

HORWIN

HORWIN SK1

USER MANUAL



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SK1 User Manual

Welcome to the HORWIN family!

We will help you to use the SK1 e-scooter correctly and safely. To ensure your safety, please read this manual carefully before using the e-scooter for the first time, and make sure that you always meet the following requirements:

Fully understand the information in this manual, including the precautions and warnings.

HORWIN accepts no liability arising from unauthorised modifications, the use of replicas, or the installation of components that impair the performance and safety of the e-scooter.

Please contact the HORWIN Customer Service Centre at this e-mail address:
service@horwinglobal.com

If you should have a problem with this scooter, we will be happy to help you.

We wish you a safe and pleasant ride!

Safety instructions

Please read this product manual carefully, and only use this vehicle if you are mentally and physically fit to do so.

Please follow the traffic rules, do not deliberately drive in reverse for long distances, do not run red lights, and do not use mobile phones while driving.

Please do not use any third-party accessories, and do not disassemble or modify the e-scooter without authorisation; otherwise, any resulting damage will be at your expense, and you will lose the right to make use of our warranty service.

Due to the continuous improvement of the product, the vehicle you purchase may differ slightly from the vehicle described in this manual. If you are unsure about the use, repair and commissioning of this vehicle, please contact our authorised specialist dealers.

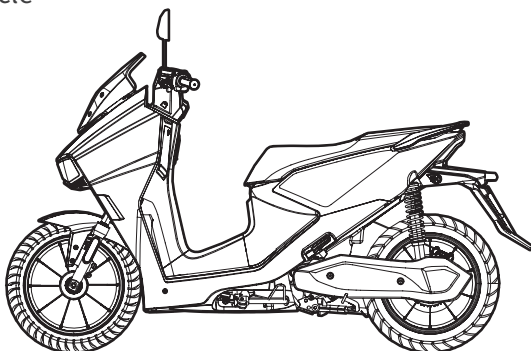


Please read the following instructions carefully for your own safety and that of others:

- Before riding the e-scooter, check that all safety-relevant functions (e.g., lighting system, horn, braking system, etc.) are in working order in order to ensure road safety. If you should notice any problems, please contact your specialist dealer immediately.
- To ensure your safety, wear a safety helmet, gloves and appropriate protective equipment when driving.
- Please make sure that you are in good health and not tired. Please do not ride your scooter if you have consumed drugs, medication, alcohol or impairing substances.
- Please observe the traffic regulations and adjust your speed according to the weather and road conditions.
- Do not park the vehicle in unauthorised locations (e.g., in escape routes, fire brigade access roads, restricted areas, etc.)
- We do not recommend charging or parking the electric scooter in the immediate vicinity of flammable materials. Charging should always be done under supervision.

