

Instruction manual

Solar pond pump set

Napoli LED and Siena LED



These instructions relate **ONLY** to this product and contain important information for using the product for the first time. Please keep these instructions for later reference and should always accompany the product in the event of transference to a new user.

1. Introduction

Dear Customer, thank you for purchasing the solar pump kit. With this solar pump kit you purchased a product manufactured according to the current state of technology.

CE This product fulfils all requirements of the valid European and national regulations. The conformity was proved. The relevant declarations and documentation are deposited with the manufacturer.

To maintain this state and guarantee a safe operation, you as the user will have to follow this operating manual!

2. Safety Instructions



- In case of damages caused by not following this operating manual, the warranty rights will expire! We exclude liability for any consequential damages!
- We exclude liability for property or personal damages caused by inappropriate handling or not following the safety instructions.
- In these cases any guarantee rights will expire.

Due to safety and admission reasons (CE) it is not allowed to arbitrarily reconstruct and/or change the solar pump kit.

Therefore, please keep to the operating manual.

The accident prevention rules of the association of the industrial trade cooperative association for electric plants and working material are to be considered in industrial environments

3. Appropriate Use

- The pumping system is designed for the outdoor use in garden ponds. The accumulator storage is charged during sunshine. The solar pump may be switched "on" and "off" via a switch. An LED-display informs you about the charge condition of the accumulator.
- **Direct solar radiation is required for the correct function.**
- The pumping system is characterized by its easy assembly. Tools are not required for the assembly.
- The pump must not be used for the raising of drinking water.
- The performance may be adjusted via a controller on the pump.
- In order to avoid any disturbing gurgling, simply attach fewer standpipes to the pump.
- In order to safely interrupt the pumping it is required to interrupt the cable connection between solar module and pump.

4. Assembly/installation and start of operation

For the details of assembly/installation and start of operation, please see the instruction manuals of the accumulator box and the pond pump.

5. Service and Maintenance

In order to preserve the performance of the pump, it is required to wash out the pump and its parts with warm water depending on the pollution of the water.

For directions for the service and maintenance of the pump and accumulator storage, please see the instruction of the pump and accumulator storage.

Occasionally wipe the solar module clean with a soft and slightly moistened cloth.

Note: Before carrying out operations on the pump, interrupt the plug connection between pump and battery pack in order to avoid any unintentional starting during the operations.

6. Technical Data

Solar pumping system	Napoli LED	Siena LED
- System voltage:	12 -24 VDC	12 -24 VDC
Solar module		
- Nominal power:	10 Wp	20 Wp
- Nominal voltage:	17,5 V	17 V
- Nominal current:	580 mA	1,2 A
- Open-circuit voltage:	21,6 V	21 V
- Short-circuit current:	680 mA	1,32 A
- Projection system:	IP 65	IP 65
- Temperature range:	-30°C to +75°C	-30°C to +75°C
- Dimensions:	400 x 255 x 25 mm	520 x 355 x 25 mm

Water pump:		
- Operating voltage:	12 to 24 V DC	12 to 24 V DC
- Power consumption (12/24V):	3 W/ 12 W	5 W/ 22 W
- Max. delivery height (12/24V):	0,8 m/ 2 m	0,9 m/ 2,8 m
- Delivery rate (12/24V):	470 l/h/ 750 l/h	900 l/h/ 1500 l/h
- Protection system:	IP 68	IP 68
- Temperature range:	+4 to +40°C	+4 to +40°C
- Dry running:	dry protected	dry protected

Accumulator storage:		
- Accumulator (lead gel):	12V/ 7Ah	12V/ 7Ah
- Output voltage:	12 to 24 VDC	12 to 24 VDC
- Runtime with fully charged accumulator:	max. 6 h	max. 6 h
- Max. module capacity:	20 Wp (36 cells)	20 Wp (36 cells)
- Max. output current:	800 mA	800 mA

Attention: Do not put the housing into the blazing sun! Overheating risk!

LED Light ring:

- Activation:	via twilight sensor on the light ring	
- Illuminants:	6 LEDs	6 LEDs
- Operating voltage:	12 to 24 VDC	12 to 24 VDC
- Protection class:	IP 68	IP 68
- Operating temperature range:	+4 to +40°C	+4 to +40°C

Note: Protect the pump from frost!

In cold winter months, it is required to take the pump out of the water and store it in a warm place. The solar module may be left outside during the winter.

