High performance electric off-road bike

Light Bee
TO

Every knight who chooses the product designed and manufactured by SUR-RON. Thank you very much for your trust and cherish. Let’s lead China’s high-end electric vehicle revolution together!
Dear Sir/Madam

Thank you very much for purchasing our product. We sincerely hope that you can provide us with valuable advices and suggestions while using our products. Your satisfaction is our greatest wishes.

SUR-RON is a professional designer and manufacturer of electric vehicles. With the advantages of novel appearance, comfortable riding, easy operation, strong power, long cruising range, good safety control and great reliability, the electric vehicles become an ideal new generation of green traffic tool.

In order to make the vehicle better serve to you, please do read the manual carefully before riding. Fully understand the vehicle’s performance, usage and maintenance methods, will enable you to properly ride the vehicle with the best performance, less malfunctions, and longer life time.

Please do not lend the electric vehicle to the people who do not know how to ride it. The helmet must be worn when you ride the electric vehicle. Please follow the traffic rules strictly and ride it on the slow lanes.

Please drive slowly in snowy days or on slippery roads, and keep a certain distance to ensure the safety.

Due to the continuous improvements of our electric vehicle, it may have any differences for different production batches. And the final right to interpret belongs to SUR-RON.

Content

I. Precautions for safe riding 001
II. Illustration of vehicle parts 003
III. Functions and operations 006
IV. Usage of Battery and Charger 010
V. Proper usage and riding operations 011
VI. Tire inspection before riding 016
VII. Regular inspection and simple maintenance methods 019
VIII. Main technical parameters and specifications 023
IX. Troubleshooting 026
X. Electrical schematic diagram of vehicle 030
XI. Installation Manual 031
I. Precautions for safe riding

When you ride the electric vehicle, please follow the traffic rules, and with the safe speed (The top speed for this electric vehicle is 20km/h)

Please be familiar with the contents of this manual, and then, better to find a training ground to have some trial riding practice. So that you can well master the riding skills and learn more about the structure and performance of this electric vehicle. This will be the base for safe riding.

Warning
Please do not lend the electric vehicle to the people who do not know how to ride it. It’s dangerous to ride the electric vehicle with one hand or without hands, as well as drunk riding.

- Please pay more attention to ride the electric vehicle in rainy and snowy days.
- The slippery ground in rainy and snowy days will be dangerous for riding. Please avoid to ride the electric vehicle with high speed, and be careful for steering. And apply the brake in advance for some possible dangers to avoid any accidents!
- Please wear qualified helmet properly and fasten the buckle
- Dress in correct way:

Please dress unrestricted cloth with non-open cuffs and good flexibility in bright colors. It’s dangerous to wear slippers or high-heeled shoes to ride the electric vehicle.

Don’t be overweight:

The electric vehicle’s performance will be much different due to the different loading weight. Overweight will generate the difficulties for the riding, and cause the dangers. The rated loading capability for this electric vehicle is 1 person. Please don’t be overweight, in case of any dangers and component damages happened during the riding.

Note
For the convenience of maintenance, inspection, and service, SUR-RON engraves the unique frame number and motor number for each vehicle. This will enable the dealer to offer the better service to you.

The frame number is engraved on the right side of the steering stem.
The motor number is engraved on the motor body.

Quick installation
Install the steering handle bar on the steering stem with proper angle.
Tighten the 4 locking bolts
The tightening torque is 5-6N.m
Reassembly illustration
2-1Headlight
2-2Front shock absorber
2-3Motor controller
2-4Front disc brake pump
2-5Front wheel
2-6Battery charging port
2-7Battery compartment cover
2-8Frame
2-9Rear Fender
2-10Tailight / Reflecting plate
2-11Front fork
2-12Rear disc brake pump
2-13Rear wheel
III. Functions and operations

4-1 Current Speed Display
4-2 Maximum Speed Display
4-3 Brand Display
4-4 KM/hour display
4-5 Mile/hour display
4-6 Odometer
4-7 One-time distance
4-8 Total distance

5-1 ECO mode
5-2 Sport mode
5-3 Horn button
5-4 Meter adjustment button
Regional functions