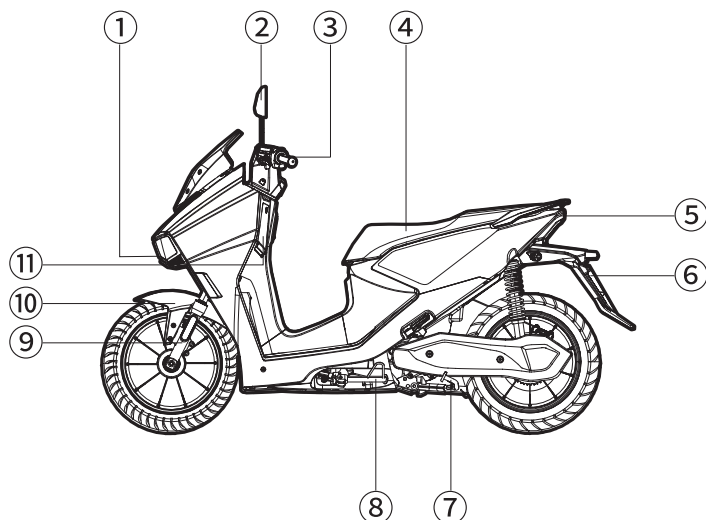
Product overview

Schematic representation of the vehicle



Description of the parts

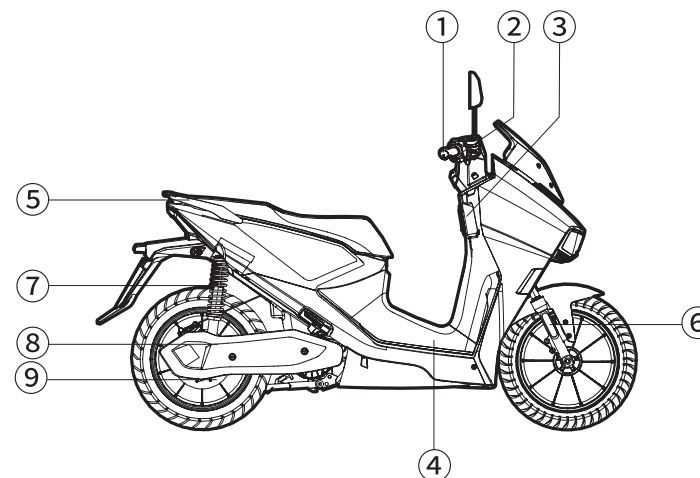
Left side



- ① Headlight
- ② Rear-view mirror
- ③ Left combination switch
- ④ Seat
- ⑤ Tail light
- ⑥ Rear fender

- ⑦ Centre stand
- ⑧ Side stand
- ⑨ Front shock absorber
- ⑩ Front fender
- ⑪ Storage compartment (built-in USB charging socket, max. consumption 1 A, voltage 5 V DC)

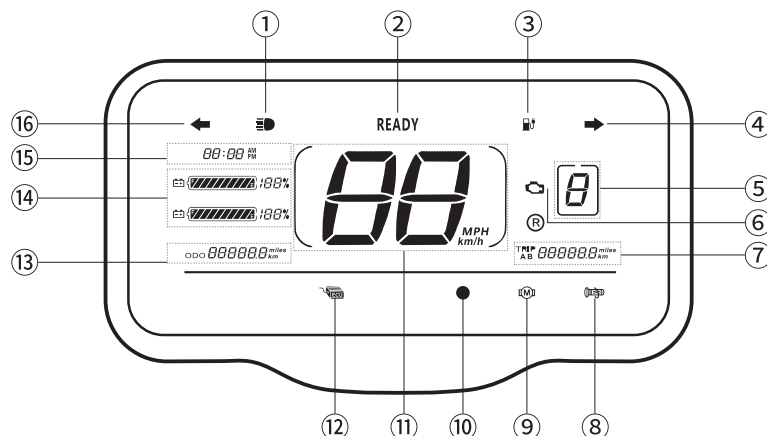
Right side



- ① Throttle
- ② Right combination switch
- ③ Ignition lock
- ④ Footboard
- ⑤ Rear armrest

- ⑥ Reflector
- ⑦ Rear shock absorber
- ⑧ Cover of the rear swing arm
- ⑨ Hub motor

Instrument cluster / display



① High beam indicator lamp

This indicator lights up when the high beam is switched on.

② Operating status

Indicates the current operating status of the vehicle.

③ Low battery indicator

If the battery charge level is less than approx. 15%, the indicator lights up.

④ Indicator, right

This indicator light flashes when you press the right indicator.

⑤ Riding modes

Displays the currently selected riding mode.

SK1 riding mode speeds:

- The maximum speed in the 1st riding mode is up to 25 km/h
- The maximum speed in the 2nd riding mode is up to 35 km/h
- The maximum speed in the 3rd riding mode is up to 45 km/h

SK1 Light riding mode speeds:

- The maximum speed in the 1st riding mode is up to 15 km/h
- The maximum speed in the 2nd riding mode is up to 20 km/h
- The maximum speed in the 3rd riding mode is up to 25 km/h

⑥ Motor indicator light

If an error occurs in the motor control, this symbol lights up.

⑦ Trip odometer

Display of the current distance travelled (automatic reset after restart).

⑧ Throttle grip indicator light

The indicator lights up if the throttle grip is not in the starting position (zero position) or is defective.

⑨ Motor warning light

The display lights up if the motor has a fault.

⑩ Side stand indicator light

Indicates whether the side stand is folded out.

⑪ Speed per hour

Displays the current speed.

⑫ Controller warning light

This indicator lights up if the controller has a fault.

⑬ Total mileage

Display of the total mileage reading.

⑭ Battery charge level indicator

Displays the current battery charge level as a percentage.

⑮ Trip travel time display

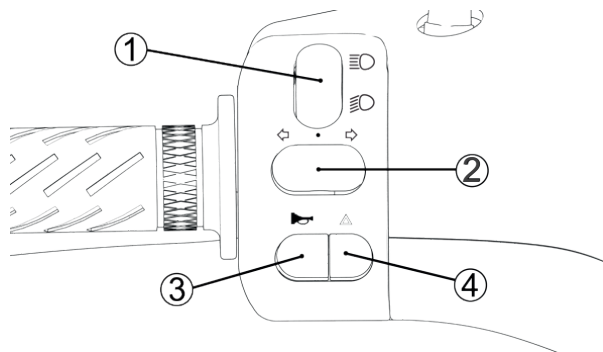
Display of the current trip travel time (automatic reset after restart).

