

# Instruction manual



**swizzbee**  
**50C**



**swizzbee**

## 1. Power on



"Power on" is the common greeting among e-bikers since the Dolphins and the team "Spirit of bike" have won the "World Solar Cycle Challenge" across the Australian desert.



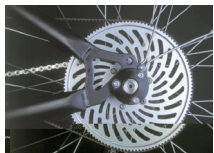
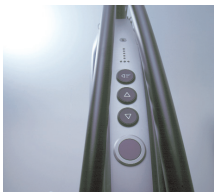
With "Power on!" we welcome you to the hot circle of swizzbee bikers. We would like to congratulate to the purchase of a quality product, which is base on a "Swiss patent". It has been designed by Michael Cutter of "Swiss Design". You will be amazed by its outstanding performance.

In its core the swizzbee 50c still is the Australian formula one racing bike. The bike has been further developed to meet daily usage requirements and it suits untrained bikers.

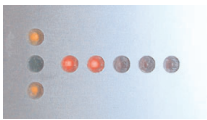
Compared with an ordinary bicycle the swizzbee comes with additional functions, components and technologies. Please read this instruction manual carefully to make sure that you are able to control the vehicle in road traffic.

Regular care and service at a swizzbee centre will ensure operational liability and long-term maintenance of value of the swizzbee 50c.

Have fun and a safe journey with your swizzbee,  
"Power on!"

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☐	Licht Einschalten
△	Mehr Motorleistung schon Bei tiefer Trittfrequenz
▽	Weniger Motorleistung Hohe Trittfrequenz Strom sparen

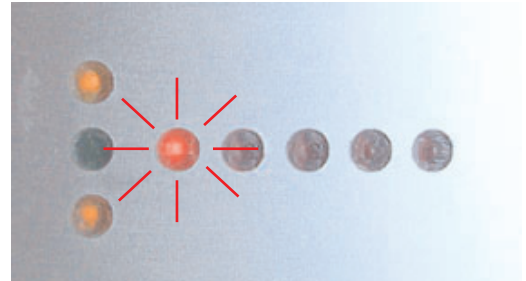
### 3. Short instruction

#### 3.1. Biking



- Storage battery box mounted and fixed?
- Push main switch (see picture above)  
> short confirmation signal
- Enter code by function keys:  
> 3 acoustic signals for confirmation
- Start biking, pedal quickly!! The engine will reach its optimal performance by a cadence of 60 revolutions per minute.
- Electronic locking device: after a pause of 5 minutes the system will be automatically switched off.  
> Switch off main switch and start again as described above!

#### 3.2. Charging the battery



- Dismantle battery box or leave it on the bike. Main switch is off!
- Connect line cord (220V):  
> 2 yellow LED are permanently lighted:  
= Quick charging
- 2 yellow LED are flushing:  
= Temperature of storage battery is too high or too low: > wait!
- Green LED in the middle is lighted:  
= top-off charge (90% full) or trickle charge (100% full)!



## 4. Biking without engine

When the engine of your swizzbee is switched off you can ride it like an ordinary bike. Due to the special transmission system within the hub of the rear wheel the electric engine runs in freewheel. You can ride your swizzbee without any further effort. The swizzbee is a light, high-quality bike, which is equipped with state-of-art bicycle components. With its 3x9 derailleur it becomes a smooth running and comfortable roadster. You can start off for longer tours and use the energy of the electric engine only in special situations: like for example ascending slopes, when you are tired or not well enough trained.

### 4.1. The mix

Your swizzbee offers you a lot more than biking with engine support or without. The engine control "Intellimatic" can be programmed to switch between normal biking and biking with engine support. Read more in the chapter "function keys".



## 5. Biking

### 5.1. Important before you start

Compared to an ordinary bicycle you will reach unusually high speed with your swizzbee. Make yourself familiar with the drive ability, the road situation, the acceleration and the brakes before you enter heavy traffic.

Be careful, you will easily reach high velocities, which might be under estimated by other motorists, cyclists and pedestrians.

Wearing a certified helmet is recommended.

### 5.2. On / off (reset)



You start the swizzbee by operating the main switch with snap function. This will be confirmed by a short acoustic signal.

If you push the main switch again the swizzbee will be switched off. There will be no signal.

Switching off will produce a reset to the default setting (=reset).

### 5.3. Swizzbee Intelli-Lock



In addition to the usual bicycle lock the swizzbee provides an intelligent, electronic anti-theft device. Before you get started you have to enter your personal access code via the 3 function keys shown in the picture above. Otherwise it does not work, like your credit card without the PIN-code.

#### 5.3.1. Entering the code

- Entering the code: After switching on the swizzbee use the function keys to enter your personal access code.
- Function keys: After entering the right code you operate the swizzbee with the function keys.

Enter your personal access code with the function keys after you have switch on the swizzbee. The enclosed info-sheet will provide your personal access code. If you have entered the right code you will hear three acoustic signals.





If you enter the wrong code, you will hear a long lasting signal. Switch off the vehicle using the main switch and start again. Enter your personal access code again. In case you cannot remember the code anymore contact to your dealer. Your dealer will provide you with a new individual code. It makes your swizzbee even more save against theft.

### 5.3.2. Limit of incorrect entries



Attention: If you or any other person enters the wrong code ten times the battery box will be blocked. In this case the thief will not be able to operate the bike. You will notice a long acoustic signal (3 seconds) when switching on the bike.

### 5.3.3. Unblocking of battery box by the customer

The new models have a software that allows the unblocking of the battery box by the customer with the help of a second code-level. Older vehicles can be equipped with a new Pic`s.

To unblock the battery box follow the instruction:

Hold the middle key pushed down, while you switch on the box (main switch). You will hear a short signal tone (not longer than 3 seconds).



Enter your personal access code. Continue to enter up to 8 numbers, according to your second code. If your personal access code for example consists of 3 numbers, you will have to enter five numbers according to your second code. You have to ask your dealer for your second code.

You will hear three signals tones to confirm that the battery box is unblocked. Once again switch off the vehicle using the main switch. Now switch it on and enter your personal access code as usual: your swizzbee is ready to start!!!

Have a nice ride and power on!!!



## 5.4. Starting off

It is very easy to ride the swizzbee. Get on the bike choose a medium speed transformation (e.g. front large chainring, rear sixth gear). Pedal easily but firm and the rest happens automatically.

The engine will reach its full performance by a cadence of 60 revolutions per minute (1 revolution per second). This default setting can be altered by the function keys (see chapter "function keys").

