the following table.

Error code	Error description	Solution
04	The gas is not coming back	Check that the throttle has returned to its original position
05	Gas error	Check the gas
06	Low Voltage Protection	Check battery voltage
07	High Voltage Protection	Check battery voltage
08	Motor cable error	Check the drive unit
09	Motor cable phase error	Check the drive unit
11	Temperature sensor failure	Check the drive unit
12	Current sensor fault	Check the drive unit
13	Battery temperature error	Check the battery
21	Speed sensor error	Check the position of the speed sensor
22	BMS communication error	Replace the battery
23	Motor cable phase error	Check the drive unit
30	Communication error	Check the driver connection

## Mounting and dismounting the bike with motor

You may need to remove the wheel with the motor engaged for transport or servicing (tube replacement).


First, disconnect the motor connector by pulling slightly (approx. 20 cm from the motor inlet). Then loosen the brake shoe (if used) and reposition it on the smallest wheel. Remove the rubber caps from the wheel nuts.

Loosen the motor nut with a #18 wrench and remove the wheel from the frame. Follow the reverse order for assembly.

The arrows on the connector must point opposite each other for proper connector connection. Switch on the drive unit and test the functionality of the drive unit.

When assembling the wheel, make sure that the centre axis of the hub is correctly positioned by recessing downwards. The cable must enter the motor from the bottom. Otherwise, water could enter the engine and damage the engine.

## Warranty electrosets:



Always file a claim with your dealer.

When making a claim, please present the proof of purchase, the warranty card with the serial number of the battery and the reason for the claim and a description of the fault.

Warranty conditions:

24 months for the components of the electric bike – covers manufacturing and material defects beyond normal wear and tear caused by use.

12 months for battery life – the rated capacity of the battery will not fall below 70 % of its total capacity within 12 months of the sale of the e-bike.

Warranty Terms:

The battery must be used solely for the purpose for which it is intended.

The electric battery must be used, stored, and maintained in accordance with this user manual.

The warranty is void:

If the product is found to have been damaged by the user (by accident, improper handling beyond the scope of this user manual, improper tampering with the design of the electric bike or the wiring of the electrical system, improper storage, etc.).

Expiry of the warranty period.

The warranty applies only to the first owner

## Notice

If you do not understand any point in these instructions, please contact your dealer for clarification. Read the whole manual!

Do not lend an electric bicycle to persons who have not been instructed in its use. Claims arising from improper handling will not be accepted.

The LF energy electric bicycle is in no way intended for children under 15 years of age. The electric bicycle may also not be used by persons who are unable to pedal or handle it independently. The manufacturer is not responsible for any injury or damage to the e-bike!

The ideal weather conditions for operating the e-bike are dry days when the outside temperature is above 10°C. In case of operation in lower temperatures, physical phenomena cause the battery to discharge faster. It is not recommended to operate the e-bike in outdoor temperatures below 0 °C.

Do not expose the bike to direct sunlight, the bike has a thermal protection sensor for the electric drive. Never immerse the battery, charger or other electrical components in water or other liquids.

**Never pressure wash an e-bike (WAP) and always remove the battery before washing.**

It is forbidden to interfere with the wiring of the electric motor, control unit or battery. Violation of this point may result in the goods not being covered under warranty or irreparable damage to the electric bike.

DO NOT use any chargers or components other than those supplied with the e-bike. We are not liable for damages caused by the use of other, non-homologated, products.

### **WARNING:**

**The product is not intended for extreme riding styles, such as jumping, riding off curbs or stairs, or any other excessive loading of the bicycle. It is also not suitable for use in demanding terrain.**

**Using the product contrary to its intended purpose may lead to damage and to the loss of the right to claim defects caused by improper use.**

# **LEADER FOX**



We wish you many pleasant and safe miles on your new electric bike.

## **Your team Leader Fox**



**Czech brand of electric bicycles BOHEMIA BIKE**

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