⑯ Indicator, left

This indicator light flashes when you press the left indicator.

Combination switch

Left side



① Left-hand combination switch with high beam and dipped beam

- Press the switch upwards to switch on the high beam.
- Press the switch down to switch on the dipped beam.

② Indicator

- Press the switch to the left to switch on the left indicator.
- Press the switch to the right to switch on the right indicator.
- Move the switch to the centre position to switch off the indicator.

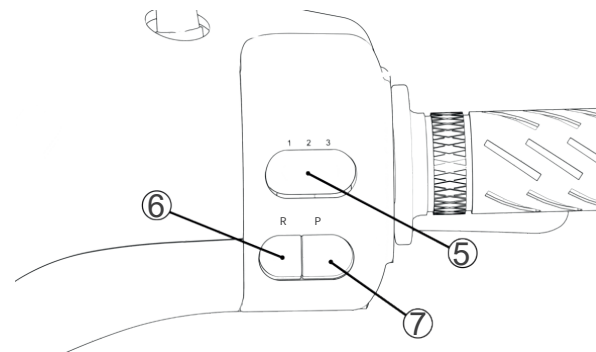
③ Horn

- Press the horn button to sound the horn signal.
- The horn signal ends when the horn button is released.

④ Hazard warning lights

- Press the button to activate the hazard warning lights.
- Press the button again to deactivate the hazard warning lights.

Right side



⑤ Right-hand combination switch with riding mode selector

- Left position: 1. riding mode
- Centre position: 2. riding mode
- Right position: 3. riding mode

⑥ Reverse switch

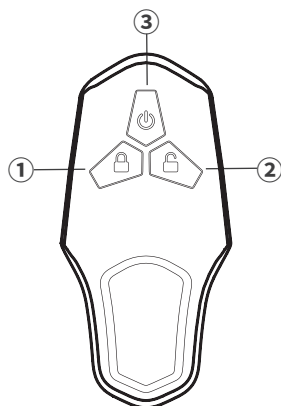
- Press and hold the button to activate reverse mode.

⑦ Start switch

- Press the button to switch to standby/READY mode.

Vehicle lock and radio remote control

Radio remote control



① Activation of the alarm system

Pressing the button activates the acoustic alarm system. If the radio remote control is more than approx. 2 metres away from the scooter, the alarm system activates itself automatically after a certain period of time.

② Deactivation of the alarm system

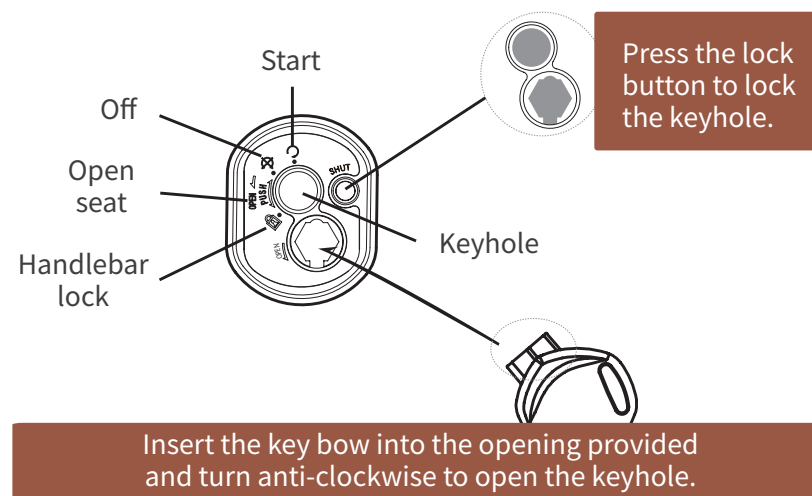
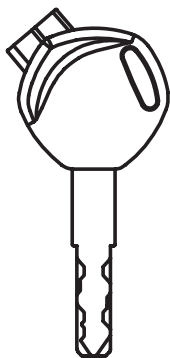
Pressing the button deactivates the acoustic alarm system.

③ Power button

The vehicle can be switched on by pressing the button twice. (Pressing button '2' switches the vehicle off.)

Please note that the batteries in the radio remote controls must be replaced after a certain time, and when the radio remote controls do not work.

