SILENCE

URBAN ECOMOBILITY

S02

USER MANUAL

GENERAL CONTENTS

1.- GENERAL CHARACTERISTICS OF THE VEHICLE

0. GENERAL SPECIFICATIONS

Motor	Type	Specifications
Motor (maximum torque / maximum power) **Type** **Maximum speed** **Position**	161.4 Nm / 4 kW BRUSHLESS HUB MOTOR 13” 80 Km/h On wheel	Regenerative brake Motor brake Reverse speed **0** Emissions LED lighting

Battery specifications	2 kWh (Pack 1 only for L1e)			4 kWh (Pack 2)			6 kWh (Pack 3)		
Capacity	2.200 kWh 44 Ah			4.200 kWh 82.5 Ah			5.500 kWh 107.3 Ah		
Cell chemistry	Lithium-ion cells			Lithium-ion cells			Lithium-ion cells		
Weight	19.5 Kg			30.2 Kg			35.8 Kg		
Battery nominal voltage	48 V			48 V			48 V		
Charger Type	**On-board 600 W**			**On-board 600 W**			**On-board 600 W**		
Standard charging time	**3 hours 100%**			**6 hours 100%**			**8 hours 100%**		
Riding modes & maximums	**2 kWh (Pack 1)**			**4 kWh (Pack 2)**			**6 kWh (Pack 3)**		
Maximum speed	**E 25 km/h**	**C 40 km/h**	**S 45 km/h**	**E 45 km/h**	**C 60 km/h**	**S 80 km/h**	**E 45 km/h**	**C 60 km/h**	**S 80 km/h**
Maximum range	**E 65 km**	**C 45 km**	**E 40 km**	**E 120 km**	**C 90 km**	**E 80 km**	**E 180 km**	**C 130 km**	**E 110 km**

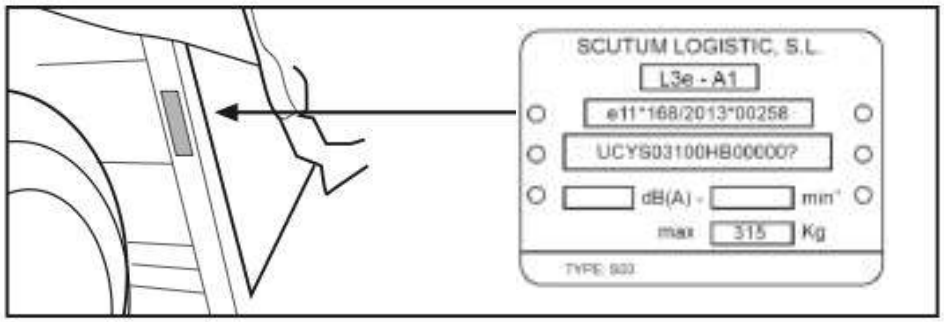
Frame	Specifications
Material	Steel
Vehicle dimension	1910x710x1260 mm
Wheel base	1482 mm
Height from ground	780 mm
Weight without battery	85 Kg
Weight in running order	127 kg
Maximum carrying capacity	188 Kg
Maximum laden mass	315 kg
General specifications	**Specifications**
Wheels	13”X3.5
Tyres	130/70-13
Front tyre pressure	2 bar
Rear tyre pressure	2.5 bar
Brakes	220 mm disc
Front / rear suspension	Hydraulic with 232 oil
Suspension	Front telescopic fork
	Accessories (optional)
	Tail boxes Document holder on leg guard Windshield Smartphone support and charger Factory remote connection Electronic data registers
	Safety
	Protection against short circuits. Protection against voltage dips and surges. Protection for low and high voltage. Protection against high temperatures of the engine, battery and controller.

1. VEHICLE IDENTIFICATION

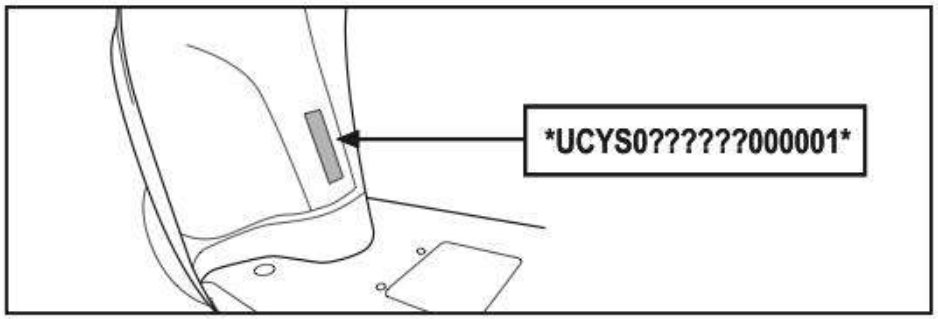
1.1 VIN - FRAME MARKING

The VIN is an alphanumeric 17-digit code which is used to identify your scooter. The VIN standard is established by the ISO laws. The VIN is required when ordering spare parts.

The VIN is stamped on the steering pipe, below the plastic cover. It is engraved directly on the frame.

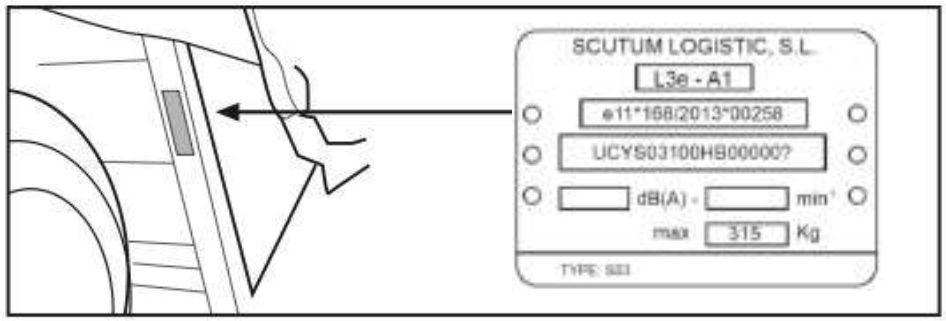


To access the VIN, remove the plastic cover.



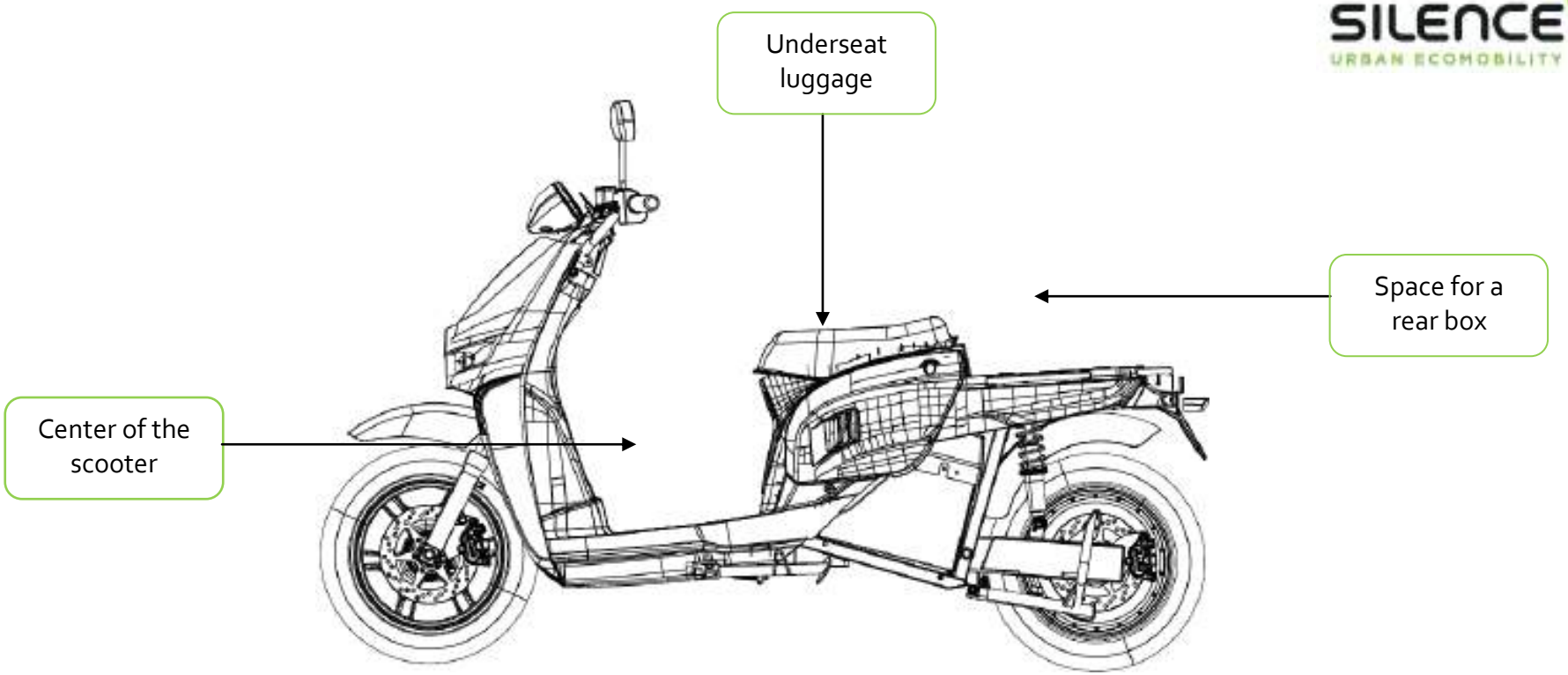
1.2 INFORMATIVE LABEL - PRODUCTION PLATE

This scooter has a label which displays the frame number, the maximum permitted noise level and the rpm.
The label is at the rear of the scooter, towards the right side, very close to the wheel.