The sensor measures the cadence and the electronic unit controls the engine. The engine will enforce each of your pedal movements automatically.

## 5.5. 3x9 derailleur

All swizzbee models are equipped with a state of art 3x9 derailleur of Sram. The offered gear range can be easily controlled by functional twist shifters.

- H (high) large chainring: level areas, downhill grade, slight slopes, run up at level areas.
- Middle: medium chainring: medium slopes, run up at an uphill grade.
- L (low) small chainring: steep slopes, run up at a steep uphill grade.



It is recommended to pre-set the derailleur according to one of the above-mentioned conditions. Also use the ninefold derailleur to select a gradation that you prefer.

### 5.5.1. Front derailleur threefold



Use the left twist shifter, like riding a mountain-bike, to choose a speed transformation ratio for the front derailleur. The settings correspond to the following biking conditions:

### 5.5.2. Rear derailleur ninefold



Use the right twist shifter to control the ninefold rear derailleur to select a comfortable speed transformation ratio. Try to choose a speed transformation ratio that allows you to reach a cadence of 60 revolutions per minute (1 revolution per second) in a comfortable way. At this cadence you will gain the optimal support by the "swizzbee Intellimatic".



The ninefold rear derailleur as well as the threefold front derailleur can be easily operated while pedalling. The electric drive does not effect the shifting. Do not operate the gear shift when the bike is not moving.

### Important!

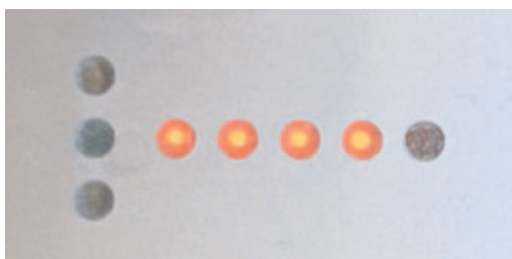
When climbing uphill shift to a small speed transformation ratio before the slope starts. Otherwise the support by the engine will decrease because of the reduced cadence.

## 5.6. Cruising range, energy supply

You can ride your swizzbee 50c with engine support for 18-25 km (NiCd) respective 30-40 km (NiMH) in level areas with slight slopes on one battery charge.

Different factors influence the cruising range:

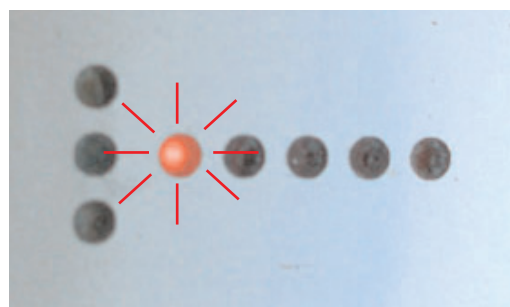
- Increase or decrease of engine performance
- Uphill grade
- Weight of the biker
- Cadence of the biker
- Wind
- Condition of the bike
- Condition of battery (age)



The 5 LED in front show the state of battery charge. Each LED stands for 25%.

## 5.7. End of power supply

As long as one LED is red lighted your swizzbee can be operated with full engine support. If the LED starts flashing the engine output will be decreased to protect the battery. The remaining power will last to bike another 2-3 km at least.



## 5.8. Deep-discharging protection

The integrated deep-discharging protection reduces the engine performance to protect the battery, so that the operational voltage will not drop below the allowed value. You will notice that the engine performance decreases gradually. The engine control prevents automatically deep-discharging of the battery. Recharge the battery immediately specially after longer breaks (winter, holiday).

## 5.9. Switch off

### Important!

Switch off your swizzbee after biking using the main switch. If you do not switch it off the "sleep modus" will be activated, which is still using energy.



## 5.10. Anti-theft device

Your swizzbee provides three different anti-theft devices

- Integrated mechanical bicycle lock
- Optional: additional cable lock
- Electronic immobiliser with personal access code

### 5.10.1. Bicycle lock



Turn the key clockwise to unlock the U-lock. Push the plastic lever on the opposite side of the lock downwards until the lock snaps in. Take the key out and your swizzbee is safe. The U-lock of the swizzbee 50c can be used with an additional cable lock, which can be obtained from your dealer. By leading the cable lock through the handle of the battery box you can lock your bike to a post or tree.

### 5.10.2. Electronic immobiliser

As soon as you switch off your swizzbee using the main switch the electronic immobiliser will protect it. Hence breaking the mechanical bicycle lock it is still useless to an unauthorized person.

### 5.10.3. Automatic locking device

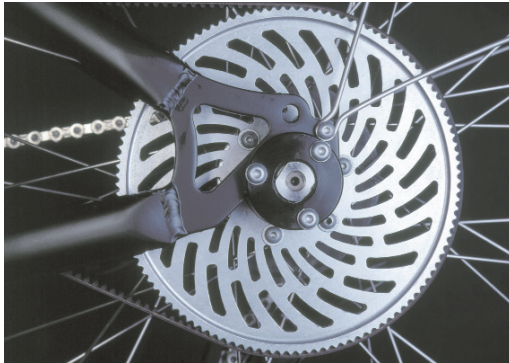
In case you forget to switch off your swizzbee, after 5 minutes the "sleep modus" will be activated. Your swizzbee is protected against misuse by unauthorized persons. The function of the engine and the light will be deactivated. A reset of the system and the entry of your personal access code will be necessary to continue your journey.

### Important!

The "sleep modus" still uses energy, although very little. Always switch off your swizzbee, as the battery might total discharge and get damaged.



## 6. Swizzbee Intelli-Drive



### 6.1. Intelli-Variomat

The simple core of the patented special transmission system is integrated in the rear wheel. Due to the continuously variable speed conversion between pedals and rear wheel you can bike without shifting. This can be very convenient in city traffic. The Intelli-Variomat adds up perfectly your pedalling and the electric drive. It feels like biking on a fast conveyor belt. These patented features are the secret of the rapid driving performance, the unrivalled gradeability and last not least its worldwide success in racing.

### 6.2. Gas pedal (accelerator)



The "gas pedal" of the swizzbee is equipped with a sensor. With 256 measurements per revolution it reads your wishes from your feet. Like riding an ordinary bicycle you accelerate unnoticed, easily and silent without shifting. The information of the "gas pedal" will be analysed and enforced by the Intellimatic.

Engine and Variomat convert the information into force and speed, which will be added silently and unnoticed.