Mechanical key



Switching the scooter on and off

Insert the mechanical key and turn it to the "Start" position to switch on the vehicle. Turn the key back to the "Off" position to switch off the vehicle.

Opening the seat

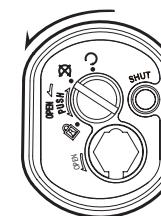
Insert the mechanical key and turn it to the "Open seat" position to unlock the seat.

Handlebar lock

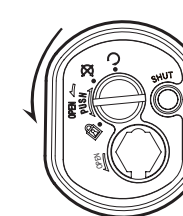
Turn the handlebars to the furthest left position. The handlebars are locked by pressing and turning the key anti-clockwise to the "handlebar lock" position.



Starting the scooter



Open seat



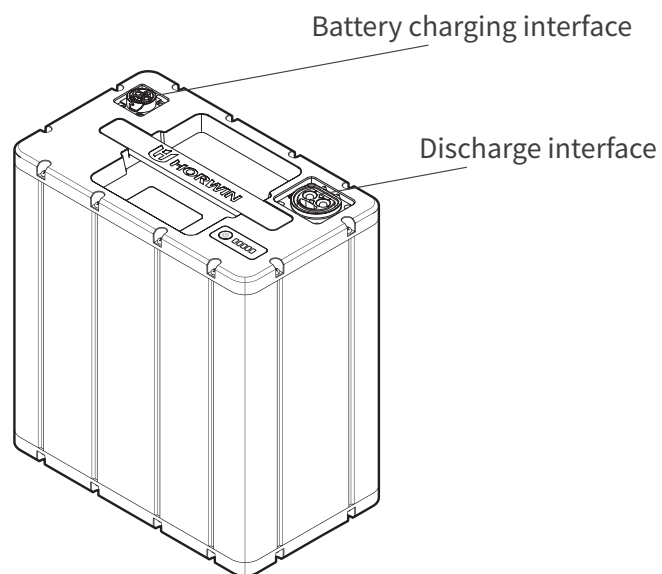
Handlebar lock

Battery and charger

Instructions for using batteries

The battery has multiple charging methods

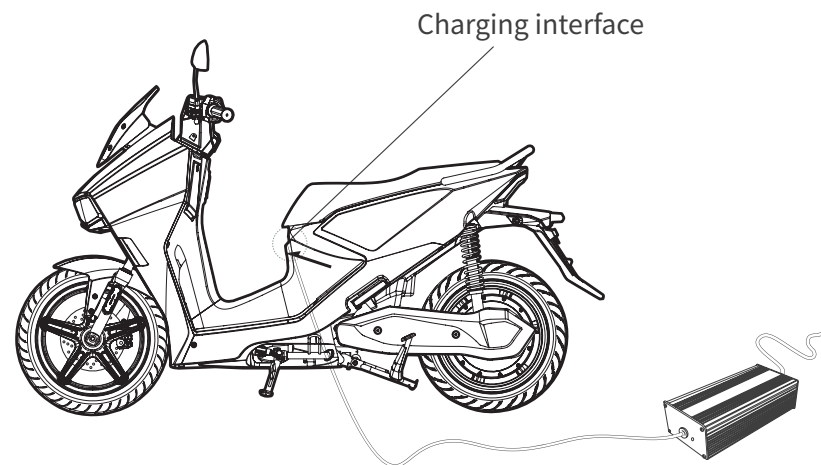
External charging mode



72 V 36 Ah

First connect the charger to the battery interface, and then to the socket. If the charging process does not start automatically, press the charging indicator button.

In-vehicle charging mode



Place the battery in the battery compartment and connect the vehicle plug to the battery.

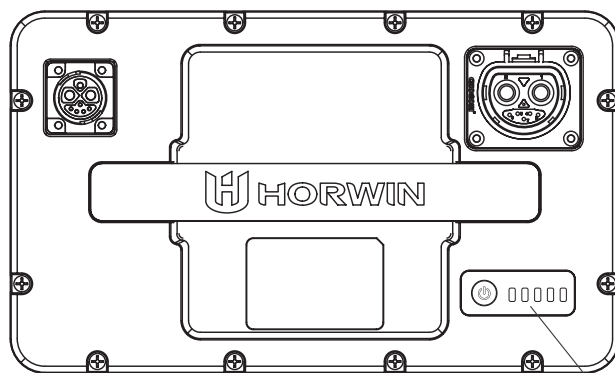
Then plug the charging plug of the charger into the charging interface above the footboard to charge the scooter.