1.3 MAXIMUM PERMITTED LOAD

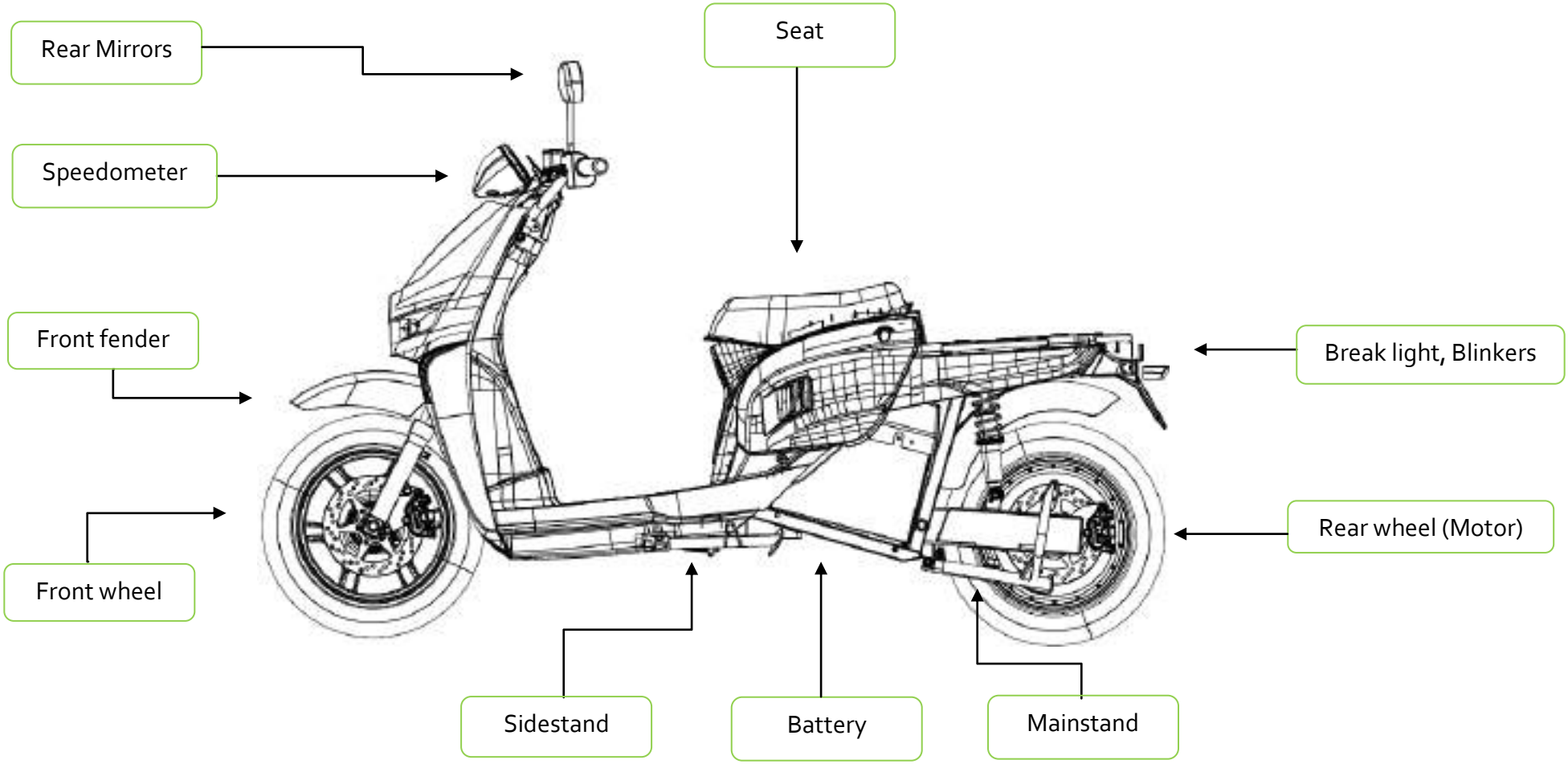
The maximum permitted weight of this scooter is 315 kg, including the rider and the maximum carrying capacity. This weight limit is shown in all the specifications tables.



Maximum Total Weight	315 kg.
Maximum Total Load	188 kg.
Maximum Load in Central Zone	Not Specified
Maximum Capacity in Under Seat Storage Compartment	3.7 Litres

2. GENERAL COMPONENTS

The general components of this scooter are:



2.1 MAIN STAND AND SIDE STAND

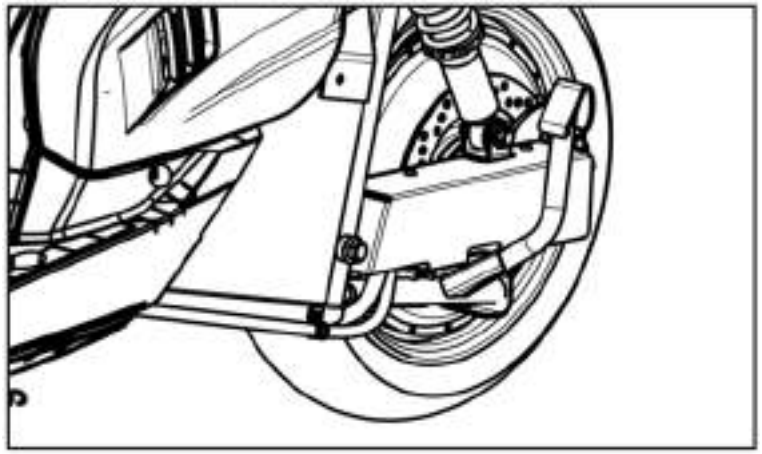
SIDE STAND

The side stand is on the left side of the scooter.
To use the side stand, push the bar downwards with your foot from the side support.
The side stand is used when the ground is too uneven, or sloped to use the main stand.

MAIN STAND

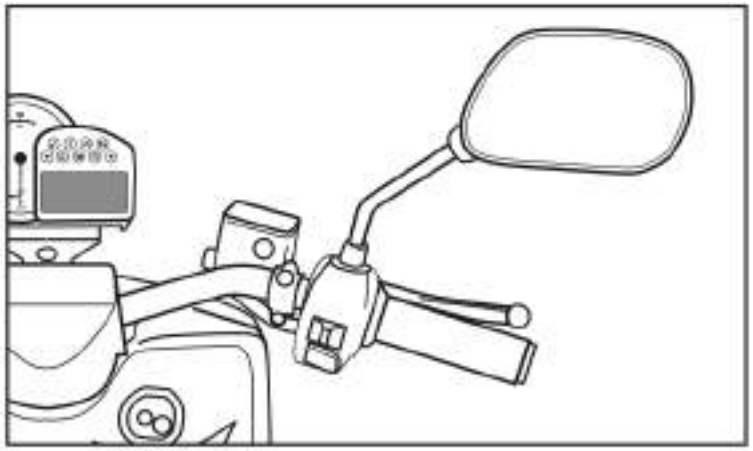
The main stand is underneath the scooter centre line.
This stand is used to keep the scooter in a vertical position.
To lower the stand, push the arm down with one foot while slowly pushing the scooter forwards and upwards.
The main stand is used when the ground is even and flat and when the scooter is going to be parked for a long period of time.

Both stands are reinforced at the fastening point in order to withstand intensive pressure throughout use.



2.2 MIRRORS

Before driving, make sure that the mirrors are correctly adjusted.
It is possible to adjust them just by moving the plastic part.



2.3 FUSE BOX

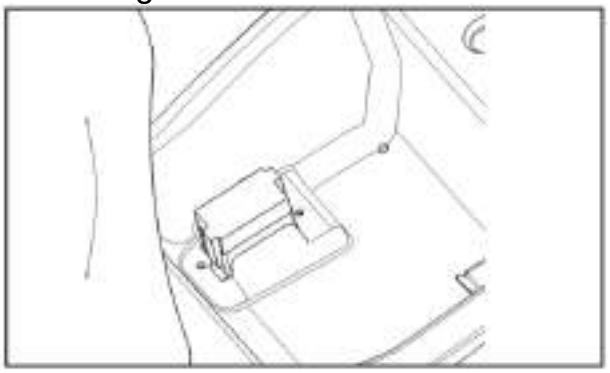
The fuse box is below a protective cover inside the under seat storage compartment. We have 4 fuses:

F1 (Black and in the front): 1 Ampere fuse that controls the lighter if the scooter has it.

F2 (Violet): 3 Ampere fuse that controls the lighting of the scooter.

F3 (Violet): 3 Ampere fuse that controls the DC/DC converter and the controller.

F4 (Blue and in the back): 15 Ampere fuse that controls the Charger.



**If any electronic anomalies are detected, please contact your official dealer.*

2.4 REAR WHEEL (MOTOR)

This scooter has a 100% electric motor on the rear wheel, with Brushless (HUB) technology with direct transmission and cooled by air.

It has a power of 4000 W and reaches a maximum speed of 80 km/h.

2.5 LIGHTS

All the lighting on the scooter is LED-based, including the dipped and main beam headlamps.

2.6 UNDER SEAT STORAGE COMPARTMENT

To open this compartment, insert the key in the lock and turn it clockwise, then pull the seat upwards.
To lock the seat, lower the seat and press down until it locks into the fitting.

The maximum carrying capacity in this compartment is 3.7 litres.

The power cable for charging the vehicle is also stored in this compartment.

2.7 TAIL BOX (optional)

This scooter has a platform suitable for fitting a tail box with different specifications. Scutum has a 200l Box that can be installed in the scooter.

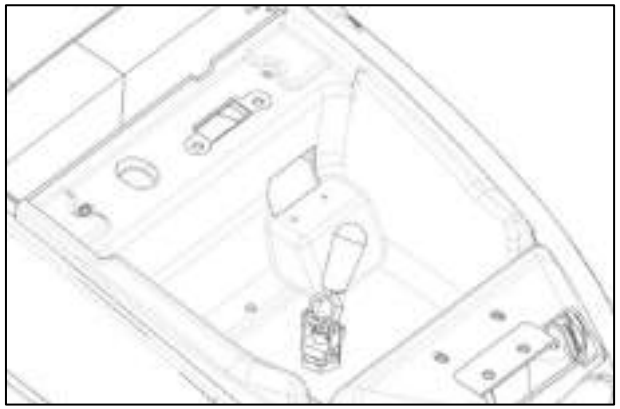
2.8 REMOVABLE BATTERY PACK

The S02 scooter has a version with a removable battery pack, the scooter has a cage in its central part where a compatible Battery Pack can be stored, the L3e version of the scooter (motorcycle) accepts both BP of 4 kWh and 6 kWh, while the L1e (MOPED) also accepts packs of 2 kWh, and this is due to the MOPED needing lower energy to function properly.

This cage facilitates the extraction of the BP so that it can be replaced easily with the special trolley.

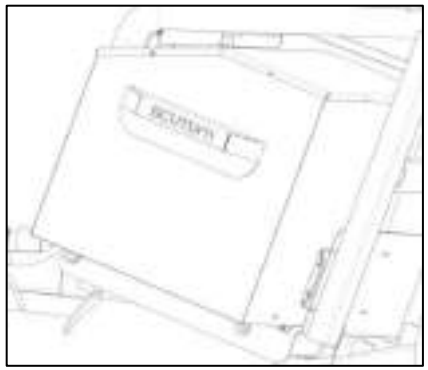
To withdraw the BP the 4 steps to follow are:

1. - With the ignition key, open the seat and move the lever 180 degrees to open the main lock.

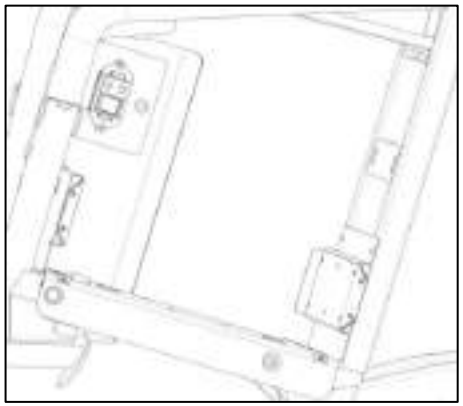


2. - Next we introduce the trolley with its pivots into the two holes of the frame in the central part of the scooter to unlock the BP.

