

Lifespan

The lifespan of a rechargeable battery depends on

- **Charging Cycles**
- **Charging Current**
- **Charging Time**

In order to save a long life of the batteries, it is necessary to avoid too frequent charging.

Charging should take place only if the voltage of the battery has reached its lower limit.

To achieve this, **a control system is installed** in the Solar System LED 10.2, to prevent that both,

loading with too high currents occur,



Charge current is limited by the max. output current of the solar module (420mA) and also by a fuse which automatically interrupts charging with too high current. The integrated control system avoids too frequent charging. **The lower limit voltage** is indicated by **a red warning LED**.

too frequent loading.

Use of the lamp after this cut off is not possible. Charge battery after cut off. The green LED indicates (only when the switch is in **position "●"**), that the lamp is ready to use.

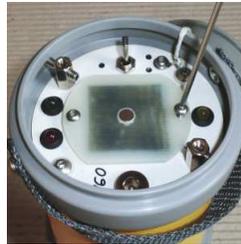
If the lamp isn't used for some time (storage), it is possible that the lamp cannot be turned on. This is due to a self-discharge of the battery and in consequence automatic cut off of the circuit. Then charge the battery as described.

Please note that the rechargeable batteries **have a self-discharge of more than 10% per month**, especially in extreme temperatures.

At the end of the charging by the solar panel (after about 6-7 hours - depending on the intensity of solar radiation) bring the switch in intermediate position. Disconnect the cable of the module from the charging socket of the lamp.

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Replacing the storage batteries

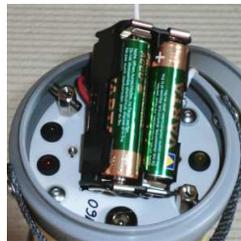


references at the end of this information.

Remove the two screws on the bottom of the lamp (make sure that they are not lost) and remove the cover. Pull out the battery tray with the help of the string and separate the connectors.

Take the three individual accus from the battery holder and replace them with three new ones. Battery

Pay attention to the polarity!



Restore connections. Then switch on the lamp (switch in position "●") to examine the function of the lamp. Insert the battery carrier in the battery compartment and close with the cover and two screws.

Recommendation storage batteries

Use only rechargeable batteries!

Use only three batteries of the same manufacturer and the same type, the same technology and the same capacity. Functioning time will be reduced when using smaller capacity batteries!

Battery type: AA - LR6 - HR6

Technology: Nickel-Metall-Hydride

Manufacturers recommended:

- **Sony NiMH C-E-Green LR6 2700mAh**
- **Varta Professional Accu Nr.5706 HR6 2700mAh**
- **GP 270 AAHC 2700mAh**
- **Sanyo Eneloop HR-3U25HM 2500mAh**
- Energizer Advance 2700mAh
- Energizer Advance 2500mAh
- Energizer 2450mAh

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Handling Lamp LED 10.2

Do not expose lamp to direct sunlight. Remove the basement cover (magnetic attachment!) to get access to the switchboard. LED Indicators, switch and loading connection are now accessible.

With **three possible positions of the switch** the lamp provides **five functions**:

Intermediate position of the switch:

1. Function: Checking external power supply

In this position the loading connector has no connection to the internal battery. Connection of an external power supply through the loading connector will illuminate the LED indicator bright yellow. If the indicator is not illuminated the external power supply is damaged. (For example: damaged solar module, damaged connector, broken cable.)



Switch in position „●●“:

2. Function: Charging storage batteries

Insert the plug of the module cable into the socket of the lamp and aim the solar cells at the sun.

You can load the internal NH-batteries of the lamp in this position. Depending on the loading status of the batteries a loading current of about 420 mA will adjust automatically.



An automatic cut off of the loading current is not part of the design due to the low current of the solar module of 420 mA. There is no danger of overloading the NH batteries.

Attention:

In order to maximize the durability of the rechargeable batteries you have to avoid frequent loading. **Only charge batteries when red LED (low battery warning) shows up.**

When the red LED shows, switch off the lamp. If the lamp is not switched off, power will be cut automatically and the green LED is extinguished. The lamp can be switched on again only after the batteries have been fully loaded.

Loading time is between 6 and 7 hours, depending on the radiation of the sun.

After charging you have to bring the switch in the intermediate position.

With higher charge currents (> 0.5 A), reverse polarity or a short circuit, an internal fuse interrupts the connection to the internal battery until the problem is fixed.

This cut off is indicated by an increase in the luminosity of the yellow LED. After fixing the problem, the fuse goes back to sleep mode. This is shown by reduced brightness of the yellow LED.

3. Function: Operating external devices

Collection of energy from the internal battery (3.6 V-2, 7 Ah) is also carried out in this switch position. External devices such as radio and others can be connected.

(Max power consumption 0.5 A)

With an increased power consumption, as well as a short circuit, the internal fuse interrupts the circuit and the yellow LED goes dark.

Switch in position: „●●“:

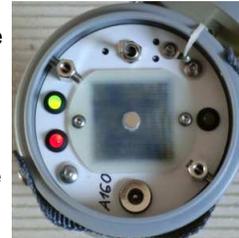
4. Function: Switching on the light

To switch on the light of the lamp choose position „●●“.

In addition the little green LED is now illuminated. The charging socket is cut off from the inner circuit.

In this position no external use is possible! This circuit is an overload protection for the internal battery.

With a complete charge the lamp will have **light for a maximum of 12 hours**. After 10 hours the brightness reduces slowly until finally the red LED gets illuminated (low battery warning).



After use switch off the light to avoid needless current drain!

5. Function: Alarm: “low battery”

The lamp has an integrated alarm system. If the battery gets low, the **red LED** lights up. The lamp should now be switched off and the storage batteries (function 2).



Recommendation:

For a better illumination of the working area it is recommended to put up the lamp with the strap. Thus the light beam is directed downward.

Solar Module Handling

Cleaning

Scratches and dirt on the surface of the solar cells must be avoided, since they directly affect the performance.

To clean the surface **only use pure water**. **Do not use cloth for drying.**

The cleaning may take place **only in the cold state** of the module (in the morning), otherwise there is a danger of destruction!

Keep connectors and sockets clean!



Alignment

Position solar cells of the module at a 90° angle to the sun. Align module about noon (12.00 h). Position can be maintained for the whole week. Use angle on the back of the module to bring it in the desired position.

Avoid shadow on the solar cells (e.g. by trees, houses) during the course of the day.

Note: High surface temperatures – up to 90°C! Don't touch!

Theft

To prevent theft it is recommended to store the module in a safe place.