If the charging process does not start automatically, press the charging indicator button directly on the battery.

Description of the battery charge level indicator on the battery

While charging, the charge level indicator shows the current battery charge level. Once the battery is fully charged, all LEDs light up continuously and no longer flash.

The current charge level is displayed by pressing the button next to the charge indicator - one LED corresponds to 20% charge level.



Charge level indicator

Battery manual

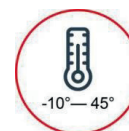
Before using the battery, make sure that it is the original battery; do not use batteries from other manufacturers or of other types.

Check the battery for obvious external damage, leakage of liquid, overheating, expansion or other damage.

Due to self-consumption factors such as transport routes and storage times, the battery does not initially have maximum capacity. Charge the battery according to the charging instructions.

Batteries must not be disassembled and must be disposed of properly.

Operating environment



Please use the battery between -10 °C and 45 °C.



Please prevent the battery from coming into contact with liquids, such as water, cleaning agents, etc.



Please avoid storing the battery near heat sources, open flames, flammable and explosive gases or liquids.



Please prevent metallic foreign objects from entering the battery compartment.

- At low temperatures, the available battery capacity decreases to varying degrees. For example: The available capacity is approx. 70% at -10 °C, 85% at 0 °C and up to 100% at 25 °C.
- If you notice any abnormalities, such as a strange odour, overheating or deformation, please stop using the battery immediately. Keep away from the battery and contact your specialist dealer immediately.

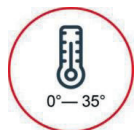


If the battery is dismantled or taken apart without authorisation, the manufacturer's warranty is automatically invalidated. Incorrect handling could cause the battery to overheat, start to smoke, catch fire or explode.

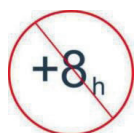
Charging environment



Please use the original charger to charge the battery. Do not use chargers from other manufacturers, brands or types to charge the battery.



Please charge the battery at an ambient temperature of 0 °C - 35 °C.



Please do not charge the battery for longer than 8 hours, since otherwise the battery life will be impaired.

- In the early phase (0-80%), the charging speed is faster; in the later phase (80-100%), the charging speed is slower, because this process is configured for charging safety and is normal.
- In winter, when the outside ambient temperature drops below 0 °C, the charging process may stop, which is a normal condition. Please charge the battery at a suitable ambient temperature.
- At higher outside temperatures or shortly after the end of the ride, charging may not start immediately due to high temperatures inside the battery. It is recommended that the battery is left to rest for some time to lower the temperature.
- During charging, chargers have a thermal effect and the temperature of the housing may increase. Please avoid touching the charger during the charging process (possible risk of burns).

Precautions for using the charger

- The charger should only be used indoors, under cover, or in environments protected from the weather.
- It is strictly forbidden to use the charger in an environment with high temperatures, and the charger must not be placed in the seat shell during the charging process.
- When the green indicator light on the charger lights up, end the charging process and disconnect the charger from the battery or the mains.
- If the indicator light on the charger is abnormal during the charging process, or if the charger smells strange or the housing of the charger is overheated, please stop charging immediately and contact your specialist dealer.
- Please do not dismantle the charger yourself, and do not replace the charger components yourself.
- If the charger is replaced, the new charger should match the battery model.

Storage environment

- As soon as the battery is inserted into the vehicle and connected, energy is drawn from the battery for the alarm system or other consumers.
- Please store the battery in an environment between 0 °C - 25 °C and not in an environment with a temperature higher than 40 °C; otherwise, the battery capacity will be irreversibly weakened.
- If the vehicle is not used for a longer period of time, the battery must be disconnected, stored separately, maintained and charged regularly, as otherwise the battery may be completely discharged and irreversibly damaged, e.g., deep discharge

of the battery. In such a case, it is excluded from the warranty.

- If the battery is stored for a longer period of time, the most suitable battery charge level is 50-70%. If the battery charge level is less than 10% or more than 90%, the battery capacity will be irreversibly weakened.
- The following technical standards apply with regard to the self-consumption protection mode when the lithium battery is stored safely:



1. If the battery is not used for a longer period of time, it can be stored in the vehicle (the battery plug is not disconnected), and the maximum safe storage period is 15 days; otherwise, the battery may become deeply discharged and the battery cannot be restored.
 2. If the battery is not used for a longer period of time, the charge level is not less than 50%, and the battery is stored separately or kept in the vehicle (the battery plug is disconnected), the maximum safe storage period is 2 months; otherwise, the battery may become deeply discharged and the battery cannot be restored.
- Please store the battery in a safe place; otherwise, the battery may be damaged in an uncontrolled manner: leakage, heating up, smoking, burning or explosion.
 - Undervoltage and deep discharge of the battery caused by improper use are not covered by the warranty.