7. Safety Instructions:

DANGER for children! Keep children away from swallowable small parts (ascending pipe and sprinklers) and the packaging material. Danger of suffocation!

WARNING: risk of stumbling! Lay the connecting cable so that it will not become a trip hazard!

CAUTION Material damage! When setting up the solar module without module bracket, please pay attention to an adequate stability. The solar module may be damaged in case of tipping or in case of an impact of a foreign object.

Disposal instruction for electric appliances:

Dear customer, if you want to get rid of the article, please dispose it according to the current regulations. The municipal authority will provide you with information.



Customer support:

If you have problems or questions regarding this product, simply contact us!

Monday to Friday 9 am to 12 noon and 1 pm to 4 pm.

By phone: +49 9605-92206-0

By e-mail for ordering spare parts: ersatzteil@esotec.de

By e-mail for questions about the product: technik@esotec.de

Product manufacturer item No.:

solar pump system Napoli LED: 101773

solar pump system Siena LED: 101780

Manufacturer:

esotec GmbH

Gewerbegebiet Weberschlag 9

D-92729 Weiherhammer

Tel.-Nr: +49 9605-92206-0

Fax.-Nr: +49 9605-92206-10

e-mail: info@esotec.de

Internet: www.esotec.de

Additional parts:

5 m extender cable for water pump and solar module: 101738

5 m extender cable for fountain light: 101740

Operating manual

solar battery station 12 V/ 7 Ah



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Product: Manufacturer Item No.: 101815

These instructions relate **ONLY** to this product and contain important information for using the product for the first time. Please keep these instructions for later reference and should always accompany the product in the event of transference to a new user.

1. Introduction

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3. Intended Use

- The accumulator station may be used in the esotec pump systems Verona, Toscana, Napoli, Napoli LED, Siena and Siena LED.
- The accumulator station is installed between pump and solar module.
- The pump may be switched-on or –off via a switch.
- Via a controller, the operating voltage of the pump may be adjusted to 12 and 24 V.
- Operation of the pump optionally via timer or permanent operation
- The integrated accumulator is protected against deep discharge, overcharge and short circuit.
- Two LEDs provide information about the state of charge and charging of the accumulator.
- The system is plug-in ready and set up within minutes.

Note: The accumulator station must not be positioned and set up in the blazing sun or in the water.

3.1 Mode of operation:

The accumulator station is interconnected between the solar module and the pond pump.

With optimal solar radiation, the solar module generates more electric energy than required by the pond pump. The excess energy is then stored in the accumulator and will be available to the pond pump when it is shady or dark outside.

The pump is switched-on and the green LED „System“ is illuminated if the accumulator voltage is within its operative range. The pump is switched-off and the red LED „System“ is illuminated if the accumulator is discharged.

The electronics protects the accumulator against deep discharge or overload. The charge of the accumulator has always priority.

3.2 Operational Behavior:

In the morning, the discharged battery is charged via the solar module. A charging timer is started as soon as the battery reaches the voltage of 12,7 V and the battery is charged fully for another 120 minutes. The LED „System“ flashes every 10 seconds for 2 times red/green. The output is switched on after this time.

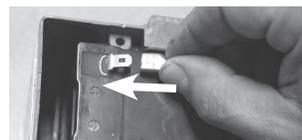
In the evening and with decreasing solar radiation, the pump is increasingly supplied with energy by the accumulator. The system will run until the accumulator has reached its deep discharge threshold (approx. 11,7 V). The pump and the LED illumination are switched-off automatically and the red LED „System“ is illuminated.

Then, the accumulator is again charged via the solar module the following morning. **This process may take several hours depending in the solar radiation.**

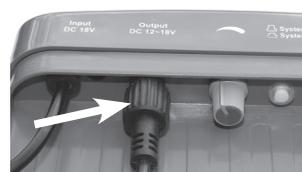
The output voltage of the accumulator station may be adjusted via the controller on the front side. In times with little sunshine, the controller should be adjusted to the lowest setting.

4. Assembly/installation and start of operation

1. Loosen the screws on the underside of the housing and remove the cover from the battery box.
2. Place the electrical connector on the red (brown) cable onto the positive terminal of the rechargeable battery.



3. Completely unroll the cable at the pump.
4. Insert the plug on the pump cable in the built-in socket „OUTPUT DC 12-24 V“ at the accumulator station. Screw the cap nut tight. Please make sure that the switch is in OFF position.