### 6.3. Intellimatic

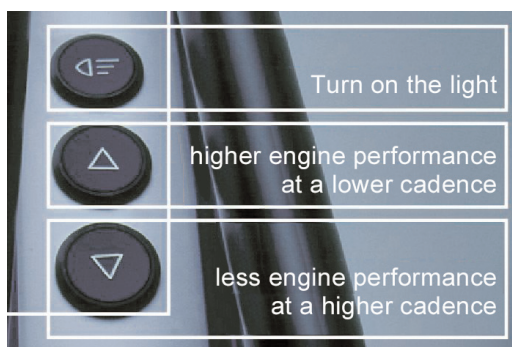


The Intellimatic inside the battery box analyses the information of the "gas pedal" 256 times per revolution and generates the engine performance and speed transformation ratio. Every pedalling will be enforced. In level areas with constant cadence the continuously variable speed converter of the Intelli-Variomat ensures rapid speedup from 0 to 30 km/h without shifting. The support level of the engine can be programmed via the display: from "mobile fitness club" to "racing without sweat".

The next chapter will show you the different options.



## 7. Function keys



### 7.1. General information

This chapter will make you familiar with the Intellimatic to adjust the parameter to your individual or current requirements. This will enable you to make the best of the Intelli-Variomat.

### 7.2. Cadence and engine performance

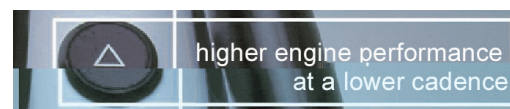
After starting off the default setting is a cadence of 60 revolutions per minute this means with a cadence of 60 r/min the engine will reach full performance. Shift to comfortable speed transformation, so you easily reach a cadence of 60 r/min (important when climbing mountains). If you are used to pedal at higher or lower frequencies, the Intellimatic can be adjusted to your individual cadence by using the "PowerUp" and "PowerDown" keys.

### 7.3. PowerUp and PowerDown key

The swizzbee engine runs automatically. According to a function based on long experience values, the Intellimatic calculates the corresponding engine performance as well as the transformation ratio of the Intelli-Variomat on the basis of the cadence.

A special feature of the swizzbee allows the individual adjustment of the Intellimatic to your requirements at any time by using the "PowerUp" and "PowerDown" keys.

#### 7.3.1. PowerUp key



The "PowerUp" changes the ratio of cadence and engine performance. Once you press the key you will receive the corresponding engine support with a lower cadence. The upwards pointing arrow symbolises a higher engine performance at a lower cadence. Each time you press the key the ratio between cadence and engine performance will be change by one step, which means 4 revolutions per minute.

Example: With the default setting the engine's maximum speed (full speed) will be reached with a cadence of 60 r/min. If you press the key once the maximum speed will be reached at 56 r/min and after pressing the key for a second time you get the full engine support at a cadence of 52 r/min.

#### Important!

If you control the engine performance by the PowerUp key for higher performance of the engine you will still be running fast at lower cadences. This only applies to lower cadences. The maximum speed of the engine stays unchanged even when pedalling at a higher cadence.



### 7.3.2. PowerDown key



You will change the ratio of cadence/engine performance in the opposite way. By pressing the key once or multiple times the engine will reach its maximum speed at higher cadences. With a normal cadence of 60 r/min only 70% to 80% of the engine's maximum speed will be reached. Receiving less support from the engine is symbolised by a downwards pointed arrow. In this way you reduce or rise the workout level during your ride, depending on the timeframe, the weather or your mood. You can also save energy and enlarge the cruising range.

### 7.4. Reset

After a reset of the vehicle the functions will be set to default. During the ride the default setting can be restored by pressing the light button. Press the light button until you receive an acoustic signal after two seconds.

## 7.5. Lighting

### 7.5.1. General information

The swizzbee E-bike provides of a 6V lighting system with halogen headlights including parking light function. The battery box provides the power. The integrated DC/DC converter keeps up the voltage to ensure the constant intensity of light independent of battery status. Even when the battery is almost discharged you will be able to ride the bike with lighting for another 30 to 60 minutes but without engine support.

### 7.5.2. Turning on/off



The lighting is to be turned on and off by the function key "light". Press the key once you will hear an acoustic signal and the light is turned on or respectively turned off.

#### Please note:

The feature is only available when your swizzbee is switched on using your personal access code. If you leave the bike without motor activity, the light will be turned off after 5 minutes.

### 7.5.3. Biking with light but without engine

The 6V system for the lighting works independent of the deep-discharging protection of the engine control. Which means after the engine performance has been reduced or stopped by the deep-discharging protection, you can still ride your swizzbee with light for another 30 - 60 minutes like an ordinary bicycle.

If you want to ride your swizzbee in the dark without engine support like a normal bicycle you do the following: You start your swizzbee in the usual way (switch on, enter code). Reduce the engine performance with the PowerDown key by so many steps that there is hardly any output.

## 7.6. Power consumption

Cycling with a higher engine performance by pressing the PowerUp key will consequently entail a higher power consumption. Hence the cruising range will be reduced.

By pressing the PowerDown key you reduce the engine performance and the power consumption.



## 8. Storage Battery box

### 8.1. General Information

The swizzbee battery box joins functionality, design and an elaborate service concept.

The swizzbee battery box consists of the following components:

- Storage battery
- Intellimatic (engine controls)
- Controls
- Displays
- Charger (depending on the model)

Functional related components are assembled in a handy casing. At any time it can easily be demounted to be sent off for maintenance purposes.



Now turn the rear part of the battery box out of the frame triangle against your body. (always keep your right hand at the back). The mushroom shaped knob of the quick release skewers stays in the key-hole shaped slot.



Then you have to move the whole battery box over the mushroom shaped end of the quick release skewers.

### 8.2. Handling of the battery box

#### 8.2.1. Demounting the battery box

Within seconds the battery box can be taken off the vehicle either to charge the battery or to ride your swizzbee like an ordinary bicycle.

From the left side of the vehicle in driving direction you open the quick release skewers on the bottom of the tube frame using a special spanner. Please note that it will only fit into its counterpart of the quick release skewers using the correct position.

Use your left hand to move the battery box with it's handle to the front until the snapping guide pins on the back of the box are uncovered. With your right hand you hold and guide the lower rear part of the box (from the left side at its best).

#### 8.2.2. Mounting the battery box

Simply try to follow the instruction for the demounting of the box in reverse order: Start from the left side of the vehicle (driving direction). Make sure that the multi connectors on the back of the battery box and of the engine unit are clean.