Precautionary measures when putting the battery into operation:

- When using the battery for the first time, please discharge it as much as possible, and then fully charge it before the next use.
- Please keep the battery charge level at a minimum of 10%, and charge the battery in good time in order to maximise the service life of the battery.



The battery must not be stored outdoors in rain or bad weather, and must not be rinsed with water or other liquids. If the vehicle is driven or pushed through high puddles of water, the water level must not exceed the height of the lower edge of the battery compartment; otherwise, water will penetrate the battery and the battery may be short-circuited, resulting in permanent battery failure.

In this case, it is forbidden to switch the vehicle on again or to recharge the battery, as otherwise the battery may catch fire and explode. Please return the battery to your specialist dealer immediately for servicing.

Driving instructions

Precautionary measures before beginning your ride

If you are impaired due to the consumption of alcohol or drugs, driving is absolutely not recommended. Read the user manual. Ensure that you have fully understood all safety instructions, as well as all functions of the operating elements. Please make sure of the following before you begin your ride:

- You are in good physical and mental health.
- You are wearing a helmet and other protective clothing.
- You should not operate the vehicle after consuming alcohol or taking medication.

Protective clothing

For safety reasons, we strongly recommend that you always wear a certified helmet and appropriate protective clothing when riding.

Checking the vehicle before setting off

General precautions

If you discover any damage, other abnormalities or technical faults when checking your vehicle, please rectify them immediately or have them rectified by an authorised specialist dealer.

Before using the scooter, check the following points to ensure your safety on the road:

- Function test of all switches of the left and right combination units
- Handle for speed control
- Recommended tyre pressure: Front wheel 2.5 - 2.8 bar, rear wheel 2.5 - 3 bar
- Tyre surface for cracks, damage, wear or foreign objects adhering to the tyre
- Observe the legal tread depth (seasonal and country-specific deviations)
- Battery charge status
- Function test of headlight, tail light, brake light, indicators and horn
- Rear-view mirror (adjustment and cleanliness)
- Brake fluid level
- Brake system function test

Loading precautions

Overloading or improper loading can lead to irregular scooter operation. The exact dimensions and weight specifications can be found below in the technical data and dimensions.

Methods for starting the vehicle

The SK1 can be started in two ways: with the mechanical key or with the radio remote control.

Method 1: Starting the vehicle with the mechanical key

- **Step 1:** Insert the key to turn the ignition lock to the start position and use it to start the vehicle.
- **Step 2:** Please fold up the side/centre stand, and press the “start switch” in the right-hand combi unit. The “READY” symbol appears on the display.
- **Step 3:** Lightly turn the throttle and enjoy your ride!

Method 2: Start the vehicle with the radio remote control.

- **Step 1:** The distance between the radio remote control and the vehicle must be less than approx. 2 metres.
- **Step 2:** Fold up the side/centre stand, and press the power button on your radio remote control twice. The scooter switches on. Press the “start switch” on the right-hand combi unit; the “READY” symbol will appear on the display.
- **Step 3:** Turn the throttle slightly and enjoy your ride!

Braking instructions

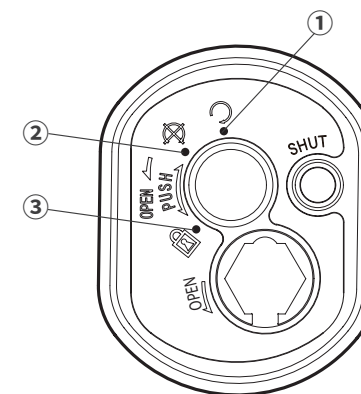
- Excessive, sudden braking can cause the wheels to lock and skid, limiting control of the vehicle. In this case, release the brake lever and drive forwards continuously until control is restored, and then brake more gently.
- Slow down as much as possible, or come to a complete stop before turning. Avoid braking when cornering, as this can cause one or two wheels to slip, thereby reducing control of the scooter.
- When riding in wet, rainy conditions or on soft surfaces, the manoeuvrability and braking ability of the scooter are impaired. In this case, all your riding manoeuvres must be adjusted; sudden acceleration, braking or turning can lead to loss of control of the scooter.
- On long, steep, downhill stretches of road, excessive use of the braking system can lead to overheating and reduce the effectiveness of the braking power. Consequential damage can therefore not be ruled out.

