

Operating manual

Accumulator box „proBatt 12/24-L“



Customer support:

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

Internet: www.esotec.de

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.: 101555

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. Intended Use

- The accumulator station can be used universally for the energy supply of pumps and illumination during the day and at night.
- The accumulator station has 3 switchable outputs each with an output voltage of 12 V DC.
- The accumulator station has different operating modes.
- The accumulator station is switched off and on via a switch. The accumulator is further changed in a switched off state.
- All outputs are protected against overload and short-circuit.
- LEDs provide information about the state of charge and the charge of the accumulator as well as about the status of the outputs.
- The system is ready-to-plug-in and set up in a matter of minutes.

Note: The accumulator station must not be set up in the blazing sun or in the water. It is designed in IP 44 (splash-proof).

Mode of Operation of the Accumulator Station:

The accumulator station is interconnected between (a) solar module(s) and the corresponding devices.

**>> Before first use, please screw in the fuse!
See item 4.1 of those instructions! <<**

Under solar exposure, the solar module generates electrical energy and charges the installed accumulator. The connected consumers are switched on as soon as the accumulator voltage is in an operational range. The LED „SYSTEM“ provides information about the state of charge of the accumulator.

The charging electronics protects the accumulator against total discharge, overcharging or short circuit.

In case of a discharged battery in the morning, the charging of the accumulator always has priority over the operation of the consumers. Only a fully charged battery has a long service and operational life!

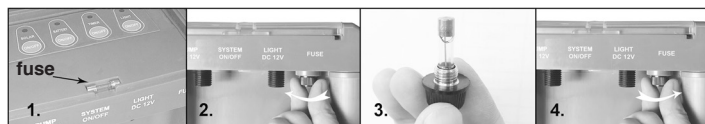
4. Assembly and Start-up

4.1 Inserting of the Fuse

Before you install the accumulator station, you have to insert the fuse according to the following steps:

1. Open the transparent plastic lid and take out the fuse inserted in the bracket (illustration 1).
2. Turn the fuse bracket at the bottom of the lid anticlockwise and take it out (illustration 2).
3. Insert the fuse into the fuse bracket (illustration 3).
4. Now screw the fuse bracket clockwise back into the bracket (illustration 4).

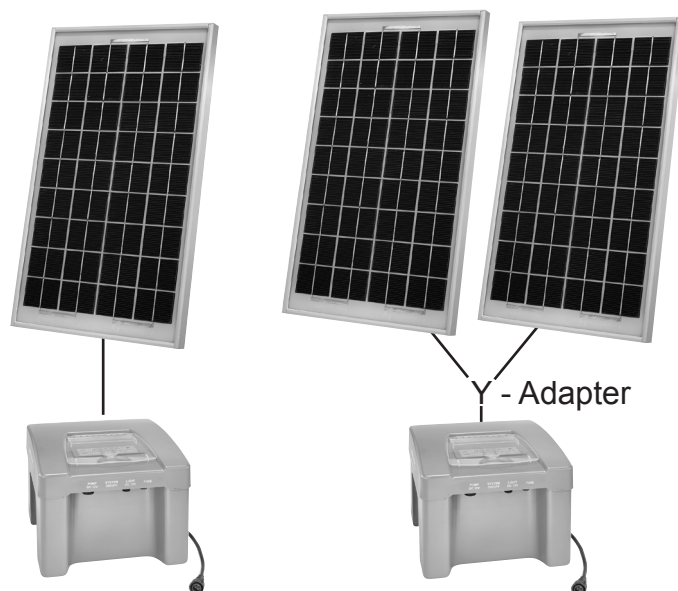
The accumulator is now connected to the electronics and you can continue with the putting into operation of the accumulator station.



4.2 Connecting the Solar Module

A maximum of 150 Wp of solar module capacity may be connected to the accumulator box. The solar module is connected at the cable on the backside of the accumulator box. A 5m extension cable for this cable is included in the set.

Depending on the version, you may connect one or several solar modules to the accumulator station. A single solar module may directly be connected to the accumulator box with the plug. A Y-distributor is required if you intend to connect 2 solar modules (e.g. 2 pieces 50 Wp). Via the Y-distributor, both solar modules are joined and then connected to the accumulator station.



If required, the cable may be extended by another 5 m extension cable.

Note: The plug connections are protected against reverse polarity. Please do not apply force when you connect them!