5. Completely unroll the cable at the accumulator station.

6. Insert the cable with the socket into the plug of the solar module. Screw the cap nut tight.



7. Put the pump into the pond. Please pay attention to the operating manual of the pump. It contains important notes regarding the start of operation and maintenance.

8. Put the switch „System“ into the position „ON“. The battery is discharged if the LED „System“ is illuminated red. Here, please pay attention to item (3.2). The output is switched on and the pump is working if the LED „System“ is illuminated green.



9. The operating voltage of the pump may be adjusted to 12V and 24 V. This is done by means of a controller. Thus, the power of the pump is adjustable.

Note: Full power should only be chosen in high summer. The increased power consumption leads to a reduction of the maximum operating time of the accumulator.



Note: The plugs and sockets are protected against inverse polarity. Do not apply force when inserting the plugs. The glass of the solar module is fragile.

Note: The accumulator station must not be set up in the blazing sun.

5. Operating mode of the accumulator station

5.1 Settings via „System“ pressure switch:

1. **Position ON :** If the built-in accumulator has the correspondingly high voltage, the pump starts to run (LED „System“ is illuminated green) and the accumulator is charged if excess energy is available. In case the capacity of the solar module should now be reduced due to clouds, the pump will be supplied with energy via the accumulator. In the evening, the pump will still run for some time until the control deactivates the accumulator (LED „System“ is red illuminated).



2. **Position OFF :** The pump is switched-off . The accumulator is charged via the solar module and the electric energy is stored. The LED „System“ is not illuminated.

Note: In case you would like to achieve a particularly long operating time in the evening, then set the switch to its “OFF” position during the day and to its “ON” position in the evening.

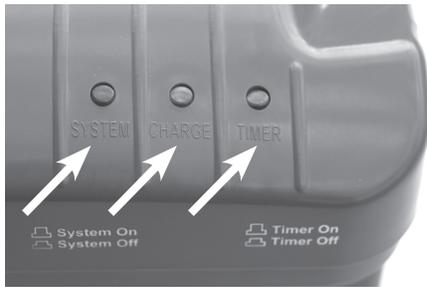
Note: In high summer and in case of a high solar radiation, we recommend leaving the switch in its „ON“ position. Thus, you will achieve the maximum possible runtime of the pump.

5.2 Timer operation:

Via the pressure switch “Timer On”, “Timer Off” it is possible to operate the battery station by means of the timer function. The function is active when the switch is pressed. The green LED „Timer“ is illuminated while the output is switched on and it is flashing during the waiting period. The pump is working for approx. 10 minutes every hour.

Note: This function shall particularly be used in case of weak solar radiation or for a longer overshoot time at darkness.





6. LED Indicators

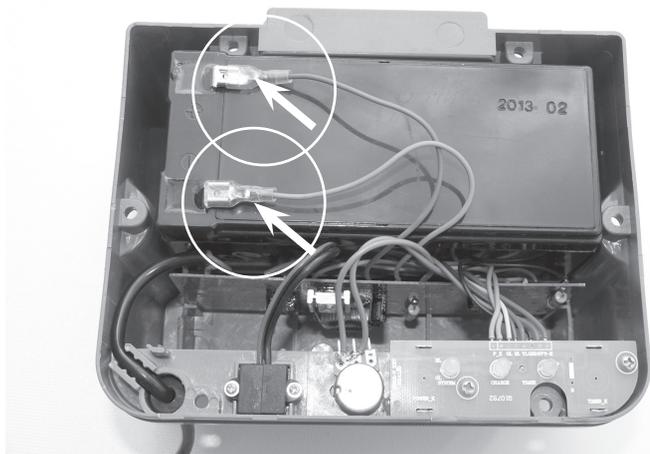
LED „SYSTEM“

- green:** Battery charged and outputs may be switched on.
- red/ green flashing:** Battery in end charging process. See item: 3.2
- red:** The battery is discharged and the outputs are switched off.

LED „CHARGING“: yellow: Battery charging

LED „TIMER“: green: Output is activated
green flashing: Output is switched off, Timer is running.

7. Exchange of the accumulator



We recommend to exchange the accumulator approx. every 2 years. A new identical in construction accumulator is available from the manufacturer or dealer.