1-51-5 Combination switch is used to set power mode and start up warning horn
1-9Coulombmeter: Press the button and check the remaining power of the battery.
1-10 USB charging port: Power the USB device with the maximum current of 2.1A
1-11 Electric start switch: When it is in the ON position, the motor and the various functions of the vehicle can be started.
2-6 Battery charging port: Connect the charger to charge the battery.
3-2 Battery compartment lock: Turn the battery compartment lock counterclockwise with the key to open it.
4-1 Current speed
4-2 Maximum speed display: The maximum speed displayed on the speedometer is the maximum speed during the previous mileage.
4-5 are kilometers and miles for speed and mileage, which can be switched by meter buttons.
4-6 Odometer: It's used to show the one-time and total distance.
4-7 and 4-8 are the operations to use the buttons on the odometer to switch the displays between one-time or total distance.

Adjustment and setting for switch and meter

5-1 and 5-2 are the power mode switches on the combination switch of 1-5.
5-1 is the switch for ECO mode. And the speed and power are limited for ECO mode. It’s good for new riders and riders who want to have a longer mileage.
5-2 is the switch for SPORT mode. And the power is fully output for SPORT mode. It’s good for riders who want some acrobatic riding or off-road riding.

The setting button 5-4 is on the Meter and used to setup the functions of Meter.
1. Switch to real-time speed and maximum speed
   - When the vehicle is not running, press the button shortly to switch the display between current speed and maximum speed. When the vehicle is running, only the current speed can be displayed.
   - The display between one-time and total mileage will be also changed at the same time when you shortly press the button.
   - When the odometer display one-time mileage, press the button more than 2 seconds, the one-time mileage and maximum speed will be reset.

2. Mileage unit switching
   - To switch the mileage unit between KM and Mile, please press the button before power on, and then hold the button longer than 3s after power on.
   - After the unit switching, the display mode of total mileage, trip meter, speed and maximum speed, will be changed accordingly.

Precautions for riding

1. In the premise of ensuring safety, please try to drive smoothly and avoid rapid acceleration and deceleration, so as to save energy, protect the body parts, and improve the endurance mileage and vehicle service life.
2. Please focus your attention and speed up your reaction, due to it is easy to cause sideslip while riding in rainy and snowy day. The braking effect maybe reduced after the vehicle cleaning or wading through the water. In that case, please slow down, pay attention to the safety, and gently brake several times until the brake returns to normal.

3. Please avoid cycling in heavy rain or water. When the water surface exceeds the center of the wheel, it may affect the work of the motor and brake. This vehicle can be used in rain and snow weather, but it is not allowed to wade through the water for a long time. Once the water surface submerges the electrical components such as controller, the electrical parts may be damaged.

Parking Method

1. In the premise of ensuring safety, please ride the vehicle smoothly, and avoid the rapid acceleration and deceleration, so as to save the energy, protect the components of the vehicle, have longer mileage, and extend the life time of the vehicle.

2. Please do ride the vehicle with concentration, so as to speed up the reactions for any circumstances may happen on the slippery road in the rainy and snowy days. After the vehicle's washing, or waded through the water, the brake's performance will be affected. Please ride the vehicle slowly and carefully, pay more attention to safety. Meanwhile, please do brake slightly for a few times, until the brake's performance to be normal.

3. We suggest not to ride the vehicle in the circumstances of heavy rain, and ponding road. If the height of ponding is higher than the wheel's radius, may have some bad effects on the motor and brake's performance. The vehicle can be ridden on the road in rainy and snowy days, but it's not allowed to ride the vehicle wade through the water for a long time. Once the water submerges the electronic parts, may cause any damages expected.

V. Usage of Battery and Charger

Warning:
It is forbidden to charge the battery at temperatures below 0℃, otherwise, the battery will be damaged. Please Do charge the battery after its temperature recovers.

1. The vehicle is with high-performance and high-rate lithium battery. The safety voltage is 48V. The working temperature range is from -20℃ to 50℃. And in the temperature range from 10℃ to 30℃, the battery will have its best performance. Temperature is too cold or hot, will affect the lithium battery's performance and life time. It's prohibited to use the vehicle in such a situation which has a temperature out of the working temperature range. It's prohibited to charge the battery in the temperature below 0℃.

2. When the temperature is too low, the battery's performance will be affected. A small reduction for mileage is normal. And the battery's performance will be automatically recovered with the temperature's recovery.