As soon as the solar module is connected and sunlight falls onto the solar module, the LED „Charging“ will light up in yellow. The accumulator is also charged in a switched off status!

Please note that the solar modules are positioned shadow-free directed towards the south and that they are mounted in a stable way.

Attention: Please pay attention to the maximum connectable solar module capacity. The electronics in the accumulator box will be destroyed if this capacity is exceeded!

4.3 Connecting the Consumers

The accumulator box has 3 outputs. One output „PUMP“ DC 12V, one „LIGHT“ DC 12 V and one switchable „EXTRA“ with 12 VDC.

The output „Pump“ may be used to connect a solar pump from our product range. The output is activated depending on the chosen operating mode.

The output „LIGHT“ may be used to connect LED lamps such as light rings, spotlights and underwater spotlights. This output is switched on by the „LIGHT“ button and 2 different operating modes can be selected.

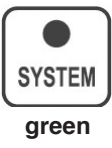

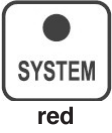
The output „EXTRA“ may be used to connect devices with a maximum power consumption of 12 VA. The output is switched via the button „EXTRA ON/OFF“ on the back!

4.4 Main Switch „SYSTEM“

Press the switch „SYSTEM ON/OFF“ to the position „ON“ to switch on the accumulator box; the LED indicator „SYSTEM“ may indicate in red during the first start-up. That means that the accumulator is discharged and currently not ready for operation! In this case, it is required to fully charge the accumulator. This is done simply by connecting of the solar module(s) and one day of sun exposure. Then, the indicator „SYSTEM“ is illuminated in green and the accumulator is ready for operation.

4.5 Indicator „SYSTEM“

The system LED indicator only works in a switched on state. The color of the LED provides information about the state of the accumulator!

	The accumulator is charged and ready for operation!
	The accumulator is in charging mode! The accumulator is ready for operation upon expiry of the charging timer (120 min.)!
	The accumulator is discharged! Wait for sunshine until the accumulator is fully charged again.

4.6 Connecting the Consumers

The accumulator box has 2 outputs. Those may be operated via different operating modes.

Below, every output is described individually. Output 2 is equipped with a protective cap. It has to be removed before connecting the consumers.

Note: The plug connections are protected against reverse polarity. Please do not apply force when you connect them!

- Connection „PUMP“ DC 12 V

Output voltage: 12 VDC, max. current load: max. 4 A/ 48 W

This output is used to supply pumps with energy. The output is controlled respectively switched according to the set operating mode!

- Connection „LIGHT“ DC 12 V

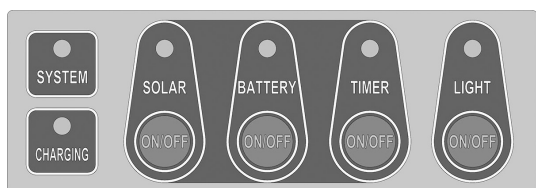
Output voltage: 12 VDC, max. current load: 1 A/ 12 W

This output is used to supply LED lights. Those are either light rings for pumps, LED underwater spotlights or other LED spotlights for outdoor illumination. This output can be set to 2 different operating modes.

Note: The outputs are connected by means of system plugs. Corresponding distributors and/or extensions are available as accessories. The protective caps at the plug-in connections have to be tightened. Not used outputs have to be closed by means of the corresponding protective caps. The plugs are protected against reverse polarity. Please do not apply force when plugging in!

4.7 Operating Modes for the Pump Output


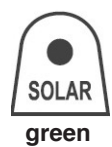
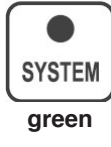
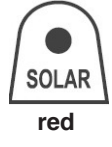

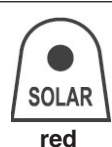

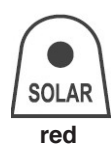
3 different operating modes are available for the pump output. They may be chosen by gently pressing onto the membrane keyboard on the accumulator box. The operating mode is then switched off by pressing the keyboard again. Gently pressing also enables a changing between the operating modes. A LED indicator provides information about the operating status.



- Operating Mode „SOLAR“

This operating mode is chosen by pressing the button „Solar ON/OFF“. In solar mode, the installed accumulator is first fully charged with solar energy. After the charging, the energy of the solar module is directly forwarded to supply the pump and the connected pump is supplied in direct operation. The installed accumulator remains fully charged and is not stressed.