Proceed as follows if you want to exchange the accumulator:

1. Set the switch „System“ into the position „OFF“ and unplug the module and the water pump from the accumulator station.
2. Turn the accumulator station upside down and loosen the screws on the bottom frame of the accumulator box and carefully remove the cover.
3. Unplug both cables from the accumulator (see picture above). Please memorize the color of the cables for the **positive pole = brown** and **negative pole = blue**.
4. Remove the accumulator from the housing and insert the new identical in construction accumulator.
5. Reattach the cable lugs on the poles of the accumulator with correct polarity. Cable color for the **positive pole = brown** and **negative pole = blue**.
6. Close the housing in reverse order.
7. Connect the pump again and set the switch „System“ into the position „ON“

Note: Please only use an identical in construction accumulator with identical voltage and capacity.

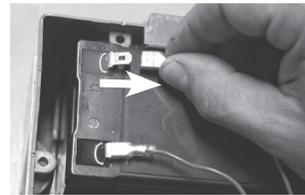
Note: The old accumulator has to be disposed of in an environmentally sound way. For this purpose, please contact your local authorities, public collection points or your dealer.

8. Storing throughout the winter

Completely charge the rechargeable battery in the battery box. Use a sunny day to do this and disconnect the battery box.

After charging disconnect the cable from one terminal of the rechargeable battery.

To do this open the housing as described in Section 7. The battery box should only be stored throughout the winter in a fully charged condition and in a frost free room.



9. Troubleshooting

LED does not light green in spite of solar radiation but the yellow LED is lit up.

1. The accumulator has not yet been charged sufficiently and the restart threshold is not reached. The charging process may take several hours in case of insufficient solar radiation See item 3.1 and 3.2.
2. Accumulator is exhausted! The accumulator should be exchanged approx. every 2 years. Please see item 7 of this instruction.

The LED is not illuminated green. In spite of solar radiation when switching-off and on again of the switch „System“, the pump starts to work and the green LED is illuminated.

1. The accumulator has not yet reached its restart threshold. The electronics is reset after the deactivation and activation of the system and the system starts to work without waiting for the restart threshold. This is a normal process and does not indicate any defect.

If the SYSTEM indicator shows GREEN, and the pump still does not work, please check the possible failures below:

1. Check if the “Timer On/Off” switch is on. Please note, in this mode, the pump runs intermittently.
2. The pump is blocked, clean the pump by referring to pump manuals.

10. Technical data:

- Accumulator voltage: 12 V
- Accumulator capacity: 7 Ah
- Deep discharge protection: approx. 11,7 V
- Voltage threshold for restart: approx. 12,7 V
- Output voltage: 12 - 24 V DC (adjustable)
- Max. load (output): 20 W
- Max. connectable module capacity (input): 20 Wp
- Protection: IP 44
- Protection class: III
- Temperature range: -15°C to +30°C

WARNING of trip hazard! Lay the connection cable so that it does not constitute a trip hazard.

Battery take-back

- Batteries must not be discarded into domestic waste.
- The consumer is legally required to return batteries after use, e.g. to public collecting centers or to battery distributors.
- Contaminant-containing batteries are labeled with the sign “crossed-out trashcan” and one of the chemical symbols. Used batteries should be disposed environmentally friendly and should not be discarded into domestic waste. Your dealer is legally required to take back old batteries.



Disposal:

Dear customer, please cooperate in avoiding waste. When you intend to dispose of the product in future, please consider that it contains valuable raw materials suited for recycling. Therefore, do not dispose it of with domestic waste but bring it to a collection point for the recycling of waste electrical and electronic equipment. Thank you very much for your cooperation!



Manufacturer:

esotec GmbH - Gewerbegebiet Weberschlag 9 - D-92729 Weiherhammer
 Tel.-Nr: +49 9605-92206-0 Fax.-Nr: +49 9605-92206-10
 Internet: www.esotec.de e-mail: info@esotec.de

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Customer support:

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 By phone: +49 9605-92206-0
 By e-mail for ordering spare parts: ersatzteil@esotec.de
 By e-mail for questions about the product: technik@esotec.de
Product: Manufacturer Item No.: 101757

These instructions relate **ONLY** to this product and contain important information for using the product for the first time. Please keep these instructions for later reference and should always accompany the product in the event of transference to a new user.

1. Introduction

Dear Customer,
 Thank you for purchasing the solar light. With this solar light you purchased a product manufactured according to the current state of technology.

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To maintain this state and guarantee a safe operation, you as the user will have to follow this operating manual!