3. The battery is with perfect self-protecting function, it will protect the battery from damages which are caused by overcharge or over discharge. However, long time over discharge will affect the battery's performance. Please charge the battery immediately when the battery's power is low.
4. The lithium battery on the vehicle has no memory effect, and it can be charged frequently. You can charge the lithium battery at any time, frequently battery charge can keep the lithium battery being in a good condition.

5. With long time no riding, the battery should be charged every 3 months a time to be with 60% quantity of electricity, and switch off the air switch. Otherwise, the lithium battery will lose its activity, and the battery's performance will be affected.

IV. Proper usage and riding operations

Start Method

Before starting: stand on the left side of the vehicle to check whether the vehicle is abnormal

1. Firstly, please check the air switch in the front of battery compartment and confirm whether it is turn rightwards to ON position, and then close the battery compartment. Secondly, insert the key into the Electric start switch and turn rightwards to ON position (running). Thirdly, check whether the switches, meter and horn are normal, hold the front and rare brake handlebars to confirm whether the brake function is normal.

2. Motor start up: Pack up the side stand, rotate the speed accelerator slowly and smoothly to start the vehicle after the driver sit on it steadily. This vehicle has the function of side stand power-off protection. When the side stand supports the vehicle, the motor cannot be started up.

Speed Acceleration

The normal status of the accelerator is in the position of power off. And you can rotate the accelerator inward for acceleration, and rotate the accelerator outward to deceleration. When you loosen the accelerator, it will automatically reset to the normal power-off position, and the motor will stop running. Please rotate the accelerator slightly, so as to avoid any accidents by the fast acceleration.

The accelerator can be used for acceleration and deceleration. Rotate the accelerator smoothly and steadily, please DO NOT operate it violently so as to avoid any accidents, or any damages for the vehicle components.

Use of brakes

1. Reset the speed accelerator quickly, hold the left and right brake handles with appropriate force.

2. Please control the force on brake handles accord to the actual situation, gradually increase the force, and do not suddenly hold the brake handles to be too tight. Otherwise, may cause the
wheel-lock and tire-slip, and bring dangers.

3. Please try to make judgments in advance, and fall injuries, like sudden braking, wild steering. Especially in rainy and snowy days, the road is slippery, the incorrect usage of brakes will bring dangers.

**Caution**

The side stand can only be used to support the vehicle. It is forbidden to sit on the vehicle when the side stand is open, otherwise, the side stand will be damaged.

- Please DO NOT park the vehicle on the inclined ground or soft ground to prevent the vehicle dumping.
- Electric vehicles contain many electrical components. Therefore, please DO NOT shower for a long time or use a high pressure water jet to flush the electrical components.

**Warning**

It's strictly prohibited to rotate the speed accelerator before well seated. Otherwise, danger may happen. Please turn off the electric start switch immediately after getting off the vehicle.

**Caution**

Sideslip may easily happen by using only front brake or rear brake. It would be much safer with combination use of both front and rear brakes.

When the temperature of the motor and controller is too high, or the battery is too low, the vehicle will run with power reduction automatically. That is not a fault.

**Battery charging and usage of charger**

<table>
<thead>
<tr>
<th>Vehicle charging mode</th>
<th>External charging mode</th>
</tr>
</thead>
</table>

**Warning**

It’s prohibited to charge the battery in the temperature below 0°C. Otherwise, the battery will be damaged. And the battery can be charged after the battery’s temperature recovered.

1. A special charger is used for the lithium battery charging. Please DO NOT use any other types of charger to charge the battery, so as to prevent any damages of battery or dangers.

2. Please check whether the charger input voltage is in accordance with the grid AC voltage from 110V to 230V.

3. Please plug the charger directly into the charging socket on the left side of vehicle, or remove the battery from vehicle for charging as well.

4. The lithium battery used in this vehicle is shown in the right illustration, and the silver outlet on the left is the charging socket. Please insert the output plug of charger into the battery terminal while charging, and then insert the input plug into the power supply socket.
5. The charger indicator flashes while charging, and once it is full, the indicator light is on. The full charging time depends on the battery's remaining energy and specification of the selected battery charger. It can be fully charged within about 3 to 6 hours. (The charger has the specifications of 5A-10A)

6. The charger will automatically turn off after the full charging.

   Please DO NOT connect the charger to the power grid for maximum 6 hours.