3. - Once the two safety stops have been deactivated, we proceed to pull the handle to take the BP to the trolley.

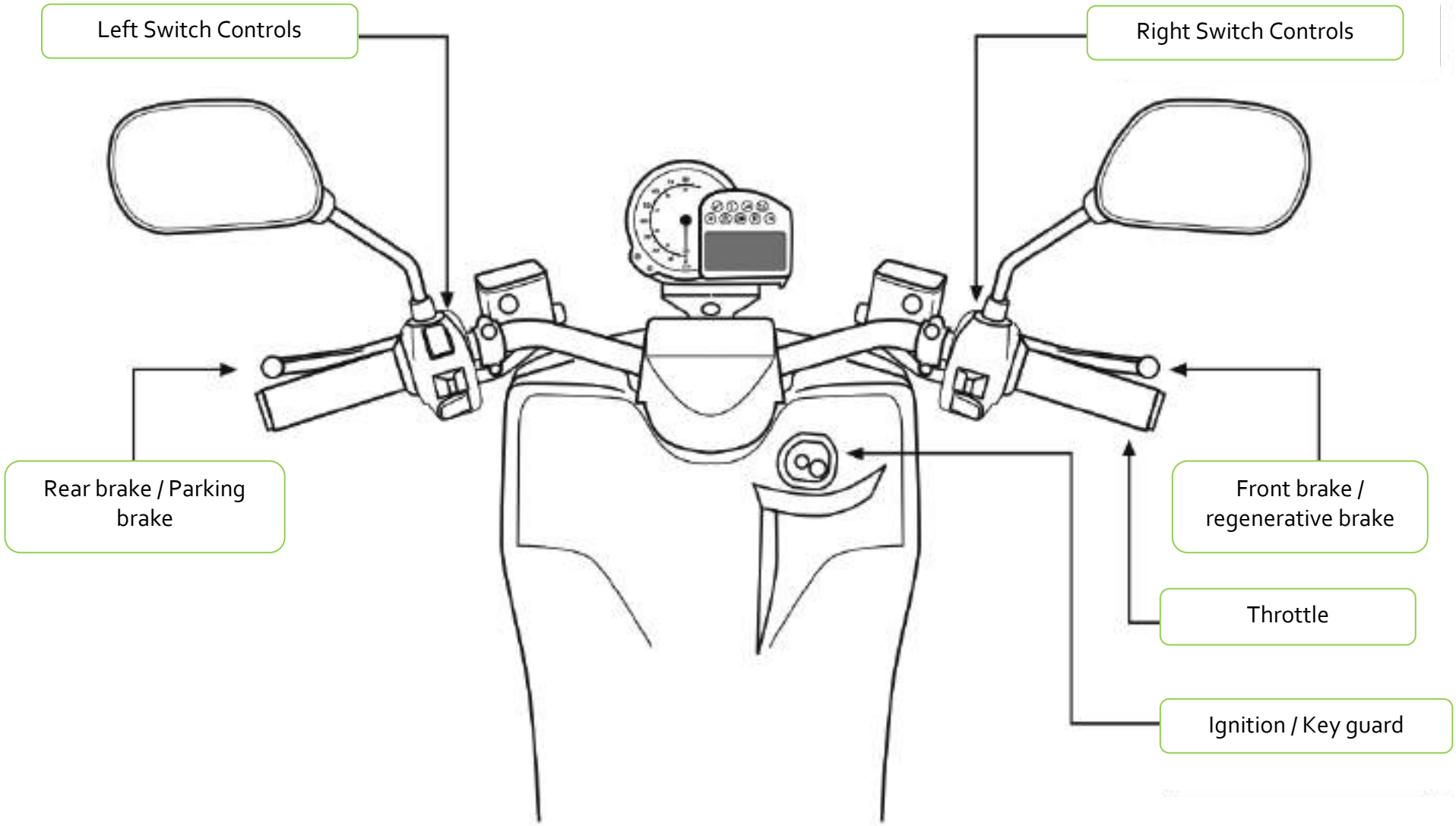


4. - Once removed, it can be deposited in another vehicle or in a charging station.



With this quick method the maximum possible operation of the vehicle is granted.

3. CONTROLS


Left Switch Controls
Right Switch Controls
Rear brake / Parking brake
Front brake / regenerative brake
Throttle
Ignition / Key guard

3.1 LEFT SWITCH CONTROLS

- **Light switch positions:**

o Position 1 **DIPPED BEAM HEADLAMP**

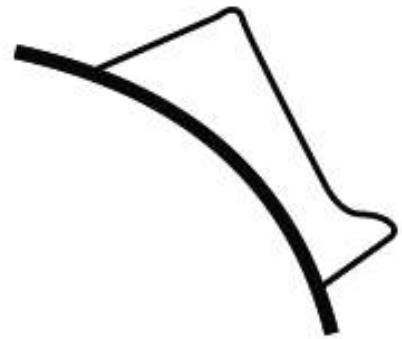
When the vehicle is switched on, the dipped lights come on by default (with the selector switch in position 1).

The blue light on the speedometer does not light up when the selector switch is in position 1.

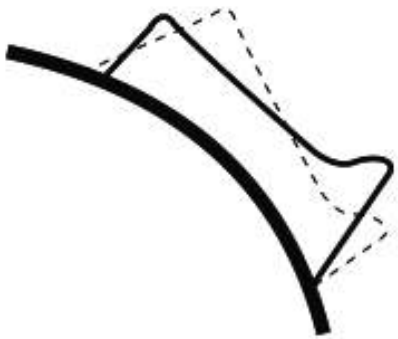
o Position 2 **MAIN BEAM HEADLAMP**

To switch on the main beam headlamp, press the upper part of the switch.

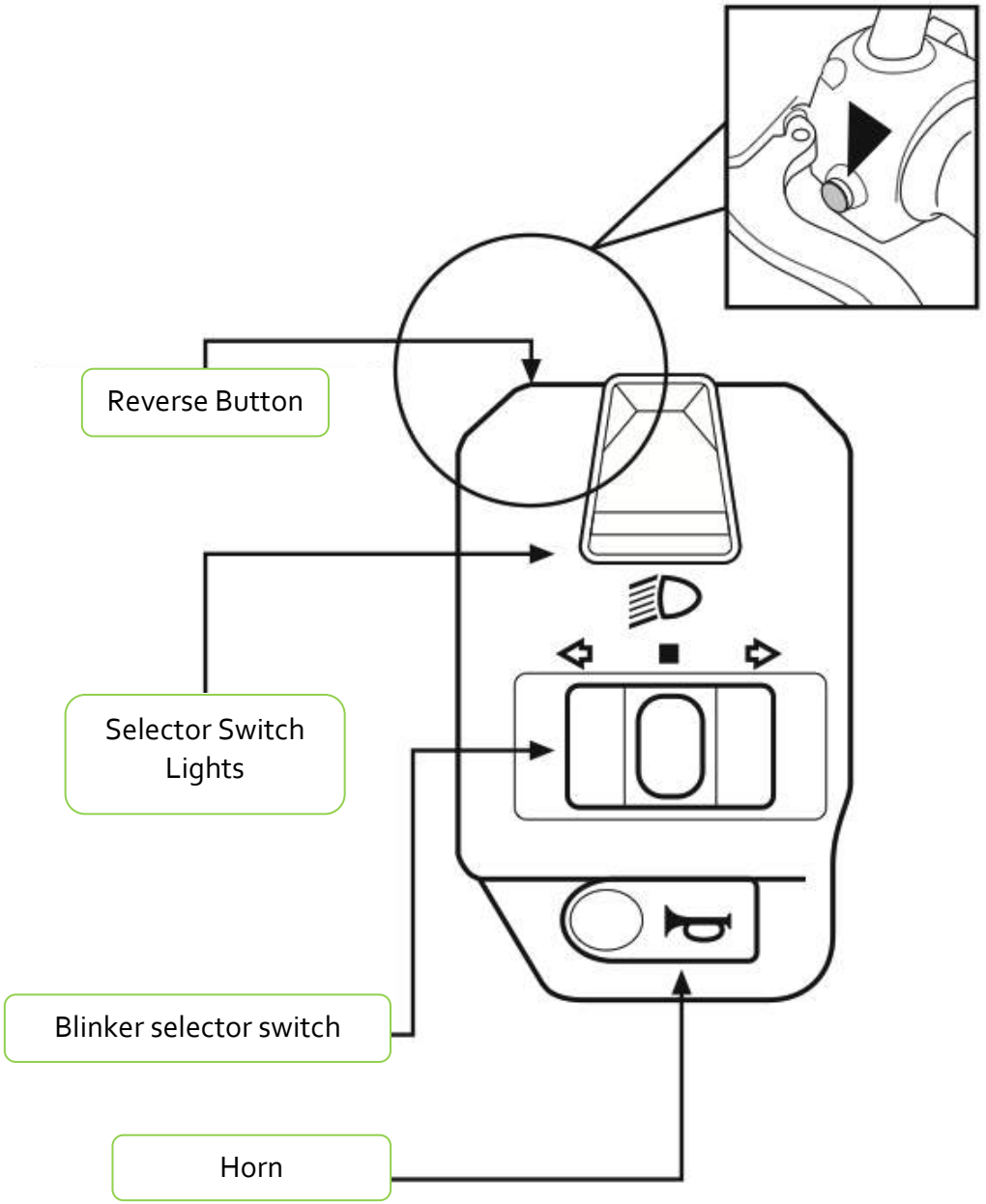
The blue light on the speedometer lights up when the selector switch is set to position 2.



Position 1



Position 2



- **Blinker selector switch.**

  To switch on the turn signal, move the switch to the right to indicate a turn to the right or move the switch to the left to indicate a turn to the left. Press the white central button to reset the position of the turn signal switch.

- **Horn.**

  Press the red button to sound the horn.

- **Reverse button.**

  This scooter has a reverse speed. To operate reverse speed, press and hold the button behind the left brake lever, and gently accelerate.

  Proceed with caution, especially the first time. This operation helps to maneuver the scooter when parking or when reversing out of a parking space.

3.2 COMBINED BRAKE AND REGENERATIVE BRAKE

This scooter is fitted with a combined brake system that operates as follows:

The right brake (mechanically) brakes the front wheel and activates the regenerative brake (electronically) of the rear wheel, while the left brake brakes (mechanically) both the front and back wheels.