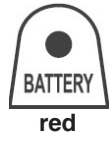
LED Display Combinations Operating Mode „SOLAR“

		The solar module is exposed to sunshine and the accumulator is charged sufficiently, the solar module operates the pump and charges the accumulator with excess energy until no sunlight is available. The accumulator always remains fully charged.
		The solar module is in the shadow or in the darkness while the accumulator is charged sufficiently. The pump stops its operation without consuming the energy stored in the battery. The operation of the pump is taken up when sunshine is available again. The accumulator always remains fully charged.
		Short circuit on the output! After the short circuit is eliminated, the output will again automatically be activated after a couple of seconds!
		The accumulator is weak and the solar module first charges the accumulator with its entire energy without operating the pump! The LED indicators „SYSTEM“ and „SOLAR“ are flashing green as soon as the accumulator is charged sufficiently.

- Operating Mode „BATTERY“

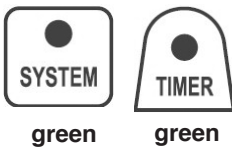
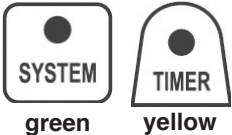
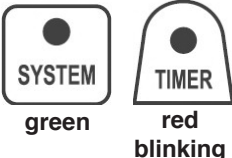
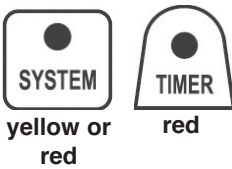
This operating mode is chosen by pressing the button „BATTERY ON/OFF“. In battery mode, the charging of the installed accumulator has priority. The pump output is activated after the accumulator is fully charged. The connected pump is then supplied with energy via the accumulator. When the sun shines onto the solar module, the accumulator is charged via the solar module and the excess energy is directly delivered to the pump. If the solar module is in the shadow or at night, the pump is supplied with energy by the accumulator until the accumulator is discharged.

LED Display Combinations Operating Mode „BATTERY“

		The accumulator is fully charged and the pump starts to work. The energy for this purpose is taken from the accumulator. The solar module continues to charge the accumulator while the sun is shining. After the accumulator is discharged, the LED indicators of SYSTEM and BATTERY switch to red and the pump stops its operation.
		Short circuit on the output! After the short circuit is eliminated, the output will again automatically be activated after a couple of seconds!
		The accumulator is weak and the pump doesn't work. The accumulator has to be recharged by the solar module.

- Operating Mode „TIMER“

This operating mode is chosen by pressing the button „TIMER ON/OFF“. After having pressed the timer button, the pump output is activated for 4 h. After this countdown, the pump output is switched off and reactivated at the same time after 20 h.

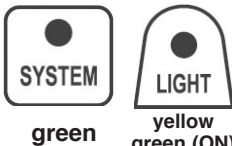
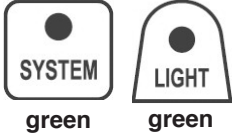
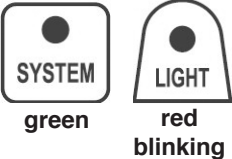
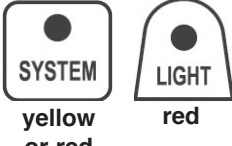
 <p>SYSTEM green</p> <p>TIMER green</p>	<p>The accumulator is sufficiently charged and the pump runs for 4 hours before the timer has expired and the TIMER indicator changes to yellow. The operation of the pump is taken up again daily at the same time until the SYSTEM indicator remains on green.</p>
 <p>SYSTEM green</p> <p>TIMER yellow</p>	<p>The accumulator is charged sufficiently but the timer has expired, the pump stops working and waits for the next round of operation.</p>
 <p>SYSTEM green</p> <p>TIMER red blinking</p>	<p>Short circuit on the output! After the short circuit is eliminated, the output will again automatically be activated after a couple of seconds!</p>
 <p>SYSTEM yellow or red</p> <p>TIMER red</p>	<p>The accumulator is weak and not yet ready for operation! The TIMER LED remains red even if the TIMER begins with the countdown for 4 hours and the pump doesn't work due to the weakly charged accumulator. The TIMER LED changes to yellow after the timer time has expired.</p> <p>When the accumulator was sufficiently charged prior to the expiry of the timer time, then both LED indicators will flash green and the pump commences its operation.</p> <p>When the accumulator was sufficiently charged after to the expiry of the timer time, then the SYSTEM LED changes to green, the timer mode indicator to yellow and the pump rests and waits for the next round of operation.</p>

Note: When no operating mode is activated, then the output „PUMP“ is switched off and the entire energy of the solar module flows into the accumulator.