Hold the box with its handle using your left hand. Move the box downwards supporting it with your right hand. Put the corresponding part of the slot in the handle over the mushroom shaped knob of the quick release skewers. Then you turn the rear part of the battery box pass the guide pins into the frame triangle. Therefore you move the box on the frame tube as far as possible to the front (driving direction). Gently move the box to the back and take care that two white guide pins slide into the guide holes.



Do not force it, it will cause damages.

Make sure that the battery box is set on the guide pins. Now lock the quick release skewers. The battery box is correctly mounted.

### **Please note:**

In case there is a long acoustic signal after the battery box is switched on, the box is not placed in the right position or the multi plug on the back of the battery box is not in proper contact with the engine unit.

### **8.2.3. How to handle the battery box**



Never put the battery box upside down put it always on its bottom side. Do not place the battery on its side, especially not when charging the battery. The side cover is the main part of its elegant design. It is fragile and prone to scratches. Make sure that you place the box in a clean and dry environment.

Always charge the battery in a dry and protected place.



## 9. Charging

### 9.1. General Information charging the battery

The battery can either be charged attached to the swizzbee or demounted in any other place: at home, at work, in the restaurant.....

### 9.2. Charging the battery when mounted to the bike

In case you have a garage, a bicycle shelter or an easy accessible cellar with a socket, you can charge the battery of your swizzbee when it is mounted to the bike. On the bottom side of the battery box you will find a 3-pole plug. Its supply cable can be pulled out by 15 cm. Connect it by an ordinary grounded extension cord to a 220V power socket. In general, everything else happens automatically. For more detail refer to the section: "charging the battery".

### 9.3. Charging the battery demounted from the bike

If there is no possibility to charge the battery mounted to the vehicle, demount the battery box according to the instruction and carry it wherever you find a socket.

### 9.4. Internal battery charger

The swizzbee integrated battery charge controller is the result of several years of experience in handling NiCd batteries for vehicle drives under different conditions. The controller adjusts the charging of the battery according to environmental conditions (battery temperature, ambient temperature, battery condition). It displays the state of charge and avoids the memory effect by "discharging before charging function".

### 9.4.1 Charging

The charging process will start automatically, as soon as the power plug is connected to a socket. The charger detects the state of charge and starts the charging process. When the battery is charged the charger switches to trickle-charge. This is to counteract the self-discharging of the nickel cadmium battery.

The supply cable of the battery box can be pulled out by 15 cm.

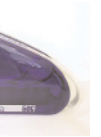
- The cable and the plugs have to be in a clean and proper condition.
- Poor contact will entail malfunctions.
- Make sure to always use a 3-pole grounded cord.
- Connect the battery box only to a power socket with a residual current device. (obtainable in electric stores).

### 9.4.2. Charging process

For easy understanding, the operating principle of the process as well as the single steps of the charging will be explain in the following:

#### Regular charging

As soon as the battery is connected to a power socket, the charging process will start automatically. The charging process starts off with 0.5 A for 9 minutes. So older batteries will not abort the charging process. Regular charging with 2.25 A follows until certain criteria are met.



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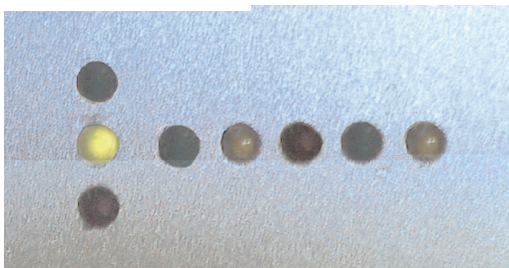
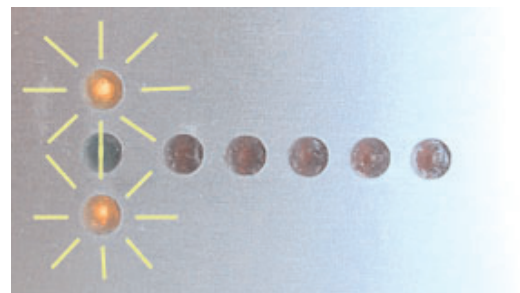
to indicate the regular  
battery is fully charged.  
The light will be lighted to indica-  
te it will go off when the  
normal charging will

### 9.4.3. Temperature

Regarding the durability of NiCd and NiMH  
batteries, hold the charge at an temper-

ature

...171432 temperature on battery too high/low flows





## 9.5. Memory-effect

Nickel cadmium batteries are prone to the so-called "memory effect". The memory effect occurs when the batteries have been only partially discharged for several times. The capacity of the battery is reduced which results in a shorter cruising range. The phenomenon is comparable with the decreasing capability of a human being lacking workout. The memory effect is reversible like decreasing capability by workout.

By regular complete discharging the memory effect can be prevented and reversed. (1V/cell=20V for the swizzbee battery-set).

The complete discharging is not always possible or wanted. The swizzbee charge controller disposes of a "discharging before charging function".

### 9.5.1. Discharging before charging function

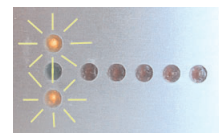


To activate the "discharging before charging function" follow the instruction: Connect the power cord and press the main switch twice. The 21W bulb within the battery box will light up and discharge the battery down to 20V. The charging process starts automatically. A half discharged battery takes approx 4 hours to discharge completely.

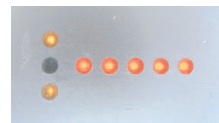
We will advise against discharging when the battery is more than half charged, as it would take too long to discharge. If the power line is shortly interrupted the charger will automatically start the charging process.

## 9.6. Overview charger display

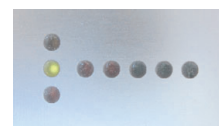
Without voltage supply the battery can not be discharged, as the charging process can not follow without power supply. The status of charger is displayed by two yellow and one green LED:



Charger stands by battery temperature too high or discharging before charging



Charging in process



Fully charged, top-off charge or trickle-charge in process



## 10. Service and care of battery

### 10.1. Storage battery

The battery is the power supply of your vehicle. Compared to fuel it can be recharged. The costs for energy amount to CHF 0.003-0.006 per km.

The battery has to be replaced, so to speak refilled but after a much longer period (approx. after 2-3 years). The costs amount to approx. CHF 0.05-0.10 per km. The careful handling of the battery influences its durability.

Although the charger of the swizzbee protects the battery you should adhere to the following instruction to increase the durability of the battery set.