7. To avoid any damages or dangers, it's prohibited to disassemble the battery.

8. After the battery over discharge protection worked, please press the red reset button on the charger to activate the battery, and then, charge the battery.

Precautions for charging

While charging, please place the charging device in a safe place where children are not accessible.

   Please DO NOT use the battery immediately after it's fully charged. It's better to use the battery 10 minutes after it's fully charged.

   It is not allowed to cover the charger with any objects while charging. This charger is for indoor use, therefore, please use it in dry and well-ventilated environment.

   When an odor or high temperature occurs during the charging, or the battery cannot be fully charged for a long time, please stop charging immediately, and sent the charger and battery to the after sales service center to do inspection.

Usage and maintenance for motor and controller

1. Please check regularly whether the motor screws are loose

2. Please check regularly whether the connection of motor and controller is loose, as well as the status of insulation.

3. Please check regularly whether the fuses are loose.

4. Please DO NOT ride the vehicle in deep water, so as to avoid affecting the motor's operation.

   It can also be used for vehicle anti-theft.

VI. Tire inspection before riding

1. Higher tire pressure will cause the inordinate wear, poor comfort, or even tire burst, and finally will result in potential safety hazards. Brake handles to be too tight. Otherwise, may cause the wheel-lock and tire-slip, and bring dangers.

3. Please try to make judgments in advance, and avoid such operations, which may easily cause the sideslip and fall injuries, like sudden braking, wild steering. Especially in rainy and snowy days, the road is slippery, the incorrect usage of brakes will bring dangers.

   According to the sunken degree of parts of the tire which contacted with the ground, we can judge whether the tire pressure is suitable. Generally speaking, the normal tire pressure for both front and rear tires are 225Kpa. (The insufficient inflation will affect
the riding speed and mileage).

2. Please check whether the tires have cracks and abnormal wears.

3. Please check whether the tires are embedded with any objects such as nails, stones, and glass.

4. Please check the tire tread depth. The tires should be replaced when the tooth on the tires are worn down by 2/3.

5. Please check whether the spokes of wheel are loose.

**Caution**

The abnormal tire pressure, damage and inordinate wear will cause driving safety hazards. Low tire pressure will cause inordinate wear, steering failures, low speed and short mileage.

**Inspection of Meter, horn, and brake**

1. Turn on the electric start switch and check if the various functions of the meter are normal.

2. Operate the switch and check if the horn is working properly.

3. Hold the left and right brake handles, and check whether the front and rear brakes work well.

**Inspection of handlebar and seat**

Please check whether the handlebar and seat are well adjusted and reliably fixed.

—

If you find the problems after inspection, please read related content in this manual, or contact the dealers, so as to get perfect after-sales service.

**Battery take-out**

1. Turn off the electric start switch, and use the key the open the battery lock on the right side, and then, open the battery compartment cover to see the battery.

2. Rotate leftwards to turn off the air switch in front of the battery, remove the discharge and communication plug on the battery and then pull the battery up and close the battery compartment cover.

**Battery Installation**

1. Please open the battery compartment cover by key.

2. Place the battery from the top and pay attention to the front and rear direction of the battery (the charging socket is to the left of the vehicle body), and then insert the communication and discharge plug. Turn on the air switch to the right, close the battery compartment cover and lock it, and remove the key.
Caution
The air switch must be turned off before the battery is connected or disconnected.
The communication plug must be connected, otherwise, the battery specification cannot be identified properly by the vehicle.

VII Regular inspection and simple maintenance methods

In order to prolong the service life of the vehicle and make it safe and comfortable, please check and maintain the vehicle regularly. When the vehicle is stopped for a long time, regular inspection should also be carried out.

The new vehicle should be inspected and maintained after 300KM.
Pay full attention to safety when you do the inspection.

1. Please choose a wide and flat place to park the vehicle.

2. Please carry out the driving test in the safe place and pay attention to the surroundings and circumstances.

3. If any abnormalities are found, please DO clear the abnormalities before riding. If the abnormalities cannot be cleared by yourself, please send the vehicle to the after sales service center to get the solution.