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3. Intended use

This submersible pump is designed for pumping water in garden ponds, fountains, water dishes, etc. It can pump water through a hose connection or can be operated through attached lifting tubes with water sprinklers.

A solar module or a power pack with a voltage of 12 to 24 volts can be used as the energy source. When used with a solar module, the pump works only if enough solar radiation strikes the solar module.

A battery box (accessory) is delivered along with this pump. When battery is on, an LED light (accessory) can be attached to the lifting tube. This gives the fountain a decorative lighting. The LED light rings are available in different colours.

The delivery rate of the pump can be adjusted using the regulator on the front side of the pump. The water pump has no On/Off switch. As soon as the pump is connected to its power supply, it starts pumping water.

4. Installation and commissioning

1. Roll out the connecting cable of the pump completely.
2. Ensure that the cap is firmly in place on the socket.
3. Place the pump in water (please note Point 5 here).
4. Connect the lifting tubes till they project out of the water surface. For this, first attach the reducer to the pump.
5. You can now choose from 2 different water nozzles.
6. Alternatively, the pump can also be used for pumping water through a hose. For this, you just have to attach a hose to the pump's pipe.
7. Now supply power to the water pump through a solar module. Use the enclosed plug with cable (brown = positive pole, blue = negative pole) for this. If you have purchased this pump as a complete solar power system, then the appropriate plug is already attached to the solar module.



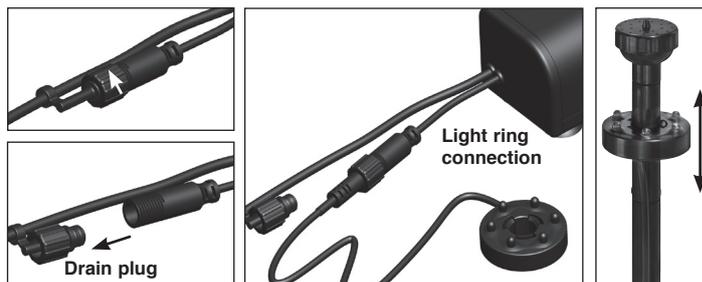
Note: The plug has reverse-polarity protection, no force should be used while inserting. The glass of the solar module is fragile. Caution! Risk of injury! A broken module cannot be repaired again and must be disposed off in an environmental-friendly way.

8. If the pumping capacity is too high, you can reduce the amount of water. Simply turn the regulator on the front side of the pump in clockwise direction. Please do not use force while adjusting. The adjustment range is 45°.

4.1 Operation with LED light ring

The accessories include a LED light ring. This light ring can be easily slipped onto the lifting tube.

Electrical connection is established via the socket on the pump. For this, remove the drain plug, insert the light ring plug in the socket and tighten the cap nut firmly. Depending on the model, the lighting is activated/switched-on immediately or via a twilight sensor.



5. Dry run protection

The pump is equipped as standard with a dry run protection. Two sensor points are provided on the side of the housing for this. The pump works if these points are under water. If a point projects out of the water, the pump does not work.



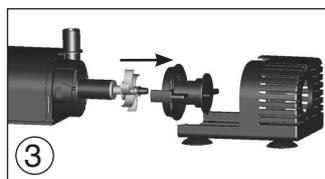
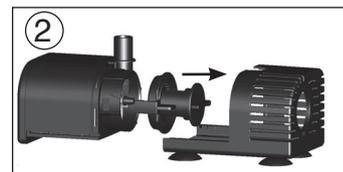
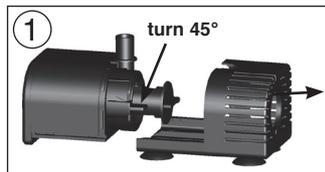
6. Care and maintenance

For optimum performance of the pump, it must be washed occasionally with warm water depending on the water contamination. To wash the pump, open the housing as follows:

Note: Please do not use force while dismantling or assembling the pump. The parts are very fragile and can break easily.

1. Disconnect the pump's plug.
2. Pull the front cover of the pump forward like a slide gently (Figure 1).
3. Turn the front cover of the pump by about 45° clockwise (Figure 1) and carefully pull the cover forward (Figure 2). Watch out for the plastic shaft and the seal while doing this.
4. Carefully drag the impeller out of the pump (if necessary, use pliers). (Figure 3).
5. Now clean all the parts carefully with warm water.
6. Then plug the shaft with the impeller carefully into the hole of the pump. Ensure that the shaft is fitted firmly.
7. Now place the cover carefully over the pump. Ensure that the seal is fitted properly.
8. Turn the front cover again by 45 degrees counter-clockwise into the starting position.
9. Slide the lower part of the pump completely into the pump housing.