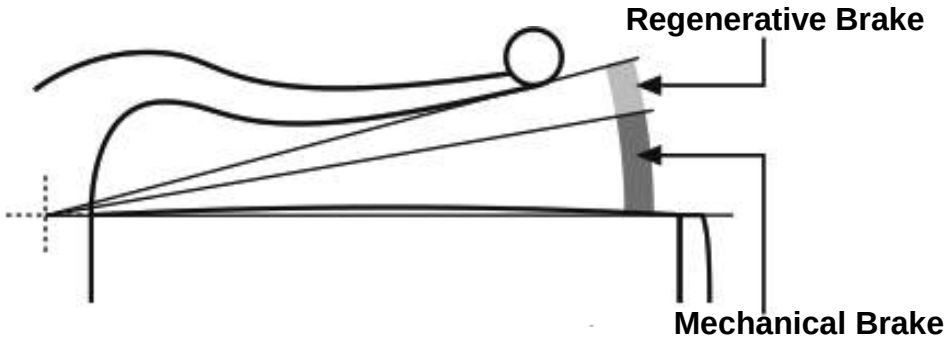
The regenerative brake has its own control on the right brake lever, allowing it to be used without activating the mechanical brake.

How to brake using the regenerative brake:

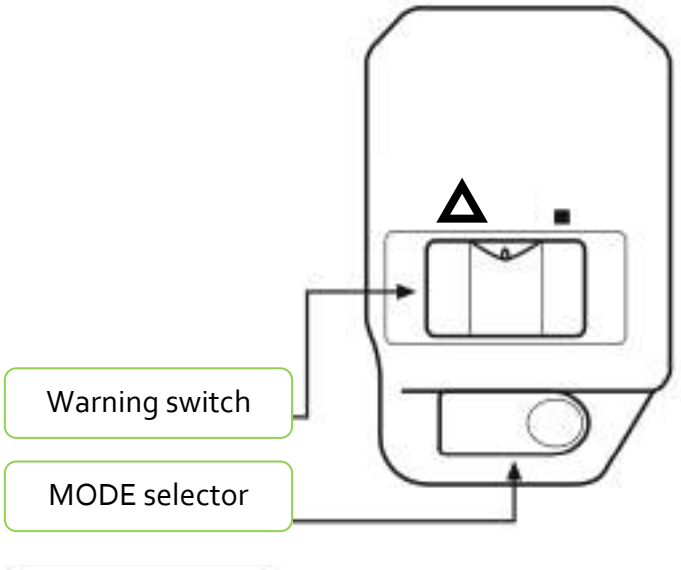
- Press the first part of the front brake lever (right) to activate the regenerative brake.
  This system electronically brakes the rear wheel and regenerates energy to the battery.
- If you continue pressing the brake lever, the front wheel brake is activated; the greater the pressure the greater the force of the mechanical braking.

Braking with the regenerative brake helps the braking and it also helps to keep the battery charged.

The force of the regenerative brake depends on the mode selected (**Eco** (without regenerative), **City** (with regenerative), **Sport** (with much regenerative)).



3.3 RIGHT SWITCH CONTROLS



- **Throttle**
  Turn the accelerator downwards to accelerate.
  Release the throttle to return to a neutral position.

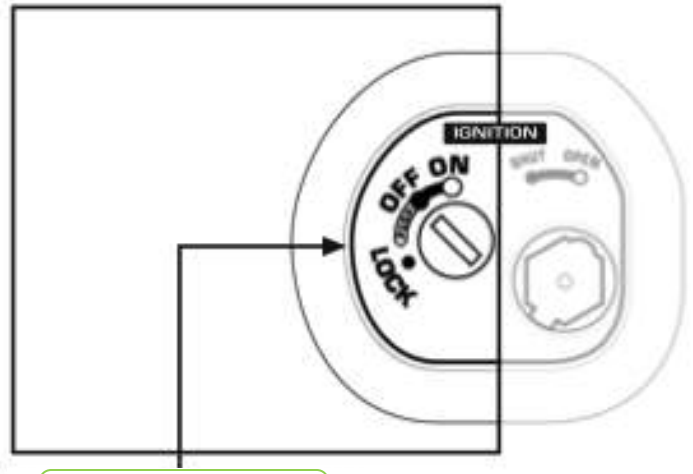
- **Warning switch**
  Right position - All lights off, default setting.
  Left position - Warning signal
  4 turn signals operating

- **Riding mode selector switch. “MODE”**
  This Scooter has three different riding modes:
  Press once to change between the ECO, CITY or SPORT modes.
  CITY “C”: The vehicle is designed to operate normally in CITY “C” mode, giving the vehicle a good performance level and a more balanced consumption.
  SPORT “S”: This riding mode offers greater power and speed in specific cases. Frequent use of the SPORT mode reduces the scooter’s range (total range in Km with load), due to the increased power consumption, and may also result in overheating of the engine/battery, leading to reduced performance or the disconnection of the scooter.
  ECO “E”: this mode offers a more relaxed style of riding, with limited speed and acceleration. The speed is limited to 45km/h. This mode extends the vehicle’s operating range.
  The **MODE** button is also used as the start button. To start the vehicle the MODE button should be held pressed down for 1 second after switching on the scooter. To confirm that the vehicle is started, the word **READY** is displayed on the screen, an acoustic signal is heard and the green LED on the speedometer lights up.

3.4 IGNITION SWITCH

Selector switch positions

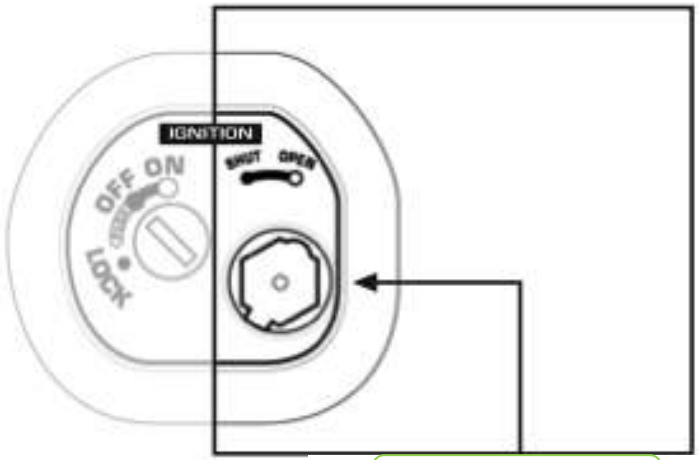
- **STEERING LOCKED**
  Turn the handlebar to the left as far as possible.
  Insert the key and turn anti-clockwise.
  All the functions are deactivated.
  The Scooter has very limited movement.
- **OFF / STEERING UNLOCKED**
  All the functions are deactivated.
  The steering lock is not activated.
  The Scooter can be moved.
  It is possible to work on the motorcycle in safety.
- **IGNITION**
  All functions are ready for use.
  The Scooter is ready to be ridden if the MODE button is held down for one second, READY is displayed on the speedometer and a green LED lights up.
  In this position, the key cannot be removed.



Ignition Switch

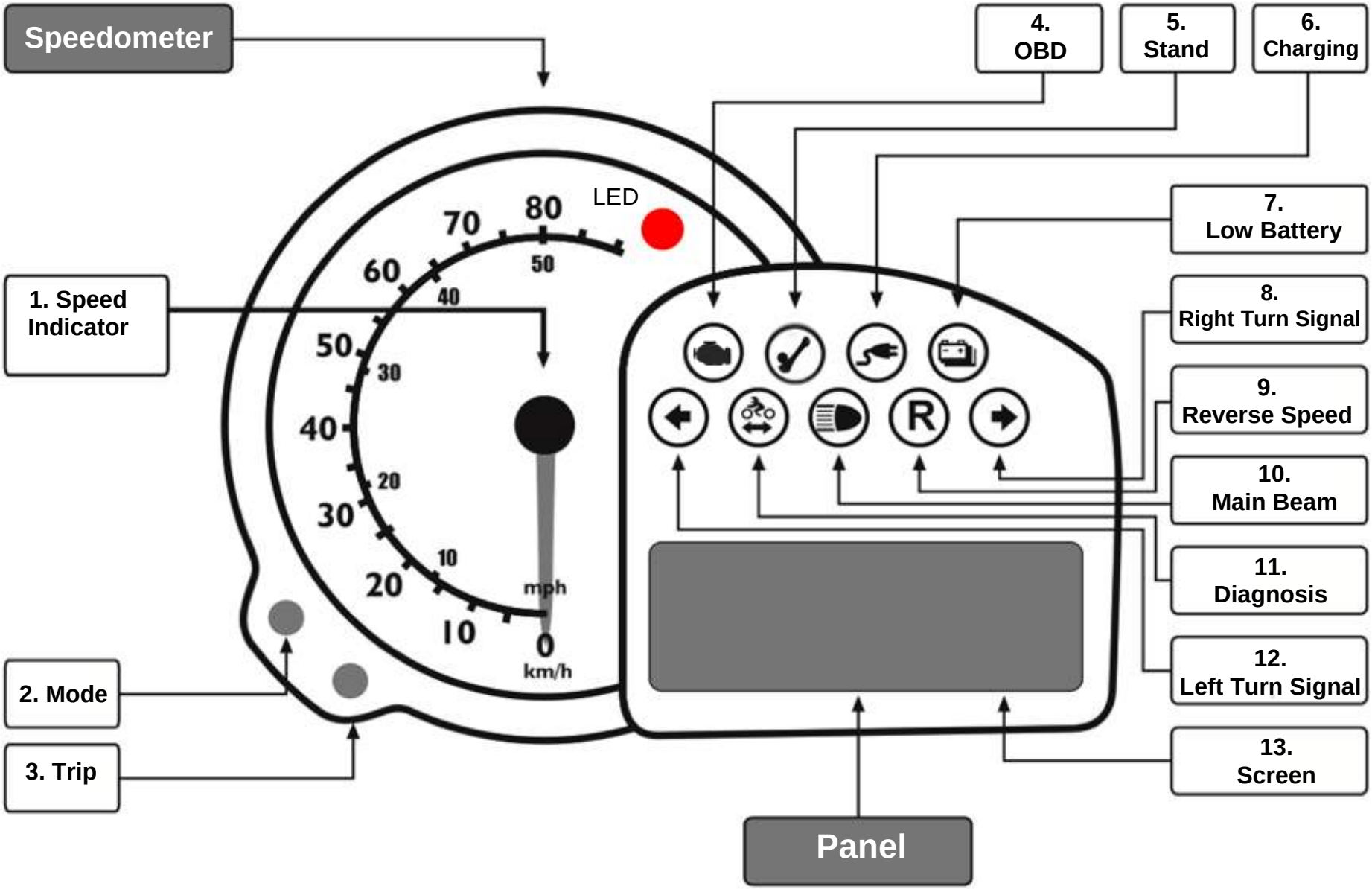
3.5 KEY GUARD

- **CLOSED**
  Place the interior side section of the key in the groove.
  Turn anticlockwise to protect the switch.
- **OPEN**
  Turn clockwise to open and then it is possible to access the ignition key.



Key guard

4. INSTRUMENT PANEL



4.1 SPEEDOMETER

1.- SPEED INDICATOR

Indicates current speed. This can be read in kilometers per hour or in miles per hour.

Red Led – High and low temperature indicator.
If the red led is ***flashing*** it means that the scooter detects a lower/higher temperature than the one is necessary for working in optimal conditions.
If it is ***fixed*****,** it means critical temperature.
- Low temperature: the battery won't work in optimal conditions; put it on charge to heat it.
- High temperature: this is due to an extensive use, please don't use Sport mode, and Stop if necessary to cool battery.