- Output „LIGHT“

The light output is activated by pressing the „**LIGHT ON/OFF**“ button. Two operating modes can be selected for the light output.

1. „**Night mode**“, the light output is only activated in darkness. The output voltage of the solar module serves as the twilight sensor. If the solar module is dark, the light output is activated. If it becomes light, the light output is switched off with a delay of approx. 1 minute.
2. „**Day Mode**“, the light output is always activated, independent of the output voltage of the solar module.

 <p>SYSTEM green</p> <p>LIGHT yellow green (ON)</p>	<p>The operating mode (night mode) is activated! The battery is sufficiently charged, but the solar module is still in brightness or sun. The „Light“ LED lights up yellow. As soon as the solar module goes dark, the light output is activated and the „Light“ LED lights up green!</p>
 <p>SYSTEM green</p> <p>LIGHT green</p>	<p>The operating mode „Day-Mode“ is activated. The battery is sufficiently charged and the light output is permanently activated as long as the battery is charged.</p>
 <p>SYSTEM green</p> <p>LIGHT red blinking</p>	<p>Short circuit on the output! After the short circuit is eliminated, the output will again automatically be activated after a couple of seconds!</p>
 <p>SYSTEM yellow or red</p> <p>LIGHT red</p>	<p>The accumulator is discharged! The light output cannot be activated.</p>

- Output „Extra Output“ on the back side

This output is switched by pressing the button „**EXTRA ON/OFF**“. Consumers with open cable ends may be supplied with 12 V at this output. This output can bear a maximum load of 1 A (12 W) and is short circuit protected. This output is protected by a plastic cap. For notes regarding the installation, please see illustration 7!

5. Short Circuit Protection

All outputs are protected against short circuit. In case of any short circuit, the respective output is switched off and the LED above the output flashes red. ! After the short circuit is eliminated, the output will again automatically be activated after a couple of seconds.

6. Charging Process of the Accumulator

In order to reach the longest possible service life of the installed accumulators, please treat this accumulator as gently as possible. If the accumulator was discharged the evening before, then the LED „**System**“ flashes red and the outputs are switched off.

In the morning and when the sun is shining, the charging of the accumulator will then have priority. As soon as the accumulator is charged, the „**Charging**“ LED will light up yellow. The charging timer is started when the accumulator reaches the voltage of 12.7 V and the accumulator will be fully charged for another 120 minutes. The LED „**System**“ flashes yellow. The outputs are automatically switched on after the expiry of those 120 minutes.

7. What to do during the Winter

Fully charge the accumulator in the accumulator box. Use a sunny day for this purpose and put the switch „**SYSTEM ON/OFF**“ in the position „**OFF**“.

Only store the accumulator box (during the winter) in a fully charged state in a frost-free room. At sunny days, the accumulator box may occasionally be connected to the solar module for charging purposes. This enables an as long as possible lifetime of the accumulator.

If you want to operate the accumulator box during the winter, e.g. in connection with a pond aerator or a string of LED lights (available as accessories), then it is possible to store the box outdoors. Please pay attention to the fact that the site is free of snow and that the accumulator box is not under water when thawing begins. A frost protection for the accumulator box would be advantageous (e.g. installation in the garden hut).

8. Problems

Problem:	Remedy:
LED „SYSTEM“ flashes yellow and won't get green despite insolation!	The accumulator is not charged sufficiently and has not achieved the restart threshold. The charging process may take several hours when the insolation is insufficient. (see item 5).
LED does not shine green despite insolation; when the switch „SYSTEM ON/OFF“ is switched off and on again, the pump starts to run and the green LED shines.	The accumulator had not yet achieved its restart threshold. After the switching off and on of the system, the electronics is reset and the connected consumers are supplied with energy without waiting for the restart threshold. This is an absolutely normal process and does not constitute a defect (please see item 5). However, this method should not be applied because it has negative effects on the lifetime of the accumulator.
The LED above the output flashes red.	1. There is a short circuit or overcharge at the output. Please check the connected device and all plug-in connections (in particular the pumps and the LED lighting) for tightness. Humidity may cause a short circuit! 2. Check the cables for damages.
The yellow LED „CHARGING“ shines but nothing else works.	Is the switch „ SYSTEM ON/OFF “ switched on (position ON)?
Nothing shines although the button SYSTEM ON/OFF is pressed!	1. Was the fuse inserted during the initial start-up? Please see item 4.1? 2. If the fuse inserted but nothing else shines, then the fuse may be defective. Please exchange the fuse for a new fine wire fuse with the value F15A.
The light does not switch off in the operating mode „Night-Mode“ when the solar module is bright!	A delay time of 1 minute is built in. If the solar module becomes bright, it takes approx. 1 minute until the light output is switched off. This prevents unwanted flashing or flickering of the light output when the solar module is briefly illuminated, e.g. by a spotlight.