The pump is ready to use again.



7. Malfunction

Pump is not pumping water

- Is the pump completely submerged in water? Dry run protection (Point 5)
- Is the polarity of the supply voltage reversed? Cable colour brown = + pole, blue = negative pole
- Is the pump dirty? Cleaning the pump, see Point 6.

8. Technical data

Operating voltage:	12 - 24 V DC
Degree of protection:	IP 68
Power consumption:	Approx. 3 W at 12 VDC - approx. 12 W at 24 VDC
Pump lift:	Max. 0.8 m at 12 VDC - max. 2 m at 24 VDC
Delivery rate:	Max. 470 l/h at 12 VDC - max. 750 l/h at 24 VDC
Operating temp. range:	+4 to +40°C

Note: The pump is only suitable for pumping water.

Note: Protect the pump from frost!
 During cold winter months, the pump must be taken out of the water and placed/ stored in a warm area. The solar module can spend the winter outdoors.

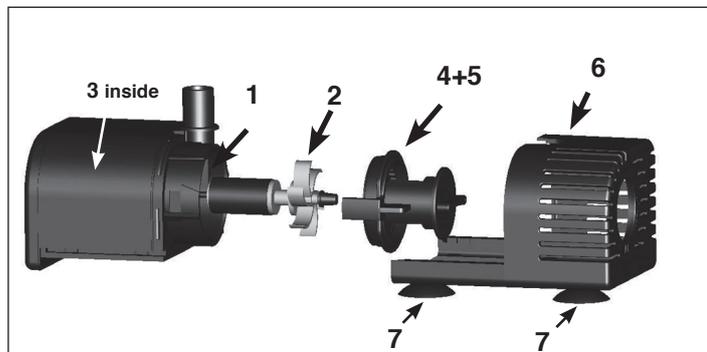
9. Safety information:

DANGEROUS for children! Children could easily swallow the small parts that come with this pump and its packaging material. Please keep at a safe distance. These parts could otherwise lead to choking or suffocation!

WARNING against danger of stumbling! Lay out the connection cable such that it does not create the threat of tripping or stumbling!

CAREFUL: material damage! If you set up the solar module without a module holder, you must make sure that it is sturdy enough to retain its position. If the module falls down or a foreign object hits against it, the solar module can be damaged.

10. Spare parts



- | | |
|--|------------------|
| 1. White ceramic shaft: | Item No.: 911020 |
| 2. Pump impeller: | Item No.: 911021 |
| 3. Internal rubber bush: | Item No.: 911022 |
| 4. Front cover: | Item No.: 911023 |
| 5. Seal for cover: | Item No.: 911024 |
| 6. Sliding carriages with suction bases: | Item No.: 911025 |
| 7. Suction bases (4 pieces) | Item No.: 911026 |
| 8. Complete nozzle set: | Item No.: 911027 |

Manufacturer/Importer

esotec GmbH - Gewerbegebiet Weberschlag 9 - D-92729 Weiherhammer
Tel.-Nr: 09605-92206-0 - Fax.-Nr: 09605-92206-10 - Internet: www.esotec.de

Disposal:

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11. Accessories

11.1 Extender cable (5 m) for water pump

Item-no: 101738



11.2 Battery box 12 V/ 7 Ah

Item-no: 101815



- The battery station can be used in the esotec pumping systems Verona, Toscana, Napoli, Napoli LED, Siena and Siena LED.
- The accumulator box is installed between pump and solar module.
- The pump may be switched-on and -off via a switch.
- The installed accumulator is protected against under- and overcharge.
- LEDs inform you about the condition of the accumulator.
- The system is ready to plug-in and is set up in a matter of minutes.

11.3 Light rings (only in combination with battery box)



- | | |
|---|-----------------|
| LED light ring white (with 6 weißen LED's) | Item-no: 101790 |
| LED light ring yellow (with 6 yellow LED's) | Item-no: 101791 |
| LED light ring blue (with 6 blue LED's) | Item-no: 101792 |
| LED light ring green (with 6 green LED's) | Item-no: 101793 |
| LED light ring red, green, blue (with each 2 LED's) | Item-no: 101794 |

5 m Extender cable for light rings

Item-no: 101740