2.- MODE BUTTON

Functions that can be selected with the speedometer MODE button:
AVG - Average speed of the TRIP selected (TRIP1 or TRIP2)
TIME - Duration of the partial selected (TRIP1 or TRIP2) in the format hh: mm: ss.
ODO - odometer (Km indicator)
Temp. B: temperature of Battery Pack
Temp. E: Engine temperature
Temp. C: Controller temperature
All temperatures are given in centigrade degrees.

3.- PARTIAL BUTTON

There are 2 different modes. Press the button to change between T1 and T2. The user can restore the trip values by pressing the button for at least 2 seconds.
TRIP1: The value is deleted each time the engine is switched off (up to 999.9 km).
TRIP2: Deleted only by the user (up to 999.9 km).

To change the hour of the clock you have to see in the display ODO (press MODE until it appears), then press MODE and TRIP simultaneously until the first number starts to blink. Pressing the MODE button will increase its value and maintaining it will change to minutes.

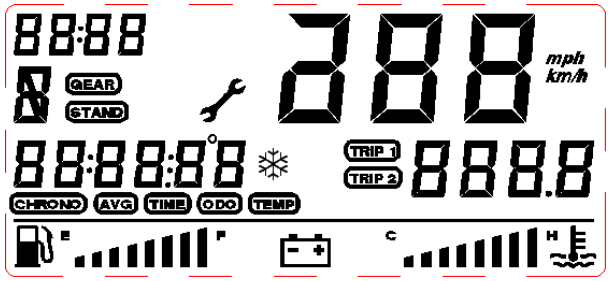
Km to Miles change- press the MODE button until you see ODO, then press it for 10 seconds to change from km to miles or vice versa.

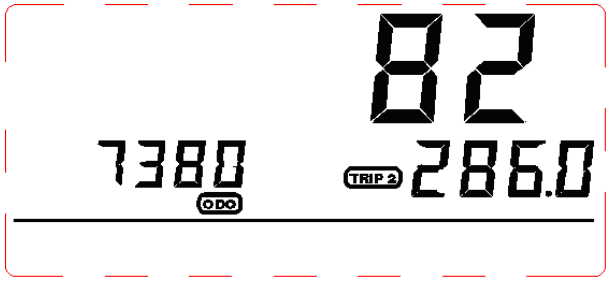
4.2 PANEL

4. - LED – Yellow, when the scooter detects any problem related with the motor (OBD).
5. - LED - Red, when the side stand is open.
6. - LED - Yellow, when the scooter is charging.
7. - LED - Yellow, low battery, it is on when the SoC is less than 25%. When you put the scooter to charge this LED will start blinking, once it stops the scooter is charging properly. If it keeps blinking the system may have a problem.
8. - LED - Green when indicating a right turn.
9. - LED - Yellow, reverse speed in use.
10. - LED - Blue, indicates main beam on.
11. - LED – Green, indicates correct engine operation.
12. - LED – Green, when indicating a left turn.
.

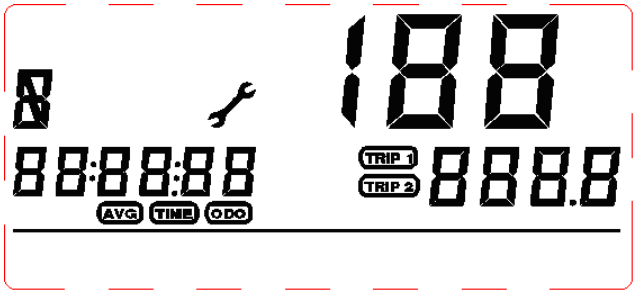
5. DISPLAY

This displays the true operation of all the segments.

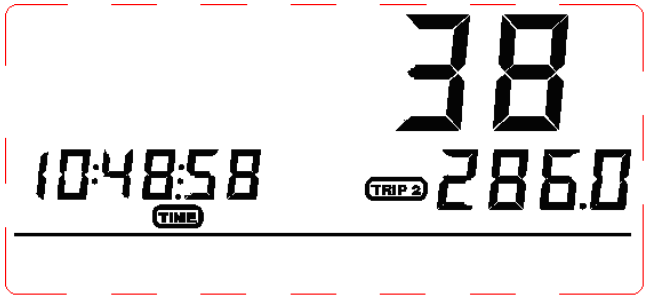




Different screen views are possible: Odometer (7380), TRIP 2 (286.0) and the battery charge level (82%).



This displays the true operation of all the segments of the screen (as in the figure above, but with other data).



Operating time (10 h: 48 m: 48s) and the current battery charge level (38%)

5.1 MAP OF THE ELECTRIC MOTOR

This displays the selected map of the electric motor.

Screen Map

E	**Eco**
C	**City**
S	**Sport**

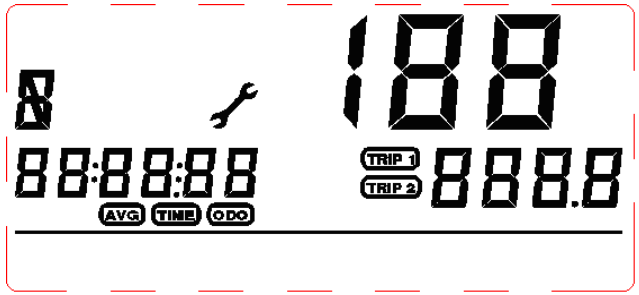
v.2 Displays ECO map

5.2 SERVICE

A wrench (see image) will be displayed on the screen when the scooter is on if the maintenance has to be done:

Service Km.

1st	**1500**
2nd	**5000**
3rd	**10000**



Read the maintenance section in the manual for further information.

5.3 READY AND BATTERY, MOTOR AND CONTROLLER TEMPERATURES

When the vehicle key is in the ignition and the MODE button is held down for 1 second, the message READY is displayed on the screen and the green **controller** LED is lit.

Vehicle temperatures displayed on the speedometer together with the high temperature warning (**Red LED**). This warning flashes when the component reaches a temperature close to the non-optimum operating temperature. When the LED remains lit this indicates that the temperature is not suitable for operation, in parenthesis you will see the first and the second threshold in ºC:

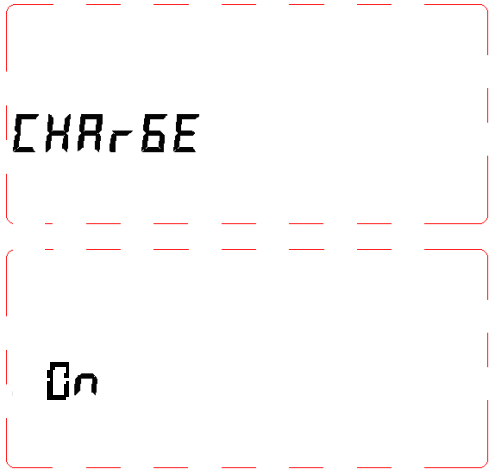
Battery pack temperature (b). (50; 55)

Engine temperature (E). (110; 120)

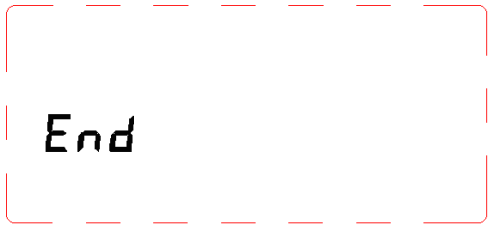
Controller temperature (C). (80; 90)

5.4 VEHICLE CHARGE INDICATOR

When the vehicle is connected to the power supply, the words **On Charge** are displayed on the screen together with the battery percentage. To check if the vehicle is charging properly the Low battery voltage LED does not have to be blinking.

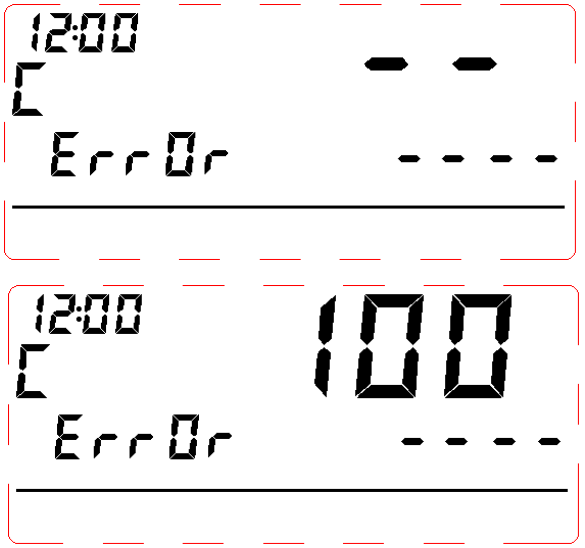


When the vehicle has finished charging, the words **Charge Ended** are displayed on the screen together with the percentage, which is 100%.



5.5 SPEEDOMETER ERRORS

When the speedometer detects a problem in the communication with the vehicle, an error message is displayed. The official service has to be able to locate the malfunction and repair it.



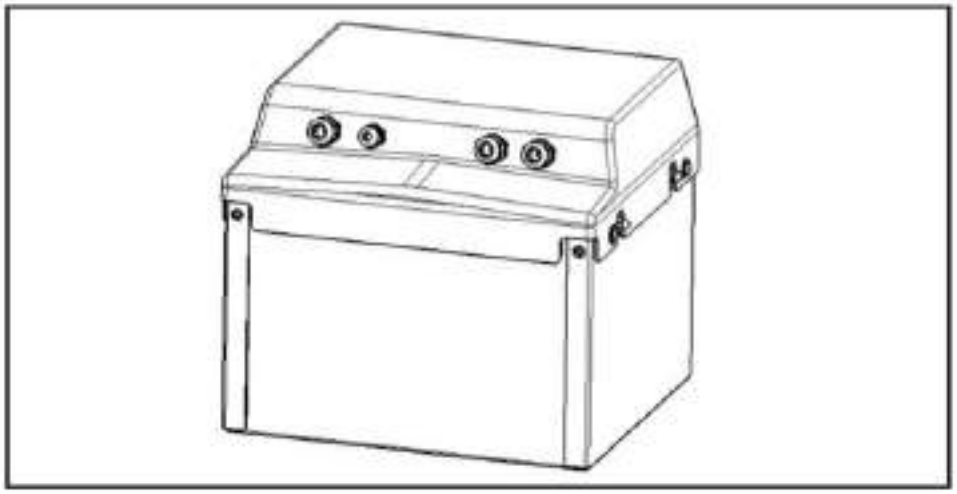
2.- TECHNICAL SPECIFICATIONS OF THE BATTERY AND CHARGER

1. **DESCRIPTION OF THE BATTERY**
2. **TEMPERATURE**
3. **CONNECTING THE CHARGING UNIT**
4. **HOW THE TEMPERATURE AFFECTS THE PERFORMANCE OF THE SCOOTER**
5. **LOW TEMPERATURE LIMITS**
   - 5.1 DISCHARGING
   - 5.2 CHARGING
   - 5.3 BATTERY CHARGE INDICATOR IN %
6. **RANGE**
7. **BATTERY WARNINGS**
   - 7.1 FIRST AID MEASURES
   - 7.2 FIRE PROTECTION MEASURES
8. **CHARGER**
9. **CONTROL SYSTEM**

1. DESCRIPTION OF THE BATTERY

The battery pack consists of a box below the frame, under the seat.