9. Technical Data:

Input

- Max. module capacity: 150 Wp (18 VDC)
- Charging timer: 120 Min.
- Protection type: IP 44
- Protection class: III
- Temperature range: -15 to +30°C
- Accumulator: PB 12 V/ 24 Ah
- Fuse value: F15 A
- Replacement accumulator (www.esotec.de): 901030 (Pb 12 V/ 24 Ah)

Outputs:

- Pump: DC 12 V/ max. 4 A/ 48 W
- Light: DC 12 V/ max. 1 A/ 12 W
- Extra: DC 12 V/ max. 1 A/ 12 W

Extension cables:

- 5 m extension cable solar module: 101736
- 5 m extension cable "Pump"-output: 101738
- 5 m extension cable "Light"-output: 101740

WARNING OF TRIPPING HAZARD! Route the power supply cable in a way that prevents any tripping hazard!

10. Exchanging the Accumulator

We recommend exchanging 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. Put the main switch (SYSTEM ON/OFF) at the front side of the accumulator box in the position „OFF“ and unplug all plugs. (illustration 1).
2. Turn the accumulator station upside down and loosen the bottom four screws (2 on each side) (illustration 2).
3. Then turn the accumulator box back again and carefully remove the lid.
4. Loosen the + Pole and - Pole connection on the accumulator (illustration 3).
5. Remove the accumulator from the case and insert a new identical in construction accumulator.
6. Reconnect the connection cable with the accumulator with the correct polarity (illustration 4). In doing so, please pay attention to the color of the cables: positive pole (red) and negative pole (black).
7. Close the case in reverse order (illustration 5).
8. Plug the connectors of the pump and the light into the accumulator box and switch the main switch (SYSTEM ON/OFF) at the front of the accumulator box to the position „ON“ (illustration 6).

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.

11. 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!



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.



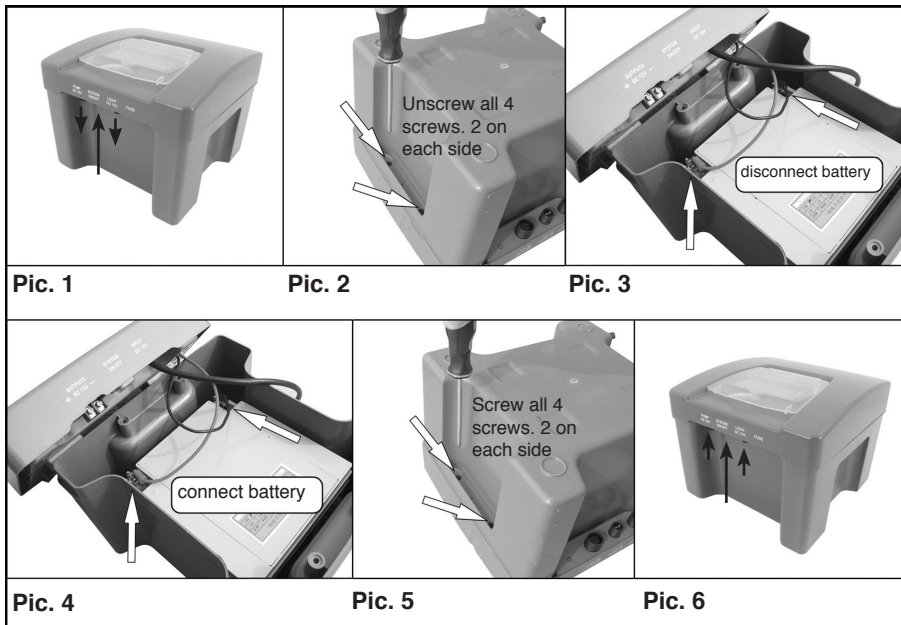
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Pic. 7 Connecting EXTRA Output