### 10.2. Nickel-cadmium storage battery

#### 10.2.1. Memory-effect NiCd

Nickel cadmium batteries are prone to the memory effect, if the battery is often not completely discharged. When cycling try to discharge the battery from time to time completely. If this is not possible use the internal charger to completely discharge the battery.

Refer to chapter "charging/memory effect".

#### 10.2.2. Self- discharging

NiCd batteries self-discharge by 1% per day. After **approx. 100 days** the battery is **completely discharged**. If you have not used your swizzbee for a longer period of time, always recharge the battery before you start off.

### 10.3. NiMH storage battery

#### 10.3.1 Memory-effect NiMH

Compared to NiCd batteries the NiMH batteries are not affected by the memory-effect

#### 10.3.2. Self- discharging NiMH

NiMH batteries self-discharge 2-3% per day and will be completely discharged after 30-40 days. These batteries should be recharged after a couple of days of non-use.

### 10.4. Precaution

#### Important!

- Never force the battery box or single cells open
- Battery cells should never be exposed to heat or fire.
- Never short-circuit battery cells or connections to the battery box.
- Recharge battery always in weather-protected places and never in the rain.
- The battery box is not a toy. Thus keep it out of children's reach.
- Battery cells are not to be thrown in the garbage. Contact your specialized dealer, if you want to replace the battery.



## 10.5. Biking in winter

### 10.5.1 Biking in winter

You can also ride your swizzbee in winter. The batteries will be exposed to extreme conditions, that will reduce its capacity and hence the cruising range. As your battery box is demountable you can easily maintain the right operating temperature. Demount the battery and store it in a warm place. Please note the following advice:

### 10.5.2. Tips for the winter

#### Important!

- During the night take the battery set off the bike and store it at temperature not below 10°C.
- Never charge the battery when its temperature is too low.  
The swizzbee charger prevents charging the battery at low temperatures.  
(Refer to chapter "Charging")
- When the battery set is cold increase the load gradually.

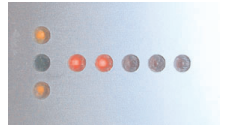
## 10.6. Winter break

If you are not using your swizzbee for a longer period of time, it is important to store the battery fully charged. In case you store it longer than one month you will have to recharge it from time to time to avoid deep-discharging. Completely discharged batteries can get damaged.

### 10.6.1. Instructions for longer breaks

#### Important!

- Charge battery before longer breaks
- Take battery off the vehicle
- Main switch off!! Possibly take off main fuse.
- Recharge battery every second month.
- Before start-up get a battery refresh by your dealer or by the manufacturer.



## 11. The display

### 11.1. General Information



The display informs you about two essential features:

- The battery's status (5 red LED in driving direction)
- The operating status of the charger, as well as the indication of errors. (3 LED positioned across)

As the battery's state of charge is not visible, is it more complex to detect than the filling level of a fuel tank.

The power consumption is constantly measured to detect the status of charge. In this way the used respective the remaining amount of energy can be ascertained. Various factors such as self-discharging, environmental temperature, condition of the battery influence the remaining energy.

### 11.2. Status of battery charge display

The status of charge display within the battery box (bq2013) detects the discharged and recharged amount of energy. The available capacity is displayed by 5 red LED.

One LED corresponds to 20% of the battery's capacity. When the below positioned LED flashes the remaining capacity amounts to 10%.

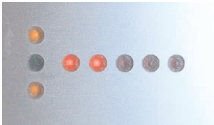
Errors caused by self-discharging and the varying temperatures will be roughly corrected by status of charge display.

With aging of the battery set the calculation is less accurate as the amount of self-discharging increases.

### 11.3. Status display of charger

Two yellow and one green LED positioned across (in driving direction) indicate the operating status of the charger. LED are only lighted when the charger is connected to a power socket.

- **Yellow LED flashes:** stand by mode but temperature of battery too high or discharge before charging.
- **Yellow LED is lighted:** charging in process
- **Green LED is lighted:** charging completed, top-off charge or trickle-charge in process

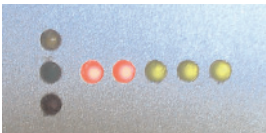
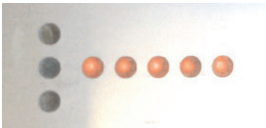


11.4. Overview display biking/cycling mode

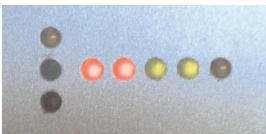
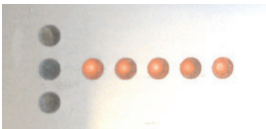
swizzbee 50cc  
External charger

swizzbee 50C  
Internal charger

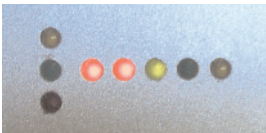
**Biking mode /stand by**  
After switching on the battery's  
status of charge is displayed



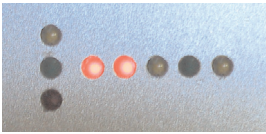
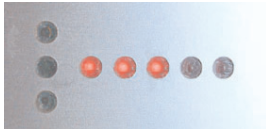
Biking mode  
remaining capacity      100% - 80%



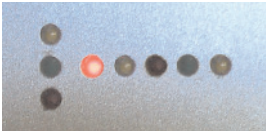
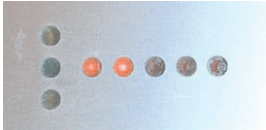
remaining capacity      80% - 60%



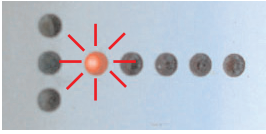
remaining capacity      60% - 40%



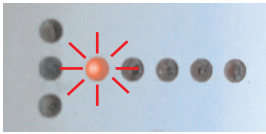
remaining capacity      60% - 40%

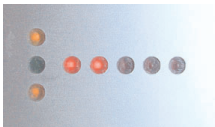


remaining capacity      20% - 0%



**Energy reserve:**  
When the battery is almost discharged the LED  
starts flashing. You will be able to bike for a  
couple of kilometre with engine support.  
The deep-discharge protection will reduce the  
engine's performance automatically to protect  
the battery set.





11.5. Overview display charging mode

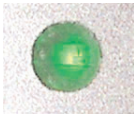
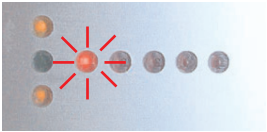
swizzbee 50cc  
External charger

swizzbee 50C  
Internal charger

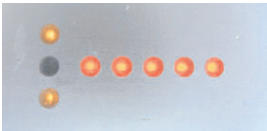
**Start of charge**  
The charger analyses the battery and starts to charge with low power supply. The two yellow LED will flush and will be lighted permanently after a while.