Only the factory is authorized and able to resolve problems regarding the battery.



Good care of your battery is essential to obtain maximum performance from your scooter. The battery has a nominal voltage of 48 volts DC which, if not respected, may result in severe injury.

The battery must be kept within the operating temperature limits specified.

The battery requires charging. It should be connected when it is convenient to do so. This is known as convenience charging.

IMPORTANT!!

A full charge must be done every 30 days to maintain the warranty

Warning: Never open the battery pack. This may be dangerous and will void the warranty.

Only the original charger may be used, otherwise the warranty will be voided.

It is possible that the battery charge indicator no longer reflects the true charge. This is due to a memory loss and indicates that a new synchronization is required. To proceed with this process a full charge and a full discharge is needed.
Please ask your authorized dealer if the problem persists.

NOTE There is no risk of the scooter starting up while it is charging, as when it is connected to the power supply, the engine is automatically disconnected.

NOTE This information will help to improve the performance of the motorcycle and extend the useful life of your scooter.

Regular use of the scooter, charging and discharging the battery, will allow the system to manage the battery (the most important element in the scooter) in the best possible way.

The battery pack always uses a small amount of energy due to the electronic control which is always connected to maintain the security of the unit. Therefore, care of the unit will help to extend its useful life and regulate the drop in capacity due to the useful life of the lithium batteries.

The charging process is necessary to regulate the performance of the battery over the long term, and also in periods of reduced use.

NOTE Leaving the battery uncharged for long periods may damage the battery operation.

To increase the battery safety the chemical used is NMC, which guarantees optimum performance, a high number of life cycles in comparison with other chemicals and greater stability above high limits of operating conditions.

Batteries of this nature have a nominal voltage of 3.65 V. To create this battery, A18650 model cells are necessary, connected by welding between series and parallels.

Within the battery pack, a sophisticated battery monitoring system controls the state of the cell series at all times. In the event that there is a problem on the Battery Pack, it is not possible to access to the Battery Management System (BMS).

2. TEMPERATURE

The scooter has a system which controls the voltage and temperature stability. To avoid critical situations, the safety systems limit the use of the battery if the cell temperature exceeds the safety limits in the event of overheating.
The battery operating temperature range is **between -10º and 55ºC**.
The performance of the lithium cells may vary, depending on the temperature.
The charger does not charge the battery if the temperature of the cells is **below 5ºC or above 55ºC**.
To heat the battery so it can charge, reaching the 5ºC threshold from negative temperatures, we have a heater on the bottom of the Battery Pack that operates form negative temperatures to 15 ºC

3. CONNECTING THE CHARGING UNIT

Connect the unit in the order specified as follows.

1.- Open the seat with the key.
2.- Connect the charger to the power supply.

This scooter is supplied with an “On board” charger, therefore it is only necessary to plug the cable into the plug.

EXAMPLE 4kWh PACK:

0-90% **600 W** **Approx. 5 h**

The charging process can be stopped at any moment.
It is important to make complete charges at least once every 3 or 4 partial charges.

4. HOW TEMPERATURE AFFECTS THE PERFORMANCE OF THE MOTORCYCLE

(Example of 3 kWh battery)

EVOLUTION OF TEMPERATURE AND SPEED ACCORDING TO THE DISTANCE TRAVELLED

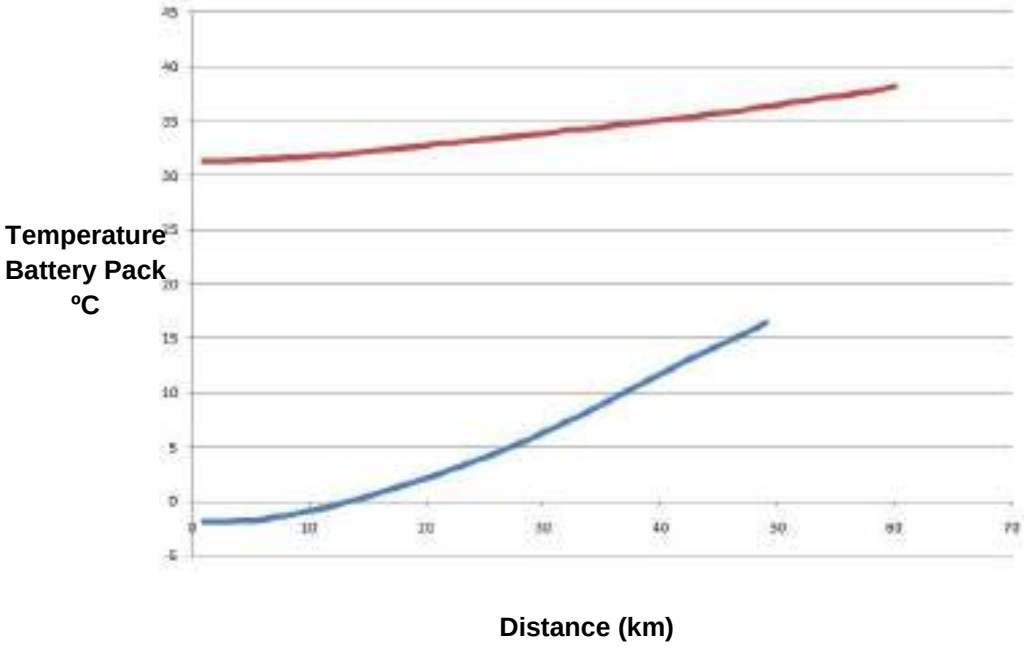
Conditions:
Weight of rider 75 kg
Straight road
No wind
Same motorcycle and battery
3 kWh battery pack

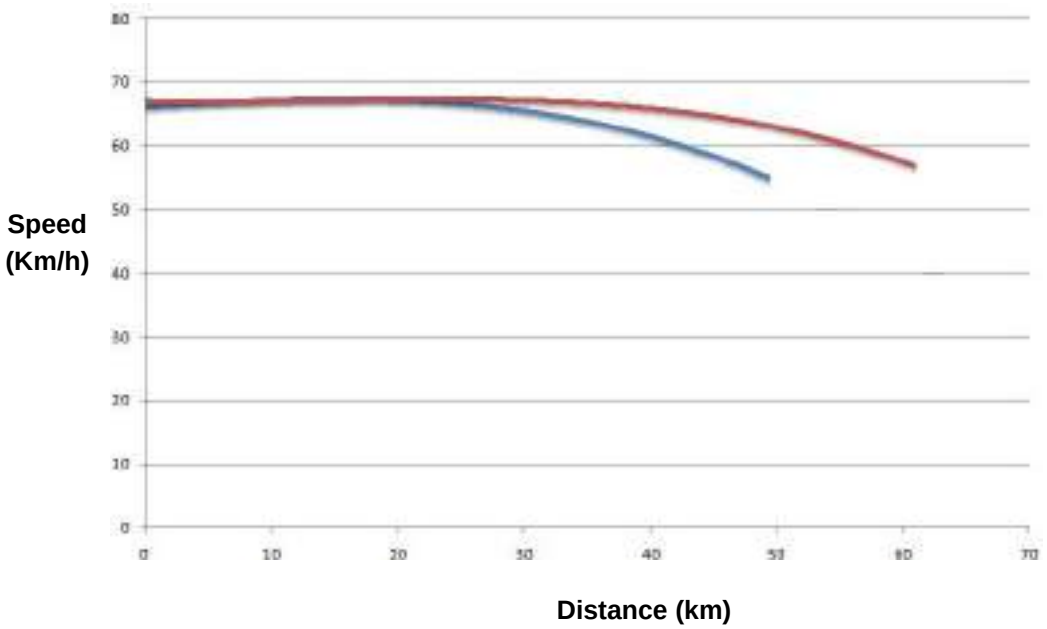
Blue graph (Cold)

Ambient temperature -10 ºC
Battery Pack Initial temperature -2 ºC

Red Graph (Hot)

Ambient temperature 20 ºC
Battery Pack Initial temperature 31 ºC





Cold Hot

The same motorcycle in high temperatures travels more than 60 km while in low temperatures it travels only approximately 50 km with reduced energy.

5. LOW TEMPERATURE LIMITS

5.1 DISCHARGING

• The scooter cannot be used when the internal temperature of the Battery Pack is lower than -10 ºC.

• If the above condition is observed (less than -10 ºC), the scooter should not be used until the internal temperature of the battery reaches higher temperatures.

5.2 CHARGING

• The battery packs include a heater for the batteries which only operates if the scooter is connected to the power supply. Therefore, we recommend, in the event of low temperatures, that the scooter is left connected to the power supply, so that the vehicle is charging and the batteries are maintained at the correct temperature level for normal riding.

• If the initial temperature is below 5 ºC, the scooter will not accept charging until the temperature inside the battery reaches 5 ºC (or higher), the heater will turn off at 15ºC.

5.3 BATTERY CHARGE INDICATOR IN %

• In order to obtain the vehicle energy reading (% charge) as accurately as possible, it is necessary to charge the battery to 100% (at least every 3 or 4 partial charges).

6. RANGE

	Speed/ Range		Speed/ Range		Speed/ Range
2 kWh	25 Km/h - 65 km 40 km/h - 45 km 45 km/h - 40 km	**4 kWh**	45 kmh - 120 km 60 km/h - 90 km 75 km/h - 80 km	**6 kWh**	45 km/h - 180 km 55 km/h - 130 km 75 km/h - 110 km

With a standard riding style in the city, the average range obtained for a 4 kWh battery pack varies between approximately 75 and 80 km. It is important, especially at the beginning, to use a safe and gentle style of riding, while you discover how the motorcycle responds in different situations. This is especially true for those who use the vehicle for medium-length distances, who will need to know whether they may have problems with the range in the distance travelled. Riders should be aware that changes in the weight of the motorcycle, tyre pressure, or unfavourable weather conditions, including wind, may reduce the range of the vehicle. The greater the forces to be overcome, the lower the range.

One of the most important parameters in the use of electric vehicles is the range, defined as the distance that can be travelled on one complete charge of the battery.
Depending on the usage made of the scooter, the life of the engine can be extended by considering a few standard factors in a vehicle of this nature. As with any motorised vehicle, the benefits vary with the style of riding. A conservative riding style will increase the range.
It is extremely difficult to define a standard distance for the range, as there are an infinite number of riding styles. Riding through typical city streets, with stops and starts and the extra acceleration and braking involved will also affect the range of the motorcycle.
We have studied a standard method that may serve as a guideline for estimating the range. These tests have been performed during the dynamometer test and on the road, considering an acceleration, constant speed and stop at the end in the test. Obviously the general conditions are not real-life conditions, but they help to define the product.
The test conditions involved a rider weighing 80 kg, no load and a flat surface.