Inspection of operating parts

1. Please check whether the front shock absorber is bent, deformed or damaged.

   Please check whether the front shock absorber has the malfunctions such as damage, loose, oil leakage, etc., and whether any abnormal noise caused by shaking of the handlebar. If the shock absorber is abnormal, please go to the service shop to check for repairs.

   2. Inspection of rear absorber
   3. Inspection of brake

   Please check whether the free clearance of the brake handle is within the specified range (15-30mm). If not, please adjust the clearance.

   4. Braking performance inspection

   Ride the vehicle slowly on the dry and flat road, and try the front and rear brakes respectively, so as to check the braking performance.

   Caution
   Both front and rear brakes are disc brakes, and the brake pads should be replaced when they are badly worn.

   Caution
   When it still fails to achieve the desired braking effect by holding the brake handlebar tightly, please check the cleanliness of the disc firstly. If it still cannot work well, please go to the maintenance station for inspection and repair.
Warning
The Run-in period of the vehicle is 300KM, and the new vehicle should be maintained for the first time after travelling 300KM. After the Run-in period, the maintenance should be carried out for every 1000KM maintaine.

Inspection of tire

1. Check the air pressure with the tire gauge in the cooling status of the tire.

2. Check for any cracks, damage, foreign objects, abnormal wear.

3. Check whether the rim spokes are loose or not

4. Check the tension of the chain. The chain can move up and down 10-15mm. (Note: The belt tension has been adjusted when the production is out of factory, therefore, please DO NOT adjust it without permission.)

Tires are in touch with the ground for a long time, and stones, glass, nails and other objects on the ground will cause damages to the tires. Therefore, please observe the road carefully when you ride the vehicle, and avoid the ride on the road where the tires may be damaged. In addition, it’s important to check whether there are obvious cracks on the tires, and other damages or wears which are caused by the stones, glass and other abnormal objects.

5. Check the tire tread depth

Please check the wear and tread depth of the tires. The tires should be replaced after the tooth on the tire are worn down by 2/3. Please go to the after sales service center to do inspection and repair, when there’s a noise or shaking of the tire during the riding. It’s recommended to set 30N.m for the axle locking torque, and 40N.m for the rear axle nut locking torque. The front axle screw locking torque is determined by the front fork.

Inspection of Battery

The sealed 3-element lithium battery is used in this vehicle. Please fully charge the battery before inspection, and then, use the universal meter to measure the voltages of the positive and negative poles. It’s normal with the fully charged voltage to be between 58-58.8V. Otherwise, please send the vehicle to after sales service center to do inspection.

Caution
Please turn off the electric start switch and rotate leftwards to turn off the air switch before removing and installing the battery.

If the battery cannot be pushed in, please DO NOT force the operation. Please pull out the battery to check if there are any foreign objects causing the battery to get stuck.

Inspection of Fuse

When the vehicle meter, horns and lamps are unable to work well after the air switch and electrical start switch are turned on, it may be caused by the blown fuse. Please turn off the air switch and then replace the fuse.
1. Open the battery compartment cover, and pull out the battery. Then please open the fuse box which is located in front of the air switch.

2. Remove the broken fuse and then install the spare fuse which is stored in the lid as backup. After that, please close the fuse box, install the battery and then close the battery compartment cover.

Caution: The fuse must be fixed firmly. If the inserted part of fuse is loose, it may cause a fuse to heat up and thereby will cause other faults and dangers.

To replace the fuse, please use a fuse with the corresponding specifications in the specified model. If the fuse that exceeds the specification is used for replacement, it may not be protective. If the fuse is broken immediately after replacement, it should be checked for reasons other than the fuse.

Please avoid the strong water current impact on fuse site.

VIII. Main technical parameters and specifications

Overall Dimensions: 885X780X1050 mm

Wheelbase: 1265 mm

Vehicle Weight / including the battery: 42 Kg / 50 Kg

Rated Load: 100 Kg

Minimum Clearance: 270mm

Height of Seat: 810mm

Front Rake: 26°

Maximum Climbing: 70% slope

Maximum Speed: 20Km/h

Power System: High speed DC brushless motor

Rated Power: 168 W

Maximum Output Power: 168 W

Maximum Torque of Driving Wheel: 120N.m

Battery Specification: High rate ternary lithium

Endurance Mileage per Charge: 70-100Km (depending on the battery)