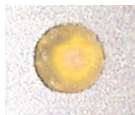
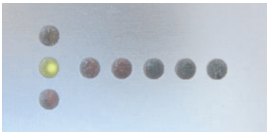
**Charging mode**  
After analysing the battery set the quick charge starts due to power supply. The status of charge display will be activated after a few seconds. The picture shows an example of a flat battery with the low positioned LED flushing red.



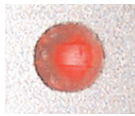
**Charging mode**  
The battery set has been recharged to almost 100%. The power supply is still on thus the status of charge display is lighted.



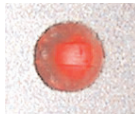
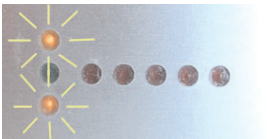
**Battery set fully charged**  
The charger switches to trickle-charge, as the battery is completely loaded



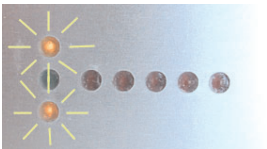
**Top-off-charge (NiMH only)**  
The top-off-charge adjusts the status of charge of the single cells



**Battery temperature too high**  
The battery temperature is too high (>45°C). In order to protect the battery set, the charger will start to charge when the battery temperature is acceptable



**Battery temperature too low**  
If the battery temperature is too low (<5°C) it should not be charged. The charging starts with a reduced power supply. When the battery temperature is acceptable the quick-charge will be started.



**Error display**  
The charger does not identify the battery set correctly. Malfunctions/error can be caused by the following problems:  
There is no contact to the battery because the main contactor has been deactivated. Switch on main contactor on the bottom side of the battery box. The battery set has been deep-discharged: contact your service centre.



12. Acoustic signals








Some of the information and error indication of your swizzbee 50 cc are communicated by acoustic signals. All entries via the function keys are confirmed by an acoustic feed back.

The chart below will explain the different acoustic signals.

12.1. Overview of signals

swizzbee with personal access code	start	swizzbee without personal access code
	<b>Switching on</b> There will be a <b>short signal</b> after you have turned on the main switch. If no personal access code is programmed there will be 3 short signals to confirm the operating state.	
	<b>Entry of personal access code</b> After you have entered personal access code using the function keys there will be <b>3 short signals</b> to confirm the operation state of your swizzbee. You can start	
	<b>Incorrect entry of personal access code</b> <b>A long signal</b> (3 sec.) indicates the wrong entry of the access code. Try again, in case you cannot remember your personal access code contact your dealer or the manufacturer.	



swizzbee with personal access code	error message	swizzbee without personal access code
	<b>swizzbee is blocked</b> (after switching on: acoustic signal 5 sec.) The incorrect personal access code has been entered 10 times. For security reasons your swizzbee has been blocked. You can unblock the swizzbee using your second code. (refer to chapter "Biking/Unblocking the storage battery box by the customer")	
	<b>Continuous signal after switching on</b> The battery box is not mounted. The battery box is not properly connected to the bike. Mount battery box again. Jumper plug on the bottom side of the engine's carrier is not connected or missing.	
	<b>After entry of access code: 3 short signals followed by a continuous signal</b> The battery set is fully discharged and has to be recharged immediately. In case the battery can not be recharged (e.g. red LED): contact your swizzbee service centre.	
	<b>Engine control over heated</b> Leave the engine to cool down for a while. In case the error occurs again afterward: contact your swizzbee service centre.	
	<b>No signal</b> If there is no signal when you switch on the swizzbee: Battery set is fully discharged - deep-discharged. This often occurs when the bike has not been operated for a longer period of time. > charging Main fuse within the battery box is open. > Have the fuse replaced by your dealer. Main switch damaged: contact your swizzbee service centre.	



13. Power consumption, cruising range

13.1. General information

Various reasons influence the power consumption of your swizzbee such as climbing uphill grade and additional weight. As the amount of energy is limited the following factors will influence the cruising range.

- Increasing or reducing the engine's performance using the function keys
- Uphill grade
- The weight of the biker
- The biking-style and the cadence of the biker
- Wind
- The bike's condition
- Battery condition

13.2. Uphill grade

As everyone knows hiking uphill will entail a higher power consumption. As a rule 300 meters elevation gain correspond to one additional hour. This rule can be also applied to your swizzbee.  
The amount of energy needed to climb 300 ascending meters corresponds to 20 km in level areas.

300 m elevation gain correspond to 20 km in level areas  
= approx. 5 km 6% uphill grade  
= approx. 10 km cruising range incl. downhill grade

Compared to level areas the engine of your swizzbee provides a rapid, high performance when climbing uphill grade. That means to bike an uphill grade will not take more time but more energy because of the higher engine performance.

For steep ascents the engine's performance is 2-3 times higher as usual. You will be able to climb an uphill grade with your swizzbee 2-3 times faster than with an ordinary bicycle. The power supply of your batteries will end 2-3 times quicker than biking in a level area.

Mountains = Energy consumption x 3  
Mountains = journey time : 3

13.3. Additional load, total weight



The total weight of the vehicle does effect the power consumption and the cruising range. The energy consumption is directly proportional to the total weight including additional luggage, weight of the biker and possible trailer. The cruising range is inversely proportional to the total weight. An average biker's weight of 70kg is assumed. If the additional load amounts to 130 kg incl. the biker (70kg), the trailer (15kg) two small children (35kg) and your shopping (10kg) approx. 54% of the cruising range can be reached.

Actual cruising range =  
$$\frac{\text{Cruising range} \times 70\text{kg}}{\text{Total of additional load}}$$



### 13.4. Biking style

Your biking style will also influence the cruising range. Contrary to other bikes with electric drives the pedalling of the biker will not increase the cruising range but the speed. Due to air resistance at a higher speed the cruising range will decrease.

The one who pedals quicker will not go further but much faster.

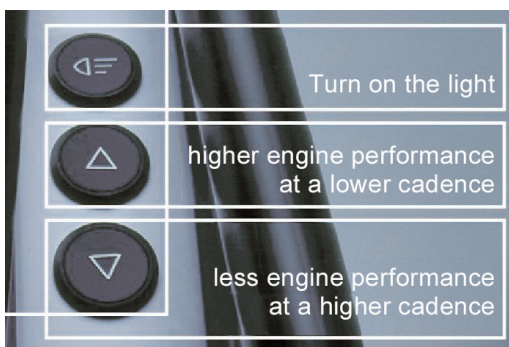
### 13.5. Maintenance condition

The maintenance condition of your bike will affect the cruising range of your vehicle.