Switching off the vehicle

The SK1 can be switched off in two ways: with the mechanical key or with the radio remote control.

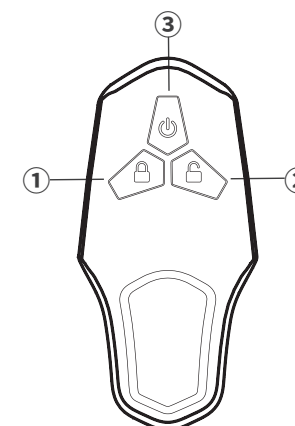
Method 1: Switching off the vehicle with a mechanical key

1. Fold down the side stand; the "READY" symbol will disappear from the display. The electrical system of the entire vehicle is still in "Park" mode, and the vehicle will not move off when the throttle is opened.
2. Turn the ignition lock to position 2, and the electrical system of the entire vehicle will switch off.



Method 2: Switching off the vehicle with the radio remote control

1. Fold down the side stand; the "READY" symbol will disappear from the display. The electrical system of the entire vehicle is still in "Park" mode, and the vehicle will not move off when the throttle is opened.
2. Press button '2' on the radio remote control once, and the entire electrical system will switch off.



Service and maintenance intervals

The exact maintenance and service instructions, as well as the warranty guidelines, can be found in the separate service and maintenance manual supplied with your vehicle.

General service tips

Please switch off the vehicle and remove the battery before cleaning the vehicle. Do not clean your vehicle directly with a strong jet of water (e.g., high-pressure cleaner, etc.), which can cause faults or damage to mechanical and electrical components due to moisture.

Troubleshooting

Troubleshooting on the vehicle

Error description	Cause	Possible troubleshooting
None Power when switching on	<ol style="list-style-type: none"> 1. Empty battery 2. Loose plug connection 	<ol style="list-style-type: none"> 1. Check that the battery plugs are correctly connected to the vehicle. 2. Please charge the battery.
Motor failure when turning the twist grip after switching on	<ol style="list-style-type: none"> 1. Battery voltage too low 2. The vehicle is parked. 3. The side stand is not folded up. 4. The "start switch" is defective. 5. The brake lever is not reset. 	<ol style="list-style-type: none"> 1. Charge the battery. 2. Fold up the side stand. 3. Read the section "Starting the vehicle". 4. Do not pull the brake lever when turning the throttle grip. 5. Contact your specialist dealer.

Error description	Cause	Possible troubleshooting
Range or speed reduced	<ol style="list-style-type: none"> 1. Low battery level 2. The tyre pressure is insufficient. 3. The vehicle is frequently braked and started or is overloaded. 4. Battery ageing or normal loss of capacity 5. The ambient temperature is too low. 	<ol style="list-style-type: none"> 1. Charge the battery. 2. Check the tyre pressure before every ride. 3. Develop good driving habits. 4. Replace the battery. 5. Normal situation
The battery cannot be charged	<ol style="list-style-type: none"> 1. The charger plug is not plugged in correctly. 2. The battery temperature is too low. 3. The battery temperature is too high. 4. Battery is already fully charged. 	<ol style="list-style-type: none"> 1. Check that the plug is connected correctly. 2. Wait until the battery temperature corresponds to the required charging temperature. 3. Contact your specialist dealer.
The USB charging socket in the storage compartment has no function.	<ol style="list-style-type: none"> 1. The USB cable plug is not correctly plugged into the interface. 2. The USB cable does not correspond to the device standard. 3. The USB charger is damaged. 4. The power supply to the USB charging interface is interrupted. 	<ol style="list-style-type: none"> 1. Check that the cable plug is correctly inserted into the USB port. 2. Use a charging cable that corresponds to the device standard. 3. Contact your specialist dealer.

Error codes / control unit

Error codes and description		Flashing frequency of the LEDs
Overvoltage protection	The battery voltage is too high.	1
Undervoltage protection	The battery voltage is too low.	2
Motor overvoltage protection	One or more phases of the motor are short-circuited.	3
Protection against blocking	The time of the stalling motor exceeds the value set in the control unit.	4
HALL sensor protection	Error on the HALL sensor of the motor or the wiring	5
Power supply error	After the self-test, the power supply to the control unit is faulty.	6
Phase line faults	One or more phases of the motor are disconnected.	7
Self-test error	Failed self-test of the control unit.	10
Overheating protection of the control unit	The temperature of the control unit is too high.	11
Twist throttle signal error	The input signal of the twist throttle is faulty.	12
Motor overheating protection	The motor temperature is too high.	13
Position error of the twist throttle after starting the vehicle	When the vehicle is switched on, the twist throttle is not in the starting position (zero position).	14
General error of the control unit	The control unit is in an error state.	15

Cleaning the vehicle



Please mix tap water and neutral detergent to clean the vehicle. After cleaning the vehicle, wipe the surface with a soft cloth.