Charging Time: 3-6h (depending on the charger)

Charger Input Voltage: AC110/230V-50/60Hz

Battery Overcurrent Protection Value: 100A

Power Mode: Economic mode / Sport Mode

Bodywork Type: All aluminum alloy forging frame

Gear Type: aluminum alloy 19*1.4

Tire Type: off-road tire -70/100-19

Front Suspension System: Double-shoulder front fork with travel 200mm, adjustable

Rear Suspension System: Multi-link hydraulic spring central type
IX. Troubleshooting

The motor does not work after power-on

Possible Cause
1. The battery connecting wire is loose.
2. Speed adjustment central controller splice falls off
3. The motor connecting wire may fall off.
4. Brake handle does not return or brake switch failed.

Action
1. Check whether the wires are connected firmly.
2. Repair the plug and connect it firmly.
3. Reconnect and fix firmly
4. Check the brake handle and brake switch.

The accelerating failures and lower top speed
Possible cause

Possible Cause
1. Battery Voltage is too low.
2. Fault on accelerator

Action
1. Fully charge the battery.
2. Replace the speed adjustment central controller in maintenance station.
Endurance mileage per charge is insufficient

Possible Cause
1. Under-inflation for tire
2. Undercharge or charger failure
3. Improper braking adjustment, excessive running resistance
4. Battery aging or damage
5. Upslope, upwind, frequent acceleration and deceleration, heavy load

Action
1. Inflate the tire to the right pressure.
2. Fully charge the battery, meanwhile, check the connection of the charger plug.
3. Readjust the brake
4. Replace the battery
5. It is normal to reduce the battery life in such operating environment

The charger does not work.

Possible Cause
1. The charger plug falls off or the connection is loose
2. The plug of battery connection wire falls off or loose.

Action
1. Fix the plug or connector firmly.
2. Open the battery compartment cover and fix the connector firmly.

The vehicle makes abnormal noise during the running

Possible Cause
1. The chain tension is unreasonable.

Action
1. Adjust the chain tension.

Other Failures

Any problems, which cannot be inspected or judged by the rider itself, please send the vehicle to the local after sales service center. Please do not try to repair the vehicle with the incorrect solution by yourself. Otherwise, any damages happened, will be out of the warranty.
X. Electrical schematic diagram of vehicle

Three Phase Brushless DC Motor
XI、Installation Manual

**Item List**

- Accessories Box × 1
- Reassemble instruction × 1
- Sticker instruction × 1
- Qualification certificate × 1
- Number Plate × 1
- Sticker set × 1 (left and right)
- Nylon Tighten Strip (200mm) × 4
- Keys × 2
- Right footrest × 1
- Owner's Manual × 1
- Toolkit
  - RST: #4, #5, #8 Hexwrench, #12-14, #17-19 Wrench
  - FAST: #4, #5 Hexwrench, #12-14, #17-19 Wrench
- Charger × 1

**Handle Bar Installation**

1. Use the Hexwrench (#4) to loosen the bolts (with washers) and get off the locking cover on the steering handle bar.
2. Fit the handle bar accord to the match
3. Fixing the handle bar and locking cover by tightenning the locking bolts with the hexwrench

**Right Footrest Installation**

1. Put the right pedal at the installation position
2. Using #14 open wrench to tighten the installation nuts of the footrest
Number Plate Installation

1. Make the 4 black nylon tighten strips (200mm) go through the 4 holes on the number plate as the picture shown.
2. Tighten the number plate on the front fork as the picture shown.

Front Tire Installation

1. Using the Hex wrench (#8) to get off the front tire axle.
2. Put the front tire into the installation position of the front fork (Please sure the front tire mounting will be well matched with the disc brake's clipper).
3. Insert the front tire axle, and make sure the axle will go through the front tire and fork as the picture shown.
4. Use the Hexwrench (#8) to tighten up the front tire axle.

Rear Shocker Adjustment

For shipping reasons, the manufacturer sets the rear shocker to a default level, please adjust the rear absorber accord to your weight and riding habit before use.

Note:
If the reversed front shocker (e.g. FASTACE) is chosen, please use Wrench (#19) to tighten the axle, use #5 inner hexwrench to tighten the 4MG bolts in the bottom of the absorber. The tighten torque is 8~10N.