The tyre pressure of 1.5 bar instead of 4-5 bar doubles the rolling resistance and reduces the cruising range by 50%! Always check the following points and have these maintained if necessary:

- Tyre pressure, condition of tyres
- Condition of chain and chainrings
- Brake : Braking effect and adjustment of brake (no stripes)
- Toothed-belt (tension, condition)
- Capacity of battery set

### 13.6. Capacity control



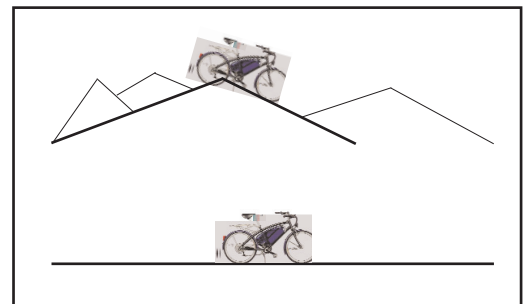
Increasing or decreasing the engine support via function keys will influence the cruising range.

Increasing the engine's support will reduce the cruising range. Reducing the performance with the PowerDown key will save energy and increase the cruising range.

### 13.7. Duration of batteries

Aged batteries lose capacity, which results in a reduced cruising range. In addition aged batteries have a higher self-discharging level. If you operate your swizzbee with older batteries and you leave it unmoved after charging full capacity will not be available anymore. Thus the cruising range will be reduced.

### 13.8. Important!



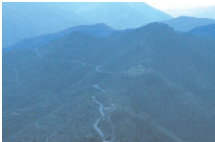
Biking an uphill grade on one battery charge always include the downhill grade in the calculation. The cruising range when climbing uphill grade including the downhill grade will always be less than biking the same distance in level areas.

> calculate always uphill and downhill grade!

> Or ascent x 2!

Basically the cruising range depends on your biking style, the additional load and the road condition. You will reach different cruising ranges from 8 - 40 km depending on the additional load, the road condition, type of battery and biking style.

Regular maintenance will increase the cruising range of your swizzbee.



13.9. Examples for different cruising ranges

Below you will find rough estimations of cruising ranges. It will only give an idea, as the above mentioned factors have to be considered



13.9.1. swizzbee 50c NiCd

terrain	elevation gain	additional load incl. biker	cruising range
level	0-30m	70kg	18-25km
level	0-30m	120kg (incl.trailer)	10-15km
slight ascents	150m	70kg	10-16km
mountains	250m	70kg	8-12km

13.9.2. swizzbee 50c NiMH

terrain	elevation gain	additional load incl. biker	cruising range
level	0-30m	70kg	30-40km
level	0-30m	120kg (incl.trailer)	16-24km
slight ascents	150m	70kg	16-26km
mountains	250m	70kg	13-20km



14. Bicycle computer

On delivery of your swizzbee all computer settings are defaulted such as wheel diameter and km-setting. The computer is mounted and ready to use.

14.1. Display

SPD	Displays the actual speed, will be permanently displayed on the upper part of the display.
ODO	Shows the total driven kilometers (since battery replacement) ODO display can only be deleted by replacement of battery.
DSt	Shows the distance of the current ride. Push button to reset DSt display to zero.
TM	Shows the driving time since the last reset. Push button to reset TM display to zero.
AVG	Average speed calculated from distance (DST) and used time (TM). Push button to reset AVG display to zero.

14.2. Daily use

We recommend using the auto-scanning mode. Push the button until "scan" is displayed. Every 5 seconds the display will switch between the various parameter.



When the scan mode is switched off one selected parameter will be displayed permanently.

14.3. Automatic start / stop

The computer starts its functions when you start biking and stops respectively when you stop biking. The computer will switch to battery saving mode after 4 minutes.

14.4. Daily counter

The functions time, distance, average speed can be used for daily journeys. To reset press the button on the back of the bicycle computer for 2-3 seconds. (until display is cleared)

- For daily use the reset can be useful to receive information of the current journey.
- Daily travelled distances, journey time etc.
- Average speed, comparison of different routes to find out the shorts way.
- Cycled distance on one battery charge to calculate power consumption

14.5. Battery replacement of bicycle computer

With the replacement of the battery all data will be deleted. The computer has to be newly set.

- Diameter of wheel
- Km setting
- Select mode



## 15. Maintenance and service

### 15.1. Service of the vehicle

#### 15.1.1. General information

Regular service and care of your swizzbee ensures operational liability and long-term value. Service and clean your vehicle regularly, check components, which are important for your safety.

Electrical components are to be serviced and repaired by the swizzbee service centre only.

#### 15.1.2. Cleaning and care

Regularly clean frame, mudguards, fork, handlebar etc. with an ordinary detergent. Do not use products, which contain silicon. Never use greasy products to clean rim, it will reduce the braking effect.

#### 15.1.3. Check-up

Always check the following items and components for your own safety:

#### **Important!**

- Brakes: Brake pads, brake control cables
- Lighting: function of the lights front and rear > replace bulbs
- Tyre: Pressure min. 3 bar ? Sufficient tread?
- Chain: Greased and tightened? > to be checked regularly by your bicycle dealer.
- Gear shift: proper function?  
Gear control cable undamaged?
- Pedal and crank arm, bracket axle: no tolerance?
- Mudguards: Distance to tyre, screws tight?
- Screws in general have to be tight!

### 15.2. Maintenance of electrical components

Electrical components are to be serviced by your authorized swizzbee service centre only.

The battery box is not to be used or charged when damaged. Defect electrical components, cables, plugs, connector etc. have to be replaced by your swizzbee service centre. For your own safety and to sustain claims under guarantee use original swizzbee spare parts only.

### 15.3. Replacement of components

There are no changes or modifications of your swizzbee permitted, which do not correspond to the registration document.

In any case specific components of your swizzbee such as the frame, the engine, the battery box with its components have to be replaced by original swizzbee spare parts.

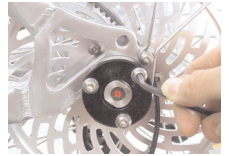
Claims under guarantee, liability and responsibility will be rejected when traced back to unauthorized modifications.

Bicycle components can only be replaced by spare parts equal with original spare parts.