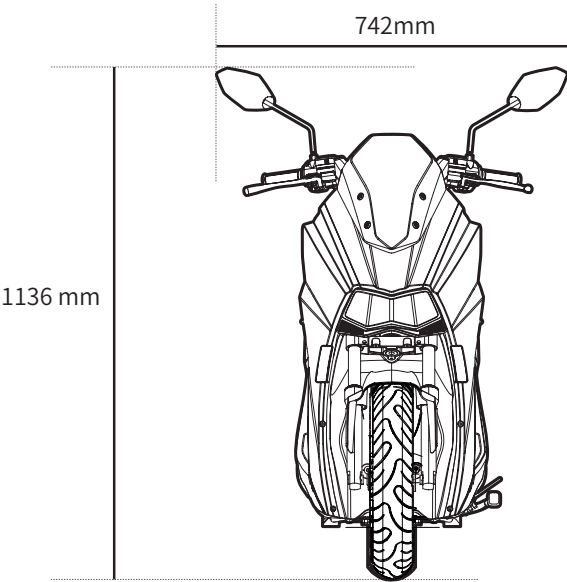
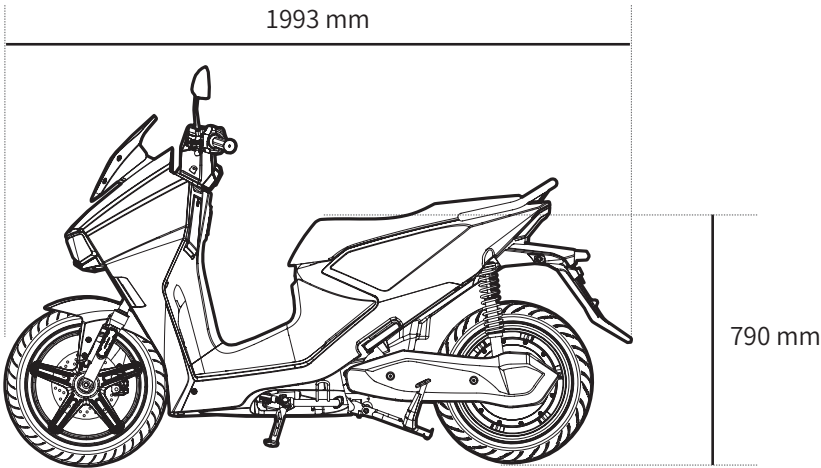
Do not clean your vehicle directly with a strong jet of water (e.g., high-pressure cleaner, etc.), which can cause faults or damage to mechanical and electrical components due to moisture.

Please refer to the more detailed information and instructions in the separate service and maintenance manual.

Secure storage of the vehicle

Please park the vehicle in a flat, solid, well-ventilated and dry place. Please avoid exposing the vehicle to weather conditions such as sunlight, rain/snow, etc. for long periods of time. If you park the vehicle for a longer period of time, please note the additional information in the service/maintenance booklet.

Technical data and dimensions



	SK1	SK1 Light
Motor type	DC hub motor	
Rated power	2.0 kW	0.8 kW
Max. power	3.0 kW	1.3 kW
Maximum speed	45 km/h	25 km/h
Range	max. 96 km (72 V 36 Ah)	max. 116 km (72 V 36 Ah)
Battery capacity	36 Ah	36 Ah
Battery type	Lithium battery	
Display	LCD	
Vehicle lighting system	LED	
Brake system	Disc brake	
Nominal battery voltage	72 V	
Standard charging current	8 A	
Battery charging time	approx. 4.5 h (36 Ah)	
Wheelbase	1360 mm	
Minimum ground clearance without load	155 mm	
Front wheel rim	MT 2.5×14	
Rear wheel rim	MT 3.0×14	
Front tyre size	100/80-14	
Rear tyre size	120/70-14	
Front brake system	Hydraulic disc brake system	
Rear brake system	Hydraulic disc brake system	
Vehicle length	1993 mm	
Width	742 mm	
Height	1136 mm	
Seat height	790 mm	
Empty weight without battery	85 kg	
Permissible total weight	270 kg	

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