7. BATTERY WARNINGS

WARNING

NEVER OPEN THE BATTERY BOX

THIS MAY BE HIGHLY DANGEROUS AND WILL TOTALLY VOID THE WARRANTY.

ONLY AUTHORISED PERSONNEL MAY WORK ON THE BATTERY BOX.

IN THE EVENT THAT SMOKE STARTS TO ESCAPE FROM THE BATTERY, IT IS ESSENTIAL TO URGENTLY CALL THE FIRE BRIGADE (DANGER OF DEATH) AND REMOVE IT FROM THE ENCLOSED SPACE IN WHICH IT IS LOCATED.

THE VEHICLE CANNOT EXPLODE, SO THERE IS NO PROBLEM IN TRANSPORTING IT TO A SAFE LOCATION.

WARNING

To prevent injuries, burns or electric shocks:

- Never dismount the battery unit or remove its caps. Only authorised personnel are permitted to do so.
- Keep children away from this part of the scooter.
- Do not perforate or knock this zone when using hoists, expose to flames, incinerate, or expose to fluids, as the generation of excess heat may lead to fire which could be dangerous.

Qualified Authorised Personnel

The workshop manual must be read before repairing or replacing the battery

Information Regarding Battery Recycling

The battery should be carried as stipulated in the applicable legislation.
Consult an authorised dealer or your technical service before replacing or disposing of the battery

In normal conditions of use, the material used in the electrodes and the solid-liquid electrolytes are not reactive provided that the battery remains intact and the seals are untouched. There is a risk of fire only in the event of abuse (mechanical, thermal, electric). Electrolyte leakage, electrode materials react with humidity / water or ventilation / fire of the battery may occur, depending on the circumstances.

7.1 FIRST AID MEASURES

In the event of a broken battery, smoke or a fire, personnel should be evacuated from the contaminated zone and the area ventilated as much as possible to eliminate the fumes / gases. In all cases, seek medical attention.

1.- Eye contact: Flush with plenty of water (with eyelids open) for at least 10 minutes.

2.- Skin contact: Remove contaminated clothing and flush affected areas with plenty of soap and water for at least 15 minutes. Do not apply oils or creams.

3.- Ingestion: Dilute by giving plenty of water and seek medical attention immediately. Make sure that the victim does not breathe in vomit due to the use of postural drainage. Make sure that mucus does not block the airways. Do not administer anything orally if the patient is unconscious.

4.- Inhalation: Remove to fresh air and ventilate the contaminated area. Administer oxygen or artificial respiration if necessary.

7.2 FIRE PROTECTION MEASURES

Fire-fighting resources:

1.- The following can be used: Type D, CO2, dry chemical extinguishers.

2.- Specific risks: reheating of cells due to external source or undue use. This may result in electrolyte leakage or the break of the battery container, with the resultant release of the interior component / material to the environment.

3.- Contact with eyes: The electrolyte solution contained in the battery may irritate eye tissue.

4.- Contact with skin: The electrolyte solution contained in the battery may irritate the skin.

5.- Ingestion: Ingestion of the electrolyte solution causes tissue damage to the throat and gastro-respiratory tract.

6.- Inhalation: A battery leak may cause injury of the respiratory tract, mucus, irritation of the membranes and edema.

7.- Special protection: self-contained breathing apparatus to prevent inhalation of irritating vapours. Use protective equipment and clothing to prevent the electrolyte solution from coming into contact with the body.

8. CHARGER

The scooter has a control system able to automatically switch off when the battery reaches 100% charge.

It has a power of 600 W and is able to withstand 1000 charging cycles.

The charger is protected with an IP 67, and is totally waterproof.

It has a high level of efficiency: 96%

It is able to function in exterior temperatures above 50 ºC and below -15 ºC.

Overvoltage and overcurrent protections

Convection cooled

The charger can be connected to any power supply up to 300 V with a Schuko type connector.

9. BATTERY MANAGEMENT SYSTEM (BMS)

This scooter has a battery monitoring system which controls parameters such as temperature and voltage. It has an important function in balancing the individual load and the set of each series of cells.

The system is also responsible for reporting the charge status and establishing the charge and discharge current settings. In addition, there is also an action plan in the event of a faulty battery state.

The scooter has a control technology for the charging and discharging of the cells.

Discharging: if the temperature of the cells, due to inadequate use reaches temperatures higher than 55 ºC, the vehicle is automatically switched off for reasons of safety

Charging: if the battery cells are at a temperature of 55 ºC, the charger will not start to operate until the cell temperature is lowered.

If, on connecting the charger to the power supply, the cells are at a temperature below 5 ºC, the heater is automatically connected and the cells are heated to a temperature of 15 ºC. The heater acts automatically, heating the batteries to allow them to be charged.

3.- MAINTENANCE PROGRAM

1. **OPERATIONS AND FREQUENCY**

2. **CHECKS**
   - 2.1 CHARGE LEVEL
   - 2.2 LIGHTS AND TURN SIGNALS
   - 2.3 STANDS
   - 2.4 TYRES
   - 2.5 BRAKE FLUID
   - 2.6 FRONT BRAKE
   - 2.7 REAR BRAKE
   - 2.8 BRAKE LINES
   - 2.9 BRAKE LEVER

3. **TROUBLESHOOTING**

4. **INCORRECT OPERATION MESSAGES VIA LED**

5. **CLEANING AND STORAGE**
   - 5.1 CLEANING
   - 5.2 STORAGE

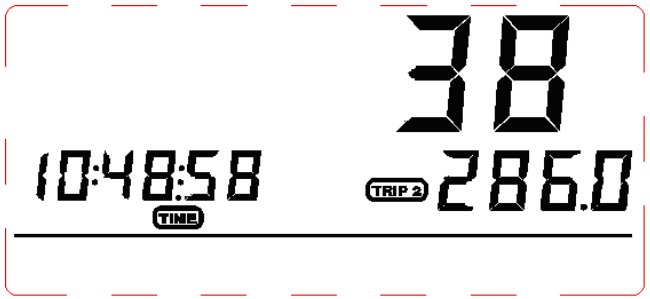
1. OPERATIONS AND FREQUENCY

Zone	What should be done.	Frequency
Painted parts	Clean with shine restoration product	Every month.
Rubber parts	Clean with special rubber protection products.	Every month.
Aluminium parts	Clean with protective spray to prevent oxidisation. Carefully remove any oxidisation spots on the aluminium using a suitable steel wool and soap.	Every week.
Metal parts	Use oil to clean and lubricate metal parts.	Every month.
Seat	Clean with a soft sponge to remove insects or dirt.	Every day.
Instrument Panel	Clean encrusted dirt with a soft sponge.	Depends on level of dirt
Tyres	Check that the pressure is between 1.8 and 2.5 bar.	Every week.
Lights	Clean encrusted dirt with a soft sponge.	Depends on level of dirt
Screen	Clean with a soft sponge to remove insects or dirt.	Every day.

2. CHECKS

2.1 CHARGE LEVEL

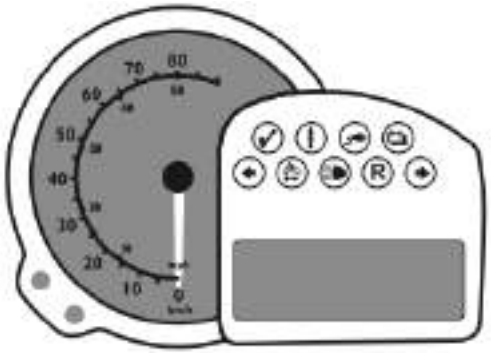
Check the charge level on the LCD screen. If the level is too low, the batteries should be recharged before using the scooter.



2.2 LIGHTS AND TURN SIGNALS

Replace the part if it does not work or is damaged before riding the scooter.

When the speedometer indicator lights do not operate correctly, they flash faster indicating a problem.



2.3 STANDS

Check that both the main and side stands are raised.

2.4 TYRES

Always inspect tyres for punctures, tears or worn tread. Never ride the scooter with worn or damaged tyres. Keep the tyre pressures at 1.8 bar (front tyre) and 2.5 bar (rear tyre).

Riding with the incorrect tyre pressure may damage the tyres and cause an accident.

REAR TYRE

It is important to observe the pressure of the rear tyre (2.5 bar) as the engine is inside the rear wheel.

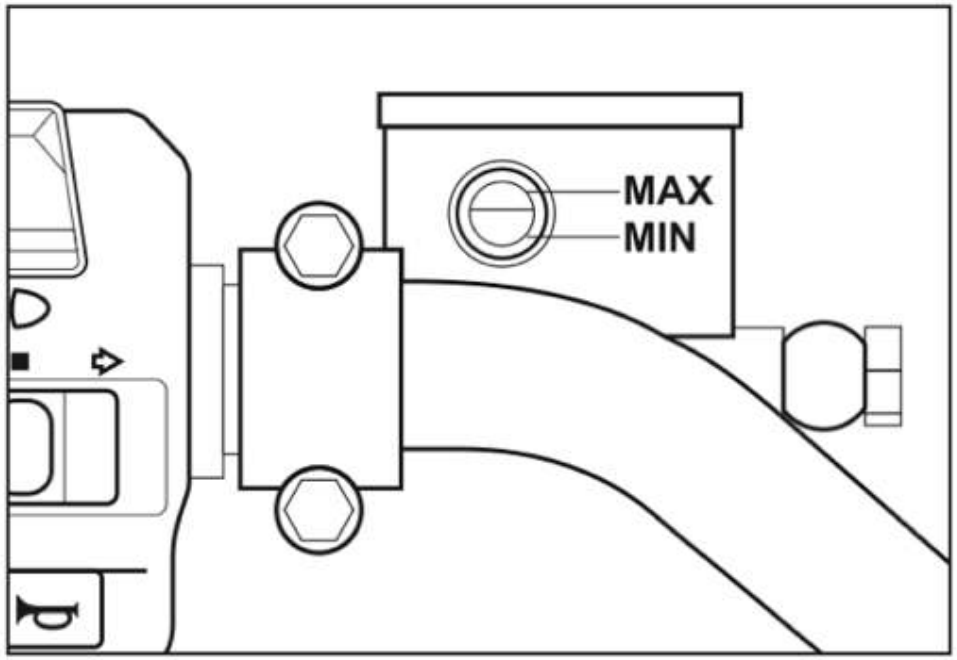
Remember that this vehicle carries more weight suspended on the rear wheel than conventional vehicles (which do not have the engine in the wheel), and therefore the wheel or engine may be affected if the scooter rides over kerbs, holes in the road or speed bumps at the same speed as a conventional vehicle.

WARNING:
Riding over kerbs, holes in the road or speed bumps at high speeds may result in damage to the wheels and/or engine of the vehicle.