### 15.4. Maintenance work

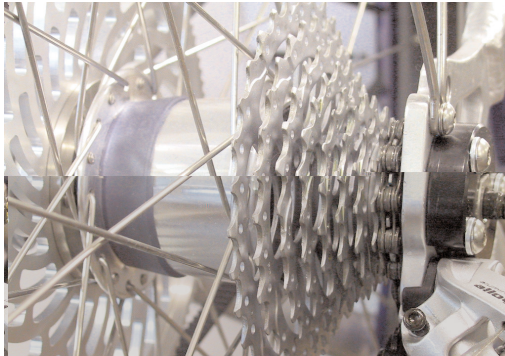
For your own safety and the capability of your electric-powered swizzbee refer to the swizzbee centre for annual check-up. To some extent your swizzbee can be serviced and maintained like an ordinary bicycle.

The following pages provide important instructions



### 15.4.1 Demounting of rear wheel

Follow the instruction to demount the rear wheel for maintenance purposes or in case of a puncture:



Change derailleur to the largest gear to remove chain.



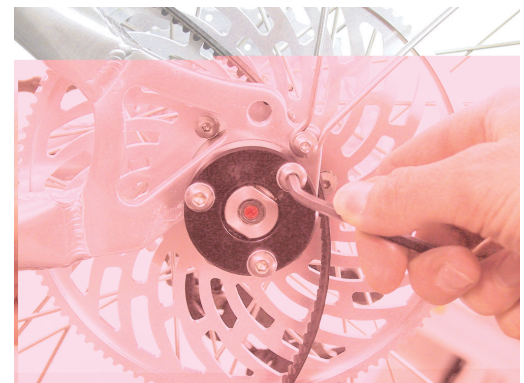
Release lever, which clamps the brake cylinder of the rear wheel brake.



Release the hydraulic brake on one side to open the brake pads to be able to move out the wheel.



Remove the toothed belt: move the belt anticlockwise outwards off the belt pulley.



Unscrew the bearing holder: six hexagon-socket screws (4 mm hexagonal spanner)

Hold the rear wheel while loosen the last screw.

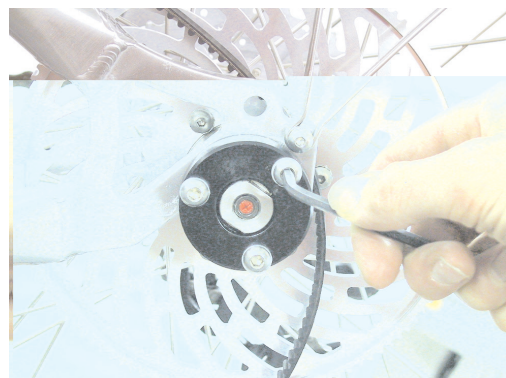
Take out rear wheel just like from an ordinary bicycle. Move right bearing holder around the derailleur. Leave the bearing holder on the ball-bearing and remove chain and toothed belt.





### 15.4.2. Mounting of rear wheel

Basically the rear wheel is mounted just like to an ordinary bicycle.



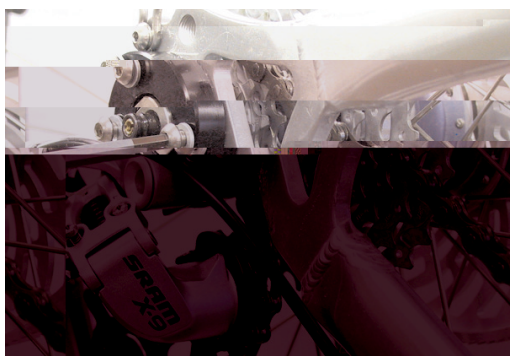
Tighten all screws to 8 Nm.

Replace chain and toothed belt to the axle of the rear wheel.



Slide toothed belt anticlockwise on belt pulley.

Move bearing holder around derailleur.



Tighten first screw by hand and don't forget washer spring! Support wheel so the screw goes in straight. Fix the remaining 5 screws.

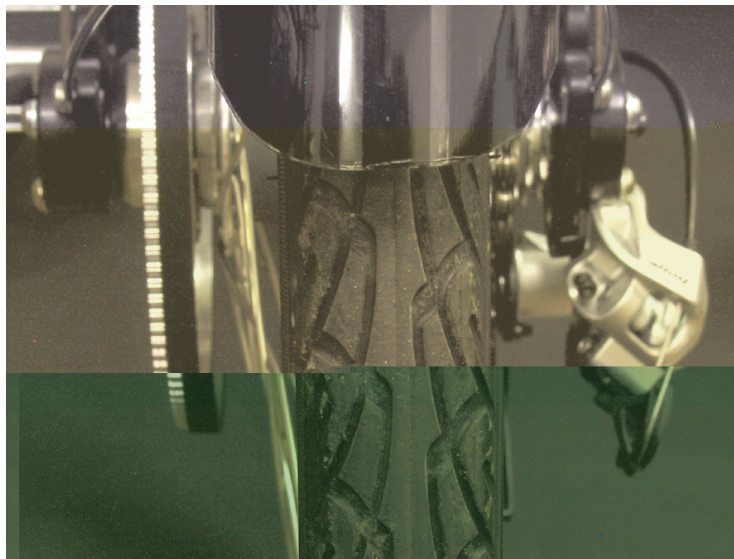
Replace brake cylinder, adjust brake pads to rim. Fasten brake cylinder with the clamping lever. Check brakes and derailleur.



16. Technical Specifications

Modell: Swizzbee V1, Basic

Frame	aluminium 7005 universal size
Fork	SUNTOUR NEX 4000
Rims	Airline Vuelta
Tyre	Schwalbe 1,5 x 26 or 1,35 x 26
Derailleur	3x9, front derailleur ShimanoLX, rear derailleur SRAM 9.X
Rear hub	Swizzbee Intelli-Variomat, patented transmission system with continuously variable speed conversion
Front brake	Magura Julie, hydraulic
Rear brake	Magura HS 33, hydraulic
Lighting	Busch & Müller, with parking light power supply from battery
Engine	Heinzmann DC 24V, 270W
Battery	NiCd, 7 Ah, crusing range 20 - 25 km
Optional battery	NiMH, 13 Ah, crusing range 30 - 40 km
Optional battery	LiPoly, 10 Ah, crusing range 30 - 40 km
Colour of frame	silver, matt black, black high gloss
Colour of side cover	transparent red, blue, dark grey
Charger	external (optional: internal charger with discharging function)
Weight	26 kg incl. internal charger
Accessory	optional: designed luggage carrier with “pletscher-adapter”



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