2.5 BRAKE FLUID

The brake fluid reservoir is located on the upper part of the (left/right)handlebar. Check the level without stands.

The brake fluid level must not fall below the MIN mark on the reservoir.



Air might enter the reservoir if it is empty. This may cause problems to the scooter's brake system.

The brake fluid should always be checked and replaced at regular intervals, usually being every 2 years. The front and rear tanks should be kept topped up above the halfway mark with brake fluid. If the level is too low, add brake fluid.

2.6 FRONT BRAKE

The brake pads have safety grooves. If the grooves of the friction material are visible, ask your dealer about the replacement.

2.7 REAR BRAKE

When the thickness of the rear brake pads is less than 1 mm, they lose their effectiveness. Ask your dealer about the replacement of the pads.

WARNING

The brake fluid may damage the motorcycle paintwork and the plastic parts in the event of accidental spillage.

The brake fluid may cause damage and injury if handled incorrectly.

If the brake fluid comes into contact with the skin, wash immediately with water. If brake fluid splashes into your eyes, flush with water and seek medical attention immediately.

Never mix used oil with new oil.

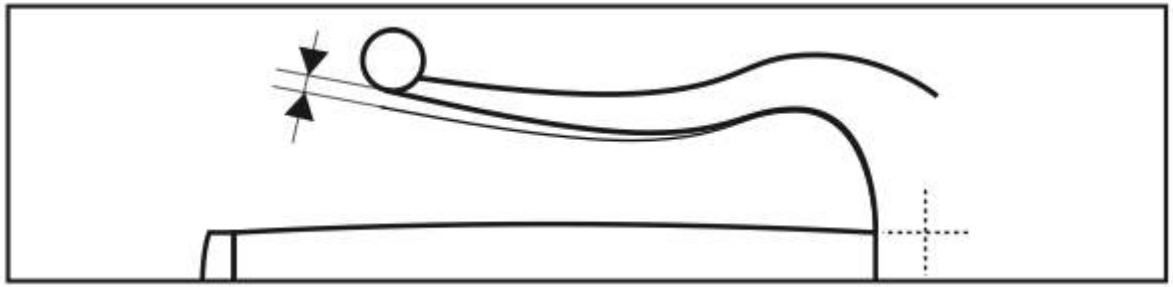
USE DOT4 OIL.

2.8 BRAKE LINES

The brake lines should be changed every four years.

2.9 BRAKE LEVER

If there is excessive play in the brake lever but the brake pads are still in good condition, take the motorcycle to an authorized dealer as soon as possible for inspection.



After the ready for use icon lights up on your scooter, make sure that the braking system operates correctly: Pull the left and right brake levers at the same time to check that both have braking pressure.
Once the scooter ready icon is lit, release the brake levers. The system is enabled and the throttle is ready to be used.

 Scooter ready icon.

3. TROUBLESHOOTING

In the faults described below, it is assumed that the final components are the cause of the fault.
If the problem persists after the final component has been replaced, take the motorcycle to an authorised dealer.

All our motorcycles are carefully inspected before delivery to the Dealer. Even after the scooter has been inspected, some problems may appear. The following table offers a guide for identifying the problem and, if possible, repairing it yourself.

If you are unable to resolve the problem, take the scooter to the dealer for repair.

4. INCORRECT OPERATION MESSAGES

Problem	Cause	Solution
Front lights are not working.	The component is defective or connectors are damaged. Damaged fuses	Check connectors and replace fuses. If the problem persists, contact closest authorized dealer.
Back lights or breaking lights do not work.	The component is defective or connectors are damaged. Damaged fuses	Check connectors and replace fuses. If the problem persists, contact closest authorized dealer.
Scooter does not speed up.	Throttle is not adjusted properly. Check the connection between the throttle and electrical installation.	Contact closest authorized dealer.
Scooter does not start.	Key not inserted. Scooter is charging. Battery is discharged. Damaged fuses.	Check if the key is inserted in the groove. Wait until charging is finished and unplug charger. Charge battery completely. Replace damaged fuses. If the problem persists, contact closest authorized dealer.
Battery is not charging, battery percentage does not increase.	Problem in the battery, problem in the charger. No electricity in the charger.	Check charger-battery and battery-electrical installation connections. Check connection of the charger to electric network.
Breaks do not break properly.	Leakage in the brakes / Low level of fluid in the circuit. Worn pads.	Check fluid level is correct in tanks. Contact closest authorized dealer.
Scooter is unstable.	Air pressure is incorrect. Pneumatics are worn. Compartments are loaded excessively.	Air pressure must be checked and brought to the correct level; front 2 bar, rear 2.5 bar. Replace the tires. Check if the load is excessive. Drive without load.
Error in the status of charge level.	Charge indicator is not synchronized with the actual status of charge.	Discharge the scooter until green OK LED blinks 7 times and then charge it completely. Go to the dealer if the problem persists.
Any other problem	Depends on the problem	Contact closest authorized dealer.

The engine controller status LED is found on the instrument panel, in green.

If the LED flashes, depending on the number of the flashes, this guide will help you to determine the cause. The LED may flash while you are riding the scooter.

Flashes	Cause	Explication and solution
2	Side stand mounted Sequence failure	If the side stand LED remains lit, the stand should be raised. While the scooter accelerates, it moves suddenly forwards or backwards. Switch off and back on. Switch on the motorcycle while the throttle is open. Switch off and switch back on without accelerating.
7	Battery discharged	The battery energy is running out. Power is reduced. Return as soon as possible to charge the vehicle.
8	Temperature too high	Allow scooter to cool. To lower the temperature, continue riding without using the regenerative brake.

5. CLEANING AND STORAGE

All the parts of the scooter have the same risk of corrosion due to the aggressive contaminants in the atmosphere and the effects of the salt on the road. The user is responsible for adequately protecting the motorcycle from these factors. This guide favours the maintenance of the vehicle, maintains its value and prevents any warranty claim.

5.1 CLEANING

Clean the scooter at regular intervals. As with any vehicle, it is important to wash it at regular intervals to keep it in good condition.

WARNING Do not clean the battery with too much water or a high pressure jet.

NOTE

DO NOT USE A HIGH PRESSURE JET CLEANER.
Never use abrasive detergents on the scooter.
Try to find gentle cleaning products for the vehicle which are environmentally-friendly.

NOTE

Always use a clean cloth to dry the scooter. Dirty cloths may scratch smooth and shiny surfaces and clean cloths help to minimise scratches.
Never use hard cloths or anti-insect sponges to remove insects from the screen.

5.2.- STORAGE

If the scooter is to be left unused for extended periods, you should read and follow the procedures below:

1 -. Wash the scooter and allow it to dry before storage.

2 -. Mount the scooter on the main stand.

3 -. Check the scooter for any past problems.

4 -. A cover helps to protect the motorcycle from the elements and is a good investment.

5 -. Place a protective sheet on the ground to protect it from possible leaks and to prevent faults.

NOTE

Always allow the scooter to dry completely prior to use. Traces of water may lead to problems of contact in the electronic components.

4.- VEHICLE AND BATTERY WARRANTIES

MAINTENANCE PROGRAM

1. **DELIVERY TO THE BUYER**
2. **WARRANTY CONDITIONS**
3. **INSPECTIONS**

1. DELIVERY TO THE BUYER

This document is the basis for any warranty applications.
Warranty applications cannot be processed if the documents have not been completed correctly.

VIN (vehicle identification number)	…….. Date of delivery
Full name……. **Street**……. **City**……. **Post code**…… **Country**…….. **Telephone / Mobile phone**…… **e-mail**……..	**Name of Dealer** **Establishment stamp**

2. WARRANTY CONDITIONS

This vehicle is guaranteed for 2 years, from the date of delivery and receipt, against any defect in the design or manufacturing, both for the engine control system. The battery pack has other conditions that can find in the annex *battery pack warranty*.

Fast-wearing parts, including the glass panels, lamp bulbs, tyres, brake discs, brake pads, are not included in the warranty. The manufacturer and the appointed workshop shall decide which defective parts are to be replaced or repaired.

The right to warranty shall not exist if:

a) The end user has treated the vehicle contrary to the regulations.
b) The end user has carried out any of the inspections stipulated in the service log or any repairs at a workshop not authorised by the manufacturer.
c) The vehicle has been modified or changed in any way or fitted with parts that do not form part of the vehicle equipment which has been expressly certified by the manufacturer.
d) The vehicle has been used in a sports competition.
e) The operation, maintenance and service instructions established in this manual have not been observed.
f) Warning: **Regular Use.** At least once a week, running for at least 10 hours.(que siginifica?)
Without Regular Use. The scooter must be fully charged before leaving it stationary for periods longer than 1 week.

A full charge must be done every 30 days to maintain the warranty.

Agreements which differ from the above warranty conditions shall be confirmed in writing by the manufacturer.

3. INSPECTIONS

The Authorised Dealer should offer advice and a comprehensive service to keep your scooter in optimum conditions.
Here are some tips for simple procedures in the event that an inspection or repair is necessary.

1 -. Only have the scooter serviced by an authorised workshop.
2 -. Make an appointment with the workshop foreman.
3 -. Explain the problem, or make a list.
4 -. If something is not clear, please talk to the workshop foreman.
5 -. Give clear instructions.
6 -. Ask for the cost estimate before the work starts.
7 -. Leave your phone number so that the workshop manager can phone you should any important questions arise.
8 -. Establish a price limit for any additional work required.
9 -. Talk openly about complicated matters with your dealer.
10 -. Observe the regular service inspections of the scooter.

FIRST INSPECTION - 1500 Km.

This official service inspection must take place no later than 1 year after the date of delivery.

It is important that the steering is retightened during the first service, otherwise the vehicle will no longer be under warranty.

Failure to perform the first service inspection may result in the loss of cover under warranty.

Service inspections must be carried out within 100 km of the due date, and no later than 1 year after the last service. The screen displays the kilometres remaining until the next service.

1.500 km **Date……..** **Km……** **…….** **Signature of the Authorised Service**	**5.000 km** **Date……..** **Km……....** **…….** **Signature of the Authorised Service**	**10.000 km** **Date……..** **Km……** **…….** **Signature of the Authorised Service**
15.000 km **Date……..** **Km……....** **…….** **Signature of the Authorised Service**	**20.000 km** **Date……..** **Km……....** **…….** **Signature of the Authorised Service**	**25.000 km** **Date……..** **Km……** **…….** **Signature of the Authorised Service**

30.000 km **Date……..** **Km……** **…….** **Signature of the Authorised Service**	**35.000 km** **Date……..** **Km……...** **…….** **Signature of the Authorised Service**	**40.000 km** **Date……..** **Km…….** **…….** **Signature of the Authorised Service**
45.000 km **Date……..** **Km……...** **…….** **Signature of the Authorised Service**	**50.000 km** **Date……..** **Km……....** **…….** **Signature of the Authorised Service**	**55.000 km** **Date……..** **Km……** **…….** **Signature of the Authorised Service**